

FEED BACK

GEORGIAN BAY AMATEUR RADIO CLUB NEWS

Editor Bill VE3EFX

SEPTEMBER 1975

Executive President	Dick Shave	VE3BIS
Vice Pres.	Dave Dixon	VE3DXO
Sec. Treas.	Cy Weaver	VE3DQA

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The annual fishing trip was called off on July 19th due to bad weather and it was re-scheduled for August 10th when 15 people took part. The day was sunny and a good time was had by all.

\* \* \* \* \*

As of this date I have been unable to find out what our Field Day score was as Terry seems to have dropped out of circulation. To the best of my knowledge he got the entry in to the ARRL in time but didn't send in the entry to RSO for the Rusty Brennan Trophy. I doubt if the entry will be accepted now , so it looks as if we'll lose it by default.

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The Bluewater club invites any of our members to a corn roast at 2pm on September 7th at the beach in Goderich. They will provide the food so be sure to let them know if you plan to go. The free feed should entice out all the tight wads and eliminate most of the procrastination.

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The Slack boys have a DX40, VF1 combination for sale at \$50. Call them on VE3OSR.

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As VE3AKC's picnic will be over by the time you read this, I'll just say that I hope it was well attended and that you all enjoyed the day.

\* \* \* \* \*

XJ3EFX will be on vacation starting August 15th so this is being typed early in the month. I will be seeing you at the meeting in September.

I plan to bring up the subject of Associate membership at the next meeting. I'd like to make a byelaw to the effect that all licensed amateurs must be full members. Associate membership will only be for SWL's. Think about it and let your thoughts be known at the meeting.

\* \* \* \* \*

The next session of radio classes will be starting in October and there are a few requirements that I'd like to see for the next group.

1. Each one in the class should have access to a receiver for code practice and also to listen to the club net, ONTARS, etc.
2. There should be a copy of the Beginners Handbook available for everyone to buy.
3. No 2m rigs should be encouraged till they are about ready for their Advanced ticket unless they are hot shots at CW and won't be slowed down by FM operation
4. A schedule of slow code should be organised so that it is available at least six nights per week on 80m till all those in the class can copy 5wpm solid, then W1AW can take over. This will save Jim having to spend so much time on CW and he can start the theory so that one chapter of the book will be done each week for 13 weeks and there will be time for some review before the exam.

\* \* \* \* \*

So that we can get to know a bit more about the members I want to get a series of articles going titled "How I Got Into Ham Radio". I tried this once before and as far as I can recall only got one response from VE3BSF. However this time I will nominate the person I want to send in his story one month ahead of time and I'd like one page typed with a half inch margin at the left, or you may send it in written form as long as I get it early enough. My nomination for the October issue is VE3DXO, Dave, our Vice President. We also had VE3DQA's story in Dec '74.

\* \* \* \* \*

The GBARC net is on 3.783 mhz every Sunday at 9.30 EDT. Please check in.

\* \* \* \* \*

There has been no reply to my letter to the Minister of Communications, but his secretary wrote to say that he would be replying. As Parliament is now on Summer vacation it is unlikely that I will hear from him before October.

\* \* \* \* \*

The repeater was put to good use at 00.07z on August 2nd when VE3AGY/m broke in on XJ3BIS and VE3AYM to say that he had come on an accident near Tara. A car had overturned and two children were injured. XJ3BIS called the OPP and they were on the scene shortly with an ambulance arriving soon after. This proves the value of Ham radio over other services in that type of situation. A passing bus driver could not raise anyone on his radio at the time. CB?????

Statistics on the club membership at the beginning of August are as follows. Members; 54. Amateurs; 47. RSO Members; 36. ARRL Members; 24.

As you can see we will just make it as far as ARRL affiliation is concerned so I hope we can get some more of you to join ARRL and assist the club to maintain this affiliation, which will be a benefit to us on all the public relations type activities that we take part in.

\* \* \* \* \*

VE3HIO and VE3HIN are putting out a good signal with their new FT200 and it didn't take them long to get into controlling Ontars and working some DX.

\* \* \* \* \*

The XJ prefix is a great attraction on the air and there are at least two new awards coming out so I will print full details on them as soon as they are available. Some people are using the prefix and some aren't, I find it surprising that anyone who is a VE3 which is hardly likely to cause a stir on the bands, doesn't take advantage of a rare prefix to get some good DX contacts easily. W.A.S. will be a cinch for a XJ3.

\* \* \* \* \*

Anyone who has listened to VE3OSR lately must have heard Dick bawling everyone's ear about his rotten tomatoes, and the mercenary farmers around the area who dare to charge him \$1.50 for a bale of hay. It appears that he doesn't stake up his plants like everybody else and they are rotting on the ground. Now he wants to spread hay under them and try to salvage the crop, it beats me why anyone would complain about spending \$1.50 to save umpteen dollars worth of tomatoes but that is how the Southampton Swami operates. Tune in to VE3OSR for the latest news on Dick's war on the mysterious tomato rot. We suspect 2m HF may be the cause.

\* \* \* \* \*

Another incident involving the Ancient Mariner was witnessed by the boating and fishing fraternity in Southampton on August 4th. Apparently the Shave Steamship Company, a subsidiary of the Shave Rotten Tomato Producers Unlimited, was in the process of sailing some visitors round the bay when the mast fell off the boat. I believe that the spectacle of Dick being demasted in midstream created more confusion than has been seen around Southampton harbour in a long time. The moral of this story is, always stay on land if you suspect the boat suffers from dryrot.

\* \* \* \* \*

The Owen Sound amateurs may use the club box number for their incoming QSL cards as the crazy type of street addresses in the city are pretty hard to get over on CW .

The following items are for sale from VE3GLR, John in London.

- |   |      |
|---|------|
| 1. Hygain 2BDQ trap dipole for 80 & 40 metres               | \$40 |
| 2. Headphones   | \$5  |
| 3. Hygain 12AVQ vertical for 10, 15, 20 metres + 130' RG8/U | \$50 |
| 4. Coaxial switch 5 position                                | \$10 |
| 5. Model 651 headset type mike                              | \$50 |

\* \* \* \* \*

The new calls issued to those who passed the Amateur exam in June are :

Gerry Bradley, VE3HXV.

Ted Brown, VE3HXW

Ian Sutherland VE3HXX.

As of this writing Ian has been on 80 metres and is getting out fine.

\* \* \* \* \*

Lots of action on the repeater in the last few weeks with many new calls heard passing through the area, and favourable comments on the coverage were heard on many occasions.

\* \* \* \* \*

The coming weeks are likely to be busy ones for the club . We have the Split Rail Festival the last weekend in September. Ian, VE3HIP, is in charge of organizing the installation and operation of an Amateur radio display. All those who can assist should get in touch with Ian right away.

The RSO Convention in Ottawa will be on the 3rd, 4th & 5th of October. This is a good one to attend and Jim, VE3CRV, plans to take the van up with those who wish to go.

The Motor Club Rally will be held on the 18th October and we will want as many 2m mobiles as we can get for that event.

\* \* \* \* \*

There doesn't seem to be any support for a club contest so I suggest that if you are interested in this type of operation you should enter the VE/W contest on the 20th & 21st of September. This is a good one for those who are new to contests and there is usually lots of activity. See QST for details.

\* \* \* \* \*

VE3HIR and VE3EFX finally got the second contact with a Peterborough station that was using the XK prefix. When the QSL comes we can send for their certificate.

The problem up there seems to be that they are all waiting on the city to buy them the special QSL cards. How cheap can you get ?

# No room in the radio spectrum

Overcrowding and electronic pollution are making life increasingly difficult for users of the radio spectrum—especially those operating in the high frequency band. Do the long established users really have such inalienable right to their channels? And just who are they, anyway?

**Peter Laurie**  
is a freelance  
journalist and  
author

Since radio goes everywhere, it makes the world a village hall. Given the will, every one of the world's 3700 million people could speak at once—a whispering gallery rocking with the shouts of multitudes. Unfortunately the radio spectrum—like every other natural resource—is rapidly becoming polluted. All over the world radio noise is increasing year by year as a by-product of increased use of electrical power, much of it from the ignition systems of motor cars. In consequence radio transmitters get more powerful in order to punch through the noise. And those that are not perfectly adjusted, which is a large proportion, add to the noise with their harmonics. Thus the useful radio spectrum is controlled in great detail by governments, following the rules worked out by the International Telegraph Union at Geneva, founded in the 19th century. This body is an unusually successful example of international cooperation, controlling the radio spectrum from 10 kilohertz—around the limit of human hearing—to 275 gigahertz (one GHz is a thousand million cycles per second). In wavelength terms, this is from 3000 metres down to 1 mm.

This spectrum is divided into eight bands, ranging from very low frequency (VLF) to extra high frequency (EHF). Each band covers a decade of frequency or wavelength. Thus the HF band stretches from 3 MHz to 30 MHz (100 metres down to 10 metres). This particular frequency band corresponds to an important physical peculiarity which forces the rest of the spectrum to arrange itself round about. The bands vary widely in their use, and naturally their applications reflect this. The basic differences between them lie in their modes of propagation—with the complication that high frequencies carry much more information than low ones.

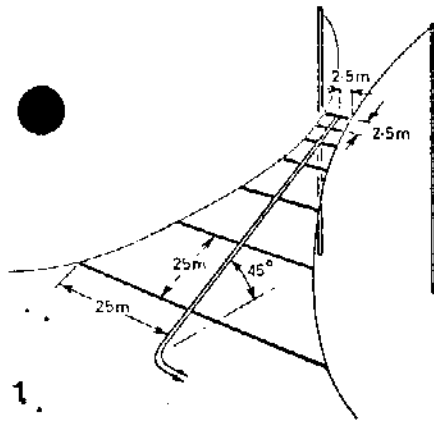
Low frequency waves are propagated either by ground wave, or in the duct between the Earth and layers of the upper atmosphere. VLF runs from 3 kHz to 30 kHz; the part of the band below 10 kHz is not actually used at the moment, though the US Navy is experimenting with extra low frequencies in an

attempt to find a totally reliable way of communicating with Polaris submarines (New Scientist, vol 59, p383). Before the First World War, this band offered the only vehicle for round-the-world communications. It needs vast aerials, so big that the world's VLF stations are some of the largest man-made structures. In Britain, there are three: Rugby, Criggion on the Welsh borders, and Anthorn near Carlisle (used to relay radar warnings from Flyingdales to the US air defence system).

Current interest in VLF is almost entirely military, because these frequencies penetrate through 10 metres of water and so allow communication with submarines and also because they are relatively unaffected by nuclear bursts in the upper atmosphere—which tend to mess up high frequency communications. The Americans have a hyperbolic navigation system called Omega, mainly for their Polaris submarines, which works at VLF. Generally speaking, in times of nuclear strife any VLF station is likely to be high on the enemy's target list—and therefore a good thing not to be neighbours with. Propagation of VLF is so regular that each transmitter has its "pole" on the opposite side of the globe, where the waves come together again in phase. Rugby's is south of New Zealand.

The low and medium frequencies (LF and MF) run from 30 kHz to 3 MHz, and are where radio first developed commercially. There is consequently a rare hodge-podge of uses in these bands, not all of which one would retain if the whole spectrum were being devised again. But because new equipment is introduced piecemeal into old slots, radio bands unfortunately preserve themselves—just as street lines do in old cities. So, although most national broadcasting networks would like to move into the VHF band, they are tied down by the millions of MF receivers there are in the world. These frequencies give daytime ranges of 100 miles, but at night are reflected erratically by the ionosphere over distances up to 1000 miles. In this band are most national broadcasting networks (more than

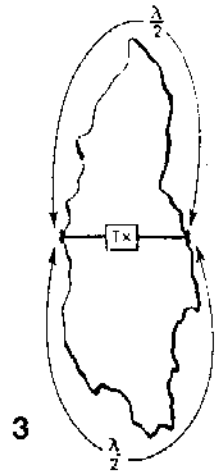
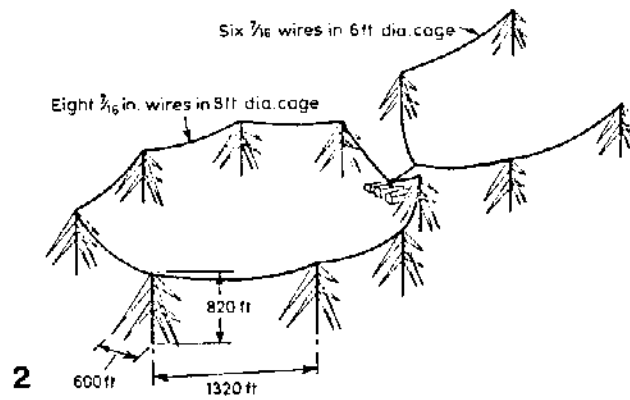
Wullenweber HF  
direction finder (above)  
operated by the US  
Air Force at  
Clicksands near  
Bedford. The inner  
ring is probably a  
VHF direction finder  
on the same  
principle. The array is  
one in a chain of nine  
stations operated  
world-wide by USAF  
(courtesy of James  
Gilbert)



**1** High frequency (HF) log periodic broadband directional aerial is designed to allow tuning to be done accurately right across the band

**2** One of Britain's three very low frequency (VLF) stations at Rugby. The two other VLF aerials are at Criggion on the Welsh border and Anthorn near Carlisle

**3** A British naval proposal for use of an island as an extra low frequency (ELF) slot aerial for communicating with submarines. In this case the conduction medium is the sea rather than the ether



half the stations operating on pirated frequencies), long range navigation aids such as Decca, Loran and Consol, and umpteen ship and aircraft radio beacons. Really the band is best suited to coastal navigation and communication.

The HF band from 3 MHz to 30MHz is the traditional jewel of the spectrum, although it is now beginning to look a little antique. Discarded contemptuously to the amateurs by American legislation of 1912, it rapidly proved to be the most useful of all. The point is that these frequencies are refracted downwards by charged layers in the ionosphere and so hop around the world, bouncing alternately off land and sky. With patience one can raise New Zealand with only 10 watts of transmitting power; regular working, however, is much more difficult. A ship's radio officer in the Indian Ocean, for instance, can spend two days clacking away with a morse key and 1.5 kW of power to raise Portishead in Somerset.

Communication in the HF band is more of an art than a science, for the maximum usable frequency (the one that gives the strongest signal between two points for the least transmitter power) varies from hour to hour, day to day, and year to year, as well as with one's position on the globe. It is at a maximum at noon, and then there are fewest sunspots. At the 11 yearly sunspot maximum the whole band is crammed down below 6 MHz and communication managers go old before their time.

Demand for HF communication is now such that channel spacing is down to 2.5 kHz, the absolute minimum for voice. This gives 10 800 speech channels in the band—not much for the whole world, particularly since any point-to-point link will have to be assigned three or five frequencies so it can keep within the maximum usable frequency curve during its many variations.

The number of HF channels, however, can be multiplied by crafty juggling. For instance, fixed transmitters and receivers have highly directional aerials so that they may give 16dB gain in the chosen direction and -3dB everywhere else. It is possible then to assign the same frequency to two links pointing in different directions on opposite sides of the world. Such stations are now very large, expensive and complicated, and have to be

computer controlled with automatic monitoring of circuit quality and automatic frequency changes according to programmes prepared months ahead. There have been many detailed improvements in HF technique in recent years. For instance, multiplexing several voice and telegraph channels together saves bandwidth. More accurate frequency standards and frequency synthesis techniques keep transmitters on tune. And single sideband transmission, though more expensive at both ends, greatly reduces bandwidth. The permitted error in a high power transmitter is now 15 Hz in 1 MHz—just about equal to the average channel spacing over most of the HF band.

Wideband cables and satellites have taken a great deal of point-to-point work off the HF band. But there are always more applicants than there is room—resulting in a good deal of unseemly jostling and piracy. The British monitoring service, run by the Ministry of Posts and Telecommunications at Baldoak, deals with 100 complaints of interference each month.

### Plummy propaganda

The cold war still goes on in the HF band. One use, very popular with governments, is international broadcasting. Disguise it how you will, the result is propaganda, and the unwary Briton who is caught by the BBC's overseas service is likely to suffer a nasty jolt. The plummy, moustached voices, the dignified understatement and, to the critical mind, the reckless slanting of the news in favour of government views, flings one back into the jingoistic dream world of wartime newsreels.

There are some 80 external broadcasting stations operating, many of them in the HF band beamed to some victim corner of the world. The BBC has HF transmitters in the Far East, Ascension Island, Cyprus as well as four stations in Britain. It is interesting that the most powerful transmitter in Britain is the Foreign Office's 600 kW "Aspidistra" station at Crowborough, administered by the BBC. Built during the Second World War for subversion of German troops, Aspidistra would pretend to be a German army pirate station broadcasting cheering items to front line troops like: "The smallpox epidemic among children in the homeland has now been contained due to the heroic efforts of German

doctors and nurses. The death rate last week was only 20 per cent."

Radio has been around for half a century or more. Vast sums have been spent on it. Many clever people have made it their life's work. And it is arguable that the last war was won by supremacy in the ether. Even so, there is still much to be learnt, even in the much-tramped HF band. For some years the Americans and Russians have been experimenting with HF radars that detect rockets and aircraft thousands of miles away, far over the horizon. A prototype over the horizon (OTH) radar was installed at Orford Ness in Suffolk which lies nearly on the great circle path through the Soviet rocket launching sites at Plesetsk and Tyuratam, and so could watch both. The US Air Force is reported to be phasing out its system of early warning radars along the coasts and the DEW-line, and to be replacing them with far fewer of these immensely long-range stations, supplemented by Airborne Warning and Control aircraft carrying very powerful centimetric radars.

Although textbooks tell us that HF signals are propagated by bouncing from Earth to ionosphere, there are other less explored modes. Sometimes signals get trapped in a duct, hurtle right round the world and come back with a loss of only 6dB. There is a low layer technique, again explored by the Ameri-

cans, which offers very secure communications in the D-layer about 25 miles up. In this case, the signals are launched and recovered from high flying balloons. During the Korean war, the military found that if they hurled sufficient power at the ionosphere enough would be scattered forward to be heard 800 miles further on, whatever the state of the ions. So these systems used enormous aerials and megawatts of power. The frequencies are still allocated, but little used.

**By line-of-sight**

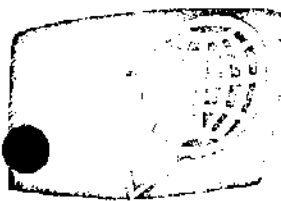
Above the HF band is VHF, first regulated by the Cairo conference of 1938. Here the band planning is more sane, though there are occasional bizarre conjunctions—like the police and fire services in Britain being on the same band as VHF broadcasting, so that any transistor radio can listen to all. A lot of this band here is taken up with television, which has to be at VHF or above just to accommodate the 8 MHz bandwidth needed. The 405 line transmissions use 25 MHz and the 625 line system 38 MHz out of a total of 270 MHz in the band. At these frequencies, propagation is essentially line-of-sight, with less bending and more shadows towards the top of the band. The band is much used by mobile links—police, radio taxis, aircraft, military. The Post Office estimates that there are more than 100 000 mobile radio telephones in use in Britain alone. The Home Office has also constructed and operates an elaborate network of VHF communications which embraces all the emergency and local authority services (including gas, electricity and water) and links them, if necessary, to the regional emergency seats of government.

Although propagation is essentially line-of-sight, on about two days in 100, when temperature inversions act as waveguides, American police messages can actually come booming out of TV sets in Britain tuned to BBC 1. Amateurs working on 70 MHz and 144 MHz bounce their signals off the aurora and clouds of sporadic E-layer to get occasional contact down from Scandinavia to southern Europe.

Functionally, VHF and UHF are much the same until one reaches about 800 MHz. At this point the technology changes. Wavelengths longer than this are in fact much larger than the components used and, but for change of values, a circuit working at VLF is much the same as one at UHF. But at this point circuits have to be etched out of copper-clad boards or built of pipe. Transistors and valves begin to run out of gain, so signals have to be generated by klystron valves or Gunn-effect diodes and amplified by travelling wave tubes. It becomes difficult to amplitude or phase modulate radio signals. Instead, innumerable forms of pulse coding are used.

At 2 GHz there is a final brute force fling at long distance communications with tropospheric scatter. Again, enough power shot at the horizon is scattered forward in this layer and comes to Earth at the next horizon 800 km further on. There are a number of these stations—each a pair of 60 ft dishes placed

	NAME	CHARACTERISTIC	APPLICATION
300GHz	Extra High Frequency (EHF)		Satellites, radar,
30GHz	Super High Frequency (SHF)	Microwave	microwave links
3GHz	Tropo - scatterer (megawatts)		
	Ultra High Frequency (UHF)		
300MHz	Very High Frequency (VHF)	Line-of-sight	Television, police, military, taxis (25 watts)
	Ionospheric scatter		
30MHz	High Frequency (HF)	Global communications (prior to cables and satellites)	Post Office (10-30 kilowatts), maritime (5 kilowatts), directional finders, aircraft, HF broadcasting propaganda, amateurs
3MHz	Medium Frequency (MF)	Regional communications	Regional broadcasting, coastal beacons, aircraft beacons, (day ranges of 100 miles; night 1000 miles, but erratic)
300kHz	Low Frequency (LF)	International	
30kHz	Very Low Frequency (VLF)	International	Submarine communication, hospital calling systems, industrial



back to back around Britain. Most of them are part of a NATO link from Iceland to Turkey.

Above this band lie the super high frequency (SHF) of 3 to 30 GHz, and extra high (EHF) from 30 to 300 GHz. Band planning here is even more rational, and shared between satellites, microwave links on the ground and radars. Line-of-sight at these frequencies literally means line of sight, and a screen of bushes is enough to block transmission. Aerials are thus highly directional and there are no all-round transmitters as there are in VHF and UHF.

Radars have their own bands here, but satellites and microwave links have to share. This presents surprisingly difficult problems, because although signals are highly directional, those used upwards to satellites are very powerful, and odd reflections getting into microwave receivers could cause much trouble. Thus Goonhilly is sited at the far end of Cornwall—not to be nearer America, but so it does not look down any microwave horns in the British chains (operated by the Post Office for the RAF and government, by the US Air Force, by civilian air traffic control, and by the gas and electricity boards). But as the aerials at Goonhilly swing in their arc from east to west through south, they hose high power signals over Holland, Belgium, France and southern Ireland. Consequently, such stations have to be laid out so they don't point to Goonhilly; those that look near it, have to work on different frequencies. Similarly, microwave stations should not look at satellites as they go down over the horizon.

### Manipulating the beam

There have been great advances in the numbers and sophistication of radars, mostly by the military, though the advances in technique have not so much been in the radio department, which is relatively easy, as in signal processing and in manipulating the beams. The major development has been the replacement of scanning aerials with a multitude of fixed dipoles whose drives are controlled in phase, so that one or many beams can be steered both horizontally and vertically. This means that the same radar can survey large volumes and track many specific targets at the same time.

A further advantage of phase scanning is that it does away with vulnerable rotating aerials. For instance, the US Air Force's AN/FPS 85 (a second prototype, the first being burnt out within a short time of start-up) which surveys Cuba from the Gulf Coast is a solid concrete block that stands nearly a 100 ft high and has some 5000 transmitters and 40 000 receiver aerials embedded in its face.

Electronic warfare and intelligence gathering is a very big business. There are odd-shaped aircraft now flying whose sole job is analysis and neutralisation of enemy transmitters. There are sophisticated airborne computers, like one recently announced by Loral in the United States weighing a mere 22 lb, which can monitor 250 000 radar pulses a second—sorting them out by frequency, direction of arrival and repetition rate into

the radars that generate them. It compares these characteristics with a memory store and displays their positions and functions—friendly or enemy, early warning, missile control—and evaluates the threat each one presents, identifies the most dangerous, and displays the frequency necessary to jam it. Jamming, too, is another big industry, and so also are methods for defeating it—broad band transmissions that have to be countered with power consuming broad band jammers, frequency jittering radars, signals disguised as noise.

One takes sensitive government interest for granted in the military sphere. But it exists equally in the civilian world. It came as rather a shock to read recently of pickets on the truck drivers' strike in the United States using citizens' band walkie talkies to coordinate their activities against black-leg drivers (two of whom were killed). In Britain, there is no citizens' band and no likelihood of such a thing being allowed to happen. In fact, radio has been used surprisingly little for civil disturbance. The FBI says that the Watts riots were radio controlled, and will doubtless be on hand with jamming equipment for the next one. Some years ago the police in London captured a VHF jammer mounted in a car for use at one of the anti-Vietnam war demonstrations. However, it would be hard to jam police communications in London. With nine channels round 100 MHz and the portable radios at a much higher frequency, the equipment needed would fill a truck.

There are occasional proposals, usually made by manufacturers, that the police should instal security systems for their transmissions; indeed, burglars sometimes listen to police broadcasts. But the risk is not thought high enough to make it worth buying equipment (that may cost as much as the car it's mounted in) to protect perhaps only one sensitive message a day. Better, argue the police, to encourage simple cryptography.

Even on the domestic front, governments are vitally interested in radio. The right to speak direct to almost every citizen is jealously guarded, disguised in quiet times by Jimmy Young and Emperor Roscoe, but in crisis a basic tool of government. The official history of Civil Defence attributes the collapse of the 1926 General Strike in Britain to the government's ability to speak straight to the voter. Hitler believed that his rise to power was made possible by the fact that he used radio better than did the opposition. It is significant that every radio and television broadcast in Britain physically passes through the hands of the Post Office at some stage between the studio and the transmitter. Illegal transmissions are quickly tracked down and suppressed with the help of a chain of Post Office direction finding stations around the country. In case of nuclear war or revolution, the BBC has an elaborate arrangement of diversified systems and transmitters linked by protected landlines, with underground emergency headquarters at Evesham, so that it can always keep control of the air. Unlike Prague, there need be no tanks outside the radio stations in London.



An antenna for two meters can be made easily from a piece of coax. As you can see from the drawing, the antenna is a part of your coaxial feedline, and can be used as a portable antenna that you can pull up into a tree at your campsite, cottage, etc. or it can be used in a permanent installation at your home.

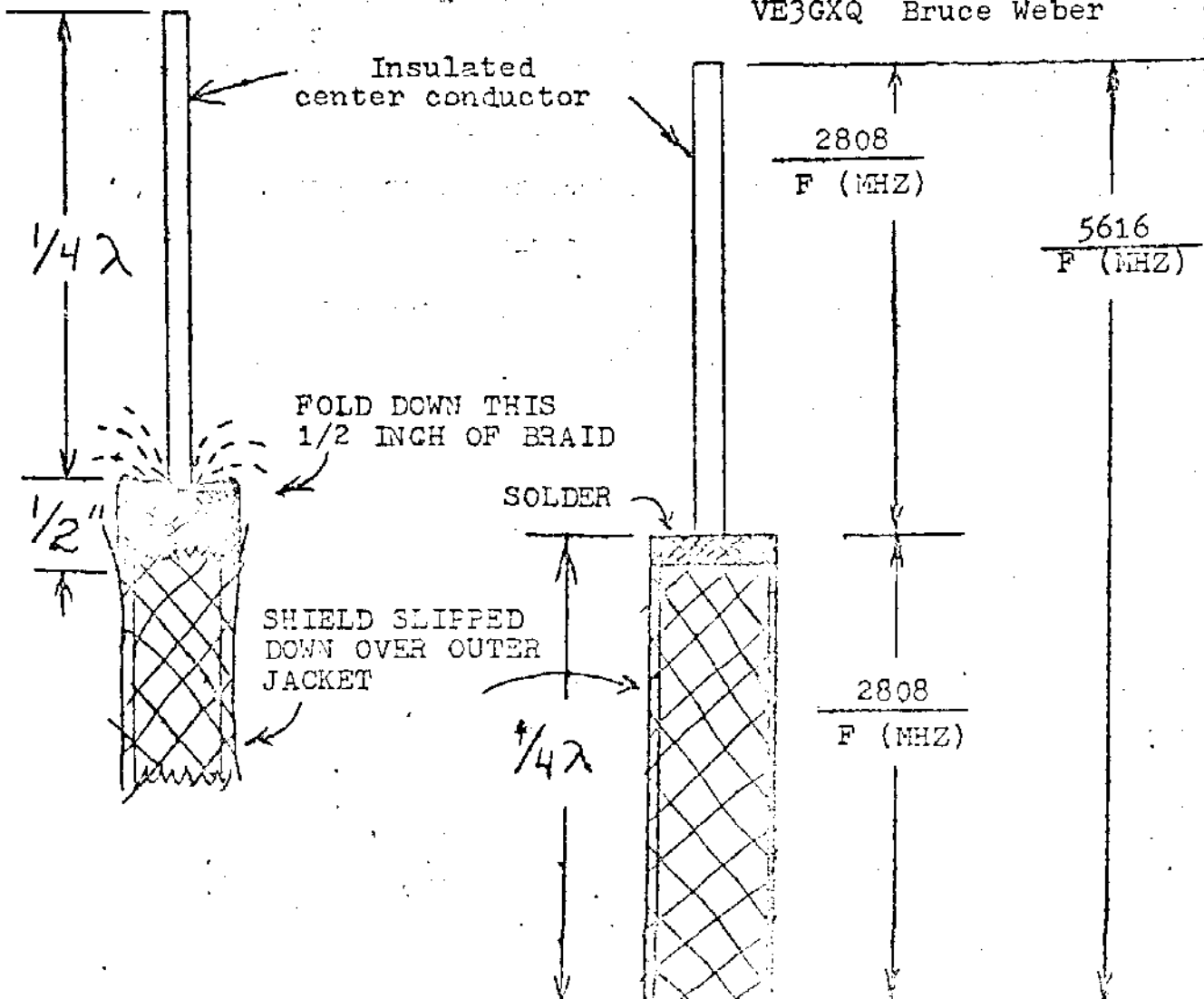
The construction is simple and can be made from RG58/U or RG8/U, although RG8/U is more desirable because of its lower loss at V.H.F.

At one end of the cable, slice down and pull off the outer insulated cover (don't damage the shield) for a distance of a  $\frac{1}{4}$  wavelength plus about 10 inches because when you pull the shield down over the rest of the co-ax, it will not be as long as when you cut it. Cut the shield off with fine-cutting diagonal pliers, leaving about  $\frac{1}{2}$  inch, bunch the shield up to make it expand in diameter and slide it down over the outer insulation. Solder it to the  $\frac{1}{2}$  inch shield that you pulled down over the co-ax in the previous step. It might be an idea to wrap the two portions of shield with thin copper wire to hold it while you solder it.

When the antenna is finished, cut the radiator and the co-axial sleeve to  $\frac{1}{4}$  wavelength. Set it up with a standing wave bridge or wattmeter, and trim it for minimum SWR or reflected power.

As for hanging it up, you can place a length of rope alongside the antenna and tape it all together, or you can put an insulator and hook at the top and hang it by this. Or you can tape it up completely to waterproof it, seal it in a plastic tube and mount it on top of a mast.

VE3GXQ Bruce Weber



# Listowel District Secondary School

PHONE 291-1800

C. D. COLOUGHOUN, B.P.R.E.  
VICE-PRINCIPAL

PRINCIPAL  
E. F. ANDERSON, B.A.

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VICE-PRINCIPAL



LISTOWEL, ONTARIO

## 1976 OLYMPICS AWARD

Amateur radio operators (and Short Wave Listeners), worldwide, are invited to participate in the celebration of the XXI OLYMPIAD to be held in Montreal, Canada, in 1976.

Two different and attractive awards will be issued for working or hearing (for SWL's) amateur radio stations according to the following conditions:

### CANADIAN '76 OLYMPICS AWARD

Communications Canada has authorized the use of the "XJ" prefix for "VE" amateur stations and the "XN" prefix for "VO" stations during the period August 1, 1975 to July 31, 1976.

At least one (1) contact must be made with each of the call areas XJ1-XJ8 and XN1 and XN2 for a total of 10 contacts. Any contact with XJø (VEø, Maritime Mobile station) or the special Olympics ham station CZ20 will be allowed as a substitute for any missing call area prefix.

Send certified log data list and \$1.00 or 7 IRC's to VE3LSS, Radio Club, Listowel District Secondary School, Mr. G. Hammond, 155 Maitland Ave. S., Listowel, Ontario, Canada, N4W 2M4.

### WORLD '76 OLYMPICS AWARD

Work and/or hear amateur radio stations in any fifty (50) countries which will compete at the 1976 OLYMPICS in Montreal, Canada. One contact must be with a Canadian station using a "XJ" or "XN" prefix. A special seal will be affixed for a contact with "CZ20" the official amateur radio station on the XXI OLYMPIAD site.

Send certified log data list and \$1.00 or 7 IRC's to VE3LSS, Radio Club, Listowel District Secondary School, Mr. G. Hammond, 155 Maitland Ave. S., Listowel, Ontario, Canada, N4W 2M4.



## DX HINTS and TIPS

- If there had to be one main piece of advice for DXers it would be *"listen"*. This can open all the doors to dxing. If you know exactly who you are calling and exactly where he is located, your call to him can be more successful. A DX station calling CQ may give instructions as to where he is listening for calls. He may be calling only certain call areas. Don't barge in like a bull in a china shop!
- If you hear a pile-up calling a DX station listen to the stations that are calling him. This can often tell you if you can expect to hear him. If you are on the East coast and the VE7s are giving 5/9 reports there is a good possibility you may not hear him. The DX station may be transmitting in the foreign phone band (below 14.200) and listening on a certain frequency or frequencies above 14.200. If the DX station is not on the same frequency as the stations calling, look for him just below 14.200 or possibly just above 14.100. Many DX stations and DXpeditions operate in this manner in order to reduce QRM on their transmitting frequency. The key to working him is always to listen carefully.
- Use established phonetics and don't change them in the middle of your call.
- Keep your transmissions short until you can establish whether the DX station wants to ragchew or if he understands much more English than a few stock phrases.
- If you hear a DX station working a pile-up listen to his response to a call. If he is working quite rapidly and is obviously trying to handle as many VE/W/Ks as he can, keep your transmission to him short. A signal report and 73 is quite sufficient. Names, QTHs, gear and WX do *not* interest him one little bit and serve only to slow down his activity.
- If you want to be more successful in answering DX stations that are calling CQ don't repeat his call more than once. If he is listening on his transmitting frequency give his call once and your call several times. He is interested in your call not his.
- Use VOX if at all possible. Push to talk is fine for mobile. Possibly the clacking of relays is distracting at first, but you can get used to it. The long-winded one-sided transmission went out with AM. These days the conversational-type QSO is the thing. Questions can be answered immediately. You can determine if your frequency stays clear. If your signal fades or QRM interferes, the other station can interrupt you to point this out.
- Breaking on the DX bands can lose you a lot of friends. Generally speaking unless you know the stations involved don't break. Go and find your own DX station to work. If you must break just announce your call. Don't call "break-break".
- Use a "Countries List" in order that you can determine, in advance, what country the station you are working or calling is in. Don't ask him what country he is in.
- Again, generally speaking, if a DX station advises you to send your QSL to his QSL manager, that QSL manager expects your QSL to arrive with a self-addressed envelope plus sufficient postage stamps of his country or the equivalent in IRCs. If the QSL manager is in Canada use a Canadian stamp. If he is in the U.S. use U.S. postage or International Reply Coupons (IRC). If your QSL is sent without the S.A.E. and proper postage, you will probably find your request ignored. Don't expect miracles from a QSL manager. He can not respond to your QSL request until he has received logs from the DX station. This may involve a period of months. If you send requests for more than one DX station's QSL send a S.A.E. and proper postage for each QSL required in order that they can be separated and returned to you as the various logs are received.

If you are not in a hurry for a QSL use the CANAD-X OUTGOING QSL BUREAU. It is available to members at no cost. Don't forget to keep S.A.S.E. at your local incoming QSL bureau.

Good DXing from

