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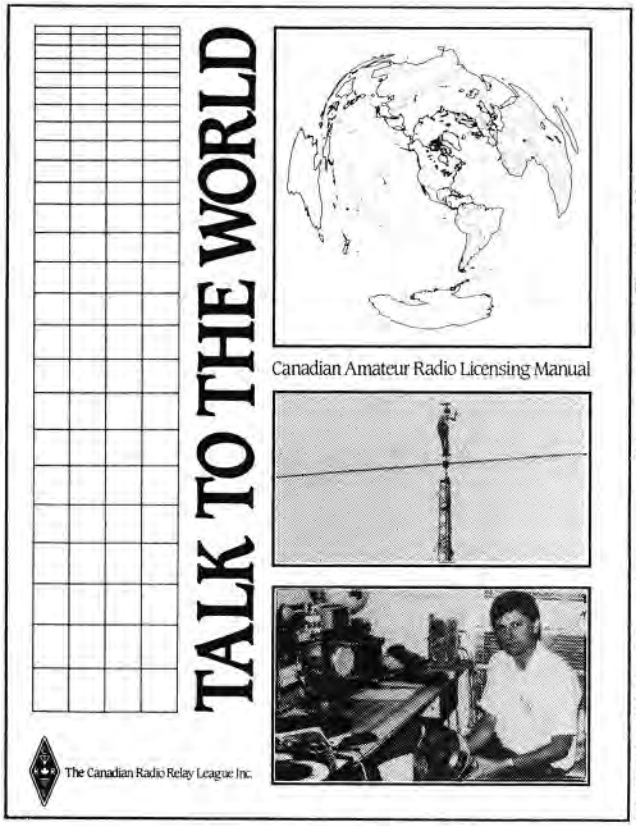

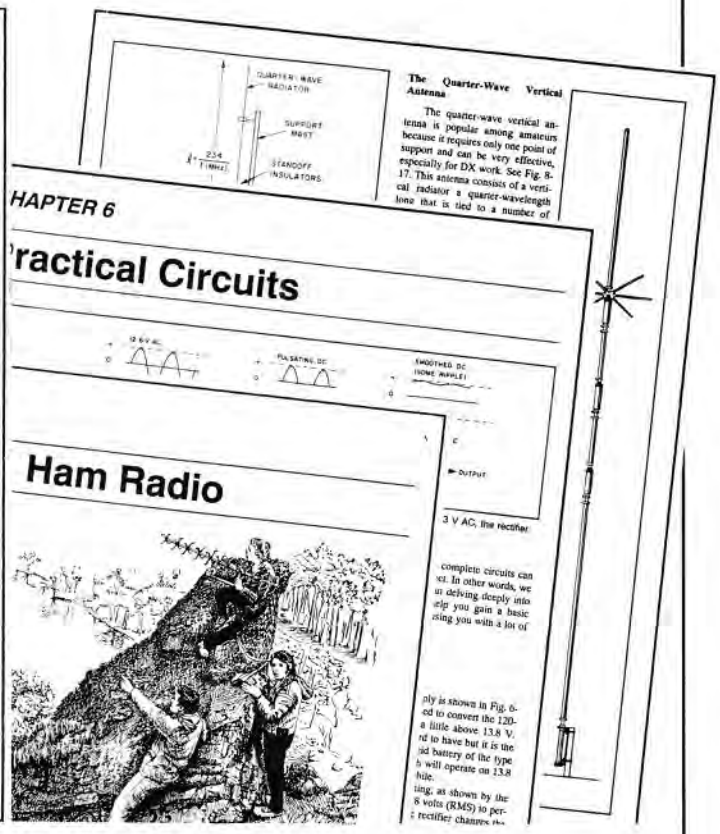

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QST CANADA

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ABOUT THE COVER

Dave Snydal, VE4XN, shakes hands with Fred Hammond, VE3HC, during a recent visit to the Hammond Museum of Radio in Guelph, Ontario. Dave and other Manitoiba amateurs have begun a similar museum in Brandon. ■

It Seems to Us.../Il nous semble...

International QSLing

It is often said that the QSL card is the "final courtesy between amateurs".

For those of you who like to exchange cards, there are basically two routes open to you. You can send a card directly to your contact or you can use a bureau. The first is the quicker way to get a card to its destination. However, it requires a lot of work on your part, and involves some expense. The work starts when you try to find an address. It may not be in a callbook. You may have to search the DX columns in various Amateur Radio magazines to come up with it. When you get the address, it may not be right.

Then there is the cost of postage. If you've confirmed 99 DXCC countries and you've just worked number 100, the trouble and expense of QSLing direct will always be justified. But QSLing direct is no guarantee of a quick response. Every country does not have direct mail service to every other country. Air mail has to change planes just like people. There will be missed flights and delays due to bad weather. If you become impatient while waiting for a card, dig out a map and figure out the path your card will take. Figure transit time, add in a couple of weeks to give your contact time to get around to making out your card, and figure transit time back.

Remember that your contact may have already sent you a card "via the buro". Under the auspices of IARU, the International Amateur Radio Union, IARU member-societies like CRRL sponsor and organize the QSL bureaus in their countries. Not all countries have domestic bureaus. In some countries, there are so few amateurs that bureaus are unworkable. Sometimes, amateurs rely on commercial QSL forwarding systems or clubs to move their cards. For example, cards belonging to CANAD-X members are consolidated by CANAD-X before being given to the CRRL to place into the international system.

Compared with direct mailing, outgoing bureaus offer two advantages and one disadvantage. The major advantage is cost. For the price of a single card sent to a foreign address, a dozen cards can be sent to the bureau. The second advantage is that an address is not needed. All you need is the address of the outgoing bureau. The disadvantage is a major one for some amateurs. Bureaus are slow! It is not at all unusual to see cards for contacts two and three years before still in transit.

That is not to say that such cards have been two and three years in coming. Remember that no card can start its journey until it has been written. For some people, operating is what Amateur Radio is all about. In the time it takes to write a card they can make another contact or two! Many foreign amateurs do have a weekly "quiet time" when operating is not possible. That time is set aside for making out cards. For other amateurs, a monsoon may have to bring down an antenna before they take time to make out cards. An extreme example, but one that illustrates that no one should expect that preparing a card just for them is going to be anyone's high priority.

Once the card is in the QSL system, it is governed by the laws of economics. Canadian amateurs are fortunate to live in a relatively affluent country. Still, this does not relieve CRRL from trying to save members' money by consolidating cards and mailng cards in groups. Don't think that because you didn't want to pay postage to send a single card to a foreign address, the bureau will do it for you!

Let's look at a few examples. Say you work a Soviet station. Your card will be held by the bureau until there are four to five kilograms of cards for the Soviet Union. That takes about four weeks. For Japan, the bureau accumulates the same number of cards in about six weeks. Many other countries take longer.

CRRL has a policy forwarding all cards within four months of receiving them. In a very few cases, this is extended to six months. Under this policy, CRRL's 1989 cost for mailing cards overseas was $4700. Countries with fewer resources may not have such a generous policy. For example, to save money, they may hold cards until they accumulate 20 kilograms before they mail their cards. Bear in mind, too, that with weights in kilograms, bureaus must use surface mail. Transportation is not only longer, it is slower than with air mail.

Once a package of cards has passed a customs examination (this can be a story in itself), the incoming QSL bureaus take over. With a few exceptions, in every country, incoming bureaus are staffed by volunteers, people who give up their time to help other amateurs. But that means if volunteers have a wedding to go to, if *their* last DXCC country comes up on 20, or if they go on vacation or get sick, the bureau closes. Bureaus in each country differ. The size of the country, the magnitude and concentration of the amateur population, available resources and many other factors influence how particular bureaus work. For example, both Japan and West Germany, countries that handle

It Seems... —continued on page 20

Letters/Lettres

Conducted By Harry MacLean, VE3GRO

All letters are considered carefully. Letters are edited and may be condensed in order to have more information and readers' views presented. The publishers of *QST Canada* assume no responsibility for statements made by correspondents.

HIGH SCHOOL AMATEURS

Re "Restructuring: Only the Beginning" (1990 July *QST Canada*), I couldn't agree with you more. I am a science teacher at St Catharines Collegiate, in the process of starting up an Amateur Radio club. I've joined a group called STARS, run by KA4FZI. She did a survey of students in schools that had Amateur Radio programs. The results are fascinating.

There seems to be a great deal of interest in Amateur Radio up to about grade eight, and quite a bit of interest at the university level, but at the high school level—forget it! Apparently, when young people reach a certain age, their hormones take over, and peer pressure and the opposite sex is everything. KA4FZI called it "hormonitis". The results seem to be about the same in every part of North America. High school kids don't want to be involved with clubs and activities like Amateur Radio.

Recently, I gave a talk to a group of "exceptional kids" at our school. These are supposed to be the cream of the crop, the "whiz kids" who play around with IBM clones instead of doing what the rest of their subculture does. My topic: "Talking to the Astronauts via Amateur Radio." There were 25 students in the class, each sitting at an PC. Interest was moderate at first, but after ten minutes, only three or four were still hanging onto every word. The rest had gone back to their PCs.

I talked for over an hour to those who were left. They couldn't get enough of Amateur Radio! I brought along all the League publications I could find, and now I'm willing to bet we will have three or four new amateurs next year.

Just for fun, near the end of my talk, I dropped in a reference to "Donny and the New Kids on the Block". Sure enough, the entire class stopped typing. For thirty golden seconds, the class and I were one!

We have a lot of selling to do. —*Dave Flarity, VE3DVE, Fenwick, ON*

ROMANCE OF AM

I would like to express my appreciation for the editorial written by VE3AUI (1990 June *QST Canada*). Even in 1990, there is still a place for AM. If one can take his reasoning a step further, one can discern what many of us feel is wrong with Amateur Radio today and why the scientifically-inclined high school student

Letters —continued on page 6

Silent Keys——

Conducted By Ray Staines, VE3ZJ

It is with deep regret that we record the passing of these amateurs:

VO1BJ, Andy Burden, Grand Falls, NF
VE2OV, George Henthorn, Louiseville, PQ
VE2VT, Paul Duberger, St-Antone de Till, PQ
VE3AQE, Bob Buckland, Lansdown, ON
VE3DF, Jack Stauffer, Stittsville, ON
ex-VE3DSH, Vic Smith, Welland, ON
VE3EWS. Ed Shields, Sarnia, ON
VE3JEY, Bruce Jardine, Bayfield, ON
VE3RF, Bob Armstrong, Nepean, ON
VE3UX, Bill Halliday, Willowdale, ON
VE5AH, Charles Conner, Saskatoon, SK
VE5HQ, Don Hunter, Saskatoon, SK
VE6JDW, Jim Watkins, Edmonton, AB
VE6RY, Ray Godslave, Edmonton, AB
VE7AC, John MacKay, North Vancouver, BC
VE7BXR, Paul Ross, Mesachie Lake, BC
VE7DJA, Eric Stevenson, Ladysmith, BC
VE7IF, Fred Neveroski, Seton Portage, BC
ex-VE7SE, Jim Elliott, Oyama, BC
VE7VR, Bill Baxter, Vancouver, BC
VE7VT, Don Jones, Victoria, BC

Note: Silent Key reports sent to *QST Canada* must include name, address and callsign of the reporter. To avoid unfortunate errors, reports are confirmed only through acknowledgement from the family of the deceased. Thus, those who report a Silent Key may not receive an acknowledgement from *QST Canada*. ■

The Care and Feeding of NiCads

Inside information from an expert in the business.

By Isidore Buchman
CADEX Electronics
7418 Sixth St
Burnaby, BC V3N 3L5

This article is part advertisement, part product review and part interesting information about NiCd ("NiCad") batteries. We decided to share it with you because the CADEX C2000 is a quality Canadian product that deserves your attention, and because this article offers insights into the characteristics of NiCd batteries that we have not seen elsewhere. —Editor

The performance and reliability of portable radios is steadily improving, but the battery remains a weak link. Unexpected down time, excessive replacement costs and frustration can be the result of unreliable battery performance. This article describes some of the causes of premature battery failures and how they can be avoided.

The NiCd ("NiCad") battery has unique needs that must be met to achieve satisfactory performance. The usable life span of a NiCd, for example, can range from 500 to over 30,000 discharge/charge cycles. This wide variation is related to the way the battery is maintained.

Many applications call for light duty use, followed by a full recharge of the battery. If continued for several months without periodic full discharge cycles, voltage depression or "memory" occurs. Similarly, a battery left on trickle charge for several month is also subject to the "memory" phenomenon.

"Memory" is caused by a crystalline deposit that forms on the plates of the cells. If identified early, the problem is reversible by one or two discharge cycles to 1 volt per cell. This is called exercise. In advanced cases, exercise may not be sufficient to restore the battery, and reconditioning is required. Reconditioning is a controlled deep discharge below the one-volt per cell threshold.

In the following study, four batteries afflicted with various degrees of "memory" were analyzed. The resulting capacities were plotted in the first column of a chart (Fig 1) on a scale of 0 to 120%. Additional charge/discharge cycles were applied (dotted lines) and the resulting capacities were shown in subsequent columns. Solid lines illustrated improvements after reconditioning was applied.

Battery "A" responded well to exercise alone. This response is typical of a battery that has been in service for only a few months or has been exercised periodically. Batteries "B" and "C" required reconditioning to recover full performance. What will be surprising to some is that even the capacity of the new battery increased after reconditioning. When examined after six months of field use, all four batteries continued to show excellent capacity readings.

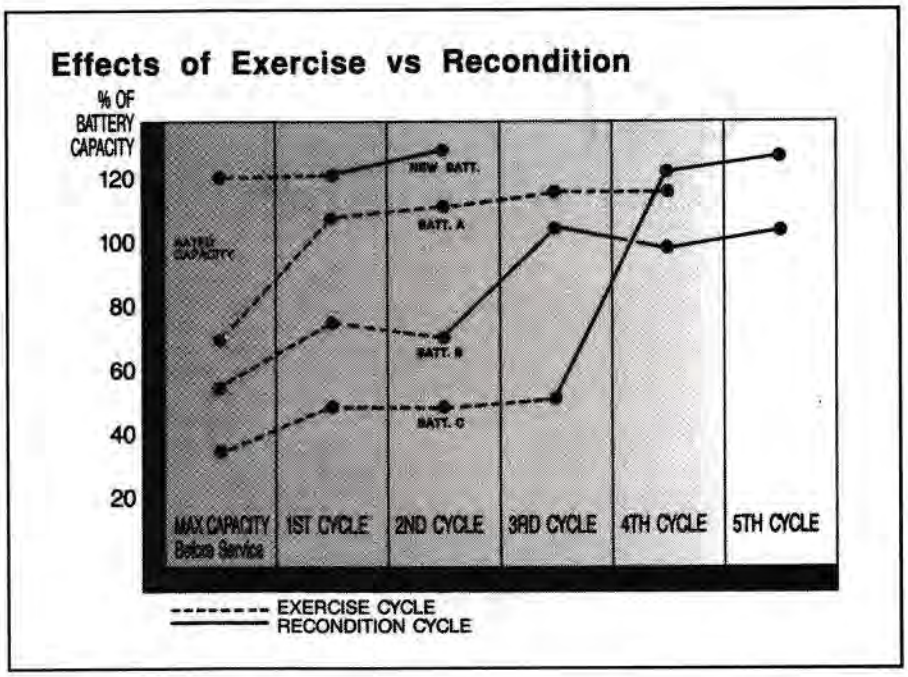


Fig 1—Four NiCd ("NiCad") batteries: the effects of "exercising" and reconditioning.

Proper Maintenance Extends Life

Manual exercise and reconditioning of batteries is awkward and the task is performed best by a battery analyzer. Today's advanced analyzers can identify and reverse the degeneration process automatically. Batteries are serviced with speed, convenience and reliability that can be readily appreciated by today's Amateur Radio operator. One such analyzer is the CADEX C2000, manufactured by our company, CADEX Electronics Inc, of Burnaby, BC (Fig 2).

The CADEX C2000 is a state-of-the art battery analyzer and charger that processes four batteries simultaneously. Each battery station may be factory configured to a different battery type. One of the special features of this battery analyzer is the ability to rejuvenate NiCd batteries affected by "memory". The reconditioning criteria can be set with the "target selector". A high target should be chosen where reliability and adequate reserve capacity are critical. For less stringent applications, a lower setting may be selected. This one step process eliminates trial runs, reduces handling and saves time.

An analyzer like the CADEX C2000 can provide the important first step of preparing new or stored batteries for field use. The analyzer repeatedly exercises the batteries to manufacturer's specifications until optimum performance is reached. The analyzer can identify and indicate a variety of faults, such as mismatched cells, incorrect voltage, soft cells or wrong battery type. Brief on-line explanations of deficiencies are available on user command.

In this kind of analyzer, superior charge performance is achieved with a reverse load technique. The reverse load intersperses discharge currents between charge pulses throughout the charging cycle. This feature achieves a cooler and more effective charge than conventional chargers. The "memory phenomenon" is

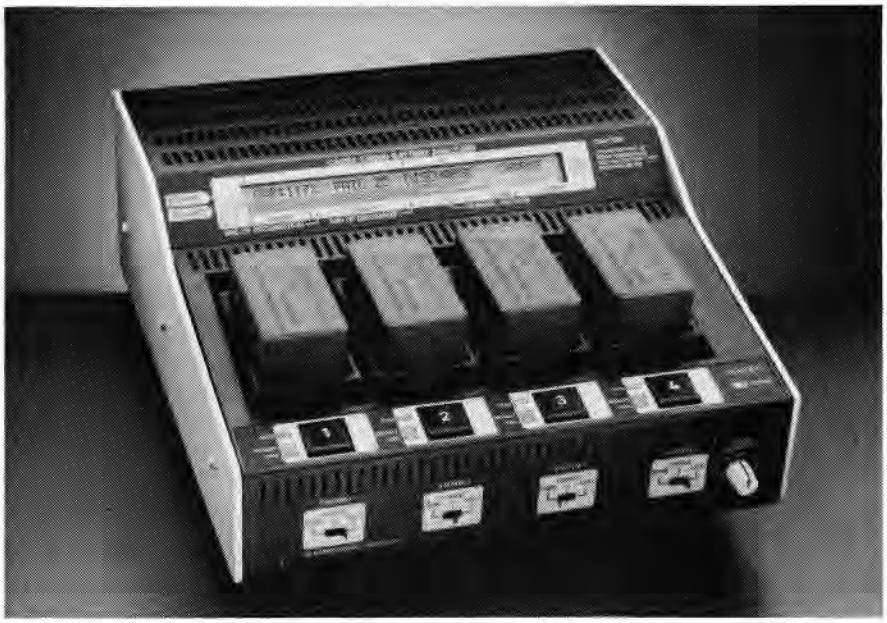


Fig 2—The CADEX C2000: a premium quality battery analyzer and charger.

reduced, as the battery is stimulated while charging, resulting in longer battery life.

As mentioned above, a NiCd battery should not be left on trickle charge for long periods, as degeneration due to "memory" occurs. On the other hand, a battery on the shelf is subject to significant self-discharge. These two characteristics make it difficult to maintain fully charged NiCd batteries on demand.

To accommodate batteries required to be on long-term trickle charge for operational readiness, the CADEX analyzer automatically applies discharge/charge cycles every 30 days to prevent "memory". Only one battery per analyzer is exercised at any one time.

Selecting the Right Battery Analyzer

There is a noticeable trend toward advanced automated battery analyzers. Such systems are becoming an indispensable tool in assuring a high level of confidence in rechargeable batteries. Users are now able to select from a variety of features offered by different vendors.

When shopping for a battery analyzer, the buyer should know what to expect from a lower cost analyzer, and what a unit in the next price class can offer. For example:

1) An analyzer must prevent overcharging of batteries. Some analyzers detect full-charge with the negative slope method only. Batteries with mismatched cells or other defects do not produce an adequate slope to terminate the fast charge reliably. The battery can be overcharged until damaged or destroyed.

2) An analyzer should have the ability to recondition batteries affected by "memory". Without this feature, batteries in advanced stages of "memory" often do not recover with a discharge/charge cycle down to 1 volt per cell alone, and the battery has to be discarded.

3) An analyzer should display the residual as well as the total battery capacities. Thus, problems such as insufficient reserve at the end of a work shift can be identified and corrected.

4) A battery analyzer should indicate the voltage of the battery being tested. This feature allows a user to detect, at a glance, batteries with unusual voltage patterns. The voltage behaviour can best be observed on analyzers with combined graphic and digital readouts.

5) An analyzer should feature a variety of user-selectable programs to meet different needs. Units with sophisticated decision making capabilities are an advantage, as they produce consistently optimal results without user intervention.

6) An analyzer should be quality built to provide many years of rugged use. Heat producing components should be placed away from the test batteries to obtain maximum isolation. It is very important that no external heat is transferred to the battery during service.

7) An analyzer should be easy to use by people with little or no technical background. Capacity readout in percentage is more convenient than in mAh as the user need not be familiar with the mAh ratings of different types of batteries. A non-technical user may prefer a simple "pass/fail" light signal in addition to more detailed information. This feature is especially helpful in multiuser applications, as it helps to distinguish the good batteries from the unserviceable ones at a glance.

8) An analyzer should provide fast service. Typical charge time should be less than two hours; discharge should be at a 1C rate, a nominal 60 minutes. Batteries with faulty cells should be identified quickly to free the slot for other batteries.

9) An analyzer should accommodate a variety of different types of batteries. Universal units that allow setting of voltage and current are ideal for lab, service and amateur use.

When evaluating battery analyzers on cost basis, the buyer should be aware that a higher priced unit not only provides quicker service, but also obtains more effective results in rejuvenating batteries affected by "memory". Even for a low-volume battery user, the added cost of a higher quality unit can pay for itself in a very short time. ■

Calendar

Attention: Deadline for items is the 20th of the second month preceding month of publication. For example, information should reach *QST Canada* by January 20 to be included in a March issue.

Ancaster, ON: Eighth Annual Fleamarket, September 15, at Marriatt Hall, Ancaster Fairgrounds, 625 Highway 53 East. Sponsored by Hamilton ARC. Talk-in on VE3NCF, 146.76 MHz (–), and 146.52-MHz simplex. For more information, contact Hamilton ARC at Box 253, Hamilton, ON L8N 3C8, or Paul, VE3NYC, Tel (416) 664-5247.

Brantford, ON: Fleamarket, August 11 at Woodman Park Community Centre, 491 Grey St. Sponsored by Brantford ARC. Opens 8 a.m., 7 a.m. for vendors. Admission: $3. Tables: $4. Talk-in on VE3TCR, 147.15 MHz (+) or 443.025 MHz (+), and on 146.52-MHz simplex. For more information, contact Don, VE3SIM, Tel (519) 879-6427, or Eric Levison, VE3DSL, 37 Magnolia Dr, Paris, ON N3L 3M9.

Calgary, AB: Sixth Annual Fleamarket, September 15, at Parkhill Community Centre, 4013 Stanley Rd SW. Sponsored by Novatel ARC. Opens 0900. Admission: $2. Tables: $2. Talk-in on VE6NRC, 146.76 MHz (–) and 146.52-MHz simplex. For more information or to reserve tables, contact Novatel ARC at 1020 64th Ave NE, Calgary, AB T2E 7V8.

Dryden, ON: Annual Camp 807, August 3–5 at Aaron Park, Thunder Lake 8 miles from Dryden. Bring trailer or tent. Family-oriented activities: nature trails, swimming, baseball, barbecue. Talk-in on VE3DRY, 147.24 MHz (+). For more information, contact Roy Orvis, VE3BJD, 28 Ingall Dr, Dryden, ON P8N 1N7.

Kelowna, BC: Okanagan Valley Hamfair, September 1–2 at Camp Dunlop, Lakeshore Rd. Sponsored by Okanagan Valley Hamfair Society. Fleamarket, commercial dealers, boat anchor auction, QCWA meeting, contests and forums. Talk-in on Kelowna: 146.82 MHz (–), Vernon: 146.88 MHz (–), and Penticton: 146.92 MHz (–). For more information, contact Orin Beebe, Box 477, Penticton, BC V2A 6K6, or Doug McIntyre, VE7APS, Tel (604) 764-8637.

London, ON: 9th Computer Networking Conference, September 22, at London Regional Art Gallery, 421 Ridout St N. Sponsored by ARRL and CRRL. Registration: $US 20 or $CDN 25, includes luncheon and copy of conference proceedings. Talk-in on VE3TTT, 147.18 MHz (+). For more information, see ad or contact Harry MacLean, VE3GRO, 500 Riverside Dr, London, ON N6H 2R7, Tel (519) 473-1668.

Nanaimo, BC: Ham Happening 1990, September 15, at Nanaimo Curling Park. Sponsored by Nanaimo ARA. Swap 'n shop, dealers, pot-luck dinner, guest speaker, RV parking (no hookups) Talk-in on 145.43 MHz (–) and 146.64 MHz (–). For more information, contact Eva Jantz, VE7NTZ, Tel (604) 758-9199, or Bill Stewart, VE7JY, Tel (604) 758-9752.

Salmon Arm, BC: Mini-Hamfest, September 7–9 at Sunnybrae Hall, 15 km west of Salmon Arm. Sponsored by Salmon Arm Seniors ARC. Estate auction, corn roast, VE7ALV's famous pancakes, dance. Talk-in on 146.76 MHz (–), 146.88 MHz (–) and 147.02 MHz (+). For more information, contact the club at Box 95, Salmon Arm, BC V1E 4N2. ■

An Experiment in Creativity

Putting Winnipeg ARC through its paces.

By W J "Bill" Karle, VE4KZ
94 Brentlawn Blvd
Winnipeg, MB R3T 4Z2

Amateur Radio is an experimental communications service, but many amateurs avoid experimentation. The symptoms are clear. Some claim that they don't have an idea or that others have better ideas. Some borrow an idea, perhaps from a magazine, but shudder at the cost of components. A few have an original idea but can't bring it to life, believing their junk box is too shallow. They rarely pick up a soldering iron. Lack of creativity is the problem.

What does it mean to be creative? It is having imagination, inventiveness, ingenuity, originality. The verb, "to create" means to cause to come into existence. A creation is often unique. Occasionally it is just something reworked in a clever way.

Doug DeMaw's work is creative. He sees a need for something, say a field strength meter. He brings together the best ideas and designs the "best" field strength meter or he makes one in a clever way. An amateur who needs a spectrum analyzer but lacks the $80,000 needed to buy one can be creative. He uses ingenuity to harness an oscillator, a mixer and a TV converter to make one.

Is there a way to unleash one's creative strength? Last year, members of Winnipeg Amateur Radio Club participated in an exercise. The object was to invent something useful from a collection of everyday things. In doing so, they discovered their creative power—and a technique to release it.

The method was to divide club members into teams of four to five. Each team was given one bag of items. There were three rules: use only the items provided; make sure that every member of the group contributed to the activity; observe the time limit of 30 minutes.

What was in the bag? Rubber bands, paper clips, thumb tacks, tinkertoy spools and sticks, a block of wood, a slip of paper, a piece of aluminum foil, plastic used to join soft drink cans, screws, nails and twist-ties. None of this was "electronics stuff". Commonplace items forced everyone to think about the items, how they were supposed to be used and how they might be used creatively.

The members tinkered. Laughter and groans marked the first few minutes. "How can we make something useful from this junk?" Then the room became quiet. The thinking caps were on. A hubbub arose as individuals promoted an idea to others on their teams. Another lull ensued as teams mulled over the best way to use their resources, especially time, since half of it had now slipped away. Teams assembled their creations.

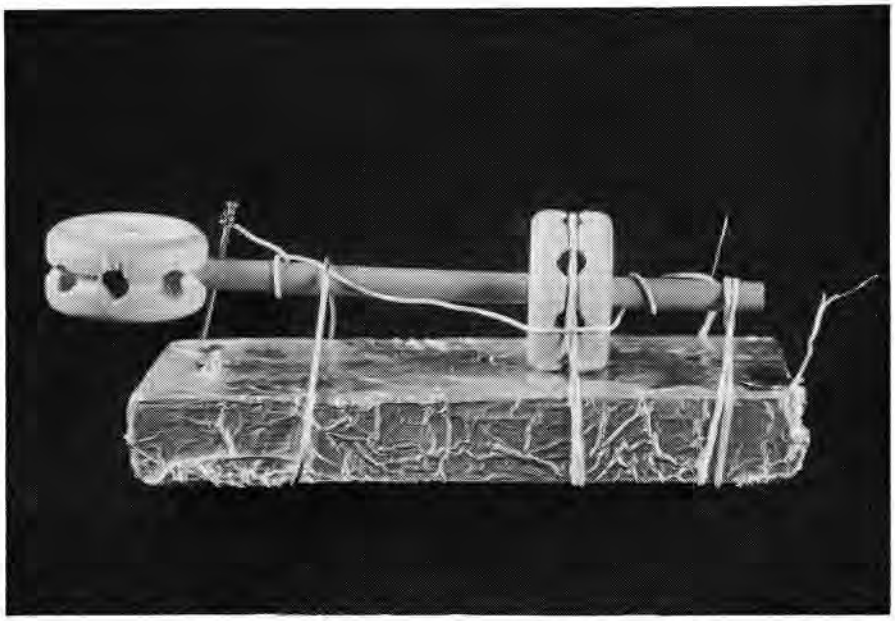


Fig 1—A straight key: Winnipeg ARC creativity at work. *(Photo by the author)*

With the calling of time, each contrivance was brought forward. A member from each team recounted why the team had done what it had with its resources. Creations ran the gamut from everything still in the bag, but labelled with the slip of paper reading "Garbage Bag", to a GHz antenna that might have worked and a straight key that really did (Fig 1).

Club members demonstrated creativity by showing imagination, originality and ingenuity, and they brought some clever and wonderful devices into existence. They had used problem-solving techniques to boost their creativity. Over and over, they had asked themselves these questions: What do I have to do? What can I do it with? How can I do it? Is there a novel way of using what I have on hand? Now that it's done, is it OK, does it work, does it really do what I want?

There are still many Amateur Radio frontiers: UHF, microwaves and EME. There is always a lot of fixing up to do in Amateur Radio: keeping equipment working properly or getting it to work more conveniently. Ideas abound in Amateur Radio literature and in our imaginations, and there's no lack of experimentation that can be done. There is a need to look at old problems in an inspired way. Parts are available through purchase, scrounging and cannibalizing. Unlocking your creativity can put experimentation back into the Amateur Service. ■

ABEGWEIT AWARD UPDATE

Dave Smith, VY2CW, President of Prince Edward Island Amateur Radio Association (PEIARA), has asked us let you know that a generic QSL card printed by a local Department of Tourism carried some incorrect information about PEI's Abegweit Award. The QSL card stated that contacts only after 1989 January 01 are valid. In fact, all contacts after 1960 January 01 are valid.

To qualify for the Abegweit Award, VE1s, VO1s and VY2s must contact station in each of PEI's three counties. Other Canadian and all US must stations contact any three PEI stations, DX any two PEI stations. Send log, certified by two other amateurs, and $5 or 10 IRCs to the PEIARA Awards Manager, at Box 1232, Charlottetown, PEI C1N 7M8. ■

Letters —continued from page 2

of today is so difficult to draw into our hobby.

The more intelligent one is, the more one seeks richness and intrigue out of life's experiences. There is no magic or thought required to purchase a solid-state transceiver and put it on the air as one would operate a toaster. Now, anyone can get radio communications by buying a cellular phone at Radio Shack—no licence is required. Why would anyone looking for a stimulating technical hobby choose Amateur Radio?

The true magic of Amateur Radio is taking a pile of inert components and fashioning a device that can provide worldwide communications: a transmitter, a receiver, even an antenna tuner. In our relentless pursuit of spectral efficiency and the latest commercial equipment, we have forgotten that Amateur Radio is a fun way to learn about an otherwise dry technical field. We have designed out the magic. In our race to justify our existence and our bands by trumpeting our ability to provide public service, we have overlooked the fact that Amateur Radio should be a fun hobby with an element of excitement.

I challenge anyone to visit a high school class with an old Johnson Ranger and the latest two-metre handheld. See which is most interesting to the kids. There is nothing wrong with learning electronics through the restoration of an old tube-type rig. Ohm's law, the rules for impedance transformation and the like will still apply when one moves on to more up-to-date technology.

I am employed as a telecommunications technician. I work daily on the latest 50-MHz 32-bit computers. I am involved with digital voice transmission, high-speed microwave networks and fibre optics. No one can say I'm a technical reactionary. Last fall, I completed building a 1-kW plate-modulated AM transmitter with audio equalization, 810 and 340TL tubes and all. When I light up that transmitter and get on 75 on a snowy evening, I get a thrill that nothing built by Intel could ever duplicate.

After all, real radios glow in the dark. *—Bill Kleronomos, KDØHG, Lyons, CO*

WANTS EXCHANGE

Following a letter in RSGB's *Radcom*, I was able to exchange my house, car and facilities with an English amateur for the European summer of 1989. I wonder if a Canadian amateur, perhaps in the Vancouver area, would be interested in a similar exchange for 1991. Bribie Island has shopping, golf and beautiful beaches. It is connected to the mainland by bridge and is one hour's drive from Brisbane. *—Don Crowley, VK4GP, 11 Tully St, Bribie Island, Queensland, Australia 4507* ■

Update: Defence of Amateur Radio Fund

The Defence of Amateur Radio Fund has been created to help IARU protect our amateur frequencies at WARC-92. Up for review: 3–30 MHz, 500 MHz–3 GHz, and 12.7 GHz and above. The fund, now independent of CRRL, is chaired by Tim Ellam, VE6SH. It currently stands at over $7000. Read the IARU column in 1990 May *QST Canada*. A WARC is coming and your support is vital. Please send your contributions to DARF, Defence of Amateur Radio Fund, Tim Ellam, VE6SH, 107 Strathearn Rise SW, Calgary, AB T3H 1R5 (Do not use the old Box 56, Arva, ON address.)

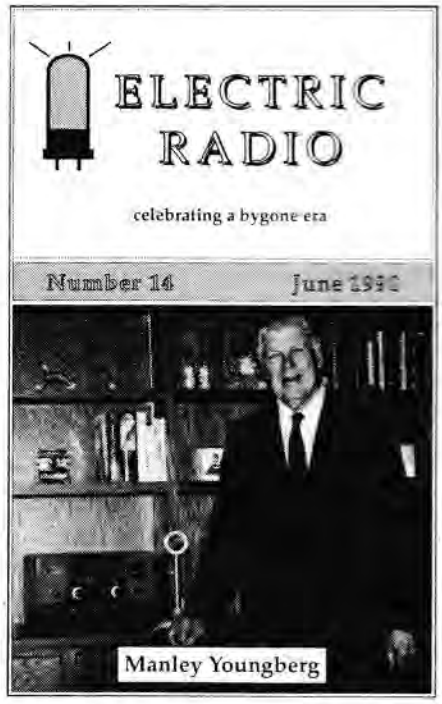
The Defence of Amateur Radio Fund thanks the following for their recent contributions: Graham Williams, VE3ST; Keith Cockburn, VE7ACR; C Ahrens, VE3BRQ; Jerry Shack, VE6CNR; Roy Taylor, VE3AHY; Len Heal, VE3BQL, John Halifax, VE3DTE; Malcom Hamon, VE3KXH; Charles Pierce, VE3JHI; B Hiltz, VE3REX; C Tooher, VE3TJL; Bert Morgan, VE3XX; Keith Lacey, VE6BLF; Gus Murchildon, VE7GUS; Cowichan Valley ARC, VE7CVA; Scarboro "Satellites"; anonymous Skywide ARC members; Tom Bruce, VE3BFT; Ray Hunter, VE3UR; members, North Shore ARC; Robert F Brown; Bob Browning, VE3EEM; J A Jemson, VE7GUT, Anthony Williams, VE2TAW.

The following have contributed $50 or more: Vince Thorneycroft, VE1ACK; E Schafer, VE6RU, Ken Andras, VE3UU; Orchard City ARC (Kelowna); E C Skowby, VE3PE; J W Ibey, VE7DFY.

The following have contributed $100 or more: Mississauga ARC; Gizeh Temple Communications Unit; Steve Leitch, VE3WIT; Tom Atkins, VE3CDM; Skywide ARC; Seaborn Allbright, VE3OBS; VE2RM Amateur Radio Club; Art Ashton, VE3OZA; Lambton County ARC.

The following have contributed $250 or more: Noel Eaton, VE3CJ. ■

ELECTRIC RADIO



We'd never heard of this magazine before, but early in June we got a call from the editor, Barry Wiseman, N6CSW/Ø. It seems that Eddy Swynar, VE3CUI, and someone in VE6-land had sent him a copy of VE3AUI's editorial, "The Romance of AM Phone" (June *QST Canada*), and Barry wanted to publish it.

That's what *Electric Radio* is all about: CW, AM phone, classic radio equipment and the people who use it. Recent articles include reviews of the Hallicrafters SX-28 and Hammurlund Super-Pro, and a story on Manley Youngberg, Chief Engineer for E F Johnson. There's an "Electric Radio in Uniform" column, a restoration column by VE3CUI, and pages and pages of classified ads. *Electric Radio* is not cheap. Twelve 40-page issues to a Canadian address cost $US 32. But if you're into old gear, as many of us are, trying to recapture the fun of our youth, *Electric Radio* is a must. The address is Box 139, Durango, CO 81302. Tell them we sent you. *—Harry MacLean, VE3GRO* ■

Tech Topics—continued from page 17

shoulder allowed the F-59 to fit perfectly.

To install the coax, I trimmed off 12 mm of outer insulation and 5 mm of shield braid. This exposed 2 mm of center conductor. I tinned the center conductor and the braid. Appearance of the final job was important to me, so I slid a 15-mm length of 3/8-inch heat-shrink tubing onto the coax. I also remembered to slide the F-connector back onto the coax before soldering the center conductor to the BNC connector center pin. The F-59 was slid into place and screwed tightly into the BNC. After soldering the coax braid to the F-connector, the heat shrink tubing was used to cover the exposed braid. It was shrunk to size with the wife's hair dryer.

The results speak for themselves. There is no radiation from the connectors, and attenuators can knock the signal well below my receivers' noise floors. With this method, several BNC chassis connectors can be placed close together without interaction. They even look professional! *—David McCarter, VE3GSO* ■

IC-765 $3799

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

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THE ULTIMATE
150 W. ALL BAND
HF TRANSCEIVER

IC-901 $1399 SALE!

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MULTI-BAND
TRANSCEIVER

2 METER AND 440 MHz
EXTRA-LARGE MULTI COLOR LCD
HM14 TOUCH TONE MICROPHONE

Heil Sound
Dual-10 Microphone $189

The Dual-10 microphone contains both the Heil HC-5 and HC-4 key elements. A tiny bat handled switch located above the push-to-talk slide switch on the Dual-10 allows the operator to select either the full response HC-5 for normal ragchew contacts or the HC-4 for the DX pileups. The Dual-10 is shown here mounted on the MA-1 boom assembly for hands-free operation.

A Models 25 WATTS
H Models 100 WATTS

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

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IC-3220A 25W 2M/440---$819
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Icom's new smaller mobile 2M and DualBanders.
Only 5.5"W by 1.6"H.
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2m, 440 MHz
SALE $899

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440 MHz MOBILE

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HF ALL BAND COMPACT TRANSCEIVER

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FT-1000 $4799
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- Direct Keyboard Frequency Entry
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- 2.3 Watts Output
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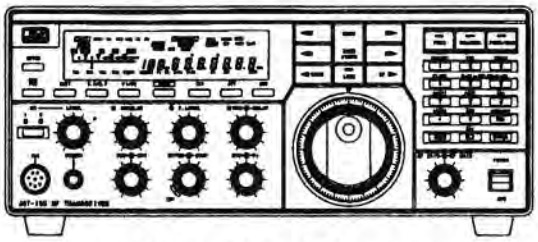

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Feature Highlights!

150 watt continous output.
Built-in antenna tuner with new fast-tune circuit.
Three digital peak-reading meters with peak-hold.
99 memories which store frequency, mode, filter and tone info.
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Electronic keyer.
Plus all the features of the popular TS940!

TS950S. The base model includes the electronic keyer, antenna tuner and power supply. **$CALL.**
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Hobbytronique Inc.

Happenings/Evénements

Conducted By Harry MacLean, VE3GRO

Notes from All Over

ELECTION REMINDER

To all CRRL members: Last month in this column, you were solicited for nominating petitions pursuant to an election for Regional Director in each of the seven CRRL Regions across Canada. Nominating petitions will be received at CRRL Headquarters in London, Ontario, until 1200 EDT, 1990 August 17. For full details, see 1990 July *QST Canada*, or contact CRRL Headquarters. —*William Loucks, VE3AR, Secretary, CRRL*

ACROSS CANADA

❒ DOC has issued a notice in the *Canada Gazette, Part 1*, asking the public to identify shortcomings in the Radio Regulations. CRRL will ask the Minister of Communications to follow through on a long-standing commitment to regulate the RF susceptibility of non-radio electronic products. The new Radiocommunications Act gives the Minister power to create RF-susceptibility regulations—a power he did not have under the old Radio Act.

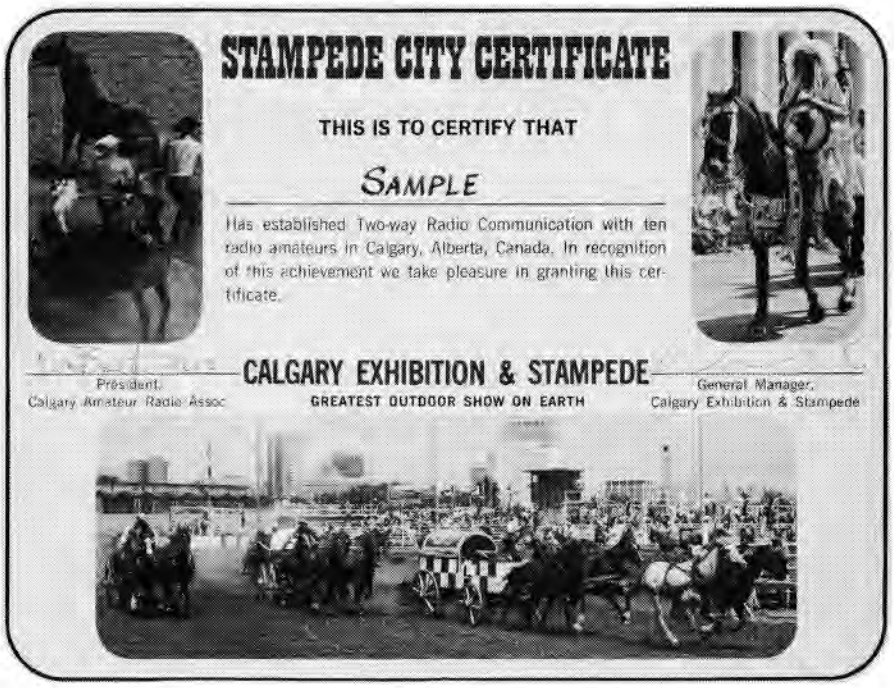
❒ On June 15, IPARN, the Inter-Provincial Amateur Radio Network, came up on Anik C2, beginning a permanent presence on this satellite. The initial linkup was between a BC network covering the BC lower mainland as far north as 100 Mile House in the Southern Caribou, and Alberta's SARA system covering Calgary, Lethbridge, Medicine Hat, Brooks, Red Deer and east to the Saskatchewan border.

❒ An Ottawa businessman was recently fined $200 for operating Amateur Radio equipment without a licence.

DIGITAL DEVELOPMENTS

❒ What's just around the corner for Amateur Radio? According to speakers at this year's Dayton Hamvention®, it's Digital Signal Processing (DSP) where microprocessors take analog signals (voice, CW or images), convert them into numbers, manipulate those numbers for a specific purpose such as eliminating QRM, and convert the numbers back into analog signals to go to speaker or screen. Since the processing is done with software instead of filter components like inductors or capacitors, DSP will eliminate the need to buy new hardware to improve signal quality. Instead, you just load in the latest and best signal processing software!

❒ The *Globe and Mail* and other Canadian newspapers have been carrying stories about a digital technology that will eventually replace conventional AM and FM broadcasting. From what we can gather, various "stations" will share a single transmitter. Each station's programs of news and music will be encoded onto a single carrier using digital techniques. Each transmitter will broadcast several stations' programs simultaneously. Receivers will decode these transmissions and give listeners a choice of programs. What are the advantages of this new technology? Sound quality equal to the best compact discs with no interference or fading. How long before the technology is in place? Optimists say within ten years, after which conventional AM and FM broadcasting will be phased out. What frequencies will be used? Indications are vague, but seem to point to frequencies above 1 GHz. Apparently, several jurisdictions including Canada are going to WARC, the World Administrative Radio Conference to be held in Spain in 1992, seeking spectrum for this new technology. Let's hope they don't want *our* frequencies, and does this mean we'll get our 200-metre band back?



Here's a new piece of wallpaper for your shack! To qualify for the Calgary Stampede Award, make ten contacts with amateurs living in Calgary. Contacts with members of Calgary Amateur Radio Association (CARA) living outside of Calgary also count. A contact with CARA club station, VE6AO, counts for two contacts. Contacts may be made on any band, using any mode. Contacts must be made after 1962 January 01. Send log information only (don't send QSLs) to CARA, Box 592, Station M, Calgary, AB T2P 2J2. There is no charge for this award.

US AMATEUR FINED

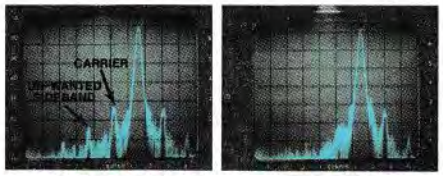
❒ According to *W5YI Report*, Michael Harrison, WB2PTI, has been fined and imprisoned for mail fraud. In the fall of 1988, Harrison placed ads in *73 Magazine* declaring that the defunct Atlas and Dentron radio companies were back in business and offering Uniden 10-metre transceivers at extremely attractive prices. Dozens of amateurs including at least one Canadian—CRRL has the complaint on file—sent money to Harrison but received nothing in return. Harrison must now serve 21 months in prison followed by three year's probation. He must also pay a $125,000 fine and a $1,210,000 confinement fee, and make full restitution to his victims, including interest.

UK NOVICE LICENCE

❒ UK's Department of Trade and Industry (similar to our DOC) recently announced an new UK Novice licence. At present, the UK has two classes of licence: a no-code Class B licence offering VHF-UHF privileges after passing a written test, and a Class A licence offering additional HF privileges after passing a 12-wpm code test. The Novice licence will further simplify entry into the UK Amateur Service. A written test will give low-power privileges on portions of the 50, 430, 1240 and 10,000-MHz bands. A 5-wpm code test will add low-power privileges on portions of the 1.8, 3.5, 10, 21 and 28-MHz bands, including phone on 1.8 and 28 MHz. The new licence will be implemented next spring. ■

DSP
Digital Signal Processing

Digital Signal Processing



Without DSP | With DSP

TS-950SD

"DX-clusive" HF Transceiver

The new TS-950SD is the first Amateur Radio transceiver to utilize Digital Signal Processing (DSP), a high voltage final amplifier, dual fluorescent tube digital display and digital meter with a peak-hold function.

• Digital Signal Processor. DSP is a state-of-the-art technique that maximizes your transmitted RF energy. Your signal stands out because it is much more pure than your competition! You can even tailor your transmitted CW or voice signal waveshape!

• Dual Frequency Receive Function. The TS-950SD can receive two frequencies simultaneously. The sub-receiver has independent controls for frequency step size, noise blanker, and AF gain and its own digital display!

• New! Digital AF filter. Synchronized with SSB IF slope tuning, the digital AF filter provides sharp characteristics for optimum filter response.

• New high voltage final amplifier. 50 V power transistors are used in the 150 W final section, resulting in minimum distortion and higher efficiency. Full-power key-down time exceeds one hour.

• New! Built-in microprocessor controlled automatic antenna tuner. The new antenna tuner is faster and you can store the settings in memory! (Manual override is also possible.)

Transmit the ultimate signal.

• Outstanding general coverage receiver performance and sensitivity. Kenwood's Dyna-Mix™ high sensitivity direct mixing system provides incredible performance from 100 kHz to 30 MHz. The Intermodulation dynamic range is 105 dB.

• *Multi-Drive Band Pass Filter* (BPF) circuitry. Fifteen band pass filters are available in the front end to enhance performance.

• High performance IF filters built-in. Select various filter combinations from the front panel. For CW: 250 and 500 Hz, 2.4 kHz for SSB, and 6 kHz for AM. Filter selections can be stored in memory!

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• Built-in TCXO for highest stability.

• Built-in electronic keyer circuit.

• 100 memory channels. Store independent transmit and receive frequencies, mode, filter data, auto-tuner data and CTCSS frequency.

• Digital bar meter.

Additional Features: • Built-in interface for computer control • Programmable tone encoder • Optional VS-2 voice synthesizer • Built-in heavy duty AC power supply and speaker • Adjustable VFO tuning torque • Multiple scanning functions • MC-43S hand microphone supplied

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Complete service manuals are available for all Kenwood transceivers and most accessories.

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Many of you are familiar with Kenwood's new HF transceiver, the TS-950SD. This new rig has generated excitement among serious hams. Kenwood Engineering has extended itself to the forefront of digital technology. The digital signal processing unit allows the TS-950S Digital HF transceiver to deliver unmatched communications performance.

In celebration of our 10th Anniversary in Canada, we would like to offer to all Canadian purchasers of a TS-950SD or TS-950S, a quality leather jacket. It has the 10th Anniversary logo embroidered on the front. This offer is valid only on *new* purchases through authorized Kenwood dealers in Canada, effective July 1, 1990, until September 30, 1990. Please contact your local dealer for further details. ■

THE CRRL BOOKSHELF

STUDY MATERIALS		Non-Member	Member	Postage	Stock#	✓
Talk to the World		$20.00	$18.00	$1.00	102	☐
Canadian Amateur Licensing Manual		18.75	17.00	.50	100	☐
Canadian Amateur Question Bank		10.00	9.00	.75	112	☐
Canadian Amateur Code Tapes	(OT)	38.00	34.25	2.50	200	☐
Canadian Advanced Question Bank		10.00	9.00	.75	116	☐
Banque de questions première		10.00	9.00	.75	113	☐
Banque de questions superieur		10.00	9.00	.75	117	☐
First Steps in Radio, W1FB		8.00	7.25	.75	470	☐
Premier pas en radio, W1FB		8.00	7.25	.75	F900	☐
Operating an Amateur Radio Station		1.25	1.25	1.25	300	☐
Help for New Hams		12.50	11.25	1.00	475	☐

CRRL INSIGNIA						
Lapel Pins	(OT)	3.00	3.00	.75	130	☐
Large Cloth Diamond (5")	(OT)	3.00	3.00	.75	141	☐
Small Cloth Diamond (3")	(OT)	2.00	2.00	.75	151	☐
ARES Circular Patch (4")	(OT)	4.00	4.00	.75	161	☐
Set of 3 CRRL Logo Decals	(OT)	1.00	1.00	.75	180	☐

OTHER					
Fifty Years of ARRL	5.75	5.25	.75	460	☐
From Spark to Space	25.00	22.50	1.00	465	☐
Gil (cartoon collection)	6.25	5.75	.75	860	☐
Night Signals (adventure)	6.25	5.75	.75	856	☐
Tompkins Adventures (6 books)	30.00	27.00	1.50	855	☐
200 Metres and Down	10.00	9.00	.75	560	☐

OPERATING AIDS						
1990 North American Callbook	(OT)	35.00	31.50	2.50	721	☐
1990 International Callbook	(OT)	37.50	33.75	2.50	711	☐
Chicken Junction Directory	(OT)	15.00	13.50	1.50	780	☐
1990 Repeater Directory	(OT)	7.50	6.75	1.50	194	☐
Log Book (pack of 3)	(OT)	10.00	9.00	2.00	122	☐
Super Log Book (pack of 3)	(OT)	17.00	15.00	2.00	126	☐
Radiogram Forms	(OT)	2.50	2.25	1.50	171	☐
Grid Locator for North America	(OT)	2.00	1.50	1.00	800	☐
DXCC Countries List	(OT)	2.00	1.50	1.50	812	☐
1990 Net Directory	(OT)	2.00	1.50	2.00	824	☐
ARRL World Map	(OT)	14.00	12.50	2.50	840	☐
Callbook Prefix Map of the World	(OT)	8.50	7.75	*3.50	RA10	☐
Callbook Prefix Map of N America	(OT)	8.50	7.75	*3.50	RA11	☐
Callbook Great Circle Map of World	(OT)	8.50	7.75	*3.50	RA12	☐
Callbook *folded* Map of the World	(OT)	6.50	6.00	1.00	RA10F	☐

ANTENNA BOOKS	Non-Member	Member	Postage	Stock#	✓
ARRL Antenna Book	$22.50	$20.50	$1.50	411	☐
RSGB HF Antennas for All Locations	19.00	17.00	1.00	330	☐
Antenna Compendium #1	12.50	11.75	1.00	420	☐
Antenna Compendium #2	15.00	13.50	1.00	421	☐
Antenna Notebook, W1FB	12.50	11.25	.75	405	☐
Novice Antenna Notebook, W1FB	10.75	9.75	.75	425	☐
Antenna Impedance Matching	19.00	17.00	1.00	450	☐
Yagi Antenna Design	19.00	17.00	1.00	630	☐
All About Cubical Quad Antennas	12.50	11.25	1.00	RP110	☐
All About Vertical Antennas	13.75	12.50	1.00	RP120	☐
Simple, Low-Cost Wire Antennas	15.00	13.50	1.00	RP140	☐
Transmission Line Transformers	12.50	11.25	.75	880	☐

OPERATING				
Operating Manual	19.00	17.00	1.50	522 ☐
Complete DXer, 2nd edition	16.00	14.50	.75	441 ☐
Low Band DX	12.00	11.00	.75	890 ☐
Low Band DX Software (available for many computers; send SASE for prices)				

TECHNICAL				
1990 ARRL Handbook	29.00	26.00	2.00	495 ☐
ARRL Electronics Data Book	15.00	13.50	.75	516 ☐
Radio Frequency Interference	6.25	5.75	.75	532 ☐
Solid State Design	15.00	13.50	1.00	551 ☐
Hints and Kinks, 12th edition	10.00	9.00	.75	512 ☐
QRP Notebook, W1FB	8.00	7.25	.75	590 ☐
Transmitter Hunting	24.00	21.50	1.00	390 ☐

VHF-UHF				
All About VHF Amateur Radio	15.00	13.50	1.00	RP130 ☐
Satellite Anthology	10.00	9.00	.75	700 ☐
Satellite Experimenter's Handbook	12.50	11.25	.75	540 ☐
Space Almanac	27.50	25.00	1.50	705 ☐
Microwave Handbook, Vol. 1 (RSGB)	44.00	40.00	1.00	345 ☐

PACKET AND COMPUTERS				
AX.25 Packet Protocol	10.00	9.00	.75	430 ☐
Gateway to Packet Radio, 2nd edition	16.00	14.50	.75	901 ☐

***Callbook Maps–A Special Note:** Callbook maps (rolled versions only) ordered together can be shipped together. Add $3.50 postage only once on orders of two and three Callbook maps.

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How to order: Please check (✓) the box at the end of the line for each item you want. Add costs and the amounts shown for postage. Enclose your personal cheque or money order for the total amount of the order. **Ontario residents: Add sales tax on total of costs and postage for all items marked (OT).** Thank you.

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(Signature)

Section News/Nouvelles des Sections

Conducted By Jack Strangleman, VE3GV

The CRRL Field Organization Forum

SECTION MANAGER ELECTION NOTICE

To all CRRL members in the Quebec and Saskatchewan Sections: You are hereby solicited for nominating petitions pursuant to an election for Section Manager. Nominating petitions will be received at CRRL Headquarters until 1600 EDT, 1990 September 07. Because of space limitations, the full election notice will not be reproduced here. For full details, see 1990 July *QST Canada*, or contact CRRL Headquarters.—*Jack Strangleman, VE3GV, Field Services Manager*

REPORTS FOR MAY 1990

Alberta: SM/STM/DEC: Bill Gillespie, VE6ABC; ASM: VE6AMM; SEC/TC: VE6AFO; OO: VE6TY. On May 24, about 36 amateurs took part in an emergency exercise with the City of Edmonton. The scenario was an aircraft downed in the city at 6 p.m. Amateurs operated from the site of the disaster, from major hospitals, and from police headquarters. The exercise was most beneficial to all concerned. The annual Jasper-Banff Relay Race is now history. Amateurs are looking forward to Field Day and the Red Deer Picnic on June 15–17. 80-metre band conditions are still very poor. As a result, stations checking into nets are at a minimum.

British Columbia: SM/SEC: Ernie Savage, VE7FB. British Columbia Public Service Net Manager, Ford, VE7DDF, reports high: 172, low: 93, and total: 4045. British Columbia Emergency Net Manager Ferdi, VE7EJU, reports QNI of 618 and QTC of 278—up 18 over last month. Let's keep this increase going. It looks good. Jim, VE7KNM, and Howie, VE7CNW, are both in the hospital with heart problems. Claire, VE7IBK, XYL of Reg, VE7BAF, recently obtained her ticket. Both attended the Yakima (Washington) Hamfest, and Claire won first prize—an Icom IC-725 all-band rig. Congratulations!

Manitoba: SM: Jack Adams, VE4JA; ASM:VE4IX; SEC: VE4TM; ATC: VE4ADP; NMs: VE4LB, VE4IX, VE4TE. Congratulations to Bill, VE4JR, on his election as Manitoba Section Manager. I still have one more month to report but I take this opportunity to thank all those who made up my Section group over the last eight years and ask that you continue doing a great job with Bill as your Section leader. Thanks to Keith, VE4KK, Orville, VE4OAH, and Tony, VE4TY, on a great job of handling communications for the recent Lions' Bikeathon. I am sure your services were appreciated. Tony, our local Kentucky Fried Chicken owner, is our newest amateur, a great asset to Dauphin ARC and the amateur fraternity. Tony is an "old" dispatcher for the railways. He has a great "fist". With restructuring scheduled for October 1, take time and encourage those who want to become amateur operators to learn the Morse code. Also teach them how to make deals on Amateur Radio equipment without their spouses knowing. Dauphin ARC held its first fleamarket at the Selo Ukrainian site on May 26. It was a beautiful location, but with the nice weather, everyone was doing other things like seeding. While organizers did not get the turnout they expected, those who attended fully enjoyed themselves. A great job by those who took time to organize this event. Have a great summer, drive carefully and limit those 807s and 813s while motoring!

Reports invited: CRRL Section Managers (SMs) and their Section-level assistants coordinate traffic handling, emergency communications and bulletin service across Canada. Your SM (name and address appears on page 2 of this *QST Canada*) welcomes reports of individual and club activities for publication in this column. Activities do not have to be related to the CRRL Field Organization or to CRRL.

Maritimes-Newfoundland: Acting SM: Carl Anderson, VE1UU; STM: Mel Lever, VE1VX; BM: Brent Taylor, VE1JH. I attended the 1990 meeting of the CRRL Board of Directors held on May 12–13 in Toronto. After a day and one-half of meetings, it was a pleasure to visit Guelph, Ontario, to meet Fred Hammond, VE3HC. Fred gave several of us a guided tour of his Museum of Radio, located in one of the Hammond Manufacturing plants in Guelph. If you are ever in that area, reserve a couple of hours to see Fred's superb collection of broadcast and Amateur Radio equipment and memorabilia. Thanks to Wally Garrett, VE7CJT/VE7QST for inviting me to a Burnaby ARC meeting while I was in Vancouver. I met many club members including CRRL Pacific Director Dave Fancy, VE7EWI, whom I'd just met at the board meeting. The Islands-on-the-Air (IOTA) official *Directory of Islands* includes several Newfoundland-Maritimes island groups that count towards the IOTA awards. Unfortunately, these island groups are seldom heard on the air. They include Belle Isle, Grand Manan (including Campobello, Deer, Long and Brier), LaHave (including Tancook), and Miscou (including Lameque). Amateurs interested in mounting DXpeditions to any of these can read about IOTA in Garry Hammond, VE3XN's HF column, in 1988 August *QST Canada*. Brent Taylor, now VE1JH, described the VE1MUF Miscou Island DXpedition in Garry's 1988 October column, and Reg Beck, VE7IG, wrote about the Green Island IOTA DXpedition in 1990 February *QST Canada*. Contact IOTA through Reg or Garry. Also, if you are a VO1, VY2, VE1 on PEI, or live on Cape Breton Island, Ile Madame or any of the "rare ones" listed above, remember that IOTA award seekers would like to work you. Try calling into their net at 1300 UTC, 14260 kHz on Saturdays or 21260 kHz on Sundays. To these people, you are as valuable as a new DXCC country. Bob Morrison, who recently became trustee of the special CRRL call, VY2QST, recently got his Advanced. However, if you work VY2QST during August 4–12 of this year, the operator will likely be ARRL Executive Vice President Dave Sumner, K1ZZ, who will be using the call while vacationing on PEI.

Ontario: SM: Larry Thivierge, VE3GT; BM: VE3GSA; SEC: VE3GV; STM: VE3CYR; TC: VE3EGO. Scarborough ARC has reached a milestone by completing 25 consecutive years of participation in its own version of ARRL's Novice Roundup CW Contest. Two beautiful trophies, designed and assembled by VE3FCE and VE3FOE, were awarded to this year's winner, VE3ILE, and runner up VE3HR. Other prize winners in the contest were VE3CNA, VE3HFM and VE3JNL. In the Niagara Peninsula area, VE3PDX is the two-metre repeater for DX information. It operates in 147.345 MHz (+) and is sponsored by the Niagara Frontier DX Group. For more details, contact VE3HO. Niagara Peninsula ARC was fortunate to have Walt, UV3GM, as a visitor at a recent club meeting. He and other Soviet amateurs participated with Canadians in 1988 by providing communications for Skitrek. Walt mentioned that Moscow has a population of ten million of which only 1200 are amateurs. Regretfully, I report that VE3GZ, an old air force buddy of VE3KK, has become a Silent Key. Manitoulin ARC recently organized a lovely banquet at the Legion in Little Current. Over 60 people enjoyed the evening which was followed by an open house put on by Al and his XYL. New executive of Kitchener-Waterloo ARC is president: VE3MJM, vice-president: VE3DYY, secretary: VE3WRN, treasurer: VE3CHQ, emergency coordinator: VE3GHL, fleamarket committee: VE3RAX, and refreshment coordinator: VE3NXB. Newcomers to packet radio interested in sending formal NTS traffic would be well advised to check the NTS "How-to" files on proper format. These can probably be found in your local BBS. If the information is not available there, please send a message to me, Larry, VE3GT, @VE3JF or VE3WQ, and I will see that you get it. A special welcome to the following new amateurs in the Ontario Section: VE3DES, VE3RRU, VE3SIO, VE3SWP and VE3TAJ.

Quebec: SM: Harold Moreau, VE2BP; STM: VE2EDO; SEC: VE2LYC; BM: VE2ALE. The Sorel-Tracy Hamfest was a success again this year with very good attendance. CRRL President VE2QO; CRRL Quebec Director, VE2EDO; Quebec SM VE2BP and QSL Manager VE2IJ, were all at the CRRL table. À Ste-Hyacinthe, une famille de trois radio amateurs: le papa Gilles, VE2AWE, les deux fils Martin, VE2MAA, et Eric, VE2EAF, sont actifs sur HF, VHF et paquet. Félicitations! Michel, VE2JEU, a été élu président de l'UMS.

Saskatchewan: SM: Bruce Rattray, VE5RC; ASM: VE5GHC; STM: VE5ELJ; SEC: VE5FY. It's my very sad duty to report that Don Hunter, VE5HQ of Saskatoon, joined the ranks of Silent Keys in May. "Good morning and welcome to the Wireless Room. My name is Bob Shehyn (VE5FY), your host for this event." With these words on May 25, Moose Jaw ARC began ceremonies to officially open its new home at the Western Development Museum. Cutting the QSL Card Ribbon: Mayor Stan Montgomery. Unveiling a commemorative plaque: Col C R Thibault, Base Commander of CFB Moose Jaw. An excellent crowd was on hand to view the club's new home and a fantastic display of WW 2 communications gear. A wonderful luncheon prepared by the XYLs wrapped up the day's events. First official contact by the Moose Jaw club station was with a station in Thunder Bay. The contact featured an exchange of greetings between the mayors of both cities. A tip of the hat to club members Al, VE5AQ; Margaret, VE5MML; Ray, VE5RQ; Russ, VE5CD; Ben, VE5YJ; Pat, VE5XC; Earl, VE5AAN; and John, VE5AFU, headed by Fred, VE5IL, and Doug, VE5QN: At the opening, the only disappointment for me was that club members insisted I return the R-1155 receiver to its display shelf. No provincial hamfest this year, but the Third Annual Craven Fleamarket on June 2 was well attended. The socializing was super! SARL is not dead, it's being reorganized, and an issue of *SARL QSO* is on the way. Hope that you enjoyed Field Day. See you on July 21 at the Glacier-Waterton Hamfest in Montana. 73. ■

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Dual Bander

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  - **d) Scan stop modes** Time operated scan (TO), Carrier operated scan (CO)
  - **e) Scan direction**
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The CRRL Incoming QSL Bureaus

Back in February, when we ran a column on the CRRL Outgoing QSL Bureau, we promised a subsequent column on the incoming bureaus. Here it is.

CRRL Incoming QSL Bureaus

CRRL VE0/VE1/VY2 Incoming Bureau (B)
KVARC
Box 141
Petitcodiac, NB E0A 2H0

CRRL VE2 Incoming Bureau (A)
A G Daemen, VE2IJ
2960 Douglas Ave
Montreal, PQ H3R 2E3

CRRL VE3 Incoming Bureau (A)
The Ontario Trilliums
Box 157
Downsview, ON M3M 3A3

CRRL VE4 Incoming Bureau (A)
Adam Romanchuck, VE4SN
26 Morrison Street
Winnipeg, MB R2B 3V4

CRRL VE5 Incoming Bureau (B)
Bjarni Madsen, VE5FX
739 Washington Dr
Weyburn, SK S4H 3C7

CRRL VE6 Incoming Bureau (B)
Norm Waltho, VE6VW
Box 1890
Morinville, AB T0G 1P0

CRRL VE7 Incoming Bureau (A)
Alex Ivsic, VE7CNE
8922 148th St
Surrey, BC V3R 3W4

CRRL VE8 Incoming Bureau (AB)
Rolf Zieman, VE8RZ
23 Taylor Rd
Yellowknife, NT X1A 2K9

CRRL VO Incoming Bureau (C)
Roly Peddle, VO1BD
Box 6
St John's, NF A1C 5H5

CRRL VY1 Incoming Bureau (A)
W L Champagne, VY1AU
Box 4597
Whitehorse, YT Y1A 2R8

Member-societies of the International Radio Union (IARU) operate a worldwide system of QSL bureaus. CRRL, as Canadian member-society of IARU, operates Canada's Central Incoming QSL Bureau, and the incoming QSL bureaus for the twelve Canadian call areas.

How do the bureaus work? IARU member-societies send cards to the CRRL Central QSL Bureau. Cards are then sorted and forwarded to the incoming bureau in each call area. These bureaus use one of three methods—envelopes, credits or a combination of the two—to get cards to you (see below). Even though CRRL sponsors the bureaus, you do not have to be a CRRL member to use them. However, CRRL hopes that users recognize that a benefit like QSL bureaus should be supported by membership.

Name and address of your CRRL incoming QSL bureau appears in the sidebar above. The letter A, B or C indicates the method that your bureau likes to use to get the cards to you.

Method A: Envelopes. Send your bureau a quantity of 5- by 7-1/2-inch envelopes addressed to yourself. On the top left corner of each envelope, print your call sign. On the top right corner of each envelope, place enough postage to permit the bureau to mail 50 grams of cards.

Method B: Credits. Send your bureau $5.00, and your name, call sign and address. The bureau will send you cards, charging the cost of envelopes and postage against your $5.00 credit. You will be informed when to send more money.

Method C: Combination. Send your bureau $5.00 as in Method B *and* addressed envelopes as in Method A. Do not place postage on your envelopes. You will be informed when to send more money or envelopes.

No matter what method is used, please inform your bureau if your call sign or address changes. Remember that these bureaus are operated by dedicated amateurs who volunteer their time to provide a service for you. Also remember that it often takes a long time to receive a card through the bureau system. With the high cost of postage, foreign amateurs and Amateur Radio societies tend to ship in bulk, often only once or twice a year. If a much-needed card is slow in coming, it is unlikely that the holdup is because of a volunteer at a CRRL bureau. Please be patient...

Finally, *do not send outgoing cards to an incoming bureau.* For information on the CRRL Outgoing QSL Bureau, see 1990 February *QST Canada.* ■

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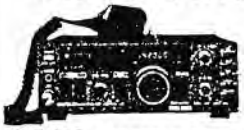

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A Stripline Filter for 144 MHz

Is intermod spoiling your two-metre communications? If so, welcome to the club! With the proliferation of paging and other radio services in the VHF spectrum, intermod is becoming more and more of a problem. It behooves us to do something about it, particularly if we want protect our ability to provide communications in time of emergency.

One solution is a stripline filter. John Lester, VE3MB, passes along the following information:

"Intermod is a nationwide problem. As commercial services multiply, intermod makes two-metre FM nearly unusable in some metropolitan areas.

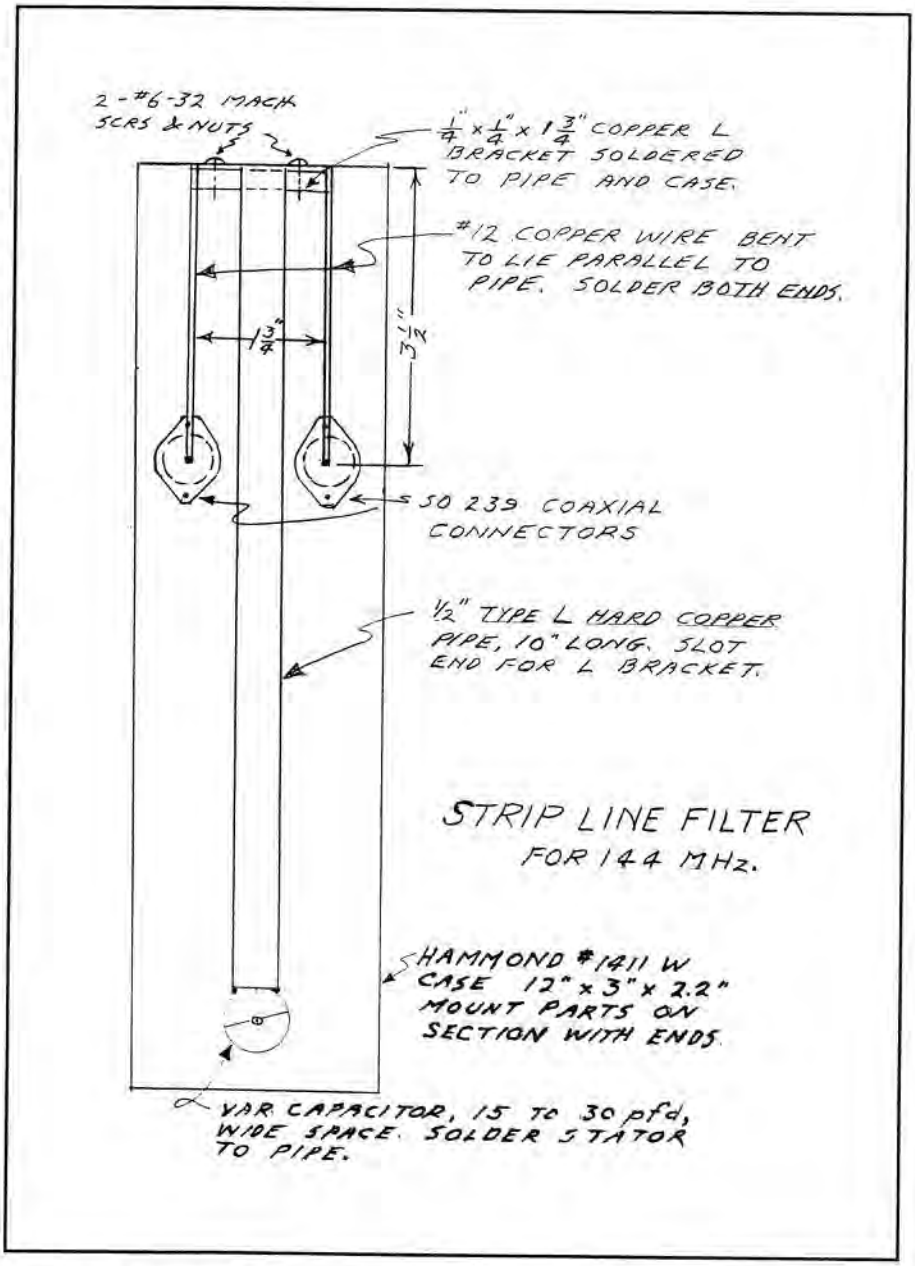
"The filter shown here can readily be built at home. The design is not new. Articles in ARRL's *Electronics Data Book*, in 1984 December *QST*, the 1988 *ARRL Handbook* and the 1989 July/August *The Canadian Amateur* describe the principle and offer various designs. This particular filter is similar to one described in 1984 December *QST*.

"The unit is housed in a Hammond Model 1411W utility box, widely available across Canada. According to formula, the 1/2-inch copper pipe which serves as an inductor should be 12 1/2-inches long. The 10-inch length used here is a compromise that permits use of the Hammond box.

"The filter should be inserted in the coax feedline close to the transceiver. To adjust the filter, insert an SWR meter between the filter and transceiver or a power meter between the filter and the coax feedline. Apply RF at the desired receive frequency. Tune the filter for lowest SWR or highest power output, depending on the kind of meter used. Remember that tuning will be very sharp. Proceed slowly to achieve resonance. Once the filter is set, leave it alone.

"When the filter is properly tuned, intermod should no longer be a problem. While there will be a slight loss of RF passing through the filter, this will not be significant in most cases.

"With one of these stripline filters in place, you can have effective communications using two-metre mobile or portable equipment, even in 'intermod alley'." —*Bob Boyd, VE3SV*



Stripline filter for 144 MHz: a Hammond utility box, a pipe, and parts from your junkbox. *(VE3MB)*

BNC CONNECTORS

The BNC connector is my favourite connector for RF projects. I often use threaded chassis-mount connectors scrounged from surplus gear.

Recently, I was working on a homebrew signal generator. A 100-mV signal was required for the frequency counter, and a second signal that could be dropped to 0.05 µV or less was required for receiver testing. Both signals came out the front of a Hammond 1590C aluminum case through BNC connectors.

Everything worked well, but the RF for the frequency counter was getting into the RF for testing. The lowest signal level available for testing was 5 µV. Copper shields between the connectors were tried with limited success. I began to suspect I would have to use expensive chassis-mount BNC coax connectors to completely shield my conductors.

While making up a TV coax cable with F-59 connectors, I got the idea of using an F-connector as a shield for the back of a BNC connector. The F-59 threads matched those on the BNC perfectly, but the extension of the BNC insulation prevented the F-59 from tightning up properly. A little work with an X-acto knife to thin and shorten the insulating

Tech Topics—continued on page 6

Public Service/Service Public

Conducted By Bob Boyd, VE3SV
and Jack Strangleman, VE3GV

"Operation No-name"

Our Kingston-area ARES group enjoys a close working relationship with the Red Cross Kingston Branch. Recently, in May, Red Cross displayed their many capabilities and services to the public. As part of this display, they conducted an emergency exercise dubbed "Operation No-Name".

The scenario was an accident involving a road tanker containing a highly toxic chemical. The chemical spilled, resulting in a poisonous cloud that drifted over a residential area. This required the evacuation of some 500 people. A reception centre was set up, as was a morgue, since fatalities were anticipated. All elements of the exercise were held in the large sail-measuring room at the city's Olympic Harbour. Thus, various relief agencies were within a hundred feet of each other!

Red Cross requested ARES to provide three emergency stations, one for a command headquarters, one for a reception and inquiry centre, and one for a morgue. Each station was to occupy a desk beside the Red Cross operation being simulated. Of course, we jumped at the chance to participate. We also decided to set up a fourth station as net control. We staffed each station with two operators. Because we anticipated that the visiting public would be interested in our operations, we provided placards and handouts at each station and then assigned a third operator who could explain what was going on. Communications would take place on two-metre simplex channels, using battery-operated handhelds.

Operation got under way on schedule at 5 p.m. with all amateurs present, all equipment in place, and a good stock of message forms and log sheets nearby. Within minutes, we were flooded with messages provided by the Red Cross exercise director. Many messages had a "priority" precedence on them, and the net control station was hard pressed to get this traffic passed with a minimum of delay.

Before long, we found it necessary to establish two more stations and redeploy our operators to staff them. Around 5:30, the exercise scenario called for a total failure of telephone communications to the outside world. We immediately set up a "telephone liaison station" prepared to pass telephone messages to our local autopatch repeater. Because of the unexpected high volume of traffic originated by the exercise director, we set up a station beside his desk. While we had arranged to have some extra operators on hand, the extra station put a severe strain on our human resources. It led to barely adequate processing of incoming and outgoing radiograms at some stations, and it certainly nullified our plans to rotate operators for relief purposes. The exercise director terminated the exercise at 8:30 p.m. By that time, we had handled over 90 messages.

What lessons did we learn? We relearned the eternal truth that in an emergency, nothing goes according to plan, and resilience and flexibility are absolute necessities. We learned that our Red Cross people needed further training in preparing messages using the standard radiogram format. We learned that our operators needed more experience in reviewing the messages given to them, to allow them to iron out things like inappropriate precedences, inadequate addresses and signatures, the use of "stop" rather than "X-ray", and so forth. Red Cross has accepted

Field Organization Reports May 1990

CRRL Section Emergency Coordinator Reports

Reports were received from the following SECs (DECs and ECs reporting to SECs are listed in brackets) denoting a total ARES membership of 984.

Reporting	ARES Members
VE3GV (VE3s AFP, DAN, EFX, FFD, FOB, GNW, GMU, ITL, ITT, JJA, KBU, LPM, LYW, MB, OZT, SV, TNL)	580
VE4TM (VE4sAEA, AG, ALW, AR, BE, BO, GM, HK, IX, JA, JK, LH, QK, VR	50
VE6AFO (VE6s AKY, CBJ)	265
VE7FB (VE7BSL)	89

CRRL Section Traffic Manager Reports

Call	Orig	Rcvd	Sent	Dlvd	Total
VE1ADJ	0	17	19	0	36
VE1ALU	1	14	13	0	28
VE1BTV	0	12	13	0	25
VE1DLC	0	8	3	2	13
VE1IH	4	0	4	0	8
VE2BP	2	23	17	21	63
VE2WH	0	12	11	12	35
VE2ALE	0	8	4	0	12
VE3ORN	9	61	58	14	142
VE3BCZ	7	57	64	8	136
VE3CYR	1	83	40	3	127
VE3ISD	6	32	49	2	89
VE3BDM	0	64	9	1	74
VE3GNW	0	21	32	1	54
VE3GT	0	12	31	0	48
VE3KK	7	7	26	2	42
VE3FGU	0	13	22	0	35
VE3AJN	0	5	11	0	16
VE3KXB	0	3	8	3	14
VE3LPM	0	3	10	0	13
VE3MNI	0	2	6	1	9
VE3WV	0	1	8	0	9
VE3BAJ	0	1	4	1	6
VE3NVJ	0	2	3	1	6
VE4JA	15	81	100	51	247
VE4JR	0	20	20	8	48
VE4TE	0	20	20	3	43
VE4STU	0	10	18	0	28
VE6CE	9	22	15	3	49
VE6CHK	-	-	-	-	31
VE6CPP	-	-	-	-	18
VE6GUS	-	-	-	-	11
VE6ABC	-	-	-	-	6
VE6AKY	-	-	-	-	4
VE6XY	0	0	3	0	3
VE7BNI	28	65	100	36	229
VE7ANG	2	117	86	4	209
VE7EJU	2	103	83	3	191
VE7AVA	3	14	28	2	47
VE7FME	8	16	8	8	40
VE7FB	3	14	21	3	41
VE7CCJ	0	17	19	0	36
VE7XA	2	25	5	4	36
VE7CDF	0	14	12	2	28
VE7TAM	9	6	10	1	26
VE7OM	0	13	12	0	25
VE7ESA	0	8	5	0	13
VE7FAZ	0	7	5	0	12
VE7FVG	0	8	1	0	9
VE7BZI	1	2	1	2	6

National Traffic System

Net (Mgr)	Sess	QNI	QTC
APN (VE1ADJ)	27	130	106
KTN (VE3AJN)	13	82	5
OPN (VE3BDM)	31	511	124
OQN-D (VE3ORN)	30	79	20
OQN-E (VE3CYR)	30	94	299
OQN-L (VE3GSQ)	10	2	0
MTN (VE4IX)	14	120	25
MEPN (VE4LB)	29	682	25
MMN (VE4TE)	31	307	26
APSN (VE6AKY)	31	462	4
ATN (VE6CPP)	31	187	68
BCEN (VE7EJU)	31	618	278

Brass Pounders' League

This listing is available to amateurs who report to their SM a traffic total of 500 or a sum of originations and delivery points of 100 or more for any calendar month. All messages must be handled on amateur frequencies, using standard ARRL-CRRL form, within 48 hours of receipt.

BPL: None this month

Public Service Honour Roll

This listing is available to amateurs whose public service performance during the month indicated qualifies for 60 or more points in the following nine categories (as reported to their SM). Please note maximum points for each category: (1) Checking into CW nets, 1 point each, max 30; (2) Checking into phone/RTTY nets, 1 point each, max 30; (3) NCS CW nets, 3 points each, max 12; (4) NCS phone/RTTY nets, 3 points each, max 12; (5) Performing assigned NTS liaison, 3 points each, max 12; (6) Delivering a formal message to a third party, 1 point each, no max; (7) Handling an emergency message, 5 points each, no max; (8) Serving as an EC or NM for an entire month, 5 points max; (9) Participating in a public-service event, 5 points each, no max. Amateurs who qualify for Public Service Honour Roll 12 consecutive months, or 18 months out of a 24-month period, will be awarded a special certificate from CRRL Headquarters.

PSHR: VE4JA (157), VE4LB (116), VE3ORN (103), VE3BDM (96), VE4STU (82), VE3GNW (79), VE4RO (77), VE3CYR (66), VE7FB (64), VE7ANG (63), VE7EJU (58), VE7BM (51)

Service and Specialized Nets

Independent Net Managers: Your monthly reports are welcomed. Send to CRRL, Box 7009, Station E, London, ON N5Y 4J9.

Net (Mgr)	Sess	QNI	QTC
ARES Canada (VE3GV)	4	121	1
ARES Ontario (VE3GV)	1	8	0
CRRL ONTARS (VE3FQV)	31	8310	0
Grey-Bruce (VE3BDM)	31	63	20
Grey-Bruce SS (VE3BDM)	31	67	34
Transprovincial (VE3EUI)	31	3591	3

our offer to provide them with training in the use of radiogram format, and as we continue to work together, we'll be able to exploit that format fully—a key tool in the emergency communications process.

Still, by and large, most of the traffic was handled effectively. The results of our traffic handling practice sessions were certainly evident. All equipment performed well, except that we had several battery failures. Some of our operators will be now be purchasing spare batteries and others will be constructing DC-to-DC converters to permit operation of their handhelds from automobile batteries and other DC sources.

Our log forms proved to be difficult to use. We are now developing new ones. We are also preparing control boards to enable the net control station to keep better track of stations moved onto other channels to handle traffic.

At a debriefing session with Red Cross, ARES presented its conclusions and made several suggestions. While Red Cross also identified numerous changes they will incorporate into next year's exercise, they had nothing but praise for ARES' contribution to "Operation No-Name".

PETERBOROUGH ARC

Recently, we received an excellent report on the Emergency Services Group newly established by Peterborough (Ontario) ARC. The report was prepared by Bob Gray, VE3RHG, who is alternate coordinator of the group. In just a page and one-half, Bob managed to define the group's function, assign responsibilities, set forth operating procedures and specify equipment to be used in an emergency. We congratulate Peterborough ARC and wish them well as they continue to develop their new emergency group and train its members.

STRIPLINE FILTER

Does intermod interfere with your two-metre emergency communications? Check out VE3MB's stripline filter in this month's Tech Topics. It's simple to build and it really works!

ARES is a branch of the CRRL Field Organization, although you do not have to be CRRL member to take part. Check with your CRRL Section Manager or Section Emergency Coordinator for details.

We hope that this column, which also appears in The Canadian Amateur, *will serve as an ongoing source of news and information about emergency preparedness activities across Canada. ARES members, particularly ECs, are invited to send information on what they are doing. We will share this information in future columns with the objective of increasing our ability to serve, should disaster strike. —Bob Boyd, VE3SV* ■

It Seems... —continued from page 1

large volumes of cards, are experimenting with automated sorting machines that print and read colourful bars similar to those used by Canada Post.

Despite their differences, every bureau shares a common goal: to move their cards before being buried alive! Don't believe stories about bureaus "sitting" on cards because volunteers can't be bothered forwarding them. It just doesn't happen that way. Any volunteer who is "burned out" after years of service is going to resign and let a replacement take over. More importantly, whether it's on the basement floor or in a spare bedroom, space for cards is always finite and there is never room for long-term storage. The obvious solution—the one that is used—is to move the cards down the chain.

If you want cards, you must give your incoming QSL bureau an address. In the most widely used system, you are asked to keep self-addressed stamped envelopes (SASEs) on file at the bureau. How often you get cards will depend on the postage on your envelopes. If you put one unit of postage on an envelope it will be mailed to you with perhaps ten cards in it. With two units of postage, the bureau can send three times the weight, so your envelope may be held until there are thirty cards.

Because space for storing cards is finite, every bureau has a "destruction policy". The busier the bureau, the more frequently they will purge their "undeliverables". If you have not received your confirmation for DXCC country 100, you might consider if you are current with the bureau. It would be very sad if your missing card was at the bureau, but could not be delivered because the bureau did not have your address.

The next time you get a package of cards from the bureau, take a moment to think about what it means. You are holding concrete proof that international cooperation—by volunteers—actually works! It may have started with a twenty-second burst of RF energy and you may have waited two years, but it worked because while you were waiting, a small army of volunteers was busy working for you!

Perhaps the QSL card is not the final courtesy after all. Perhaps the real final courtesy should be a handshake and a quiet "thank you" the next time you see a QSL bureau volunteer at a convention or hamfest. Volunteers may even be pleased to accept your offer to serve a shift or two, sorting some of those cards! —*Ray Staines, General Manager, CRRL*

Address of the CRRL Outgoing QSL Bureau is Box 56, Arva, ON N0M 1C0. Service is free to CRRL members. Addresses of CRRL Incoming QSL Bureaus appear in the "HF Bands" column in this month's QST Canada. ■

9th Computer Networking Conference

The American Radio Relay League, Inc, 225 Main Street, Newington, Connecticut 06111 USA
The Canadian Radio Relay League, Inc, Box 7009, Station E, London, Ontario N6H 2R7 Canada

Plan to participate in the **9th Computer Networking Conference,** jointly sponsored by ARRL and CRRL, to be held this September in Canada—the country that first brought you packet radio! Here are the details:

Time and Date: 9 A.M.–5 P.M., Saturday, 1990 September 22.

Location: London Regional Art Gallery and Museum, 421 Ridout Street North, London, Ontario.

Registration: $US 20 or $CDN 25. Registration fee includes a copy of the conference proceedings and a catered hot luncheon.

A Word about the Location: London, Ontario, population 270,000, is located in Southern Ontario midway between Detroit, Michigan, and Buffalo, New York (or Toronto, Ontario). London is accessible by car via Highway 401, rail or air. While no major airlines have direct service to London, excellent connector service to Toronto and Detroit is provided by Air Ontario (Air Canada) and Canadian Partner (Canadian Airlines International). ComAir (Delta) provides connector service from Cincinatti and Cleveland, Ohio. For those in the US who might want to take in a bit of countryside, flying to Detroit or Buffalo, or to Niagara Falls, New York, and renting a car for the 2–3 hour trip to London can be a cost-effective alternative to flying directly. Check with your travel agent for details. The London Regional Art Gallery and Museum is located in downtown London, overlooking Harris Park at the forks of the Thames River. There is adequate free parking nearby.

A Word about Accommodations: Conference organizers have negotiated a special flat rate of $CDN 85 a night (no limit to the number of people allowed to stay in one room) at the 322-room Radisson Hotel, London Centre, located about four blocks from the conference site. It is highly recommended that conference participants stay at this hotel to facilitate organizing Friday-night dinners and informal get-togethers. (A list of alternate accommodations can be furnished on request.) Conference participants must make their own reservations at the Radisson. Use the toll-free number (800) 333-3333 and mention the conference.

A Word about the Conference: Past computer networking conferences have attracted 120–150 participants from all over the US and Canada—and occasionally from beyond. Conference speakers share the results of recent work at the leading edge of packet radio. All participants hear all speakers—there are no concurrent presentations. Is this a place to find out how to get into packet radio? We would say no. But if you're a beginner and you do attend, you're certain to develop an enthusiasm for this wonderful mode. Is there anything to look at or buy? Not really—it's a conference, not a hamfest. Of course, that doesn't preclude a few interesting displays or demonstrations—or the deal of a lifetime made in the parking lot! What about Saturday activities after the conference? Conference organizers will make arrangements so that everyone who wishes can have dinner together and a night out at a popular restaurant—a good way to end the conference.

How to Register: Fill out the coupon below, and send to 9th Computer Networking Conference, c/o Harry MacLean, VE3GRO, 500 Riverside Drive, London, ON N6H 2R7. *Don't forget to enclose the registration fee.* You will receive a confirmation in the mail, along with maps and additional information related to the conference. ■

ARRL-CRRL 9th Computer Networking Conference, London, Ontario, 1990 September 22

Send to Harry MacLean, VE3GRO, 500 Riverside Drive, London, ON N6H 2R7 Canada

Here is my registration for the conference. I enclose ❒ $US 20 or ❒ $CDN 25 registration fee.

Name: _____ Call: _____

Address: _____

_____ Zip/PC: _____

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