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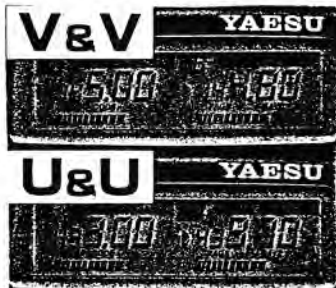
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ABOUT THE COVER



Sixty amateurs from Fredericton (NB) ARC provided communications for the 1992 Fredericton International Air Show. Holding the banner, from left to right: John, VE1IW, Sterling, VE1SKC, and Don, VE1WB. ■

Tower Problems—and a Suggestion

We amateurs are facing a dramatic increase in the number of challenges by local government bodies to tower installations. I'm not going to argue the pros and cons of the Department of Communications' mixed bag of responses to these challenges, but we do have a serious problem, particularly in our urban areas.

CRRL and CARF have issued a joint release on this subject. It appears on page 6 of this issue of this *QST Canada*. Until their long-awaited replacement by Radio Amateurs of/du Canada (RAC) later this year, both organizations are working together to resolve this issue.

However, why are we waiting for our organizations to solve this and other problems. What are we, as individual amateurs, doing about these problems? Have you given any thought to alternative solutions? Imagine *your* frustration if your local planning commission had the power to restrict *your* tower and antenna height to a maximum of ten or twenty feet above ground level. Would you be willing to settle for that, or would you look for some alternatives?

I happen to believe there are a number of solutions to the tower and antenna dilemma for many of us urban types, particularly in this era of linear translators and computers. "Necessity is the mother of invention," the old saying goes. So let's get busy inventing solutions, and the sooner, the better! For starters, let's take a look at one possibility.

Did you know that our military forces, our ministries of transport and some commercial organizations normally operate their HF, VHF and UHF communications from *separate* remote transmitter and receiver sites some distance from their operating positions? Why these remote sites, you may ask. No local interference, ultra-low noise on receive, and high-gain broadband multidirectional antennas on transmit are a few of the advantages. Several US amateurs and at least a few Canadian amateurs use similar setups. And with these setups, there's no RF interference to neighbours and no complaints about unsightly towers or antennas.

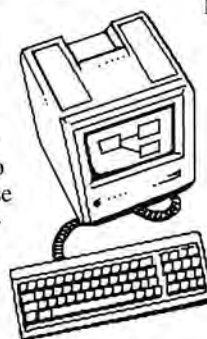
All very fine, but here come the questions: How can a group of amateurs, say, all in one town, access such a system, all at the same time, with each individual amateur wanting to receive and transmit in

a direction different from that of the next amateur? What if you wanted to work on a band different from what the others were using, or wanted to run at a power level different from that preferred by the rest of the mob? QRPers *would* have a ball with those low-noise, high-gain arrays!

Actually, you don't have to let your imaginations run wild with far-out, off-the-wall solutions. The technology that would be needed, in one form or another, is already being used by some of our fellow amateurs, and certainly by military and commercial organizations. All amateurs need to do is expand our imaginations a little, and reshape that technology to resolve our ever increasing dilemmas whether they concern towers, antennas, neighbours, interference or whatever.

I won't go into the details of getting the land, putting up the antennas and so forth. That would be the easy part. Let's think about how we would couple everyone to these antennas, operating on different bands at different power levels, in every conceivable direction.

This is where we call in our hardware and software experts. How about a combination of 450/220-MHz linear translators managed by computers to control the two-way links from our shacks to the remote sites? Other computers could manage the other tasks through various ports, determining direction, power level, and so on. A number of low-cost dial-up phone lines could look after the needs of those of us who might not live within line-of-sight of the remote sites.



Now, *you* tell me how *you* would improve on the setup above. Maybe you have a much better idea. Remember, don't worry about an HF transceiver in the ham shack. A computer and software can look after that. VHF/UHF linking equipment can do the rest.

Have I got you thinking? If so, drop me a line with your ideas and suggestions on how we might develop such a setup. Maybe, just maybe, we can awaken some of that innovative and creative thinking that we used to be famous for. Then we can get some imaginative planning going on our ideas. Eventually, we should be able to concentrate our efforts on some of the other problems that we amateurs are facing today. —Earle W. Smith, VE6NM ■



1993 CLARA and Family HF Contest

1700 UTC March 16 to 1700 UTC March 17



Open to all licensed amateurs. SSB and CW modes. Use all HF bands with most activity on 20, 40 and 80 metres. Each station may be contacted twice, once in each mode. Crossband contacts will count as an SSB contacts for both stations. Single-operator stations only.

Call: CQ CLARA

Logs: Logs must include date, time in UTC, frequency, mode, callsign of contact, name of contact, and whether contact was a CLARA member or not. When submitting logs, be sure to include your own name, address and claimed score. Logs will not be returned unless accompanied by an SASE.

Scoring: The following points are for SSB contacts. For CW to CW contacts, points count double:

1. Any contact with a CLARA member, score 5 points (includes CLARA to CLARA contacts).
2. Any contact with a CLARA family member, score 2 points (includes OMs, sons, daughters, aunts, uncles, nephews, nieces, etc).
3. Any contact with a non-CLARA YL, score 3 points

Scoring Notes:

1. No score can be claimed for contacts between OMs who are non-CLARA family as per number 2 above.
2. Multipliers are one for each Canadian province or territory, and one for each ARRL DXCC country, contacted for points.
3. Total points claimed = total contact points x total multipliers.

Send logs to the CLARA Contest Manager by 1993 May 31: Janis Cameron, VE7AAP, 3528 11th Avenue, Port Alberni, BC V9Y 4Y7.

The Canadian Radio Relay League, Inc La Ligue Canadienne de la Radio Amateur, Inc



The Canadian Radio Relay League (CRRL) is a noncommercial association of radio amateurs organized for the promotion of Amateur Radio communications and experimentation, for the establishment of networks to provide communications in the event of disasters or other emergencies, for the advancement of the radio art and the public welfare, for the representation of radio amateurs in legislative and other matters, and for the maintenance of fraternalism and a high standard of conduct.

CRRL is incorporated under the Canada Corporations Act. Its affairs are governed by a seven-member Board of Directors elected every two years by the CRRL general membership. CRRL is noncommercial, and no one who could gain financially by the shaping of its affairs is eligible for membership on its Board.

CRRL is the Canadian member-society of the International Amateur Radio Union (IARU). "Of, by and for the Canadian Radio Amateur", CRRL numbers within its ranks the vast majority of active amateurs in the nation and has a proud history of achievement in amateur affairs.

A bona fide interest in Amateur Radio is the only essential requirement for membership. An Amateur Radio licence is not required, although full voting membership is granted only to licensed amateurs in Canada.

Membership inquiries and general correspondence should be directed to CRRL Headquarters, Box 56, Arva, ON N0M 1C0 Tel (519) 660-1200.

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Strays



VE3LF HONOURED



Al Lightstone, VE3LF, shown here with his XYL, Elaine, was a recent recipient of the 275 Award for Distinction in Engineering. Al was presented with his award at the Annual Spring Reunion of the University of Toronto Engineering Alumni Association. (VE3DSS photo)

MOVING?

For uninterrupted delivery of *QST* and *QST Canada*, please send your change of address notice to CRRL, Box 56, Arva, ON N0M 1C0, at least eight weeks before moving. Don't forget to include your call-sign or the seven-digit number on your mailing label. —Ray Staines, VE3ZJ, General Manager, CRRL

Fighter Plane Raised from 260 Feet Under Greenland Ice

The complete story derived from Amateur Radio contacts with Ernest Bracy, W1BFA.

In July, 1942, two B-17 Flying Fortresses and six P-38 Lightning fighter planes had to be abandoned in bad weather on the Greenland ice cap. Their crews were rescued, a remarkable story in itself.

Since then, the aircraft gradually came to be buried under almost 260 feet of ice. A group of determined people decided to try to rescue the planes, if possible, bring them up to the surface, and perhaps some day, restore them to flying condition.

In July, 1989, a party of seven people led by Richard Taylor, KC4FST of Atlanta, was on the Greenland ice cap 100 miles south of Angmassalik. They had located the buried planes by radar and were making plans to use steam to melt a one-metre shaft down to them. But this would have to wait until next year.

In May, 1990, operations in Greenland were started up again, and by the end of May they had melted down to 145 feet. A week later they reached a B-17 at 250 feet. Unfortunately, the aircraft was very badly crushed by the ice, and thoughts of salvaging it had to be abandoned. Various pieces of equipment, however, were recovered.

The Greenland Expedition Society had been formed to coordinate and carry out the ambitious effort to recover the war-planes from under the ice. Plans now went ahead. The society renewed and redoubled its quest, and in May, 1992, the team was back on the Greenland ice cap.

A prominent supporter at this stage was Norman Vaughn, a noted explorer who had been with Admiral Byrd in the Antarctic, and with Grenfell in Labrador. Vaughn was in charge of US air-sea rescue in the North Atlantic during the World War 2, and had organized the 1942 rescue of B-17 pilot Colonel Harry Spencer. It was an Amateur Radio operator in Maine who had picked up the SOS that brought about the rescue of Spencer and the other downed pilots. They were rescued by dogsled teams. The aircraft had to be abandoned. Vaughn, now 86, retains quite a remarkable vigour. He plans a return to Antarctica this year, to climb Mount Vaughn, named in his honour by Admiral Byrd.

The instrument that made it possible to bore down through the ice cap was a ther-



P-38 aircraft 260 feet under the Greenland ice cap. (Photos courtesy W1BFA)

mo meltdown generator, more commonly known as "the gopher".

The expedition's station on the ice cap operated with the special call, XPIAX. Richard Taylor, KC4FST, was chief operator. Anchorman and daily contact coordinator was Ernest Bracy, W1BFA, Controller of the International Air Traffic Controllers Net. He received assistance from net members in many countries who relayed messages back and forth when propagation became difficult.

1992 was an exciting year for the expedition. It was 50 years earlier, on July 15, 1942, that the six Lightnings and two Flying Fortresses were abandoned. The hope was to bring things to a fitting climax in time for the 50th anniversary.

The hot water probe drill "bumped" one of the P-38's in mid-May, and work began in earnest to get down to it with the "gopher". On May 31, they reached it, 257 feet down. Next day they pumped out water, and melted a cavity around the plane, using 700,000 BTUs to do the melting. Their first sight of the aircraft showed part of the right wing and the form of the cockpit. Reports said: "They are working around the clock. They clear

off the nose and uncover the guns. They sit in the cockpit and bring up the pilot's checklist—still legible."

They were delighted that the aircraft was in much better condition than expected. They could not sit in the B-17 which was far too crushed. But the P-38's structural condition was good, with the skin only slightly damaged. Many items were brought to the surface: ammunition cans, 50-calibre shells, a hardware kit, a brass and wood antenna, and a stencil set for painting the pilot's name "Harry Smith". It took 15 minutes to go up or down the hole.

On June 14, Ernie, W1BFA, had a very special QSO from 260 feet below the ice:

"THIS IS P-38 DELTA NUMBER 17630. READ YOU 5 BY 9. ERNIE GORDON IN THE COCKPIT, DAVE AND LOU ON THE WINGS."

"THAT'S A LOT OF PEOPLE FOR A P-38... I SUGGEST YOU DE-ICE THE AIRCRAFT BEFORE TAKING OFF!"

Arrangements were then made to contact RAF Bovington—50 years late—on the 50th anniversary of the expected arrival date of the flight.

Mechanics were flown in from the US



Fifty years late: Norman Vaughan, on the right, during a 1992 visit to the Greenland ice cap.

to take apart the P-38. One of them, Gary Larkin, who works on P-38s at a Tucson aviation museum, was astonished when he saw the plane. "I can't believe it," he declared. She's mint."

Working around the clock, they had it all in pieces within a week and left to return home on July 8. The ice hole had to be enlarged to allow the wings to be brought up. Then a 25-foot steel beam was brought in by the DC-3 supply plane, to place over the hole for the biggest and most difficult task of all: raising the 3500-pound centre section of the aircraft.

Meanwhile plans for the 50th anniversary celebration were going ahead, with key expedition people converging on the ice cap. Among them was Earl Toole, the only remaining member of the dog team that brought the pilots out in 1942. The aircraft parts were cleaned and polished until they shone.

Then, a message was passed by Ernie, W1BFA, to those gathered on the ice:

"IT GRIEVES ME THAT I AM NOT THERE WITH YOU TODAY. YOU HAVE ONCE AGAIN DONE THE IMPOSSIBLE."

The message was from Norman D. Vaughn. Another message, from Buzz Coplin and Jim Hanley, said:

"YOU HAVE WORKED UNDER EXTREME DIFFICULT CONDITIONS TO ACHIEVE WHAT MOST PEOPLE THOUGHT WAS AN IMPOSSIBLE DREAM."

Pat McManus, one of the original P-38 pilots, said the ice cap had not changed in appearance in the 50 years since he had landed there. (Though if he had stayed with the aircraft, he would now have been 260 feet below the surface!)

On the big day, July 15, 1992, mes-

sages of congratulation filled the airwaves. One came from a Danish official who had visited the ice cap in 1990. Another was sent to Norman Vaughn:

"THIS YEAR'S SUCCESS AND CELEBRATION OF THE 50TH ANNIVERSARY OF THE FORCED LANDING OF THE LOST SQUADRON IS TESTIMONY TO MAN'S WILL TO PERSEVERE OVER ADVERSITIES, COUNTLESS SETBACKS AND SEEMINGLY IMPOSSIBLE ODDS. THE GREENLAND EXPEDITION SOCIETY RECOGNIZES NORMAN VAUGHN AS THE ONE MAN MOST RESPONSIBLE FOR THIS ACHIEVEMENT, BY PROVIDING UNWAVERING LEADERSHIP AND EXPERIENCE, AND MOST IMPORTANTLY, SPIRITUAL COURAGE THROUGH OUR DARKEST YEARS, AND NOW, IN THE SUNLIGHT OF SUCCESS, FROM ALL OF US ON THE ICE CAP, BEST WISHES ON THE MT. VAUGHN EXPEDITION."

There was also a message to Ernest Bracy, W1BFA:

"COMMUNICATIONS HAVE BEEN MOST ESSENTIAL TO THE SUCCESS WE ARE ENJOYING TODAY. NO ONE HAS BEEN MORE ESSENTIAL TO US... THAN THE AIR TRAFFIC CONTROL NET AND MOST IMPORTANT TO YOU ...IN BOTH LINKING OUR LOVED ONES BACK HOME AND TO THE SAFETY OF THE EXPEDITION."

Good communication was established with RAF Bovingdon. Royal Air Force officials were on hand as Pilot McManus spoke with his original destination in the UK, 50 years late, and received clearance to land on "Runway 040 with visibility five, haze, and wind two knots from the northwest". Toole, radio operator of the rescue mission 50

years ago, also spoke with RAF Bovingdon.

One of the RAF members asked for McManus' age and rank at the time of the 1942 flight. At that time, he had been 24, and his rank was second lieutenant.

After the anniversary day, it was something of an anticlimax. But a major operation remained: bringing up and then shipping the 3500-pound centre section of the P-38. Wing, engines and other parts had been flown by DC-3 to Kulusuk, to be flown to Oshkosh, Wisconsin, where they would be a star attraction at an air show.

On August 1—"ANOTHER AIRCRAFT IS ON THE RAMP". Seven people were on hand to welcome the 3500-pound hulk on to the surface, and to celebrate with a turkey dinner. They had been too busy to stop for lunch! They named the aircraft *Glacier Girl*.

On August 12, the ice cap station was closed down for the season, and the few remaining personnel were taken to Kulusuk, 80 miles away on the coast. Only the 3500-pound centre section was left behind on the ice, to be picked up by an S-61 helicopter on August 22 and lifted to the coast. From there it would be taken by ship to Denmark, to Sweden, to Rotterdam, and then to Halifax and down the coast to Savannah, Georgia. The final leg of the long journey would be by truck to Kentucky. There, in a hangar 100 by 80 feet, the plane would stay for the next 18 months while a crew would restore it to working condition. ■



Silent Keys—

Conducted By Ray Staines, VE3ZJ

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

VE3AGY, Don Southcott, Kingston, ON
 VE3AUU, Ross Dryden, Stirling, ON
 VE4JY, John McFerran, Selkirk, MB
 VE6ADI, Henri Bois, Grand Centre, AB
 VE7AFL, Jim Swan, Richmond, BC
 VE7CAW, Leo Meyer, Kelowna, BC
 VE7DNV, Bob Ramsey, Lower Nicola, BC
 VE7DSI, Ken Cheeseman, Fort St John, BC
 VE7FTO, Stan Waddington, Victoria, BC
 VE7GUN, John Sloan, Victoria, BC

Note: Silent Key reports sent to *QST Canada* must include name, address and call sign 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*. ■

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Antennas Threatened by Policy Problems

Local governments seek to usurp federal jurisdiction.
Presidents of our two national organizations speak out...

CARF and CRRL are working behind the scenes, attempting to stop some cities and municipalities from restricting the installation of antennas and antenna structures. DOC's Client Procedures Circular 2-0-03 (CPC-2-0-03) governing antenna installations and environmental issues is not working. It is generally misunderstood and even rejected by some municipal officials. Some local DOC people are very slow or appear reluctant to correct municipal actions which override federal powers.

In some cases local DOC people are unfamiliar with the distribution of powers under the Radiocommunication Act, causing further difficulties for municipalities and amateurs.

Your national organizations are talking to DOC at national and regional levels to try and resolve this serious threat to Amateur Radio and other licensed radio services. CRRL and CARF, as members of the Radio Advisory Board of Canada (RABC), are seeking RABC support in this threatening situation.

People like Bill Wilson, VE3NR, Jim Munsey, VE6BKW, Tim Ellam, VE6SH, René Poitras, VE1CB, Dave Fancy VE7EWI, and others across the country, are helping amateurs who must deal with restrictive by-laws and unsympathetic officials. Places like Calgary, Edmonton, Kamloops, Vancouver, New Westminster and Madawaska, New Brunswick, have instituted by-laws or procedures to control the erection of antenna structures. Antenna heights are being limited, in Edmonton to 32 feet, in Madawaska to 13 feet, in Vancouver to "1.9 metres above existing grade". New Westminster defines antenna structures as "accessory buildings" subject to local land use restrictions. Calgary requires a "development review permit" costing \$142, and Madawaska demands that an amateur must follow a "variance" procedure costing \$55. These are but a few examples of current challenges to federal jurisdiction.

The federal Radiocommunication Act clearly states under Section 5(f) that the Minister... may "approve each site on which radio apparatus, including antenna systems, may be located, and approve the erection of all masts, towers and other

antenna supporting structures..." The 1987 Townsend Report, commissioned by the federal government, dealt with the constitutional claims of various powers, and backed up federal authority over free-standing antenna structures. Still, some municipal officials challenge this.

A Calgary official stated in a letter to CRRL counsel that, "I'm not prepared to concede, as you are, that support structures are the exclusive domain of the federal government. Clearly, this issue would be dependent on the facts of the case. For example, whether what was of prime importance was the impact of the structure on the neighbourhood versus its suitability to transmit or receive radio signals". New Westminster ignored the pleas of radio amateurs at council meetings, and renamed antennas and support structures "buildings" to get around federal control. There are many more examples. Such opinions and actions seriously threaten federal jurisdiction over the Amateur Service and other licensed radio services in Canada. Policies seem to be misunderstood.

Some regional and local DOC people seem to be out of step with the national policy coming out of Ottawa. Vancouver DOC states in a letter to city officials that "Municipalities make by-laws concerning safety, aesthetics and similar issues pertaining to antenna towers". Saint John DOC instructs an amateur that "...it is my recommendation that you make application... for a variance to the municipality of Clair by-law pertaining to accessory structures". Unfortunately, both statements unwittingly support *ultra vires* actions which undermine federal jurisdiction and control of radiocommunication matters. It is unclear what DOC intends to do about all of this.

Other matters seem to be working against DOC's Client Procedures Circular, CPC-2-0-03, as an effective process in the management of the issues. First, the CPC is not well written. It causes confusion over the distinction between commercial and amateur licensees in the process. It combines antenna appearance matters and radio frequency power concerns and threatens them like similar issues. DOC officials wished to keep the CPC's

language general in nature. However, the lack of specifics leaves details of obligation and procedure too much to chance. This causes costly misunderstandings for all concerned.

Second, some DOC regions appear to have neglected to work closely with city officials and municipal associations to ensure that federal jurisdiction, policy and procedures are clearly understood and accepted. We are told that Ottawa DOC cannot always influence the operational actions of regional managers in such matters.

Both CRRL and CARF take the position that municipalities should not be able to enact by-laws or legislation wherein individual amateurs have to ask permission to site antenna structures. While DOC has stated that amateurs are not obliged to request permission, we advise amateurs to follow DOC policy and consult with neighbours and municipal officials. Let those concerned know your intention. Be open, courteous and co-operative. Follow siting practices which protect you and your neighbour's property. Err on the side of caution over matters of structural integrity and safety. Keep structure and apparatus appearance consistent with current practice: for instance, a regular tower—Delhi, Hy-Gain, Rohn, Trylon, etc—with a tribander—will function adequately in an urban setting, and is not out of step with similar structures in use around the world.

We recommend that club executives engage in meetings and friendly discussions with municipal planners and elected officials, pointing out the many ways that Amateur Radio enhances the life of a community.

Meanwhile, your national organizations will work in co-operation with DOC and RABC, and with provincial and local governments, to ensure that current law and reasonable policies are clearly understood, and that effective procedures are followed. We will keep you informed on this potentially dangerous and disruptive matter as actions and issues unfold.

—Dana Shtun, VE3DSS, President, CRRL

—Farrell Hopwood, VE7RD, President, CARF

From 90 cm to 7 mm

The ultimate radio receiver...

By Jim Oty, WB5GWH
1219 Calle del Dalo
Socorro, NM 87801

You are sitting in your ultra-modern ham shack on a quiet evening, watching a video terminal, waiting to see which of the nine receivers available in your receiving system will be used. These are not receivers for your normal Amateur Radio bands, but bands set aside for the world of radio astronomy. The computers are ready, all the receivers are normal, the tape recorder is on standby, the antenna is ready to be pointed, and you have checked the station clock and completed all checklists. Before your arrival, you know the evening's operating schedule has been loaded into the main computer. This was done over a computer network by a control operator at some far-away place. As you wait, you think about the other nine stations, identical to yours, located across the country. At each of these stations, a technician has gone through the same checks. You don't really have to be here as the station will run remotely, but this is the first real test of all the systems, and you want to be on hand just in case. It is exciting to realize you are a part of the world's latest state-of-the-art radio telescope operation.

Radio astronomy began in 1932. An engineer for Bell Laboratories, Karl Jansky, was investigating interference affecting long-distance radio communication. He reached the conclusion that some of the interference was not terrestrial, and seemed to be coming from the heavens. His findings stirred interest in the scientific community, and in 1936, an Amateur Radio operator, Grote Reber, designed and built the first steerable parabolic dish antenna and used it to make the first radio map of the sky. This was the start of a new science called radio astronomy.

Progress was delayed by World War 2. But the war brought many advances in electronics, including radar. Radio astronomy pioneers took advantage of shorter and shorter-wavelength instruments. Better amplifying devices, waveguide technology, and eventually the computer, were pressed into use. By the early 1960s, radio astronomy was in high gear.

To provide radio astronomers with a new instrument that could provide a new window to the heavens, two qualities were vital: resolution and sensitivity. Very fine resolution was needed to separate individual radio sources, and very high sensitivity was needed to pick up the faintest signals. It would also be useful to



A typical Very Long Baseline array (VLBA) antenna in St Croix, US Virgin Islands. (WB5GWH photo)

be able to tune the receiver over a very wide frequency range.

Radio waves and optical waves are both part of the electromagnetic spectrum. They differ only in wavelength. Just as optical astronomers kept building bigger and bigger optical instruments, radio astronomers began building larger and larger antennas. The resolving power of an optical telescope—or an antenna used as a radiotelescope—is calculated by dividing the wavelength by the diameter of the aperture. At radio wavelengths this seemed a great disadvantage. To get the resolving power of a large optical telescope, a radiotelescope operating at a wavelength of one metre would have to have a diameter in the tens of kilometres. Impossible!

But we tried. Radiotelescopes got bigger and bigger—up to 300 feet in diameter. Resolution increased, from the 20 degrees of the primitive instrument Jansky used in 1932 to about one degree using a 140-foot diameter radiotelescope in 1967. Something new had to be tried.

The answer was the interferometer. Radio astronomers found they could synthesize a resolution equal to that of a large aperture by combining data from smaller radio antennas that were widely separated. The effective aperture size would be

equal to the distance between the antennas. This is called synthesis imaging.

Meanwhile, receiver sensitivity had come a long way since the days of vacuum tube. The travelling-wave tube and the parametric amplifier came along. Then the transistor made its debut. GaAsFETs, HEMTs and SISs were developed. These made new, higher frequencies available. To overcome the internal noise inherent in all electronic devices, the first RF stages in receivers were cooled to cryogenic temperatures as low as 15 degrees Kelvin. These developments resulted in some of the most sensitive receivers in the world.


So, how do we collect the data from several widely separated antennas and combine it into a useable form? How do we control and monitor the antennas? Early interferometers were close enough together that data could be transmitted to and from a central location over coaxial cable or a waveguide. As antennas were moved farther and farther apart, control computers and tape recorders were brought into service. As the interferometer improved, more and more telescopes were added to the array. So a new wrinkle was added: baselines.

A baseline is formed by any two elements in an interferometer array. As the earth turns, the path length of the received


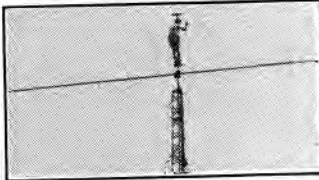
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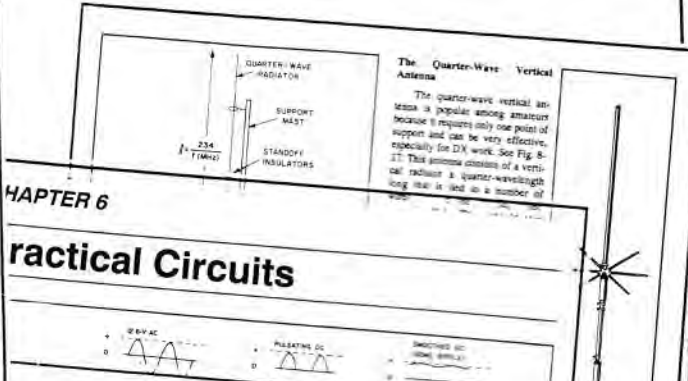
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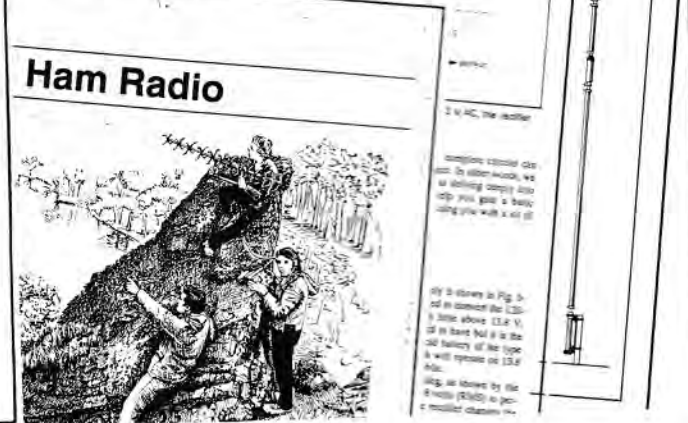


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signal changes. This path-length change causes a corresponding change in the phase of the received signal. Since the signals from the two antennas that form the baseline are added together, the resultant amplitude has a series of peaks and troughs—an interference pattern. If phase relations of the signals are preserved, the resulting interference pattern will produce an image by applying a process of Fourier transformation. The quality of this image is determined by the number of baselines of the interferometer and the spacing of the elements that form the baselines. If the locations of these baselines are properly selected and data is taken over a period of time, the earth's rotational effect adds many new baselines to the array. This adds to the overall quality of the image.

For the computer that does the Fourier transformations to have access to all the antennas' data, the received astronomical signal must be digitized, formatted, time stamped and stored on magnetic tape. The tapes from all the antennas are then shipped to a central location. There, all the tapes are played back and the data correlated and processed to form a single image as if taken by one large telescope.

The night's observation has started and the antenna swings toward the spot in the heavens that is of interest. The tape recorder reels spin, signalling that data is being recorded. The next tape change is twelve hours from now, so you go home for some rest. You check that your pager is on, lock the door and walk over to the base of the antenna. It seems almost stationary. Only by watching the drive wheel carefully can the slight movement of the tracking program be detected. The only noise is the sound of the compressors that keep the receivers cold.

This is the last site to be completed in an array of ten sites. The project, the Very Long Baseline Array (VLBA) was started several years ago by the National Radio Astronomy Observatory. Antenna mechanics installed specialized parts like the feedhorns and the sub-reflector. Electronics experts strung cables and installed racks of electronic equipment in the antenna and the station building. The cryogenics crew added helium lines and vacuum systems. Finally, the nine receivers were put into place and activated. As each piece of hardware was tested, the experts from the home office departed and you were left all alone. The responsibility for the site became yours.

The antenna is an 82-foot diameter parabolic dish weighing 230 tons, supported by four steel wheels on a circular track. It is driven by four motors in two axes. The azimuth axis has 540 degrees of freedom and the elevation axis covers from horizon to straight up.

The receiving system consists of eight vertex-mounted cryogenically cooled

receivers, each with its own feed. By rotating an asymmetrical sub-reflector mounted at the apex of the main reflector, the received signal is directed to one of the feeds. The ninth receiver is a low frequency 90–50-cm unit located at the apex with its own dipole antenna. The receivers are selected and tuned by a computer and the received signal is converted to an intermediate frequency and sent to the station building over heliax cable. There it is converted, this time to a baseband frequency, digitized, formatted and recorded on a 32-track multipass tape recorder. To keep your station synchronized with all the others in the array, a hydrogen maser clock puts out a standard frequency to which all the signals are locked. This is stable enough to assure signal correlation at even the highest frequencies.

This VLBA, the largest dedicated astronomical instrument in the world, will provide valuable information about our Earth. Using quasars, some of the most distant objects in our universe, as reference points, scientists will be able to pinpoint each of the ten VLBA stations within less than one centimetre. Thus they can measure precisely the movements of the giant plates that make up the Earth's crust, and provide geologists with data to help in predicting earthquakes.

The VLBA can be used to study everything from stars in our own Milky Way galaxy to quasars at the end of the known universe. It has revealed details of maser activity in shells of gas around stars hundreds of light years away, and it has shown details of a strangely twisted jet of subatomic particles moving at nearly the speed of light.

Optical telescopes typically give resolution up to half a second of an arc. The Very Large Array (VLA) in New Mexico

can match that. But the VLBA will give a resolution of less than a thousandth of a second of arc, and will yield important and probably surprising results for years to come.

Maybe after supper there will be time for a contact on 20 metres. And *maybe* the schedule at your *other* Amateur Radio station will allow a quick look at the moon for the next EME contest! What a receiving system that would make. Oh, well, you can dream, can't you? ■

Strays



RADIO ASTRONOMY IN FRENCH

The October/November issue of *Radio Amateur du Québec* published an excellent article, "Très haut en fréquence: La Radioastronomie" by René Racine, Professor of Astrophysics, University of Montreal. The article was taken from the magazine *Québec Science*, with the authorization of the Quebec Government Department of Scientific Development.

ONWARD AND UPWARD

The *Canada Gazette* for 1992 December 19 announced that, for 1993, annual fees for Amateur Radio station licences are increased to \$23.

POSTAL RATE INCREASES

Canada Post has advised that its special mailing rate for books will be eliminated on February 28. After that time, it will cost more to mail books. If you are contemplating ordering books from the CRRL Bookshelf, do so before the end of February. ■



Sunset over the antennas of the Very Large Array (VLA) of the National Radio Astronomy Observatory, Socorro, New Mexico.

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If 6M Dx is your cup of tea, then the UT-50S is for you. Most repeat networks also have access to 220Mhz repeaters with little or no Intermod, and lots of privacy when making phone patches (*Most scanners don't even cover*



220Mhz) UT-220S. Be the first on 1.2GHz. Rumour has it that there are going to be some new 1.2GHz machines soon to be appearing. You will need the UT-1200S.

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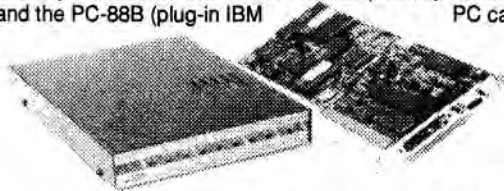
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IARU HF Band Plans

Supplied By Thomas B. Atkins, VE3CDM
Vice President, IARU Region 2

Region 1	Region 2	Region 3
1800 – 1838 CW 1838 – 1840 RTTY 1840 – 1842 RTTY/Phone 1842 – 2000 Phone	1800 – 1830 CW 1830 – 1840 DIGIMODE (DX CW window) 1840 – 1850 Phone (DX Phone window) 1850 – 2000 Phone	1800 – 1830 CW 1830 – 1834 RTTY 1834 – 1840 CW 1840 – 2000 Phone
3500 – 3510 DX CW 3510 – 3580 CW 3580 – 3590 RTTY 3590 – 3600 Packet 3600 – 3620 RTTY/Phone 3620 – 3730 Phone 3730 – 3740 SSTV/FAX/Phone 3740 – 3775 Phone 3775 – 3800 DX Phone	3500 – 3510 DX CW 3510 – 3580 CW 3580 – 3620 DIGIMODE 3620 – 3635 Packet/DIGIMODE 3635 – 3645 DIGIMODE 3645 – 3750 CW/Phone 3750 – 3775 Phone 3775 – 3800 DX Phone 3800 – 3840 Phone 3840 – 3850 SSTV/Phone 3850 – 4000 Phone	3500 – 3510 DX CW 3510 – 3535 CW 3535 – 3775 Phone 3775 – 3800 DX Phone 3800 – 3900 Phone
7000 – 7035 CW 7035 – 7040 RTTY/SSTV/FAX 7040 – 7045 RTTY/FAX/Phone 7045 – 7100 Phone	7000 – 7035 CW 7035 – 7040 DIGIMODE 7040 – 7050 Packet/DIGIMODE 7050 – 7080 Phone 7080 – 7100 DX Phone 7100 – 7166 Phone 7166 – 7176 SSTV/Phone 7176 – 7300 Phone	7000 – 7025 CW 7025 – 7030 Narrowband 7030 – 7040 Narrowband/ CW/Phone 7040 – 7300 Phone
10100 – 10140 CW 10140 – 10150 RTTY	10100 – 10130 CW 10130 – 10140 DIGIMODE 10140 – 10150 Packet/DIGIMODE	10100 – 10140 CW 10140 – 10150 Narrowband
14000 – 14070 CW 14070 – 14090 RTTY 14090 – 14099 Packet 14099 – 14101 Beacons 14101 – 14225 Phone 14225 – 14235 SSTV 14235 – 14350 Phone	14000 – 14070 CW 14070 – 14095 DIGIMODE 14095 – 14099 Packet 14099 – 14101 Beacons 14101 – 14112 Packet/Phone 14112 – 14225 Phone 14225 – 14235 SSTV/Phone 14235 – 14340 Phone 14340 – 14350 Emergency/Phone	14000 – 14070 CW 14070 – 14099 Narrowband 14099 – 14101 Beacons 14101 – 14112 Narrowband/Phone 14112 – 14225 Phone 14225 – 14235 SSTV/Phone 14235 – 14350 Phone
18068 – 18100 CW 18100 – 18110 RTTY 18110 – 18168 Phone	18068 – 18100 CW 18100 – 18105 DIGIMODE 18105 – 18110 Packet 18110 – 18168 Phone	18068 – 18100 CW 18100 – 18110 Narrowband 18110 – 18168 Phone
21000 – 21080 CW 21080 – 21100 RTTY 21100 – 21120 Packet 21120 – 21149 CW 21149 – 21151 Beacons 21151 – 21335 Phone 21335 – 21345 SSTV/Phone 21345 – 21450 Phone	21000 – 21070 CW 21070 – 21090 DIGIMODE 21090 – 21125 Packet 21100 – 21149 CW 21149 – 21151 Beacons 21151 – 21335 Phone 21335 – 21345 SSTV/Phone 21345 – 21440 Phone 21440 – 21450 Emergency/Phone	21000 – 21070 CW 21070 – 21125 Narrowband 21125 – 21149 CW 21149 – 21151 Beacons 21151 – 21335 Phone 21335 – 21345 SSTV/Phone 21345 – 21450 Phone

Region 1	Region 2	Region 3
24890 – 24920 CW 24920 – 24930 RTTY 24930 – 24990 Phone	24890 – 24920 CW 24920 – 24925 DIGIMODE 24925 – 24930 Packet 24930 – 24990 Phone	24890 – 24920 CW 24920 – 24930 Narrowband 24930 – 24990 Phone
28000 – 28050 CW 28050 – 28120 RTTY 28120 – 28150 Packet 28150 – 28190 CW 28190 – 28300 Beacons 28300 – 28675 Phone 28675 – 28685 SSTV/Phone 28685 – 29200 Phone 29200 – 29300 Packet/NBFM 29300 – 29500 Satellites 29500 – 29700 Phone	28000 – 28070 CW 28070 – 28120 DIGIMODE 28120 – 28189 Packet 28189 – 28201 Beacons 28201 – 28675 Phone 28675 – 28690 SSTV/Phone 28690 – 29300 Phone 29300 – 29510 Satellites 29510 – 29700 FM Phone/ Repeaters	28000 – 28050 CW 28050 – 28150 Narrowband 28150 – 28190 CW 28190 – 28200 Beacons 28200 – 28675 Phone 28675 – 28685 SSTV/Phone 28685 – 29300 Phone 29300 – 29510 Satellites 29510 – 29700 6-kHz Wideband

ITU/IARU Region 1 includes Africa, Europe, the CIS, the Middle East excluding Iran, and Mongolia.
ITU/IARU Region 2 includes North America, South America, Hawaii, Johnson Island and Midway Island.
ITU/IARU Region 3 includes the rest of Asia and Oceania.

Notes:

1. CW is permitted on all frequencies, but is exclusive where shown.
2. Where two modes are shown in a subband, the first mode has priority.
3. All 10-metre Beacons in 28200–28300 kHz are to be removed by 1993 January 01.
4. DIGIMODE means digital modes including RTTY, AMTOR and packet, and new systems including PACTOR and CLOVER)
5. Narrowband includes all digital modes.
6. Region 1 contest frequencies: CW: 3500–3560 kHz. SSB: 3600–3650, 3700–3800, and 14000–14050 kHz.



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IOTA—Islands on the Air

Charlton Island, IOTA NA-173 in Zone 2, was first visited by Europeans in 1631 when Captain Thomas James and his crew spent a harrowing winter trapped on the island. In 1680, the Hudson's Bay Company made the island its main depot for all trading in the region. Their sailing ships sent cargoes of furs to Europe until 1931 when the depot was abandoned. Now the silence of the 75-square mile deserted island is broken only by the sound of wind and waves, the cries of wild geese and the hum of a large and lively insect population. A few tipis and shelters used by native Canadian hunters are the only signs of human occupation.

For a brief time in August 1992, the wild blueberry barrens echoed with the sounds of activity of VE8CWI, manned by members of West Island Amateur Radio Club (WIARC) of Montreal. See 1992 June *QST Canada*, for the background on this DXpedition.

WHAT IS IOTA?

Created over 25 years ago by English SWL, Geoff Watts, and taken over by the Radio Society of Great Britain in 1985, IOTA is one of the most popular awards programs available to DXers.

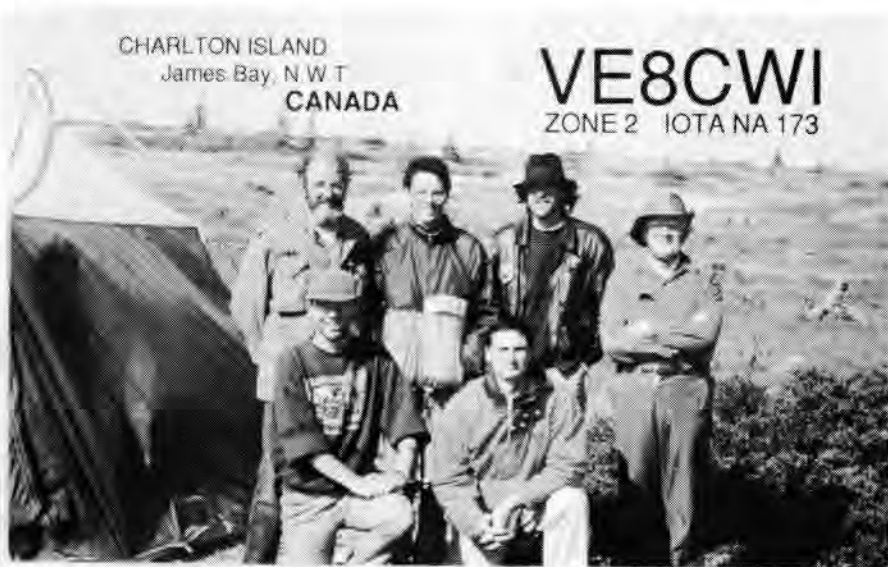
IOTA offers 17 separate awards graded in difficulty. To get started, you need the *IOTA Directory* which lists all the world's islands or island groups and allocates each a number, as in the case of Charlton Island: NA-173 (NA is for North America).

Because the awards program is difficult to administer, islands are not always distinguishable by prefix or suffix. A checker may not know to which group a particular island belongs. This is why QSL cards are required. Applicants in Canada and the US send cards to Dewitt Jones, W4BAA, Box 379, Glen Arbor, MI 49636.

The *IOTA Directory* costs £6.00, US\$10 or 15 IRCs. Orders from Roger Balister, G4KMA, La Quinta, Mimbridge, Chobham, Woking, Surrey GU24 8AR, England.

WHAT ISLANDS OR ISLAND GROUPS COUNT?

Not every island counts separately. Islands are grouped wherever possible. The number of single islands counted separately is relatively small. But all islands or groups that count for IOTA are listed in the *Directory*—with a reference number if they have been activated. The *Directory* lists more than 1150 islands or groups, of which more than 650 have been activated and have reference numbers. The *IOTA Directory* covers more than 99.9 per cent



Charlton Island DXpedition members Benoit, VE2JBF; Mark, VE2PTT; Hank, VE2HN; AI VE2DAV; Andrew, VE2WHO, and Fred, VE2SEI, all of West Island Amateur Radio Club.

of the oceans' islands appearing on world map with a scale of 1,000,000:1.

All island DXCC countries count separately except when sharing the same island (e.g. Haiti and the Dominican Republic).

In the quarter century of experience amassed by the IOTA Committee, organizing and categorizing islands, the criteria used to determine whether an island may qualify for the IOTA awards has been honed to a degree that leaves little or no room for argument. Some examples:

To qualify ... "if within one kilometre of the mainland, an island must be separated from it by a minimum 219 yards (200 metres) of sea at low tide."

And "the following will not count:

- Islands that have ceased to be islands by no longer being surrounded by water including those linked by causeways less than one kilometre long.
- inland islands in lakes, rivers or largely enclosed bays, and
- manmade islands."

THE IOTA AWARDS

• The Basic IOTA Award requires proof of contact with at least 100 islands or island groups with different reference numbers in the *Directory*. At least one contact must be made with an island or island group in each of the seven continents.

• The IOTA 200, 300, 400, 500 and 600 islands awards are for the appropriate numbers of confirmed contacts.

• Each continental award is for contacting 75 per cent of the numbered islands or island groups in that continent.

• The IOTA Arctic Islands, British Isles and West Indies awards are for contacting 75 per cent of the numbered islands or island groups in those areas, or 75 islands or island groups, whichever is less.

• The IOTA World Diploma is for contacting 50 per cent of the numbered islands or island groups, or 50 islands or island groups in each of the seven continents.

THE IOTA NET

This net meets at 1300 UTC, Saturdays on 14.260 MHz, and Sundays on 21.260 MHz, primarily for passing information about island activity and QSL routes. These frequencies, as well as 28.460 and 28.560 MHz, are meeting places for island chasers at all times. ■

February Contests

- NCJ North American Sprint – CW – February 6
- Classic Radio Exchange – February 7-8
- NCJ North American Sprint – phone – February 13
- YL-OM Contest – phone – February 13-14
- ARRL International DX Contest – CW – February 20-21
- CQ WW 160-Metre Contest – phone – February 26-28
- RSGB 7-MHz Contest – February 27-28
- YL-OM Contest – CW – February 27-28

Operating "Horse-Mobile" in the Wilds of British Columbia

This article and picture were supplied by Joyce Sutherland, VE6JOY, who says: "In the short period that I have been licensed, Russ Wilson, VE6VK, has been the most helpful and encouraging Amateur Radio operator I've had the pleasure to meet." This story, written by Russ, originally appeared in the Calgary Amateur Radio Association's newsletter, Key Klix.

On one of my fly fishing trips to Hihium Lake, BC, I was invited to spend some time at Skitchine Lodge. It stands amid tall spruce on the shore of Dagger Lake, in the Tranquile Plateau wilderness area. In the background of the photograph (at right) is an extinct volcano called Poison Butte.

Access is by vehicle to the wilderness boundary, followed by a one-hour horse pack train, or by a float plane or helicopter from Kamloops. The elevation is 5000 feet. There are 16 lakes within walking distance.

My job was to fix the 170-MHz communications system into Kamloops. To get a signal into Kamloops, this system uses a ten-element beam, low to the ground, and relies on bounces off various hills. There is no direct route due to the difficulty of the terrain.

The packhorse, Shadow, was equipped with the usual "pannier" which was used to carry a 12-volt battery. The rig was an IC-740, and the antenna was a modified Hustler mounted on the side of a piece of aluminum with the coax running inside the pipe. Both SSB and CW were used "horse mobile" with excellent results.

Shadow did not like the antenna, but after the wrangler showed it to her she became docile. I believe she was getting her code speed up to 15 wpm by the time I left her!

No Amateur Radio had ever been used in this area. I had an A-frame chalet all to myself, so I installed the IC-740 and a homemade half-wave vertical which was good for 40, 20, 15 and 10 metres. It was also used with an antenna tuner on 75 metres. This enabled me to work several of the Calgary gang who were attending the hamfest in Glacier National Park.

Many contacts were made with stations in North America and overseas, both from the horse and from the chalet. The lodge certainly was a great place to get rid of stress. The scenery was magnificent, the meals were fabulous, and the fishing for rainbow trout was excellent. —Russ Wilson, VE6VK ■



Russ Wilson on Shadow, with IC-740 powered by a 12-volt battery and feeding a modified Hustler antenna.



Keswick (Ontario) Girl Guides enjoying on-the-air contacts with Girl Scouts in the US.

GOTA: GUIDES-ON-THE-AIR

The 9th annual Guides-on-the-Air operating event (GOTA) takes place on 1993 February 20-21. This event gives Girl Guides and their leaders an opportunity to talk to other guides all over Canada, the US and Europe.

In Canada, GOTA is coordinated by Cathy Hrischenko, VE3GJH, on behalf of CLARA, the Canadian Ladies' Amateur

Radio Association, and the Girl Guides of Canada. Amateur Radio clubs and individual operators are asked to open their stations to local Girl Guides. This year, for the first time, girls taking part will each receive a GOTA Camp Crest.

Cathy will be operating the Girl Guides net control station, VE3GGC, on 14.133 MHz during GOTA weekend. ■

Bermuda Contest—35th Edition

One feature that has set this contest apart from all the others will be missing this year. There will be no free trips to Bermuda for contest winners to pick up their trophies in person. However, other aspects of this contest still make it a highlight of the contest season.

Who may participate

The contest is open to licensed amateurs in Canada, the United States, the United Kingdom, Germany and Bermuda.

Contest period

The contest runs from 0001 UTC, March 20 to 2400 UTC, March 21, 1993. Actual operating time is limited to 36 hours maximum. Off periods must be no less than three hours.

Eligibility

Single operator only, operating from own private residence or property. Top winners from the past five years are eligible only for the area awards.

Bands

3.5-, 7-, 14-, 21- and 28-MHz amateur bands, phone or CW. No crossband or cross mode contacts are permitted.

Exchanges

All contestants exchange RS(T) plus province or territory (Canada), state (US), county (UK), DOK number (Germany), or parish (Bermuda). Canadian and US stations may exchange reports with German, UK and Bermuda stations only. Bermuda's nine parishes are Sandys (SAN), Southampton (SOU), Devonshire (DEV), Warwick (WAR), Pembroke (PEM), Paget (PAG), Smiths (SMI), Hamilton (HAM), and St George (STG).

Scoring

Each contact on each band counts for five points. Phone and CW contacts on same band count only if made more than one hour apart. Multipliers are the Bermuda stations worked on each band. Bermuda Novices (three-letter suffixes beginning with an "N") may be found at the low end of each band operating Morse code at five wpm. Each Bermuda novice counts for a multiplier of two. Final score is the sum of QSO points for all bands multiplied by the sum of Bermuda multipliers on each band.

Awards

The top scorer in Canada, the US, the UK and Germany each receive a trophy, which will be mailed to them, unless they

choose to collect the trophy in person at the annual banquet in October. Each winner wishing to attend this banquet will be responsible for his or her own transportation and accommodation. Top scorers in each Canadian province and territory, US state, UK county and German DOK area will receive printed certificates, provided that at least 100 contacts, including five Bermuda contacts, have been made.

Closing date

Logs must be received by the Contest Committee, Radio Society of Bermuda, Box HM 275, Hamilton HM AX, Bermuda, not later than 11 a.m., Tuesday, 1993 June 01.

GOLDEN ANTENNA AWARD



Each year the town of Bad Bentheim, in Germany near the Dutch border, presents the Golden Antenna Award during the German-Dutch Radio Amateur Festival. The 12th annual award will be presented during the Festival to be held on 1993 August 27.

Amateur Radio organizations all over the world, individual radio amateurs and those who have been helped by radio amateurs, are invited to submit proposals and supporting documentation, by 1993 May 15, to Stadt Bad Bentheim, Box 1452, D 4444, Bad Bentheim, Germany.

The jury that will select the winner consists of the mayor of Bad Bentheim, the president of IARU Region 1, and the presidents of VERON, VRZA, DARC and VFDB.

Who is eligible for the award? Individ-

ual radio amateurs as well as groups who "in emergency situations, rendered their services to other people self sacrificingly...in the humanitarian field or in connection with rescue operations in military conflicts, disasters or catastrophes. The only thing that counts is that Amateur Radio shall have played an important part in the humanitarian deed".

The winner of the award will be invited to come to Bad Bentheim for the presentation. Cost of travel and accommodations will be defrayed by the town.

YL/OM CONTEST

All licensed men and women operators worldwide are invited to participate.

Contests

SSB: 1400 UTC, Saturday, February 13, to 1700 UTC, Sunday, February 14, 1993. CW: 1400 UTC, Saturday, February 27, to 1700 UTC, Sunday, February 28, 1993. OMs call CQ YL. YLs call CQ OM. All bands may be used. No crossband, net or repeater contacts.

Exchanges

Station call, QSO number, RS(T), ARRL section, VE province or territory.

Scoring

Score phone and CW as separate contests. One point per station per band. YLs count only OMs, OMs count only YLs. Log must show time, band, date and transmitter power. Send logs, within 30 days of the contest, to Carla Watson, WO6X, 473 Palo Verde Drive, Sunnyvale, CA 94086. ■

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.

New Westminster: Burnaby ARC Fleamarket, Sunday, 1993 February 21 at New Westminster Armories, 6th Street and Queens. Admission: \$2. Tables: \$7.50. Opens at 0900, 0800 for vendors. Good parking. Refreshments. Talk-in on VE7RBY, 145.35 MHz (-) and 442.850 MHz (+). For tables or information, contact Burnaby ARC, Box 80083, Postal Station South, Burnaby, BC V5H 3X1.

St Catharines, ON: The Big Event Hamfest and Dinner Dance, Saturday, 1993 February 6 at the CAW Hall, 124 Bunting Road. Hamfest admission: \$5. Tables: \$5, \$12 for commercial tables. Talk-in on VE3NRS, 147.24 MHz (+). For tables or more information, contact Niagara Peninsula ARC, Box 692, St Catharines, ON L2R 6Y3, Tel (416) 934-3231. ■

The CRRL Field Organization Forum

REPORTS FOR NOVEMBER 1992

Alberta: Acting SM, SEC, TC: Ken Oelke, VE6AFO @ VE6YYC; STM: Gus Bakker, VE6AKY; OO/RFI Coordinator: Dick Sheppard, VE6TY; NM: VE6CPP, VE6AKY, VE6AUZ. Don Wilcox, VE6CG has resigned as interim SM. Don has been serving as Interim Section Manager for the past two years. Hopefully Alberta will soon be back on line with a permanent Section Manager to keep our Section properly represented. Alberta has always been an active Section with many things going on. On a sad note, the Amateur Radio League of Alberta, and many radio amateurs have had a tremendous loss with the passing of Henri Bois, VE6ADI. Henri was membership secretary for ARLA for over 20 years. He will be dearly missed by all who knew him. Congratulations to Bert Farmer VE6PW, on his 60 years of Amateur Radio. Bert's 60 years has also rubbed off on two of his sons: Max, VE6SL, and Jerry, VE6PWJ. We trust Bert enjoys many more years of Amateur Radio. Other Albertans who have celebrated 60 years of Amateur Radio recently included Norm, VE6NB, Dave, VE6BA, and Roy, VE6EA. The CARL, Red Deer area, has been working with the Salvation Army for integrating Amateur Radio into search and rescue communications. The EC for that area is Garry, VE6CIA. The EC in the Camrose area, George, VE6AMM, informs me that the City of Camrose is getting more involved with Amateur Radio for its backup emergency communications. The Edmonton ARES group is now incorporated with charitable organization status, and is very active. Congratulations fellows! A job well done in a very short time. EC reports from other areas are badly lacking. We hope for more information in the future. The SARA network now expanded to Thompkins, Saskatchewan, with good linking up to Edmonton and down to Milk River. ARLA now has temporary membership secretary, John, VE6JAV. Address all ARLA membership matters to Glenora Postal Outlet, Box 53124, Edmonton AB, T5N 4A8. George, VE6GHH, is out on the BC coast for a couple of weeks, trying to get his voice lubricated with the moist air. Last speaking with George, it had not helped so far. I had a nice visit with Earle, VE6NM. He is our CARF/CRRL/DOC liaison and is trying to resolve the many tower issues that keep coming up nationally. If you have copies of any municipal or other bylaws that restrict antenna structures, mail these to Antenna By-Law Watch, c/o Earle Smith, VE6NM, Box 412, Grande Prairie, AB T8V 3A5. For those who know Bob, VE6AA, he is doing fine in Glenmore Park Auxiliary Hospital in Calgary. Many of his friends have missed him on 20 metres since he was admitted. Bob is on two metres though, and is happy for this. Bob, VE6PWT, keeps his radio going for him at the hospital. Calgary and other cities will be working with CIDA, possibly from the Red Cross station, VE6RCC, to allow young people to communicate with people in countries less developed than Canada. This is an educational program, now in its fourth year, that helps make people in Canada aware of problems in third-world countries. It will all happen on February 3.

British Columbia: SM: Ernie Savage, VE7FB. New BC Public Service Net (3729 kHz, 0130 UTC daily) Manager Ed Galbraith, VE7ELF, reports check-ins: high—204, low—155, and total—5471. BC Emergency Net (3652 kHz, 1900 UTC daily) Manager Ray, VE7BCL, reports QNI—1249 and QTC—464. Sixteen stations had a perfect check-in record for the month. We welcome our new NCS: Brian, VE7BLC, and Vicki, VE7DKS. Just a friendly reminder that BCEN code speed is 10 wpm. No complaints lately to the SM's office of any infractions, thanks. This office is looking for more A/EC members. Please send a message requesting a Form 7. Happy New Year to all. 73.

Manitoba: SM: Bill Crooks, VE4JR; A/SM: VE4IX; STM: VE4STU; SEC: VE4TM; NMs: VE4FP, VE4LB, VE4TE and VE4TY. I received a note from

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.

Judy, VE4JBN, regarding a new club station, VE4SJR. It is located at St John's Ravenscourt School in Winnipeg. About 15 boys between the ages of 9 to 13 are actively talking, listening and learning about radio under the tutelage of Judy, VE4JBN. Also some local amateurs, VE4s AJR, AKI, CBK, HK, KU, SG, YF, YU and XYL, have helped by donating time, equipment and expertise to this club. As well as talking on two metres to local amateurs, the boys have been listening to stations around the world on general coverage as well as on the amateur bands. They have made crystal sets, are becoming proficient in the use of phonetics, and have been practising their Morse code. The boys were invited over to the Winnipeg Senior Citizens Club, and all the boys thoroughly enjoyed their field trip. On another note, there is a group of amateurs that meet at the "Golden Arches" restaurant on St James any morning of the week. At these McDonald's "coffee clutches", you can always find unconditional acceptance, interesting talk, good friendship and free coffee refills, upstairs in the southeast corner. On weekdays and weekends, the group includes advanced amateurs and VHF hopefuls, OMs and XYLs, and old timers and children of all of the above. With no agenda or minutes, this group manages to retain an enduring and devoted membership. We thank Joe, VE4JK, and Adam, VE4SN, custodians of the CARF and CRRL QSL bureaus for Manitoba, for a job well done.

Maritimes-Newfoundland: Acting SM: Carl Anderson, VE1UU; STM: Bob Kirkpatrick, VE1VAR; BM: Brent Taylor, VE1JH. No report available. The Maritimes-Newfoundland Section needs a Section Manager. Duties are not onerous and work can be rewarding. Contact VE1UU or CRRL for details.

Ontario: SM, Acting SEC: Larry Thivierge, VE3GT @ VE3OSQ; A/SM, BM: VE3AV @ VE3JF; STM: VE3CYR @ VE3KRG; TC: VE3EGO. ARRL'S DXCC Desk has a new Decision Data line matrix printer that will be used exclusively to print out reports that DXCC members receive when they join or endorse their totals. Until now, those reports shared printer time with other HQ users. The DXCC Desk has been running two shifts, using temporary evening data entry personnel, to whittle down the backlog of DXCC processing. Again this past month, I have been notified of several Silent Keys. In memory, we list VE3ATP and VE3BYH. VE3RHO and VE3XLW are new members of the Ontario Trilliums. EC reports this month were received from VE3AFP, VE3FS, VE3GNW, VE3LPM, VE3LVO, VE3OJN and VE3TNL, and VE3HZQ who is newly appointed EC for Sudbury. VE3LVO reports that the first of a new series of Regional Emergency Communications exercises was held recently, with six clubs taking part. New executive for Sudbury ARC includes: President—VE3PHC, Vice President—VE3BEK, Secretary—VE3LRH, Treasurer—VE3AC, and Editor—VE3SGK. Canadian Girl Guides On-the-Air (GOTA) sponsored by CLARA will be held on February 20—21. This is an open invitation for all amateur operators to participate in this annual event. After the event, photos of participants and copies of publicity announcements, etc. should be sent to VE3GJH for the GOTA scrapbook. Recent visitors to an OARC meeting included VE3RWW and VE3TIX. VE3FDK and VE3FN are both collectors of vintage Collins equipment. New amateurs in the Lakehead area include VE3JXR, VE3MPT, VE3RUR and VE3XJD. The 1995 IARU Region 2 General Assembly will be held in Niagara Falls, Ontario, the first time Canada has hosted a General

Assembly. Canada was chosen over Cuba and Nicaragua. RAC and the nearest local radio club, the Niagara Peninsula ARC, will be busy planning for the event. VE3BNO is a new addition to the PL Club. He was one of my Elmers. Congratulations George! It's not too early to start planning for the Dayton Hamvention, April 23—25.

Quebec: SM: VE2ALE; STM: VE2ED; OBS: VE2GOP. No report available this month.

Saskatchewan: SM: Joan Lloyd VE5JML. Regrettably I announce that Bill Parker, VE5CU of Saskatoon became a Silent Key on November 18. Congratulations to the Southwest Amateur Radio Club for the fine fleamarket held in Swift Current November 28. About 40 amateurs braved the roads to snap up the bargains. Saskatchewan Amateur Radio League (SARL) directors and executive held a meeting in Swift Current November 28. SARL members are encouraged to participate in the monthly on-the-air meetings held the third Monday of every month at 0300 UTC on 3744 kHz. The Regina Emergency Communications team was busy in November, November 11 saw team members assisting Regina City Police in an exercise—a search for stolen vehicles. During the 90-minute search, two cars were recovered, several abandoned and vandalized vehicles were discovered, and one wanted person was apprehended. Our thanks to the following VE5s for their participation: AGM, BV, CON, CS, DCP, EE, ELJ, FAR, HQ, IC, IQ, MH, MNM, MQ, MU, RJR, SF, SHK, VR and WJ. It is through exercises like these that the community becomes aware of what Amateur Radio is, and how amateurs can help out. Keep up the good work, team! On November 27—29 fourteen team members received certification in first aid and CPR. Snow has arrived in VE5 land, and as I write this it is only 19 days until Christmas. From the CRRL team in Saskatchewan I wish everyone a Merry Christmas, and we all look forward to 1993 and the formation of Radio Amateurs of/du Canada. Happy New Year to all. ■

NEW BOOK FROM ARRL

ARRL's *Understanding Basic Electronics* is a well-written book with many points illustrated by cartoons featuring "Hammett", a very smart pig. The book starts with basic number skills, and the metric system. DC theory, terminology and laws are explained, as is AC theory, semiconductors, integrated circuits and vacuum tubes. Layout of the new book is interesting. Most topics are presented on two facing pages, so a whole lesson is in front of the reader at all times.

This new book is not study material for the Canadian Amateur Radio examinations. *Talk To The World* continues to provide that. Amateur Radio instructors may wish to use this new book as supplementary study material for their students.

Order from CRRL. Cost: \$21.25 plus \$2.25 for mailing, plus GST. ■

Communications for Special Events

Is there any connection between emergency communications and communications for special events such as Santa Claus parades, walkathons, goblin patrols, etc? The answer is, yes, indeed.

In providing assistance for special events, ARES groups develop their communications skills, give their equipment a good workout, and get used to working together as a team. ECs practise their skills as organizers and motivators. Net controllers get valuable practice as well. Not the least benefit is the development on the part of the community and its leaders of confidence in our ability to handle communications in a professional manner.

This month, Pierre Mainville, VE3LPM, the Emergency Coordinator for Brampton-Caledon gives us his thoughts on the principles of special event communications. Then Larry Nason, VE1CX, describes how the Fredericton ARC provided communications for the Fredericton 1992 International Air Show. This is an example of special events communications at its best.

PRINCIPLES OF SPECIAL EVENTS COMMUNICATIONS

Amateurs are known for their communications in disasters such as the Mississauga train derailment and the Barrie tornado, but they also provide communications services during special events. These are usually held for the enjoyment of the public and draw large crowds. They provide good public relations opportunities for radio amateurs who provide organized communications at no charge. These activities make Amateur Radio visible to non-amateurs. They sharpen our operating skills and help justify our existence. Also, operating in special events is just plain fun!

Here are some of the principles to be followed:

- 1) Use simplex FM whenever possible, with a repeater for backup and for talk-in. Get permission to use the repeater well in advance.
- 2) Arrange for someone who knows the area to handle the talk-in and provide him or her with a good map.
- 3) Get a clear understanding of the needs of the group you are serving.
- 4) Arrange for someone to be in charge as a net control station (NCS). Even small events can have messy communications without an effective NCS.
- 5) Arrange for relief operators. We all need lunch and coffee breaks.
- 6) Arrange for your operators well in advance, but check with them the week

before the event to make sure they are still available. If you can have extra operators or standbys available, do so.

7) Excuse each operator as soon as you can, provided his or her job is fin-

ished and that all the other positions still needed are covered by other operators.

8) Have the NCS keep track of who is where, so he or she knows whom to call when asked to contact a person or an area.

Field Organization Reports November 1992

CRRL Section Emergency Coordinator Reports

Reports were received from the following:

Reporting	ARES Members
VE3GT	136
VE6AFO	372
VE7HJS	160

CRRL Section Traffic Manager Reports

Call	Orig	Rcvd	Sent	Divd	Total
VE1BTV	1	21	20	0	42
VE1VAR	2	10	14	0	26
VE1YS	0	12	13	0	25
VE1ALU	1	10	11	0	22
VE1BYO	0	1	0	1	2
VE2ALE	0	49	251	1	301
VE2GOP	0	35	188	0	223
VE2ED	2	10	8	2	22
VE3GSO	7	93	79	0	179
VE3GNW	0	56	63	0	119
VE3PXR	16	28	42	5	91
VE3HZQ	0	30	60	0	90
VE3ORN	7	31	38	1	77
VE3FS	3	33	36	0	72
VE3GT	0	27	45	0	72
VE3CYR	0	53	8	2	63
VE3AJN	0	56	0	1	57
VE3BZB	1	25	25	1	52
VE3BDM	0	13	31	0	44
VE3WV	0	38	3	0	41
VE3SB	0	8	12	2	22
VE3DBG	0	4	15	0	19
VE3ADX	1	8	9	0	18
VE3DVE	1	5	11	0	17
VE3MNI	0	4	9	3	16
VE3LPM	0	8	5	0	13
VE3BAJ	0	1	6	1	8
VE3NVJ	0	2	5	0	7
VE3GKB	0	1	2	0	3
VE4JR	0	35	30	19	84
VE4JA	0	35	5	5	45
VE4FP	0	12	12	4	28
VE5KZ	4	70	70	1	145
VE6CE	16	34	18	9	77
VE6XG	14	25	16	9	64
VE6CPP	6	6	6	6	24
VE6CHK	0	6	6	6	18
VE6AKY	2	3	3	3	11
VE7BNI	52	216	300	73	641
VE7ANG	2	117	101	5	225
VE7BCL	0	115	43	14	172
VE7XA	5	34	39	5	83
VE7CCJ	3	44	29	3	79
VE7FB	1	20	16	8	45
VE7GKA	2	28	10	4	44
VE7EGM	0	21	8	3	32
VE7BZI	4	19	5	4	32
VE7FME	0	23	8	0	31
VE7BCF	1	24	5	0	30
VE7FRZ	3	18	6	1	28
VE7WI	0	18	8	1	27
VE7OM	0	16	9	1	26
VE7DKS	0	20	5	0	25
VE7BUU	0	21	2	1	24
VE7CZW	0	15	3	0	18
VE7BPO	0	12	3	1	16
VE7AHU	0	13	1	0	14
VE7ALV	0	10	1	0	11

National Traffic System

Net (Mgr)	Sess	QNI	QTC
APN (VE1YS)	27	141	115
QSN (VE2ED)	16	73	2
KTN (VE3AJN)	12	90	11
OLN (VE3POJ)	30	996	38
OPN (VE3AJN)	30	685	148
OQN-D (VE3ORN)	28	87	44
OQN-E (VE3CYR)	29	150	61
OQN-L (VE3GSQ)	30	82	35
MEPN (VE4LB)	30	998	17
MMWX (VE4TE)	30	420	16
MTN (VE4IX)	22	203	8
SEPN (VE5CJ)	28	1374	8
APSN (VE6AKY)	31	1299	6
ATN (VE6CPP)	31	157	46
BCEN (VE7BCL)	30	1249	557

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

(1991 Revision) This listing is for amateurs whose public service performance during the month indicated qualifies for 70 or more points in the following eight categories (as reported to their SM). Maximum points per category: (1) Checking into a public service net, any mode, 1 point each, maximum 60; (2) Acting as Net Control Station (NCS) for a public service net, any mode, 3 points each time, maximum 24; (3) Performing assigned liaison between public service nets, 3 points, maximum 24; (4) delivering a formal message to a third party, 1 point each, no maximum; (5) Originating a formal message from a third party, 1 point each, no maximum; (6) Serving as a CRRL SM or field appointee, 10 points for each office, maximum 30; (7) Participating in a communications network for a public service event, 10 points each event, and (8) Providing and maintaining an automated digital system that handles messages in standard ARRL-CRRL format, 30 points. Those qualifying for Public Service Honour Roll 12 consecutive months, or 18 months out of 24, will earn a special certificate.

PSHR: VE2ED (98), VE3GSO (135), VE3AJN (129), VE3BDM (128), VE3GT (128), VE3FS (123), VE3HZQ (108), VE3CYR (99), VE4JA (99), VE4LB (89), VE4JR (85)

Service and Specialized Nets

Independent Net Managers: Your monthly reports are welcomed. Please send your reports to CRRL, Box 56, Arva, ON N0M 1C0.

Net (Mgr)	Sess	QNI	QTC
ONTARS	30	12986	0
GBN (VE3WV)	30	103	32
GBSSN (VE3WV)	30	114	34
Manitoba Repeater	9	690	0
Aurora 1 (VE5ND)	30	1624	7
Aurora 2 (VE4FP)	28	1325	0
Prairie WX (VE5EX)	30	760	0
Sask ARES (VE5FY)	4	260	0
Sask 2-Metre (VE5HG)	30	850	0
MJARC 2-Metre (VE5JJP)	28	405	0
ARG 2-Metre (VE5EE)	28	881	0
Alberta ARES (VE6AKY)	8	180	2

9) Keep your EC or SEC informed about what you are doing and who is participating. The EC can also help you get the operators you need.

10) Tell your operators exactly what their assignments are and remind them of the general guidelines for the event. Assignments and changes in the guidelines should be made known to the group.

11) Thank your operators and encourage feedback from them.

12) Identify vehicles as Amateur Radio Communications Vehicles. Operators should also have plainly visible identification.

13) Maintain a courteous, professional image. You may be working with several agencies. Extend every possible courtesy to them. Make sure they know who you are and what your communications are.

14) Make sure the frequency is clear before making a call. Keep transmissions as short as possible. Resist the urge to ragchew or ramble.

15) Do not apply first aid unless you are trained and certified to do so. Call for medical assistance and trained personnel will be sent to your location.

16) Do not handle business or commercial communications.

17) Prepare equipment and supplies in advance. Make sure your batteries are fully charged and take spares if available. A clipboard with paper and pencil is often useful.

18) Enjoy yourself. Public events communications is fun. —VE3LPM

FREDERICTON INTERNATIONAL AIR SHOW

With the 1991 Fredericton Air Show under its belt, Fredericton Amateur Radio Club was called upon again, to provide communications for the 1992 show. In 1991, the show drew 50,000 spectators to the banks of the Saint John River. For the 1992 show, the City of Fredericton was able to procure the world famous Canadian Snowbirds and the new US Stealth bomber. With these two major attractions added to the regular show, attendance was expected to be much larger than for the previous year.

Sterling, VE1SKC, Don, VE1WB, and John, VE1IW, who organized communications for the 1991 show were called upon again as they had done an excellent job. In planning for the second show, these three put a lot of time and effort into making sure that things went right. The planning committee started meeting in January. As the date of the air show approached, more and more requests were received by Fredericton ARC, to the point where 60 operators were needed for the Sunday show alone. With the heavy demand for operators and equipment, Don, Sterling and John certainly had their hands full.

On Saturday, the air show included a

static display and a flying display. As the show was located at Fredericton Airport, parking was limited. The public was asked to park cars at other locations, from which they would be bussed, free of charge, to the airport.

At the airport, a communications centre was set up with several operators manning the radios. Parking lot operators stationed in the city, where the buses were picking up the spectators, were linked to the communications centre. Radio traffic became very heavy as the crowd poured in. This link was on two metres, on 146.55-MHz simplex. Also using this link was the airport's perimeter control system. These operators carried handhelds and were responsible for reporting any problems in that area. The communications centre was also tied into the airport control tower via a 440-MHz link. Both the Provincial Mobile Communications Centre and the VE1BM repeater autopatch were on line. To top it off, the Amateur Radio communications centre was tied into the RCMP and Fredericton International Air Show Committee members via a 150-MHz link. So, as you can see, John, Don and Sterling had all their bases covered.

Special hats and stickers were issued to all radio operators so the public could readily identify them and receive assistance. As the day progressed, all traffic was relayed through the Amateur Radio control centre. One thing learned was that headphones or earpieces were needed for all radios, as the noise drowned out the audio from the radio's speaker at times.

As mentioned, on Sunday 60 operators were needed. The communications command centre was set up and tied into a vast network of radios. Shawn, VE1SLM, built two 440-MHz beams so the command centre could communicate with the Fredericton Airport control tower via a 440-MHz link. As each aircraft left the airport the information was relayed to the command station, which passed it to the proper personnel. Radio stations CIHI and CKHJ were both linked to the command centre, and any messages that had to get to the public were relayed by them to their listeners. Radio station CIHI on many occasions broadcast live to the public the fact of our presence, and announced that we should be contacted if any problems occurred. This system worked very well, and several lost children were reunited with their parents using this system.

It should also be mentioned that the Fredericton Police Department specifically asked for one Amateur Radio operator to work with each of the 17 extra officers that were put on for the Sunday show. Their job was to serve as radio backup to assist the officer where needed. As on Saturday, when problems occurred, information was relayed to the control station.

Communication was to be carried out only if necessary, and all operators adhered to this requirement.

During the two days of the Fredericton International Air Show, communications passed without any problems. One of the main reasons for this was the effective work of the amateur organizing committee. This is not to take anything away from the other amateurs who volunteered their time, but sometimes the behind-the-scenes work does not get the credit that is due. —VE1CX

Fredericton Amateur Radio Club certainly did an excellent job. Special thanks to the 60 operators, including five from the US, who participated in this event. —Bob Boyd, VE3SV

This column appears in both The Canadian Amateur and in QST Canada. We hope that it serves as an ongoing source of news and information about ARES for members of both CRRL and CARF.

A reminder that ARES is part of the CRRL Field Organization, although you do not have to be a CRRL member to take part. For more information about how to set up an ARES group, contact your CRRL Section Manager (address appears on page 3 of this QST Canada) or your CRRL Section Emergency Coordinator. —Editor



New Products



Oak Bay Technologies recently announced a companion product to their UNICable™ Universal Packet TNC-transceiver cable line.

The CA-232HH connects all TNCs to all handhelds that use the 2.5-mm and 3.5-mm microphone and earphone jacks.

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For more information, contact Oak Bay Technologies Inc., Box 65494, Port Ludlow, WA 98365, Tel (206) 437-0718. ■



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