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THE CANADIAN AMATEUR

Canada's Amateur Radio Magazine

La Revue des Radio Amateurs Canadiens

NOVEMBER 1989



Dog Days!

At the Castlegar, B.C. Amateur Radio Group, everything has gone to the 'DOG'. Operator 'Fritz' is calling CQ via OSCAR 13. Thirty-three contacts were made during Field Day 1989.

— Henry Traue VE7BL



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

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

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WHAT IS CARF ?

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

1. To act as a coordinating body 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

Pro Bono Publico, or perhaps Pro Bono Amateur Radio

By Bernard H. Burdsall VE3NB

Does anyone read editorials? I must admit they are not my first choice; I usually go to the technical section. Guess we all have our favourite interests.

On the off chance you will finally read this, the heading is, as the Romans so aptly put it, "For the Public Good," and the lesson will be about volunteers, that great unpaid staff, without whom Society, and certainly Amateur Radio, would be deep in trouble.

When you, the Reader, open up *The Canadian Amateur*, there are two mastheads. Have you turned back to look? Right—the first lists Editor and Columnists, technical writers and production staff who make the magazine look so good month after month. They all work for C.A.R.F. Publications Ltd., not CARF Inc. Work is the right word—producing copy every month is hard work, and the financial rewards are minimal.

Now turn the page to the CARF Inc. masthead, a whole page full of volunteers, the unpaid staff, with one exception. Debbie Norman, our Office Manager, is an employee of C.A.R.F. Publications Ltd.

To some people, working without pay is a No-No; their choice of course. Why do people volunteer as Executives, Committee Chairmen, Assistant Directors and Managers of QSL bureaux?

It obviously isn't for the money or the 'perks'—not many of them. The Treasurer guards the cash, it's in trust for the members.

Oh yes, prestige and power. Well, there is, of course, a danger of a missionary zeal and an arrogant use of power, but not for long or you will lose your volunteers. Leadership of non-profit organizations, such as CARF, is not privilege but responsibility.

So we are left with 'Pro Bono Amateur Radio'. Yes, a desire to maintain and improve our fine hobby, our Canadian way of doing things, and because we believe in the Canadian Amateur Radio Federation and want to continue what is printed in the statement on the masthead page: "WHAT IS CARF?"

Volunteers, "bless them all, the long and the short and the tall." ■

NEW CARF TREASURER

The CARF Inc. Board of Directors has appointed R.K. (Bob) Wanless VE3PSC as Treasurer of CARF Inc., replacing Ollie Schijns VE3LXO, effective Sept. 15, 1989.

Bob, as a retired physicist from the Canadian Geological Survey in Ottawa, has a home north of Kingston on beautiful Sand Lake, a part of the Rideau Canal system.

The Board expresses its thanks to Ollie for a long term as Treasurer and concurrently for two years as General Manager. It is not easy to hold even one position— as volunteering can fill up one's waking hours— and to do additional work with the Girl Guides and nurture one's family can be overwhelming.

The Board is also pleased to announce that Paul Cooper VE3JLP, columnist for CQ DX CQ DX, has accepted the position as CARF liaison with the Radio Advisory Board of Canada (RABC).

LETTERS

MARITIME CALLSIGNS

To Mr. M. Nunas, Radio Regulatory Branch, Communications Canada:

As discussed at the April meeting between Ray Perrin VE3FN, John Iliffe VE3CES and yourself, the two national Amateur radio organizations have conducted a survey of the Amateur operators in the VE1 callsign district regarding separate callsigns for each province.

From responses received at CARF, we conclude there is no demand in either Nova Scotia or New Brunswick for separate callsigns.

In Prince Edward Island there is demand and we recommend that subject to the following constraints a new call prefix should be issued there.

1) existing VE1-PEI Amateurs should be allowed to retain their VE1 callsign as long as they are resident in the area currently in the VE1 district.

2) VE1-NS and VE1-NB Amateurs should be treated as any move between provinces if they move to PEI after the new call prefix is assigned.

3) New VE1-PEI Amateurs will not have an option, they will be issued a call from the new block as their first call.

4) A 'grandfather' period of one year should be granted for VE1-PEI Amateurs who wish to retain their current suffix to obtain a new prefix and the original suffix. After that time the suffix will be available for assignment again. Note that this means that in theory there could be both a VE1ABC and xx1ABC in Prince Edward Island.

5) Club and repeater VE1 callsigns in PEI should fall under the same rules as individual calls, except that a club with multiple calls (i.e. a repeater and a club call) should be able, on a once-only basis, to have the same suffix and both prefixes assigned if they wish. This would amount to retaining the VE1 call and issuing a new call in the new prefix but with the same suffix.

6) Released VE1 suffixes would become available for reissue.

For the record, 82 positive responses and one opposed were received from PEI. From the other two provinces the results were not statistically significant.

Will you please let us know what the Department's final decision is and what the new prefix will be?

This proposal will be printed in *The Canadian Amateur* in the next issue.

Sincerely,
John Iliffe VE3CES
President

TO CARF FROM DOC

Over the past several months, numerous Amateur radio operators

from Prince Edward Island have written to the Department requesting a change in call sign prefix. Their main theme was to have a distinctive prefix in order to emphasize their provincial individuality.

After considering all input received from Amateur organizations such as yours and from individual Amateur operators, we are prepared to issue the Amateur operators of Prince Edward Island with the prefix VY2. This change will take effect Oct. 30, 1989, and all new Amateur radio call signs assigned in Prince Edward Island after that date will have the new prefix. Existing licence holders will have the option of retaining their current VE1 call sign or changing to the new prefix. PEI Amateurs should contact their local Departmental District Office for information on how to obtain the new prefix for their current call sign.

In undertaking the study to respond to the Prince Edward Island situation, we also took the opportunity to canvass Amateur licensees in New Brunswick and Nova Scotia as to their position on the question of individual prefixes for each province. In the case of New Brunswick Amateur operators, no action will be taken at this time as there does not appear to be a consensus one way or the other regarding a change in prefix.

The overwhelming response of the Amateurs of Nova Scotia indicates that they would prefer to retain the VE1 prefix and therefore no further action is warranted.

Your interest and assistance in resolving this matter is appreciated and we hope the distinctive new prefix will alleviate the identity concerns of the Amateur operators of Prince Edward Island.

Yours truly,
R.W. Jones
Director General
Radio Regulatory Branch

MORE FROM MILAND

Further to the information on regulations in VU-land, sent recently, I would advise:

I have checked with the wireless controller in Delhi, while here on summer break, and find that the former tight ban on importation, and very heavy duties, have been lifted in India, promising more Amateur activity.

Power limitations on the HF bands have been eased to 150 watts. Grade 11 (CW) is still limited to 5 watts, Grade 1 to 10 watts, and Advanced Class 25 watts. Satellite operators can use 100 watts.

SILENT KEYS

VE7AHK— Harold A. Irish of North Vancouver, B.C. on Aug. 12, 1989. Born in Winnipeg but moved to the West Coast with his parents when a very young child. A staunch Monarchist, he was quick to join the Royal Canadian Navy in early September, 1939 as a telegraphist but switched to the newly formed Photo Branch early in 1940. He quickly obtained a commission in his branch and retired from the RCNVR as a Commander. Many of his photographs of Canadian Naval vessels appear periodically in various papers or magazines. He enjoyed working on new antennas and, being small in stature, he also delighted in miniaturizing electronic gear. When describing some new 'gadget' or circuit he would remind a listener that "After all, you know, the world IS becoming much smaller!"

VE3PSP— Charles Camidge, July 31, 1989, Waterloo, Ont.

Ordinary supplies for hamming, like insulators and copper wire for my dipole antenna are not available in my town. It has to come from Delhi, rather a handicap, but I am operating on 20 metres SSB, using a HW-32, with many contacts in India, U.S.S.R. and all of South-East Asia. I have not, however, heard any VE or W stations, owing to the intense solar activity.

In September, I will return to Pearson College and VE7LPC, and a big-gun station. This will be quite a change from the HW-32. The HW-32 power supply was changed over to 240 volts by Jack Scarlet VE7JS, and it operated the rig quite well on that voltage.

Miland Sharma VU2GOC/VE7

CODE AND THEORY CLASS IDEAS

Last year we tried some new ideas. This year in our planning we have continued in the same vein.

First, the classes are run strictly by the club. In the past we jointly sponsored the classes with the local School Board; they paid our Theory instructor.

We decided last year to take a different approach. We used a different club member as a Theory instructor each week. We covered one chapter in the CARF CSG each week.

During the years when our classes were run by the school board, the cost of the course was \$60 per student, plus study materials. We were not allowed to encourage club membership, and consequently only a few students joined the club.

Since the club now independently sponsors the classes, the course is free to club members, and class students can get a first year membership for \$10,

whereas regular membership costs \$20 per year.

The club benefits from the new members, the students get to know many club members, the instructors think it's great, and the general spirit in the club is improved.

Another new wrinkle was to give each class member a Course Manual to help organize good study habits on the vast amount of material to be covered. The Course Manual consists of eight sections as follows:

Section 1— Course Outline (available from CARF HQ for SASE); 2— RIC-24, The Syllabus; 3— RIC-24 Regulations; 4— Exhibits (index available from CARF); 5— Personal Notes, Theory; 6— Personal Notes, Regulations; 7— Personal Notes— Morse Code; 8— DOC Question Bank (Amateur or Advanced).

Note the index for the Exhibits. These cover a lot of practical things new people in the hobby need to know, but which we cannot teach due to the heavy emphasis on Theory. We give the students the Exhibits, and while they don't need to study them to pass the exam, the Exhibits do make the students more informed.

We feel the volunteer contribution by many club members as Instructors on an unpaid basis is far superior to our former method whereby we used only

one paid member for Theory instruction. We also find that the individual instructors take the time to bring in many more samples and hands-on items.

One other thing we accomplished this year was to design and build a special display to try to lure more candidates into the Code and Theory classes.

The display fits on one eight-foot table, is light and easily moved and set up at Malls, schools, etc.

There are two metal stands made from metal strips usually used for bookshelf applications. These are bolted together using small stove bolts and a number of 1 x 1 inch angle brackets.

On each stand is mounted a foamcore board 40 x 30 inches in size. On each foamcore board, four signs each 11 x 14 inches are mounted. Above the one stand there is a large sign about 30 x 12 inches which says:

AMATEUR RADIO

Hobby - Public Service

On the table in front of the stands, a number of pertinent items are displayed, such as: RIC-24, RIC-25, CARF CSG, Morse Code key and oscillator, a world globe, a copy of Certificate of Proficiency in Amateur Radio, copies of Club Info Card, and copies of a form on which candidates can register.

The whole theme is unified by running heavy red yarn from appropriate points on the signs to the various items sitting in front. The display was part of the CNE Amateur radio display for the duration of the 'Ex'.

It is hoped that other clubs might benefit from our experience until such time as the new 'Restructuring' comes into effect.

Bill Rook VE3MBF

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.

G. Guy Charlette VE3PAL, 2 Devondale St., Bowmanville, Ont.
Albert Bryanton VE1BPW, Colville Rd., North Wiltshire, P.E.I.
M. Moorhouse VE7KE, 614 Allison Place, New Westminster, B.C.

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

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

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

For November we have:

- (1) Large stock of Esterline Angus chart recorders, most Model AW less pens. \$10.00 each
- (2) Gonset Communicator transceiver Model IV complete with mic, manual & power cord. Operates from 12VDC or 110 volts AC. A collectors 2 metre set. \$45.00
- (3) B & K tube checker Model 500 complete with 610 adaptor panel, tube adaptors and manual. \$35.00
- (4) Military receiver type R390, special at \$90.00
- (5) DC motors, series wound 115V with electric brakes. Made by Robins & Meyers, 5/8 shaft, 5 1/4" flange, wt approx 10Kg. \$20.00
- (6) Military tube checker, TV-7. \$25.00
- (7) Vero rack mounting card frames complete with 34 prs card guides and locking device. These are approx 5 1/4 x 19W x 13 1/4 deep. Very similar to Vero KM4 series of frames. All aluminum components screwed together. New \$15.00. Also limited selection of Vero 3U new modules available.
- (8) Printer, Diablo 1550 mounted on table, chrome legs arborite top. Built in diagnostics etc. Friction feed. \$35.00
- (9) 35 mm film strip projectors. Singer, Bell & Howell etc. With lense \$12.00
- (10) Rohde & Schwarz VHF field strength meter/receiver. 47-225MHz, FM/AM with case and battery charger. \$75.00

Ionospheric Disturbances and World War II

By Bob Brown NM7M

If one were to write the history of the ionosphere, it would be a brief work compared to most other histories, going back at most to the turn of the century. But if the focus were placed just on ionospheric disturbances, the span of time would be even shorter, more like 50 years or so.

Thus, in 1937 the sudden ionospheric disturbance (SID) due to solar x-rays was reported by Dellinger and other more gradual disruptions due to geomagnetic activity were recognized. Later, almost a decade after Dellinger's work, observations came together from several disciplines to reveal the solar origin of radio blackouts in the polar regions. Indeed, the first event of that kind to have a full interpretation occurred in the Spring of 1942; however, it was not until well after the end of WW-II that the various observations— from the fields of solar astronomy, ionospheric and cosmic ray physics— were published and the true nature of such events revealed.

Now the Spring of 1942 was not the happiest of times, the United States still reeling after the attack by the Japanese at Pearl Harbour, all of Europe over-run by the Germans and Great Britain under almost daily air attack by the Luftwaffe. It was in that setting that two major ionospheric events took place, solar flares on Feb. 28 and Mar. 7, 1942 producing protons that reached the earth in large numbers and with sufficient energy to penetrate down to sea level.

In retrospect, it is fair to say that such energetic events resulted in strong ionospheric absorption of radio waves but primarily in the polar regions where solar proton bombardment is concentrated. And the magnetic storms which actually followed those events could have disrupted HF communication at lower latitudes as a result of the reductions in F-layer critical frequencies or, correspondingly, in the maximum useable frequencies (MUF) on communication paths.

As one who has studied solar proton events, various aspects of geomagnetic storms and other ionospheric disturbances but who also has an

interest in radio communications, albeit Amateur, I became curious recently to see if those two unique events, and perhaps others like them, disrupted military operations or strategic communications during WW-II. To that end, I tried to elicit information on communications from wartime radio operators as well as scientists working on radio problems at the time; in addition, I looked into the history of WW-II to see if there was any mention of these disturbances in the annals of electronic warfare. The results of these inquiries follow and I think you'll find them interesting, even at this late date.

First, to begin we should divide the discussion by considering the parts of the spectrum above and below 30 MHz, the dividing line between HF and VHF frequencies. Thus, we note that with the start of WW-II, there was intense effort in the VHF part of the electromagnetic spectrum, the development of VHF transmitters and receivers being of paramount importance to the military situation. Indeed, air attacks on England were guided by VHF beams from Europe and measures taken in England to counter them.

In addition, early warning radars in the lower part of the VHF spectrum were used to alert the air and naval defenses of England. A good example of this, dealing with both radar and counter-measures, is found when the two German battle-cruisers *Scharnhorst* and *Gneisenau* made a dash past the southern coast of England in early February '42 with the aid of radar-jamming signals from France.

Interestingly enough, it is about this time and on those frequencies that we find the first evidence of disruption of military operations as a result of solar activity, indeed from the same solar regions responsible for the two flare events cited above.

Thus, around the time of the dash along the English Channel by the two German battle-cruisers, the fire-control radars of anti-aircraft batteries in England experienced severe interference, thought at first to be a new radar counter-measure. Careful study, however, revealed that the interference came not from jamming but from solar radio noise bursts in the VHF part of the

spectrum. Given that the frequencies involved were in the range where the ionosphere is essentially transparent, the interference has to be considered as solar, rather than ionospheric, in origin. Of course, that proved to be the beginning of solar radio astronomy and has a history all its own but for the original question of interest here, disruption of operations because of ionospheric disturbances, it fails to meet the criterion.

In the HF part of the spectrum, where ionospheric disturbances would be expected to play a role in communications during WW-II, the record reveals little evidence of serious or continued disruption of operations. In contrast to the VHF part of the spectrum where radar counter-measures were under continuous study and deployment, jamming was not a factor in HF communications. In point of fact, that was a conscious decision on the part of the Allies since it seemed that more could be gained by listening to enemy radio communications than by jamming them. Indeed, the breaking of both the German and Japanese military codes proved the wisdom of that choice and a tremendous amount of valuable military intelligence was gathered as a result.

However, when it comes to natural disruptions of communications, it is not to say that such physical events or circumstances did not occur. Rather, the lack of a record of disruptions was probably due more to the methods and communication paths in use at the time, largely relays of traffic over a series of relatively short paths and relay links mostly at middle or low latitudes, geographic regions relatively immune from ionospheric disturbances.

Of course, the brief disturbances on the sunlit hemisphere of the earth due to D-region absorption from solar x-ray events, SIDs probably were encountered; however, they are rather infrequent and their durations short enough that the radio operators during WW-II were able to just 'wait them out' and then continue as before, not even being perturbed enough to make note of their occurrence.

There was one exception to this discussion, namely communication

paths at latitudes close to the auroral zone. There, from Alaska through Canada to Norway, interruptions of communications were found in conjunction with auroral activity. While the aurora has its origin, more properly its energy source, on the sun, the disturbances in propagation were ionospheric in character, due to the formation of auroral E-regions by auroral electrons and with the corresponding scattering and absorption of radio waves. Such events also have signatures which are evident in the records of magnetometers at those latitudes, even prior to the actual onset of an auroral ionospheric disturbance, and the German ionospheric prediction service in Occupied Norway used the magnetic signatures to anticipate the deterioration of propagation conditions. Indeed, by that odd twist of circumstances, they managed to improve the reliability of communications in Scandinavia from 40% to 80%, even going so far as to cancel reconnaissance flights and save aviation fuel when magnetic records suggested an impending auroral event.

That same German ionospheric prediction service, under direction of the late Dr. G. Lange-Hesse, noted ionospheric absorption events of long duration on HF paths between points in northern and southern Norway, for example Tromsø and Oslo, and lasting for days instead of a few hours as in the case associated with auroral displays.

The first such event started in Norway just after 1200 UTC on Feb. 28, 1942 and lasted for several days, particularly on paths having one terminus in northern Norway. Unknown to the Germans, the event had its origin in a large solar flare (importance 3+) near the central meridian of the sun. The flare outburst promptly produced a SID at latitudes where the sun was above the horizon; in addition, protons in the solar atmosphere were accelerated to high energies, the order of 1 Bev or more, and secondary particles penetrated to sea level, being recorded by a cosmic ray ionization chamber at Cheltenham, MD (50 deg mag lat) operated by the Department of Terrestrial Magnetism of the Carnegie Institution.

The German ionospheric prediction service, not having the full story at the time of the event, simply wrote up their observations in an internal report and kept their data in files marked as 'Effect of Unknown Origin'; after WW-II, the story gradually unfolded and with other observations, it was recognized as the first example of what is now termed a polar cap absorption (PCA) event. Before leaving this point, however, it should be noted that another event of the same type occurred about a week later, on March 7, 1942.

Like the first PCA event, the solar

protons were energetic enough to penetrate through the entire atmosphere.

Beyond those two events, the German ionospheric service found no other cases of a similar nature in the time up to the end of the occupation of Norway, May 1945. In the decades that followed, further observations of solar cosmic rays showed that such ground level events (GLE) occur on the average once every seven years or so, thus pointing to the unique circumstances in 1942 when the same solar region produced two GLE in the span of only one week.

With several decades of hindsight, to say nothing of newer, more sensitive detectors and techniques, we now know that PCA events are D-region absorption events which occur more frequently than those two GLE events and vary tremendously in the numbers and energies of solar protons; indeed, some are detected only as weak fluxes of solar protons at satellite altitudes without any significant ionospheric absorption at HF frequencies while others give rise to large fluxes at satellite altitudes and many dBs of absorption for HF signals that pass through the D-region in the polar caps.

It should be noted that both auroral and polar cap absorption events might have affected communications between the German Naval Headquarters in France and the U-boats in the North Atlantic during WW-II. Such communications involved operational orders and the responses from the U-boats

were kept to a minimum for obvious reasons.

Passive measures, involving direction finding (DF) techniques, were used to deal with that threat to Allied supply lines from the United States. It is interesting to note that the degree of effectiveness of DF work varied with the distance between the receiving station and the U-boats, ship-borne efforts being quite effective because of their close proximity to the U-boats while shore-based efforts suffered from systematic errors due to ionospheric tilts and sporadic auroral disturbances in the North Atlantic region.

All in all, the sum and substance of the above information was enough put my curiosity to rest about the possibility of ionospheric disturbances being significant factors during WW-II, seriously disrupting either Allied operations or communications; there just didn't seem to be any recollection or record of specific dates or events along those lines in the material that I went through. But then I stumbled onto something that was absolutely amazing, at least for a person of my background: the Allies installed an ionosonde, a radar-like device to probe the ionosphere, in the war zone at Spitzbergen in the Fall of 1942. That brought me to the other side of the coin, the possibility of ionospheric observations being disrupted by military operations. That should be enough of keep your interest until the next installment. ■

Call for Nominations for Regional Directors 1990-92

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

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

Atlantic Region
Ontario Region
Pacific Region

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

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

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

WARC 92: Shaping Our Future

By J.F. Hopwood VE7AHB

A World Administrative Radio Conference (WARC) has been scheduled by the 1989 ITU Plenipotentiary Conference for early 1992! The last WARC in 1979 gave us the 12, 17 and 30 metre bands. The mood of a new WARC may not be so benevolent. The Amateur Service and Amateur Satellite Service band allocations must be protected, enhanced and expanded. An effective defense is to be on offense. This means Canadian Amateur radio must play an influential role in defining and shaping the issues and proposals which our government would pursue and 'vote on' at the conference. The time has come to prepare a Canadian Amateur radio representative for the Government/Industry Working Group.

An International Telecommunications Union 'WARC' on radio matters is to be held in early 1992 in Spain. Until the ITU Administrative Council sets a definitive agenda we will not know the exact issues to focus on. However, the resolutions and recommendations of specialized WARC's such as WARCHF-BC-87 (HF Broadcasting), WARC MOB-87 (UHF Mobile) and WARC ORB-88 (Satellite Orbit) give us an insight on matters to be reviewed. We consider it a challenge for Amateur radio.

Extending the crowded HF Broadcasting bands is a possible agenda item. This could affect the Amateur HF bands, particularly 40 and 80 metres. Also, alterations of the spectrum allocations for some services is proposed. The Amateur Service must be well prepared to defend any proposal to reduce its frequency allocations or undermine its band privileges. Some administrations are prepared to favour new business communications demands at the expense of other services. The United Parcel Service reallocation of 220-222 MHz in the U.S. is dramatic case in point.

The deregulation and re-allocation of the radio spectrum, brought on by the explosion of business and personal communications products and opportunities, can be a threat to existing 'non-business' VHF/UHF/SHF users. Lobbies, both marketing and legal, are already working to change the radio legislation in some countries. The notion that the radio spectrum is 'business territory' is gaining popularity. This does not bode

well for non-business users of the spectrum. Our advocates must be prepared.

The Amateur radio representative on the Canadian delegation at the 1979 WARC was the late Bud Punched VE3UD. He did a first class job for Amateur radio. He was the accepted choice of CARF and CRRL. As a very knowledgeable retired person, his free-time and independent income made his selection an ideal choice for the fraternity and the government. Canadians also benefitted from the work of Noel Eaton VE3CJ who was a senior member of the IARU delegation. Canada couldn't be better represented!

Other hams, such as Bob Eldridge VE7BS who was the representative of the then Canadian Radio Technical Planning Board (now RABC), worked with Bud and several other Canadian Amateurs to influence the acquisition of the new WARC bands. Incidentally, Bob is the current Amateur radio rep on the Canadian CCIR Study Group 8. Back at WARC '79 he chaired a Committee of all

nations to assemble the technical data necessary for his segment of the WARC. Bob says that now is the time to prepare!

CARF is preparing for WARC '92 and a possible special WARC in 1993 for HF broadcasting. Bill Wilson VE3NR has a wealth of experience at ITU/CCIR matters from his DOC days. Ably assisted by CARF's Government Relations Committee of experts in Ottawa, Bill will be gathering information and data for the delegate-elect to use toward the upcoming WARC. We are indeed fortunate to have a person the calibre of Bill who is so knowledgeable and so well respected on the national and international scene.

Now is the time to analyze, to plan and to consolidate our position toward the upcoming WARC. There is no better way to influence the shape of our future at the WARC than by being a part of our government's position and delegation in Spain in 1992. Canadian Amateurs can rest assured that CARF will play an important part in the preparation and decision-making to do just that! ■

More modems from CNIB

The CNIB Amateur Radio Program has obtained more Rixon T212A Data Sets (modems) which now are offered for sale with all proceeds going to support Amateur Radio for the blind in Canada. This is an extension of those made available last Fall.

Modems enable computers to transmit and receive data over normal automatic switched telephone networks. The Rixon T212A was standard to Bell for a number of years, but now is surplus to their requirements. It is a full duplex modulator/demodulator operating in one of two modes, switched from the front panel: (1) up to 300 bits per second, or (2) 1200 bits per second.

If the computer has an RS232C interface (standard with IBM), all that is required to hook one up is interconnecting cables to the computer and to the telephone line, and a double pole, double throw, centre off toggle switch. If the computer does not have an RS232C interface, one will have to be provided to drive the modem. These are available

for most makes of computers at moderate cost. The modems come with a five page set of instructions to install, operate and diagnose troubles.

In the very unlikely event that repairs are required, included in the price is a five year extended warranty covering repairs and replacement of parts. This service will be provided by Croft Taylor VE3CT.

Price of the modems is \$47 each, shipped post paid, a steal considering the original price in the \$800 region. Units are available now and can be seen and purchased from Will Melhuish VE3AOY, Manager of the CNIB Amateur Radio Program, at the CNIB at 1929 Bayview Avenue, Toronto, Ont. M4G 3E8, telephone 416-480-7438. Please phone for an appointment (leave a message on the answering machine if no one is there). Mail orders accompanied by a cheque also are accepted.

Remember, all proceeds go to the Amateur Radio Program for the blind. ■

New Bill is in!

NEW COMMUNICATIONS BILL IS LAW

Bill C-6, the vastly amended Radio Act which had suffered from technical insufficiency and legal sterility for some 38 years, was finally reborn.

Bill C-6, which passed the House of Commons on June 22, 1989, was stalled on the last day that the Senate Review Committee met during the Spring session. In a change of heart, the Bill received a speedy passage on October 5, 1989.

The new Radio Communication Act replaces the title Radio Act. Harmful interference has been defined for the first time and embodied in the Act and means "an adverse effect of electromagnetic energy from any emission, radiation or induction that:

"(a) endangers the use or function of a safety-related communication system, or

"(b) significantly degrades or obstructs, or repeatedly interrupts the use or functioning of radio apparatus or radio sensitive equipment."

Interference causing equipment means any device, machinery or equipment, other than radio apparatus that causes or is capable of causing interference to radio communications.

Radio sensitive equipment means any device, machinery or equipment other than radio apparatus, the use or functioning of which can be adversely affected by radio communications emissions.

PROHIBITIONS

4(2) "No person shall manufacture, import, distribute, lease, offer for sale or sell any radio apparatus, interference causing equipment or radio sensitive equipment for which a technical acceptance certificate is required under this act, otherwise than in accordance with such a certificate."


4(3) "No person shall manufacture, import, distribute, lease, offer for sale or sell any radio apparatus, interference causing equipment or radio sensitive equipment for which technical standards have been established under

paragraph 6(1)(a) unless the apparatus or equipment complies with those standards."

MINISTER'S POWER

Of particular significance to Radio Amateurs is the following provision: Part 5(1) "make determination as to the existence of harmful interference and issue orders to persons in possession or control of radio apparatus, interference causing equipment or radio sensitive equipment that the Minister determines to be responsible for the harmful interference to cease or modify operation of the apparatus or equipment until such time as it can be operated without causing or being affected by harmful interference."

In addition, the new act conveys power to the Minister of Communications to "establish technical requirements and standards in relation to (1) radio apparatus, (2) interference causing equipment and (3) radio sensitive equipment or any class thereof." ■



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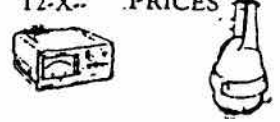
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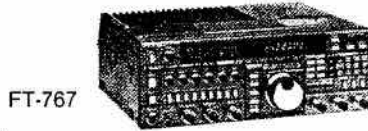
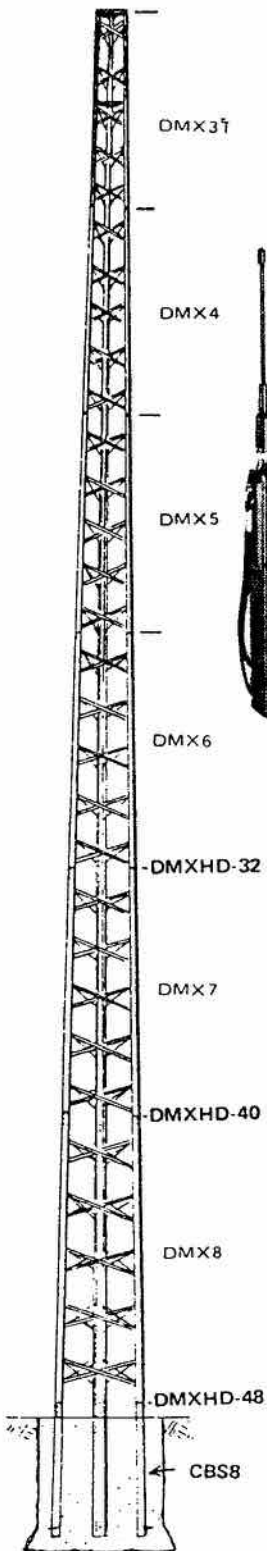


HYGAIN



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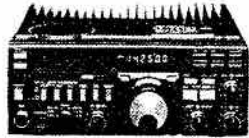
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FT-767



TS-940, 440, 140



FT-767GX, 757GX, 747GX



TM-721

TM-721A FM DUAL BANDER
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Ham Hacker held without bail

In a rare ruling, convicted computer whiz, Kevin David Mitnick N6NHG, 25, of Panorama City, CA, was ordered jailed without bail. Mitnick has been charged in a three-count federal grand jury indictment with illegally penetrating international computer and telephone systems and causing up to \$4 million in damage.

Among the systems he accessed were those of Digital Equipment Corp., Leeds University/England and MCI to obtain free telephone use. It is believed that the case is the first in the nation to be prosecuted under a federal 1984 Computer Fraud Statute that makes it a crime to gain access to an interstate computer network for criminal purposes.

His attorney, Anthony J. Patti, said Mitnick could be controlled by placing him under house arrest and disconnecting all telephone lines. A federal magistrate denied bond, however, ruling, "It sounds like the defendant could commit major crimes no matter where he is." Federal prosecutors obtained a court order restricting Mitnick's telephone calls fearing he might gain access to a computer over jail phone lines.

A chronic hacker, Mitnick has in the past accessed the internal records of the Los Angeles Police Dept., TRW and Pacific Telephone and tried to break into the USC system five years ago. His teenage record shows that he served six months in Juvenile hall for stealing computer manuals from Pacific Telephone and altering telephone bills... and for using a pay phone to destroy \$200 thousand worth of computer data of a Northern California company.

Mitnick later penetrated the files of TRW Corp. and altered the credit information of several people, including his probation officer whose telephone he allegedly disconnected with his computer. Mitnick was also found guilty of stealing software under development by Microport Systems but his conviction record mysteriously disappeared from Santa Cruz's police computer files. He earlier held Amateur callsign WA6VPS, General class.

Prosecutors alleged that Mitnick used a computer belonging to a friend, Leonard M. DeCiccio at his Calabasas, California, work place to intrude on the Digital Equipment network. Mitnick might have gone undetected had DeCiccio not notified DEC's security

division in Maynard, Massachusetts, about the invasions into their system. A monitoring device confirmed Mitnick's activities that evening.

Mitnick was allegedly examining the system to allow him to identify persons having legitimate access so he could further infiltrate the system, according to the complaint. DEC said it had lost about \$4 million because its 30,000 unit system had been the target of numerous breakins over the past year. A search of Mitnick's car turned up confidential DEC documents and he was carrying a list of 14 MCI network access codes when arrested on Dec. 9.

Mitnick is also charged with stealing a DEC security software program valued at \$1 million from a Boston computer. Assistant U.S. Attorney Leon Weidman said he did not know what Mitnick intended to do with the program but he could have tried to sell it. A second charge accuses Mitnick of unauthorized use of MCI telephone lines to get into the computer at Leeds University in England.

More new evidence turned up last week indicates that Mitnick has penetrated the computer files of the nation's ultra top secret National Security Agency where he obtained telephone billing data. There was no evidence however, that Mitnick has accessed their classified data files.

A Los Angeles newspaper report said

that he may have planted a false story on a financial news wire that was released in the New York Stock exchange about an astronomical \$400 million loss at Southern California's Security Pacific Bank. The story could have caused catastrophic damage exceeding that figure to the bank had it reached investors. Due to a 'coding error' the hoax was uncovered before that could happen and the report not further circulated to newspapers. Mitnick had been turned down for a job at the bank just four days earlier for lying about his past criminal record.

The Los Angeles Police said, "He's several levels above what you would characterize as a computer hacker. He started out with a real driving curiosity for computers that went beyond personal computers. He grew with the technology."

The LAPS reported that Mitnick has tried unsuccessfully for years to get a job as a computer-security expert. Apparently no one put any stock in his ability. Mitnick, who was on 36 months probation in connection with the December 1987 Santa Cruz computer fraud sentence, now faces up to 20 years in prison and a \$750,000 fine if convicted on the new charges. He was arraigned on Dec. 27. ■

WSYI Report
via Groundwave

Canadian computer keyboard standard

Department of Communications staff played a significant role in the development and adoption of a preliminary Canadian standard for arrangement of the alphabetical characters on computer keyboards.

The standard, published under the title *Canadian Keyboard Standard for the English and French Languages* by the Canadian Standards Association (CSA) in December 1988, offers Canadians for the first time a single keyboard providing access to all characters used by the English and French languages.

Users and manufacturers of computer and electronic equipment have long

awaited the adoption of such a standard, which is the only CSA-recognized standard for the aforementioned keyboards.

Testing, as well as a survey of Anglophones and Francophones, confirmed that most people preferred the new keyboard. One of the main features is the priority placed on the access to all English and French characters. According to the standard, the alphanumeric section consists of 48 keys, each of which can be used on three different levels: directly (first level), with a shift key (second level) and with an additional shift key (third level). ■

USER REPORTS

KANTRONICS KAM

Kantronics All Mode, KAM Communicator comes complete with cables and connectors for KAM, but you must supply your transceiver microphone or accessory plug jack and your computer connector. You must also supply your own terminal program or buy Kanterm from Kantronics or a dealer.

My Commodore C-128 employs the User Port in a TTL configuration and the plug for this socket came packaged with Kanterm 128, which is Kantronics terminal program selling for an extra \$30. U.S. including disk and instruction book. You can operate without this sophisticated program by using the simple terminal program you type in from the KAM instruction book.

All Mode may not be entirely correct because SSTV is not available nor is there a built-in contest keyer or SSB facilities. By the way, Kantronics have finally caught up to this version 2.85 equipment by just recently issuing updated and more explanatory manuals. Now, instead of the original 104 pages, they have THREE books. The old manual was still supplied with equipment purchased up to December 1988. After an appreciable exchange of correspondence trying to set mine up for HF operation, the new manuals were offered at an additional fee of \$15 U.S. plus shipping. My supplier also sent the wrong disk program three times, so it wasn't until May and the third reading of their books that KAM became operational! Without some help from John VE6BOX even that date could have been extended. He pointed out the book vaguely mentions KAM default is VHF port for packet and to use HF you

will find obscure instructions under the heading 'Multiple Connects'. Who would even think of multiple connects the first day, let alone read that paragraph? Even the new books are written by someone who assumes the user has an engineering degree in computers and/or packet, KA-NODE, AMTOR, FEC, ARQ, SELFEC, RTTY, ASCII, WEFAX, KISS and ACP/IP besides AX.2512v2 protocol.

He or she very adroitly maneuvers around actually guiding anyone through a specific mode, especially WEFAX, by ending that three page blurb with 'Suggestions for Writing a WEFAX Terminal Program'. Needless to say that left me out in the cold when I wrote to ask if their MAXFAX program would work with my 7 dot matrix printer, the engineer replied, "Maxfax has been used by several of our customers, but I do not know what printers they are using." So I am still out in the cold, without WEFAX, which was my main reason for the original purchase. As for something to copy CW, the original computer between my ears does fine up to 70 wpm, thank you.

Good Features:

By now most readers are saying there must be some good points about the equipment, even if it might only be compactness. Recent advertisements show KAM sitting on top of an ICOM 745 which would indicate relative immunity from RFI. Its dimensions are 22.8 cm deep by 14 cm wide by 4.5 cm high, weight 1 kg, powered by a 12v DC 300mA plug-in transformer which is included. I have to admit KAM is more sensitive than my first homebrew TNC designed for VHF but used exclusively

on HF. Plus the fact KAM can be used as a Gateway, meaning you can transmit and receive on VHF while it is automatically transferred to an HF circuit through your station. Besides this feature, it is a dual port communicator which means simultaneous connections in packet via both VHF and HF. Or you can operate VHF packet while conducting QSOs on HF RTTY, AMTOR or CW. Digi-peating is again automatic as long as your station is on the air but what the legalities are insofar as no-one in attendance is yet to be determined.

Following the book:

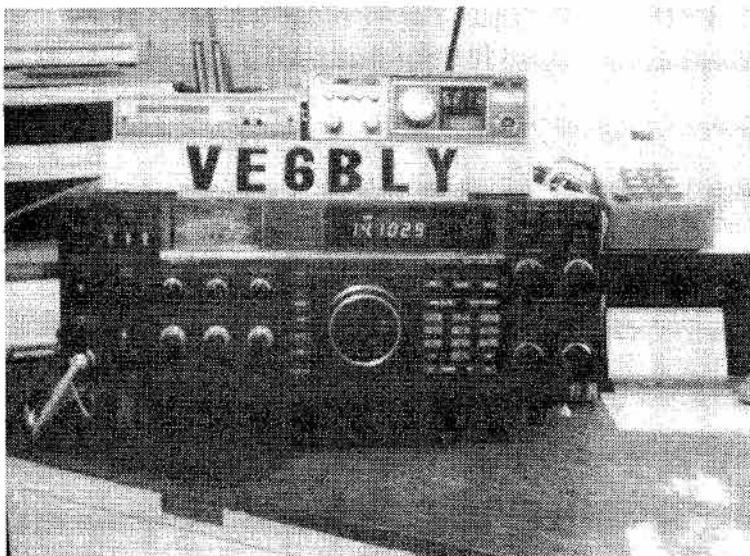
Always a good idea, and one that pays dividends in the long run providing it is one written in layman's language. When Kantronics rewrote their 104-page book into three volumes, total pages jumped to over 204 which includes six pages for index in each volume. Now instead of stress through frustration in not being able to find a particular reference, there are three places to find it. Each index is cross-referenced so you know whether to look in the Operations, Commands or Installation Manual.

Next it is hoped any future revisions will include an actual 'example' description, laid out in such a manner that any user could pick up the books and begin operating shortly thereafter (not 5 months). There are 114 commands that apply to packet or all modes plus 50 or more for RTTY, AMTOR, etc. It is readily obvious without prior experience that considerable time will be spent getting 'on the air'. My first packet message went to Bernie VE3FWF@VE3JF and reply received back quicker than postal service. I asked him for some more of the basics to be covered in this column so we shall wait and see. Right now I am busy trying to figure out how to program this tying for automatic identification while on the air. When done properly it will be transmitted on both HF and VHF and look something like this: VE6BLY-1>IDV: VE6BLY-1R QRPVED-4/D VE6BLY-5/G VE6BLY-3/M QRPVED/N.

Among other things, this blurb announces a station capable of digipeating, gateway, mailbox and node operation. Any of these except gateway can be carried out by another station while you are busy operating CW, RTTY or AMTOR via the HF port.

The Big Day:

Fortunately my IC761 uses the common DIN plug for the accessories socket but, as I had a spare microphone plug on hand, that is where the KAM was wired. My Yaesu 227R used a 5-pin



On top of IC761, left to right, Kantronics KAM, Yaesu 227R, VHF 145.01 MHz, HF 14102.9 kHz.

DIN for the accessory socket, so again it was easily wired to the Kantronics cables. This little exercise turned out to be the easiest of all once appropriate technical manuals were sorted out.

There is an internal jumper change to be done inside the KAM for TTL operation with Commodore C-64 or C-128. That and wiring the various plugs was probably the easiest of the instructions to carry out. Receiving in any mode again was not too difficult and had I been using VHF to start, the whole operation would not have been so disappointing. Skipping the 'Multiple Connects' section in the manual was also a mistake.

The on/off light (green LED) is on the extreme right of the front panel and to the left is the push on/off power switch. Left again is the push in/out switch marked AM/FM to select Limiters in or

out of the demodulator circuits. AM for no limiters as recommended for CW operation and FM for RTTY/AMTOR/ASCII. It is your choice of either AM or FM during packet operation.

Front Panel:

Looking from left top we see a green bargraph window which row of ten LEDs are used for accurately tuning ... signals using Mark/Space RTTY tones and HF packet tones. VHF packet does not require any tuning. Below the bargraph left to right is a red XMIT LED to indicate KAM is keying your HF transmitter or when HF packets are being received. Next, a green LED marked CON/LOCK which will illuminate when KAM connects on HF packet or an AMTOR Lock condition.

Next is the STA/VAL LED which lights for unacknowledged HF packets or Valid AMTOR data. These first three

LEDs are classed in the HF section. Now follows four more LEDs comprising the VHF section. An XMIT red LED shows when KAM is keying your VHF radio. A green LED marked RCV indicates receiving a VHF packet. CON, another green LED indicates VHF connection OR when operating non-packet HF it will blink for about 10 seconds if your KAM receives a request to connect on VHF packet.

Number 4 LED is STA and again green to indicate remaining VHF packets not yet acknowledged. When CON is OFF and STA blinks you have mail in your mailbox. If STA is ON steady then your PBBS has a connection.

General Coverage:

Here is where you can make the best use of your KAM, especially if you have a copy of *Ferrel's Confidential Frequency List* on hand. In RTTY mode there are commands available to change baud rate (wpm), select frequency shifts of 850, 425 or 170 Hz or custom set your own mark and space frequencies.

The KAM will lock on to a signal and maintain readability even during rapid fading once you have properly tuned it in and selected the correct parameters. Trying to judge baud rate by ear will take considerable practice and this is where the above-mentioned book comes in handy. They list frequencies with mode which often includes shift and speed, call, location, service whether marine, aeronautical, fixed, etc., and remarks such as hours of broadcast, embassies, traffic, news, etc.

Kantronics new Operations Manual has a certain amount of theory at the heading of both RTTY and AMTOR chapters. For any newcomers contemplating this unit as a first acquisition, my recommendation is that you make sure your purchase includes these new manuals V2.85 or later.

Techniques

Here is where prior experience tends to be helpful in developing personal operating and tuning attributes. KAM has a number of multi-function uses such as being able to connect to 26 stations in each HF and VHF or you can restrict this number to as few as one. Once you feel comfortable with any configuration, it is possible to 'write' your choices in to the KAM EEPROM. Next time you fire up the KAM, all these choices are again available until such time as you decide to change them. You can write to this EEPROM a minimum of 1000 times before it is necessary to perform a 'Hard Reset' as described in the manual to restore the factory default parameters.

KISS TCP/IP:

The height of my stupidity does not allow comprehension of the KISS or TCP/IP modes available with KAM, nor does either the Command or

Specifications

KAM, KPC-4, KPC-2, KPC-2400, KPC-1

Size: KAM: 1-3/4" x 6" x 9"

KPC-4, KPC-2, KPC-2400, KPC-1: 1-3/4" x 6" x 8"

Weight: KAM: 2-1/2 lbs.

KPC-4, KPC-2, KPC-2400, KPC-1: 2-1/4 lbs.

Power Requirements: KAM: 11 VDC to 14 VDC < 300 ma
 KPC-4: 11 VDC to 14 VDC < 200 ma
 KPC-2: 9 VDC to 14 VDC < 250 ma
 KPC-2400: 10 VDC to 15 VDC < 330 ma
 KPC-1: 10 VDC to 14 VDC < 330 ma

Power Plug Polarity: All units: Center pin positive

Watch Dog Timer: KAM, KPC-4, KPC-2400: ~2-1/2 minutes
 (Optional board for other units)

External Carrier Detect (XCD): KAM, KPC-4: Pulldown to ground

External Reset: KPC-4: Pulldown to ground

PTT Output: All units: Open collector, +40 VDC max

FSK Output: KAM HF: Open collector, +40VDC max

Key Output: KAM HF: Reed relay contact rated 0.5A and 300 VDC max
 (100Ω series resistance)

Audio Output:	KAM HF	All Others
Output Drive:	100 mvpp (LO) 500 mvpp (HI) 1.6 vpp (no jump)	10 mvpp (LO) 50 mvpp (HI) 1.7 vpp (no jump) (does not apply to KPC-1)

Output Impedance: (ac coupled)	600 Ω	600 Ω
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Audio Input:	KAM HF	All Others
Input Sensitivity:	20 mvpp (FM) 100 mvpp (AM)	20 mvpp
Dynamic Range:	>60 dB	>60 dB
Input Impedance: (unbalanced)	600 Ω	600 Ω
Max Input Voltage:	±12 VDC	±12 VDC

Modes of Operation:

KAM: Packet, CW, RTTY, ASCII, AMTOR, WEFAX, KISS
 All Others: Packet, WEFAX, KISS

Other Features:

All units: PBBS, KA-NODE
 KAM, KPC-4: Dual-port with gateway and cross-connect

Continued on next page ►

REPORTS (cont'd)

Operations Manuals give satisfactory clarification. We will have to call on *The Canadian Amateur Radio Packet Rap* columnist to write a layman's language article.

This User Report is not intended as a treatise on protocols of any description. When it comes to digital communications, my right hand has utilized three digits for over 60 years in a satisfactory manner. We may even be able to get Bernie VE3FWF to expound on other packet features like Personal Packet Mailbox™, Personal Bulletin Board Systems, Gateway and Digipeater operation as well as KANODE™ and Packet Cluster™ compatibility.

Kantronics advertising led me to believe WEFAX was possible, but on receipt of KAM it was found that a special program was needed.

Dual-Port operation has not softened my original disappointment, as it appears just another way of watching drivel in stereo! — Moe Lynn VE6BLY

KANTERM 128

Everybody needs a program to talk to their Terminal Node Controller (TNC) or other interface between computer and radio. Not many advertisements will tell you what is required, how sophisticated their brand is or how much!

Kantronics RF Data Communications Specialists in Lawrence Kansas are one of those whose advertising keeps you in the dark. WEFAX requires its own program. Once you have ordered any one of a number of TNCs which they sell, you suddenly realize a terminal program is a must. Mine arrived on a floppy disk with the KAM, but was the wrong one as sent by my supplier. When returned they again sent the wrong disk but on the third attempt, some five months later, I was able to use my TNC.

FOUR PROGRAMS on the disk, KANTERM V2.61 are for C128, C64 and Europe C128 and C64. To load and run mine (Kanterm 128) it was only necessary to press SHIFT and RUN/STOP keys together. This is contrary to the instructions in the book but the only way it could be done. One program is designed for use with a Commodore C128 and the following Kantronics terminal units: UTU-XT, UTU-XT/P, 'KAM' and all KPC Packet Units. It will work with either 1541 or 1571 disk drives, 40 or 80 column monitor and a printer is optional. They tell you on page 18 that Star SG-10 and 10C and Commodore 1526 work just fine. To print incoming information or copy mail from a PBBS you must turn the printer on and have 'prt' appear in the clock line, otherwise the program goes back to BASIC if you select 'prt' using SHIFT @ without applying power to the printer first. This means reloading the program right from the start as does



All Mode Amateur Radio Station: Left to right, top, Star SC10C printer on 1571 disk drive, 1902A RGB monitor, 1541 disk drive under fan and paper rack. Kantronics KAM left top of Icom 761 and Yaesu 227R 2M beside KAM. Centre foreground, Commodore C128.

a 'File Not Open' in your buffer that you want to print, or if 'MISSING FILENAME' for the disk buffer is not there it will go back to BASIC. Very disconcerting to say the least! Setting up for different printers, they tell you to select a number from 0 to 9 and default is 27 while in the set-up mode; then consult your printer manual.

Split Screen:

There are however, some good features with Kanterm 128 as it shows both received and transmitted text. It runs in either 40 or 80 column mode which latter uses the 2 Hz clock in 80 column and accounts for double the speed over the 40 column. A pop-up window in the lower right hand corner of your receive screen by pressing F8 gives you abbreviated help information. Pressing the £ key will display major functions as a quick reminder rather than looking through the book.

Major Menu:

Under F6 is the major menu and 0 is the first item which allows you to load, edit, examine and automatically save your buffers. Any of these ten buffers will store up to 250 characters each. Then follows the disk functions, screen & character colour, station heard beacon, enter Beacon update, Set Kanterm parameters, Mini word processor, Send a binary file, Receive a binary file, Save Unit parameters, Load Unit parameters and if you select 12, No action is taken but you return to program.

Other function keys seem to be well programmed and useful during operations as follows:

F1 Selects cmd: mode unless you were in that mode already.

F2 Presents a menu for transferring sequential files to unit, screen and/or printer. NOT for use with binary files.

F3 Places TNC in converse mode.

F4 Allows entry of today's date and time.

F5 While in cmd: mode will list stations heard in packet.

F6 displays a menu of common features. See text.

F7 Press this key to clear packet of stations heard.

F8 Displays an abbreviated help screen in the lower right corner.

Various and Sundry:

The displayed time and date on screen are supposed to be automatically appended to saved files. Such is not the case with my copy of Kanterm 128. Default Shift £ key is supposed to access the VHF port but doesn't. Default Back slash is also supposed to provide access to HF port but doesn't. There is no such key on Commodore that I can find and the Kanterm book does not tell you which one to use! It was necessary to reassign keys of my own selection in order to toggle between HF and VHF.

The book also says SHIFT @ displays a checkmark when you select the printer besides 'prt' appearing on the clock line. Again such is not the case and quite disconcerting. Confusion reigns supreme when they try to explain on page 8 'how to get started'. This will not work until you have read at least up to page 13 and then nothing is really functional until you have digested pages 26 and 29. The second last page states 'Set Parameters'. This menu selection is the very FIRST one you MUST use. Why it is not nearer page one or at least on page 8 is hard to understand. It sets the KAM to operate

correctly with Kanterm 128. Prior to using this function you will see double characters on the screen and other strange phenomenon, so it is just as well to read the whole book.

Permanent Parameters:

You must remember if you do not always want your personal selected parameters written to the KAM EEPROM (PERMed) that they not be selected before pressing F6 and 6 which sets and PERMs parameters for Kanterm 128 with KAM power on. Select F6 then 6 before inserting your particular parameters, those that change continually under different circumstances, before turning the KAM power on.

Not very many of my questions were answered by letter but at least one reply invited me to send the disk back for their examination. This may be the most expedient way to confirm all purported facilities are operational unless another local user has a C128.

Audio feedback is available to Kanterm users by pressing the left arrow key which is used to toggle the sound on or off. Just something to keep you company while typing, particularly if your speaker is off! HELP will display every command available in the KAM. ESC will return your C128 to BASIC but you should reset in order to restore all function keys to normal. Certain other keys pressed in conjunction with CONTROL key such as 0 to 9 will send those buffers to the screen.

Control I will send your ID to the screen and Control D will send today's date and time to the screen. How you get these sent out on the air is not explained. All buffers can be Loaded, Displayed, Examined singly or altogether. Disk functions allow you to examine a directory, scratch disk entries, rename disk entries and Collect; the latter is not explained nor demonstrated.

Screen colours displays all possible combinations in bar format and by answering the questions a satisfactory arrangement of background and character colour can be selected, then saved to disk for future use. The manual contains instructions for C128 and C64 and, unless you are careful, the two can be easily confused and/or combined at the most inopportune moment.

Another way to print

Using the sequential file transfer function F2 is probably the most useful method for printing. With the disk in the drive that has the file you want to print, press F2 and follow the prompts which are all in reverse display. This is the only way you can get a copy of whatever you happened to type using the built-in mini word processor after it was saved to disk. This method is also used to get a hard copy of files that you may decide to transfer over the air. Remember not to turn the printer on from your keyboard

while trying to bring the file up from the disk for display or printing. You must turn it on before selecting F2.

Conclusion:

An explanation and drawing is included to show how the plug and cable that comes with the disk is wired up for Commodore. It would be interesting to hear from other users as to their successes while using other terminal programs for C128.

— Moe Lynn VE6BLY

DIGICOM >64 V1.52

There are later versions of this popular packet TNC emulator but none have presented themselves to me as yet. The kit I am using was given to me by Hart VE6PA (ex-VE6BRY) for the express purpose of doing a review. Since bringing VHF into my CW domain (to write the report on KAM) this Digicom (VHF only) was finally hooked up during the last week of August. Elmer VE6BLO is now doing his own user report on my KAM.

The Digicom >64 kit came complete with the Commodore cassette port plug and leaves only audio lines, mic in, mic ground, PTT, audio input and power lines to be connected. Power requirements of 12VDC measure out to about 27mA on transmit and 16mA on receive. My IC-761 packed up insofar as supplying me with 12VDC on her rear apron. I cannot understand why 40mA drain at the most could cause any difficulties. So I have had to resort to a 12-volt battery pack that took about two hours to find and to rejuvenate the shorted cells.

Later Digicom versions use the 5VDC supplied at the cassette port on pin #2 according to the announcement by CP Interface, 922 Baltimore Drive, Orlando, FL 32810-5531 under New Products column conducted by Linda Reneau in *73 Magazine* for April 1989. It is a single chip TCM3015JL and a few passive components which all in turn draw about 40 mA. Kits are available for \$38.50 U.S. and \$10 more for the assembled and tested version plus \$2.50 shipping.

Barry W2UP produces a kit that he described in *73 Magazine* for August 1988. It uses the AM7910 chip and is designed for Commodore 64 and 128 computers. The kit includes a reed relay output, watchdog timer and requires no alignment. His kit price is \$49.95 for the PCB, parts, disk and documentation, \$30 more for assembled and tested plus \$2.50 shipping. Address Barry Kutner W2UP, 614-Palmer Lane, Yardley, PA. 19067 as announced under New Products column by Rus NJ2L in *QST* for April 1989.

Information with my Digicom >64 kit comprised a hand-drawn parts layout which was more than adequate to permit even me to make up cables

afterwards with appropriate equipment plugs. As mentioned in my KAM report, my Yaesu 227R accessory socket matches the 5-pin DIN plug. A schematic drawn by WB2PLW using Doodle with modifications and distribution by W2UP includes set-up and adjustments for Tx and Rx.

Another sheet with general comments rounds out the documentation except for 14 pages available on the disk. The German command is your choice either ON or OFF; it helps to understand both as Frank DL1SBR apologizes for his poor English in translation and included his address for enquiries. There are also versions for Commodore 16, SX64 and one for the User Port.

It is actually possible to begin receiving packet without any test instrument application. Transmitting can also be done without test equipment, but takes a little longer, say another hour! This could be shortened if you were able to hear your own tones or talk to someone who has a good musical ear. The designer advises that the PTT line should be loaded to ground with a 2.2kohm resistor.

I doubt very much if anyone could begin operations even with prior packet experience without reading the manual or being under instruction from someone who had used the Digicom >64. For example, the HBAUD default is 1200 Hz but as the program was written in Europe using 50 Hz power you must enter HBAUD 1156 which adjusts for our 60 Hz hydro before anything will print to screen. Another idiosyncrasy of the program requires you to delete the command prompt : (colon) after a CONNECT in order to send any further information to that station which is converse mode actually.

This fact is found in the manual under an obscure section and reads: "To reach the normal Tx/Rx mode, the colon must be deleted by the DEL-key". Don't think it didn't take awhile for that to sink in! Remember, you must re-install the colon to send a command such as D for disconnect. Other functions described in the manual are not correct but do not affect overall operation. For instance, when asking for the date you press SHIFT + not ARROW left as stated in one section of the manual.

The manual does not explain all the commands listed under HELP on the screen, which, by the way, should be enlarged with the DIV command from 8 to at least 15, so all 74 commands will fit and you can copy them. I have yet to run into anyone else using Digicom >64 (never did find another Australian TNC user either) or anyone who is not tone deaf. Consequently my tones will not be correct for those TNCs that are in range but reject my advances to CONNECT.

Continued on next page

REPORTS (cont'd)

But with a little extra twiddling I was able to CONNECT quite smartly with most stations and even QSO. A big ironic, you might say, because Commodore has one of the finest built-in tone generators just waiting for a program and interface to access it. My present program is not debugged yet!

No doubt the newer Digicom>64 versions are more up-to-date and certainly worth enquiring about if you are interested in packet and have a Commodore 64 or C128. This particular kit is no longer available but when introduced was \$15 plus \$2.50 shipping NOT including parts. The complete kit of parts, PCB, disk, schematic etc. was \$52 plus \$2.50 SH. An extra \$15 plus the \$2.50 SH brought you the assembled, aligned and tested unit but no fun!

For anyone on a tight budget who likes to tinker and/or experiment (who doesn't) this is the way to go. Get the urge out of your blood and not have too much tied up that is doing nothing toward your experimenting as called for under our licence or your enjoyment either.

This kit even has an adjustable split screen, Gateway facilities, 40 or 80 column screen in 64 mode, printer, disk and screen options for received data, Beacon, Digipeat on/off, time stamp for received packets, remote control by another Digicom user, 26 standard text areas can be stored then recalled by command, my D area says Digicom 64 V1.52, a tone sounds on CONNECT, RETRY EXCEEDED and DISCONNECT (a nice feature that allows you to carry on with other work nearby).

Further to the split screen, the separating line is called the 'status' line and is covered under section 7.3 of the instructions. The line begins with QRV, RECV or SEND and are toggled automatically. Then comes a figure from 1-up indicates the number of unacknowledged packets, a couple more spaces and a checkbox to indicate AX 25 protocol (is there anything else?).

Connect to EDM, CPROG VE6MC or DISCONNECTED fits in next followed by the time as you had set it earlier but without indication of zone. The last group on this line is DC 64— being I suppose a gentle reminder that you are using something unique. Watch for more conflicts between the book and

actual key function; for example the back arrow will display time on the : (command) in hours and minutes. Shift + will display the date on the same line and together they can combine with received packets or text to the screen, disk or printer.

The disk comes complete with a word processor VIZAWRITE and will do what the instructions tell you, but how do you get the thing to load and tell you how to start? Printing out the disk directory doesn't help because none of the programs LIST when loaded or RUN either. The built-in word processor is called TEXTMURXER; when this is loaded and RUN it tells you how to print out DOC1 and DOC2. As it turned out these two programs when printed out do not give you the same as DIGICOM.DOC which is a SEQ file and works with my regular word processor. When printed out some discrepancy appears between commands in DOC1 and DOC2 as compared to the HELP screen but nothing that affects the overall operation again.

So now there are two manuals on the disk and the second one seems more

informative. Both make interesting reading and could have spelled earlier success for a greenhorn had I known sooner! So far, out of three TNCs the Digicom>64 was the easiest to get on the air and running full steam but don't just take it from me, get started on one of your own! The newest one uses the AMD-7910PC FSK Modem 26-pin chip that is available locally for \$34.84 each. Shouldn't take many more passive components to make it in to the best ever performing Digicom>64.

Word has come through since starting this user report that version 2.03 is available on disk here in Edmonton. It will take time to gather up parts, PCB, etc., and do a report, but that is my intention.

If someone has the new version and is prepared to do a report, it would be appreciated if you would advise the editor-in-chief as quickly as possible to avoid duplication. With any number of improvements in the latest version over this review unit, it could well replace anything else on the market especially for economy and simplicity!

— Moe Lynn VE6BLY

Electro-Cross 2

By Dave Bennett VE7YJ

Abbreviations, Q-signals, anagrams, what-have-you. All are used in Amateur radio communications of one type or another. They may be found horizontally, vertically or diagonally, backwards or forwards, up or down. Draw a ring around each word you find. Not every letter is part of a word, and not every word you may find is one in the word list.

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

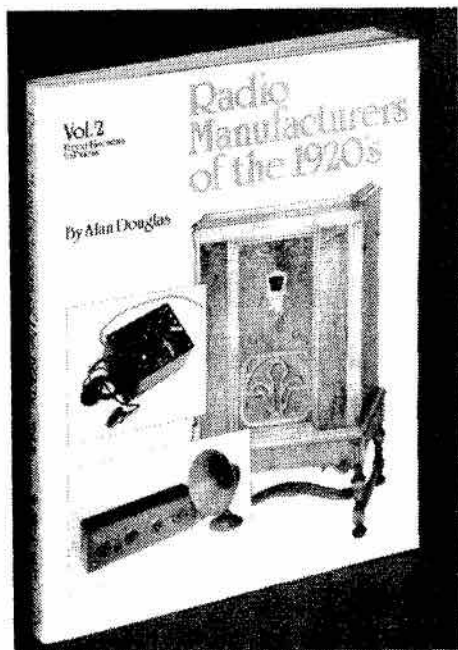
WORDS: AC, AM, AMSAT, ARC, ARRL, ATV, BCB, CRRL, CARF, CLARA, CQ, CRTPB, CSA, SW, DC, DE, DX, DXCC, EMI, FB, FM, GHZ, HI, HF, IARU, JARL, NCDXF, OM, OOTC, OSCAR, PSE, QCWA, QRA, QRL, QRM, QRN, QRO, QRP, QRS, QRZ, QSB, QSL, QSO, QST, QSX, QSY, QUA, RACES, RSGB, RTTY, SASE, SSB, SWL, TCA, TNX, UHF, UTC, VCR, VHF, WARC, WPX, XYL, YL.

TCA COPIES

Copies of articles from *The Canadian Amateur* from Vol. 1 No. 1 Jan. 1973 are available. One article per issue \$2 ppd. Back issues for 1988/89 are available from the CARF office for \$2.50 each post paid.

REVIEWS

Books



RADIO MANUFACTURERS OF THE 1920's, VOLUME 2: FREED-EISEMANN TO PRIESS

By Alan Douglas, The Vestal Press Ltd., 272 pages, Hardcover \$39.95 U.S., Softcover \$24.95 U.S.

In the October, 1988 issue of *The Canadian Amateur* magazine, Vol. 1 of this series, which covered manufacturers alphabetically from A-C Dayton to J.B. Ferguson, was reviewed.

Vol. 2 published in August 1989, covers 31 companies from Freed-Eisemann to Priess, including such well-known names as Grebe (pronounced Greebie), Magnavox, Majestic, Philco, Pilot and the lesser-known Martian Manufacturing Co. Ltd.

Vol. 2 continues the excellence found in Vol. 1 again with a wealth of information on these companies, extensive technical details, and high professional quality reproductions of contemporary advertisements—so clear that most of the dials and controls can easily be read. It makes one wish for those far-off days when radio was so exciting. Should I buy a Martian Big 4 crystal set at \$6.50, a Murdock C26 5 tube Neutrodyne in mahogany console with built-in cone speaker, only \$125 or a Pilot tuned screen grid 4 tube kit covering 14 to 500 metres, two sets of plug-in coils and blueprint included \$29.50?

Maybe I should get on the air with a Kiltzen Rotary spark gap, a transmitting condenser, good for 40,000 volts and their regenerative receiver set covering 150 to 800 metres all for \$79.

Vol. 2 is 272 pages, on 8½ x 11 high quality stock, of fascinating reading. Old timers, Amateur operators and collectors of antique radios will find it a valuable asset for reference and pleasure. Vol. 3 answering RCA to Zenith is scheduled for future publication.

Hard cover, ISBN 0-911572-83-X \$39.95 U.S. plus shipping \$3. U.S. Soft Cover, ISBN 0-911572-77-5, \$24.95 plus shipping \$3. U.S. Available from The Vestal Press Ltd., Dept 112H, P.O. Box 97, Vestal, N.Y., U.S.A. 13851-0097 or from your local bookstore. Quote the ISBN (International Standard Book Number).

Write Vestal Press for a catalogue of their archival quality books please mention this magazine.

— B.H. Burdsall VE3NB

THE FIRST ELECTRONIC COMPUTER

The Atanasoff Story by Alice R. Burks and Arthur W. Burks, 1988 by The University of Michigan Press. 400 pages hardcover. A very good picture of John Vincent Atanasoff who was born in Hamilton, New York on Oct. 4, 1903, appears on the first page after the inside title page.

This is the story of the electronic computer which launched the computer revolution and should be read by everyone who wants to be well-informed on computer history. I always thought the ENIAC was the forerunner of all digital computers. A machine completed in 1942 by John Atanasoff was left behind in Iowa when he went into war research in Washington.

The authors have drawn on their direct knowledge and on the proceedings of a multimillion dollar patent trial to upset the commonly held view that the ENIAC was the world's first electronic computer. With over 30 illustrations, the authors detail the Atanasoff computer and its influence on the ENIAC and on computers of today.

Alice R. Burks is a research associate in the Department of Electrical Engineering and Computer Science at the University of Michigan. She is also a professional writer, a graduate in mathematics of the University of Pennsylvania and worked there and at the Aberdeen Proving Ground for U.S. Army Ordnance, computing firing tables for which the ENIAC was

conceived and built as an automatic means of computing these tables. She is coauthor with Arthur Burks of *The ENIAC: The First General Purpose Electronic Computer* (*Annals of the History of Computing*, 1981).

Arthur W. Burks is a professor in the Department of Electrical Engineering and Computer Science at the University of Michigan, where he has also been the Russel lecturer. Early in his career he worked with John von Neumann and Herman Goldstine at the Institute for Advanced Study, Princeton, in developing the logical design of an electronic digital computer. The basic design produced there became the prototype for many other computers built by universities, government research units, and International Business Machines Corporation. He is the author of *Chance, Cause, Reason: An Inquiry into the Nature of Scientific Evidence* (1977) among many other books and scientific articles. He and Alice Burks were at the Moore School of Electrical Engineering at the time the ENIAC computer was being developed.

Their purpose in writing the book is to tell the story of Atanasoff's invention from an historical perspective. It contains descriptions of the machine itself, not just in terms of its final form, but in terms of its development. That purpose is really twofold: first, to present Atanasoff's electronic digital computer as it evolved in his mind from the existing technologies; second, to defend its priority and its casual linkage to later computers.

The authors have done all of this by splitting the book into five chapters and two Appendices, all of some considerable length, not to mention a list of references and a very concise index. It is not until one reaches Chapter five that it becomes clear as to just who really invented the first 'automatic electronic digital computer' and only then because of the findings of the Federal Court.

Two other men, Mauchly and Eckert, began where Atanasoff left off, to improve or better the computer sciences.

Almost everyone recalls the lawsuits involving ENIAC: Honeywell versus Sperry Rand Corp. was one. The other lawsuit was by Illinois Scientific Developments, a wholly owned subsidiary of Sperry Rand against Honeywell. News of the decision on the invention of the Electronic Computer received very little media attention because it came at the height of the

Continued on next page

REVIEW (cont'd)

Watergate scandal. This book will certainly give all the answers before and after the notorious lawsuits and is very good reading.

— Moe Lynn VE6BLY

AMATEUR RADIO AND ELECTRONICS STUDY GUIDE

Third edition by Ian Ridpath ZL1BCG.

First published in 1982, it has seen several printings since, my copy being Jan. 1987. Ian is now back in Canada residing at 9 Pleasant Avenue, Stoney Creek, ON. L8G 2L3 and his callsign VE3EAN.

The book is soft cover and just over 220 pages, sized 15x21 cm and 99% handwritten which gives one the impression the reader is taking notes. Besides a contents page, the author also included a very comprehensive index. The latter is not usually found in other study guides and actually makes this book a 'ready reference'. Page numbering begins at one and follows through each section consecutively so that at least you can see the entire total figure on the last page.

Ian VE3EAN will continue to publish and print this original undertaking, done during his 12 years in New Zealand. The New Zealand Post Office administers Amateur Radio licences and requires the beginner to meet a considerably higher standard of technical proficiency than their counterparts in Canada. This disparity was noted while comparing the CRRL Study Guide with the New Zealand Publication.

No doubt the study guide Ian intends to publish here will meet and exceed our requirements and should be accepted if for no other reason than it will be a good Canadian written reference book. His presentation of questions from past exam papers is commendable in that answers are included at the end of each section. These answers are then cross-referenced to the page number at which review or further study may be followed. All this in addition to answers for problems presented progressively throughout the book and again includes page references. A better explanation is hard to find for 'Radiation Resistance', long a favourite question on final exams here and in New Zealand too, apparently.

Ian says in the Preface that he hopes the book will fill the gap between high level Amateur Radio Handbooks and over-simplified beginners' manuals. It is a bit heavy for our Amateur grade licence, as we are nearly as demanding as they are in New Zealand. Again the Preface mentions having included all the theory required by the New Zealand Post Office for the Grade III Amateur Radio Exam and further material so that

NZCE and RTC students may use the book as well. He is no doubt referring to some sort of Technical School or College level student with those abbreviated references. His Additional Reading listed on the last page enfolds 12 items ranging from handbooks, both British and American, to magazines from Australia, New Zealand, Britain and U.S.A.

Also listed on the Additional Reading page is a second book by Ian Ridpath, *Level II Radio and Electronic Theory*. Again handwritten, it is a sequel to his first book mentioned above. In this Preface he says three objectives were set in the writing of Level II. They were, first, to cover Advanced Electronic Theory up to a level of technical knowledge equivalent to most technical certificates. Second, to present such theory in a clear and concise manner which reflects his interpretation and presentation in a classroom situation. Last, to allow the reader to add to, in the form of separate notes, his or her knowledge of specific areas of theory.

Ian has strayed from his original orderliness of consecutive numbering

for each page to that style of section-page identity. The 166 pages are again well-indexed but lacking in the sample question/answer routine of his first book. He has supplemented this feature with a total of ten questions at various locations throughout the book and answers in two pages comprising section 11. Section 12 is the index which leaves ten sections for technical discussion.

Each section begins with a page headed 'Keywords In This Chapter'; these words also appear in the index as a ready reference. These sections vary in length from as few as five pages to a maximum of 33 which latter topic is Digital Circuits, logic and boolean algebra followed by Microprocessors with 31 pages.

Not having a copy of a comparable Canadian Study Guide for comparison, it is difficult to conclude what differences occur. However, judging from the first book and comparing it to ours, this second book no doubt far exceeds the knowledge level required of a Canadian Advanced Amateur.

— VE6BLY

Products

UNIDEN HR2510 MULTIMODE 10 METRE MOBILE

With the solar cycle on the upswing and 10 metres open every day, I decided to obtain a 10 metre mobile rig. Over the years I had modified several SSB CB radios and, while they all worked well, they were always lacking features that were desirable.

After comparing what was available on the market, I decided on the Uniden HR2510 multimode. A radio was ordered from a U.S. dealer and eight days after placing the order, the radio arrived. Landed cost including exchange, FST and shipping was \$312.

Upon opening the package, the first thing found was a sheet of paper explaining how to modify the radio for use on the CB band as well as from 29.7 to 30.0 MHz. This modification is simple and requires no technical expertise. It makes one wonder just what market this radio is really aimed at.

Many of the features of this radio are definitely CB-oriented. The scan steps in 10 kHz increments, as do the channel up/down switches. This is basically useless for Amateur use. The VFO is selectable for 10 kHz, 1 kHz and 100 Hz steps. The band is divided into three 500 kHz and one 200 kHz segments.

The operator's manual is comprehensive and describes all functions adequately. The radio is supplied with two accessory plugs. One is wired for

use with the internal speaker and the other has pigtailed for use with an external speaker, PA speaker and CW key.

The squelch control works in the normal manner plus, if turned completely CCW, provides automatic squelch. A frequency lock switch is also provided. A metre switch allows selection of S/R/F, modulation, SWR calibrate and SWR readout. There is also a switch to provide a courtesy beep at the end of transmission.

The radio measures 7.3" x 10.3" x 2.4" and weighs four lbs. Quality of circuit boards, components and construction is very good. All manufacturer's specifications for performance were met or exceeded by the sample radio. Output power was 12 watts on AM and FM and 28 watts PEP on sideband. I have heard several of these radios on the air and all sounded very good. Their owners were all very satisfied with them and to date I have heard of no problems with them. The sample radio even works at temperatures as low as minus 35.

Dual VFOs would have been a nice addition to the radio to allow operation on FM repeaters, but for the price I suppose I shouldn't complain. I wrote the manufacturer asking if it would be possible to rework the CPU for operation on the 12 metre band since the radio will operate at 26 MHz and should operate at 24.9 if the necessary

frequency parameters could be activated. To date I have not had an answer. I would also like to see this radio offered for 6 metre use, as there is a definite need for a low-priced 6 metre mobile.

Several manufacturers have introduced similar radios but when the cost, quality and features are compared, the HR2510 is very worthy of consideration if a 10 metre multi-mode mobile is on your wish list.

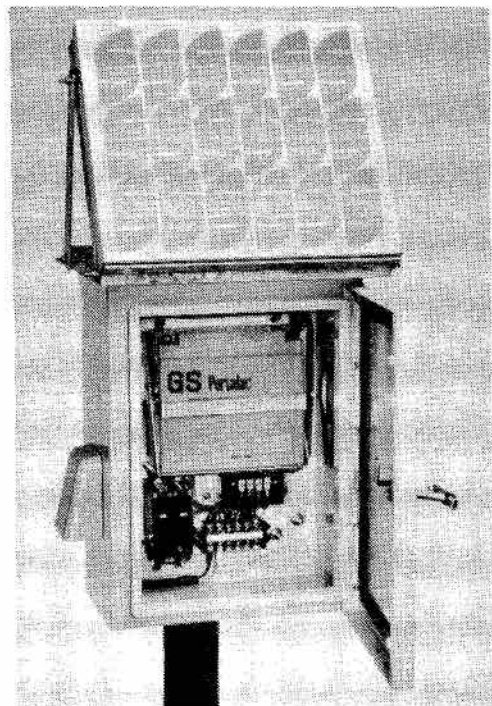
— VY1CW

easy to install and can operate with minimal maintenance for many years," says Tom Siebert, Vice President of Heliopower. "This makes it especially useful in remote areas, to power pipeline telemetry, irrigation system controls and light duty radio repeaters."

Heliopower's SPPs are designed for lower power applications for which pre-assembled systems are cost-effective. Available load capacities range from 19 to 73 watt hours per day. Assuming 4.5 peak hours of sun, each can operate up to five days on battery power alone. Because the power production of each SPP type varies with climate and site, Heliopower will assist customers in choosing the correct SPP for each location and application.

"Just tell us where you plan to use the SPP and how much power is required, and we can tell you which model will best answer your needs," Siebert says. The smallest unit, the SPP-06, would be sufficient to run a small data acquisition device in Vancouver, for example, while a remote cellular telephone in Iowa would require the largest model, the SPP-23. In addition to the standard SPPs, Heliopower offers custom-designed systems, including the Industrial Photovoltaic Power systems (IPPs) for larger-scale applications.

Heliopower is a joint venture of American Standard Inc. and Hoxan, a diversified Japanese firm. Using state-of-the-art manufacturing techniques to provide reliable single crystal PV cells, the firm has developed a wide array of products for low-cost, non-polluting solar power generation in areas where electricity is not available and maintenance is difficult to provide. For more information, contact Heliopower at One Centennial Plaza 3F, Piscataway N.J. 08854.



Solar Power Pack

SOLAR POWER PACKS

Complete, self-contained DC solar power systems with numerous applications—telemetry, pumping stations, illuminated signs, environmental or plant monitoring devices, cellular telephone or private radio systems, alarms and navigational aids—are now available in three standard sizes from Heliopower, Inc. of Piscataway, N.J.

The Solar Power Pack (SPP), available in three useful outputs, includes all the components of a solar power system: a high-performance photovoltaic (PV) module for efficient collection of solar energy, a charge regulator for precise charging and discharging control plus a sealed, deep-cycle, low-maintenance storage battery. These components come completely assembled in a weatherproof NEMA 3R enclosure with hardware for various mounting applications.

"With its protective enclosure, high-quality system components and reliable Hoxan PV module, the SPP is

DOG DOME

Tired of the same old Dog House when the XYL lays down the law? Well, don't despair brother, help is on the horizon! Masterhouse Distributors are pleased to announce: 'The Ultimate Doghouse: Guaranteed for the life of your dog'.

The Dog Dome, an innovative polyethylene dome-shaped doghouse, is now available in Canada. It is durable, easy to clean, odorless, and waterproof. It also resists flea and tick infestation. The Dog Dome features a unique covered entrance and elevated floor for the dog's comfort. It retails in Canada for about \$250 and is guaranteed for the life of your dog.

The Dog Dome has been tried by veterinarians, breeders, trainers, pet stores, and dog owners to ensure that it meets the needs of the consumer and his dog.

This doghouse is a high quality, vacuum molded, four-foot-diameter dome made of high density polyethylene (FDA approved) and is strong enough to stand on. The Dog Dome weighs only 36 pounds, but gives the animal over 10 square feet of comfortable floor space. It keeps him warmer in winter and cooler in summer.

The Dog Dome is easy to assemble and requires no foundation. It will not crack or leak, never needs painting, and is an attractive addition to any yard.

Patented by Domation Incorporated, the Dog Dome is available in Canada through Masterhouse Distributors, 21 Bishops Road, St. Catharines, Ont. L2M 1T8. Two metre rig and antennas extra! See your local distributor.

ULTRA-COMPACT IC-725 HF TRANSCEIVER

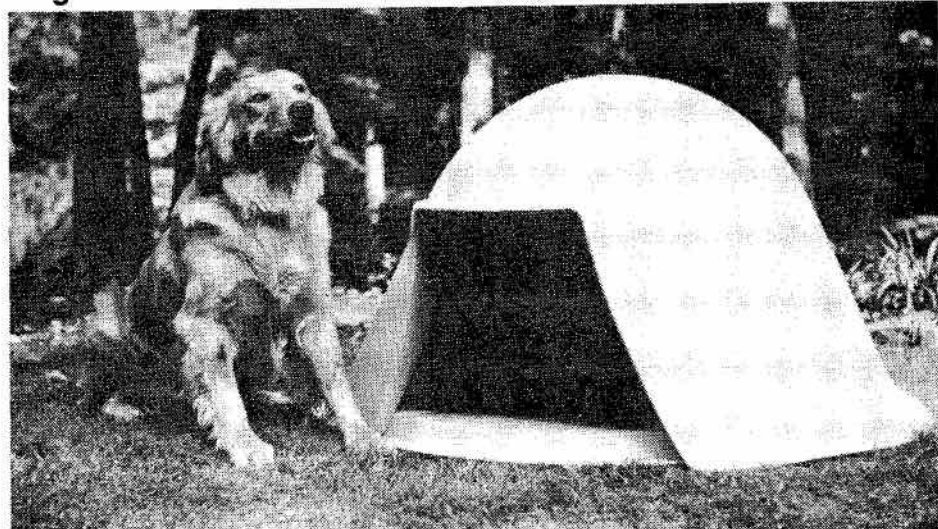
ICOM recently announced the new ultra-compact IC-725 HF transceiver.

The all mode IC-725 features:

- Compact (9.0"W by 3.7"H by 9.4"D);
- USB/LSB/CW transmitting and receiving. AM receiving. Optional

Continued on next page ▶

Dog Dome





IC-725

module #UI-7 for FM transmit/receive and AM receive;

- 26 Tunable memories with Band Stacking Resistors. Two memory channels (channel 23 and 24) memorize both receive and transmit frequencies and split operation. Store the frequency, offset and subaudible tone for each memory;
- DDS (Direct Digital Synthesizer) system;
- Built-in AH-3 controller. Optional AH-3 automatic antenna tuner available;
- Three Scanning Systems. Programmable scan: scan all frequencies between memory channel 25 and 26. Memory scan: scan all memory channels or lock-out channels in the memory sequence. Selected Mode scan: scan a selected mode.
- Priority watch. Monitor the call channel every five seconds while operating on another frequency.
- 105dB dynamic range receiver.
- Low noise DDS switching.
- 160 through 10 metre operation. Shortwave reception from 30 kHz to 33 MHz.

Other features include: Panel-selectable RF preamp and attenuator, dual VFOs, highly effective noise blanker, RIT, Semi-break in CW, selectable AGC, a rugged full duty cycle and optional narrow CW filter.

BRUNELLE FUNCTION GENERATORS

Brunelle Instrument's latest addition to their Commander Series are two Function Generators Models 3020 and 3030. Model 3020 output wave forms are Sine, Square, Triangle, Pulse and Ramp; frequency range is .2 Hz to 2 MHz in 7 ranges. Model 3030 has the addition of a Frequency Counter for added convenience. For further information contact: Brunelle Instruments (Canada), 73 Godin Rd., St. Elie D'Orford, Quebec J0B 2S0.

ICOM MICRO SURVIVES ULTIMATE TEST

The ICOM Micro IC-u2AT of Fred Henning NOFIA survived the ultimate test of durability.

Henning, of Arvada, Colorado, was

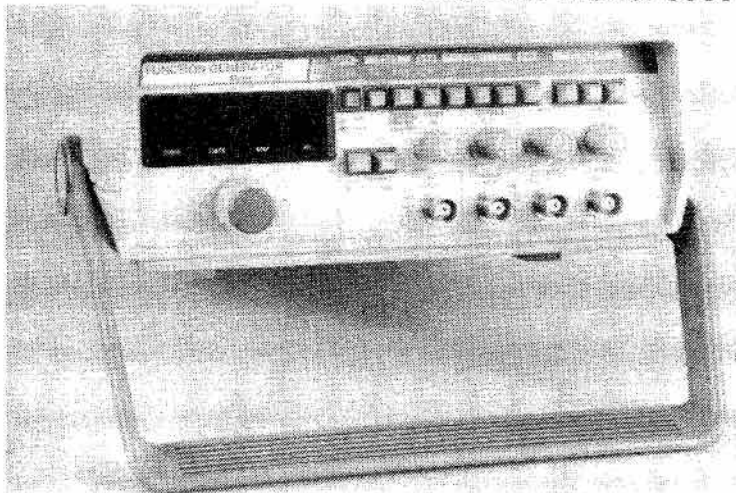
riding his 1983 Honda Goldwing motorcycle on a four-lane street when he suddenly encountered a car making a U-turn. Swerving to no avail, he was forced to lay the bike down, narrowly missing traffic and sliding some 650 feet through an intersection on his IC-u2AT handheld!

Luckily for Henning, the Micro absorbed the majority of the impact allowing him to escape with just cuts and bruises. Henning wrote, "After picking up the batteries for the battery pack, the radio actually worked! That Micro saved my hide!"

IC-u2AT



Brunelle Model 3030



JOIN THE CROWD(ING)

The Southern California 'DX Packet Cluster' has been forced to move frequency once again. The Packet Cluster is a part of an area-wide DX spotting network designed to alert DXers to on-air DX activity and propagation anomalies.

For some of the area's 2M users, the Packet Clusters were a sore spot. Some Amateurs contended that there was no room for any new activity like this in the already over-utilized band.

After several months of fighting for survival, the Packet Cluster has found what appears to be an acceptable channel on 145.68 MHz and hopes to be able to retain that channel as a permanent operating base.

Currently the Packet Cluster has nodes in Sherman Oaks, Fullerton, San Diego and Long Beach, with several more planned.

A 2M radio, TNC and personal computer or terminal are all that is needed for area Amateurs to avail themselves of the Packet Cluster DX spotting service.

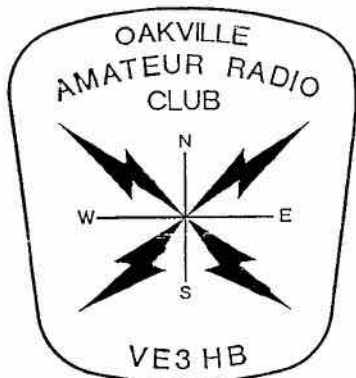
— Westlink Report

CLUB CORNER

J.P. LeBlanc VO1SK/VP9LA, Box 356, Kingston, Ont. K7L 4W2

YACHTING NEWS

Jane VE3JWE continues to be in the news. She was interviewed by the Atlantic Satellite Network (ASN) in Halifax prior to her departure for a solo trip across the Atlantic. Jane was using VEOMLS as her callsign on 14121 MHz and had lots of company on her trip. Jane was heard by me in QSO with George VE1XS, Sonny VE1ZB, Enos VE1YR and Marge VE1VCH. Jane has problems with her generator and the Coast Guard was asking ships to be on the lookout for her. At last report, Jane was just off the coast of England and doing fine.



OAKVILLE CLUB

The Oakville Club reports that all went well during the 10K Run except for two calls for medical assistance. As well as a motley throng of runners, wheelchair competitors also took part. Representing Amateur radio from the club were Jack VE3ITM, Peter VE4OK, Jack VE3JCR, Gary VE3TGH, George VE3HBM, Fred VE3FYR and John VE3JVS. Enlarged reproductions of the club shield were prominently displayed in those vehicles carrying Amateur operators. Does your club prominently display its club logo at public service events?

Bill Thomas, editor of the Oakville Club's *Hot Bananas* newsletter is stepping down. Except for a four-year period when Bill moved away, he has been editor of the newsletter since 1974. It's been a pleasure reading your work, Bill, and I wish you all the best.

CALGARY CLUB

The May long weekend is the time for the annual Golden Triangle bicycle tour organized by the Elbow Valley Cycle Club and supported by CARA for communications. This year 350 cyclists took part in the three-day event. Strung out along the route were seven radio equipped vehicles. Frank and Sheila

VE6ANL, Don VE6EY, Bill VE6WA, Doug & Deanna VE6CID, Dave VE6ADT, Cal VE6LZ, Hermanna VE6JI, Arnie VE6AXB and Bill VE6HO were there as the volunteers from the Amateur fraternity.

CARA also supported the Banff-to-Calgary Roadrace. There were 105 teams of 10 members taking part in the event. A total of 28 CARA members were involved in providing near real time results to officials from their mobiles.

The Calgary Club was also instrumental in making the First Annual MRC Spring Break Triathlon a huge success. Under the communications expertise of George VE6VA and his wife Shirley, Alan VE6TZY and his wife Marlene, Jim VE6IBM, Paul VE6YU, their effort and diligence, under a cloudless sky meant the 138 cyclist/triathlons successfully completed their 20K ride.

Like any first time effort, the success was not without a few exciting moments. Following a debrief after the event, it was suggested that all event 'officials' and communications personnel in like events should be coached by the Police in their respectful duties and authority. Further, a command post should be established with police, Amateur and event organizer able to have instant communications with all points as well as make immediate decisions. (This is an excellent observation and should be taken into account when your club is involved in any such activities.)

SUDBURY CLUB

Doug Stickles VE3DNS presented a certificate to the club on behalf of the Snowflake Festival organization.

NANAIMO CLUB

The Club's participation in this year's Diabetic Bikeathon was due to the kindness of the following Amateurs: Tony Lumsden, Gerry Pement, Rod Luck, Bill Behan, Jack Olsen, Bob Banks, Aaren Haland and Ed Fowler. Despite a poor turnout of cyclists, a good time was had by all and members learned about the capabilities of their radios through the local repeater.

NIAGARA PENINSULA

All NPARC activities this summer will be on Video. By arrangement with West-Parc High School Audio-Visual Group and McLean Hunter (Cable 10), footage will be gathered on the club's many activities and will be edited into a 15-20 minute video for the club.

Seventy-five children between the

ages of 10 to 12 of Orchard Park Elementary School in St. Catharines were treated to a live geography lesson thanks to Amateur radio. The kids had so much fun that they refused recess and were reluctant to go home at 3:30 p.m.

YL NEWS (CLARA)

Quite a number of YLs are involved in emergency communications in Vancouver. Deputy Communications Coordinator Jan VE7JAN is a key player in organizing the all-important training exercises which provide a communications network for local community-oriented sporting events. Other YLs currently with Communications Vancouver include Jackie VE7FGG, Carol VE7CCF, Agnes VE7CPO, Edna VE7SH, Jean VE7JB, Lynn VE7LYN and Grace VE7FGJ. The most notable event with which Jan and the other YLs have been involved is the Vancouver International Triathlon, where up to 55 communications personnel are deployed, and which receives nationwide media coverage.

THUNDER BAY

Club members supplied communications for the Legion 10 Mile Road Race. In attendance were VE3s, ILX, JSC, BBS, OTC, JQ, SAJ, NPS and KRH.

SAULT STE. MARIE

The club set up an Emergency Services Display in the local Mall. An HF and VHF station were in operation with equipment being provided by Ben VE3BPS, Walt VE3CWE and Ron VE3BVF. Jim VE3ADP and the following crew: Garry VE3PHB, Roy VE3FOD, Fraser VE3KOF, Walt VE3CWE, Bob VE3SDX, Susan VE3PHG, Ken VE3GWN, Wilf VE3EOW and John VE3UFO kept the equipment going and answered questions.

OKANAGAN

Jim Vanderwal VE7ELS earned seventh highest B.C. mark in 1989 Simon Fraser University Prize Chemistry Exams. Well done, Jim.

Norm VE7EGO won a singles tournament in Lawn Bowling recently, that qualified him for a place in the B.C. Summer Games.

Amateurs from NORAC provided communication for the 'Run for Sight', a promotion operated by CNIB and the Girl Guides, by manning various points along the route. All went well, with only minor incidents. Those taking part were Norm VE7EGA, Stu VE7BQY, Mike VE7MK, Kevin VE7EGD, Bob VE7BSL and Bill VE7WFG.

Continued on next page

PACKET RAP

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

MOVING THE BITS (PART 1)

This month we are going to discuss what happens between the TNC and a terminal in a typical Packet Radio setup. As many of you may know, a certain code called ASCII is used to communicate between computers. ASCII is a worldwide standard. For the most part, ASCII is the code used by most digital systems. ASCII is used to represent letters, numbers and other special characters.

SOME BASICS

Everyone who discusses a topic has to

CLUBS (cont'd)

CHARLOTTETOWN

Communications for the annual Red Cross Multisport relay, provided by members of CARC, went extremely well. All checkpoints were manned by local Amateurs, passing the team numbers of leading contestants, administrative and health and welfare traffic. Amateurs were also stationed in various Red Cross vehicles, ready in case emergency communications were required.

OTTAWA

Activity Chairman Doug VE3JDF of PARC (Ottawa), reports that the following PARC volunteers provided radio communication for the Ottawa Royals Indoor Soccer Tournament: Bob VE3PUE, Jerry VE3AVI, Stu VE3MHX, JP VE3PXZ, Peter VE3JBJ, Al VE3ANO, Ian VE3CZ, George VE3NJJ, Ed VE3HCA and Doug VE3JDF.

Four PARC operators, Nick VE3FFW, Ian VE3CZ, Jerry VE3AVI and Doug VE3JDF provided radio communications for the Colonel By Triathlon.

Technical innovation was used by the PARC this year for its executive meetings. Executive meetings were held by audio teleconferencing. From the comfort of everyone's den and no wasted travelling time, the club business was efficiently handled. All of the executive found this a very valuable innovation and the club plans to continue this new approach for their executive meetings.

BELLEVILLE

A total of 14 Amateurs took part in the 418 Wing Walk-A-Run. Ed VE3OBG planned the project and it went perfectly. The weather was a bit iffy, but the spirits of all participants were tops. This type of radio activity has quite an important security side to it. Safety of the youngsters is of prime importance, and the club's presence means a lot in this regard. ■

assume a certain level of knowledge. For the following discussion I am assuming that you know about hexadecimal and binary notation. If you are a little rusty on this topic, then you should consult any of the many hundreds of textbooks on this subject. First a few definitions to make sure we all are talking the same language. A *byte* is a grouping of 8 bits. Most computers can address a byte of data. A *nibble* is half a byte or 4 bits. Some people prefer the term *octet* instead of a byte. Anyway, for our purposes, octet and byte mean the same thing—a group of 8 bits.

THE ASCII CODE

The ASCII code uses 7 bits to describe a total of 128 different items. Various ranges are used for letters, numbers and special control characters. The ASCII code is shown in Figure 1 and Figure 2.

As can be seen by examining Figures 1 and 2, the first 32 codes are special. These 32 codes are sometimes known as *control codes*. You can usually form a

control code by hitting the *CONTROL* key on your keyboard and another key. For example, CONTROL-G rings the bell (BEL), CONTROL-H is backspace (BS) and CONTROL-K is a vertical tab (VT). The software flow control characters used by many TNC controllers are designed by DCI (CONTROL-Q) and DC3 (CONTROL-S). The default cancel character used by your TNC is usually the CAN code (CONTROL-X). Note that most people who use the codes use hexadecimal notation when describing a code. The capital letter A is hex 41 and the lower case letter a is hex 61. The ASCII codes described in Figures 1 and 2 have the familiar decimal notation along with the hexadecimal notation.

NEXT MONTH

I have used a considerable amount of column space this month by including the ASCII codes. Next month, I'll be referring to these Figures so do keep this copy of *The Canadian Amateur* handy. You will need a copy of the ASCII table to understand nextmonth's column. ■

Welcome to PacCom-1

A variety of information on the DOC and its activities can be accessed through PacCom-1, the Pacific Region Information Retrieval System.

PacCom-1 was created in response to numerous requests from individuals and industry for up-to-date departmental information.

Here are some examples of what the database contains:

- an index of radio standard procedures and specifications
- an index of broadcast documents including technical bulletins and notices to consultants;
- a list of upcoming ITU conferences;
- policy and programme announcements and activities;
- current licence fees
- DOC organization, mailing addresses and telephone numbers;
- messages providing information available within the Department.

PacCom-1 can be accessed by anyone who has: a computer terminal, a modem, access to the telephone system. If your terminal can be set to the following parameters, you are ready to access PacCom-1:

baud rate;	300/1200/2400bps
bit rate;	8
parity;	none
stop bits;	1

duplex: full

The Pacific Region is offering this service to its clients at no charge. If you are accessing the system from outside the Vancouver area, long distance telephone charges apply.

Dial (604) 666-2981. The system will ask you for your full name as well as your city and province. Once entered, it will ask you to provide a password. This password (your choice of up to 15 characters) will enable the system to distinguish you from other users of PacCom 1.

Once you have worked through these simple steps, you will be presented with a *User's Guide to Opus* which will lead you to the other areas of the system available to you.

Once you have accessed the system, there are two main things to remember:

1. If the system is idle for two minutes you will be automatically signed-off;

2. In order to ensure the maximum number of people access to the system, there is a cumulative 45-minute limit per person for each 24-hour period after which you will be automatically signed-off.

Should you experience problems, call (604)-666-5695, or write to Public Affairs, DOC, 1700-800 Burrard Street, Vancouver, B.C. V6Z 2J7. ■

Value		Control/Graphic	
Dec	Hex		
0	00	NUL	CTL-@
1	01	SOH	CTL-A
2	02	STX	CTL-B
3	03	ETX	CTL-C
4	04	EOT	CTL-D
5	05	ENQ	CTL-E
6	06	ACK	CTL-F
7	07	BEL	CTL-G
8	08	BS	CTL-H
9	09	HT	CTL-I
10	0A	LF	CTL-J
11	0B	VT	CTL-K
12	0C	FF	CTL-L
13	0D	CR	CTL-M
14	0E	SI	CTL-N
15	0F	SO	CTL-O
16	10	DLE	CTL-P
17	11	DC1	CTL-Q
18	12	DC2	CTL-R
19	13	DC3	CTL-S
20	14	DC4	CTL-T
21	15	NAK	CTL-U
22	16	SYN	CTL-V
23	17	ETB	CTL-W
24	18	CAN	CTL-X
25	19	EM	CTL-Y
26	1A	SUB	CTL-Z
27	1B	ESC	CTL-[
28	1C	FS	CTL-\
29	1D	CS	CTL-]
30	1E	RS	CTL-^
31	1F	US	CTL-`
32	20	space	
33	21	!	
34	22	"	
35	23	#	
36	24	\$	
37	25	%	
38	26	&	
39	27	'	
40	28	(
41	29)	
42	2A	*	
43	2B	+	
44	2C	,	
45	2D	-	
46	2E	.	
47	2F	/	
48	30	0	
49	31	1	
50	32	2	
51	33	3	
52	34	4	
53	35	5	
54	36	6	
55	37	7	
56	38	8	
57	39	9	
58	3A	:	
59	3B	;	
60	3C	<	
60	3D	=	
62	3E	>	
63	3F	?	

Figure 1:
First 64
ASCII
characters

Value		Control/Graphic	
Dec	Hex		
64	40	@	
65	41	A	
66	42	B	
67	43	C	
68	44	D	
69	45	E	
70	46	F	
71	47	G	
72	48	H	
73	49	I	
74	4A	J	
75	4B	K	
76	4C	L	
77	4D	M	
78	4E	N	
79	4F	O	
80	50	P	
81	51	Q	
82	52	R	
83	53	S	
84	54	T	
85	55	U	
86	56	V	
87	57	W	
88	58	X	
89	59	Y	
90	5A	Z	
91	5B	[
92	5C	\	
93	5D]	
94	5E	^	
95	5F	_	
96	60	`	
97	61	a	
98	62	b	
99	63	c	
100	64	d	
101	65	e	
102	66	f	
103	67	g	
104	68	h	
105	69	i	
106	6A	j	
107	6B	k	
108	6C	l	
109	6D	m	
110	6E	n	
111	6F	o	
112	70	p	
113	71	q	
114	72	r	
115	73	s	
116	74	t	
117	75	u	
118	76	v	
119	77	w	
120	78	x	
121	79	y	
122	7A	z	
123	7B	{	
124	7C		
125	7D	}	
126	7E	~	
127	7F	DEL	

Figure 2:
Last 64
ASCII
characters



S.P.E.C.I.A.L

KENWOOD TH-25AT TH-45AT
NOW ONLY \$399.00

TH-25AT/45AT New Pocket Portable Transceivers

The all-new TH-25 Series of pocket transceivers is here! Wide-band frequency coverage, LCD display, 5 watt option, plus...

- Frequency coverage: **TH-25AT:** 141-163 MHz (Rx); 144-148 MHz (Tx). (Modifiable for MARS/CAP. Permits required.)
 - **TH-45AT:** 438-450 MHz.
 - Automatic Power Control (APC) circuit for reliable RF output and final protection.
 - 14 memories; two for any "odd split" (5 kHz steps).
 - Automatic offset selection (TH-25AT).
 - 5 Watts from 12 VDC or PB-8 battery pack.
 - Large multi-function LCD display.
 - Rotary dial selects memory, frequency, CTCSS and scan direction.
 - T-ALERT for quiet monitoring. Tone Alert beeps when squelch is opened.
 - Band scan and memory scan.
 - Automatic "power off" circuit.
 - Water resistant.
 - CTCSS encoder / decoder optional (TSU-6).
- **Supplied accessories:** StubbyDuk, PB-6 battery pack for 2.5 watts output, wall charger, belt hook, wrist strap, water resistant dust caps

Optional accessories:

- PB-5 72 V, 200 mAh NiCd pack for 2.5 W output • PB-6 72 V, 600 mAh NiCd pack • PB-7 72 V, 1100 mAh NiCd pack • PB-8 12 V, 600 mAh NiCd for 5 W output • PB-9 72 V, 600 mAh NiCd with built-in charger • BC-10 Compact charger • BC-11 Rapid charger • BT-6 AAA battery case • DC-1/PG-2V DC adapter • HMC-2 Headset with VOX and PTT • SC-14, 15, 16 Soft cases • SMC-30/31 Speaker mics. • TSU-6 CTCSS

KENWOOD

TS-440 \$1699

- Compact HF Transceiver with General Coverage Receiver
- All Band, All Mode
- Built-in Automatic Antenna Tuner

KENWOOD **NEW!**

TM-731A \$899

- 2 Meter/440 FM Mobile
- Automatic Repeater Offset on 2 Meters
- New Amber LCD Display
- Dual Scanning
- CTCSS on Main or Sub Display

CALL TODAY!

KENWOOD

\$669

TH-75A

- 2m/70cm Dual Band HT
- One Watt (Optional 5 Watts With PB-8)
- 10 Memory Channels
- Multiple Scan Functions
- CTCSS Encode/Decode Built-In

KENWOOD

\$579

TM-231A

- Compact VHF 2 Meter Mobile
- Optional Full-Function Remote Controller
- 50 Watts Output
- 20 Memory Channels

CALL NOW!

ASTRON

• RS7A	\$ 109	• RS35M ..	\$ 359
• RS12A	\$ 159	• VS35M ..	\$ 419
• RS20A	\$ 215	• RS50A ..	\$ 459
• RS20M	\$ 249	• RS50M ..	\$ 519
• VS20M	\$ 299		
• RS35A	\$ 319	• VS50M ..	\$ 579

ABA

PK-232 \$549

MULTI-MODE DATA CONTROLLER

- Morse Code, Baudot, ASCII, AMTOR, Packet, Facsimile, Navtex
- Operate on VHF and HF
- Use With Almost Every Computer or Data Terminal

• A Proven Winner!

ICOM IC-765 \$3999



100W GENERAL COVERAGE RECEIVER
HF ALL BAND TRANSCEIVER
Maximum Operation Flexibility

ICOM IC-781 DEMO !! \$6599



THE ULTIMATE
150 W, ALL BAND
HF TRANSCEIVER

GREAT PRICE!

ICOM A Models 25 WATTS
H Models 100 WATTS

IC-275A/275H, 138-174 MHz
IC-375A, 220 MHz
IC-475A/475H, 430-450 MHz



ONLY 2 LEFT !! SPECIAL \$1339
IC-471H 75W 430-450 ALL MODE

ICOM SPECIAL
IC-28A/28H A \$599 H \$649



2-METER MOBILES
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Alaska					
Arizona					
Arkansas					
California					
Colorado					
Connecticut					
Delaware					
Florida					
Georgia					
Hawaii					
Idaho					
Illinois					
Indiana					
Iowa					
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Kentucky					
Louisiana					
Maine					
Maryland (D.C.)					
Massachusetts					
Michigan					
Minnesota					
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•CQ DX•CQ DX•

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



CALLSIGN DIRECTORY

The month of August has been a good one for correspondence addressed to the DX Editor. Several readers have taken the time to send in log extracts and comments on band conditions and I will be using their material later in the column. The month was unusual in that two very fat envelopes arrived, one from Germany and one from Finland.

The first of these contained the fourth edition of a publication that was completely new to me, *The Callsign Directory*. It is compiled by Hans Schwarz DK5JI and published by DARC which I think is the West German national Amateur Radio Club.

What is a Callsign Directory? In a nutshell, it attempts to explain exactly the rationale behind the allocation of callsigns in each DXCC country. This is pretty straightforward in places like Hungary where the only special rules seem to apply to repeaters where UHF ones use suffixes in the block RUA-RUZ while VHF repeaters use the block RVA-RVZ. However, contrast this with the Soviet Union, where it takes 20 close-typed pages to explain the complex logic evolved by the Russian authorities! For example, if you work ULJG you can use the directory to determine that this is in the Soviet Socialist Republic of Kazakhstan in the city of Vostochnyj. We also learn that this in in Oblast 19, WAZ Zone 17, ITU Zone 31.

The U.S. entry is also very detailed and is broken up into four separate sections covering prefixes beginning with A, K, N and W respectively. Anyone working on those awards that require you to contact a number of stations within a given DXCC country would probably find the directory useful. It's priced at 16.80 DM (about \$10 Canadian), has 196 pages and is available from DARC Verlag, Postfach 11 55, D-3507 Baunatal, Federal Republic of Germany.

M-V ISLAND DXPEDITION

The second of the fat envelopes to arrive in my mailbox recently came all the way from Finland and was sent by Jarmo Jaakola OH2BN. Inside I found 'M-V Island Dxpeditio, Malj Vysoskij Island 1988'. You may remember that M-V Island... that abbreviation has been adopted by everyone who has attempted to pronounce its name... lies at the eastern end of the Gulf of Finland within Soviet territory. The island is leased to Finland as part of an arrangement which allows that country to use the Saimaa Canal, which links



Rod Poulter VE2ANE in his very tidy shack in Deux Montagnes.

their Lake District 220 feet above sea level with the Gulf of Finland. The booklet might be described as 'everything you had ever wanted to know about the 1988 M-V DXpedition' and it has been put together by that well-known Finnish DXer, Martti Laine OH2BH.

It includes all the material submitted to the ARRL to justify M-V as a new as a new country together with full details of the 1988 DXpedition including a great many photocopied versions of the original colour photographs that accompanied the text sent to the DXCC desk. It is too bad we don't have more space in *The Canadian Amateur* so that I could include major extracts from OH2BH's booklet. However, I will take this opportunity to thank Martti Laine, on behalf of all the readers of CQ-DX, for taking a lead role in getting M-V approved as a separate DXCC country and then putting it on the air. It's the fourth time he has done this, the other three being Annobon Island, Market Reef and Western Sahara.

By the way, I noticed in *QRZ DX* that Martti will be living in California for the next 10 months. How nice for the DX clubs there who will be able to get first hand accounts of his various DXpeditions.

Just to complete the picture, the statistics on the 1988 DXpedition were 14,800 QSOs made in 96 hours of operation. Since only one station was allowed on the air at a time the efforts

were concentrated on 14 MHz with 70% of the contacts made on SSB and the balance on CW. There was talk of another DXpedition to M-V in May, 1989 but to the best of my knowledge this never came off.

PACKET RADIO

There can't be many DXers who haven't heard of 'Packet Radio', that relatively new computer-driven communications mode that seems to have captured the imagination of so many Amateurs. Here in the Ottawa area we have an extremely active group of 'packeteers' who make sure that the rest of us, who haven't yet embraced the new mode, are constantly reminded of what we are missing.

I think many DXers have not yet got involved in packet since they prefer to concentrate all their limited spare time on chasing DX, a branch of the hobby which has always been extremely time consuming. I belong to this dinosaur (?) group however I have to admit that the evidence is building month by month that DXers who are not on packet are missing a great deal.

You will remember my reports in earlier columns of the very successful packet DX spotting nets that are operating in several regions of the U.S. Granted a Canadian ham would have some difficulty in accessing these networks, most of them are many signal 'hops' from our shacks and in some

Continued on next page

DX (cont'd)

cases they are far enough away that propagation conditions would be quite different. However, there are some other services available on packet that could save us all a great deal of time and money. Jim Cummings VE3JPC outlined some of these services to me recently. I later climbed into my car pondering whether I should take the plunge and buy the necessary black boxes to hook up my trusty computer to the local packet system.

Jim pointed out that it is now possible to access a very comprehensive data bank of QSL managers run by W1NY. If the data bank can't answer your query it puts you in a pending file and will let you know automatically when it has an answer. He feels this data bank is comparable to the 'GO' list that I mentioned in last month's column. How many of us realize that the entire contents of the U.S. Call Book are available on packet via WA4ONG?

Not to be outdone, there is a source in Canada, VE3JF, for the addresses of all Canadian hams. I hope to interest Bernie VE3FWF the author of the Packet Rap column in *TCA*, in running a short section one month with full details of all the DX services available on packet and how to access them.

QRP AGAIN

This challenging aspect of DXing has always fascinated me, although I have to admit that so far I haven't actually put a QRP station on the air. Moe Lynn VE6BLY does a fine job covering this part of the hobby in *TCA* but this month I've scooped him with a letter from Jim Thompson VE1AEQ/QRP who lives on P.E.I. Jim was kind enough to write to me with a particularly interesting page from his log, covering a brief period Aug. 19-25, when he concentrated on SSB contacts on 10, 15 and 20. In this very short time Jim worked 26 DXCC countries and seven IOTA islands, not counting the main islands of Japan. Of special interest were contacts with: T5MF in Mogadishu, Somalia. 7X3DA in Laghoaut, Algeria. 3D2RJ on Rotuma Island near Fiji. 9N1MM in Katmandu, Nepal.

What makes these loggings outstanding is that they were achieved with only five watts output to a KT34A on a tower 17 metres high! It makes you think, doesn't it?

BITS AND PIECES

ZS1IS Warvis Bay— Dxsers can't be accused of not looking to the future. Imagine a pile-up on a station that does not count for any DXCC country at all! I've only just found out that there is at least one part of the world, apart from Maritime Mobiles of course, that doesn't count for anything. It's Warvis Bay, a South African enclave in South West Africa. The latter will soon, we hope,

become the independent country of Namibia. I found the pile-up on Sept. 1 and, as pile-ups go, this was quite a big one. (Cooper's definition of a 'Big One'? A pile-up I can't break!) It was on 28.025 MHz during the afternoon, EDT, and I learned that the QSL manager is KC2AG. All this interest is because if and when Namibia gets its independence, Wavis Bay may qualify, under the revised DXCC rules, as a new country. Whether the DXCC desk will back date contacts to made before Independence seems rather doubtful to me but 'Work First, Worry Later' is as strong as ever, hence the pile-up.

IOTA Checkpoint— I'm not sure how many readers are working on the 'Islands on the Air' awards but for those of you who are, take note of a new checkpoint for your cards. They should be sent to Dewitt W4BAA. This does not apply, however, to IOTA Honour Roll members with claimed scores of over 400. There is a note of caution concerning Dewitt's address. He appears to be half the year in Michigan and the other half in Florida, so you are advised to check with him on the appropriate address.

4WOPA Yemen— Yet another post script on the abruptly terminated DXpedition of a few months ago by Hans. At the moment cards are not

accepted for DXCC credit as the full documentation has not yet been submitted to the ARRL. However according to *DXPRESS*, reported in *QRZ-DX*, Stu WA2MOE "... is preparing 4W0 documents and is waiting for some additional statements to complete the request for DXCC status." I know of several VEs who will be waiting the results of this submission with bated breath!

70 P.D.R. of Yemen— A further update on Paul I1BRJ's efforts to mount a mini DXpedition from this southern neighbour of 4W. Apparently the July plans fell through and now he is hoping to operate for two 72-hour periods before the end of September. By the time you read this, September will be past history, but you may be interested to read the entire period that he is on the air there will be a Yemeni official by his side.

I think it's time to recognize, yet again, the debt we all owe to that tiny group of enthusiasts who remain undaunted by horrendous difficulties in their efforts to put rare DXCC countries on the air for the world's DXers.

Thanks are due to the following sources for some of the material appearing in this column: DK5JI, OH2BH, OH2BN, QRZ-DX, DXPRESS, VE3JPC, VE7AHB and VE7JQ. ■

Band Reports

Thanks to Ron VE7JQ and Hoppy VE7AHB for these extracts from their logs.

<u>CALL</u>	<u>FREQ (MHZ)</u>	<u>UTC</u>	<u>DATE</u>	<u>QSL</u>
T77T	14.193	0427	JUNE 13	
T38RW	14.007	0525	JUNE 13	ZL1AMO
9V1XR	14.066	1542	JUNE 27	
5Z4FM	14.012	1426	AUG 2	
UA3PAM/JT	14.009	1502	AUG 2	RW3PW
9M6MA	14.161	1558	AUG 4	
V85JB	14.161	1604	AUG 4	
9M8STA	14.176	1517	AUG 5	
9M2FZ	14.157	1553	AUG 6	
3B8CF	14.028	1401	AUG 18	
NH6D/KH3	14.033	1336	AUG 2	
9V0WW	21.243	1549	AUG 9	
N2NHQ/KH8	18.139	0452	AUG 13	
5W1IH	14.192	1515	AUG 15	
BV2A	14.012	1511	AUG 20	
BZ1DX	14.031	1403	AUG 8	
BZ4AU	21.027	2315	AUG 9	Box 538

CROSSWAVES

Ralph Cameron VE3BBM, 30 St. Remy Drive, Nepean, Ontario K2J 1A3



ELECTROMAGNETIC RADIATION— A GROWING CONCERN

Newspaper articles over the past few years have paid increasing attention to the suspicion that electromagnetic radiation may have some harmful effects on humans. Not a week goes by but some mention is made of a community group forming a committee to prevent another 'close encounter of the invisible kind'. The United States produced several reports under the auspices of the EPA, Environmental Protection Agency.

BARRHAVEN

The Barrhaven Radio Interference Task Force (Ottawa area) uncovered some well-founded community concerns about proximity to all this radio energy and cited many cases of malfunctioning electronic appliances, control systems and equipment. Some felt human control systems could also be affected by radio energy as well as the energy of powerline frequencies. There seem to be more suggestions nowadays that there are several adverse effects from electromagnetic radiation which are difficult to duplicate.

ENVIRONMENTAL PROTECTION AGENCY

The EPA's findings certainly indicate that, as frequencies increase, there are many more possibilities of energy absorption by nearby bodies. While the dry body is not a good conductor of direct current, the principle of mutual induction for radio energy ignores DC resistivity. Moreover, the proximity effect of a human body to a radiator can appear to have all the desired properties of absorbing energy, particularly as frequency increases. Localized heating effects have been used for many years by the medical profession, by way of diathermy. Many internal organs respond differently to different wavelengths. Some of these effects are used therapeutically.

UHF AND MICROWAVES

The known bands which have caused harmful effects to human tissue span the 450 MHz band and certainly 2.45 GHz which microwave ovens use. The 10-10.15 GHz band was at one time considered to be another useful microwave oven band until FCC stepped in and allocated it to the commercial radio relocation services. Thirty years ago one form of treatment of the skin disease sebhorrea utilized the almost unheard of frequency of 50 GHz. The radiation was applied to the affected

area by means of a small dish antenna, about 3 inches in diameter. This treatment is only used now as a last resort because it was found to actually damage the tissue and appeared to cause the same effect as mild X-ray radiation.

'ELECTRO-FEELING'?

Recent documented reports appearing in *Radiocommunications* tell of radio Amateurs experimenting with 14 MHz antennas and concluding that what were initially passed off as migraine headaches, again appeared months later, after resuming the same tests. Other people experience headaches when playing sports on fields near high voltage power lines. Is this coincidence? Are these the only effects? I've talked personally to radar operators who used to service the radar choke flanges, right beside the parabolic antennas, while the transmitter was in operation! To be responsible Amateurs we must be concerned about any possible effects.

DOC REPORT— RP 184

Consider a recent report published by the Dept. of Communications entitled *HF Amateur Stations Tests in the Toronto and Ottawa areas*. DOC undertook a series of test during 1986/87 at the suggestion of CARF. The purpose was to gain some insight into the electromagnetic environment in the vicinity of HF Amateur stations in urban areas. It was based on measurements taken around several cooperative Amateur stations in the Ottawa and Toronto areas, during the winter of '86/87. A total of 26 stations were measured.

The objectives of the project were:

- Measure the electric fields in the vicinity of the station;
- To compile a statistical database in order to generate actual and normalized graphs and tables of electrical field strength amplitude distribution.
- Determination or estimation of the field effects in and around a typical house by measurement of the induced voltages on house power lines, due to radiated emissions.
- Determination of the effects arising from the operation of Amateur station equipment due to conducted emissions on house power lines.
- Comparison of emission effects.

TWO PHASE PROCESS

Measurements were undertaken in two steps. In the first, measurements were taken in the vicinity of the

Amateur's home while he transmitted. This was done to determine the electric field strength in the neighbourhood. This arbitrary approach was used because of the problems of obtaining meaningful repeatable results when there are so many reflective bodies in the near field of the antenna. Statistically, these should result in a certain probability given a selected number of samples.

In phase two, the samples were taken both inside and outside the Amateur's house, to determine typical structural attenuation and the level of the induced voltages due to radiated and conducted emissions.

GENERAL

Frequencies selected for tests were: 3.75, 7.15, 14.20, 21.30 and 28.50 MHz. Transmissions were made under CW conditions with a reference power metre reading power output. Readings were then normalized to the 100 watt output level and extrapolated to the maximum permitted Amateur power output of 1591 watts. Field strength measurements were taken using a commercial field strength metre and portable loop antenna. All measurements were referenced to 2 metres above ground or floor.

26 SITES MEASURED

On the average, measurements of field strength were made at 26 selected sites which were just inside the property limits of the participating Amateur and along the streets immediately adjacent to this property. Again, an attempt was made to obtain representative readings— absolute values of field strength, particularly in the near field, are difficult to obtain without correction.

DOC/MOBILE!

A well-equipped DOC van was next parked at the curb in front of the Amateur's home, at a distance that generally exceeded that to his immediate neighbour. In order to estimate the structural attenuation of the house at HF frequencies, electric field measurements were taken inside and outside the home, at two separate locations. (These results are to be the subject of a separate report.)

The DOC van was equipped with Amateur transmitting equipment and, when parked at the front curb transmitted at the above frequencies to reverse role play fashion induced voltages due to radiated emissions from

CROSSWAVES (cont'd)

the DOC van were then measured in two rooms in the Amateur's house and referenced to a known impedance by means of a Line impedance stabilization network connected to the mains line. (These voltages may be in error— see technical comment.)

AMATEUR ROLE

The Amateur transmitter was operated into a dummy load while induced voltages on the house power lines due to conducted emissions were measured. (This measurement technique is a contentious issue— See technical comment.)

The report continues on for some 60 pages and summarizes the measurement results. Some interesting observations and conclusions have been drawn and those thought to be of interest have been extracted and summarized below. To appreciate the detail and effort that went into these measurements and results requires reading the report in full and understanding exactly what the technical ramifications are. While this columnist has taken issue with some of the measurement techniques, from an objective point of view there are some credible results and they have been done by our own DOC, at their expense, at the request of CARF and they have been the FIRST to do such comprehensive tests. For this they are to be congratulated as well as the Amateurs who took the time to participate. Test results such as these may well have a bearing in justifying the immunity levels required of susceptible entertainment electronic appliances as well as more sophisticated control and electronic systems.

RESULTS—

TECHNICAL COMMENT

Radiated Emissions— The highest values measured for radiated emissions were 1.0 volt and 2.3 volt for Ottawa and Toronto respectively.

Conducted Emissions— The highest values measured for conducted emissions were 1.0 volt and 0.8 volt for Ottawa and Toronto respectively.

CONCLUSIONS:

It can be concluded, from the statistics gathered, that the electric field strength from an Amateur transmitting with 100 watts will exceed 1.0 volt/metre, in his immediate neighbourhood in about 28% of the cases. The possibility increases to 70% when his power is increased to the maximum allowable.

Average attenuation of the house structure appears to be roughly a factor of 2.7 times. In certain situations the electric field couples more efficiently to house wiring by virtue of the wave-

length being comparable to the wiring length and the orientation of the interior conductors.

The report concludes with the statement, "The results obtained indicate that in the vicinity of an HF Amateur transmitter, the electromagnetic environment has appreciable strength and potential for affecting electrosensitive devices or consumer electronic equipment. Given these results, it is not surprising that at certain times, complaints have been registered with respect to the operation of a legally licensed transmitter. Certainly, the results here will have to be considered in the development of any standards— voluntary or regulated— for immunity of radio sensitive equipment." signed, Arto Chubukjian DCE, April 1989.

TECHNICAL COMMENT:

The absolute values of the field intensity can be open to question because the wave impedance for the near field measurements must be adjusted and there is no indication in the report that this has been done. The wave impedance for far field measurement is taken to be 377 ohms. This would have some effect on actual voltages measured.

A loop antenna was used to make vertical field strength measurements. Usually a vertical whip is used to make this measurement.

The impedance of the LISN was specified as $Z = 50 + j50$ ohms. In the standard LISN, the impedance is usually lacking a reactive component and is a nominal 50 ohms over the frequencies of interest.

ACKNOWLEDGEMENTS

This report would not have been

possible without the participation of several groups and individuals. I believe the following Amateurs and DOC personnel have demonstrated their willingness to bring these interesting and original measurements which may be the basis for further study by those concerned with the problems of electromagnetic compatibility.

- The Amateur communities of Ottawa, Kanata, Metro Toronto, Guelph, Brampton, Bramalea and Stoney Creek in Ontario.

- Mr. Brian Kasper, EMC Technologist, DOC DEB

- Mr. Brian Quigg, Systems Engineer, DOC Ontario Region

- DOC Regional Ontario Office Staff

- DOC Toronto District Staff

- DOC Ottawa District Office Staff

- DOC Action Regional Spectrum Services Centre Staff

- DOC Certification and Engineering Bureau Staff (DEB)

- Mr. Ralph Cameron VE3BBM, Chairman EMI Committee, Canadian Amateur Radio Federation, Ottawa

- The following participating Amateurs: VE3ATJ, VE3RZ, VE3GG, VE3GX, VE3KLG, VE3NR, VE3OAI, VE3TL, VE3JQW, VE3KH, VE3CZE, VE3ACO, VE3AR, VE3AZA, VE3UR, VE3BLQ, VE3UT, VE3OVU, VE3CHB, VE3DNZ, VE3AEJ, VE3EWN, VE3BQL, VE3CUS, VE3ITV, VE3KYZ.

Many thanks to the DOC for their cooperation in funding this undertaking. A copy of this report is on file with CARF headquarters and is available for a cost of \$5 to cover duplicating and postage. NOTE: Practical telephone filters will be given next month. ■

CSA/BSI/KEMA sign testing agreement

To assist Canadian manufacturers to export their products, Canadian Standards Association (CSA) has signed reciprocal testing agreements with BSI in Britain; and in The Netherlands, with N.V. tot Keuring van Elektrotechnische Materialen Utrechseweg (KEMA).

In the new agreements, BSI and KEMA will now accept CSA testing reports as a means for granting certification to North American manufacturers who want to export their products to European Community countries.

BSI and KEMA have acted on CSA's behalf for almost 40 years as testing, certification and inspection agencies for European manufacturers wishing to sell their products in Canada. The CSA/BSI agreement also allows CSA to

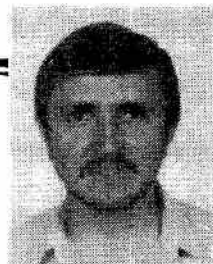
assess quality systems on behalf of BSI for North American manufacturers.

Similar agreements were made with the Japan Electrical Testing Laboratory (JET) and JMI Institute in Japan to facilitate the export of North American goods to the Japanese market.

Implementation of the Free Trade Agreement gave added impetus to the movement towards greater compatibility of Canadian and U.S. standards. The efforts by the members of the European Community to have common standards for a wide range of products by 1992 has had a similar effect. Already, CSA standards committees are working to develop North American standards, harmonized wherever possible with the standards of either the International Organization for Standardization (ISO) or the International Electrotechnical Commission (IEC). ■

Listening To The World

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



Once again both Amateur and Shortwave radio showed off their importance during the devastation of Hurricane Hugo through the Caribbean and the southeastern United States in mid-September. I spent many long hours at the receiver taking down vital information from the various emergency nets set up to handle the situation. I was contacted by many media sources locally here in Montreal as well as by the CBC television network in Toronto and Winnipeg, for which I prepared reports on the information monitored at my location. Much of the material supplied to them was information which they were unable to obtain from their sophisticated news gathering sources. More on this later in the column, but now on to our regular feature.

COUNTRY OF THE MONTH

We'll look this month at one of the smaller countries of the world which is home to one of the smaller, but most popular, international broadcasters in the world of shortwave broadcasting. The country is Austria and the station is Radio Austria International (RAI).

Broadcasting in Austria is handled by the Osterreichischer Rundfunk (ORF). The foreign service, Radio Austria International, operates 500, 300 and 100 kilowatt transmitters located at Moosbrunn. As indicated in the *World Radio TV Handbook*, RAI's shortwave service comes to you from Vienna, the capital of neutral Austria in the heart of Europe. The station states that the main emphasis in programming is on straightforward information embracing politics, the economy, the arts, science and sports. Information broadcasts are supplemented with entertainment and musical programmes.

RAI broadcasts to the world in German, English, French, Spanish, Esperanto and a recently added Arabic service to the Middle East. A unique aspect to the broadcasts of Radio Austria is its high content of local news, information and entertainment. Many larger international shortwave broadcasters, unfortunately in my opinion, spend much of their broadcast time dealing with world events and not spending enough time telling listeners around the world about their own countries. Austria is a dramatic exception to this statement. Austria's international broadcasts are almost totally comprised of national material.

The daily English language programme is entitled 'Report from

Austria'. It follows a regular weekly pattern including shows like 'Austrian Coffeetable', an entertainment programme, 'Austrian Shortwave Panorama', RAI's weekly DX programme; and 'Report from Austria' featuring all aspects of news from Austria.

Here is the current schedule for times and frequencies of the broadcasts in English to North America. The times indicated are in Greenwich Time (UTC). 0130 to 0200 UTC on 9875 and 13730 kHz; 0530-0600 on 6015 kHz; and 1130-1200 UTC on 21475 kHz.

Radio Austria International appreciates letters, comments and reception reports from their listeners. In return they will forward a QSL verification card together with a colourful frequency list and programme schedule, free for the asking. You can write to Radio Austria International at the following address: A-1136, Vienna, Austria. I think you will enjoy their unique style of international broadcasting.

HURRICANE HUGO

All too often, it takes a major catastrophe such as a hurricane, tornado or earthquake, or a major world event such as the massacre in Beijing to bring the public attention to Amateur Radio and Shortwave Radio monitoring. It is at times like these where these 'hobbies' become such vital links between the affected areas and the rest of the world.

As mentioned earlier, I was contacted by local and national media outlets when Hugo hit the Caribbean islands. They had my name on file from reports I had prepared for them last year during Hurricane Gilbert's destruction of Jamaica. Once again with Hugo, I supplied the CBC national network as well as local radio, television and newspapers with information monitored from the numerous emergency networks which were operating throughout the duration of the storm. Once again, during this emergency, I stressed to them how, by simply setting someone up with a semi-decent shortwave receiver, these media outlets would be able to monitor these broadcasts themselves, but they preferred to rely on my personal monitoring of the situation.

Probably many Amateurs reading this have been involved in operations relating to these types of situations, but you may be asking how the shortwave monitor becomes involved and what

they are capable of doing. Well, I feel that an advantage I have over the Amateur operator in this situation is that while the Amateur is transmitting, he or she cannot be listening. As a monitor, I focus my attention on simply what I am hearing and I have the opportunity to tune quickly around the numerous frequencies active with information and pull what I feel to be vital information at the time.

The experienced monitor usually has developed the skill of listening, which I believe to be very important. Sometimes I feel that the Amateur may, from time to time, put too much emphasis on transmitting, when in cases like these emergency situations, the listening aspect becomes more important. You too, as a shortwave monitor or Amateur can be of assistance to your local media outlets by first of all making them aware that you exist and that you are available to monitor situations like this. You can also take the initiative. When you come upon an emergency situation or if you hear a partial report on a story in your local media and you feel that you have more material to add to the story through your monitoring, contact your local newspapers, radio and television stations and establish media contacts who can make use of your information.

Actions like this can be the best advertiser for the hobbies of Amateur Radio and Shortwave Monitoring.

Each time I have supplied such information to local outlets and my name has been connected with the stories, I have been contacted by many people, curious to find out more about shortwave radio monitoring. By using the public media to our advantage, we can make the public, as well as the media, aware of the importance of radio communications and help to put it in the spotlight where we all know it really belongs!

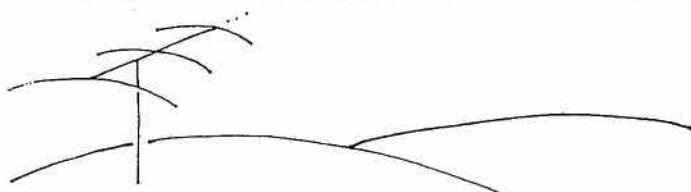
If you have had any opportunity to help out in supplying information to the media through your contacts or monitoring, please let me know about them. It never fails to amaze me how ignorant the media is to this vital source of news and information and to the importance of international Amateur Radio and Shortwave Monitoring.

For anyone interested in the 1990 edition of the popular shortwave frequency guide, *Passport To World Band Radio*, I will have received the new edition by the time you read this. This book is an increasingly popular source of shortwave station frequency and

Continued on next page

OVER THE HORIZON

Bob Brown NM7M,
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Perhaps you've never thought about it, but the Canadian ionosphere has to be close to an award-winner, particularly for its size as well as its variety. Thus, there is a bit of the mid-latitude ionosphere out to the West, almost a third of the northern auroral ionosphere and a portion of the polar ionosphere that is only matched in size by that over the Greenland icecap. On the other hand, the winner of the award for the largest national portion of the ionosphere is Russia. but compared to the Canadian ionosphere, that over Russia is tame, mid- to low-latitude in character with the auroral zone skirting their northern coastline and only a few islands in the polar cap.

Of course, Antarctica covers the full range, from mid-latitudes of the balmy Palmer Peninsular, through the austral auroral zone to the harsh rigours of the southern polar cap. However, the terms of the Antarctic Treaty gives title to no country, only claims and access for research in that barren region. With that, Antarctica has to be relegated to a non-contending status and only warrants an honourable mention in any national competition.

Now the polar icecaps are present year in and year out, cold and harsh to all who venture there; however, the polar ionosphere gives rough treatment to radio signals only when bathed in solar protons, particles accelerated and ejected during some solar flares. Such events used to be called 'polar radio blackouts' but that was before their solar origin was recognized.

Now, with observations that started during WWII and then expanded afterward, the origin and other features of those events are pretty well understood.

The present terminology is polar cap absorption (PCA) events and a good part of the research that resulted in the new knowledge was conducted in the Canadian Arctic, at places like Ft. Churchill and even as far north as Resolute Bay.

The 'absorption' used in the term 'PCA' is nothing more than the usual ionospheric absorption that goes with radio waves traversing the D-region. Indeed, one doesn't have to go into the polar caps to have a knowledge of it. Just operate anywhere in the world on the lower bands like 80 and 160 metres and you'll come to know it well, the factor that limits the usefulness of those bands to times when the paths are in darkness. The difference between the usual absorption and that during PCA events is that the D-region ionization in the first instance is due to solar ultraviolet lights and x rays while the latter is due to charged particles, protons, penetrating to the D-region and creating additional ionization.

The normal D-region essentially disappears at night, only the weak ionization due to galactic cosmic rays being present; that's when the D-region absorption largely disappears and the lower bands come to life. With the case of solar protons, they continue to bombard the polar caps, whether the sun is too hot or not, penetrating to the D-layer and making additional ionization. Hence, D-region absorption continues into night during PCA events; however, for reasons of ionospheric chemistry that we'll discuss another time, the nighttime absorption is much smaller than during daytime.

In order to obtain a sense for the

magnitudes involved, consider one of the early PCA events back in Cycle 19, Aug. 22-25, 1958. Using a receiver at a low-noise site with its antenna directed vertically upward and recording cosmic radio noise at 30 MHz, a peak absorption of about 7 dB was observed at Ft. Churchill around noon of the first day of the event; with nightfall, the absorption dropped to about 0.7 dB.

Now those figures were for radio waves passing once through the ionosphere. For waves at oblique incidence those figures should be increased by a factor of 2-3, say 15-20 dB for each traversal of the polar D-Region. From that, it is clear where the original term 'polar radio blackout' came from.

The number of solar flares that produce solar protons varies from cycle to cycle and, of course, with time during a given cycle. To give you some numbers for reference, in Cycle 21 that was just completed back in Sept '86, there were a total of 54 proton events. While such events occur largely during the active phase of a solar cycle, the numbers vary year by year. Thus, just after the last solar maximum in Dec. '79, there was only one proton event in '80 and, curiously enough, 10 proton events in '82. Right now, it looks like Cycle 22 is running ahead of Cycle 21 when it comes to these events, so things should be interesting in the months and years ahead.

Of course, not all solar proton events result in significant polar cap absorption events, some only being detected by particle detectors at satellite altitudes. And there is the question of spectra, the numbers and energies of the protons both affecting the amount of ionization in the D-region. In that regard, we should pause at this point, digressing a bit to talk about the motion of solar protons from their source on the sun to their impact on the earth's atmosphere.

The protons, being positively charged, will be deflected on going through magnetic fields, whether in interplanetary space or the vicinity of the earth. The interplanetary magnetic field (IMF) can be described as variable in time and rather disorganized in space. Thus, a solar proton will essentially wander away from the sun, deflected this way and that. If it arrives in the vicinity of the earth's orbit, it finds a more organized magnetic field, say within 10 earth radii from earth's centre.

At that point, the geomagnetic field

LISTENING (cont'd)

schedule information, as well as an annual source of equipment reviews and shortwave radio related feature articles. The book is over 400 pages long and features a unique graph-type format in frequency order of international broadcast stations transmitting around the clock, indicating languages, target areas and power of transmissions. If you are interested in obtaining a copy of the 1990 *Passport To World Band Radio*, you can order through my address indicated above. The cost of the book is \$20, shipping and handling included, payable by cheque or money order.

Next month, I'll have a report on the Montreal Hobby Show which took place

on Thanksgiving weekend in Montreal. This was the 5th Edition of the Hobby Show at which our CIDX Club presented a shortwave exhibit. We were joined for the first time by the Amateur Radio community with an exhibit at this year's show. This show attracts over 50,000 people each year and gives us a great opportunity to present Shortwave Radio to the masses.

Thanks again for all of your nice comments with respect to this column. If I can be of any assistance to any of you in tracking down a particular country or station, or if you have questions regarding shortwave equipment, antennas or publications, please feel free to contact me. It's always great to hear from you. Until next month! ■

► HORIZON (cont'd)

essentially sorts out solar protons according to their momentum and direction of travel. While it is a complicated subject, the things that concern us here are simple: if the protons are moving essentially along the direction of the earth's field, they move with little deflection whereas those moving more perpendicular to the earth's field are significantly deflected and may not even reach the earth's atmosphere.

From those two extremes, you can see that solar protons would have easy access to the polar caps where the field is nearly vertical and be kept away from equatorial regions where it is nearly horizontal, parallel to the earth's surface. Of course, the details depend on momentum or energy but that is the general idea, solar protons bombarding the polar caps and rapidly falling off in numbers going toward the equatorial regions.

Perhaps that's more than you wanted to know about PCA events, but since you have a national interest in them, almost like a native crop, it seemed worthwhile to put forward some of the ideas. Indeed, if you think about it, all that I've said and then some is being played out overhead several times a year, all according to the laws of physics.

Now 'pragmatism' is one of the buzzwords of the year, so let's take that kind of approach to DXing in the face of the hazards that would be presented by PCA events. In order to do that, the first thing that's needed is one of those azimuthal equidistant maps that are advertised in Amateur magazines, the ones that can even be centred on one's QTH. Given that, the next question is: in which DX headings would you have a problem during a PCA event? One direction is certain, that of the north magnetic pole. But which pole?

Everything considered, I'll wager you weren't prepared for the word 'which' in that sentence but face it, there are at least a couple of poles out there: the dip pole and the centred dipole. Each has its own coordinates, where the imaginary axis cuts the surface of the earth. But the centred dipole is more relevant to PCA events than the other as it averages out all the local hills and valleys of the field and does a better job of representing where solar protons wreach the ionosphere in coming from distant regions several earth radii away.

The dip pole and the coordinates associated with that system have their place, more appropriate for local ionospheric matters such as F-region critical frequencies and heights. We'll have plenty of opportunity to consider them later; for the moment, the dipole field representation is what we need for PCAs and its axis cuts the surface of the earth at 78.98N, 289.1E in the northern

hemisphere and at a diametrically opposite point in the southern hemisphere.

With those coordinates as references, one can draw a polar cap on a globe that's suitable for PCA purposes, something extending 15-20 degrees equatorward from the magnetic pole. By transferring that region to the azimuthal equidistant map, one can determine the beam headings where DXing might be hampered during a PCA event, out to something like 20-30 degrees either side of the pole for QTHs in central North America.

Of course, there remain the questions of how one learns of PCA events and their duration. As for their presence, you can check on the status of the Omega Navigational System, one that seems to be affected by PCA events. Since I have no nautical experience in Canadian waters, I turn to the WWV broadcasts at 16 minutes after each hour; at that time, information is given if a PCA is in progress. The regular WWV broadcasts at 18 minutes after each hour also provide similar information, even events only reaching satellite altitudes.

All of that was 'high tech', but on the personal level, if you sense that DX from polar paths is really not on the bands, say Europe when listening from the West Coast as I do, you can pretty well figure a PCA is in progress; at that

point, simply check with WWV.

As for the duration of PCA events, they're quite variable and depend on the size or importance of the solar flare as well as the state of the interplanetary magnetic field (IMF). Some events seem to be brief, lasting a day or so; others can be quite long. The best case I can point to is when a colleague of mine was stranded in Ft. Churchill in July '59. He wanted to fly to Resolute Bay and carry out balloon flights to look for possible solar proton events; instead, because of the July '59 PCA events, he had to wait there for ten days until HF communications were adequate for the flight north. I was in Alaska at the time and one could spin the dial of an HF receiver and hear nothing more than local signals.

Perhaps you had a similar experience recently, the PCA event of Aug. 12, 1989 being the largest one since Aug. '72, with more than 30 dB absorption on 30 MHz reported at Thule, Greenland! As I said, PCAs are indigenous to the Canadian Arctic, so if you're situated right in the polar cap, you're stuck and DX signals will disappear when the protons arrive. The rest of us at lower latitudes are more fortunate; we can just spin our beams in other directions and return to polar paths when the protons are gone. But we don't have polar bears. ■



Shack of the Month

VE6BLY

Left to right: Writing desk, computer desk with dot matrix printer, sitting on 1571 disk drive, 1902A RGB monitor, fan on top of letter paper and 1541 disk drive. ICOM 761 with Kantronics KAM

and on left and Yaesu 227R 2M. Electronic key, bug and handkey with Icom 745 almost hidden at extreme right. Lois vacuums and keeps the place tidy! ■

QRP

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



Is it any wonder we are losing bits and pieces of our Amateur Radio spectrum when you hear the abuses some licensed members extend toward our bands? Like a kilowatt and a 100 watt station here in Edmonton with almost the same antenna system talking to someone who told them they must be using the same equipment because their signals were equal. Then there is one here (maybe more) using an old Henry transmitter idling along at 3 kW.

Al VE6AXW has the right idea, trading his linear for a W7EL QRP transmitter kit from Small Parts Centre. He certainly is not one to be left standing around when the new rules come down from above about reducing power to allow more effective use of our spectrums. Besides he can take it along on holidays and not lose touch with home. His son Kevin is well on the road toward getting his licence.

GLEANINGS

Mike WB8VGE was in his true environment writing about solar cells even back in August 1988 in *73 Magazine*. Always something to be learned whether recent or a few months old. Photovoltaic (PV) was first observed by a French physicist Edmond Becquerel in 1839. Albert Einstein explained the photoelectric effect in 1905 and since the 1950s PV has gained wide use to its present prolific applications.

Each cell generates 0.5 of a volt and current increases with the intensity of the light and surface area of the cell. Photos of anyone using solar energy periodically for QRP, Field Day or any time of the year are more than welcome. We are not all able to power our house in the manner that Mike WB8VGE does, but any small application is progress.

Nick VE7NJP writes that he is settled in at Qualicum Beach with his new parish. His present station, a TS-520S and some homebuilt gear, runs off solar power charged batteries. The solar panel is 5 watts/0.35 amps which he finds sufficient. After doing some modifications to an HW-8 in an attempt at getting restarted in experimentation, he is starting on a 100 MW single transistor rig. He is also on the lookout for an Icom 725 or the new Ten Tec to put himself in the digital readout class... He really enjoys QRP with his G5RV working Russia on 20M with .75 watts. He also worked another ardent QRP operator, Rick VE7FOU whom many will recall used to be in Bull Harbour until it was closed, is now in Inuvik signing VE8VK. Usually Rick is on 20

or 40 metres QRP frequency looking for old or new friends.

I may have to revert to solar power here for my QRP packet. I am using DIGICOM 64 with 10 nicads since the IC-761 quit putting out 13.5 volts on her rear apron. Then I replaced the nicads with a Radio Shack nine volt give-away until the bank of ten nicads recharges. They were a thrown out pack in the first place and had three cells dead but when zapped with about 40 volts through a 3500 mFd capacitor they started to take on a charge and continue to do so even now. They will operate the interface down to about 8 volts and the pack calls for a charge rate of 120 mA for 14 to 16 hours. The overall rating is 12vDC at 1.2 ampere hour which makes an ideal QRP battery pack whose total weight is 550 grams (on my postal scale). Now to find a solar charger and take this TWO-FER II out in the boondocks of AZ this winter.

Sam VE6BDK, using an Argonaut from his forestry lookout tower near Hay River, is in daily communications with Al VE6AXW. One day he asked Al to reduce power. Al went from 5 watts to 10 milliwatts and talked for another hour and a half at about 30 wpm, when Sam told him to reduce further. Al reckons he was down to about 1 milliwatt and still able to talk to Sam. It worked out to 420 miles as the crow flies between the two stations. What would the watts per mile work out to in this instance? Al has since visited Harry VE6XG, who is quite often bedridden, and moved his rig from downstairs to the bedroom, complete with a new

antenna which Harry can tune from his bed. Al tested the installation out using QRP, but unless Harry remembers to turn up his 940s we may just have another QRP addict.

I had expected a recent catalogue from Small Parts Centre before now after Al showed me his latest one which has some new items already. Antenna Specialists sent me their new Amateur Antennas catalogue showing their new patented ON-GLASS® window mount mobile antenna and DURA-FLEX® elastomer (rubber) spring which they exclusively designed and developed.

It has a dampening effect on whips, dramatically reducing the circular sway often experienced by metallic spring types. They go on to say this technological breakthrough reduces both mechanical and electrical noise while maintaining the advantages of a spring.

Other antennas in their catalogue range from 2 metres to 23 centimetres including the usual run of mounts. They also illustrate a Vertical Field Pattern diagram with their Omnidirectional Base Station antenna for 70 cm. The accessories section includes a 2M coupler for use with ungrounded antenna combination AM/FM lowband, mobile 2-way radios, a Magnet Mount Kit with BNC connector, Reinstallation Kit for ON-GLASS® antenna, RF power dividers for custom phased antenna without special coax, etc. with six models available for frequencies from 144 to 960 MHz and two lines of VHF-UVF RF amplifiers.

I received a nice little gift of blank

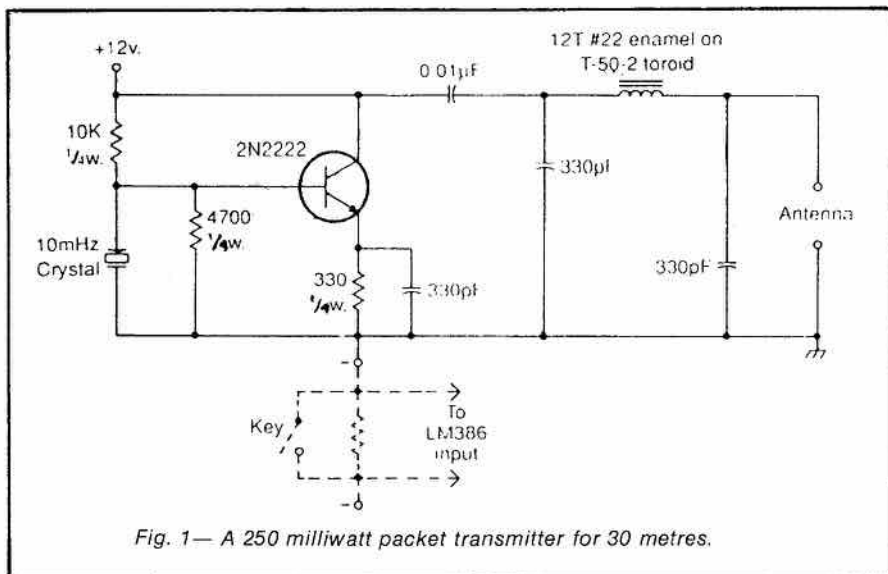


Fig. 1 — A 250 milliwatt packet transmitter for 30 metres.

floppies from Bill W7GHT who has not reported any more QRP escapades but keeps active on his numerous traffic nets.

Nice to see Bob NM7M in *The Canadian Amateur* with his words of wisdom. Thanks for the postcard, Bob, and I only try riding the stationary exercycles at the Club where they sit on the floor.

Being pleasantly surprised at the weekly gathering of Amateur radio, Amateur aircraft builders, and General Aviation types is a never-ending experience. Pleasant except maybe when someone wants you to go flying again on airphoto work in an Aztec yet! More recently, it was my pleasure to have Bill VE7UX/VE6 walk up and say hello after not having seen one another since 1948. As Martha Mason once said, "The richest man in the world is not he who has his first dollar. It's still the man who has his first friend!" Bill falls in that category in my books for more than one reason. First, it was he who arranged for me to relieve him on the CPA radio circuit and then brought in a war surplus No. 19 set in its original box from McMurray to Fort Smith by DC3. It was my first QRP rig (even under today's rules) because of the extremely low output. Then there was the VHF channel that fell outside the Amateur bands but again at low power. We were able to use it between two No. 19s. Seems Bill needed another relief operator so he could spend a weekend in Edmonton with his betrothed. So it was his way of repayment and we sure did enjoy using them as Amateur equipment. The second one, for a friend, actually worked G-land on more than one occasion but too late at night for me... While we were chatting at the airport lunch counter, it turned out that Al VE6AXW and Bill both were with CPA at the same time, but at different ends of the country. So as a result, there was more bush flying than radio, but certainly it was interesting to see Bill again. Some readers may have run into him on the Snowbird net where he acted as net control from Kelowna. He is presently in an apartment, but declares himself an ardent QRP reader who one day just might find room to build a rig.

Al VE6AXW has his W7EL kit for 30 metres but his final coil arced over at a bare spot and then he dropped the ferrite, so is held up redesigning another one for a different core. Has anyone wondered how to make use of this band without a lot of outlay in dollars? Dave K4TWJ presented a good idea for a transceiver in CQ for June '88. Reproduced here is the schematic for our breadboard technicians and when it works let us know!

The rig runs 250 milliwatts and is easily carried in your pocket (inside a '30s style fountain pen?) or some such miniaturization with a few D cells for

power hidden in another pocket. The dotted line circuitry is a suggestion by Dave for those attempting to use the design. (I am waiting for a crystal.) The resistor value across the key is determined experimentally.

The LM386 requires a good signal so the R should be high yet low enough that the transistor circuit continues to oscillate at a lower level for mixer detector operation. Use a 47k ohm pot as a start in experiments. The key shorts out the added 47k emitter resistor for transmit. This also disables the receiver input which raises the transmitter output to maximum and it is QSK!

All you hot-to-trot QRP enthusiasts are encouraged to fine tune Dave's idea. Without transformer coupling in the receiver, you may not pick up AC hum around home as was noticed when VE6AXW experimented with the TWO-FER II.

DEFENCE FUND

Somebody writing from VE3 land has suggested we send them some money to support their efforts and IARU at the next World Conference sometime in the late '90s. Regardless of money we should all work with our licence to experiment and serve the general public.

Traffic is falling off and many will say it is going by packet or AMTOR, BUT did you know it does not get delivered while it sits and festers on some appliance operator's BBS??

QRP can certainly occupy more of our assigned spectrum without driving potential users off. We had it happen here in Edmonton with packet, for

heaven's sake, just because one SYSOP wanted it all his way. How do you keep people checking nets every day (60-70 per week for me) if there is no traffic? Did you ever deliver a message to someone who was not even aware there was such a thing as FREE Amateur Radio service? Do it sometime and see how much you enjoyed it and the satisfaction gained from a job well done!

Vigilance through numbers and amount of activity on each band will do more to convince WARC that we use our allotments for Public Service (message handling) and Amateur Radio Experimenting in accordance with our licensing requirements. Why else are we sending Ottawa \$20 per year? Our government (not any other that I know of) charges annual fees but not to operate a HOBBY. So get in gear and participate outside the little circle of individual Amateur clubs formed for only the Amateurs!

NET ACTIVITY

Still shows no sign of picking up and could be due to propagation. I hear local reports of gearing up on QRP to no avail because of conditions. For that matter no one is doing much operating with normal power.

Try the QRP frequencies as often as possible, 1810, 3560, 7039/40, 10106, 10120, 14060, 18106, 21060, 24906, 28060 all on a daily basis of 24 hours. Then remember VE QRP Sunday at 1900 UTC on 14060 plus or minus QRM, followed by TCN the ARCI QRP net on 14060 or thereabouts starting at 2330 UTC. ■



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

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

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

FOR SALE: SB-200 Linear Amplifier, excellent shape, \$575.00. Jim Nazar

VE4NC, 20 Main St., Flin Flon, Man. R8A 1J4.

WANTED: Good used Yaesu 726 or 736 transceiver, with 432 module. Adrian VE3AYA, Wyoming, Ont. R.R.1 NON 1T0. Phone 519-845-3517.

WANTED: Kenwood VFO-520, excellent condition preferred. Jim Holowchak VE6KEY, 9111-84 Ave. Edmonton, Alta. T6C 1E5. (403) 468-6245.

Please send your Swap Shop notices to the Canadian Amateur Swap Shop Box 356, Kingston, Ont. K7L 4W2. Single insertion is \$1.00 minimum, 20 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 sign 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.

ARES AMATEUR RADIO EMERGENCY SERVICE

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



ARES SURVEY

Have you ever wondered how your group compares with other ARES groups across Canada? As mentioned in an earlier column, I sent a two-page questionnaire to all Canadian ECs. The idea was to obtain an in-depth knowledge of the organization and operating practices of ARES groups across the country. Forty-five ECs are listed in the ARES records, all of them from Ontario west to B.C. Of these, 30 returned completed questionnaires. Here are some of the results—how does your organization compare? Can you sit back with a warm feeling of satisfaction, or are there some things your group should consider adding?

MEMBERSHIP

The first question was to determine the number of members in the group. The smallest group has five members, and the largest, the Scarborough, West Hill, Pickering and Ajax group under EC Peter VE3JPP, has 150 members. Other large groups were VE7JAN's Vancouver group with 113, VE3JJA's Northwest Ontario group and VE3HNH's Niagara Region group with 85 and VE6AFO's Calgary District group with 70.

NEWSLETTER

Another question dealt with the existence of an ARES newsletter. Only one said yes and two others reported they cover ARES matters in their Club newsletter. The rest do not communicate regularly with their members in writing. The one specific newsletter is the *Metro Toronto ARES Update*, edited, printed and mailed by Gord VE3HSF. This is an excellent effort—in addition to news items it contains information on emergency equipment, liaison with client agencies, operating tips and so forth.

ARES NETS

When it comes to communication with members by radio, the situation, not surprisingly, is much better. Some two-thirds of those reporting have a periodic net for their members, with anywhere from 40 check-ins on average. Most nets are conducted on the local two metre repeater, with the balance on 75 metre SSB. Three groups meet on both two metres and 75 metres.

EXPERIENCE IN EMERGENCIES

Of considerable interest, of course, was the experience of the groups in providing communications in a real emergency. No less than half of those

responding have participated in real emergencies. These ranged all the way from helping to find a lost senior to the major effort associated with the Mississauga train derailment.

DISASTER EXERCISES

Still another question dealt with exercises involving simulated disasters. About 60% of the respondents do conduct periodic emergency exercises to give their members experience in handling communications under conditions as close as possible to the real thing. About half of those who do so act in collaboration with other emergency response agencies such as Red Cross, police and ambulance services. Skip VE3BBS sent along a description of last year's successful test of the telephone tree for the Thunder Bay area, in connection with a simulated emergency put on by the local EMO people. There is much to be learned from any exercise, and this test was no exception. Here, in Skip's words, are some of the things his group learned.

"I did the telephoning from my office and 27 minutes later I contacted the EMO and advised them that a total of 23 operators had been contacted and were available. The exercise got me thinking and raised some questions which we should ask ourselves. Had the telephone tree been activated without warning, did I have a copy at my workplace? Would my employer have been upset that I did this calling during business hours? Would my employer have given me the time off had it been a real emergency? Did I have a copy of the emergency plan readily available? Did I have the equipment to check into our emergency repeater during the business day had the net been activated?"

EMERGENCY PLANS

Forty-five percent have an Emergency Communications Plan and a further 25% are covered to some degree in their Municipal Emergency Plan. Gord VE3HSF has issued an ARES Operations Manual which, among other things, details the communications services that the Metro Toronto ARES group can provide. For instance, the Manual has this to say about Data Traffic: "Data Traffic allows the user agency the ability to pass messages over a digital radio network connecting several locations in and around Metro Toronto. These messages are entered into a keyboard and transmitted to another location. Typically these messages contain lists of items or

details of such complexity and length that using the Voice Traffic service is impractical." In addition to providing guidance for ARES members, this manual also provides to the various user agencies a powerful and clear picture of how they can expect to be served in an emergency.

LOCAL WORKING ARRANGEMENTS

To get a picture of the status of planning for cooperation with local emergency response agencies, another question dealt with any working arrangements or agreements that are in place with these agencies. Practically every group has such arrangements. The agencies include the Red Cross, Municipal Emergency Control Groups, police, fire, ambulance, hospitals and major industries. Ken VE6AFO, Ron VE6FV and Garry VE6CIA all noted their collaboration with the Alberta Public Safety Services organization. Al VESAQ mentioned his arrangement with the Moose Jaw Air Force Base.

EMERGENCY FACILITIES

Around 75% of respondent groups have some emergency equipment. Many have portable gasoline engine driven emergency AC generators. Many have installed fixed antennas at their Municipal Emergency Control Centre, their Red Cross HQ, etc. Quite a few have dedicated HF and VHF transceivers. Metro Toronto members have several portable emergency packet stations for handling high volume emergency traffic. Mike VE3XD reported that his Peace Area group even has a long range portable repeater.

There are two emergency communications vehicles. Janet VE3FUN reports that the 22-foot Chatham trailer has three separate stations operating on HF and VHF, complete with emergency power and antennas. Garry VE6CIA's group owns part of the Red Deer emergency communications vehicle. This excellent elaborate set-up was described in some detail in our column last March. Several groups have access to complete emergency stations with emergency power capability. For instance, Vic VE3KBU reports that VE3SSN, the station at Science North in Sudbury, will be available to ARES in emergencies. In addition to HF SSB, the station has packet, RTTY and AMTOR capability.

Continued on next page ▶

CONTEST SCENE

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

CONTEST CALENDAR

Nov 4-5 Int. Police Assn. Contest
Nov 4-6 ARRL CW Sweepstakes
Nov 10-12 Japan Int'l SSB DX Contest
Nov. 11 Australian Ladies ARA Contest
Nov 11-12 European RTTY Contest
Nov 11-12 Montana QSO Party
Nov 18-19 ARRL Int'l EME Competition
Nov 18-20 ARRL SSB Sweepstakes
Nov 25-26 CQ WW DX CW Contest
Dec 1-3 ARRL 160M Contest
Dec 2-3 Texas QSO Party
Dec 9-10 ARRL 10M Contest
Dec 10 ARCI QRP CW Sprint
Dec. 17 CANADA WINTER CONTEST
Jan 6-7 Hunting Lions CW Contest
Jan 6-7 ARRL RTTY Roundup
Jan 13-14 Hunting Lions SSB Contest
Jan 13-15 ARRL Jan VHF Sweepstakes
Jan 26-28 CQ WW 160M CW Contest
Jan 27-28 YL-ISSB YL/OM CW Contest
Jan 27-Feb 4 ARRL Novice Roundup
Feb 10-11 QCWA CW Party
Feb 17-18 ARRL DX CW Contest
Feb 23-25 CQ WW 160M SSB Contest
Mar 3-4 ARRL DX SSB Contest
Mar 9-11 Japan Int'l CW DX Contest
Mar 10-11 QCWA SSB Party
Mar 24-25 YL-ISSB YL/OM SSB Contest
Mar 24-25 CQ WPX SSB Contest
(Courtesy John Dorr K1AR & CQ Magazine)

ARRL SWEEPSTAKES

CW: Nov. 4-6, Phone: Nov. 18-20; Starts: 2100Z Sat., Ends: 0300Z Mon.

This is the 56th running of the Sweepstakes, making it the oldest domestic competition going, and it really stirs up a lot of activity.

Operation is limited to stations in ARRL sections. Operating periods are restricted to a maximum of 24 out of the 30 hour contest period. Times off may not be less than 30 minutes and must be clearly indicated in your log.

In order to minimize QRM to non-contesters it is recommended that

ARES (cont'd)

FUNDING

Finally, we come to the question of funding of ARES activities. Most respondents reported that their minimal annual expenditures were easily met by contributions by ARES members or by the local Amateur radio club. A few groups have sought and received financial assistance from their municipality or the federal New Horizons Program. Here in Kingston we have received several generous grants from our flea market committee. In Chatham, Janet VE3FUN reports that most of their needs are filled by bingos conducted by their club!

This, then, is the picture as reported by two-thirds of the ARES groups in Canada. These groups are to be

operation be confined to certain portions of the bands. It is recommended that you check QST for details.

There are several other regulations, including a cross-check sheet if you make 200 or more contacts. A large SASE (45¢ in postage) will get you the 'SS Package' and Operating Aid #6 with enough log and summary sheets for an average outing.

Exchange: QSO no., power class, call last two digits of year first licensed, and your ARRL section.

Stations using 150 watts or less are classed 'A', over 150 watts 'B', and QRP 'Q'. The same station may be worked only once regardless of the band.

Scoring: Each completed QSO is worth 2 points. The multiplier is derived from the number of ARRL sections.

Awards: The usual certificates in each class and mode for single operator stations in each section and multi-operator stations in each division.

Logs must be received no later than December 31st and go to: ARRL Communications Dept., 225 Main Street, Newington, CT 06111.

CQ WW DX CW CONTEST

0000Z Sat. to 2400Z Sun., Nov. 25-26

Just a reminder, as if you needed one, that the CW section of our WW DX Contest is coming up the last weekend of this month. The phone section, of course, is past history. Be sure to take special note of the new Single Operator Unlimited Category. The contest trophies list has been updated and well covered in the rules.

All logs, both Phone and CW, must be sent to the CQ office: CQ World-Wide DX Contest, 76 North Broadway, Hicksville, NY 11801 U.S.A.

Deadline for logs for the Phone

congratulated on the many steps they have taken to deal with disaster when it strikes. Do the survey results suggest any action your group should take to improve its capability? ■

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.

section is Dec. 1, and Jan. 15 for the CW section coming up. Be sure to indicate Phone or CW on your envelope. This will avoid your log from being entered in the wrong section.

ARRL 160 METRE CW CONTEST

2200Z Fri. to 1600Z Sun. Dec. 1-3 This is the 20th year for this 'Top Band' activity. Exchange is between U.S. stateside, VE and DX stations. DX to DX not permitted for contest credit.

Classes: Single operator, and multi-operator single transmitter. Exchange: RST and ARRL section for W/VE. RST only for DX stations; ITU Region for maritime and aeronautical mobiles.

Scoring: Contacts between stations in ARRL sections count 2 points, with DX stations 5 points.

Multiplier: Determined by number of ARRL sections and DX countries worked (for W/VE). (DX use ARRL sections only.)

Final Score: Total QSO points times the ARRL section and DX country multiplier.

Awards: Certificates to the top-scoring single operator station in each ARRL section and DXCC country. And to top-scoring multi-operator station in each ARRL Division and continent.

Indicate the multiplier in a separate column only the first time it is worked. Entries with 200 or more QSOs are required to include a dupe sheet. Official log forms are recommended and are available from the ARRL. A large SASE and 45¢ postage or 2 IRCs will get you a supply for more than 300 contacts.

The usual grounds for disqualification— violation of established rules, excessive duplicate contacts, etc.— will prevail.

Mailing deadline for logs is Jan. 6 to: ARRL Communications Dept., 160 Contest, 225 Main Street, Newington, CT 06111. ■

METRIC CONVERSIONS

This is part of our continuing effort to keep our members well-educated. You may want to become familiar with the following metric expressions so as not to sound dated:

- A miss is as good as 1.61 kilometres.
- There isn't 0.06 gram of truth in it.
- She felt 3.05 metres tall.
- He wore a 37.86 litre hat.
- First down and 9.14 metres to go.
- Don't hide your light under 35.36 litres.

— Argonne RC, Hinsdale, IL
via Worldradio

QUA

News and Views from around the world

CANADA

Sealed maintenance-free batteries with 'Green Eye' (or sometimes 'Blue Eye') indicators do not meet Canadian Coast Guard requirements that "a means shall be provided for assessing the state of charge of batteries used to supply the reserve source of energy" on a vessel.

The problem is that most of the indicators can only show whether the battery is completely discharged or is charged to some extent. They cannot show any difference between 10% charge and 100% charge.

Automotive batteries are not designed for deep discharge. They are intended to supply great gobs of current for starting purposes and spend most of their life taking a small booster charge while the car is in motion. The voltage regulator on the car sometimes prevents substantial charging even when the battery is well down, so you need a lot of driving to bring the battery up from dead to full charge. If you want to be sure the battery is fully charged, measure the specific gravity of the acid or put in on a charger for a few hours. And don't rely too heavily on the theory that maintenance-free batteries never need topping up!

GREAT BRITAIN

The European Community is in the process of creating common standards for Electromagnetic Compatibility, to apply to equipment sold after Jan. 1, 1992. In their final report the Commission which made the

recommendation said that equipment used in Amateur Radio activities should be excluded from the Directive because Amateurs are subject to individual licensing by the competent authorities of their country who control compliance with disturbance requirements before delivering a licence.

U.K. Amateurs have some problems with the IARU bandplans for the WARC bands. Although the bandplans for 18 and 24 MHz permits phone operation, the U.K. licence does not. The reverse is the case on 10 MHz—the licence permits modes other than CW, but the IARU recommends CW only.

G3VA quotes some authorities on nicad cells as saying it is not true that it is necessary to fully discharge cells before recharging—in fact this will shorten their life. Also the famous or infamous 'memory effect' is often misunderstood. A battery continuously trickle-charged does not lose capacity drastically; it develops a voltage depression effect—at a certain point there is a slight downward knee in the discharge voltage curve. From that point the voltage is lower than normal, but the available capacity remains at about 90% of normal.

The depression could be as much as a volt in the case of a 13V battery, and if the equipment requires almost the full voltage of the battery, it may quit operating when there is still lots of reduced-voltage capacity left, giving the impression the battery is discharged.

Heating caused by long-term trickle-charging can reduce the useful life of a battery in terms of the number of charge-discharge cycles. This is best avoided by using a pulsed constant-voltage charger.

Disposing of Chemicals

G3HOH was concerned about the disposal of ferric chloride, which he uses when making printed circuit boards. The Thames Water Authority advised that it is considered quite safe to dispose of a couple of pints of ferric chloride down a toilet. It could be rendered quite harmless by adding washing soda, but this is not necessary for small quantities. But DO NOT empty ferric chloride into a stainless steel sink!

— Radio Communication

A new magazine

Radio Bygones is dedicated to the history of radio, restoration and repair of old models, reminiscence and nostalgia, museums and private collections.

It incorporates *The Radiophile* and will be published six times a year. Annual

subscription for Canada is 13 pounds sterling, from G.C. Arnold Partners, 8A Corfe View Road, Corfe Mullen, Wimborne, Dorset BH21 3LZ, United Kingdom. A sample copy can be obtained by sending two pounds twenty pence (2.2 pounds) to that address.

AUSTRALIA

VK-land is somewhat like VE-land—"...Australia is a country where seven separate colonies are pretending to be a nation." The Wireless Institute of Australia is like that too. Each Division is a separate body, with its own constitution; the 8,000 members (there are about 18,000 Amateurs) are not members of the Federal WIA, but of the various state Divisions. The representatives of each Division get together once a year in a Federal Convention to keep their act together.

WIA is considering increasing their membership dues to \$70 a year, primarily to pay for more full time staff and increase the lobbying effort in defence of Amateur Radio.

The DOTC computer system has problems assigning VK9 callsigns with suffixes indicating the location of the station (VK9M... for Mellish Reef for example), so VK9 calls are now being issued on a random basis. WIA are going to try to get this straightened out. The computer system also has problems dealing with callsigns of the form VK2/G3AAA, now preferred in most countries over the old G3AAA/VK2.

It has been proposed that Australian 28 MHz beacons change frequency to comply with the Region 3 IARU band plan, and change their mode of operation to single frequency time-sharing with stepped power output levels.

VK-LA on 50 MHz

On Feb. 25 VK6WD was talking to some locals on 50.110 MHz about the possibility of a European opening on Six when he heard LA3EQ and exchanged a 5 x 3 reports both ways. LA8WF and LA9UX were also worked during the opening, and SM6PU was worked crossband to 28 (there is no 50 MHz band in Sweden). LA3EQ was using 20 watts and LA8WF about 5 watts. Several other VKs made it to Scandinavia, and VK6KXW also worked OH1TP. On March 1 some VK8s made it into OH.

Wind Shear Radio on 50 MHz?

It is reported that a wind shear radar station is to be erected at Darwin using a frequency of 48.945 MHz, with a peak

Continued on next page ▶

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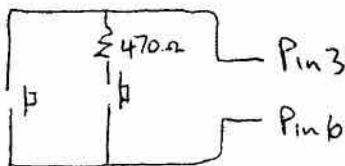
► QUA (cont'd)

power of 80 kW and 1 or 2 millisecond pulses.

SPAIN

Anyone having an IC-730 must have wondered why no scanner option has been provided, nor does it say in the manual how to incorporate it. But in the manual itself it speaks about a microphone with scanner for the HM10. The microphone is full of pushbuttons and controls outside and inside, but half of these do not have a function in this unit—the mike is organized for VHF equipment.

All you need to provide scanning is a 1/8th watt 470 ohms resistor and two pushbuttons. Connect the resistor in series with one of the pushbuttons, and connect this combination between pins 3 and 6 of the mike connector. In parallel with this goes the other pushbutton (see the drawing).



The performance seems quite acceptable. The scanner of this unit has only one speed, although one can vary the jumps of the VFO 10-100-1000 Hz. When the VFO is locked the scanner does not work. But with the scanning mike made by ICOM the same limitations apply, and it costs a lot of money.

(EA3ERT in the magazine of URE)

Social Events

25TH ANNUAL TELEPHONE PIONEER QSO PARTY

A reminder for all the Telco hams across the country that the 25th Annual Telephone QSO Party takes place 1900 UTC Saturday, Dec. 2 through to 0500 UTC Monday, Dec. 3 (Saturday and Sunday local time). The event is co-sponsored by the Ladd (San Francisco) and Sabin (Sacramento) chapters of The Telephone Pioneers of America.

A total of 17 'bands' are defined for use which include the 12 and 17 metre WARC bands and 144 and 220 MHz and UHF above 420 MHz. Contact your local telephone pioneer Chapter QSO Party Coordinator for details and a copy of the rules and contest forms. If you have operated in all 25 QSO Parties (1965-1989), inform the organizers when you mail your results and you will be awarded a special certificate.

NEWMARKET HAMFEST

The York Region Amateur Radio Club presents the 13th Annual Newmarket Hamfest, Saturday, Nov. 4, 1989 at Huron Heights Secondary School, Newmarket, Ontario.

Admission: \$4 per person, talk-in on VE3YRC 147.225+

This is the Fleamarket all the others

are judged by, featuring over 150 vendors. Plenty of parking. Dozens of door prizes. Refreshments available. Extra space for eyeball QSOs and socializing.

For more information contact: The York Region Amateur Radio Club, P.O. Box 352, Newmarket, Ont. Attn: John Ellison VE3WHY. Phone: (416) 841-6220, for Packet Users VE3WHY @ VE3NUU (pbbs), or if you can hit Aurora try VE3YRC 147.225+ (voice).



UNION DER BELGISCHEN AMATEURFUNKER

The 'UBA-FRIENDS' will be active on Nov. 11, 1989, to commemorate Armistice Day of the Great War.

Call: ON4UVW, Preferred Freq.: SSB 3.789-7.089-14.189; 21.289-28.589. CW: 10 Kcs from band begin. Special QSL card: via buro: ON6PJ, direct: ON4ACB.

Marcel Masse to speak at Spectrum 20/20 '89

Communications Minister Marcel Masse has been invited to deliver the keynote speech on the future of Canada's airwaves at the 1989 Spectrum 20/20 symposium, 'Innovation— Sharing the Challenge,' to be held in Montreal Nov. 28-29, 1989. The announcement was made today by Dave Garforth, President of the Radio Advisory Board of Canada, which is organizing the event.

"The Minister is particularly concerned about the future of communications in Canada and about the challenges facing government and industry in meeting the telecommunications needs of Canada in the next decade and into the 21st century," said Mr. Garforth. "We are looking forward to his views on this important subject."

The DOC, co-sponsoring the symposium with the RABC, will contribute \$40,000 to the cost of this second spectrum symposium, which will promote industry and government discussion of the opportunities and difficulties facing spectrum users and regulators.

"This symposium will be a unique opportunity to address the issues in the new environment of the 21st century," Mr. Masse said. "Telecommunications and new technologies are vital to everyday life, but few people realize that the increased variety of broadcasting and new services such as cellular telephones, satellite communications and radio-controlled equipment are crowding the radio spectrum, creating new challenges for those managing this finite natural resource."

Mr. Masse said the future of telecommunications services and technologies depends on a vigorous debate of the issues by all players. He welcomed the symposium as a chance to discuss these questions with industry.

The RABC is an association of 28 non-profit organizations concerned with the use of the radio spectrum. Its purpose is to consult with government on behalf of radio service providers, users and manufacturers on the development, management and regulation of radio services in Canada.

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YL News & Views

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



GOTA

Guides on the Air 1989 continues to be a success. I have received many newspaper clippings and information from across the country.

A picture and full write-up in the *Manitoulin Recorder* indicated that Girl Guides and leaders from the First Gore Bay Guide Company crowded into VE3VIV Viv's radio room. Other Guides were at Oscar Yarnold's.

In Bloomfield, N.B., three members of the Loyalist City Amateur Radio Club set up a station in a nearby school. Guides from the Kennebecasis Division got to talk with other Guides on ham radio during an International Birthday.

York Region Amateur Radio Club, in conjunction with CLARA took part in the 5th Annual Guides On the Air. Operating from St. Andrews College, a total of 53 girls ages 6-18 participated (Sparks, Brownies, Guides, Pathfinders and Rangers).

In Nova Scotia, Marge VE1VCH hosted 15 girls and their leaders.

The 58th Burlington Brownies visited the shack of Ted Barrette. Ted's wife is the Brownie Leader, and felt it was too good an opportunity to miss.

The *Daily Free Press*, Nanaimo, B.C. reported that Nanaimo Guides and Pathfinders were assisted in GOTA by operator Bill Stewart. He helped the girls link up with their counterparts. Guider Iris Symon said she hoped that the event would be ongoing.

The *Dunnville Chronicle* indicated that Kylie McIntee participated in GOTA while visiting the home of George VE3MFE.

In Chesterville, GOTA was jointly sponsored by CLARA and the Chesterville Girl Guides. Under the direction of Jean Doan, the girls took up their post in Moose Creek where the radio equipment was located. The story was carried in the *Winchester Press*.

The 3rd Penticton Guides got first hand experience with ham radio at the homes of four local Amateur radio operators. The *Herald of Penticton*, B.C. publicized the event.

Several dozen Port Coquitlam, B.C. Brownies, Guides and Pathfinders participated in GOTA.

The *Times Journal*, St. Thomas, reported that about 100 Guides and Brownies spent the day on the radio supplied and manned by the Elgin Amateur Radio Club.

On P.E.I., the girls had a great time at station VE1AID. They used letters, news clippings, radio messages, land line and meetings. The consensus: "A great time was had by all... what are the dates for next year?"



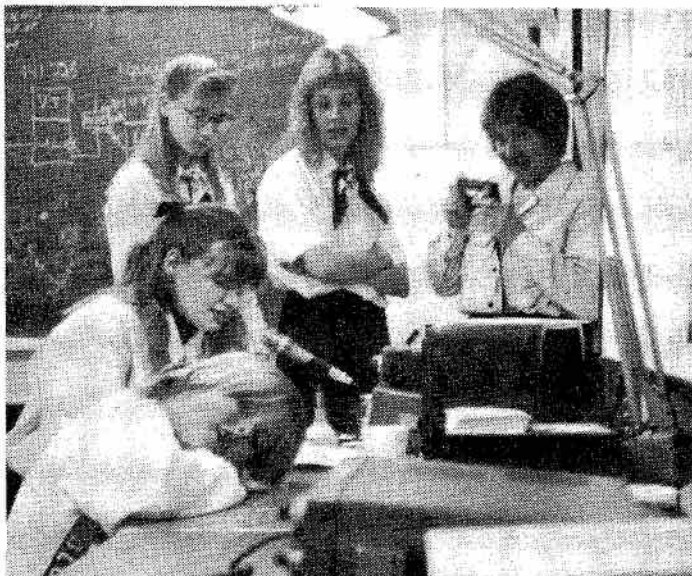
After several contacts with the United Kingdom Coordinator, it has been decided that the dates for 1990 are Feb. 24 and 25. Please pass the word. If some of you would like to help, but prefer not to have girls at your station, we can use you as Net Controls on the calling frequencies. Contact me if you are interested.

Now, to thank all those who participated, those who got news publicity, and those who took the time to write me of your activities. We have now started the 3rd Scrapbook on GOTA. Photos are kept separately.

The United Kingdom now has a Radio Badge. In less than one year, 200 girls have received it... all as a result of GOTA! We'll have more on that on the home front soon!

DON'T FORGET: GOTA 1990, Feb. 24 and 25.

It has been brought to my attention that the readers might like to hear more about YLs and Restructuring, Merger and Deregulation. This is your column, and I write what you tell me you wish to hear. So— keep those letters and comments coming. ■





Opposite, top: How about some beauties from Nova Scotia! QTH of Marg VE1VCH

Opposite, below: Dianne Harrison and her 3rd Aurora Pathfinders, 1 Spark, Angela.

Above: Joy Stark, April Hill, Emily MacLean, Julie Stark, Bill Wilson, Linda Hill and Nancy Henry at QTH of Bill Wilson VE3VOT, St. Catharines, Ont.

Right: QTH of Susan VO1OI, Lark Harbour, Newfoundland.

Below: Nancy Currie, 'Uncle Ray' Hunter, Dawn Nita VE3UR, 359th Toronto Pathfinders.



LOOKING AROUND



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

Several years ago we had a need for an AF square wave generator and decided to see if the Heath Decade AF Generator, Model AG-9A, could be modified to produce square waves. Several circuits were tried, including back to back diodes, saturated transistors, etc., with final circuitry used employing a Schmitt Trigger TTL integrated circuit— type 7414. This chip encloses six Schmitt Triggers and two are used (Figs. 1 and 3) and requires a 5VDC power supply producing a few mAs of current (Fig. 2).

The action of a Schmitt Trigger is such that the state of the output depends on whether the input voltage is above, or below, a particular value—the threshold voltage. One of its functions is to turn a sine wave input into a square wave output and the 7414 chip does this smoothly. The 7414 chip has a positive-going threshold of 1.7 volts and a negative-going threshold of 0.9

volts, so difference (called hysteresis) is 0.8 volts. The high level output is 3.4 volts and low level is 0.2V with a switching time of about 20 nano-seconds so the chip can be used, theoretically, to 45 MHz.

Fig. 1 shows the circuit we used with the Heath Generator. The sine wave output was taken directly from the generator output (ahead of the attenuator circuits) through a 1K potentiometer and a pair of back-to-back diodes to the input of one of the Schmitt triggers, with its output fed to the input of a second trigger circuit. Any of the six trigger circuits may be used. The output of the second trigger is fed through a 20K pot and controls the amplitude of the square waves produced. The use of two triggers does produce much better square waves than using a single trigger. The 1K pot is a PC board type and is adjusted for

symmetry of the square waves produced.

The power supply is fed from the 65.3VAC filament voltage of the Heath Generator and uses a zener diode circuit and a series pass transistor. If we were building the circuit today, would probably use a 7805 regulator but the simple circuit shown does work well. Note that a 10 uF and a 0.1 uF capacitor are used to bypass any slight LF and HF ripple on the output of the supply. A similar power supply can be useful in powering low current TTL ICs that are added to existing tube-type equipment.

The square waves produced are above ground and, if they are required to be positive and negative going with respect to ground, the output can be fed through a large value, series capacitor. Finally, if a pulse output is wanted, the Width Control can be adjusted to produce variable width pulses. ■

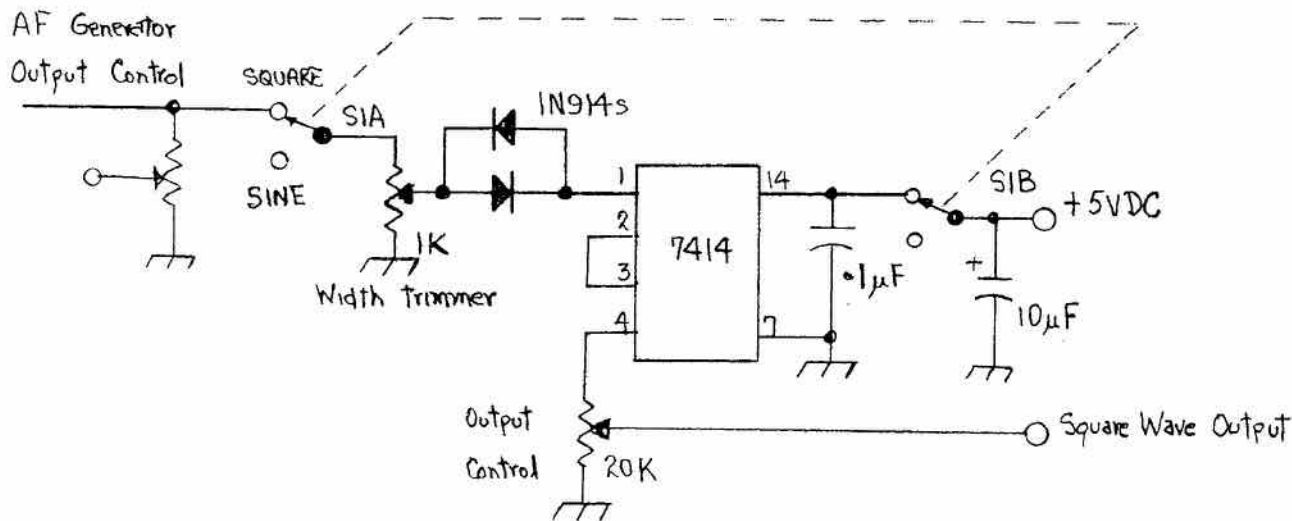


Figure 1— Schmitt Trigger

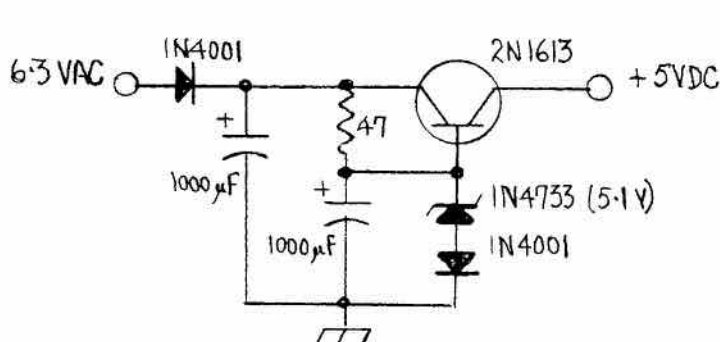


Figure 2— Power Supply

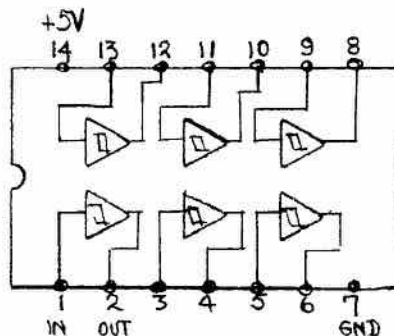


Figure 3— 7414 hex Schmitt Trigger

ANTENNAS

THE GAIN GAME by GERRY KING VE3GK



THE FULL WAVE LOOP

The following is an antenna that I have used for 80 metres which has given me excellent results. The antenna is a full wave radiator shaped in the form of a triangle sometimes identified as a 'Delta Loop'. I seem to remember that this loop was usually a triangle with its base, or flat side up, with the point downward. Anyway, a loop in the shape of a circle, in theory works best and exhibits some gain over a 1/2-wave dipole placed at the same height and direction.

The antenna that I use is in the shape of a triangle, point up, because I have only one tall support structure. I think it would work even better if it was an inverted triangle (point down). At resonance the minimum reflected power is greater than 10% because of the high impedance energy transfer point. Since this point is a little more than 100 ohms, I use a 1/4-wave matching line consisting of about 43 ft of 72 ohm, RG11U, coax cable. NOTE: any odd multiples of 1/4-wave for example: 3/4, 5/4, 7/4 etc. would work as well. One could also add an in-line connector after the 1/4-wave line and continue with 52 ohm coax.

In my case, the 1/4-wave 72-ohm line is long enough to reach the shack. This arrangement dropped the reflected power to a very low value (.5 watts reflected with 100 watts forward at resonance as measured on my Bird 43 wattmeter). The bandpass is about 200 kHz at the 1.5/1 VSWR points. Since my loop has its point straight up, I use less coax, have less line loss and less weight on the tower. It suits me well because I have my tower about 70 ft. away. This set up allows one corner of the bottom flat of the triangle to be very close to the shack.

I soldered the centre conductor of the coax to the wire going up to the top of the tower. If possible, the inside loop angle should be close to 120 degrees. Try it and have fun.

My loop does not come straight down, it drops at about a 30° angle. It is nice to have the bottom side of the triangle at least 20 ft. above ground. One could use a tall tree for a top support and other trees as bottom anchor points. If the angle away from the top support is greater than 30° it should work. It would be interesting to hear from someone who has experience in this area. These problems are simplified at higher frequencies.

Remember to seal all the outside coax connections from the weather.

The antenna could be used on other bands and to help I have included a projected chart of approximate dimensions for loop and 1/4-wave matching lines.

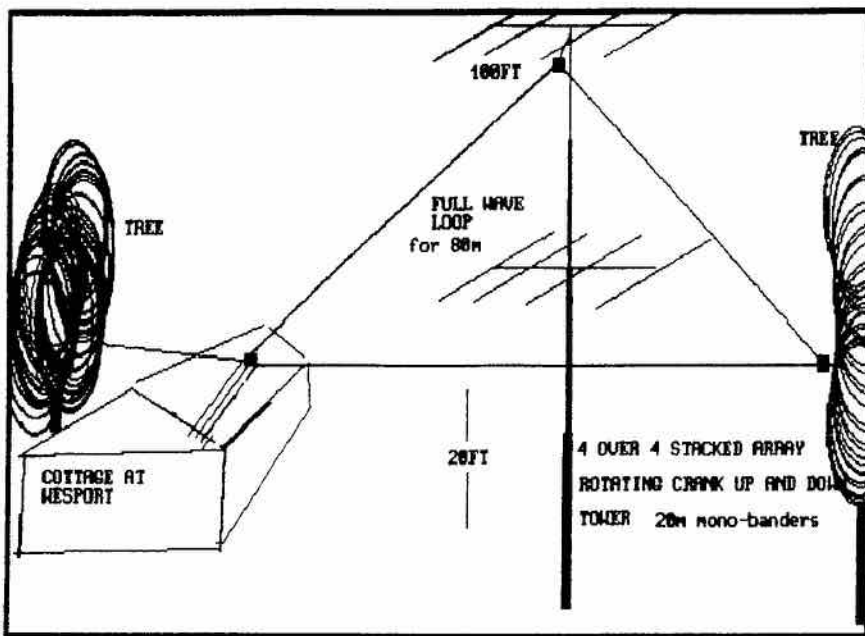
I think one should experience the final tuning of an antenna to resonance and then match it to the generator

output impedance on their own. If not, where's the fun?

I have also included a drawing of my particular installation at my portable location.

In a later issue I will describe my rotating 2 element cubicle quad for 75M on the 117 ft. sky needle tower.

Have fun— 73!



APPROXIMATE - LOOP AND 1/4 WAVE TRANSFORMER DIMENSIONS

BAND	LOOP		1/4 WAVE TRANSFORMER		468 FREQ (MHZ)	TOTAL LENGTH IN FT * 2=LOTH IN FT
	FT	MTRS	FT	MTRS		
160M	1.8	520	158.5	98.2	27.5	
80M	3.8	246	75.0	42.7	13.0	
40M	7.1	132	48.2	22.8	6.9	
30M	10.1	93	28.3	16.1	4.9	
20M	14.2	66	20.1	11.4	3.5	
15M	21.2	44	13.4	7.6	1.4	
12M	24.9	38	11.6	6.5	2.0	
10M	28.5	33	10.1	5.7	1.7	

THESE DIMENSIONS SHOULD GET YOU STARTED

VE3GK

TECHNICAL SECTION

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

A PC Board Desoldering Tool

By Ken Rolison VE3CRL

If you have ever tried to replace components in a complicated and congested PC board, you will readily appreciate how difficult it is, after identifying the component in question, to accurately locate the corresponding solder points on the reverse side of the board which require desoldering. I had this problem in servicing a Panasonic reel to reel stereo recorder which I am using in editing my ongoing Morse training tape program.

Necessity is the mother of invention, however. So I immediately thought of the wondrous world of fibre optics. One of my department's last responsibilities before I retired from CNCP in mid-1986, had been the Outside Plant activities involved in the Toronto-Montreal-Ottawa fibre optic system. I couldn't, on reflection, see much use for those exotic fine fibres for my mundane task. The next thought that struck me was the use of the so-called 'scope in surgical operations. The utility of this tool of modern surgery had been demonstrated on both my brother-in-law and son-in-law. What I needed was

a reasonably sized (and priced) light guide!

The homemade device illustrated in the attached sketch proved to be both adequate and economical. The parts required are: 1 size AA penlight, with prefocussed bulb; 2 AA cells; 1 half barrel of a clear plastic stick type ballpoint pen (You can keep the discarded ink barrel and point as a spare for field days or Morse exams, hi); 1 rubber grommet; a quantity of adhesive tape (I used fibreglass parcelling tape).

Slip the butt end of the pen barrel into the grommet. Centre the pen barrel bore over the prefocussed penlight bulb. Secure the pen barrel and grommet to the penlight with the adhesive tape you have selected. You should try to prevent any light from being projected other than down the plastic bore or via the plastic sides of the pen body. If you do a careful job the tool will project a circle, complete with a bright bullseye, on the component side of the PC board and through any etched portions of the board to the soldered side.

With a little practice, you will now find it much easier to locate the correct

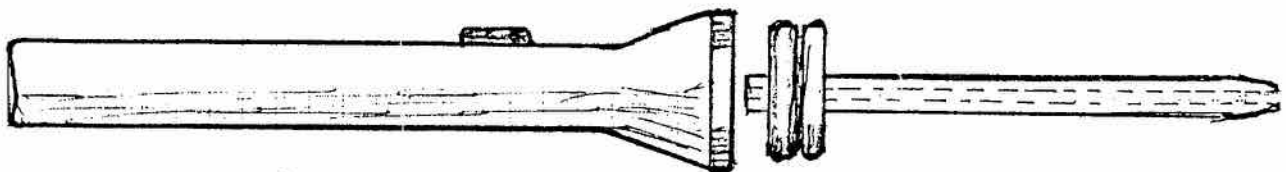
soldered tabs for desoldering a defective component. After you have located the tab you can mark it temporarily, pending desoldering, using the adhesive centres from three-hole looseleaf paper reinforcements. ■

SEEING STARS IN TORONTO

On June 21, 1988, the Astro Net had its first meeting on VE3RPT. Since the beginning, the Astro net has been a great success with a total of 284 check-ins to date. The Astro net takes place every Tuesday evening from 10 p.m. to 11 p.m. to discuss astronomy and other space-related subjects. Many astronomical subjects are discussed such as nebulas, galaxies, planets, constellations, black holes, nova, super nova, binary star systems, binoculars, telescopes, Astrophotography and the right film to use at what time exposures.

The net controller is Dave VE3MDK, who lives in Mississauga, Ont.

— Toronto FM
Communications Society



2 CELL (AA) PEN LIGHT
WITH PREFOCUSED BULB

RUBBER GROMMET

BOTTOM HALF
OF CLEAR PLASTIC
STICK BALLPOINT PEN

— REMOVE TIP & PLASTIC
INK TUBE FROM PEN
BARREL BEFORE
CUTTING—

1. SEAT PEN BASE OVER PREFOCUSED BULB
2. TAPE PEN & GROMMET TO PENLIGHT LENS HOLDER - I USED FIBREGLASS PARCELLING TAPE, $\frac{3}{4}$ INCH WIDE

Erecting a Portable Antenna

By Russ Wilson VE6VK

The following is a description of a method I use to effect a long wire portable antenna when out in the bush or camping beside a lake. It requires trees or some other support.

List of materials required:

1. Plastic reel (similar to power cord reel, preferably with a winding handle).
2. Length of insulated copper wire (fairly flexible) 150-200 feet.
3. Ground rod about 4' long with short length of wire attached, equipped with a clip.
4. Roll of heavy twine. (This can be reused)
5. Length of wire, similar to antenna wire, about 30'
6. Antenna tuner which will tune single wire.
7. Sling shot.
8. Steel rod 3' long with an open faced spinning reel attached to the top of it. Also the reel is equipped with 15 lb. test line with a sinker attached to its end. (The reel can be obtained at a flea market for \$1 or so.)
9. Compass.
10. Insulators attached to a short length of rope about 2' long. One insulator is split (see diagram).

When situated in a camping area, use compass to find direction you wish to

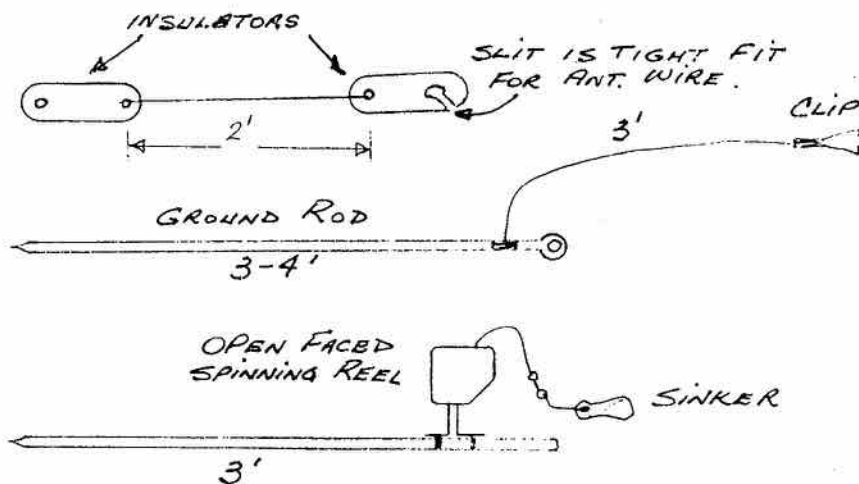
QSO. i.e. SW. Locate tree in that general direction. Lightly tap rod (with spinning reel attached) into ground so that the reel is facing towards the top of the tree. Open bail of reel. Using sling shot, place sinker which is attached to fishing line, in sling shot pouch and fire it over the appropriate branch of tree selected. You may have to assist the sinker to come down by gently pulling on fishing line and letting it go. Once you have recovered sinker and fishing line, remove sinker and attach twine to fishing line. I use a swivel and clip to simplify this operation. Wind in the fishing line until twine is back to you. Remove fishing line and attach antenna to the end of the twine. Pull the antenna up into tree and tie off at bottom of tree, winding in excess twine. A nail works well for this.

Repeat the above procedure at the selected tree at the other end of antenna. Once you are ready to pull antenna up tree, tie on the small rope with two insulators attached. (One is a split insulator.) Use the unsplit insulator to tie twine to, slip the antenna wire through the split insulator. Pull twine to bring insulators as close to tree as possible; tie off twine at bottom of tree. Wind up the slack with antenna reel and once antenna is at height desired, lock reel.

Mount reel at some convenient point. Attach the 30 ft. of wire to the connector on the reel and bring into antenna tuner and attach it to antenna single wire terminal. Place the ground rod close to either front or rear bumper and hammer it in the ground. Take clip and attach the ground rod to the bumper. Inside the vehicle, take a wire from a convenient ground on the vehicle to the antenna tuner.

Attaching ground in this manner seems to minimize RF around the vehicle. Tune to desired bands and make note of settings for future reference.

This antenna works very well on all bands with excellent results. It usually takes about 20 minutes or less to erect.



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TECHNICAL SECTION

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

The VT Proximity Fuse

What radar was to the RAF during the Battle of Britain, the proximity or Radio Influence fuse was to the Allies toward the end of World War II.

Used first against enemy personnel during the Battle of the Bulge in December 1944, Gen. Patton said this Funny Fuse was what really caused the enemy advance to falter. Previously, its effect in neutralizing the V1 Buzz Bomb attack on London and later on at Antwerp was decisive with a kill factor of nearly 90% after our fighters had found the bomb too fast to be caught. Why should this fuse be of any great interest to Radio Amateurs?

The heart of the shell was a miniature radio transmitter and receiver located in the nose cone. When the shell approached a target within what was called the lethal range, acting on the radar principle, the reflected signal activated a thyatron which in turn set off a series of small charges which ended up exploding the shell and spraying the immediate area with thousands of shrapnel 'bullets'.

Everything in the TX/RX was miniaturized to the Nth degree. The tubes were thinner than a pencil and the battery was as small as the present-day hearing aid types. There were four tubes in each cone— one for oscillator, two for amplifiers and one thyatron. The latter was used to discharge the stored energy into an electronic detonator. A brass slug in the cone acted as an antenna.

To make the fuse thoroughly effective, the radiation pattern, HPD/VPD, had to be just right. The fuse was elaborately protected with safety devices to make handling safe and prevent muzzle-bursts.

Everything in the radio part of the nose cone had to be constructed to conform to the shape of the cone itself. The battery consisted of a number of metal plates with an acid electrolyte in a glass vial. Upon being fired from the gun, the vial broke and the electrolyte flowed into the plates so as to provide instantly the voltages required to operate the radio equipment (100 volts for HT, 'A' supply for filaments and 'C' bias for thyatron cut-off voltage).

It goes without saying that a lot of experimenting and hard work went into the design and manufacture of these fuses before they met the 50% success rate demanded by the armed forces. The tubes had to withstand a force of 20,000G when the shell was fired, plus the high rate of spin of the shell as it left the rifled barrel of the gun.

At first, for many of the tests, the failure rate was 100%. Finally, glass was being manufactured which was strong enough not to break, and in fact could be used as a hammer head to drive nails. By the time the war ended, over five million fuses had been made at a cost of \$75 each.

Before the proximity fuse was used in the Pacific, it took thousands of rounds to destroy one aircraft. With new aiming and tracking systems, and the fuse, the rate fell to just hundreds for each aircraft destroyed. In Europe in 1945, the U.S. First Army was claiming 11 rounds for each kill.

Testing the radio sets was done by

having the shells fired vertically and recovered from the sand afterward. Many instances of melted solder, broken wires and crushed rubber gaskets came to light and were corrected through these tests.

During the experimental work and manufacture of the fuses, strict security was maintained and double-talk was the order of the day. At one point, when ordering nose cones (to deceive Nosy-Parkers) the order was placed through John Hopkins hospital and the crates were labelled as Rectal Expanders. ■

Fred VE3HC via
Kitchener-Waterloo Kilowattter

Cool it!

By B.H. Burdsall VE3NB

Some years ago, on the advice of a friend, I bought a Koolatron™ portable cooler for use while travelling in my car.

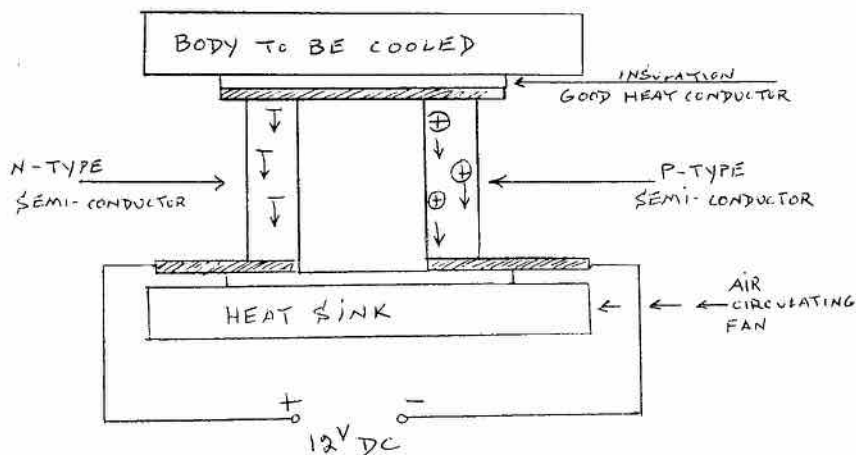
It is great to be able to keep food cold (or hot) and it works on 12V at 4A from the cigarette lighter socket, or from a power supply unit which gives 12V DC from a 110V AC power source.

Thus, one can use it in a motel room overnight, at the cottage, or in the car or boat. By throwing the reversing switch, we can keep food and drinks hot. This is not an advertisement, but an explanation, in the true Amateur spirit, of how the unit works.


Thermo-electric devices such as this unit have been used successfully in

military and aerospace applications for over 25 years. This particular type uses a simple semiconductor Peltier device. The diagram shows a basic unit. There is a large heat sink inside the insulated case and a heat sink outside with an air circulating fan; two pieces of semiconductor material, one is p-type and the other is n-type.

When DC current is applied, charge carriers move through the two materials, causing cooling on the inside heat sink and heating of the outside heat sink. If the current is reversed, the inside heat sink will get hot and the outside one will cool. Ingenious! No wonder I couldn't find the compressor when I opened it up to see how it worked! ■



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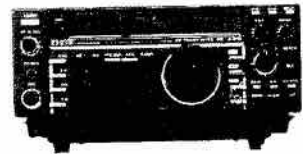
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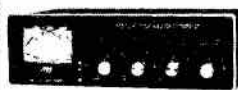


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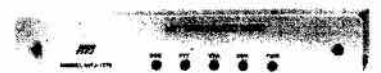
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