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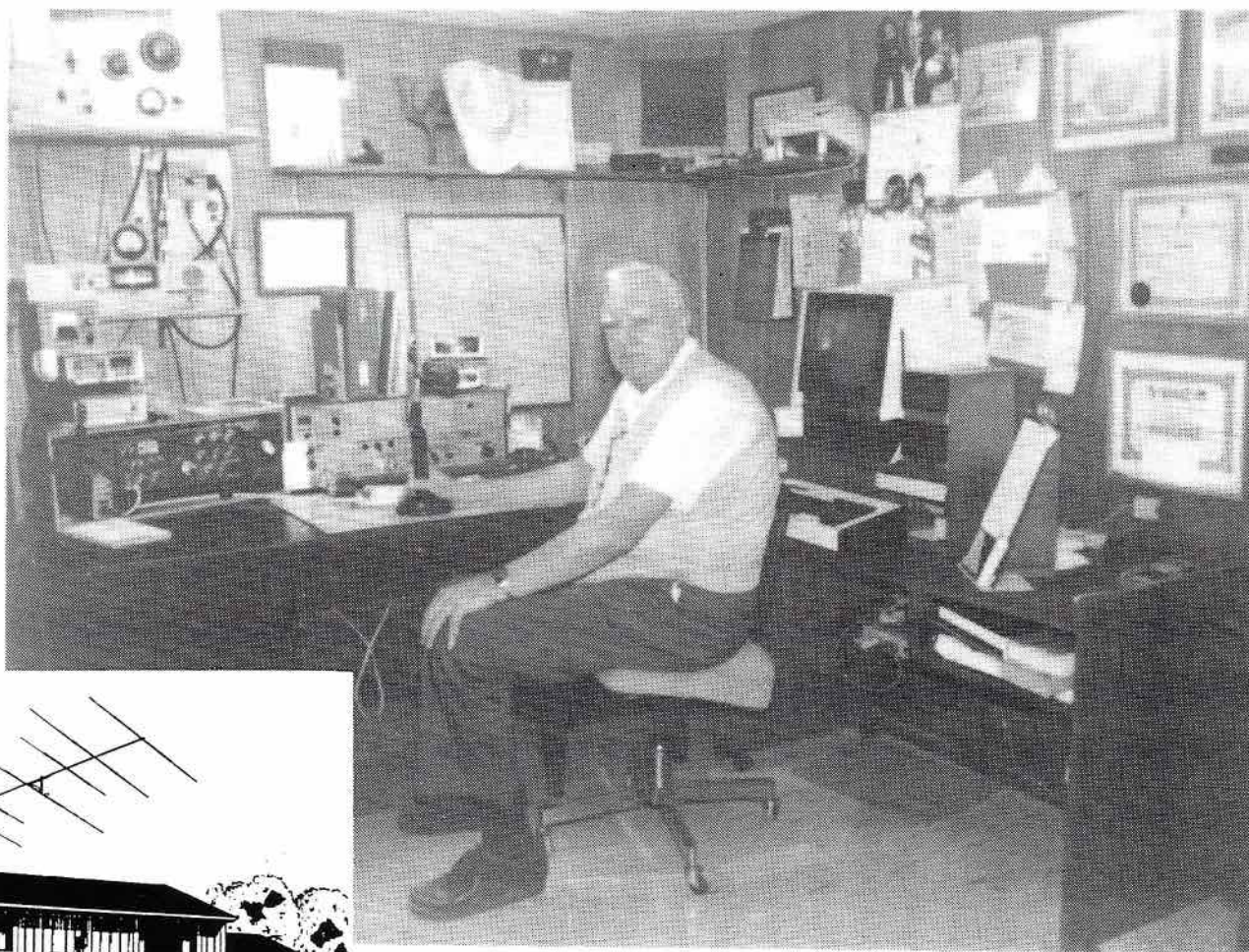
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THE CANADIAN AMATEUR

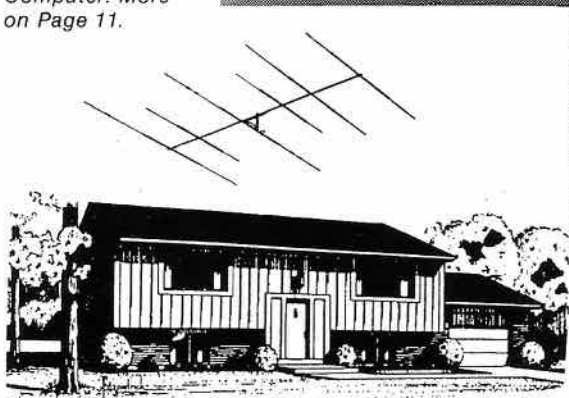
Canada's Amateur Radio Magazine

APRIL 1989

La Revue des Radio Amateurs Canadiens



This month's Shack of the Month belongs to Art Blick VE3AHU. Seen in this photo is the HF Transmatch, Antenna Switch, beam control, HW 2036A 2M Transceiver, Kenwood TS830S HF SSB/CW Transceiver, Station Console and 6809 Micro Computer. More on Page 11.



**Where did the tower go?
Great news for suburban
dwellers on page 13.**



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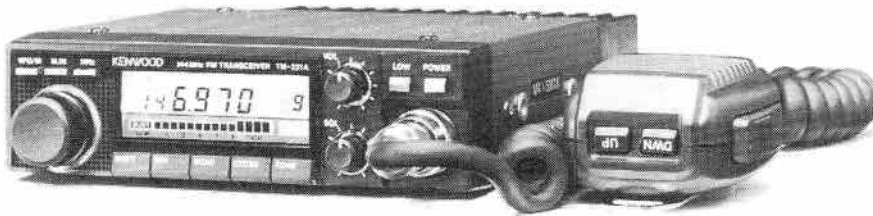
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THE CANADIAN AMATEUR

Canada's Amateur Radio Magazine

EDITORIAL, VE3PS	3
LETTERS	4
FEATURES	
News & Views from W-Land, VE7AHB	7
CC proposes deregulation	8
CARF proposal on 902 MHz Band, VE3CES	10
Monkey Business, VE3NB	13
Amateur Radio on View, VE7YJ	15
1988 Canada Winter Contest, VE6CB/3	18
The Wind Profiler issue and beyond	20
Ham Radio and the Coast Watch Program	21
SHACK OF THE MONTH	11
LOOKING AROUND	22
CARF OPERATING AID	23
GLOSSARY OF PACKET TERMS	26
CQ DX CQ DX	27
CLUB CORNER	29
LISTENING TO THE WORLD	31
PACKET RAP	32
LINE OF SIGHT	33
NYBLES & BITS	34
ARES COLUMN	36
QRP COLUMN	37
INTERNATIONAL AMATEUR RADIO NETWORK	38
SWAP SHOP	45
TECHNICAL	
Simplified measurement of conducted susceptibility for consumer appliances and electronic equipment	40
A Dummy Load for 13.8 volt power supplies, VE1GM	46

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.

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

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EDITORIAL

AES Wind Profiler— the final chapter

By Paul A. Smith VE3PS

The core group of the Ad Hoc Committee on UHF Utilization is comprised of representatives of the following organizations: CARF, CRRL, SAAC, VE3ULR Repeater Network and Toronto FM Communications Society.

Environment Canada AES places considerable importance on the Wind Profiler program due to its ability to provide real-time research data on wind patterns, particularly in the study of violent storm conditions such as tornadoes and hurricanes. The Department of Communications (DOC) has had outstanding since 1985 a frequency request from AES for a Wind Profiler operating in the 400-500 MHz band.

DOC has just now assigned a frequency of 441.0 MHz for the first Profiler, to be located near Egbert, Ontario.

The Amateur community initially heard indirectly of DOC's intention to allocate a 70 cm frequency for the Profiler close to two years ago. The Ad Hoc Committee investigated of 404.37 MHz instead.

After a long technical investigation and negotiation with DOC, our latest report on frequency allocation for the Wind Profiler, submitted Sept. 21, 1988, had continued to endorse the use of 404.37 MHz, based upon all available facts at the time. It also suggested, however, that our analysis indicated a potential for interference to SARSAT if and only if data on the AES Profiler(s) (listed as 'assumed' within the DOC report RP-135) were valid.

The DOC contacted AES during its review of our report and a meeting was convened Nov. 23. In attendance at that meeting were DOC, the Ad Hoc

Committee core group and a representative of the Southern Ontario and Western New York Repeater Council.

DOC confirmed that the 'assumptions' were in fact correct, as AES intends to use the Profiler(s) for research (versus simple weather forecasting as in the U.S.). This requires much greater power and narrower pulse widths. The resultant greater bandwidth moves interference to SARSAT from the realm of 'potential' to 'real'. With this knowledge, and with a concern for the security of the SARSAT program, the Ad Hoc Committee could no longer continue to endorse a 404.37 MHz allocation for the Profiler(s).

During this lengthy negotiation, the Ad Hoc Committee had exhaustively examined possible alternatives, but had been unable to locate any acceptable 400 MHz frequency outside the 70 cm band. N.B.: the 430-450 band is RADIOLOCATION Primary, AMATEUR Secondary!

Extensive technical evaluation involving the entire Ad Hoc Committee and consultation with special interest groups had earlier determined that 441.0 MHz would be the least disruptive 70 cm frequency for the Profiler at Egbert. DOC has concurred and allocated 441.0 MHz.

The meeting concluded with discussion of AES's stated willingness to co-operate and work with the Amateur community to minimize the potential interference, by aligning their antenna system in a favourable direction, building berms, etc., as may be required.

The Ad Hoc Committee will be contacting AES in the near future to follow up.

DOC's statement follows:

SUMMARY— AES CLEAR AIR DOPPLER RADAR 441 MHz FREQUENCY ASSIGNMENT

In 1985, the Atmospheric Environment Service (AES) approached the DOC for advice as to which 400 MHz frequency band would be acceptable for their proposed Clear Air Doppler Radar (CADR). The CADR would be installed at various location and would be used to experiment in the sensing of

wind velocity versus height data over a range of elevations from near the ground to the maximum level possible. As the CADR was determined to be a radiodetermination/radiolocation device in accordance with the ITU definition, AES was advised that the 430-450 MHz band, allocated to RADIOLOCATION on a primary basis, would be appropriate.

AES subsequently submitted applications to operate an experimental CADR in the 430-450 MHz band as part of their newly established facilities located at Egbert, Ontario. At that time, the frequency 433.5 MHz was tentatively selected for CADR use.

To respond to the concerns of the Amateur community on this matter, a working Ad Hoc Committee comprised of various Amateur representatives, including the two national organizations (CARF, CRRL), was formed to formulate recommendations as to the selection of a suitable frequency assignment for the proposed radar system which would have the minimum impact on Amateur operations.

During the past year, several meetings between the Department and the Ad Hoc Committee took place to discuss the various technical issues in this matter. These meetings served to explain and clarify the technical parameters of the radar, and to discuss the technical reports presented by the Department and the Ad Hoc Committee.

As a result of this extensive dialogue, consensus was reached which recognized the adverse effect that could result to the SARSAT system, if the CADR was accommodated in the 401-406 MHz band. In view of the safety aspect associated with the SARSAT system, it was recognized that the only suitable alternative was the 430-450 MHz band.

In conclusion, the Department accepted and concurred with the committee's recommendation of 441 MHz as the most suitable frequency assignment within 430-450 MHz band. AES has been advised of the assigned frequency of 441 MHz, and have indicated a willingness to work closely with the Amateur fraternity to define and evaluate measures to minimize mutual interference to both services. ■

LETTERS

MORE ON YOUNG HAMS

With growing concern over both young Amateurs and the new upcoming complete restructuring of our licensing arrangements, letters keep popping up in our magazine. We have to address each issue separately.

First, the issue of young Amateurs. We all read a copy of this magazine, but how many of us have taken a close look at pages one and two? We see all types of different areas dealing with our hobby on page one. On page two we see our organization's executive and committee chairmen. What is missing? Well we have someone for everything but the young people in our hobby. As a person who, thanks to HOWL (Hams of Western Labrador) and especially VO2AC (now a VO1, Mac Moss), I wrote and passed the exams for my licence when I was 14 years old. I know how intimidating it is to ask a much older ham those very first, foolish questions. Someone, especially a young person, who feels his way may never decide he wants to continue with this studies and become an Amateur.

Young people need special attention. I do not mean pampering, I mean special programmes and learning techniques to help them get off on the right foot. There are limited programs in place but we need more! Maybe a youth director or at least a person who can help the young people of this hobby. This can act as an incentive for others if they see another young person across the country or around the world involved in Amateur radio.

This may help give them the little push they need. We cannot force young people, we have to entice them. We must also have a programme for study that is finally aligned with Communications Canada's exams. (Great ground has been made in this matter.) Our hobby faces a large challenge in trying to attract young people into it. If we succeed, our hobby continues to grow; but if we fail it dies and becomes forgotten.

Second, we have to face the topic of licence restructuring. We have to advertise these changes. Make it known what changes are taking place in

SILENT KEYS

VE7TH— Doug Beales of Parksville, B.C. passed away recently. His previous call was VE7DIX. He was 92 years of age and enjoyed the hobby very much. Doug was an avid fisherman, and was often out on the water by 5 a.m. Our condolences go out to his family.

VE7QT— Owen Evans of Comox, B.C. passed away Feb. 1, 1989. Owen was a west coast lighthouse keeper and worked lots of DX from his QTH at Sandheads Light six miles from land and the QRM. His former call sign was VE7BAH. Owen was honoured by the Nanaimo ARA in recent years as their oldest member.

Amateur radio. If this is not successful we face the same dilemma we are in today, a dying hobby that we cannot attract enough people into to lower the average age of operators.

I would be more than willing to dedicate my time to the above. It is very important, and will become even more important in the future.

George Andrews VO2AA

A BEEF FOR COOPER

"We work them as and when we can," a direct quote from Paul Cooper's (VE3JLP) CQ DX column for January. So what's the big deal? On the terms he outlined, one QSO is just as good as the other.

Or as bad. I mean, to a 'purist' neither one is a 'real' QSO. These contacts lasting a few seconds, with the exchange of minimal data, quality as QSOs for countries logged, and I do it myself, but it seems to me that a 'real' QSO would last longer and be more satisfying if we could get beyond the "3 x 1, 73 OM" stage and find out a little about the person on the other end.

That's what makes two metre operation so attractive to so many. Chances are the average two metre operator knows just about everything about everyone they converse with on a daily basis. Wouldn't it be nice if we could know our DX contacts as intimately?

In the meantime, let's stop the navel contemplating, Paul, and enjoy working them as and when we can. As the song says, "don't worry, be happy!"

Dave Bennett VE7YJ

MORE FORMER EDITORS

In your editorial in the February issue of *The Canadian Amateur*, you mentioned a couple of former Editors of the magazine. You may be interested in the full listing: Jan73-Jun73— the late Gill Stevens VE3BBK; Sep73-Mar74— Steve Campbell; Apr72-Aug80— Doug



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CANADA

Dear John,

I have been directed by the President and Members of Council, Wireless Institute of Australia, Queensland Division, to advise you, your Executive and Members of the Canadian Amateur Radio Federation that the news of Jack Ravenscroft VE3SR becoming an SK was received here with a great shock upon receiving the December 1988 issue of TCA just after Christmas.

Jack's courage to stand up for the cause of Amateur Radio was followed here in VK4 with great interest, not only by his VK4 colleagues but also by the Queensland Branch of the Australian DOTC.

The sad thing, for us, is that your DOC is now starting to look into the matter of compatibility whereas our DOTC, already well advanced, has been told to temporarily halt their efforts.

You can rest assured that the name of Jack Ravenscroft VE3SR will continue to be remembered by the Radio Amateurs of Queensland, Australia.

It will be appreciated if you could pass our condolences on to Jack's widow.

With our best wishes to CARF from Down Under,

A. John Aarsse VK4QA
Hon Secretary WIAG
(Assoc Mbr CARF since 1980).

Burrill VE3CDC; Sept80-Jun84— Cary Honeywell VE3ARS; Jul84-Mar87— Frank Hughes VE3DQB; Apr87-May87— Steve Campbell; Jun87 to date— George Sansom VE3LXA.

I remember the early days of production very well, especially the financial problems we encountered. From 73 to 75, CARF had provincial membership with individual associate membership (Subscribing Patrons). The provincial membership dues had to be devoted to financing the general operations, etc., of CARF, with the magazine depending completely on advertising revenue and subscribing patron's dues. We started out, Jan. '73, with 260 patrons, that increased to 736 in Jan. '74, and 1200 in mid-July '75 when CARF changed to full individual membership and membership took off, reaching 5000 plus in the early 80s.

Standard procedure in 73/74, was for the Editor/Publisher to phone me, as President/General Manager, and tell me how much the next issue of TCA would cost to publish and circulate. My job was to check with the Treasurer,

Peter Smith VE3DEX, and see if we had the necessary funds (if not, we would make a 'loan' to CARF) and tell the Editor to go ahead. A real shoe-string operation!

As for your comments on merger, and the Survey held in Saskatchewan, it does seem that either CARF or CRRL must take the initiative, e.g. arrange a meeting of representatives from both organizations, to discuss merger possibilities. The governing bodies of both CARF and CRRL state that they are in favour of merger and should take positive action in this regard to back up their statements.

A.E. Blick VE3AHU

TEN METER HIGHS FORTY YEARS LATER

(To Milt Saunders VE7KH, author of the article.)

I am XU Yu-Jia ex-C1CH, please let me tell you what a thrill I got when I was shown a copy of the November issue of *The Canadian Amateur*, page 9, entitled 'Ten Metre Highs 40 years ago'. It sure reminded me of the exciting QSO with

you 40 years ago. After our QSO, I had my P.A. boosted to have 500W with 2x100 THs and 1 kW input with 833 respectively.

You must have heard of the Chinese old hams club station BY4AOM and of the 'Able Old Men' whom are members that operate the station. Well John Xia ex-C1TH is its master and I am its Vice station master, with other Old Hams Tom ex-XU8WM, Feng ex-C1KF, Eugene ex-XU8EC, Wang ex-C2CA and Zhuhan C1SP, of whom you may have contacted back in the '40s.

Since we resumed operation in 1985, we have been putting great effort to introduce Amateur radio activities to younger generation. Up to this time of writing, we have helped and trained the members of four Amateur club stations in Shanghai alone. We feel it our responsibility to revive and hand down the radio Amateur's tradition to our youngsters before we become silent keys, Hi!

After reading your article, we thought it would be a good example of radio Amateur friendship that would help boost the enthusiasm of our youngsters. So we intend to have the article translated into Chinese and published. In so doing we ask a favour of you to send us the duplicate of your QSL and the photos on the cover of *The Canadian Amateur*. Let me thank you in advance.

BY4AOM now has two transceivers, a Drake TR-7 and an old Collins KWM-2, that were gifts to us from the Boeing Aircraft Amateur Radio Club and an old Chinese Amateur ex-C1HY who is now in Hongkong respectively. And a linear Amplifier that runs up to 400W output. And now John has rigged up a homebrew X'cvt which we are testing now.

We used to work with a multiband 2 El Quad, but a windstorm last winter blew the bamboo frame to pieces, so in the meantime before our 3 elements Yagi is up, we are using an inverted V Dipole. We meet regularly Sundays but make special arrangements to work 24 hr. continuously now and then. Hope to meet you on the air very soon. We look forward to hearing from you soon!

XU Yu-Jia ex-C1CH
Shanghai, China

SOME IMPORTANT DATES

Mike's Flea Market— Vernon, B.C.,
Sunday, May 7th.
Alberta Hamfest, Edmonton, May
26-27-28.
Maple Ridge Hamfest— Maple
Ridge, B.C., July 8-9.
Waterton-Glacier Hamfest— Three
Forks Campground, Montana, July
14-15-16.

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Mr. Alvin Gabrielson

Dear Sir,

Recently, our attention has been brought to certain notices in *Canadian Amateur* publications that reflect concern over the marketing of a new 10 metre CW/SSB transceiver by Radio Shack. The concern being the potential for increased interference to the amateur 10 metre band from this new product being made available to unlicensed operators.

Although Radio Shack has not as yet marketed the HTX-100 10 metre transceiver in Canada, concerns of the amateur community may be lessened by displaying a product warning label, similar to that for Marine radio apparatus. The warning, to appear on the packaging, would indicate a radio station licence is required and the radio operator must have the appropriate certificate before the equipment is installed or operated.

Should you agree to displaying the warning on the packaging of this apparatus, I would be pleased to provide any assistance in the preparation of mutually acceptable wording and label design.

Yours truly,

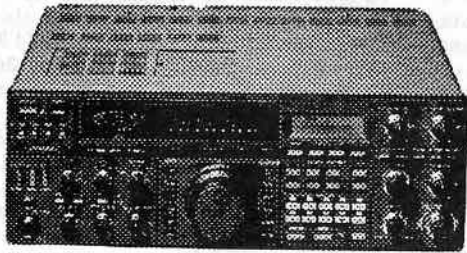
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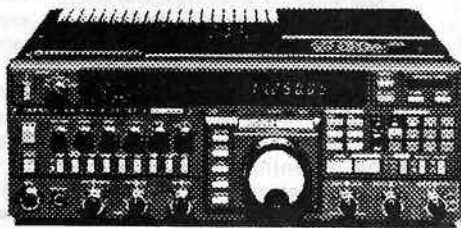
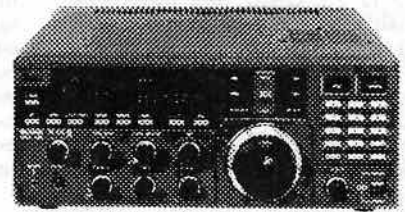
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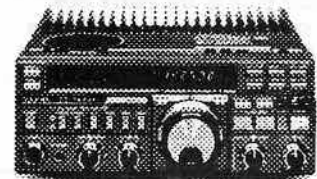
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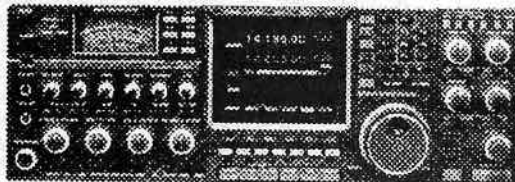
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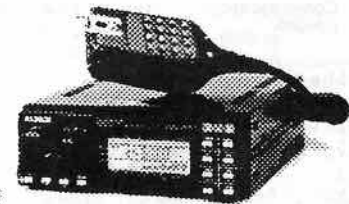
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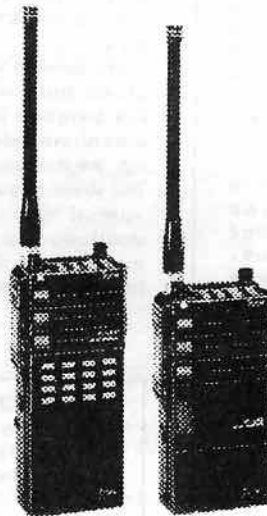
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By J.F. Hopwood VE7AHB

NO-CODE REVISITED— SHADES OF WAYNE GREEN?

The 'Novice Enhancement' program introduced in early 1987 is not working! The offering of 10 metre phone and 200 MHz privileges to novices has not resulted in a dramatic growth in the entry of new people to U.S. Amateur Radio. According to recently released FCC statistics, 9.6% less applicants joined the Amateur ranks for the first time in fiscal 1988 than in 1987. There were only 1.54% more licensed Amateurs at the end of fiscal 1988 than a year previous. The average American Amateur is 50 years old and only 1.9% of all U.S. licensed Amateurs are under age 20. This has sparked a new round of speculation and criticism of the U.S. Amateur licensing structure.

CQ Magazine columnist Fred O. Maia W5YI is championing a campaign to increase the ham radio ranks in the U.S. He has used Canada's proposed restructuring as a good plan to follow and, in particular, supports a similar no-code VHF licence for the U.S. Entry level. A national VEC (Volunteer Examiner Co-ordinator) since 1984, Maia says that the W5YI-VEC programme conducts about one-third of all Amateur radio operator licence examination sessions held in the United States.

"It has been an eye opener," he said. "The truth of the matter is that practically no applicant wants to operate in the CW mode." Perhaps Wayne Green W2NSD, 73 Magazine's Guru who struck no-code terror in the hearts of Hamdom a few years ago is a prophet after all? But then, who ever recognizes their own prophets?

NEW U.S. NATIONAL ORGANIZATION

W5YI is a major supporter and an organizer of a new American organization called the 'National Amateur Radio Association' (memories of the origins of CARF!) NARA seeks to realign the Amateur Radio service in the U.S. They plan to file a petition with the FCC which has the proposed Canadian Amateur Service restructuring as its basis.

NARA emphasizes the need to accept the reality of an emerging 'operator licence structure' which is more in tune with the modern use of manufactured equipment to transmit an unlimited

variety of telecommunication modes.

He states that "Our primary objective is to see a revitalization of the Amateur Radio Service with its many side benefits, not the least of which is the eventual development of more engineers and technicians of the spectrum."

NO-CODE? VARIOUS U.S. VIEWS!

CQ's editor-in-chief, Alan Dorhoffer K2EEK, supports W5YI and talks about a conversation he recently had with an ARRL official concerning Fred's column and proposal.

"His first response was that the membership would fight it. A little later he said that perhaps the time wasn't right just yet, maybe in another five years. And still a bit later he said he would have to see what the Executive Board decides and that's how he would vote. I simply replied that maybe it's time for the ARRL to lead rather than follow, simply because it's the right thing to do."

In any event, CQ is not alone in pushing the debate up front.

The February issue of *Ham Radio* magazine features some reasons why Amateur radio has lost its attraction for the young. Harry Helms AA6FW makes these points:

1. Radio is no longer something mysterious or exciting. Youngsters have grown up with live TV from the moon. Direct dialing foreign countries and cordless telephones make radio an accepted thing.

2. Amateur radio has been 'curmudgeonized'. Who wants to listen to a bunch of old retirees on 75 metres? If you're a teenager you don't want to talk to a bunch of people old enough to be your grandfather.

3. A lot of Amateurs don't want growth. This is Amateur radio's little secret. No more QRM please! They want it all to themselves.

4. The ham industry isn't as involved as it must be for its own future. Other hobbies actively pursue people to join with them in their fun and enjoyment pastime. Go to a scuba diving shop and ask about becoming certified. They won't let you go until you've signed up for a course!

5. We need some form of code-free licence. What's so terrible about substituting stiffer theory for CW above 144 MHz? Ever noticed the hypocrisy it brings out in the Amateur ranks where the strongest defenders of the code

don't have Extra? If CW is that essential, why don't they get their CW speed up to 20 wp.?

Harry goes on to say that the problem is not lack of technical interest or smarts among young people. He notes how rapidly teenagers interested in computing can master C and assembly programming and discuss the intricacies of the micro-channel data bus.

"They're learning and having fun, and being a computer whiz is 'cool' in a lot of circles," he comments. He also notes that many young ex-hams are now in the computer game. He reminds us of Steve Wozniack, the co-founder of Apple Computer who started out in Amateur radio.

CODE? "OH YES" SAY THE YOUNG!

One last comment on the no-code debate. I monitored a popular far-reaching 2 metre repeater from Seattle, Washington recently. It was linked around the U.S. Pacific Northwest for a 'Youth Net'. The Net is for those under 20 years only. Lo and behold the topic was, "Should there be a no-code entry for the U.S. Amateur service?" About 18 of the 20 young people polled said "NO"!

Both the lads and lasses said that at first they resisted learning the code. Now that they're experienced operators, they find it great fun and believe that it is a mode that should be mastered for a VHF licence as well!

They are proud of their ability and of the historic significance of Morse code in radio operating. Kinda like knowing and using a foreign language-special status for those with a special skill. Can't blame it all on old-timers now can we?

17 METRES AT LAST

By now you are already aware that U.S. Amateurs started using the 17 metre band (18.068-18.168 MHz) on Feb. 1. The ARRL, in a request to the FCC to permit the immediate use of the band, pointed out that Amateurs in over 60 other countries (including Canada) were already using it. The FCC reallocated the band to the Amateur Radio Service on a primary exclusive basis, effective July 1. Until that time, the band remains an alternative allocation to the Fixed Service and some government stations are still operating there.

Continued on next page

It seems the FCC was not ready to release it until July. The ARRL was smarting from the insensitivity of the FCC in the reallocation of 220-222 MHz away from the Amateur service without an adequate and just assessment of the impact on the future of Amateur radio. The early release of 17 metres is seen in some circles as a move to appease the Amateur community. ARRL counsel feel the commission carved out a few MHz from the Amateur's spectrum without first requiring the land mobile lobby to first accommodate desirable new modes within its own allocations!

THE 10-10 NUMBERS GAME

Now that 10 metres is wide open we are witnessing the frenzy of the U.S. 10-10 numbers exchange. It seems that 10-10 International membership has now exceeded the 50,000 mark. It takes the combined effort of a lot of volunteer help to keep the numbers game in play. Lee Pasewalk W6POZ, the 10-10 Records Manager, is kept busy controlling the computer record update from 13 District 10-10 managers—one in each of the 10 U.S. call districts, one in VK, one in ZL and one for the rest of DX land. (There used to be a VE3 for Canadian membership, but not so now.)

Not only are there elaborate awards for accumulating 10-10 numbers, but a 10-10 International News is mailed to each paid up member on a quarterly basis! If you're new to 10 metres and wonder what this 10-10 number thing is all about, a 'green stamp' (\$1) will get you an information package and application form. The address is 1010 International, 18130 Bromley Street, Tarzana, CA 91356-1701, U.S.A. Enclose an address label if you have one.

Acknowledgement and thanks to the following sources for material appearing here: *CQ, Ham Radio, Open Wire, Radiosporting, WorldRadio.* ■

AMATEUR STATISTICS FROM RADIO RIVISTA

Some statistics from the land of the Rising Sun:

As of March 31, 1988, 1,608,128 hams were licensed.

Of these, 12,615 had a first class licence, permitting them to operate on all frequencies and modes with up to 1 kW of power.

48,224 had a second class licence permitting them to operate as above but with a maximum power of 100W.

89,313 had a third class licence which allows one to operate on only a couple of bands up to a maximum of 10W.

And finally, 1,457,976 had licences to allow them to operate on VHF and UHF only.

CC proposes Deregulation

In a Canada Gazette Part I Notice, dated Feb. 18, 1989, Communications Canada has proposed the deregulation of the Canadian Amateur Bands. Copies may be obtained from any District Office. Here is a summary of the more important amendments being proposed:

1. Eliminates the restriction on the types of emissions that Amateurs may use within the radio frequency allocated for the Amateur radio service. In its place, the regulations would specify a maximum bandwidth, regardless of emission. In an attached schedule listing the existing Amateur bands, these would be 6 kHz up to 29.7 MHz; 30 kHz - 50-148 MHz; 100 kHz 220-225 MHz; 6 MHz 430-13- MHz and above 2300 MHz no bandwidth is specified.

X means any emission is permitted; T means only aural or direct printing radio telegraphy is permitted—no emissions allowed;

2. Revokes Section 64 on occupied bandwidths.

3. Also in the attached schedule, Advanced Amateurs would be permitted to use any emission in any band. Amateurs would be permitted to use only aural or direct printing radio telegraphy in the Amateur bands between 3.500 and 24.990 kHz and any emission in the remaining bands, that is 1.800-2.000 MHz and those above 28.0 MHz. Amateur Digital Operators would be permitted to use any emission only above 50.0 MHz. Of course, compliance with the above noted bandwidths would be required.

4. Eliminates the Amateur Radio Certificate endorsements at six months and one year for extra operating privileges and authority to use emissions that do not appear in the service schedules.

5. Amends the regulations to permit Foreign Amateurs, who are permitted to operate using radio telephony or telegraphy below 28 MHz in their own country, Advanced Amateur privileges. A Foreign Amateur who is permitted to operate with indirect aural telegraphy below 28 MHz (a Novice) would be allowed an Amateur's privileges while a Foreign Amateur who is neither a Novice nor a General Amateur would be allowed the same privileges as a Digital Amateur.

6. Updates the Amateur service allocations in accordance with the Canadian Table of Frequency Allocations.

7. Requires Amateurs to ensure that interference is not caused to the primary service in those bands where the Amateur service is the secondary service, that is, Amateur bands between 430 MHz and 248 GHz.

8. Revokes some of the restrictions on Amateur station identification but requires Foreign Amateurs operating in Canada to use their own Call followed by the word Mobile or Portable or by an oblique stroke, followed by the appropriate Canadian prefix when identifying by phone or radio telegraphy respectively.

9. Revokes the conditions for Amateur radio operation on board aircraft.

Communications Canada is counting on the Amateurs' enviable record for 'self-policing' to ensure the success of the proposed deregulation.

Thirty Days, from date of gazetting of this notice, are being allowed for comments which should be sent to: John Fraser, Chief, Radio Regulations, Department of Communications, 300 Slater Street, Ottawa, K1A 0C8. All representations should cite: Canada Gazette Part I, dated Feb. 18, 1989. ■

CARF to develop Canadian Amateur Band guidelines to replace DOC sub-bands

As a result of DOC's decision to deregulate the sub-bands, CARF would like to know the views of individual Amateurs, Clubs and Associations regarding the frequencies and/or sub-bands and related modes and/or uses for each band that should be adopted for the guidance of Canadian Amateurs.

In making their recommendations, Amateurs should take into account present usage patterns, that is: the

frequencies and sub-bands and related modes and uses which are now followed on a Canada-wide and world-wide basis and are essential for our local and long distance communications and experimentation.

Please send us your recommendations by the end of April so that we can consolidate the recommendations and publish them in *The Canadian Amateur* for Canada-wide comment. ■

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CARF proposal on 902 MHz Band

By John Iliffe VE3CES

Recently Communications Canada issued a proposed policy for use of the band from 896 to 960 MHz. This band, which includes the 33 cm Amateur band, is one of the group of UHF/microwave bands where Amateur is a secondary service.

Based on recent experience in the 70 cm/450 MHz band, CARF can see a potential problem with Amateur/primary user interference and we feel that now is the time, when the occupancy of this band by both the primary user and by Amateurs is low, to attempt to find an acceptable long-term solution.

Certain uses of this band also have somewhat unusual characteristics compared to current Amateur experience. In many ways these characteristics are complementary to our use of the band. CARF's proposals have been outlined in a response to CC which is printed at the end of this article. In defining this response we considered the following:

NATURE OF SHARED USERS

Nature of shared users. Primary users are government shipborne radiolocation (radar) on both coasts and in the St. Lawrence River, wireless office products, and Industrial, Scientific, Medical (ISM). Little interference is expected from shipborne radar since there will be few installations in the foreseeable future and these are mobile and not located in the area where there are large numbers of Amateurs. ISM could be anything, of course, anywhere, and it is difficult to assess what may arise from this. Given that the other co-primary users must also accept interference from this service, it is not likely to be severe.

The particular problem, in CARF's opinion is the wireless office products. These are very low power LAN (local area network) products. We foresee that they may be installed in office towers, giving them an excellent antenna location to receive interference. On the other hand, due to their low power, two Amateur stations in QSO may not be aware that a primary user exists on their frequency. Likely interference would take the form of excessive retries on the office LAN and poor performance. Since these LAN's will have to be licensed, it is CARF's opinion that inter-

ference can be eliminated by ensuring that they are not assigned on frequencies used by Amateur digipeaters, repeaters, etc., which have high duty cycles and similarly good antenna locations.

NATURE OF USE

Maximum use of office equipment occurs during the working day, and rarely on weekends. Amateur stations, on the other hand, tend to be active at night and on weekends. We feel this complementary usage pattern will reduce interference problems. Since the LAN technology will likely include error detection and correction, the effect of interference on a LAN will be less important because it will occur in off-peak periods when the LAN is not loaded heavily.

POSSIBLE RESOLUTION

From an Amateur viewpoint, CARF's objective is to maximize our use of the band without severe restrictions. We feel this can best be achieved by a formal policy of cooperation with CC on allocation of the types of stations most likely to be affected. We are NOT talking about CC assigning repeater frequencies. This would still be up to the

local Amateurs and their repeater councils. What we ARE saying is that the frequencies and geographic locations least likely to cause problems will be indicated by CC to these councils and their choices will be from them.

On CC's part, they have indicated a willingness to consider Amateur recommendations for frequencies within particular bands. The recent choice of the frequency for the Egbert, Ontario, wind profiler was recommended by a committee of Amateurs, for example.

With proper discussion between CC and the Amateur organizations, including local special interest groups, it should be possible to preserve the Amateur band planning and at the same time ensure that no interference occurs between services.

CARF's proposal represents a radical departure from traditional practices. It depends strongly on cooperation between Amateurs and between Amateurs and CC. We at CARF are convinced that, properly handled, this proposal will best serve the needs of Canadian Amateurs well into the 21st Century.

Letter to Communications Canada

TO: PAUL RACINE, Director General,
Telecommunications Policy Branch,
Communications Canada, 300 Slater St.,
Ottawa, Ont. K1A 0C8

Dear Mr. Racine,

I am writing in response to Canada Gazette Notice DGTP-005-88 regarding 'Spectrum Utilization Policy for the Band 896-960 MHz'. As this includes the Amateur band 902-928 MHz and this Federation represents Amateurs across Canada, we want you to take our views into account in any decisions you may make regarding utilization policy for this band.

We note that it is proposed to have the Amateur service share the 902-928 MHz band with the Radiolocation Service (government shipborne radiolocation stations), the fixed service (wireless office products), and the Industrial, Scientific and Medical service. We note, too, that the Amateur service is to be secondary to the Fixed and Radiolocation services and that all

radiocommunication services must accept interference from the ISM service.

In 1959 the decision was taken by the ITU to classify radio services into primary, secondary and permitted categories. This was done with the objective of permitting more efficient use of particular bands through sharing until such time as the primary services needed the entire bands allocated to them. In practice it means that, as the primary service requires frequencies in a shared band so its use by a secondary service will be relinquished and this will go on until the band is fully occupied by the primary service, if ever. We all know that this is working out fairly well internationally and domestically and is enabling more efficient use of the spectrum.

The Federation would have no objection to the proposed policy if

Continued on next page ▶

LETTER (cont'd)

acceptable frequency plans and assignment coordination could be worked out for major Amateur service installations such as repeater stations, digipeaters, etc. These types of stations generally have the most continuous operations, best antennas, and highest effective powers and thus form the most likely sources of interference to assigned primary users.

Coordination with various Amateur bodies as to power limitations or operating periods in various frequency subsets of the band in various geographical areas would also be required.

We recognize this would be a new approach as far as the Amateurs of Canada are concerned; we feel a new approach is needed in the microwave bands where the Amateur service is classified as a secondary service and is sharing bands with primary services. To this end, representatives of the Federation would be glad to meet with representatives of Communications Canada to discuss this proposal further.

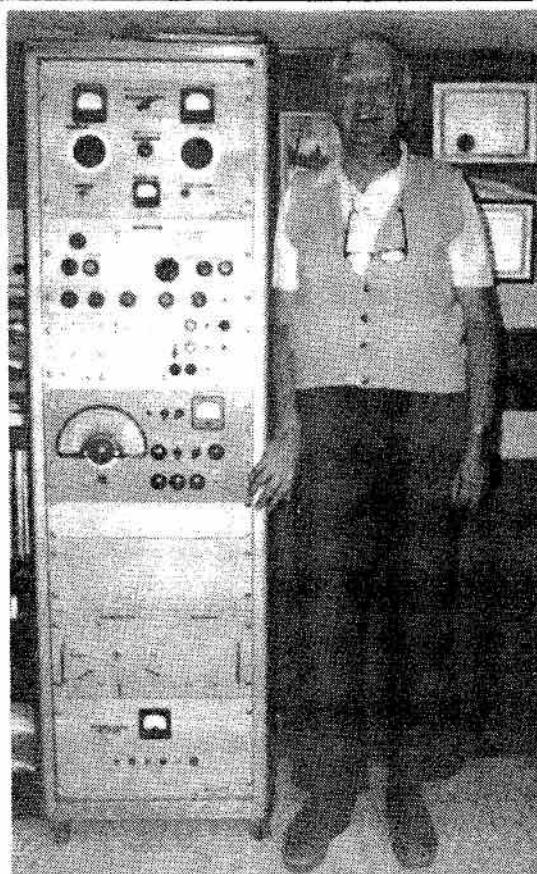
If you have any questions or further thoughts regarding this proposal I would be pleased to respond.

John Iliffe VE3CES,
President

Shack of the Month

*Art Blick VE3AHU's station
from 1960-70.*

*Top: G2DAF Linear Amp, HF
Transmitter SSB/AM/CW, 50 W
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Supplies, High Voltage Power
Supplies.*



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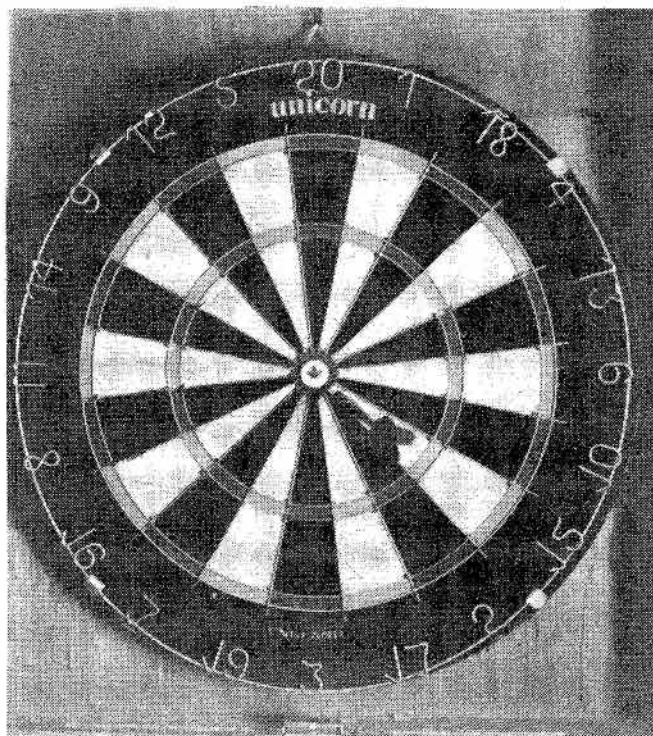
This edition of THE CANADIAN AMATEUR has been mailed to you in the hope that you will find it interesting and steadily improving.

We, the Management of CARF, are always concerned when members do not renew. Perhaps we failed to remind you, maybe your interests have changed, but we hope that eleven issues a year of THE CANADIAN AMATEUR plus our excellent National Outgoing QSL Bureau service will tempt you to return as a subscriber.

Each and every member adds strength to our ability to work with Government and other organizations to further the cause of Amateur Radio for Canadians.

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Monkey Business

By Bernie Burdsall VE3NB

It was when I was doing volunteer work at the Marine Museum of the Great Lakes at Kingston and the *Alexander Henry*, an ex-Coast Guard ship, came into the dock, that I got interested in ships and their workings. Being an ex-RAF type, I always associated the sea with troopships, which are not the best way to take an ocean voyage.

One day, checking through the paint locker in the forecabin (pronounced folksall) for some touch-up paint for the binnacle which sits on the 'Monkey Island' atop the wheel house, and having no luck, I remembered some cans ashore in the Museum, together with all types of marine bits and pieces we acquired from a Montreal shipyard.

There was one five-gallon can with a serial number on it. It looked like an RCN number according to another volunteer, Chiefie Jones, who was a former ERA (engine room artificer).

The number was AP (Admiralty Pattern) 507Z-1-4-42 and taped to the top of the can was a round piece of 3/8 plywood, slightly smaller in diameter than the lid of the can, and in the middle of it was an oblong slot. See diagram.

"What is that for?" I asked Chiefie Jones.

"Search me," he said. "Why not look inside?"

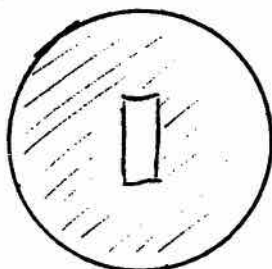
So, getting a screwdriver, I pried open the lid but couldn't see anything. The can was heavy, so it had to be full of something, but well, it sure looked odd. We could see through it to the bottom; yet we couldn't see anything. This was getting queerer and queerer so we decided to consult higher brain power and went up to the Archives where a Sweet Young Lady looked it up for us.

"It's a camouflage paint for Corvettes," she said. "You've heard of Western Approaches Blue and all the other colour schemes, like WA Green, and mixtures of paints in the Admiralty Disruptive Patterns?"

Well, we had now, so what had we got in the can? "It was a special camouflage paint developed by Canadian Industries, and it makes ships invisible," she said with a smile.

"Come off it," said Chiefie and I.

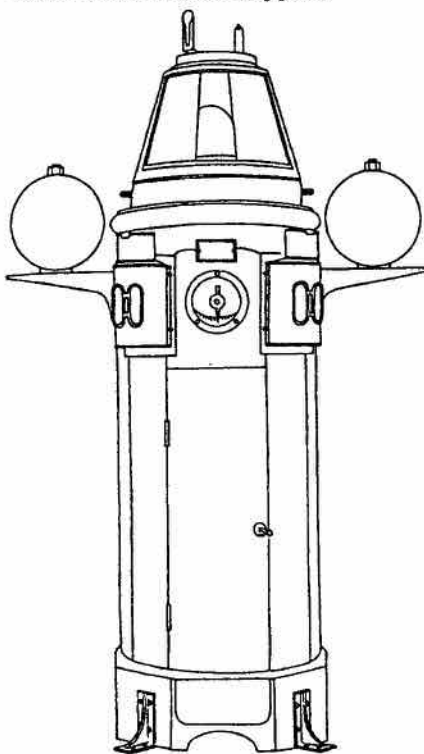
But the SYL explained that this colour was outside of the normal spectrum colours of Red-Orange-Yellow-Green-Blue-Indigo-Violet, known as dispersion and thus the human eye cannot see the colour. The actual colour



of any object is due, first, to the kind of light which illuminates it and, second, the kind of light which it reflects or transmits to the eye.

After that lesson, Chiefie Jones and I went out to the Sailor's Rest Inn for a couple of cool ones. We were puzzled over the find and then Chiefie, who was pretty smart considering many years spent banging his head on steel beams and falling into bilges, said that the round piece of wood with the hole in it must be to show the level of the paint and the hole for the paintbrush, because the paint is not visible.

"You're right," I replied. "Let's paint the binnacle on the 'Monkey Island' with it and see what happens."



We sneaked aboard the ship and painted it and it disappeared. You couldn't see through it but the outline was there against the background. Picture 2 shows a binnacle which is a weatherproof housing for a magnetic compass. The two round objects on each side are known as "Lord Kelvin's Balls".

We went ashore and waited for something to happen—sure enough, the Curator roared: "Someone has pinched the binnacle from the ship's 'Monkey Island' atop the wheelhouse. How could they unbolt it and carry it away? A hurricane couldn't move it." We owned up, after all they can't fire volunteers, and who else knew how to pump the sewage holding tanks out with compressed air. If you turn the wrong valves the shxx (censored... Ed.) goes back up the toilets, creating a bit of a stink and frightening anyone standing there.

"Time to go home," says Chiefie, and on the way home I remembered it was Radio Club night so, after tidying up, off I went. There was a talk on antennas and towers and the problems Amateurs have with their neighbours. Then I had it: why not paint the tower and beam with the camouflage paint? I mentioned it at the meeting, and was treated a bit of a nut case by a group who are normally a bit nutty themselves.

The Amateur who had neighbour troubles contacted me after the meeting, not quite believing that I had found some paint that could make his beam and tower invisible.

"It's not invisible paint," I said, "but it makes things look not there, if you follow me."

"Not really," he said, "but come around and show me."

The next Saturday I got the can, a brush and the round piece of wood with the hole in it and we painted the tower and coax cables.

The effect was weird, you could see something was there, it made a hole in the backyard but from the end of his garden there was no sign of anything. That day only the tower was painted. Yes, we started at the top and worked down; it was better that way, otherwise you sit at the top of the tower until the paint dries. The photograph shows what it looked like before the beam was removed and painted.

There were numerous calls about this

Continued on next page ▶

MONKEY (cont'd)

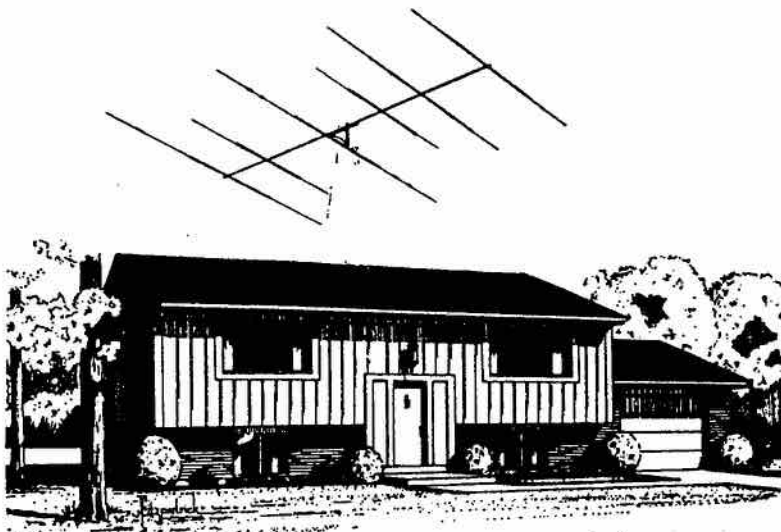
strange thing which looked like the skeleton of a glider with nothing to hold it up. We had a visit from a gentleman from India who thought it would be a great addition to his Indian Rope Trick.

After getting the beam painted, it also disappeared. The birds, who must have different vision to humans, would perch on the boom and it was quite a sight to see a row of sparrows or starlings with no apparent support slowly rotating as the beam was turned.

I regret to say that the can is now empty, because we can see the bottom of the can without the wooden circle. Chiefie and I looked for more cans, but sorry, all you hopefuls out there, you're just out of luck.

If you do see a can with AP507Z-1-4-42 on it between now and next April, let me know. I'll be up there on the 'Monkey Island' polishing the binnacle. ■

— Idea suggested by Bob VE3SV



Above: A view of VE3NB's work project at the 'half-way' stage.

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Amateur Radio on view

By Dave Bennett VE7YJ

The building housing the Pacific National Exhibition's Hobby Show is large. On this warm late summer afternoon the crowd is sparse. Not even the flying saucer buffs can attract much of an audience. One booth though, has a slowly expanding crowd in front of it. It is the Amateur radio booth and their two metre rig has broken down.

The booth occupants are performing delicate surgery on the rig and the group out front has found something interesting going on. The hams are 'selling' their hobby by live demonstration, not just words.

Every year, Amateur radio groups across the country are called upon to set up public displays. These efforts often don't bring the anticipated response from the public. Herewith, a few thoughts and observations gleaned from 20 years of hamming.

It was interesting to see what attracted the public at these displays. They liked seeing a station in operation or seeing something happening, such as the rig repair at the PNE— but if there was no one to talk to, they soon lost interest and wandered off.

Looking at some of these booths from the outside, it's easy to see why the customers don't stick around.

In a cluttered, dark, cramped space sits one lone ham, his back to the audience, headphones clamped over his ears, talking into a microphone or pounding away on a key, oblivious to his surroundings. Not a great way to impress anyone not familiar with Amateur radio!

When you set up a booth at an exhibition, fair or shopping mall, have sufficient people to operate the station and to talk to the customers. If you don't have enough people to do both, then one person can talk to the customers and explain or demonstrate the equipment as needed— but not spend all his time operating. Be prepared to explain what is happening and have literature to hand out. CARE, CRRL and AMSAT are excellent sources. There should also be some information on the local clubs, indicating meeting places and times, contact persons and class information.

The booth's appearance and contents are important; a small club may not be able to include everything that follows, but some things worth putting in your well-lighted, tidy display area besides the usual HF/VHF stations are: fast or slow-scan television, Amateur satellite operations, and computer terminals.

The ATV and computer could be handled by tape or disk recording of typical transmissions for more reliable presentations. If a printer is available, you could arrange one of those printouts that comes out as a picture... they make popular handouts.

Have someone either building something or working on a piece of equipment. Everyone likes to watch work being done. A display of the 'tools of the trade'— oscilloscopes, metres, frequency counters, etc.— adds a lot to the presentation.

Put a simple-to-operate receiver up front where they can tune around themselves— if they happen to prefer listening to shortwave broadcast, so be it. Have a CW sounder where they can use it— sound out their names for them— with a code list nearby so they can practice if they wish. Give everyone who successfully sends their name in CW a Certificate of Proficiency (see 'New Germany Rural High School Ham Day 1988', page 14, July/August 1988, *The Canadian Amateur*).

Put together an audio/video production (slides, movies, videos) to show what we do aside from the 'normal' station operations. Public service communications for parades, races and other events are prime examples. There are several good programs available and some of the DX

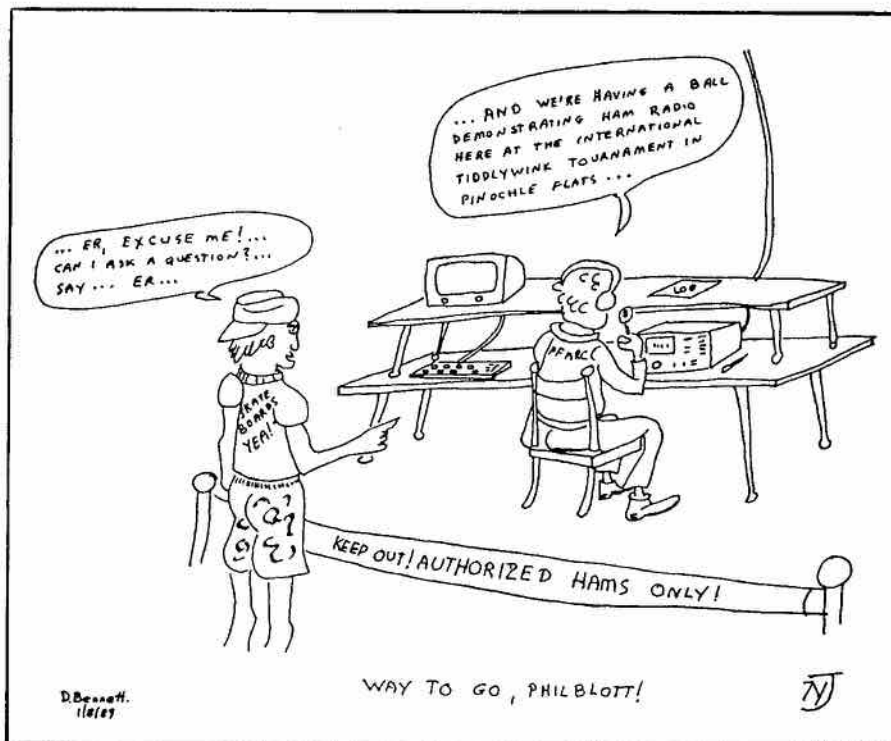
organizations have slide shows or videos on DXpeditions.

Show that Amateur radio is not just sitting on your duff talking to a microphone (the common picture of Amateur radio held by the public). We all know hams who almost never appear on the air, spending most of their time experimenting or tinkering. That very thing could attract some members of the public. The 'backyard' mechanic could well turn into the basement technician.

To initially attract customers, make up some brightly-coloured signs or banners to hang above the booth and on the front of the table. These could include your group name, brief information or slogans ('Hams Talk to the World'). Large photos or posters could be used as backdrops in the booth. How about making up a set of model satellites that could be hung in the air over the booth?

The back of your booth, and the front, could be covered with paper and the paper decorated with pictures, signs, QSL cards, etc. It may be possible to obtain paper roll-ends from local printers, though they try to recycle as much as possible. An approach based on giving the printer credit for supplying the paper could give you all the material you'll need— even a small

Continued on next page



ON VIEW (cont'd)

roll-end will have several dozen feet on it, more than enough to recover several booths.

Equipment for use in the booth can be obtained from the local hams, but this can present a rather haphazard appearance. A more organized look presents a better image. Try approaching your local dealers. Some of them are willing to loan complete stations, providing credit is given.

Have some really enthusiastic types man the booth to talk to the passersby. Let the ones who are a little shy do the operating. The prime purpose of such a booth should be to sell Amateur radio to the public, in the hope of getting a few recruits. I know the word 'sell' is going to rankle, but if you are going to attract people into our hobby, then 'sell' is what you must do. Just having people familiar with what we do can win friends, if not new recruits.

It can be both fun and challenging to explain Amateur radio to a public which knows little or nothing about our hobby. If someone who already knows a little about radio comes by, half your battle could be over. These people can be a prime source of recruits and are worth a little extra time.

If your customer is a CBER, explain the obvious advantages and versatility

Amateur radio has over CB. DON'T ridicule the CBERs— CB has its place. If your customer wasn't interested in communicating, then he likely wouldn't have bothered with CB in the first place. Amateur radio should be presented as an attractive, and perhaps better, alternative.

Explain what the requirements are to get on the air as a ham, but don't overdo the amount of work— that seems to scare most people off. Of course, you can't minimize the work but get them fascinated first, then hit them with the bad news. Most people realize that anything worth having is worth a little hard work.

The better looking and more interesting you can make your booth, the more impact it will have. Impact sells— the better the image presented, the better the sales job.

Just because we're called 'Amateur' radio operators doesn't mean we can't be 'professionals' in our appearance to the public. ■

TECHNICAL ARTICLES

The Canadian Amateur welcomes technical articles. Please send them to the Technical Editor, Bill Richardson VY1CW, 36 Range Rd., Whitehorse, Yukon Y1A 3V1.

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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.

Some interesting items for this month include: M/W Tellurometer units complete with a built in parabolic dish and antenna under a radome, solid state, tuneable cavity, dual miniature meters, modular pwr supplies, runs off internal or external batteries supplying 10 to 16 VDC. All in portected case approx 12x12x12 inches. Accepts headphones and microphone for voice transmission. Very clean with canvas carrying case. \$95.00

(2) Another interesting item is Swiss Wild model BL16-21 subtense bars complete with 4 Ft. leather and canvas carrying case. These are the illuminated version with precise 3 pt transit style levelling head, bubble level and optical plumb bob. These are available at a fraction of acquisition cost, in very good condition. \$50.00 (3) We have a few rigid wood 5 ft. tripods to hold the tellurometer units. They come complete with foot protector and plumb bobs. \$25.00 (4) Finally we have a few solid state Eddystone receivers, Model 958/3 covering 10 KHz to 30MHz. These come with a copy of the manual plus an assortment of spares which include mechanical components as well as various modules, pcb's and components which the military felt were worth stocking. Due to the variety of spares, no two receiver kits are identical. The complete package is available for \$600.00

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1988 Canada Winter Contest

By Jeff Parsons VE6CB/3

The 1988 Winter Contest is history and my first effort at scoring a contest of any kind saw 59 entries from five DX countries, seven U.S. call areas, and every Canadian Province or Territory except P.E.I. and VE8 land. My thanks to all the entrants for providing legible logs and especially to all those who used the score sheets taken from *The Canadian Amateur*. There were a number of soapbox comments made about the difficulty in scoring this contest, and from the number of errors that my Lotus program spit out, there may be something to these remarks. There were 24 logs with some kind of problem, and the most common one was not counting the TCA/VCA bonus contacts as a 10 point Canadian contact as well. Many of you will see significant changes in your scores... in almost all cases, it was a change to the better!

Enough rambling... let's get to some of the scores. Congratulations to Edna WK7V, who outscored all other single operator entrants with 582 QSOs and a total score of over 112K in the all band mixed class... well done! Tops in the multi-op class was the group from the Calgary Amateur Radio Association DX section, Ted VE6AMR, Gene VE6CIZ and Tim VE6SH, who piloted VE6AO to a whopping 131K points. In the other classes, Manuel XE2NNZ outscored all others with over 31K in the all band phone class, and Barry VE6BMX took the honours in the all band CW class.

Single band leaders were VE3NPY on 10, VE5XU on 15, VE7ARS on 20, VE7DLM on 40 and VE6GUS on 80. My hat goes off to Gus VE6GUS, who managed to stay awake long enough on 80 metres to work 129 contacts... of which 109 were VEs... for a very respectable score of nearly 14K. (I can't believe how good your signal was in the far east of VE3-land so early in the evening!)

In the very close battle of the official stations for the President's Award, Tony VE2KM chalked up nearly 77K with a contest leading 51 multipliers while Norm VE6VW operated VE6VCA to second place, just barely nipping out the boys from Whitehorse at VY1VCA (ops VY1s CW, AU, AL, BR, DN, DU and BE).

Here's what some of the contesters said:

"We got more QSOs on 10 metres than

any other band, but only managed a handful of VEs" — VE6AO;

"We religiously scrutinized the rules only to find that our computer logging program did not accept CW QSOs" — VE3JWZ;

"This is definitely the most difficult contest to score" — VE3NBE for VE3SPC;

"Always enjoy the VE parties and contests and it seems to be getting back

to the activity of the 60s and 70s... Hurrah!" — W5NR;

"This was my first contest and I was nervous" — VE1BAN;

"Conditions were terrible from my QTH" — VE3NXQ;

"Conditions not the best, but seems like everyone had a good time" — VE6VCA;

"Nice to hear the VE1s and VE2s for a change" — VE7CAL;



= X E 2 N N Z =
MANUEL

If sometimes we don't win a contest is because we've another Hobby also....



BOX 1928
ENSENADA, B. C.
MEXICO

Si alguna vez no gano un concurso es que tengo también otro Hobby....

Top: VE6NOV Multi-single operators from NovAtel ARC: Tony (SWL), Ara VE6APY, Andy VE6CTJ, Russ VE6KZ, Ken VE6BLA, Larry VE6KC.

Above: A card from XE2NNZ.

Right: Multi-single winner VE6AO's antenna farm.



"A nice relaxed but fun contest"—
VE3GRA;

"Met a lot of friends on the air and had a
lot of fun. See you all next year"—
VE6GUS;

"Very happy to participate in your
contest"— XE2NNZ.

I, too, hope to see all you next year...
and a lot more as well. This is a great,
fun contest to get started off in and I
certainly invite all you first-timers to

give it a try. It doesn't take much time
and effort and for the price of a stamp,
you might get yourself a nice piece of
wallpaper... just look at the ones in the
score list with the star beside their
name... they did!

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
* VE6RCA	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	WB	28	21	7	5	12	4056
* G4LOI	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	* VE7NNH	BC	62	14	48	2	5	1860
* MO1ZZ	W0	27	20	7	2	13	3484	* LZ2TU	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
* VE7VCA	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	* VE1BN	NS	38	32	6	5	14	6216
* VE3GRA	ONT	27	21	6	6	15	5310	* KB0C	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	* NL7DU	ALASKA	1	1	0	0	1	10
ALL BAND CW CLASS								SINGLE BAND 40 METERS							
* VE6BMX	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
* NW0F	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/0	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, VE6C12 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, VE33HCZ, VE3PLA, VE3SL, VE3ERT, VE3PYA,							
VE4VCA	MAN	179	107	72	9	18	27684	VE3PKH AND VE3POS * VE3VCA - VE3NK, VE31DU, VE3DXY, AND VE3LXA *							
								WBXT - WBXT AND NBJLT *							



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The Wind Profiler issue and beyond

By Cameron A. Grant VE3LCC

Now that the head to head negotiation between Radio Amateurs and Communications Canada over the Wind Profiler issue has come to a close, it is perhaps time to reflect on the events of the past two years. (Yes, believe it or not, it has been nearly that long!) Having been involved in the negotiation from the beginning, I have made a few strategic observations that I believe should be discussed and acted upon.

First, there have been generally two opinions that have pervaded the entire process: one of enthusiasm and the other of passivity. The passivists argue that it is counterproductive to engage in a confrontation with Communications Canada, fearing retaliation. If negotiators in general held this attitude, we would have no constitution today let alone a country.

In dealing directly with Communications Canada, I can personally reassure those worried about retaliation that the decision makers in the department are professionals who respected our position. In fact, I would argue that our performance, including our technical analyses, have done far more good toward building the department's respect toward the Amateur community than any passivist stand could ever do. After all, the department continued negotiations long past scheduled deadlines even in light of 'radical' behaviour. Contrary to some theology, the letter-writing campaign was very successful. Communications Canada had never seen so many letters devoted to one issue. Wanting to avoid becoming a political football, Communications Canada recognized that responding to these letters was unavoidable. Let's not use weak, childish excuses to condone lethargy.

Now, although I have made a number of positive statements about Communications Canada, I have a number of concerns that when voiced will likely seem contradictory. They are also, paradoxically directed to the Amateur community as well. When negotiations drew to a close in November, and we forged our way toward a settlement and communiqué, I could not help but feel a grave sense of loss. It seemed the Department never had any intention of changing the allocation and they indicated that they have no intention of protecting Amateur spectrum. Even in the interest of curbing future confrontation, the Department refused

to commit to informing the Amateur community of any future proposals that posed a threat. Therefore, since the department would not adhere to a change in policy, we are doomed to similar events and possible loss in the future.

The question is, how is Amateur Radio going to survive in the future with this attitude? In the past, Amateurs had the privilege of being masters in their own house. Now, with the spectrum being applied to so many different technical interests, Amateur Radio does not have to be close to the heart of the majority that use the spectrum. As a result, most of the governing bodies that dictate spectrum allocation are comprised of engineers and administrators with little if any interest in Amateur Radio. These new administrators, when faced with the dilemma of allocating a new service, simply apply a cost benefit analysis using their understanding of each service.

The benefits of Amateur Radio that Amateurs have learned to respect and preach from their soapbox is no longer automatically included in the equation. If I had only a casual exposure to Amateur Radio, I, too, may observe it as a glorified CB and whittle away at 'wasted' Amateur spectrum awarding it to 'more useful' services that benefit the public good directly. So, the task is obvious: we must market Amateur Radio as effectively as any commercial competitor.

Marketing Amateur Radio effectively is something we have failed miserably at. Ask the average person on the street what Amateur Radio is and you will likely conjure up images of rooms filled with huge tube radios or spark gap transmitters, if any image at all. We should get involved in creating flashy videos and glossy literature to catch the public eye and encourage involvement or just understanding. We should devise ways to touch almost every Canadian's life. Even pursuing more media coverage of Amateur events is fundamental.

In fact, a terrific idea that I believe originated in the west was the inclusion of a credited communications course in a high school curriculum where the final exam gave the student not just a credit but a ham ticket as well. There is definitely enough material to create such a course.

The value of Amateur Radio to education is probably its greatest asset. It is shameful how the medium is not just underutilized but ignored in a field

where it could serve as a most invaluable practical experience tool. During my education in Electrical Engineering at the University of Toronto, I was astounded to find that most people, even professors, had little knowledge of Amateur Radio, yet much of the research that they were involved in had some basis in this hobby.

It would be an immense bonus to the hobby to have those in the forefront of research and education utilizing our spectrum. Amateur Radio would again be back to harbouring groundbreaking research as it once did. In fact, the benefit is twofold, since those involved in managing our spectrum would experience Amateur Radio firsthand in their education. The hobby would again have a sound foundation within the governing ranks. It would be that much more difficult for Communications Canada to justify the erosion of Amateur bands.

The survival tactic of marketing Amateur Radio falls mainly in the hands of our national organizations. Unfortunately, our own organizations are in a state of misfortune. Marketing, being a particularly arduous task requiring full time attention, demands that we place more emphasis on and give more support to an organization that properly combines talent and enthusiasm with a full-time, paid president who does not insult but rather respects all aspects of the hobby.

There is no room for any clique to represent all Amateur interests. In every policy-making and negotiating team, we must assure that at least one visible member of each major mode of interest is represented. We cannot have the 'old boys network' that has created disunity and mistrust in the past (thus the existence of two Canadian organizations).

The answer is one unified, strong and enthusiastic voice of combined talent and diverse networking. Disagreement should be voiced and debated loudly internally, but not in front of Communications Canada. Some argue that two organizations are needed to keep each other in line but isn't that what elections are for? Elections should be fought, not won by acclamation.

In the next set of Amateur elections, keep these points in mind. Strive for that ideal organization. Get involved and work on a marketing strategy. Create some videos and glossy pamphlets and approach the educators. By acting now, we still have time to save Amateur Radio (at least in Canada). ■

Ham Radio and the Coast Watch Program

By Bob Comeau VE1ARN

On the evening of Wednesday, Oct. 19, 1988, a meeting was held between members of the Lunenburg County Amateur Radio Club and the RCMP. The topic for discussion was the Coast Watch Program, and the ongoing struggle of our law enforcement agencies to curb the serious problem of drug smuggling along our coastline.

While on the surface this subject would not appear to have anything in common with Amateur radio, sometime back it had occurred to me that there might be something that we, as radio operators and SWLers might be able to do to provide a service in this area.

Those hams who do a lot of monitoring the various bands know that there are numerous types of radio transmissions in the HF and VHF bands which are heard at all hours of the day. With this in mind, it is possible, that the opportunity may someday arise when we might monitor a transmission that could be of a suspicious nature. Having a little background in the way smugglers have operated in the past might indicate whether or not what we are hearing may be of interest to the authorities.

Our guest speaker was Corporal Bill Parker, from the Division Drug Enforcement Section in Halifax. Corporal Parker is also the co-ordinator for the Coast Watch Program in Nova Scotia. For those not familiar with the Coast Watch program, it was started about eight years ago to try to offset the lack of RCMP marine resources.

Corporal Parker's group acts as liaison between his and other Federal departments: Coast Guard, Fisheries and Oceans, DND, Lands and Forests, etc. They also take on the task of enlisting the aid of local citizens such as fishermen and those who live near the coast to let the local authorities know if anything suspicious is spotted along the coastline.

The lecture was enhanced by an overhead slide presentation showing where some of the major busts had been made in Nova Scotia over the past eight years, along with slides showing one of the codes that was used over the air by one operation. This code had been intercepted during the course of the investigation.

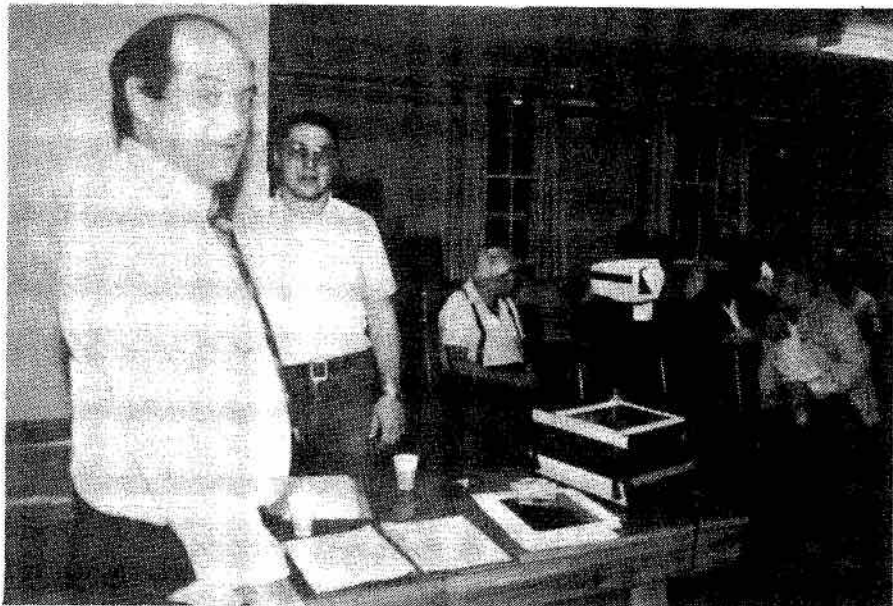
Corporal Parker made the comment that talking to ham operators was an approach they had not considered before, and was one he felt should be pursued further. "The more ears, the better," was the general opinion,

because there is a chance that someday, someone could hear something the Mounties might just be interested in. For those areas which do not have a Coast Watch program, Corp. Parker advises that aircraft are one of the most popular methods and used where there are no coastlines to take advantage of. So you see, a lack of coastline does not mean this type of problem doesn't exist.

In closing, I would like to recommend that any radio group get in touch with their local police detachment and arrange a similar meeting. Not only is it a very worthwhile service which we may perform right from our own

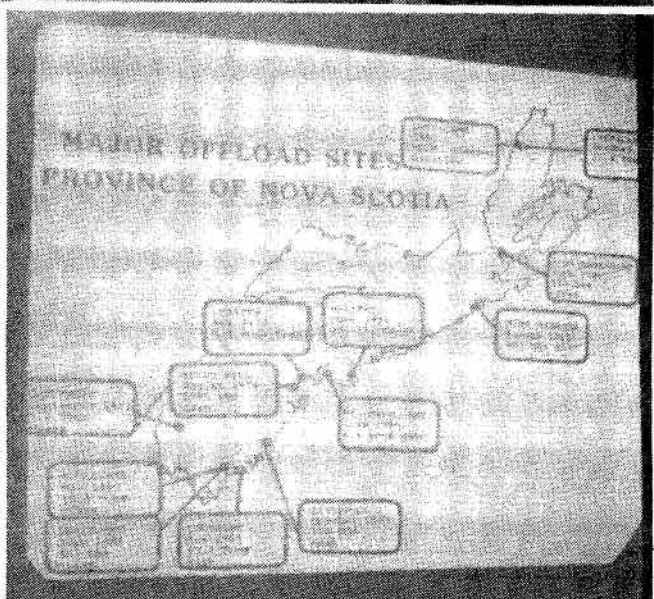
listening post, but it gave us a vast amount of information as to what does go on around us that we are perhaps not aware of. All too often the knowledge we have of these activities is limited to a short broadcast on the local evening news.

I would like to thank all those who attended, especially Bun VE1AGD and Roxanne VE1VCC who helped with refreshments and acted as our official photographers. A very special thank you goes to Corporal Bill Parker for a most enjoyable and informative meeting. ■



Above: Corp. Parker, left, with Bob Comeau VE1ARN before the meeting setting up the display.

Overhead slide showing major busts in Nova Scotia over the past eight years.



LOOKING AROUND

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



In this column we will discuss certain aspects of the various components used in low-voltage, regulated power supplies and how to select the correct values of these components. A block diagram of the supply is shown in Fig. 1.

The first consideration in the design of a power supply is to list the maximum values of voltage and current that you want it to produce. In the supply we will consider, the output voltage wanted will be 13 volts and maximum current 3 Amps, suitable to operate a 2 metre transceiver with power output of 10-15 watts. The next step is to list the voltage losses between the transformer and the output to determine the specifications of the transformer to be used.

Working back from the output, there will be a voltage loss in the regulator circuit. For this supply we will use a 3 Amp, 3-terminal voltage regulator adapted to give an adjustable output. (Details of regulator circuits will be given in a future column.) From data sheets it is noted that there is a 'voltage differential' across the regulator and this is 2.3 volts, or, for 13 volts output we require a minimum DC input of 15.3 volts.

The filter circuit, consisting of a large value capacitor, changes the pulsating DC output of the rectifier into a steady DC output plus a ripple voltage. Fig. 2 shows this and the capacitor used must

be of such a value that the minimum voltage from the filter is above the minimum value of voltage input to the regulator (15.3 volts). The various handbooks and technical articles give equations, graphs, etc., to determine this value and, for the supply we are considering, a value of 2700 uF is required. Note that a larger value of capacitor is required if the output current is increased, e.g. 4700 uF for a 5 Amp supply.

A good grade of capacitor is needed, i.e. one with low leakage (computer grade capacitors are ideal, but more expensive than normal types) with proper voltage ratings. The maximum voltage supplied to the capacitor will be the peak voltage from the rectifier—1.414 times the AC RMS voltage output of the transformer with no load—and the voltage rating of the capacitor should be at least twice this calculated value (40 or 50 volts for this supply).

The rectifier circuit used will determine the specifications of the transformer. In this supply, and we recommend that this practice is followed, we will use full-wave rectification and this can be accomplished by use of either two diodes and a centre-tapped transformer, or a bridge rectifier with a single output transformer. See Fig. 3.

Assuming a ripple voltage of 1.6 volts and a 0.7 volt loss through the rectifier

circuit, the AC RMS specification of the transformer, at full load (3 Amps) will be 17.6 volts and a transformer with 36 VAC RMS, centre-tapped at 3 Amps will be the minimum requirement for use with the two diode rectifier, or a single output of 18 VAC RMS at 3 Amp for the bridge rectifier.

Rectifiers, and bridges, are rated by PIV—peak inverse voltage—and a PIV rating of at least twice the peak voltage supplied with no load is required. Current rating will be the same as the maximum output current supplied.

If you use the various formulas, or graphs, mentioned above, the value of the secondary resistance (R_s) must be calculated. Specifications given by manufacturers, e.g. Hammond, give the 'No load secy volts' and 'Full load secy volts', and for a typical 36 volt, 3 Amp transformer, these are 37.9V and 36V. The value of R_s can then be calculated, using Ohm's Law, using the voltage differential between no and full load for E and full load current rating. R_s for the typical transformer is $1.9/3 = 0.63$ ohms.

Note that a larger value of transformer voltage rating, e.g. 50 VAC RMS, centre-tapped, will give a higher voltage to the filter and a smaller value of filter capacitor can be used, as the ripple voltage can be 7 volts higher than that using the 35 V transformer. A transformer with rating of 50 VCT, 3A output is not common and practice is to use a 25 V, 3A transformer with a bridge rectifier.

For protection, when powering equipment, it is advisable to fuse the output of the power supply with fuse located after the regulator output. It is also a good practice to install a pilot light, or an LED indicator, between the output and ground to show that the supply is functioning. An additional fuse and indicator can be installed in the transformer input circuit for maximum protection, etc. ■

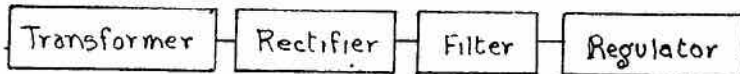


Figure 1

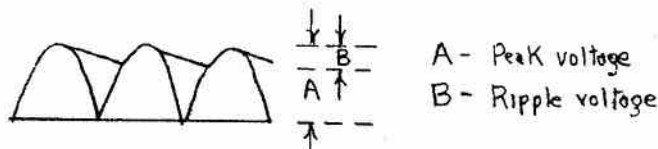


Fig. 2— Voltage output from filter.



Fig. 3— Full wave diode and bridge circuits.

VE7LAN

Vancouver area Amateurs use the VE7LAN voice repeater as their local packet LAN. Coverage from this 5 watt mountaintop duplex repeater is about 80 km. The repeater was put into service 18 months ago and has eliminated the requirement for digipeating. This doubles the channel speed.

— Rob Bareham VE7TT

Bring a blind Amateur with you to your next club meeting.

CARF Operating Aid

The Canadian Amateur Radio Operator's Guide (c)
 Table 1
 Authorized High Frequency Band Limits and Types of Emission

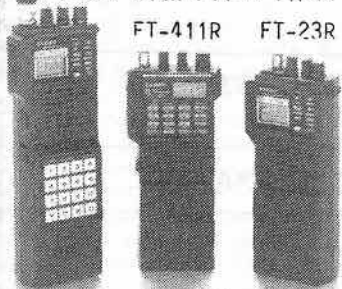
ALLOCATIONS			AUTHORIZED TYPES OF EMISSION		
METRE	FREQ LIMITS (MHZ)		AMATEUR		ADVANCED AMATEUR
BAND	LOW	HIGH	BASIC	6 MONTH ENDORSE	
160	1.800	2.000	A1	A1,A3.	A1,A3,F3.
80	3.500	3.725	A1	A1,F1.	A1,F1.
	3.725	4.000	A1	A1	A1,A3,F3,A4.
40	7.000	7.050	A1	A1,F1.	A1,F1.
	7.050	7.100	A1	A1	A1,A3,F3.
	7.100	7.150	A1	A1,F1.	A1,F1.
	7.150	7.300	A1	A1	A1,A3,F3,A4.
30	10.100	10.150	A1	A1	A1,F1.
20	14.000	14.100	A1	A1,F1.	A1,F1.
	14.100	14.350	A1	A1	A1,A3,F3,A4.
17	18.068	18.168	A1,F1.	A1,F1.	A1,A3,A4,A5,F1,F3,F4,F5.
15	21.000	21.100	A1	A1,F1.	A1,A3,F3.
	21.100	21.450	A1	A1	A1,A3,F3,A4.
12	24.890	24.990	A1,F1.	A1,F1.	A1,A3,A4,A5,F1,F3,F4,F5.
10	28.000	28.100	A1	A1,F1.	A1,F1.
	28.100	29.700	A1	A1,A3,F3	A1,A3,F3,A4.

DEFINITION OF EMISSION SYMBOLS

- A0 unkeyed or unmodulated emission
- A1 telegraphy by the on-off keying of an unmodulated carrier
- A2 telegraphy by the on-off keying of an amplitude modulated audio frequency signal or by the on-off keying of the amplitude modulated carrier
- A3 telephony by amplitude modulation
- A4 (i) facsimile by amplitude modulation of a carrier, either directly or by a frequency modulated sub-carrier, or (ii) slow scan television.
- A5 television by amplitude modulation.
- F1 telegraphy by frequency shift keying where one of the two unmodulated carriers is being emitted at any one instant
- F2 telegraphy by the on-off keying of a frequency modulated audio frequency or by the on-off keying of a frequency modulated emission
- F3 telephony by frequency modulation
- F4 facsimile by the direct frequency modulation of the carrier
- F5 television by frequency modulation

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2 Mini HT packs big performance. Choose Yaesu's miniature FT-23R Series for serious pocket-size performance. 2-meter, and 440-MHz models. Includes 10 memories (7 store odd splits). Memory scan at 2 frequencies per second. High/low power switch. LCD power output and "S"-meter display. Lots of PL features. Auto battery saver. Aluminum-alloy case. Water-resistant seals. Variety of battery packs available, from 2 to 5 watts. More.

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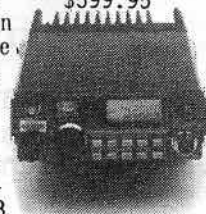
6 Mobiles that double as answering machines. Our FT-212R Series mobiles take messages just like an answering machine (with DVS-1 option)!



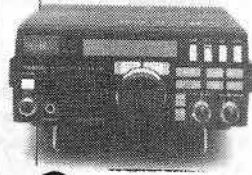
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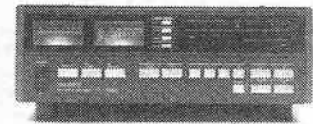
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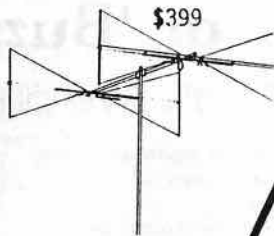
13 Serious VHF/UHF Receiver. Our FRG-9600 is a smart way to monitor. 60 to 905 MHz coverage. USB, LSB, CW, AM, FM wide and narrow. Optional NTSC video module. Scanning steps of 5, 10, 12½, 25 and 100 KHz. 99 memories store frequency and mode. Memory scan (also scans between memories). Keyboard frequency entry. 24 hour clock. Multiplexed output. Fluorescent readout. Signal strength graph. Much, much more.



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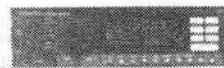
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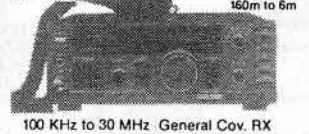
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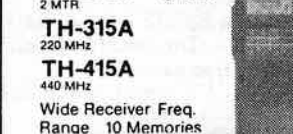
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Glossary of Packet Radio Terms or 'Buzzwords'

From The Ontario Amateur

- We know that the experts in packet radio know all of the following terms by heart. However, we've printed them for the benefit of the newcomers and less expert.
- ACK**— Acknowledgement of a correct, complete packet frame.
- ASCII**— American Standard Code for Information Interchange.
- ASYNCHRONOUS**— Serial Data Communication with start and stop timing.
- AX.25**— A Protocol named for Amateur use after X.25 system
- BAUD**— a unit of data rate i.e. 1200 baud.
- BBS**— An operating station where messages and programs can be left for the benefit of others.
- BINARY**— Used in electronics, using the Base 2 system showing an OFF and ON switch rate.
- BIT**— The smallest unit of information in Binary.
- BPS**— Bits per second.
- BUFFER**— Temporary storage area for data information.
- BURSTY**— Communication which is random and short in duration.
- BUS**— A group of wires or connection which carry signals throughout a computer, making contacts at similar locations on several different PCBs.
- BYTE**— 8 bits.
- CAPTURE EFFECT**— The ability of an FM receiver to reject a weak unwanted signal, and lock onto the strongest signal present.
- CHECKSUM**— A frame check sequence whereby a sum of all bytes of data are added and a check value is formed.
- CONNECT**— Establish communications with another station.
- CPU**— Central Processing Unit. A chip which is the 'heart' of a computer.
- CTS**— An RS232 signal. Clear to send.
- DATA**— Information usually in binary format.
- DCE**— Data Communications Equipment, i.e. TNC or modem.
- DIGI**— A Packet Radio Repeater to link or extend range.
- DIS-CONNECT**— Termination of communication with another station.
- DOS**— Disk Operating System. Program for a computer with disk drives.
- DPSK**— Dual Phases Shift Keying. 2 bits per baud.
- DSR**— An RS232 signal. Data Set Ready.
- DTE**— Data Terminal Equipment. Equipment connected to a Modem or TNC.
- DTR**— An RS232 signal. Data Terminal Ready.
- DUPLEX**— Transmitting and receiving simultaneously on different frequencies.
- EPROM**— ICs which are ROMs and can be programmed and erased by the user.
- FCS**— Frame Check Sequence. A frame error check routine.
- FILE**— Information or program stored on disk or tape.
- FLOW CONTROL**— Regulating the input and output of data.
- FRAME**— A packet of information bits. Designed by the protocol used. Usually having a start flag and an ending flag.
- FRAMING ERROR**— A signal provided by UARTs or ACIA chips to indicate that no stop bit was found.
- FULL DUPLEX**— Communication between 2 stations transmitting and receiving at the same time.
- HALF DUPLEX**— Communication between 2 stations whereby only 1 station tx. at a time.
- HARDWARE**— Electronic components, i.e. resistors, capacitors.
- HEX**— Hexadecimal math system. Based 16 numbers, i.e. 0123456789abcdef.
- HOP**— To repeat or go via a Digi.
- IC**— Short form of Integrated Circuit.
- I/O**— Input/Output in a computer or other device.
- LINKS or LINKING**— A method of using Digi's to extend range and communicate between cities.
- MODEM**— A MODulator DEModulator device which encodes and decodes data signals.
- MODULATION**— A process of imposing information on a carrier.
- MULTIPLE ACCESS**— Allowing more than one user to input or receive information from one source.
- MULTIPLEXING**— Dividing a single communications channel into several usable channels by sub-carriers.
- NETWORK**— A pre-arranged plan of communications between several stations.
- NODE**— A junction or re-transmission point in packet radio, i.e. Repeater Node, Station Node, Terminal Node.
- OCTAL**— Electronic math with Base 8 number system.
- OVERHEAD**— Information contained in a packet frame which controls its destination and direction. Added to the information or message sent.
- PACKET**— A communications data module and an address and from statement plus message information.
- PARALLEL**— Transmission of data bits over 8 wires simultaneously.
- PROTOCOL**— A set of rules which are laid down to control the packet framing so all participants on a frequency can communicate.
- QPSK**— Quadrature Phase Shift Keying, sending 4 bits per second.
- RAM**— Read Access Memory, temporary volatile storage in a computer. Also known as Read/Write memory.
- RANDOM ACCESS**— Unscheduled input to a data system
- READ THRUPUT**— The actual successful transmission of a message or information through a data system. Less overhead.
- REPEATER**— Re-transmission of data to extend range.
- RESET**— To re-start programme or computer.
- ROM**— Read Only Memory. Pre-programmed and is permanent.
- RS232**— A serial data standard for communications.
- RTS**— An RS232 signal, Ready to Send.
- RTTY**— Radio Teletype.
- RX**— Receiver or Received.
- SERIAL**— Transmission of bits in succession. One after the other.
- SIMPLEX**— TX and RX on one frequency.
- SOFTWARE**— Computer programmes.
- STACK**— Temporary storage of information.
- SYNCHRONOUS**— Serial communications which is clocked control.
- TNC**— Terminal Node Controller; interface between radio and computer to decode and control data.
- THRUPUT**— Successful TX and RX of data or information.
- TRANSPARENT**— Operation of the system is invisible to user.
- TTL**— Transistor to Transistor Logic IC.
- TX**— Transmit or Transmitter.
- VAN or VADG**— A protocol used by many stations.
- VIA**— Command used in AX.25 for repeating through another TNC.
- VOLATILE**— Lost data when power removed. ■

•CQ DX•CQ DX•

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



4W AT LAST!

If you were on the air around Jan. 24, you may have stumbled across the big DX news item of 1989... so far anyway... Yemen has been put on the air at last. Hans 4WOPA is a medical doctor from the Netherlands and he plans to be in the Yemen for two years. After all the hype about the Lynx group's abortive effort last year to activate 4W, this successful operation has crept up on us almost unannounced. While there are numerous rumours flying around, it would appear that Hans first came on the air around Jan. 24 operating with low power. His QSL manager, PA3CXC, who is editor of *DXPRESS*, says he "believes the operation is legitimate." Hans has been reported on a number of 20 metre SSB frequencies including 14.150, 14.178, 14.183 and 14.196 MHz either around 0200 or 2000 UTC. It sounds as though he has been checking into Snooky's DX Net on 14.183 MHz at about 2000 UTC.

Everyone seems surprised that this operation has got off the ground. Apparently the Yemeni authorities were pretty upset by the last operation from 4W which was unlicensed. Over the last few years there have been several Amateurs visiting or working in the Yemen but none of them has ever managed to get permission to operate.

It's good to hear that a number of Canadian DXers have already managed to get through the pile-ups and work Hans. You will have noticed in our 'Band Report' section that Fergus VE3NQi managed to contact him on Feb 3. Also a recent phone call from a VE2, Terry, indicates yet another success for one of our readers. Nice work, gentlemen!

80-METRE DXCC

According to *The ARRL Letter*, the first ten recipients of the 80 metre single band DXCC are:

1. John Devoldere ON4UN _____ 326
2. Bob Eshleman W4DR _____ 419
3. Russel Martin W3MFW _____ 294
4. Randy Schaaf W9ZR _____ 288
5. Albert Hix W8AH _____ 284
6. Austin Regal N4WW _____ 233
7. Robert Dixon K4MQG _____ 282
8. Robert Mitchell W1NH _____ 280
9. Leslie Murphy K4DY _____ 279
10. Richard Roderick K4UR _____ 276

The list certainly provides food for thought. It's no particular surprise to see ON4UN at the top. He has built a solid reputation for himself over the years as perhaps the leading expert in low-band DXing.

However 326 is a staggering total for a single band, most of use would be tickled pink to have that total for our lifetime, all-band, score! It's also interesting to see that, with the notable exception of John the list only contains U.S. call signs. I'm not too sure what this means, as I would have expected to find one or two other Europeans in there somewhere. Can anyone explain that?

CORRESPONDENCE

Several letters this month with useful comments on the column. Murray VE3HI would like to see more information on 40 and 80 metre DX. I quite agree that I have been tending to concentrate on 20, 15 and 10, which is a pity as we all know 40 and 80 probably have just as much DX on them. They do, however, present some different challenges in terms of propagation, antennas and so on. Murray is back on the air after a dozen years in a condominium apartment and, for starters, he has been working 40 metre CW with a simple wire antenna and a tuner. He tells me that he has worked DXCC on 40 metres since last November.

He points out that, in some ways, 40 and 80 are an ideal haven for those who want to work DX but are unable to compete with the big guns on 20, 15 and 10 with their kilowatts and multi-element beams. I have asked him to send me some extracts from his log. This is a good opportunity for me to ask any other readers who particularly enjoy

these bands to take a few minutes to list some of the more interesting DX they have worked or heard recently and mail it to my QTH.

Another interesting letter from Bob Eldridge VE7BS. He has a question which I'm not sure I can answer, so perhaps some of you propagation gurus out there can shed some light on it. Here's his problem:

"The graph showing the relationship between 10 cm. solar flux and sunspot number is relating SMOOTHED solar flux to SMOOTHED sunspot number. The formulae used in prediction programs for conversion from flux to SN are based on this graph. The flux was 255 at Christmas, 182 on Jan. 1, 256 today. How many readers smooth the flux number before running a MUF prediction? How many know how to do so? Over what period should it be smoothed?"

Any question concerning propagation sends me looking for my bible on the subject, *The Shortwave Propagation Handbook* by Jacobs and Cohen. It's a book I've mentioned before in the column and I've found it a mine of information on this somewhat complex topic. The book contains a graph showing the relationship between the two variables and suggests one can calculate values from the formula: $SF = 73.4 + 0.62R$ (where R is the daily sunspot number)

The interesting point here is that the

Continued on next page ▶



The April 1985 DXpedition to Clipperton stayed for six days and made 31,000 QSOs.

DX (cont'd)

graph relates *daily* sunspot numbers to *daily* Solar Flux. I can't comment on Bob's point that the prediction programs use smoothed values. If this is the case, I think the program designers should have used daily values which are available, as we all should know, from WWV at 18 minutes past the hour.

I think we mostly use prediction programs to find out if paths are open *today*, not the average possibility of those paths being open over a period represented by the duration of the smoothing process.

I sense that I have opened a can of worms here but, before I leave the subject and you all rush off to your typewriters, I'd like to make one more point. The level of solar flux is one of the key factors in making effective short-

term forecasts. It, together with the current value of the K-index, allows us to make reasonably accurate estimates of which paths should be open today to various parts of the world on the various HF bands. Sunspot numbers, as far as the propagation forecasting game is concerned, are a less precise measure of what conditions are likely to be today. They are with us, at least partly, for historic reasons since we have records of sunspot numbers going back to 1749!

DX NETS

Dieter Konrad OE2DYL tells me that the 1989 edition of his popular *DX Nets Around the World, List 8* is now available. The list contains information on more than 120 active DX Nets throughout the world and should prove a useful aid to

all DXers... except those who refuse to use list operations! The price is \$3 (U.S.) by airmail, or if you would like a package of all the previous editions (1-8), the price is \$10 (U.S.).

Dieter accepts IRCs at the rate of three to the U.S. dollar. However please do *not* send cheques or money orders. Send your order with SAE to Dieter Konrad, Bessarbiestr. 39, 5020 Salzburg, Austria.

DX SPOTTING NETS AGAIN

Observant readers will have noticed that I have added my telephone number to the heading of the column. It's there to help readers who, for various reasons, decide to give me a shout on the land line. Last month I had another welcome DX spotting call, this time from Terry, a VE2. He was able to tell me that XX9CT was at that very moment, 2345 UTC, on 14.236 MHz working into North America. It was too bad that I was on my way out of the door to the Ottawa Amateur Radio Club executive meeting and really couldn't delay my departure. However I was able to use the time and frequency to keep a look out for Macao for the rest of that week—thanks Terry. I feel quite guilty about readers calling me long distance with useful tips like this but if you feel the urge I'm delighted to hear from you!

OBLAST REVISIONS

I'm not sure how many of my readers are collecting 'Oblasts', perhaps some of you don't even know what an Oblast is? My encyclopedia tells me that it is "...an administrative unit in the U.S.S.R. corresponding to a province."

The use of the word 'province' here is a little confusing since an oblast is certainly smaller than the average Canadian province, there being about 200 of them across the whole Soviet Union. Anyway I know that there must be quite a few collectors of oblasts in North America as I often hear a pile-up on an apparently common Russian station and the reason is usually that he is located in a rare oblast.

Some recent changes to the list have been passed on to me by VE7BS (from W4KM) and *QRZ DX* so I'll summarize below what you need to know:

Deleted Oblasts

043 (UH-H) is now part of new oblast 193 (UH-B, UH-H).
176 (L-Y) is now part of 026 (L-L).
177 (UM-P).
179 (L-A) is now part of 020 (L-O).
180 (UH-B) is now part of new oblast 193 (UH-B, UH-H).
181 (UI-V) is now part of 173 (UI-D).
182 (J-K) is now part of new oblast 192 (J-K) Khatlonskaya.
183 (J-X) is now part of new oblast 192 (J-K) Khatlonskaya.
184 (UM-T).
185 (UI-Q) is now part of 051 (UI-I)

New Oblasts

192 (UJ-K). See above.

BAND REPORTS

(Some more impressive extracts from the log of VE3NQI, Fergus)

CALL	FREQ (MHZ)	UTC	DATE	NAME	QSL via
VP8BUO	14.001	0033	12/18/88	Adrian	G0IHK
FO5LZ	14.236	0300	12/20/88	Jean Claude	***
JX1UG	14.181	2150	12/20/88	Ivor	LA5NM
EL2JM	14.280	0300	12/24/88	Joe	KA5ZMK
9J2AL	28.543	1925	12/26/88	Al	**
5U7DX	14.195	2249	12/27/88	Hans	DK9KX
HL9JZ	14.012	0041	12/28/88	Dennis	KA10XO
UI8CQ	14.017	0100	12/28/88	Faat	
9Q5NW	21.250	2020	12/29/88	Tom	AL7EL
ZD9BV	21.250	2055	12/29/88	Andy	W4FRU
UA0BEZ/UA10,14.009		2215	12/30/88	Eugene	RA3YA
SU1EE	14.026	0308	1/6/89	Sig	
ZC4AB	28.582	1500	1/7/89	Alan	ZC4 Buro
VK9ZM	7.055	0826	1/12/89	Joe	NM2L
VK9ZW	28.495	0055	1/21/89	Ian	NM2L
SV5TS	28.551	1742	1/22/89	Bill	****
HL3IID	28.533	2358	1/28/89	Kim	Buro
JY9LC	28.493	1528	1/29/89	Jack	
4W0PA	14.180	2033	2/3/89	Hans	*

QSL ROUTES

*PA3CXC, John Fung-Loy, Strauslaan-4, NL2551 NM-S, Gravenhage.

Netherlands.

** Lusaka Zambia, US Aid. Washington DC. 20523. USA

***BP.41, Nuku-Hiva, Marquise Island. French Polynesia.

**** Box 251. Rhodes. 85100, Greece.

CLUB CORNER

By J.P. LeBlanc VO1SK/VP9LA

It's with great pleasure that I take over the Club Column in *The Canadian Amateur*. First of all, I'd like to thank George Morgan for the excellent job he has done in the past. I'm sure the many readers of this column join me in wishing you the very best, George.

I will start by introducing myself. My name is Jean-Paul LeBlanc, but I'm better known as 'JP'. I'm 38 years old and married with two teenage daughters. I'm originally from Moncton, New Brunswick, but since joining the military 18 years ago, I have lived the life of a gypsy. This has had its advantages and disadvantages. For example, the four tours in Alert (VE8RCS) weren't much fun, but the two years in Bermuda were great. I have been licensed for seven years, hold an advanced licence and have been a member of four different clubs. I'm interested in most facets of the hobby, as well as being a very keen shortwave listener. I am presently the Base Telecommunications Officer at CFB Gander.

► CQ DX (cont'd)

193 (UH-B, UH-H) see above.
Changed Oblasts
036 (M-M) now includes Talasskaya.

BITS AND PIECES

18 MHz Open to U.S.— Those of you who occasionally check the 'new' WARC bands may have been surprised to find 18 MHz full of U.S. Amateurs on Feb. 1. The FCC, in a surprise move, provided temporary authorization for early access to the band. The official date for U.S. access is July 1, 1989, the band is now open to General, Advanced and Extra class operators with the usual power limitations. The band plan looks like this:

18.068-18.168 MHz CW.
18.068-18.110 MHz Digital (RTTY etc.)
18.110-18.168 MHz Analog (Fax, TV, SSB, etc.)

Contacts on this band DO count for DXCC credit.

SU Egypt— While not counted as rare, Egypt is one of those countries with so few active Amateurs that I find I hear an SU perhaps once every three or four years. It's good news to read that SU1EE likes to work 20 metre CW and can be found around 14.026 MHz at 0130-0230, 0500 and 1600 UTC. He is also sometimes heard near 3.500 MHz on or before 0500 UTC.

XU Kampuchea— Sad news about Seth, who has been keeping XU on the air for the last couple of years. According to

Over the years, this column has reported on various club activities across the country. I will continue to do this, but I also hope to be able to make this column a place for the exchange of ideas about what clubs are doing to make meetings and activities a success.

My main source of information for this column comes from club bulletins. So, if you have a club bulletin and are not sending a copy to CARF, please do so. There may be information in your bulletin which might be of interest to other TCA columnists (i.e. awards, flea markets, etc.), or if the information is time-sensitive it will be distributed via the CARF Bulletin.

If your club does not have a Bulletin, you can still send me photos and details of your club activities. Newspaper articles are okay, but newspaper pictures are no good. We prefer original black and white photos if possible, but colour photos can be reproduced if a good contrast is present. Just drop me a letter at the CARF address.

While we are on the subject of club bulletins, I have to congratulate some of

YB3CN, his QSL manager, quoted in *Inside DX*, his equipment has been impounded and the operator has moved to a new location. The current political situation in Kampuchea may well keep him off the air.

VK9ZW Willis Island— Last month I mentioned the QSL routes for the recent Mellish Reef and Willis Island operations. The second of these has now been changed as VE3CPU's address was wrong in callbook editions prior to 1988. Your QSLs for both these operations should go to NM2L.

ZS8 Marion Island— Good news about this isolated spot, 45 degrees South, 30 degrees East, which has not been official on the air for some ten years. Peter Sykora ZS6PT will be travelling to the island in April as a member of a meteorological team. He will be on the island for 14 months as a radio technician and is taking Amateur gear for HF, 6M and satellite with him. Peter operates CW and SSB and he plans to use the station's rhombics, which are part of the South African Weather Bureau communications system, whenever the commercial station is off the air. Let's hope one of those rhombics is pointing in our direction!

Thanks are due to the following sources for some of the material appearing in this column. OE2DYL, VE3NQI, VE3HI, ORZ DX, DXPRESS, VE7BS, W4KM, Terry VE2??? and *Inside DX*. ■

the clubs for the quality of their bulletin. There are some very professional publications out there. Editors, keep up the excellent work.

Well, a new year of club activities has just begun and I'm sure the new club executives have been busy getting various activities organized. Many clubs have started their yearly Amateur radio course. Hopefully the success rate will be high. Clubs with DX sections have been busy with the CQ WW CW and SSB Contests. It is hoped your efforts will be rewarded with an award. The 31st Annual Jamboree On The Air (JOTA) Oct. 14-16 generated a lot of activity from various clubs across Canada.

The Charlottetown P.E.I. Club played Santa Claus by taking part in the 'Christmas Daddies' collection. Due to the contributions made by club members, several needy children had a happy Christmas.

The Moncton N.B. club held a successful dinner with 43 members attending. The evening was most enjoyable and the fellowship was first-class. Excellent support was given by local community businesses to supply a number of quality draw prizes.

The Peel Amateur Radio Club Inc. in Bramalea had a very interesting talk by Bernie VE3ATI of the Northshore ARC (Oshawa) on Camp X. This was the camp set up by Sir William Stephenson (*A Man called Intrepid*) during World War II. The December meeting consisted of films from Northern Telecom via Vic VE3FOX.

The Peterboro ARC handled the communications for the Tall Pines Rally. Participating were Bob VE3RA, Bob VE3GEE, Mac VE3PBM, Al VE3AAL, Rick VE3IQZ, Bill VE3MCC, John VE3KXE, Don VE3CBA, Roger VE3RKS and Brent VE3ETW. The group was under the leadership of Larry VE3NTQ.

The Oakville Club on Nov. 15 completed the 10th evening of helping with the Kiwanis Club Bingo, and were presented with a donation in the form of a \$1,000 cheque which will go into the club repeater fund.

Saturday, Oct. 29 was the date for another successful annual banquet for Amateurs in the Waterloo-Wellington area and their friends. The 100 people present were from the Cambridge, Guelph and Kitchener-Waterloo clubs, with guests from Hamilton and points as far away as Manitoba.

Well, that's it for this time. 73s for now and do get involved with your club. ■

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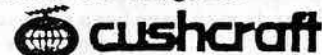
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Listening To The World

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



I hope you have been having success in logging some of the stations which have been profiled in this column over the last few months. Reception conditions continue to improve and each week old familiar voices from the shortwave past begin to return to the receiver. There are just so many possibilities for new catches every day. As I mentioned last month, reception has been particularly good to the Far East and Southeast Asia. This month, I'd like to focus on one of these countries and their broadcasting activities on the shortwave band.

COUNTRY OF THE MONTH

Let's take a look at the most heavily-populated country in the world, the People's Republic of China, and their international voice on shortwave radio, Radio Beijing. Some of you probably remember them as Radio Peiking, but when the Mao era ended, the station name was changed to Radio Beijing along with the city.

Radio Beijing was inaugurated on Sept. 11, 1947, when its English language service began. After 42 years on the air, Radio Beijing now broadcasts in 38 foreign languages as well as in standard Chinese and four local Chinese dialects. Transmitting 137 hours a day of news and commentaries on international affairs, they also feature many regular programs about the country, its people and culture. Special programming is often produced for holidays and festivals.

They also feature Chinese language lessons as part of their programming. All programming is designed to enhance the listener's understanding of China. Radio Beijing is most anxious to receive letters and reception reports from listeners and has become known in the SWL world as one of the most generous of stations when it comes to issuing souvenirs to go along with QSL cards.

Radio Beijing probably has the widest variety of station souvenirs of any shortwave station today. Often a letter or reception report to Radio Beijing will generate a number of souvenirs from the station including colourful pennants, books, pins, magazines and, of course, the annual edition of the Radio Beijing calendar. You can address letters to the English Department, Radio Beijing, Beijing, People's Republic of China.

With China reaching out in the world, making contact and developing new relations with foreign countries, the

importance of the external service of Radio Beijing has grown. In order to more consistently reach a wider audience, particularly in North America, Radio Beijing has made some interesting changes to their broadcasting in the last few years. With the growing popularity and economical advantages of transmitter swapping, Radio Beijing has begun to make inroads to new listeners in places around the world where their signal did not previously reach.

Radio Beijing went to the West African country of Mali and offered to restore some old shortwave transmitters which were located there, at their own expense, with the agreement that they would be able to relay Radio Beijing programming from the location. Since the development of this relay site, the signals of Radio Beijing in North America have been much more reliable.

Transmitter swap time agreements have also been implemented between Radio Beijing and Radio France International, Spanish Foreign Radio, Swiss Radio International and shortly with Radio Canada International. These swaps are allowing these broadcasters time on the transmitters of Radio Beijing as well, enabling them to reach new target areas. At the time of this writing, the best chances for listening to the Radio Beijing broadcasts in North America are the following:

0000 to 0100 UTC- 9770 and 11715 kHz

0300 to 0400 UTC- 9770 and 11715 kHz

0400 to 0500 UTC- 11695 kHz

1100 to 1300 UTC- 9665 kHz

These schedules could change by the time you read this, so best to write to the station and request their latest program schedule. Radio Beijing is always happy to hear from their listeners.

BOOK REVIEW: 1989 WORLD RADIO TV HANDBOOK

Every year the shortwave community anxiously awaits the arrival of the so-called 'shortwave listener's bible', the *World Radio TV Handbook*. This annual publication of Danish origins is now published by Billboard Limited under licence from Billboard A.G. the Editor is Andrew G. Sennitt. The publication is now in its 43rd year.

As the title suggests, the book lists information on radio and television stations around the world, including AM, FM longwave and shortwave radio stations and VHF and UHF television, together with schedules, frequencies and addresses of the stations. The book

is divided first into two sections: the radio and television sections. Each section is divided into continents and then sub-divided alphabetically by country, giving the details of the stations broadcasting from each country. Information is given to help you track down and identify the various stations. A supplementary listing of all stations in frequency order is also included. There are maps indicating transmitter sites, special articles on radio listeners' clubs, propagation reports, receiver test reports and other articles on specialized subjects.

This year's issue marks the return of a larger 'Listen to the World' section of articles at the back of the book. Included this year are articles on The Year of the Relays, The WRTH Radio Industry Awards, Medium Wave in Asia, Radio Related Computer Software and The Equipment Test Bench. This section is co-ordinated by well-known shortwave broadcaster, Jonathan Marks of Radio Nederlands.

The book is almost 600 pages thick and chocked full of useful information to the radio hobbyist. It is not necessary that you purchase this book every year, but upon seeing a copy of it and reviewing the information it has to offer, I am sure that you will become a devoted fan of the publication. In order to supplement the annual publication, the publishers also issue a quarterly supplement, *Downlink*, which contains updated schedules, news from collaborators worldwide, an updated frequency list plus articles of special interest. An order form for these updates appears in the handbook.

The book can be found in some commercial book stores in Canada, usually for around \$30. In my opinion, the best way to obtain a copy is to order one from either of the two Canadian Shortwave radio clubs, the Canadian International DX Club, who has the book for \$27, or the Ontario DX Association who sells the book for \$27.50. These prices include shipping costs. You can order from CIDX at my address above or from ODXA, Box 161, Station A, Willowdale, Ont.

I am interested in hearing from the Amateur community as to the performance of various general coverage transceiving equipment which you might be using. The ham community has been given the opportunity to explore the world outside the Amateur bands with the introduction of this new, high-quality

Continued on next page

PACKET RAP

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

PACKET OPERATING PROCEDURES

Although some of the following may be obvious, here are some of the finer points about using a packet radio station:

1. When operating a BBS, try to be brief during prime time. Do not download large files in the early evening!

2. Please be patient with the sysop of the BBS. Remember that he is providing a *volunteer* service using his own time and, in many cases, his own equipment.

3. Ensure that your TNC has the correct parameter settings. Setting the retry timeout too high just pollutes the frequency with needless traffic. Leave a message with your local sysop if you are not sure what the parameters should be.

4. Don't digipeat your traffic to another node unless you really need to.

5. Do use a NETROM node to connect to a station that is more than one digipeater away. The NETROM node will give you a better chance at getting through when errors do occur.

6. Do not try to work DX SSB stations during prime time. The best time to do this is late at night or early in the morning. Traffic is usually light in non-prime time and you won't get frustrated by having your DX contacts fail.

7. Get involved with the local packet group if you don't like the way things are being done. Complaining about the way things are does not accomplish anything useful. Remember, most groups are short of 'doers'. Volunteers are always welcome.

8. Run enough power for a reliable

contact, but don't run too low a power level since other stations may not hear you. Since other stations won't hear you, they may transmit over top of your signal and cause collisions and the ensuing retransmissions.

9. Move off the prime frequency if you and a friend are going to move a lot of data. Large file transfers on 145.01 are not usually appreciated by other users.

10. Don't send junk mail. You don't like getting junk mail from Canada Post, and you should not send out messages to everyone unless you really want to do that.

ABOUT THE NET PROGRAM

Phil Karn's Net Program is being continually enhanced and improved. Here are some of the features of the net program:

1. Perform AX.25 QSOs (just like a TNC-2 or clone).

2. Act as a digipeater.

3. Support a protocol called Telnet. Telnet allows reliable QSOs between stations running the net program.

4. Perform reliable file transfers using a protocol called FTP (file transfer protocol).

5. Support a defacto standard electronic mail protocol called SMTP (simple mail transfer protocol).

6. Allow mail forwarding from an AX.25 BBS to your station.

7. Supports a protocol called ping which allows you to find out if a certain station is up and how long it takes for a test packet to reach the station that you are 'pinging'.

8. Act as a gateway between two or more frequencies.

9. Run the IP (internet protocol) using a NETROM network.

10. Do all of the above at the same time (if you wish).

As mentioned before, the net program is free of charge and will add a note of pleasure to your packet operating time if you can afford a PC or PC clone. The net program runs on the IBM PC or clone, the Amiga, the MacIntosh and many Unix-based machines.

ABOUT THIS COLUMN

This column is written on an IBM PC and electronically sent to CARF Headquarters in Kingston via the packet radio network from Ottawa. No actual paper is involved until the Editor unloads the file from his Packet Station and sets up the column for the production manager to typeset.

FEEDBACK REQUESTED

I have some limited feedback about the column and it has been positive. If there is some topic that you would like me to expand upon, please let me know. Tell me what is happening with packet in your area of the country. Any action with the Maritimes? How about Toronto, Vancouver, etc.? See you next month. ■

CARF/VE3VCA ON PACKET RADIO

The Canadian Amateur Radio Federation may now be reached by Packet Radio. This form of communication is to be used for non-commercial traffic, i.e. news items, short articles and general messages. It may NOT be used for renewal of memberships, ordering publications etc. Please understand that, although it would be handy, we cannot break these rules for anyone.

The Packet Address for CARF Kingston is VE3VCA@VE3IWJ or VE3LXA@VE3IWJ.

In addition, CARF is offering a Name and Address service on Packet Radio. Larry VE3FXQ has been appointed Official Callsign and Address Custodian. As such, Larry will provide names and addresses of Canadian Hams, to Canadian Hams, as listed in the latest CARF/Communications Canada *Address and Callsign Book*. This service is offered 'on packet only' and on a 'one at a time' rate.

Please send your requests to VE3FXQ@VE3NUU.

Write to *The Canadian Amateur*, c/o CARF Office.

LISTENING (cont'd)

equipment. Not being a ham myself, I am curious to know just how well some of this new equipment is performing in the area of shortwave monitoring.

In my monitoring of the ham bands from time to time, it appears that the equipment certainly performs in the transmission side of the game, but how is it doing on the receiving side? I would like to hear from you with your experiences in using the transceivers as shortwave receivers. I am sure that a number of the shortwave listeners in clubs like CIDX and ODXA would appreciate these comments. Who knows, some might just get the urge to take the plunge into the world of Amateur radio.

Personally, I am using the Kenwood R-5000 communications receiver and would be most interested in hearing from users of the Kenwood transceiving equipment. I would also be interested in

the results obtained by using Amateur antennas for shortwave reception. Most SWLs are simply using some form of inverted L or random wire, or perhaps various types of dipoles, but it would be interesting to know how more specialized Amateur antennas work in conjunction with shortwave reception.

I would appreciate any of your comments on this or on any other aspect of shortwave monitoring. Your criticisms, suggestions and comments about this column are most appreciated. Also you are welcome to submit the results of your radio monitoring to me in the form of your choice. As previously mentioned, I would like to include a logging section in this column should your input dictate so. Looking forward to hearing from you. Thank you to all those who have responded so favourably to this column. ■

line of sight

Robert Smits VE7EMD, 13894 94A Ave., Surrey, B.C. V3V 1N2

30-890 MHz SPECTRUM REVIEW

One of the more immediate possible 'threats' to Amateur use of the VHF/UHF spectrum results from the present 'spectrum review' being carried out by Communications Canada for all frequencies between 30 and 890 MHz. In recent years, Communications Canada and its predecessor, the Department of Communications, has undertaken spectrum policy reviews relating to the usage of various bands. These reviews are undertaken periodically to examine the current level of usage on each band, technological progress, operational requirements and Canadian user needs.

Such reviews have led to "rationalizing use, identifying strategies for the introduction of more efficient utilization techniques, allowing sharing of under-utilized spectrum, and, in general, providing a concise policy framework to direct future utilization of the frequency spectrum."

In translation from bureaucratese, this means that in the process of the spectrum review Communications Canada will:

1. Examine the present usage of the bands concerned. The three key factors here are the degree to which a band is being used, amount of investment in equipment, and the possible use of new technology to improve use.

2. Identify new services that could use this range of spectrum.

3. To figure out how much spectrum each service needs.

In other words, they'll look at ways of squeezing more use out of available spectrum, which may include forcing users to give up or share existing spectrum, and to come up with a 'game plan' for dealing with that spectrum in the foreseeable future.

The spectrum review process works pretty much like this. In the first step, Communications Canada releases a discussion paper that describes the terms of the review, outlines current usage policies, provides regional frequency assignment statistics on a band-by-band basis, and poses some 'theme questions' on which Communications Canada wants comments.

Next, interested parties file comments with Communications Canada. CC will then generate, based on the comments and their own research, 'policy proposals'. These will describe the action Communications Canada proposes to take on the bands in question, and users as well as the

general public may comment on the proposals.

The 'policy proposals' are expected to be issued in three parts: first, for all bands which are to remain as is; second for bands with minor changes; and third, for bands with major changes proposed. In the last stage in the spectrum review process Communications Canada will write and issue 'spectrum policy' that will define who goes where, etc. No public comment is provided for at this stage.

30-890 MHz review began in September 1987, the DOC issued a discussion paper called Utilization of the Radio Frequency Spectrum in the Range 30.01-890 MHz as the first step in a review of all bands—including the 'Amateur bands' between 30 and 890 MHz—50-54 MHz, 144-148 MHz, 220-225 MHz, and 430-450 MHz. Comments had to be filed by March 15, 1988, and it was expected that policy proposals would be completed by the end of 1989.

Canadian Amateurs who commented on the discussion paper have expressed concern that Communications Canada underestimated not only the number of repeaters but also the significant portions of non-FM, non-channelized use of VHF spectrum. For example, Amateur Co-ordination Records showed 111 Amateur 2M repeaters in B.C. and the Yukon. The discussion paper listed only 62, or 56% of those on the air.

Many also felt that Amateur Radio should not be evaluated in the same way as 'commercial' radio, but that instead, Amateur Radio should be treated as parkland is treated within a municipality. A place where experimentation, creativity, public service and friendship are more important than profit and loss or numbers.

In addition, pointed comments were made by Communications Canada regarding the apparently 'lightly used' portions of Amateur spectrum such as six metres and 220-225 MHz.

Theme questions in the discussion paper Communications Canada referred to a number of 'theme' questions that they solicited input on.

The major questions affecting Amateur radio were:

1. Considering the use of 220-225 MHz for a personal/business radio service. Such as service should be 'low cost', operate on a block of frequencies in base/mobile usage with a range of about 40 km, and would not require much technical skill. (Sounds like CB, eh?)



2. Use of various low-power devices for remote control, computer linking, control applications, etc. on various frequencies including 30 to 47 MHz and other bands.

3. Land mobile and UHF TV sharing of frequency spectrum. This is of concern to us because: land mobile wants more spectrum, TV broadcasting doesn't want to give up any spectrum, and everybody is looking at 'our' Amateur frequencies to expand to.

Well fellas (and gals) the preceding should have given you some idea of what the spectrum review process is about. Next month, I'll tell you about some of the proposals made to Communications Canada. ■

ANDRE BUREAU'S CONTRIBUTIONS TO BROADCASTING

Communications Minister Marcel Masse has thanked Andre Bureau for his important contributions to Canadian broadcasting as chairman of the Canadian Radio-television and Telecommunications Commission; Mr. Bureau announced his resignation from the position, effective March 1.

Mr. Bureau began the simplification of the regulatory process, which has made significant progress during the past five years. The Commission has opened the telecommunications industry to increased competition, ordered long-distance rate reductions and frozen local telephone rates. On the broadcasting side, the Commission has completely revised and simplified all its regulations, and has made important decisions regarding pay television, extension of service, and levels of Canadian content required by licensees.

FOREIGN MEMBERSHIP ISRAELI ARC

The Executive Council of the IARC has decided to accept foreign membership. Foreign members will have an 'Associate Member' status in the society and will receive *HaGal International* by air mail. Annual membership is \$25.

— *HaGal International*

NYBLES AND BITS

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

THE GEM DUP PROGRAM PART 2

In this month's column we want to expand on the program which we started in the last issue, i.e. keeping a simple dup sheet. The idea for this program was obtained from my GEMRADIO system which was reviewed in the February issue. Of course, the GEM system is a comprehensive data base system consisting of about 15,000 lines of Turbo Pascal code which has taken me several years to write, keeping track of call, name, location, country, date, band, mode, etc. etc. and only runs on an IBM compatible machine. No program of this calibre could be efficiently written in BASIC which is the computer language I am using in this column.

This month we want to add two more functions to GEMDUP: SCREEN and PRINT which will allow us to view the dup sheet on the screen or print it out on our printer. The extra lines of code that you have to insert are shown in Figure 1. (The statement numbers are just added to the previous program.) You can simply do this by LOADING the old program and typing the new additions as shown in the figure. This will work fine for as long as you have used the same line numbers as in my original code. When finished you can SAVE it in the normal way, or use a new name for it if you want to keep both versions.

RUNNING THE PROGRAM

The program is run in the exact same way as outlined last month. However now you have two more options when the Enter new call -> prompt appears. By typing SCREEN <Enter> you will get the screen display or by typing PRINTER <Enter> you will get your output on the printer.

CORRESPONDENCE

Thanks to VE3NIY, VE3JTO, VE3GOV, VE3EJY, VE3PRY, VE7OR,

SASKATCHEWAN HAMFEST

The Regina Amateur Radio Association would like to invite Amateurs and friends to the Saskatchewan Hamfest, August 11, 12 and 13, 1989 in Regina. The programme includes a variety of items for Amateurs and Non-Amateurs and a flea market. Watch for further details and listen to the Saskatchewan Phone Net at 0100Z nightly on 3753 kHz.

K3SKE for letters received. Our column seems to be gaining popularity! Thanks to all.

My programs to date have been written in C-64 Basic. If you have problems in printing the results it may mean that your printer is not properly

set. Please check the October 1988 column.

The programs may be distributed freely by anyone or on any bulletin board. My only stipulation is that you acknowledge that the programs are distributed courtesy of CARF. ■

THE PROGRAM

The program is written in GWBasic. To make it run on a C-64 Basic machine you have to make the following changes:

	For (in GW Basic)	Type (in C-64 Basic)
	CLS	PRINT CHR\$(147)
	LPRINT	PRINT# 4,
Lines	Explanation	
560-570	These two lines check to see if the call sign (CA\$) is SCREEN or PRINT. If it is SCREEN then it will execute the routine at 1250 and the go back to 480 - where the prompt is displayed - when done. If it is PRINT, then it will execute the routine at 1400 and then go to 480.	
1240-1250	The function comments.	
1260	Since we may have deleted several calls or some garbage may be in our table we better blank out the 20 positions in the table after the last valid entry. The reason for 20 is that we are going to display 20 calls on the screen.	
1270	This statement calculates one less than the number of screens (NS) required to display the number of calls (N) that we have in our table. To do the calculation we use the internal function INT, this function returns the integer part of the division i.e. $INT(4/20) = 0$; $INT(23/20) = 1$; $INT(75/20) = 3$. A loop through all of the screens.	
1280,1370	Clear the screen.	
1290	Display the title.	
1300-1310	A loop to display each of the calls in the table (TA\$) on a separate line. Note the index calculation to get the right position in the table. You can look on the index I as the screen number, and the index J as the line number.	
1320-1340	A prompt for the users to signal when they are done by pressing the <Enter> key (A\$). When finished we leave a clean screen! Return to where we were in the main program.	
1360	The function comments.	
1380	On this line we set the number of columns (NC) you want across the page. I arbitrary set it at 4 but you could use a larger or smaller number.	
1390	The number of lines to be displayed on each page i.e. the page length (PL).	
1400-1420	The number of records per page (RP) is calculated.	
1440	As above we blank out the next page full of records from the end of the table in case they contain garbage.	
1450	We calculate one less than the number of pages (NP) required in our output.	
1460	A loop for each page.	
1470	The header for each page. You may change this to suit your own needs and/or likes. Note that we use the TAB in built function to go to position 15 on the page.	
1480	These rather complex set of statements print out the calls in each of the columns at positions 1, 20, 40 and 60 on the page. The complex calculations are required to go to the correct element in the table. For example $P*RP+3*PL+J$ can be explained as follows: the $P*RP$ calculates the page; $3*PL$ calculates the column; and J is the line. This calculation is confusing so don't be put out if you cannot follow it. I assure you that it works! If you have used more/less columns than four you will have to insert/delete extra expressions.	
1490,1620	Write out the page number at the end of each page.	
1510-1530	This statement sends the printer to the top of the next page. CHR\$(12) is the special form feed character.	
1540-1570		
1580-1614		
1615		


```

560 IF CA$ = "SCREEN" THEN GOSUB 1250 : GOTO 480
570 IF CA$ = "PRINT" THEN GOSUB 1430 : GOTO 480

1240 REM ----- Display the results on the screen -----
1250 REM
1260 FOR I = N + 1 TO N + 20 : TA$( I ) = "" : NEXT I
1270 NS = INT( N / 20 )
1280 FOR I = 0 TO NS
1290     CLS
1300     PRINT "The calls worked to the present time:"
1310     PRINT
1320     FOR J = 1 TO 20
1330         PRINT TA$( I * 20 + J )
1340     NEXT J
1350     PRINT
1360     INPUT "Press <Enter> to continue: "; A$
1370 NEXT I
1380 CLS
1390 RETURN
1400 REM
1410 REM ----- Printing table -----
1420 REM
1430 NC = 4
1440 PL = 10
1450 RP = NC * PL
1460 FOR I = N + 1 TO N + 1 + RP : TA$( I ) = "" : NEXT I
1470 NP = INT( N / ( NC * PL ) )
1480 FOR P = 0 TO NP
1490     LPRINT
1500     LPRINT
1510     LPRINT TAB(15) "The Calls worked to the present time are"
1520     LPRINT
1530     FOR J = 1 TO PL
1540         LPRINT TA$(P*RP+J) TAB(20) TA$(P*RP+PL+J) TAB(40);
1550         LPRINT TA$(P*RP+2*PL+J)TAB(60) TA$(P*RP+3*PL+J)
1560     NEXT J
1570     LPRINT
1580     LPRINT
1590     LPRINT TAB(60) "Page " ; P + 1
1600     LPRINT
1610     LPRINT
1620     LPRINT CHR$(12)
1630 NEXT P
1640 RETURN

```

Figure 1: The GEMDUP program additions.

If you like our in-depth columns on DX, Packet, Computer, QRP, Interference, YLs, Emergency Operating, SWL, Clubs... and our regular Technical Section, feature articles and news on the present and future of Amateur Radio in Canada...
Recommend us to a friend!

ARES AMATEUR RADIO EMERGENCY SERVICE

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



BRITISH COLUMBIA EMERGENCY NET

The B.C. Emergency Net has operated daily at 1900 hrs local time on 3650 kHz for many years. Away back in 1973, the first issue of the *BCEN News* was published. The newsletter was the brainchild of Ernie Savage VE7FB, the EC, and Ken Wilmot VE7QQ, who was the first editor. When Ken became a silent key, Ernie carried on as editor. The current issue is filled with news of the net, and contains several useful operating and technical tips. The Honour Roll, of the top 50 stations to check into the BCEN during the past year is impressive—VE7EJU and VE7EJW share top honours with 349 check-ins each! The station at the bottom of the list had 50 check-ins, and 32 stations had over 100 check-ins each. Ferdi Wenger VE7EJU, the Net Manager, deserves congratulations for running a most effective net that could make a major contribution if disaster should ever strike in our westernmost province.

TRAFFIC HANDLING

There are those who claim that emergency communications can be provided on an ad hoc, seat of the pants basis, and that the standard message format is for the birds. The contrary view, which is held by experienced

ARES operators, is that messages must be handled in the standard format with proper preamble. An important facet of ARES training is the efficient, effective handling of formal messages, both by CW and by phone.

Bert Lussier VE3TNL, EC for Sault Ste. Marie, recently organized an emergency exercise that was run in his area to give his group additional experience in proper message handling. The scenario involved a major gasoline spill from a ship disaster which required evacuation of part of the city, and overnight housing and feeding by the Red Cross of hundreds of evacuees at three reception centres. There were five simulated emergency sites—the Red Cross HQ, three emergency shelters and a mobile unit at the disaster site. Three or four operators were assigned to each simulated site. Each site was provided with the subject matter of several messages, and each was required to put each message into the standard format, and to pass it to the appropriate receiving station.

As a result of the exercise, Bert feels that he now has 15 operators who can make effective use of the standard radiogram format in times of disaster.

PUBLIC RELATIONS

It seems that nowadays every organization is competing for an opportunity to tell its story to the world, through the various media. As members of ARES, we have a particular obligation to keep before the authorities and the general public our ability to contribute in case of disaster. In our mail we have received several examples of how our fellow members are doing it. Here are some:

- In *The Belleville Intelligencer* we note an excellent story on emergency communications during the recent Jamaican hurricane. It covers the help being provided CFB Trenton, and describes how local Amateurs handled welfare inquiries from the Belleville area. The article is headed with a fine photo of John Lester VE3MB, who is the EC for Quinte region.

- Algoma ARC operated VE3SOO in the 1988 Field Day, and ran up the respectable score of 2974 points using 16 operators. Bert Lussier VE3TNL, the EC for Sault Ste. Marie, sent us a clipping of an interesting article on the operation. The article, from the *Sault Star*, was complete with a photo of Roy Brockelbank VE3FOD, the Club President, and another operator with their solar powered station.

- The Ministry of the Ontario Solicitor General publishes *Emergency Planning*

News four times per year. The Fall 1988 issue carried a half-page article entitled 'Amateur radio responds in emergencies'. The article commences with these words: "The term 'Amateur Radio' is a misnomer. The people who have this skill are professionals all the way...". The article summarizes the contribution hams have made in such disasters as the Barrie tornado. It goes on to recommend that municipal planners include the Amateur radio resource when writing or revising Emergency Plans.

- We referred last month to the splendid write-up in the *News and Notes* of the Alberta Public Safety Services. This described the contribution of Alberta ARES to the emergency communications following the Edmonton tornado. The article reads: "The citizens of Alberta owe a debt of thanks to all these dedicated volunteers for their humanitarian assistance." There is a great photo of Bill Gillespie VE6ABC at the controls of the newly-established emergency station VE6GOC at the APSS Headquarters in Edmonton.

- The Bruce County ARES Group provided a Halloween night patrol in Kincardine. The EC, Bill Hardie VE3EFX, received a very nice letter of thanks from the Kincardine Police Force for helping to curb any major acts of vandalism within the municipality.

- Finally, George Sansom VE3LXA and yours truly were interviewed on CKWS TV's *Morning Break* show. We described some of the attractions of Amateur radio, and covered the role of our local ARES group in assisting during civil emergencies. We made the point that ARES is specifically covered in the Emergency Plan of the Township of Kingston. Feedback from viewers was encouraging—interest in emergency planning has increased, and we may have even attracted a few new recruits into our hobby! ■

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. ■

HAMS BEWARE

Italian hams are encouraging hams around the world not to send QSLs to F6FNU. It seems that this very popular manager with rare DX stations not only demands a high fee for his services but also demands a separate SAE with a couple of green stamps for every QSO. He will not accept two or three cards in a single envelope with a couple of green stamps. This would mean that each QSO with a station administered by F6FNU would cost a ham \$3 for a QSL card.

— *Radio Rivista*

JRSD FUND

The Jack Ravenscroft Susceptibility Defence Fund (JRSD) is still looking for donations. According to Ralph Cameron VE3BBM, the Fund is still \$1500 short of being able to pay all expenses connected with the Ravenscroft case. Your donation would be much appreciated. Send to: JRSD Fund, Box 8873, Ottawa, Ontario K1G 3J2.

QRP

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



Something interesting to all QRP fans and maybe not known must be the QRP DX BEACONS on 20 metres. Bert DL2HCB, who is 19 years old, started SWLing in 1981 and got his Amateur licence in May 1984 has drawn the accompanying map and table for ARCI QQ.

24 HOURS DAILY

Beacon signals heard on 14100 kHz are all radiated using a simple ground-plane antenna and are of utmost importance to the QRPer. Each station has a decreasing output from 100W to 0.1W in 10 dB steps and uses the following format every 10 minutes for example:

100W QST de 4U1UN/B beacon;
100W 1 dot then long nine second dash;
10W 2 dots then long nine second dash;
1W 3 dots then long nine second dash;
0.1W 4 dots then long nine second dash;

100W SK 4U1UN/B.

Total transmission time for each station in the accompanying list is +/- 58 seconds at a code speed of 20 wpm and are all crystal controlled. The Q of each QST begins within a fraction of a second of the assigned time and should help in improving your station or knowledge when:

- comparing antennas and receivers during the same nine second dash;
- checking DX versus short-skip on different antennas;

- trying your own propagation investigation or
- setting your station clock.

Regular observations can be sent to Al Lotze W6RZ who co-ordinates reports and acknowledges all with a QSL.

Another supplier to the QRP market is Doug DeMaw W1FB, 4061 N. Douglas Rd., Luther, MI. 49656 who has sent me his latest information kit. Not only does Doug supply kits and parts but also designs equipment for the QRPer including assembled kits. He also presents a few QRP operating facts and application notes.

"A five watt QRP signal is only 13 dB weaker than a 100 watt signal. Therefore a 100 watt signal that is S9 will be S7 when using five watts. A 600W signal drops 20.8 dB when QRPing to five watts or 3 1/2 S units. Hence, a 20 dB over S9 signal (600W) will fall to S9 at five watts and still be Q5. The key to success with DX QRP is not gallons of watts but starts with a good antenna. Avoid using random-length wires or dipoles that are close to the ground."

Doug touts a half-watt exciter kit as a starter TX and expandable with another kit to five watts and both combined with a third kit which acts as the antenna change-over unit. He also tells you where to get a companion superhet receiver kit.

A Canadian mail order distributor is J&J Electronics Ltd., P.O. Box 1437, Winnipeg, MB R3C 2Z4. They put out a

catalogue of over 60 pages on 8 1/2" x 11" and bi-monthly bulletins of another eight pages. Almost everything imaginable appears to be in their stock and a lot is at electronic surplus prices. An ideal opportunity for those a little hesitant about doing any homebuilding would be to acquire some parts and a solderless breadboard for the following experiments.

Everyone should prove to themselves just how things work and after putting together a few simple experiments, branch off into more interesting projects. Gather up the following parts and start in with the experiments to follow over the next few months and send in the results of your findings to the editor-in-chief.

The following is just a partial list of parts you should have on hand but will suffice for the experiments we will discuss here. A solderless breadboard is not absolutely necessary if you are careful in assembly, so each part can be used more than once. The breadboard can, of course, be used several times later on to prove whether a circuit is worthwhile before making or buying a printed circuit board. The decision to buy or not is left up to each individual and not shown in the parts list.

- 1 - 9v battery
- 1 - small speaker 8 ohms
- 1 - .01 mFd disc ceramic
- 1 - .047 mFd disc ceramic
- 1 - 1mFd 50V electrolytic
- 1 - 100 mFd 50V electrolytic
- 2 - Red LED indicators
- 1 - IC 555 timer
- 2 - 220 ohm 1/4W resistor
- 2 - 330 ohm 1/4W resistor
- 1 - 560 ohm 1/4W resistor
- 1 - 2k ohm 1/4W resistor
- 1 - 2.2k ohm 1/4W resistor
- 1 - 4.7k ohm 1/4W resistor
- 1 - 51k 1/4W resistor
- 1 - 50k ohm adjustable pot
- 1 - 4.7k ohm adjustable pot
- 1 - 300k ohm 1/4W resistor
- 1 - 2N2222 transistor
- 1 - 2N2907 transistor

Hook the following circuits up first and observe what takes place when applying your 9V battery. Be certain to

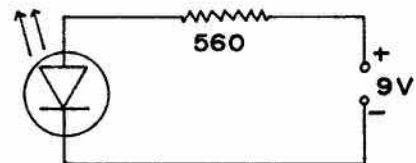
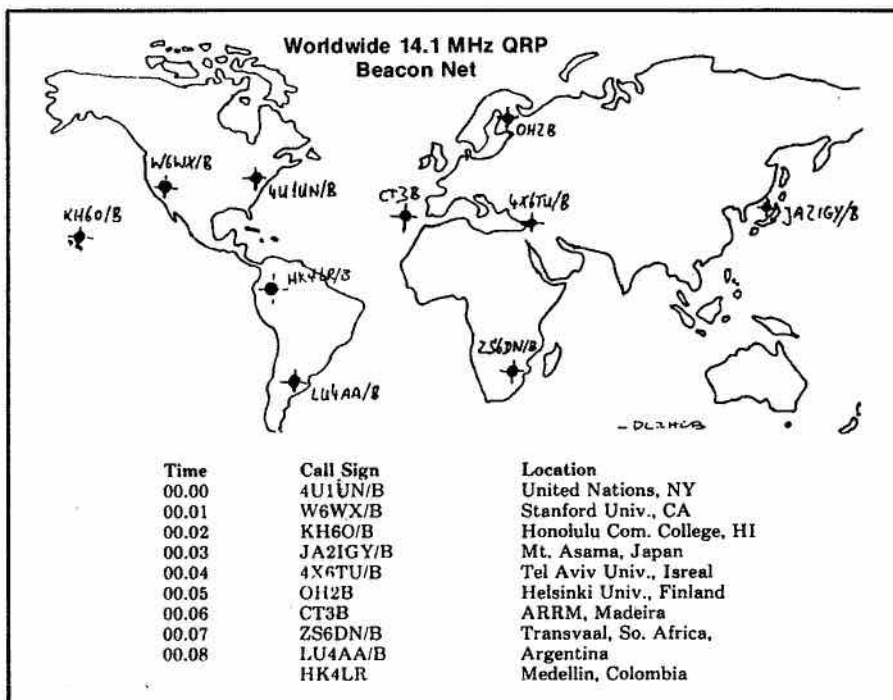


FIGURE 1— SINGLE LED

Continued on next page

International Amateur Radio Network

Glenn Baxter K1MAN, Long Point Lodge, Belgrade Lakes, Maine, U.S.A. 04918

Glasnost via Ham Radio, Part III

Well Chuck Sheffer KJ4TY is back home from the Soviet Union, having brought with him a signed agreement between the Young Communist League in Moscow and the International Amateur Radio Network. Also approved by both sides and ready for signing (by mail) is the Yerevan agreement setting up a joint IARN-POISK office in the Soviet Armenian capital. The historic two agreements make official the Soviet IARN and cooperation between Soviet IARN and all other IARN member countries.

There are now four IARN chapters in the Soviet Union (known as International Amateur Radio Clubs) and plans for a Soviet Delegation of three to visit the United States between April 22, 1989 and May 6. The delegation will visit New York, Washington, D.C., participate in the IARN International Amateur Emergency Communications forum on April 29 at the Dayton, Ohio Hamvention and then stop in Chicago.

The IARN Network Manager, yours truly, K1MAN, and XYL Bonnie will pay a return visit to the Soviet Union between Oct. 13 and Oct. 27, 1989, stopping in Moscow, Minsk, Lvov and Yerevan. Soviet IARN adds a powerful dimension to IARN worldwide with good connections to their super power government, their large Aeroflot airline and their capable and available radio amateurs for worldwide deployment in future emergencies.

What a wonderful tribute to the ability of Amateur Radio to cut through red tape and tear down diplomatic walls which separate people who have no good reason to remain separated. Out of lemons created by earthquake disaster and government bickering we have not made lemonade. How sweet it is to savour. What a wonderful future we have for Amateur radio in its proven role of showing the world new ways of working together. Be sure to stop by to see us at the Dayton Hamvention, radio

Amateurs and short wave listeners alike. Thank you all for your support and keep those cards and letters coming.

For a copy of the Moscow and Yerevan agreements, send a self addressed envelope with enough postage for two ounces to IARN, Belgrade Lakes, Maine 04918 U.S.A. See you next month right here. ■

TECHNICAL ARTICLES

The Canadian Amateur welcomes technical articles. Please send them to the Technical Editor, Bill Richardson VYICW, 36 Range Rd., Whitehorse, Yukon Y1A 3V1.

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.

Hugo M. Martin VE7UFO, 3190 Wallace Cr., Prince George, B.C.
Arnold Chambers VE3JAA, 50 Shuniah St., Thunder Bay, Ont.
Sam McReynolds, RR 1 Sharon, Ont.
John Kassay VE3FDK, L54 Fernwood Cr., Hamilton, Ont.
Gord Roberts VE3IMA, Box 21, New Lowell, Ont.

► QRP (cont'd)

hook the LED in the proper way and try different size resistors to see how bright or dim the LED light becomes. Just touch the battery voltage to the circuit briefly each time.

Make a note of the amount of personal satisfaction you gained from this simple circuit. Try the next circuit, making certain you have the LEDs in proper order and remember the LED life is long at low voltage but extremely short if there is no resistor or very low ohmic value.

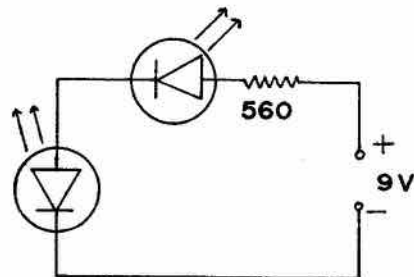


FIGURE 2— DOUBLE LED

Find and read all you can about light emitting diodes which will help in future experiments or trouble shooting LED-equipped gear. Now to complicate

the single LED circuit slightly let us add a transistor and switch or loose wire.

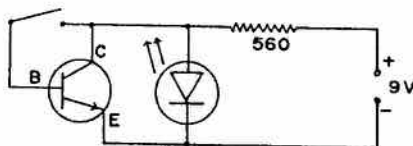


FIGURE 3— 2N2222 LED

Then move the LED from the present position and insert it at the point indicated with an X in the above diagram by changing the leads on your breadboard. Put the LED in one way, then test with the switch and by reversing the LED and try the switch again. Make a note of your findings for future reference as mentioned previously.

Try all the above experiments with the 2N2907, a PNP transistor and battery leads reversed but make notes of your findings for future reference. In an upcoming article or in reply to your enquiries we will show how to use this circuit for sorting unknown transistors. You could, of course, arrive at a similar conclusion at the end of these few experiments. Your feedback dictates whether or not to continue with home-building experiments. ■

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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	Correct Postage
CARF National QSL Bureau P.O. Box 66 ISLINGTON, ONTARIO M9A 4X1		

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

VE2QSL Bureau
2960 Douglas Avenue
Montreal, Quebec
H3R 2E3

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

VE4QSL Bureau
Box 365,
Carman, Man.
ROG 0J0

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

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

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

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

VY1QSL Bureau
Box 4597,
Whitehorse, Yukon
Y1A 2R8

VO1/VO2QSL Bureau
Box 6,
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A1C 5H5

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

TECHNICAL SECTION

Bill Richardson VY1CW, 36 Range Road, Whitehorse, Yukon Y1A 3V1

Simplified measurement of conducted susceptibility for consumer appliances and electronic equipment

Application of TDR technique produces repeatable results, easily compared to a reference, without powering the appliance!

By Ralph Cameron VE3BBM

EMI MEASUREMENTS

Conducted and radiated radio energy causes problems to most modern appliances and electronic equipment when the equipment is located close to the transmitting facilities. Practical evidence suggests an appliance malfunction can occur from distances approaching 1 to 2 km when transmitter powers of 50 kW are involved. Amateurs are more likely to suffer problems within 50-100 m from their antenna location. Malfunction is defined to mean any audible or visual impairment or unintended operation of an appliance or control system. The mechanisms by which EMI occurs have been well established and are depicted in Fig. 1—EMI Propagation/Coupling Modes.

TIME DOMAIN REFLECTOMETRY

A simple but comprehensive measure of appliance susceptibility to conducted energy is possible using a technique that involves no shielded cage or special fixturing. A variety of measurements have been made and have proven to be repeatable, made in a matter of a few minutes and require no special skill. The instrument used was portable; measurements were made in situ, without application of power and, in similar fashion, comparisons made between various commercial and Amateur constructed filters which permitted device evaluation. The technique uses time domain reflectometry.

AMATEUR RADIO STATISTICS

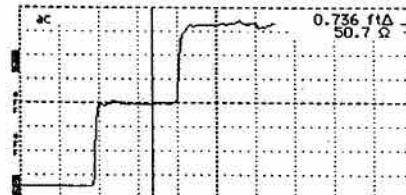
Amateur Radio statistics bear out the contention that powerline-conducted RF energy causes 80% of this most prevalent form of EMI, in the HF bands, 1.8-30 MHz, due primarily to proximity. Mutual coupling to energy absorbing materials—whether they be wall panels, eavestroughs, fences or, indeed, household wiring—all convert radiated energy to conducted energy by their

Cursor 0.736 ftΔ
Distance/Div 0.5 ft/div
Vertical Scale 0.00 dB
VP 0.31
Noise Filter 4 avs
Power ac



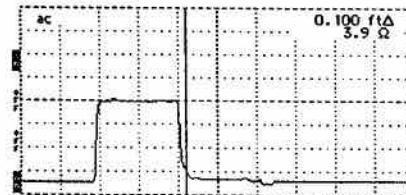
Tektronix 1502B TDR
Date AUG 16 1988
Cable 50 Ω COAX
Notes 50 Ω TERMINATION
Input Trace _____
Stored Trace _____
Difference Trace _____

Cursor 0.736 ftΔ
Distance/Div 0.5 ft/div
Vertical Scale 0.00 dB
VP 0.31
Noise Filter 4 avs
Power ac



Tektronix 1502B TDR
Date AUG 16 1988
Cable 50 Ω COAX
Notes OPEN CST. CABLE
Input Trace _____
Stored Trace _____
Difference Trace _____

Cursor 0.100 ftΔ
Distance/Div 0.5 ft/div
Vertical Scale 0.00 dB
VP 0.31
Noise Filter 4 avs
Power ac



Tektronix 1502B TDR
Date AUG 16 1988
Cable 50 Ω COAX
Notes 50 Ω CABLE SHORTED
Input Trace _____
Stored Trace _____
Difference Trace _____

1. Incident step on 50 Ohm cable-end open.

Cursor 0.000 ftΔ
Distance/Div 5 ft/div
Vertical Scale 2.25 dB
VP 0.50
Noise Filter 16 avs
Power ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

2. Same as 1—end shorted.

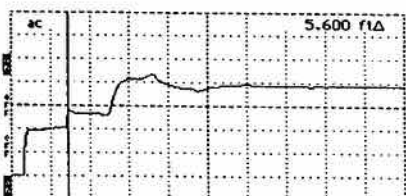
Cursor 5.600 ftΔ
Distance/Div 5 ft/div
Vertical Scale 2.25 dB
VP 0.50
Noise Filter 16 avs
Power ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

3. Same as 1—Cursor at 5.6ft. (open)

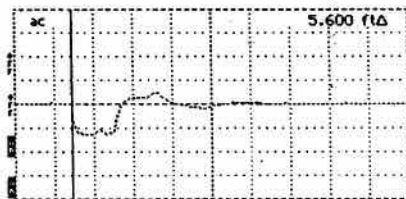
Cursor 5.600 ftΔ
Distance/Div 5 ft/div
Vertical Scale 2.25 dB
VP 0.50
Noise Filter 16 avs
Power ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

4. Connected to 6ft. 2 wire parallel wire line cord. 8 turns around 3" toroid ($\mu = 850$).

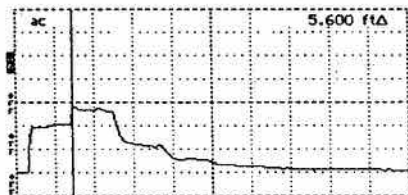
Cursor 5.600 f Δ
 Distance/Div 5 ft/div
 Vertical Scale 2.25 dB
 VP 0.50
 Noise Filter 16 avs
 Power ac



Tektronix 1502B TDR
 Date _____
 Cable _____
 Notes _____
 Input Trace _____
 Stored Trace _____
 Difference Trace _____

5. Differential view of 4— each line with respect to ground, showing the difference.

Cursor 5.600 f Δ
 Distance/Div 5 ft/div
 Vertical Scale 2.25 dB
 VP 0.50
 Noise Filter 16 avs
 Power ac



Tektronix 1502B TDR
 Date _____
 Cable _____
 Notes _____
 Input Trace _____
 Stored Trace _____
 Difference Trace _____

6. Same as 5— plug shorted.

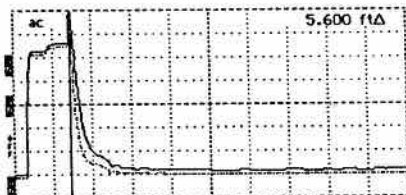
Cursor 5.600 f Δ
 Distance/Div 5 ft/div
 Vertical Scale 2.25 dB
 VP 0.50
 Noise Filter 16 avs
 Power ac



Tektronix 1502B TDR
 Date _____
 Cable _____
 Notes _____
 Input Trace _____
 Stored Trace _____
 Difference Trace _____

7. CD APPS 600L EMI Filter, 6A 250V— differential view at line input. Load side open.

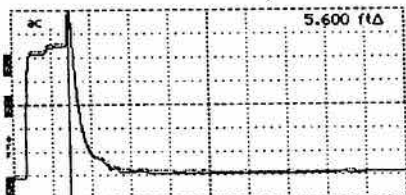
Cursor 5.600 f Δ
 Distance/Div 5 ft/div
 Vertical Scale 11.00 dB
 VP 0.50
 Noise Filter 16 avs
 Power ac



Tektronix 1502B TDR
 Date _____
 Cable _____
 Notes _____
 Input Trace _____
 Stored Trace _____
 Difference Trace _____

8. Comparison of a dead short and input to a filter. (An abrupt change is desirable) Filter Model SAE STD-49, Mfr unknown.

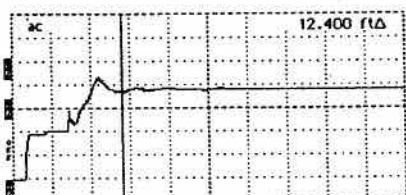
Cursor 5.600 f Δ
 Distance/Div 5 ft/div
 Vertical Scale 11.00 dB
 VP 0.50
 Noise Filter 16 avs
 Power ac



Tektronix 1502B TDR
 Date _____
 Cable _____
 Notes _____
 Input Trace _____
 Stored Trace _____
 Difference Trace _____

9. Filter in #7 compared to filter in #8(dotted). Note Symmetry.

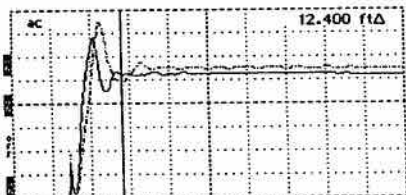
Cursor 12.400 f Δ
 Distance/Div 5 ft/div
 Vertical Scale 2.25 dB
 VP 0.50
 Noise Filter 16 avs
 Power ac



Tektronix 1502B TDR
 Date _____
 Cable _____
 Notes _____
 Input Trace _____
 Stored Trace _____
 Difference Trace _____

10. Filter check for symmetry. Line 1 to gnd., Line 2 to gnd. overlaid. Output open. Note the two input lines are almost symmetrical and should be. Good test for finding condition of filter without knowing its characteristics.

Cursor 12.400 f Δ
 Distance/Div 5 ft/div
 Vertical Scale 14.00 dB
 VP 0.50
 Noise Filter 16 avs
 Power ac



Tektronix 1502B TDR
 Date _____
 Cable _____
 Notes _____
 Input Trace _____
 Stored Trace _____
 Difference Trace _____

11. Comparison of CD filter vs. SRE type, line 1 to gnd. CD filter is better (top one).

partial resonance and sometimes complex interaction. While such structures may be inefficient in terms of radiating they can cause severe problems by maintaining phase relations which support reradiation with gain, in the area close to the antenna.

RERADIATION

Imagine the case of an aluminum siding wall on your neighbour's house acting as a passive reflector or a non-resonant element and it's not difficult to imagine a resulting reradiated signal 2 to 3 dB stronger than the transmitter ERP. This larger field may exist in the immediate vicinity, with the antenna pointed toward that wall.

VHF can cause even more noticeable problems which are not easily addressed by the same techniques as at HF because standing waves are more readily formed due to the smaller physical wavelengths. Even most lumped LCR components have appreciable impedance at VHF unless otherwise designed.

RADIATED SUSCEPTIBILITY

Radiated susceptibility is most readily handled by shielding considerations. The number of times direct radiation will be a problem with Amateur power levels will be very small, except for VHF installations where high ERP is the major cause. In some cases, building structures appear to be transparent, particularly in the near field of large arrays. It is not unusual to have field intensities of 10 volts per metre in such cases.

Additional shielding is quite extensive and difficult because of the rotating nature of the antenna system. Most TV sets are swamped at this level and exhibit complete blanking of the raster as well as interrupted audio when CW transmission is used. The effect is usually on all channels. In the absence of a technical requirement to incorporate any immunity except minimum front end selectivity, appliances such as these can be expected to react in this manner. RF voltages of much less than one volt on the mains will often do the same thing.

In one interesting case, the turning of a large beam antenna some 30 m from a neighbouring home caused interaction with a cableless TV located inside a house with two intervening walls. In this case, the TV signal almost disappeared when the beam was turned. This effect can easily happen when there is a poor signal to start with, and an out-of-phase signal reflected from a moveable beam serves to compound what is an antenna azimuth related problem. It would take a trained person to explain the difference between the effect caused by the

Continued on next page

MEASUREMENT (cont'd)

antenna and a bad case of temperature inversion. Worse still, not many neighbours would understand the reason why their reception could be impaired (except, perhaps, in the Ottawa area).

CONDUCTED ENERGY

Any time a conductor cuts an electromagnetic field, energy is induced in the conductor and is converted to a quantity that is measurable. Usually, it is the voltage that is measured, from one or more lines to ground, or if the line is unbalanced, i.e. single conductor or coaxial cable.

BALANCED LINES

In a balanced line such as 300-ohm twin lead, voltage will be induced by our external field in one of two ways. If the line is electrically symmetrical with respect to ground, equal currents will be induced in each conductor and can be measured from each line to ground, as a voltage drop across some common impedance. It is very unlikely this perfect balance would be achieved because very small capacitive imbalance with respect to ground and any other nearby object would be enough to cause a small but measurable voltage difference between each line and the common point of ground. This voltage imbalance and associated current flow is the cause of conducted EMI. By simple design engineering it can be greatly attenuated.

It is this 'common mode' energy that reaches the appliance and can cause malfunction, unless steps are taken to reduce it. *Common mode rejection ratio* is a specification usually used to define how much common mode voltage a device can withstand before causing measurement errors. In our case it can define a measurable figure of merit relating interfering voltage to desired signal. Too much interference and it can be heard or seen on our appliance. It may even cause it to malfunction.

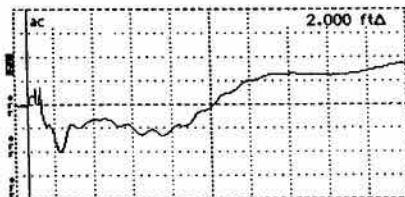
CMRR, as it is called, may be expressed in dB and the larger the value the better. In simple terms it means an appliance is less susceptible or more immune to common mode energy when the undesired voltage occurring between any input line and a common point is very small. The common point may actually be a floating ground as well as a true earth ground. Another term for Common mode, familiar to telephone people, is Longitudinal interference or Series mode interference.

In practice, any amplifying device or active circuit, unless suitably decoupled from the common mode interference voltage, may malfunction.

RESONANT CABLES

Another effect caused by proximity is the relative placement of our

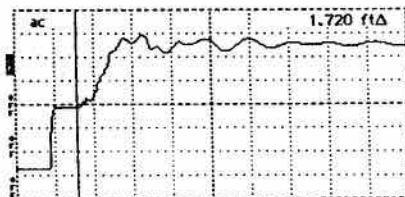
Cursor 2.000 ftΔ
Distance/Div 5 ft/div
Vertical Scale 386 mV/div
VP 0.31
Noise Filter 8 avs
Power ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

12. Typical return loss at input to 75 Ohm TV antenna input.

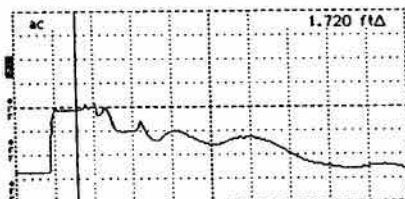
Cursor 1.720 ftΔ
Distance/Div 2 ft/div
Vertical Scale 386 mV/div
VP 0.31
Noise Filter 8 avs
Power ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

13. 75 ohm input to VCR thru high pass filter, Mid scale is 75 ohm reference. A fast in a positive direction is desirable.

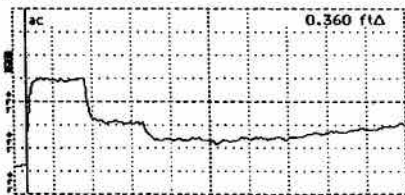
Cursor 1.720 ftΔ
Distance/Div 2 ft/div
Vertical Scale 386 mV/div
VP 0.31
Noise Filter 8 avs
Power ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

14. Same as 13 with high pass omitted.

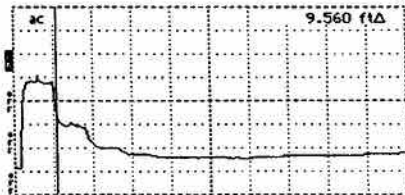
Cursor 0.360 ftΔ
Distance/Div 5 ft/div
Vertical Scale 386 mV/div
VP 0.31
Noise Filter 16 avs
Power ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

15. VCR line cord thru toroid. Not very evident characteristics.

Cursor 9.560 ftΔ
Distance/Div 10 ft/div
Vertical Scale 386 mV/div
VP 0.31
Noise Filter 16 avs
Power ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

16. TV line cord no toroid.

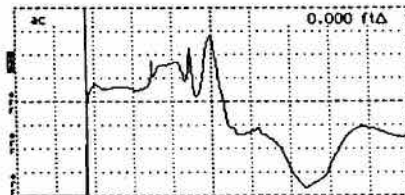
Cursor 1.100 ftΔ
Distance/Div 1 ft/div
Vertical Scale 94.1 mV/div
VP 0.31
Noise Filter 32 avs
Power ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

17. TV line cord, each line to ground compared differentially. Not such unbalance.

Cursor 0.000 ftΔ
Distance/Div 1 ft/div
Vertical Scale 182 mV/div
VP 0.31
Noise Filter 128 avs
Power ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

18. 50 ohm termination used ahead of 75 ohm input to TV antenna. This suggests tuner/balun/antenna input impedance changes dramatically and could be a cause of poor common mode rejection.

conductors with respect to the originating energy. In the case of a coaxial cable, the sheath intercepts most local radiated energy which may bear no dimensional relation to the frequency for which the antenna is cut. This is done by design but there will be situations where a resonant cable length can absorb much more energy, given the right conditions. A good example is an exposed horizontal run of TV cable which one sees pegged to the side of older duplexes and apartment buildings. These cables can pick up considerable energy and pipe them to the nearest cable amplifier or directly to a distribution system or neighbour's TV.

In a couple of cases familiar to the author, audible impairment of the enter-

tainment appliance at the end of the cable occurred without power applied to the device! In these cases, movement of the antenna and change of antenna polarization eliminated the problem.

Impedance imbalance or mismatch in any conductor paired with a common ground or another conductor which encloses a large physical area are two common sources which create common mode problems. Modern electronic design now takes advantage of Computer Aided Design packages to minimize susceptibility before it occurs, by paying particular attention to board layout, decoupling, grounding, shielding and filtering. Enclosed areas of signal/current carrying conductors is minimized and ground planes are made as large as practicable to

minimize abrupt changes in impedance.

DIFFERENTIAL MODE

Obviously, when two conductors carry unequal voltages there exists a voltage difference between them. This differential voltage can also be measured. This is the voltage that common mode remedies do not effect. For instance, while the toroid core is a simple, effective, non-intrusive remedy for common mode problems, it will not affect the voltage that exists between conductors. Inductance placed in series with the conductors cures problems related to differential mode voltages. Obviously, the inductance should not degrade the desired signals. This type of problem on the AC line is best tackled with a good commercial line filter that is CSA-approved. High pass filters perform a similar function at the input to a TV tuner or VCR. Most times a toroid will suffice because the problem is local energy being conducted along the outer sheath of the cable distribution system and it is common mode in nature.

In my limited experience, even the most stubborn case of conducted EMI can be eliminated by use of toroids on the incoming cable system and the mains. When properly installed, sufficient decoupling can be achieved.

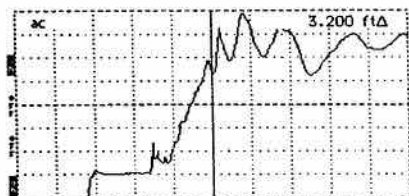
HIGH PASS FILTERS

Although most TV high pass filters have the additional advantage of a finite cutoff frequency and rejection of frequencies below 40 MHz, they don't always prevent common mode sheath voltages from entering the appliance. Properly chosen and wound correctly, the toroid is simpler, non-intrusive, less expensive and wider band than an HP filter. Be a believer... try them! So much for defining the modes which cause problems.

TIME DOMAIN REFLECTOMETRY

Time domain reflectometry, commonly called TDR, works like radar. A short voltage pulse is sent over the conductor(s) of interest and on the way may encounter an impedance variation. The reflection produced is like the action of a hammer hitting a solid object. Some of the energy expended in hitting the hard object can be felt as a sharp force in the direction opposing the direction of the blow. The resulting voltage reflection can be positive or negative in polarity and may be viewed on a display device, such as an oscilloscope. It is necessary to switch the viewing device such that the incident pulse and reflection can be viewed simultaneously so that the former acts as a reference.

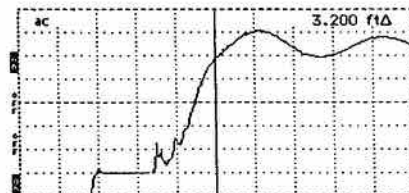
Cursor 3.200 ftΔ
Distance/Div..... 1 ft/div
Vertical Scale..... 8.50 dB
VP 0.31
Noise Filter..... 2 avs
Power..... ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

19. Same as 19, with Drake TV-75 HP Filter in input. Note the steep rise after the beginning about 4 divs. from left. This is desirable.

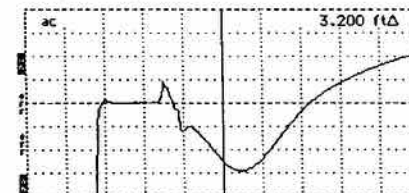
Cursor 3.200 ftΔ
Distance/Div..... 1 ft/div
Vertical Scale..... 8.50 dB
VP 0.31
Noise Filter..... 2 avs
Power..... ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

20. Fooling around! TV-75 HP filter terminated in 50 ohms to see effect of terminating the filter in a known impedance.

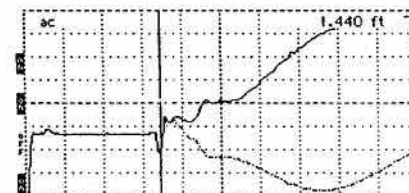
Cursor 3.200 ftΔ
Distance/Div..... 1 ft/div
Vertical Scale..... 8.50 dB
VP 0.31
Noise Filter..... 2 avs
Power..... ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

21. Characteristics of Radio Shack 15-582 filter, each input thru Radio Shack 15-579 balun.

Cursor 1.440 ft
Distance/Div..... 0.5 ft/div
Vertical Scale..... 6.75 dB
VP 0.31
Noise Filter..... 16 avs
Power..... ac



Tektronix 1502B TDR
Date _____
Cable _____
Notes _____
Input Trace _____
Stored Trace _____
Difference Trace _____

22. Comparison of Radio Shack 15-582 filter and Drake HP, both terminated in 50 ohms. Filter characteristics are opposite because of filter design. The one with the steeper slope is the better. (Lower one Drake.) Difference in cost of filters is about 5 to 1.

Note:

The TDR signatures show impedance variations from nominal (generally mid scale) versus distance travelled. In this way it is possible to very accurately measure the distance to faults on a cable system with known impedance. Evaluation of filters can be done using the same technique.

Continued on next page

AMPLITUDE & DISTANCE

TDRs present amplitude and distance information. While distance in this application is only important for the first few inches, amplitude is more so. The pulse risetime is also important because a fast risetime pulse permits better resolution for a reason which may not be clear. Frequency components contained in a step pulse can be calculated using Fourier analysis. In the commercial TDR used for these measurements, a 200 picosecond series of pulses was used.

While these pulses have low energy, they cover a very wide range of frequencies and it is possible to detect impedance variations and measure the distance to such points within 1.2cm in 30m. The Model 1502B time domain reflectometer made by Tektronix Inc. of Portland, Oregon was used for all measurements since pulse risetimes are repetitive and controlled in amplitude. The 1502B is battery powered and has a built-in chart recorder which makes in situ readings a snap.

2-5 NANOSECOND PULSES

Meaningful measurements may also be made using pulse generators with 2-5 nanoseconds risetime since this value will permit viewing areas of interest. Results using this technique have been quite revealing and an experimental pulse generator is under construction for the purpose evaluating performance in this application and should be available in a later article. Since published circuits exist, an attempt is being made to optimize one for this application.

RETURN LOSS

The TDR display shows an incident step pulse applied to a pair of conductors, such as the power cable from a VCR. The VCR, of course, need not be plugged in.

A precaution to observe when using a TDR is that the input is particularly sensitive to static electricity because the sampling bridge used to switch between transmit and receive is a very fast wideband device. Static electricity or charges stored on conductors to be measured should first be eliminated. In the 1502B the input is protected until the cable is applied. The reason for draining these charges is that diode junction separation is purposely made narrow to reduce the capacity and decrease system time constant.

The ratio of the incident voltage to the reflected voltage is known as Return Loss and may be specified in one or more ways. Decibels is one way. Another common name one encounters is Reflection Coefficient. It is simpler to use the term which is more descriptive of what it represents. Simple calculation can give absolute values, but forget it,

remember the intent is to keep the method simple. It is only necessary to view what happens when our pulse meets an impedance discontinuity.

DC ANALOGY

There is a simple DC analogy we may use to explain return loss... by drawing a series circuit including a resistor equal to the internal resistance of the DC source. If basic theory is remembered, half the voltage is dropped across the internal resistance of the source and half is dropped across the load or series resistance. Our formula becomes a little more complicated in order to be able to calculate the Return loss. It is much simpler than it sounds. The important things to remember are some simple principles of TDRs.

DISPLAY POLARITY

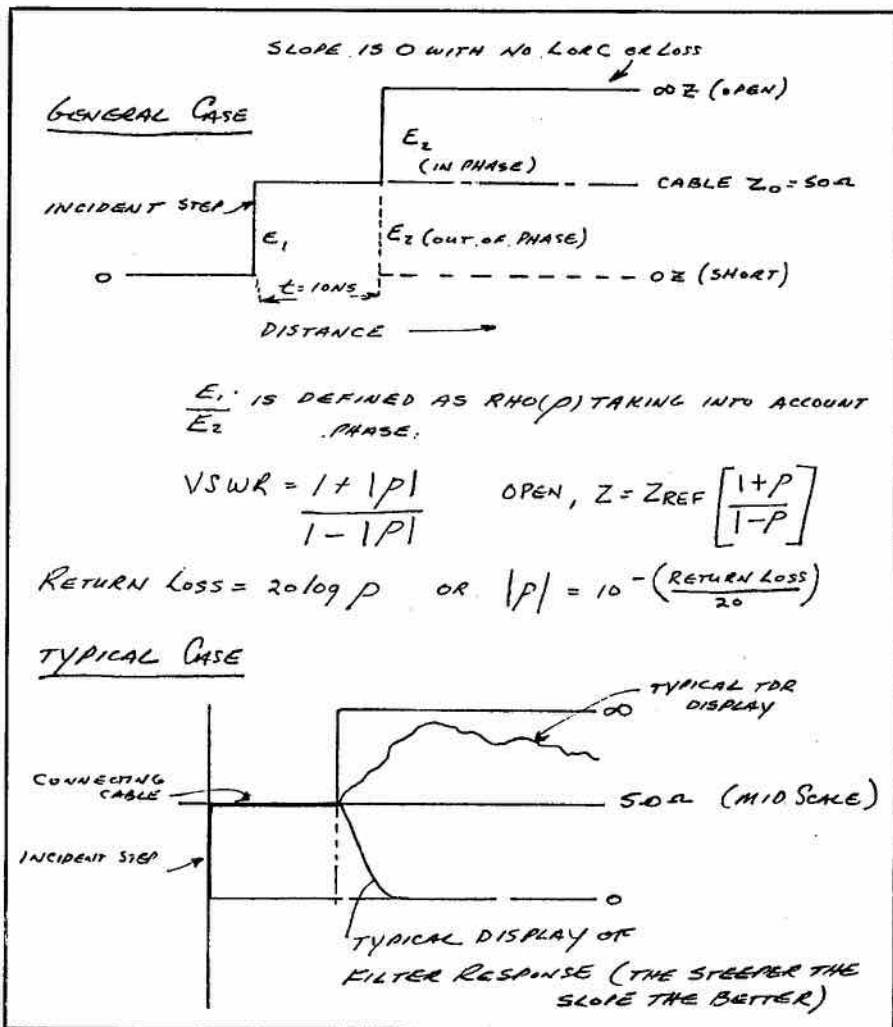
Fig. 1 shows the incident step, reflection polarity and amplitude when the generator looks into an open circuit. The opposite situation occurs when the output of the generator is shorted. The two displays are mirror images and when one display is subtracted from the

other a straight line should result. The Model 1502B does this digitally, by storing the first trace and subtracting the second.

By experience one can focus on what happens at the start of the reflected pulse. This tells us what we need to know, i.e. for common mode signals the reflection should occur as close to the input as possible.

50 OHM REFERENCE

It may be seen from inspection that the middle of the screen represents our 50 Ohm reference, although this can be made any other value to suit the line impedance being measured. Common cable impedances of 50, 75, 93, 110 and 150 Ohms are encountered in industry. Balanced matching networks permit use of the TDR on telephone circuits of 600/900 Ohms. There are many uses for this technique including troubleshooting local area networks, fuel sensors and all manner of telephone cables. In this application it is only necessary to view characteristics of the reflected pulse, i.e. the return loss signature.



OPEN TERMINATION VALUES

The effect of having the generator open-circuited causes the reflected voltage to appear added to the incident step and it will be equal in value. See Graph 1.

Conclusion: Values of impedance between 50 Ohms and infinity will be displayed depending on the finite value of the open circuit impedance.

SHORTED TERMINATION VALUES

When the generator is terminated in a short circuit, the reflected voltage will be 100% of the value of the incident voltage and will appear on our display as a negative going pulse of equal amplitude (assuming no losses). If the generator were now terminated in 50 Ohms (a matched condition), there would be no reflection and the line would appear straight. See Graph 2.

Conclusion: Values of impedance between 50 Ohms and 0 will be

displayed depending on the impedance of the short. Values can be calculated from the formula for Return Loss shown with the Figures.

PRACTICAL OPERATION

In practice, concern for the impedance seen in the first few inches is where we want to see what happens to our common mode signals. Examine graphs 1 and 2. They represent the open line condition and the shorted condition. The intention of the common mode suppression using filtering or toroids is to make the reflected step take on as steep a slope as possible. See Graph 3).

Different filters appear capacitive in their rejection band while others will appear inductive. Look at the overlaid (differential) display of the Radio Shack and Drake High pass filters. Since both filters claim 40 dB rejection, a look at the rising slope at the beginning of the reflection will give a comparison of performance.

By increasing the vertical gain of the display device we can magnify these differences as much as we want. Results may be similar, but if you view a reflection which slowly dribbles up for a

distance of $\frac{1}{4}$ m, more suppression will be needed to improve and move the return loss signature closer to the start of the reflected pulse (zero distance).

CONCLUSION

Conducted susceptibility of appliances accounts for the majority of Amateur radio compatibility problems. It is technically incorrect to label problems of this type as 'interference' when the appliances offer no immunity.

The qualitative comparison of appliances to the ideal short or open measurement of return loss gives a straightforward measurement of conducted immunity. Actual return loss values could have been used, but comparison to a reference such as an open, a short or known filter provides an instant answer. Why complicate the measurement unless real values are needed?

In most Amateur cases investigated to date, the appliances appeared to return to normal function with 20 dB of common mode suppression. How one obtains it is his choice. More suppression or lower return loss is desirable. Why not try the TDR technique? It works! ■

G4GKO ON PACKET

Ron Roden G4GKO, who represents the IARC regularly at the international forums of IARU region 1, can now be reached by Packet Radio. Any messages should go to G4GKO @ GB7SEK.

— HaGal International

THE TRANSPROVINCIAL NET (TPN) 7055 kHz

The name 'Transprovincial' is probably the best one that anyone has ever come up with for the "ol' meeting place" on 7055 kHz. It used to be ONTARS 40 but changed as we cut away from mother's apron strings and now draws the crows from VE1, VE2, VE3 and sometimes even V4 land. I've even worked VESHL from the mobile on 7055, so who knows what check-ins we'll get as 'The Net' becomes more popular.

'The Net' has reverted to Lower Sideband, which may make it a little more difficult for CW operators, however, I think we will be better off in the long run. Most operators have RIT these days so zero beating to the CW station is relatively easy.

The Net is officially on 7055 kHz LSB, from 1000 hrs to 1500 hrs EST, daily. All are welcome to check in. If you are interested in becoming a Net Controller, contact:

Net Manager,
Earl Andrews VE3YOU,
368 Zephyr Ave.,
Apt. 16,
Ottawa, Ont.
K2B 6A1

LETTERS

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



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 e. equipment and accessories. Especially looking for power amplifier and pocketwatch. I am willing to buy and/or trade equipment. Please write to Chris Bisailion VE3CBK, RR#1 Old Camp Road, Kanata, Ont. K2K 1X7.

WANTED: My son Ronnie VE7GRS, age 11, urgently requires a 10-80 metre transceiver (No Tubes Please), Tuner and Power Supply to get on the air. Must be reasonably priced. Write to: Gary Anderson VE7GJA, Box 681, Ucluelet, B.C. V0R 3A0.

WANTED: Kenwood Digital VFO-230. Contact Roy Bennett, 416-493-5526 or 27 Clansman Blvd., Willowdale, Ont. M2H 1K5.

FOR SALE: B&K Radio TV Shop Equipment 735 Tubes, never used from 20's to recent RCC Manuals. \$1,000.00 takes all. Send \$2.00 for complete list. Bill Barz VE7EGF, 323 Wallace Rd., Kelowna, B.C. V1X 4T4.

FOR SALE: Icom R71A General Coverage Receiver. As New. In original box. Harold MacFarlane VE3BPM, R.R. 2 Battersea, Ont. 613-353-2800.

FOR SALE: Heathkit Phone Patch HD-1515 \$15.00; Lambda regulated power supply LMCS, 5VDC at 5.1 Amp \$50.00; Lambda regulated power supply LMC12, 12VDC at 4 Amps \$50.00; Heathkit power supply HP-1144A 13.8 VDC at 20 Amps \$75.00; Hewlett

Packard Power Meter Model 432A \$500.00; Packard Bell Modem Model PB 1200 Plus \$150.00. J. Tejero, 3151 Wallace Cres., Prince George, B.C. V2K 3V5. 604-962-6387.

FOR SALE: HRO-500 solid state communication receiver 5 kHz to 30 MHz in 60, 500 kHz bands. Extreme tuning accuracy and stability. Phase locked frequency synthesizer. SSB, AM, Fax, FSK \$900.00. Franz Maschmann VE3MZG, P.O. Box 21, Dwight, Ont. POA 1H0.

WANTED: Macrotronics Terminal modified for Amtr c/w software for Apple II Plus. Write A. Robinson VE/DBN, 20378-41 Ave., Langley, B.C. V3A 2Z4.

FOR SALE OR TRADE: 1 Heath Antenna Tuner SA-2060A \$300.00; 1 Heath VTVM IM-18 \$60.00, 1 Heath Micrilizer HD-1986 \$40.00. All in very good condition and very little used. Will sell or swap for Heath SB-200 Linear Amplifier in good condition. Contact P. Mengelberg, Box 15, Longlac, Ont. Phone 807-876-4318 during daytime and evenings.

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. This feature is for the use of members wishing to trade, buy or sell personal radio gear. It is not open to commercial advertising.

A Dummy Load for 13.8 volt power supplies

By David Vail VE1GM

Anyone who builds regulated power supplies for today's low-voltage, high-current equipment should consider having a suitable dummy load for thoroughly testing the power supply before it is connected to an expensive piece of equipment. If the voltage regulation should fail while the supply is being developed and tested, it's better to have the overvoltage condition applied to a dummy load rather than to your new super-duper transceiver or amplifier. It may also be used to check the secondary voltage drop of 12 volt transformers under various loads.

RESISTANCE ELEMENTS

After deciding to build such an item, I looked through the junk pile and found a spare heating element, left over from a clothes dryer which has since been replaced. The element consisted of 5 feet of coiled resistance wire, rated 4400 watts at 250 volts, making its current carrying capacity about 17 amps, quite sufficient for our purposes. This is not a very exotic item, so it should be available just about everywhere.

CONSTRUCTION

The first step is to cut the resistance wire to the length which presents the proper resistance for the current we wish to draw from the power supply. By using two lengths of wire, which may be connected to the power supply individually, in series or in parallel, we end with a dummy load which is capable of drawing 5, 10 or 20 amps from a 13.8 volt supply. To determine the correct lengths of wire, I used a 0-20 DC ammeter and my car battery (with the engine running) as a stable source of 13.8 volts.

CALIBRATION

Connect a pair of heavy jumper cables to your car battery, with the free end of the positive cable to the positive terminal of the ammeter, the free end of the negative cable to one end of your resistance wire, and the free end of the resistance wire to the negative terminal of the ammeter. Note the reading on the ammeter, and adjust the length of the resistance wire until you get a current of exactly 10 amps.

As the wire heats up, its resistance will change slightly, so wait a few seconds for the current reading to stabilize. When the current reads 10

amps, disconnect one jumper cable from the battery and allow the wire to cool. Now cut it at the point where it is connected to the ammeter, and crimp a heavy lug at each end. Next, prepare a second length of wire in the same manner. With the particular wire I used, the length required for 10 amps was $7\frac{1}{2}$ inches.

MOUNTING

Cut out a breadboard about 5 inches wide, and long enough to accommodate your two resistance elements (side by side) allowing 2 or 3 inches to spare at each end of the board. Attach a rubber foot at each corner of the bottom of the board, or make feet from scrap lumber. Mount two insulated standoffs 2 inches apart, near each end of the top of the board. Attach a piece of sheet metal, or heavy aluminum foil to the top of the board directly below the resistance elements.

Mount three $\frac{1}{8}$ " bolts through the board near one end, with the heads under the board, and the shanks protruding about $\frac{3}{4}$ " above the top, to serve as terminals. Mount the resistance elements on the standoffs and connect them to the terminals with heavy wire, as shown in the diagram. At 20 amps of current, 276 watts will be dissipated by the load as heat, so a top cover made of heavy metal screening would be a good idea.

USING THE LOAD

To place a 5 amp load on your power supply, connect it to the common and 5 amp terminals, with the shorting link between the two right-hand ends of the resistance elements open. This places the elements in series.

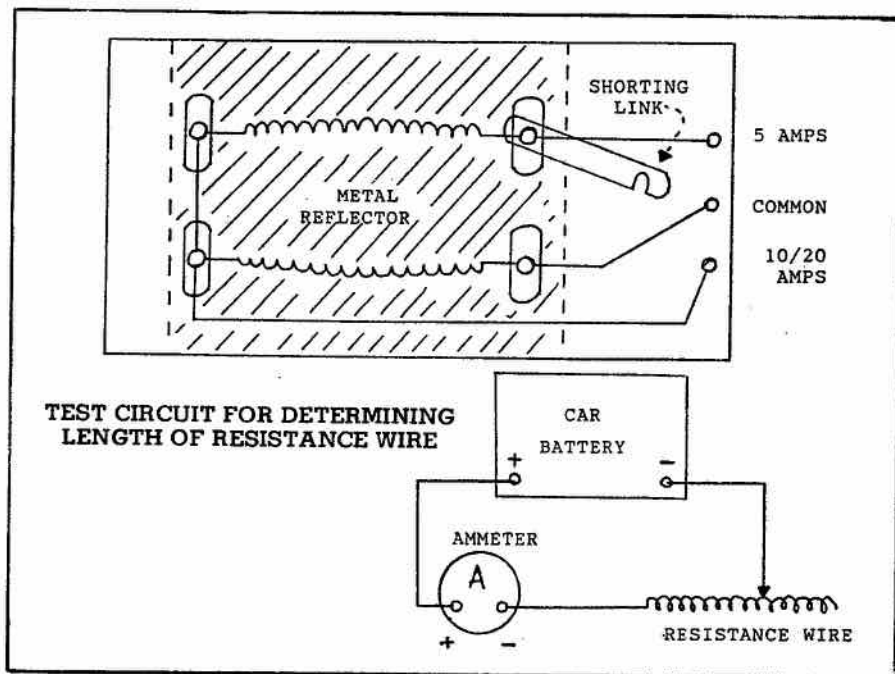
For a 10 amp load, use the common and 10/20 amp terminals, leaving the shorting link open, thereby using only one element.

For a 20 amp load, use these same terminals with the shorting link closed, connecting the elements in parallel.

If you would like to have a dummy load for other values of current, just select your resistance elements for the desired values. For example, if you make each of the elements for 5 amps, you will have a load capable of 1.5, 5 and 10 amps.

Be sure to place the dummy load in an open area where the heat generated by the resistance elements will be dissipated safely.

Now you can experiment with power supply design, construction and adjustment, checking such things as the adequacy of pass transistor heat sinks, stability and reliability of voltage regulators at various output currents and the trip point of overvoltage protection circuits, without putting your valuable radio equipment at risk.



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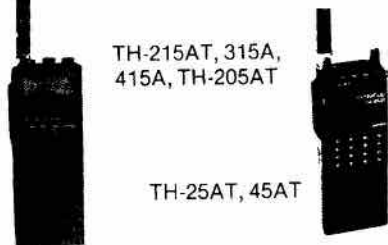
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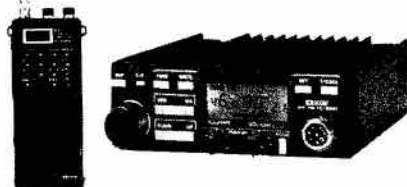
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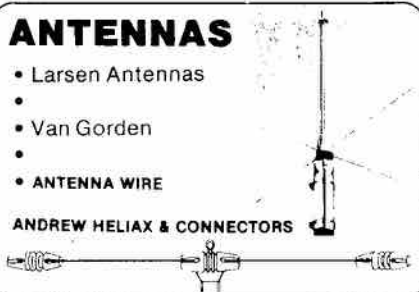
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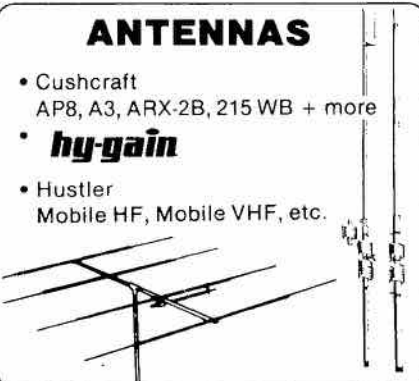
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