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

1. To act as a coordinating body of Amateur radio organizations in Canada;
2. To act as a liaison agency between its members and other Amateur organizations in Canada and other countries;
3. To act as a liaison and advisory agency between its members and the Department of Communications;
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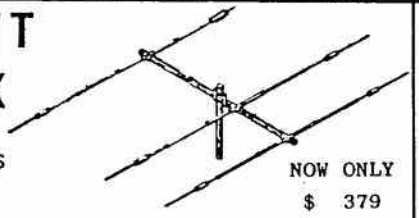

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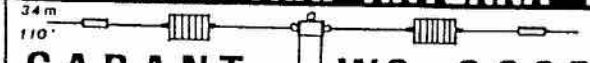

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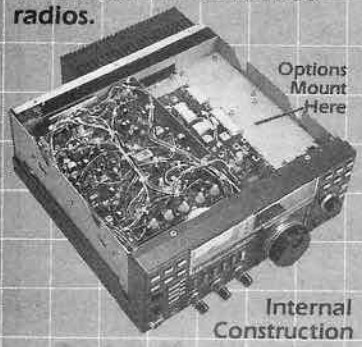

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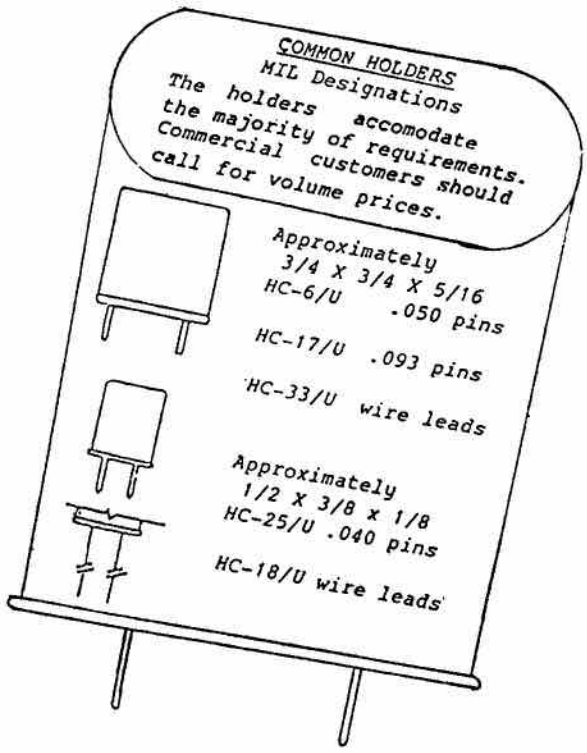

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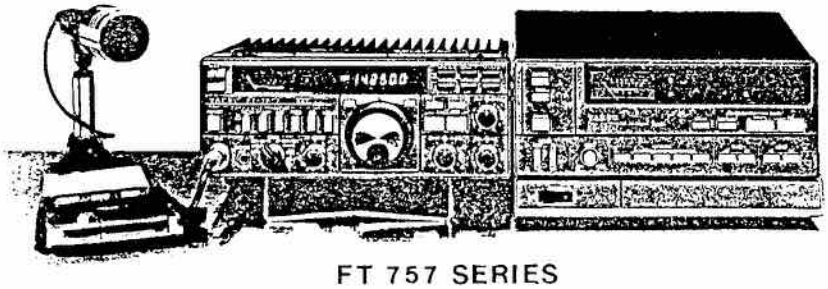

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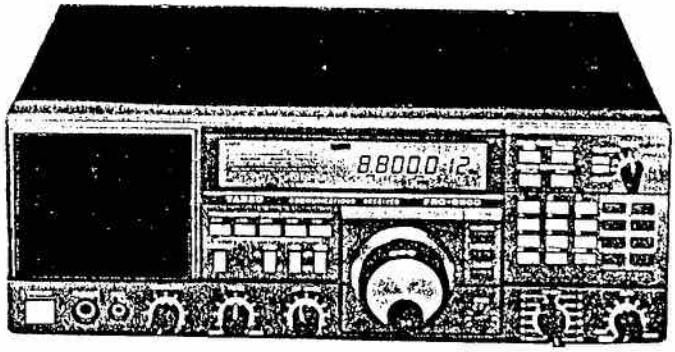

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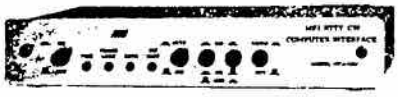

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Kenwood TR-7400 2 mtr. 800 channel synthesized(used)	$275.00
Realistic DX-302 Quartz synthesized SWL receiver(used)	$489.00
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HD mast $39.50
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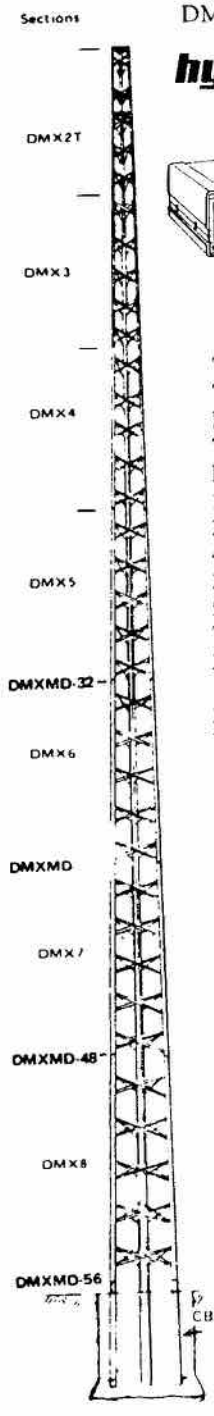
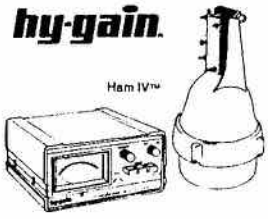


hy-gain Rotors



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Ham IV $309.00
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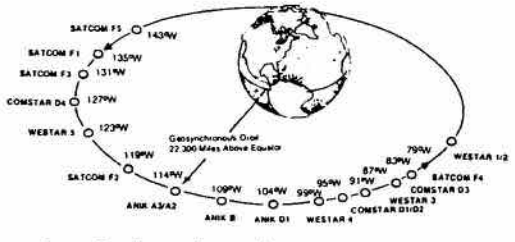

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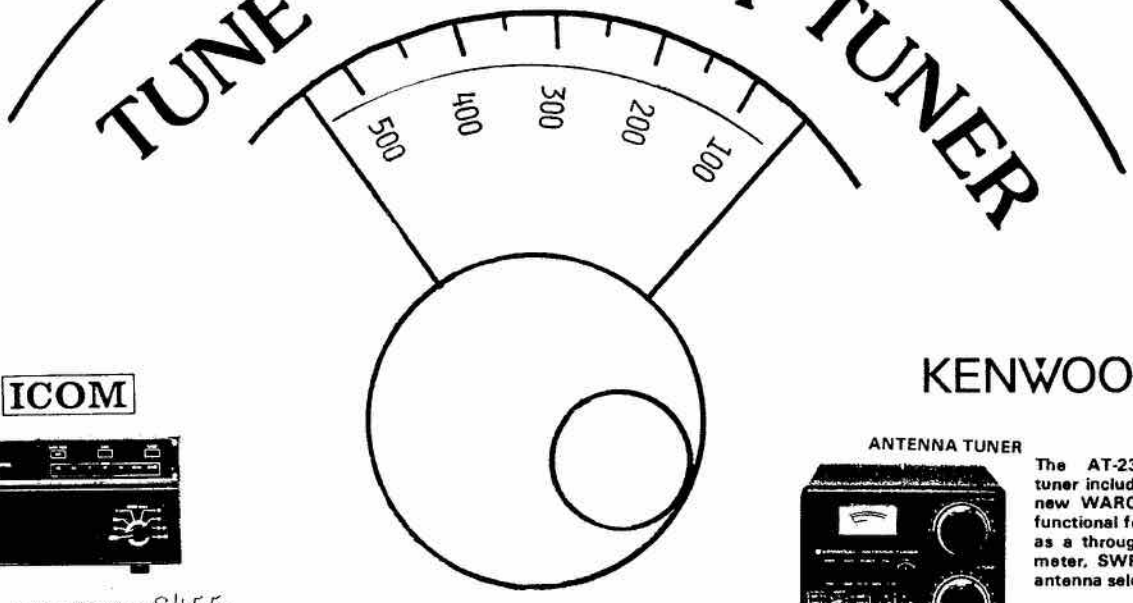

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AT-100 100w 8-band automatic ant tuner $455.
AT-500 500w 9-band automatic ant tuner $599.
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The lowdown on the Untenna

bringing you improved reception... perfect tuning...
plus reduction up to 95% in height

Choosing an antenna that is best suited to your communication system is, of course, important. Whether your needs are for a mobile, portable, or fixed application, you'll be far ahead with Untenna™. Unlike any other type of antenna, it offers unequalled advantages for common carriers, public safety, wireless security systems, government, military, forestry, marine, aircraft, and business/industry.

Distinctly different from whips, Untenna HF, VHF, and UHF antennas perform dependably, with exclusive features that conventional whips cannot match. Design characteristics like High "Q", allow Untennas a narrower band width, all but eliminating "inter-mod" (refer to graph on back cover). Height savings up to 95% versus whips, enable Untennas to be installed more easily, more obscurely, and located in places where whips cannot be accommodated.

Untenna lets you tune to a perfect match anywhere on the band. Raise the disc and you raise the frequency. Lower the disc and you lower the frequency. It's that easy. Nothing to cut. Band can be tuned continuously.

In any application, Untennas outperform whips and offer unequalled conveniences in a variety of ways.

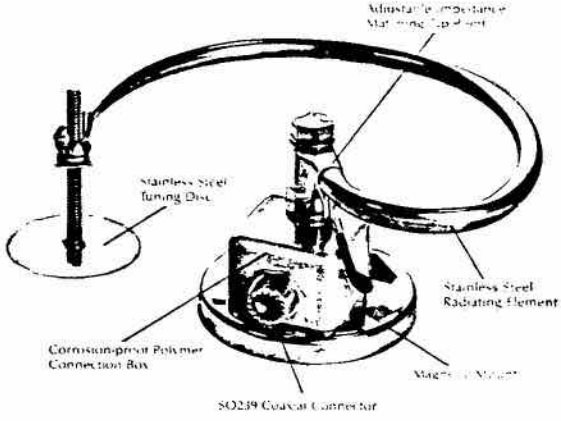
DIRECT SURFACE MOUNTS**
A special connection, compatible with Motorola-type direct mount, is optionally available for all Untenna models. Model CR109A Helical Untenna is also optionally available with a magnetic mount.

Mobile Radio Advantages
- With their extremely low-profile, Untennas avoid whip "wipe-out".
- There are no clearance problems. No longer must you go out of your vehicle to take down the antenna for parking ramps, garages, canopies, and other obstructions.
- A more uniform, omnidirectional (vertically polarized) pattern is produced, providing increased communication efficiency (see polar plot).
- Rigid construction minimizes annoying mobile flutter (picket fencing), permitting base station quality transmission from a mobile antenna!
- Adjustable impedance tap point matches any coax. Untenna is directly grounded to car frame, providing automatic static drain to ground and eliminating static charge induced by fog, dust and precipitation, thereby improving receiver signal-to-noise ratio.

Portable Radio Advantages
- Substantial height savings.
- More convenient to transport.
- Quicker to set up.
- More obscure operation.
- High "Q".

Fixed Radio Advantages
- Height savings of 80% and more.
- Can be installed indoors or outdoors.
- Ideal where limited space is available.
- With a radome, Untennas can be installed outdoors inconspicuously.
- Narrow band width minimizes inter-mod.

Corrosion-Resistant
Untennas are made from anti-corrosive stainless steel, aluminum, phosphor bronze, and chrome plate, with durable nonmetallic support structures.



RADOMES
A weather-proof cover made of transparent high-impact plastic with excellent UV resistance is available for all VHF and UHF Untenna models. The inside can be painted with any *non-metallic* pigment color of your choice, aiding in disguise. Untenna and Radome must be ordered together to avoid modification charge.

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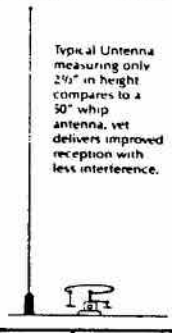
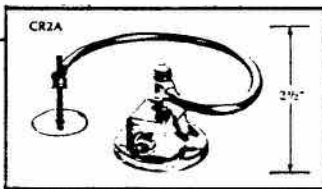
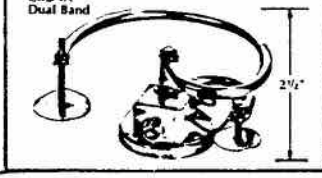




Frequency: VHF 140-170 MHz
Max. Power: 200 watts
Mounting**: magnetic
Net Wt.†: approx. 1.2 lbs.
Shipping Wt.†: approx. 1.5 lbs.

$69.95
+$4 Freight

THROW YOUR WHIPS AWAY!



Frequency: VHF 140-170 MHz*
UHF 430-470 MHz.
Max. Power: 200 watts
Mounting**: magnetic
Net Wt.†: approx. 1.5 lbs.
Shipping Wt.†: approx. 2.0 lbs.

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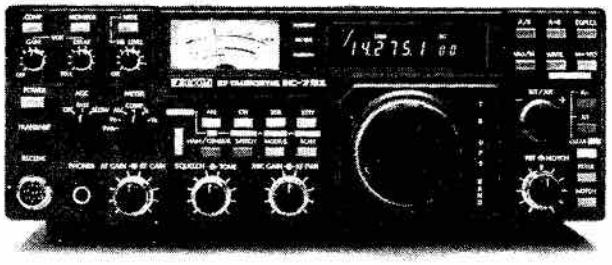
SPECIALS



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- *32 Memories*
- *Microprocessor Controlled*
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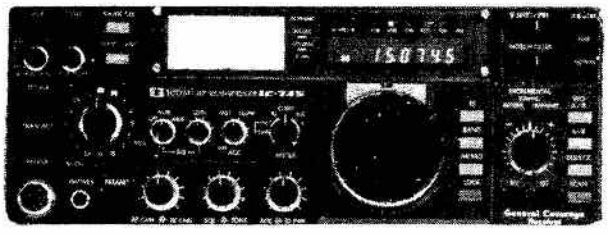

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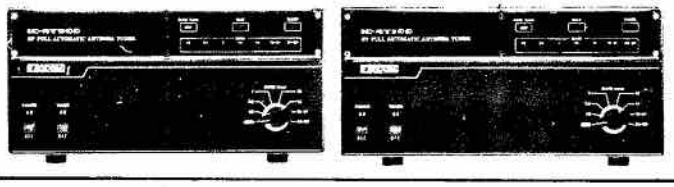

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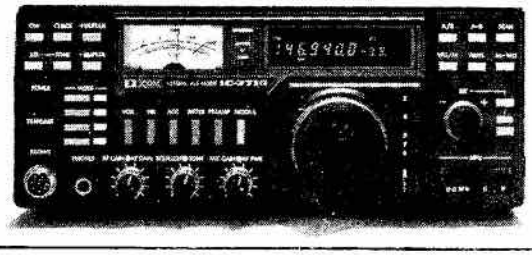

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- *100/25 Watts*
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- *Compact*
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- *32 PL Frequencies*

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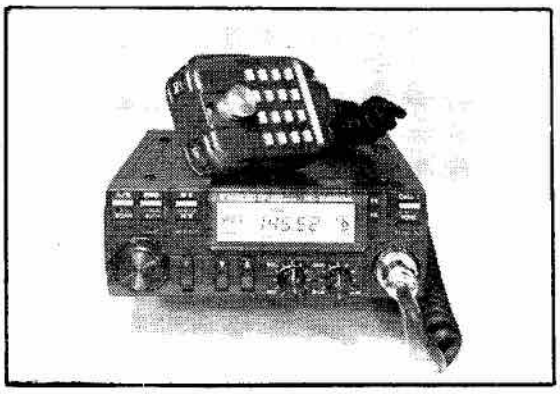
25 watts output on both bands, full scanning with memory lockout, 10 tunable memories with lithium batteries, PL tone encoding, and only one antenna connector (duplexer is installed!). Price is reg $699.00, our introductory special is $629.00. Available April 1985



ICOM IC-471A UHF BASE REGULAR $1025.00
IC-471H UHF BASE REGULAR $1399.00
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- *75/25 Watts*
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- *Fluorescent Display*
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- *12 VDC Operation*

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CALL FOR SPECIAL PRICE

- *440 - 450MHz*
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- *Microprocessor Controlled*
- *Scanning*
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- *12 VDC*

ICOM IC-37A 220 MHZ REGULAR $556.00
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- *3 Watt Std/ 5 Watt Opt*

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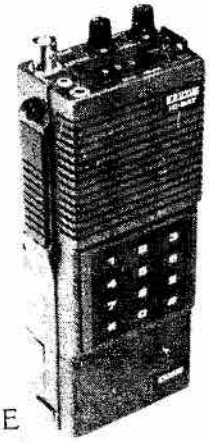

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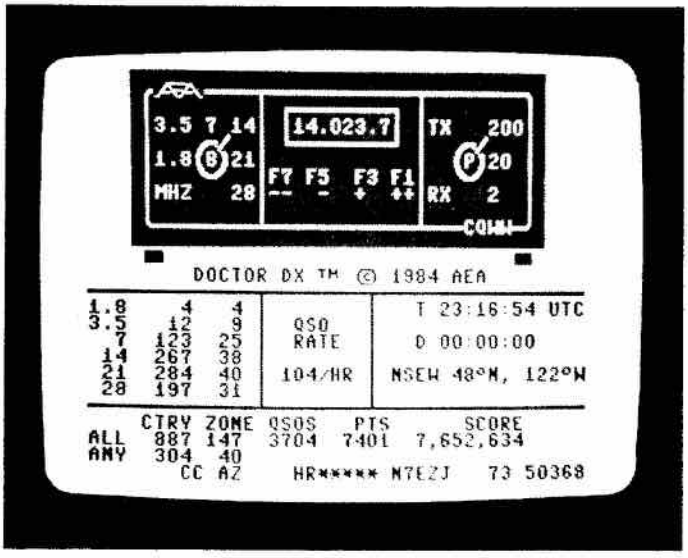

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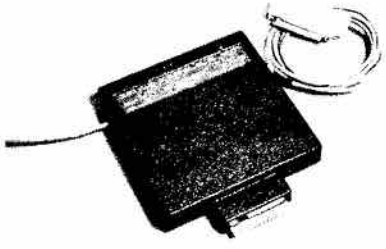

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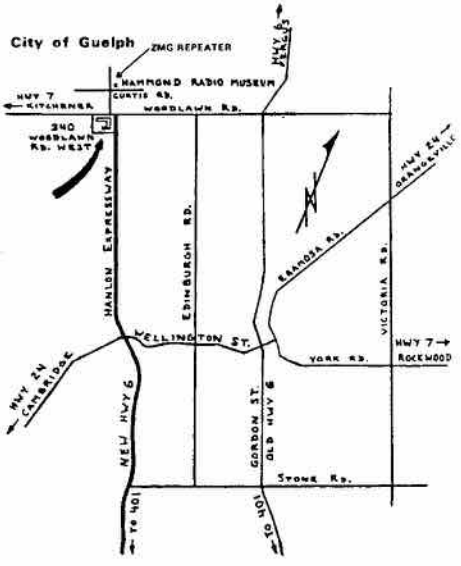

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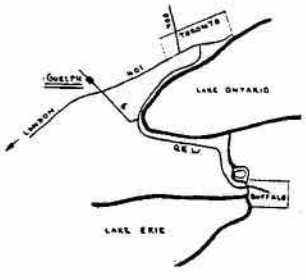

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TCA

ISSN 0228-6513

April 1985
Vol. 13 No. 4

Ron Walsh VE3IDW

It was with a sense of appreciation that I accepted the Board of Director's request to fill the position of Interim President. I appreciate their trust in my ability to fill the post. I hope I can continue the excellent leadership which CARF has had in the past.

As I may not be familiar to many of our members, I will attempt to give a brief biography. I am 39 years old and have lived in the Kingston area most of my life. I have been married for 14 years and have one daughter, Jennifer, who is 8 years old. For the past 15 years I have taught for the Frontenac County Board of Education. During my career I have taught mainly Intermediate grades (7 and 8) but have also spent a year as acting Vice-Principal, and I spent some time teaching in Secondary school.

I am an avid curler and take a great interest in the history of the Great Lakes. I am, at present, completing a Minor Water Master's Captain's certificate so I may continue to sail tour boats on the St. Lawrence during the summer.

My interest in Amateur Radio began when I met Chuck Millar VE3GO many years ago. I became an SWL in 1959 and continued until the 1970's. When I had completed my B.A. in Economics, I took the local course to get my Amateur licence. In 1976 I received my licence, and my Advanced in 1978.

I operate most Amateur Bands, both CW and phone. I am control for ONTARS on 3.755 Saturday, 0700-0800 EST.

My Father, VE3BRK, obtained his licence before me, and my brother, VE3KBW, after.

I have been involved with CARF since 1977, when I first worked to increase membership. I became, in turn, Assistant General Manager and Vice-President. I handled Affiliate clubs and various other business.

As a further part of my responsibilities I had spent three years working on the TRC-24 committee and was pleased to see the DOC adopt many of the recommendations put forth by CARF and CRRL.

In June 1984, I retired from active participation in CARF, to spend time working on my Master's Degree.

As these duties are well in hand, I felt ready to accept this position with CARF.

I hope to foster growth within CARF and to bring a more businesslike structure to some functions. I hope back-ups will be developed for our officials, and someone will be available to control each function of our organization. I hope to maintain and foster co-operation between CARF and CRRL in order to help the entire Amateur community.

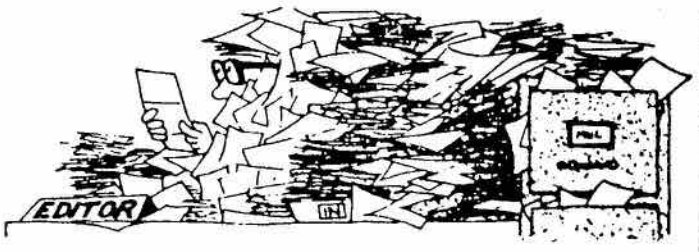
I look forward to hearing from any Amateur who seeks help or wishes to comment.

73
Ron Walsh

Amateurs support tournaments

B.C. Amateurs supported the Pacific Cup Oldtimer's Hockey tournaments this year. Some 50 Victoria Amateurs set up a net between the eight arenas to report scores and other vital information from one to the other.— From Update January 1985.

LETTERS



NOT THIS FAIR YOUNG LADY

I would like to add a correction to one of your letters to the editor in Jan. 85 issue, on the passing of Dave McTaggart VE7RH. It said he had a daughter, Sue, her call being VE7FYL. This is my call, so there have been many phone calls to me, but VE7RH was not my father. I guess there was a mistake in deciphering the call letters.

73, Lynda Schiere VE7FYL

RICH MAN'S DELIGHT?

Your recent issue of *TCA*, Oct/84, complimentary copy was received and appreciated, same goes for the previous one, Nov/83.

So, why haven't I signed up for CARF membership? Well it's the perspective I suppose, the way one looks at things, circumstances and priorities.

I have long held the view that Amateur Radio is a rich man's hobby, and that is borne out even more than ever these days hearing Amateurs discussing trips to Hawaii, New Zealand, etc., others telling of their 100 ft. towers, the guy wires of which alone cost thousands of dollars. How do they do it...? There sure is a good proportion of wealthy Amateurs out there,— are there any poor ones?

I took my first steps in radio and on the air back in England 1949/50: did Amateur radio for about a year, then got my commercial licence in 1951 and went to sea. My interest at that time lay more in marine radio. I wanted to be a Radio Officer in the worst way. So once I became a Merchant Marine sparks I let Amateur radio drop and enjoyed the sea-going life for some 12 years with Marconi Co. and later on Foreign flag ships.

In 1981 I felt the urge to take up Amateur radio again, renewed my licence, on the strength of my D.O.T 2nd class certificate I was issued an advanced Amateur licence and issued station licence with the call VE7EII.

With the work shortage and restraint you probably have heard of, it's a struggling existence out here in the West, so groceries must come first.

I estimated it would take me about five years to get on the air again.

Well I almost decided to cancel the licence and let it go for a while, not much use without a rig, but then decided for the cost of the yearly fee to hang on at least for the five years I had set. Perhaps I should have made sure I had enough to cover the costs first then apply for the Radio licence. I guess that's the way to do it.

O.K, I went the wrong way about it. Anyway if I don't make it on the air in five years, may as well say it's not for me.

I kind of like hearing all the O.T's, retirees on 40 M, as well as newcomers, and I hear so many CQ's going unanswered, sure often wish I had a rig dammit! At least I'm working steady now, which is more than a lot of unfortunates out here can say. It seemed a lot easier back in the 50's when I could get hold of parts real cheap, used but good surplus tubes etc., and build a Tx in no time. For 20 bucks you had yourself a great rig, and $90 bought a good receiver. Those days are gone of course...

So to end my story. It's just a matter of time, I'm on a limited budget but I'm looking on the positive side. If I can hang in on my job I should be on the air with QRP within a year, and if I scrape and save I hope to get a QRO rig also by the time I retire. It's a great retirement interest. Looking at it that way I've got lots of time. I'm 55 now, and though there seems to be a lot of other important things and I've been in the electronics business as a technician for years (but no longer am) and even if I feel I've done it all before, it would be nice to do it again.

73, Dennis Swetman VE7EII

Certainly by listening around the bands one gets the impression that everyone has enormously expensive equipment. When did you ever hear someone boasting of his poverty? Indeed, if I was in the position where occasionally I went to the 15-metre room and switched to the Africa rhombic I might boast about it too.

Yes, in the 50's we could get hold of parts and tubes very easily. We can today. An old TV will build a transmitter with very few purchased parts. Indeed, an old TV and an old AM radio will give you everything you want to build a rig. Naturally, you have to have a little experience to do this, but you, Dennis, with your training and knowledge could do so. – Editor.

THE ABEGWEIT AWARD

The Prince Edward Island Amateur Radio Association is planning an event in May, the **VE1 Abegweit Award** which has been in existence since the early 60's.

Abegweit is the earliest known name for Prince Edward Island. It is a Micmac Indian name meaning "Cradled on the Waves."

Prince Edward Island is located in the Gulf of St. Lawrence on Canada's east coast, separated from Nova Scotia and New Brunswick by the Northumberland Strait.

On May 19, 1985, the Prince Edward Island Amateur Radio Association is sponsoring an Abegweit Award Contest. Rules for the contest are:

VE1 and VO1 stations must confirm contacts in all three counties. (Prince, Queens and Kings County.)

All other VE's and U.S.

Amateurs must confirm contact with any three P.E.I. stations, regardless of county.

All DX Amateurs must confirm contacts with any two P.E.I. Stations, regardless of county.

Any Island contacts after Jan. 1, 1960 are also valid for the award.

Operation will be on SSB and CW only.

CW— 21.100, 14.050, 7.100, 3.700

SSB— 21.300, 14.250, 7.200, 3.800

From 12:00 UTC to 00.00 UTC.

Frequencies may change due to band conditions.

Note: Because of the number of Amateurs operating, we will not be on all bands at the same time, but will change bands with the conditions.

Send a copy of the Log (certified by two other Amateurs) and $2 or 10 IRC's to P.O. Box 1232, Charlottetown, Prince Edward Island C1A 7M8, to claim your award.

For more information write David A. Smith VE1CIK, Box 529, Kensington, Prince Edward Island C0B 1M0 or telephone 902-836-4246 after 22:00 UTC.

David A. Smith VE1CIK

MANUALS FOR LOAN

I have in my possession the combined operating/service manuals for the following and I am willing to loan them to anyone who wants to make a copy. Perhaps you could use this as 'filler' in an issue of *TCA*, perhaps opening up on a monthly basis a section where requests for such manuals (or offers) could be listed.

The manuals are:

Marconi CSR-5 (Types 930, 930A, 930-W)
Airway Communication Receiver Type RCF-2 (Manufactured by National)
National RCF, RCD
RACAL Communications Receiver Type RA.117
TMC Communications Receiver Model GPR-90RXD, GPR-90RX
National HRO-500
Hammarlund HO-145A
RACAL Communications Receiver Type RA.17L, RA.17c
Hallicrafters SX-62
Hallicrafters HT-9
National HRO-60
PYE Ranger PTC2001/2002YN
National NC109
Hallicrafters S-40
PYE PTC 2007

TCA continues to give great pleasure. Hopefully we will get our problems with the office and computer straightened out. John and I spent all day yesterday at the office in Kingston helping Ron Walsh.

73, Geoff Smith VE3KCE

RICH MAN'S COMPLAINT?

$20.00 a year— my God what a price to pay— for what you say— a subscription to CARF, a 40 oz. bottle of booze, 25 feet of RG8/U?

No! No! It's for my Amateur radio licence and well worth every cent for the pleasure I get from having it.

So you rich Amateurs, and you must be rich to buy all those expensive rigs and computers, quit complaining and think how fortunate you are.

73, Bernie Burdsall VE3NB

SILENT KEY

Jean-Paul Martel VE3FLM passed away on Jan. 28, of cancer.

Jean-Paul was well-known in Eastern Ontario, on the nets and in the clubs. He was a founding member both of the Quebont Radio Club and the Radio Club Carillon Radio Club.

The editor can vouch for Jean-Paul's kindness, helpfulness, and friendliness. He will be missed.

TESTING DX ANTENNAS

Down under in ZL, if we ever wanted a really good giggle, we went listening up around 14225 to all the boys with the new beams running checks with each other over a 500 mile range or so. Now there is a lot to be said for "TWO GOATS ON THE BAND AND WHO'S GOT THE STRONGEST HEAD" type testing, but the local performance of an antenna tells little or nothing about its DX performance and that takes time to decide.— from South Pickering ARC Sparc-Gap.

Send Letters to the Editor to Box 855, Hawkesbury, Ontario K6A 3C9. They're always welcome!

Editorial

I am honoured to be asked to fill the position of CARF President until the next A.G.M. and I look forward to hearing from many other Amateurs who are willing to work on behalf of Amateur radio in Canada.

As most of you know, the Kingston office has not functioned well since Art and Hazel had an accident last year.

One of the many problems our office suffered was a breakdown of *three* separate computers. I won't bother you with the details here, but Murphy was very active. We seem to have things straightened out now and will have everything caught up soon.

However, during this period of tribulation I noticed one very important fact. From all corners of the country, people offered help. I respectfully recognize the help from the CRRL in publishing our request for membership data which we might have lost. The main fact about this help is that it came from people already working inside Amateur organizations and clubs.

At the same time, I kept hearing that C.A.R.F. should do this or do that. People still seem to think that there is some mythical beast called C.A.R.F. or a massive staff of troops ready to handle any problem or program. We are still a largely volunteer organization with only two paid office employees. We need your assistance to head up and direct some of the programs we should like and would like to attempt. As an example at the present time, we need people to take over the affiliate clubs program. Please, when you think that we should attempt to do something, offer us your assistance to get the program going. Contact headquarters or better still your regional Director, and offer to help.

The Federation can only do as much as the supply of willing workers can handle. We can only handle your interests if YOU and others like you, are willing to work for those interests. Δ

73
Ron VE3IDW

DOC DOINGS

Special prefixes

DOC has assigned special call sign prefixes to commemorate the 75th anniversary of the Royal Canadian Navy.

The Department has made available special call sign prefixes for Canadian Amateurs in the Navy and retired members only. The call sign prefixes have been assigned as follows:

Newfoundland	VC1
Labrador	VC2
Maritimes	CF1
Quebec	CF2
Ontario	CF3
Manitoba	CF4
Sask.	CF5
Alberta	CF6
B.C.	CF7
N.W.T.	CF8
Yukon	CY1

(VO=VC, VE=CF, VY=CY)

The above prefixes may be used from April 1 to May 31, 1985.

Special call sign prefixes for the 75th anniversary of the Girl Guide Movement world-wide have been assigned. The following prefixes may be used by Canadian Amateurs taking part in any Girl Guide function Canada-wide:

Newfoundland	VF1
Labrador	VF2
Maritimes	CG1
Quebec	CG2
Ontario	CG3
Manitoba	CG4
Sask.	CG5
Alberta	CG6
B.C.	CG7
N.W.T.	CG8
Yukon	VG1

(VO=VF, VE=CG, VY=VG)

The above prefixes may be used from Feb. 17 to April 17, 1985.

Finally, Parks Canada are commemorating their centennial this year and the Department has made available special call sign prefixes for Canadian Amateurs taking part in the events as follows:

Newfoundland	XO2
Labrador	XO2
Maritimes	XJ1
Quebec	XJ2
Ontario	XJ3
Manitoba	XJ4
Sask.	XJ5
Alberta	XJ6
B.C.	XJ7
N.W.T.	XJ8
Yukon	XK1

(VO=XO, VE=XJ, VY=XK)

The above prefixes may be used from June 29 to Aug. 29, 1985.

Let's move on licence fees!

February 18, 1985

Don Boudria, M.P.
House of Commons,
Ottawa, Ontario.

Dear Don,

The Department of Communications charges users of radio a yearly fee, the accrual from which is used to finance the charging of users of radio a yearly fee.

This is manifest nonsense. The Department of Transport does not charge aircraft owners a yearly registration fee, there being instead a once-only charge, whenever the registration is changed. This procedure should be copied by the D.O.C.

The Canadian Owners and Pilots Association has submitted a brief to the D.O.C. putting forward this proposal. Radio Amateurs and Citizens Band licensees support it. Please use your influence to have yearly radio licence fees replaced by an initial $25 fee.

Sincerely,

F.P.Hughes, VE3DQB.
Editor, TCA.

Go, and do thou likewise.

A blow-by-blow account

Tornado for Dessert?

By Derek Dier VE3MGU
and Frank Salter VE3MGY

Many of the London Amateurs were discussing the heavy rain storm on VE3TTT in the early evening of Sept. 2. Derek VE3MGU had just summed up his observations crisply when he commented, "South London never gets hit by bad storms."

Seconds later, Derek's tone changed from the casual, "just finished the hotdog barbecue" note to one of astonishment. About 300 metres from Derek's front window a tornado touched down, pulling in sheds, roofs, barbecues and even bathtubs and sending them spiralling into the houses and back yards of south London.

The hydro went out a few seconds later when the twister knocked down a row of hydro poles. Derek provided the listeners on VE3TTT with a "blow by blow" description of the damage.

A Disaster!

It was evident that a disaster had happened. After a brief discussion of the problem, the Police Department was called on behalf of ARES and ARES's participation and assistance was welcomed.

The tornado had hit at 1917 h. local and by 1935 h. ARES had QSY'ed to the VE3LAC repeater and completed a call-up. Thirty-four Amateurs checked in, among which were 24 mobile units. Bill VE3FQV acted as net control until the post in the Police Department was activated. The Amateurs also activated the emergency stations in the local hospitals.

Mr. Murphy, of course, got into the act. The connector in the Police Department had to be jerry-rigged until the correct type arrived ten minutes later. The station in the Police Department Command Post was operational at 1945 h., when Ken VE3MGG and Derek VE3MGU reported to the man in charge that the ARES net was operational.

Even before the net was officially opened from the Police Department, mobile units were in the zone damaged by the twister.

How we helped

The Amateurs were able to assist the police in several ways... checking vehicles, buildings and damaged areas for possible victims, defining the parameters of the disaster area and reporting suspicious activities. Communications with the local hospitals made it possible to determine the extent of personal injuries from the tornado.

The extent of damage to homes and the injuries were moderate. Property damage consisted mostly of stripped roofs, broken windows, some structural damage to homes, and a mass of utility sheds sent into the next county. Fortunately, there were no totally destroyed homes or fatalities. The effect of the tornado was lessened by the fact that many people were relaxing in the rec room after dinner...but this wasn't what anyone wanted for dessert.

Goblin patrol

At 2223 h. the initial part of the exercise was over, but since some of the mobile units had reported that there were unauthorized 'door checks' and property removal, the ARES net was shut down and a 'Goblin Patrol' was set up.

The school in the area was set up as a point for anyone who needed shelter for the evening, and that was manned by the ARES Amateur, who was at the site before the emergency power arrived. Seven Amateurs remained on Goblin Patrol and at the collection point until it was decided that no one was in need of shelter for the evening. The Goblin Patrol was set up from 2223 h. and closed down at 2323 h., which concluded the evening's events for ARES. The local militia moved in and secured the area for the evening.

When it was all over, the bleary-eyed RF addicts retreated to the local coffee shops outside the area for a coffee and recap. In their session, they decided that they were well-organized, charming, professional, well-disciplined, relevant (and the other seven things, whatever they are). Probably one of them was biased, too.

The local Amateurs were pleased to help out, and hope it never happens again. Δ

ARES proves its worth

A group of the lads cheerily chattering over the local repeater— there's a heavy rainstorm. Without warning, a tornado rips through a peaceful suburb. Within minutes— 18, to be exact— the police have been alerted, and 34 Amateurs are patrolling the disaster area. That's immediate response!

If it happened near you now, how long would it take your group to swing into action?

We would like these disasters never to happen, but we know they do. We must be ready for them, and that is what ARES is all about.

Quickly, now, who's your emergency coordinator?

DID YOU KNOW?

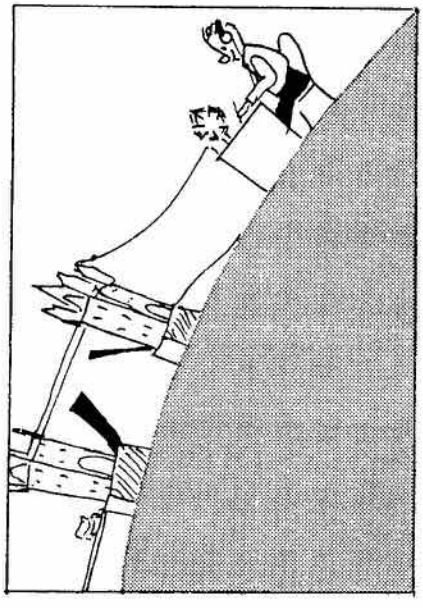
YL was adopted as a general term denoting any licensed female operator regardless of age or marital status— from January 1984 *QST* YL News and Views page.

What they didn't tell you, OM, was that YL replaced OW. I wonder why?

Amateurs Girdle the World

American Papers, please copy

By Marshall Killen VE3KK



(The story so far. In 1923 the Americans had proved to their own satisfaction that only American Amateurs, with American equipment, could span great distances like the Atlantic Ocean. That story you will find endlessly repeated in *QST*. What follows, you won't.)

Part III

In 1924 it was beyond the wildest dreams of anyone that wireless communication between Europe or the U.S.A. on the one hand and New Zealand or Australia on the other, could ever take place.

However, for some months past, Amateurs in Europe and the U.S.A. had been logging signals on wavelengths below 100 metres from Down-Under and vice versa. Excitement among British Amateurs was at fever pitch, so tests were started late in the year with a view to effecting a two-way contact. It seemed just a matter of time before someone was lucky.

The problem

In those days, one did not listen exactly on the wavelength of one's transmitter but, after calling CQ, had to sweep the band looking for replies. There were not too many stations on the air and for sure there was no such thing as zero-beating, which makes operating so easy these days. This was the problem; stations were logging each other but could never get together for a solid QSO.

The British stations sent code words which could be verified by cable if received. On Oct. 17, 1924, Ernest Simmonds G2OD received a cablegram for Z4AA in New Zealand, confirming the reception of the code word ZINCO. A QSL card received later by G2OD had this notation "UR THE 1ST EUROPEAN AMATEUR TO HIT OUT 12000 MILES. UR SIGS QSA EVERY DAY HERE — CAN HEAR U EVERY TIME U PRESS UR KEY".

It looked as though G2OD was going to have the honour of being the station making the breakthrough, but it was not to be so.

Cecil was just one of the gang trying hard to be the first, but compared to some of the other top operators with more sophisticated and higher power transmitters, he did not think much of his chances. He was now a freshman at London university and Amateur radio had to take a back seat when it came to studies. Weekends were just about all the time he had for operating G2SZ.

A morning to remember

Sunday morning, Oct. 19, 1924, was one Cecil never forgot. He got up very early that morning and was over at the school before 4 a.m. He fired up G2SZ and soon was hearing signals from New Zealand. Around 6 a.m. he heard Z4AA calling CQ, so he went back to him as near as he could to Z4AA's frequency.

Immediately, much to his delight, back came Z4AA reporting Cecil's signals as FB and saying that his name was Frank Bell. The QSO was solid and Cecil learned that Z4AA was located at Waihemo, near Dunedin and that Frank was a sheep farmer. For some reason and much to Frank's puzzlement, Cecil would only say his initials were CW but would not give his name.

Before closing out, Cecil said "If you are really in New Zealand send me a cablegram." A confirmation cablegram was received next day by Mr. Brown, headmaster of the school. Fifty years later a cairn was erected at Waihemo commemorating the event.

Z4AA told Cecil during the QSO that several NZ stations could easily have worked G2OD the previous evening but that G2OD was so busy sending that he did not seem to be taking much time out to listen.

Condition yellow

Cecil's success did not go down well with the other more experienced operators and the press reported: "There can be little doubt but Cecil Goyder's youthful success was bitterly resented by some of the leading Amateur operators of the day, who had organized the trans-oceanic tests, including E.J. Simmonds G2OD whose signals had been heard in New Zealand the previous day."

Cecil's victory certainly bore heavily on G2OD, for without a doubt he was head and shoulders above most of his contemporaries in the zeal and assiduity with which he pursued Amateur radio. G2OD was also the first European station to contact a station on 23 metres when he worked Charles

D. MacLucan A2CM at Stretfield, New South Wales on May 2, 1925.[4]

Cecil went home that Sunday morning and, joining his family at the breakfast table, remarked: "If someone has not been pulling my leg, I've just talked to a man in New Zealand."

Cecil's first QSO with New Zealand was hailed by the press throughout the world as a great breakthrough in the world of wireless communication.

Having confounded the experts, including some of the top engineers of the day who said it could not be done, especially on short wavelengths, Cecil and his fellow Amateurs on both sides of the Atlantic led the way with further experiments that eventually led to short wave broadcasting world-wide; beam and radio telephone services and to the inauguration of the BBC's Empire Service.[5]

Congratulations

Following G2SZ's QSO with Z4AA, congratulations poured in from all over the world, both to Cecil and to Frank Z4AA. *The Wireless World,* which was the RSGB's magazine and Bible for the British Amateur, reported the event under the headline "Amateurs girdle the world, American papers please copy." The president of the RSGB, Professor W.H. Eccles, D.S.C., F.R.S., congratulated Cecil in a letter which wished him even greater success.[6]

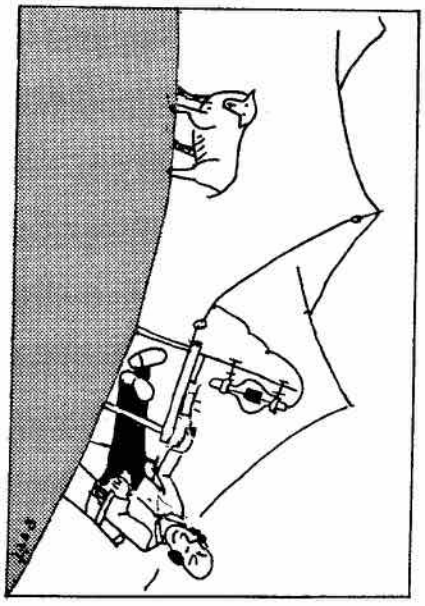
Later on, the greatest compliment of all came from Sir Edward Appleton who wrote in the BBC publicaton *Calling All Nations* the following: "Then a very remarkable thing happened. In October 1924 the greatest distance of all was spanned when communication was established between Mr. F. Bell of New Zealand and C.W. Goyder. Thus began what I have often called the short-wave revolution. This is probably the most dramatic moment in the history of the development of the short waves when the greatest distance possible on this earth was bridged for the first time".

In 1925 Cecil with G2SZ went on to achieve more fame by acting as relay station between the MacMillan Arctic Expedition and the National Geographic Society in Washington DC.[7]

So ended one phase of Cecil Goyder's claim to fame, although being famous was one of the things he wanted to avoid. He was a shy and retiring sort of person and remained so throughout his life. He kept up a correspondence with Z4AA and the latter even came to visit Cecil in London. Δ

Bibliography:

3. GPO cablegram Nr18 19 Oct 1924 "Congratulations First Transworld message" signed Bell.
4. World at their Fingertips. RSGB History. Pages 101/102.
5. International Press Bureau. News Chronicle. Aug. 12, 1924.
6. Letter from RSGB president August 21, 1924.
7. National Geographic Society. Letter August 24, 1925.



To be continued.

CORRECTION

The map on page 44 of the January *TCA* is in error. For M read N, for N read O, for O read P, for P read R. Anyone wanting a corrected map, please send a SASE to Box 855, Hawkesbury, K6A 2R2, marked 'Grid map.'

VE3BMV scored 2,827,440 in the 1984 CQ WW WPX Contest, second to T32AF, 2,991,352. Fire that robot, Yuri!

One Year of NARC...

by Jim Cleveland VE1CHI

The Halifax Amateur Radio Club established a New to Amateur Radio Committee a year ago January and, through the committee, attempted to interest and encourage potential Amateurs in the local area.

We obtained a list of club members willing to host a Ham Shack Visit evening: two of these were held in February of last year, one with Brit VE1FQ, and one with Ralph VE1QU. These sessions were very informal with the fellows asking questions about the gear, operation and just about anything else. The committee thanks Brit and Ralph once again for their contribution.

I am happy to report that at least two of the fellows we contacted have now passed theory and regs and just have code to conquer. Needless to say, it is to their credit, not ours, that they were successful.

Other activities have included phone calls for meeting and theory info, and help with theory problems.

In June, it was suggested that Amateurs in our club clean up their shacks and bring in any old handbooks or other study materials which they did not need any more so that the NARC committee could pass these materials on to those that could use them. We were overwhelmed by the response and have distributed some of the books during the fall.

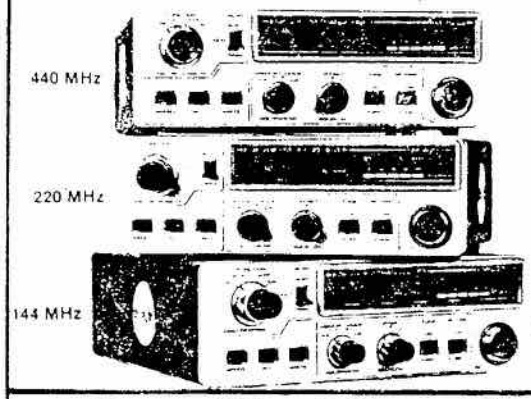
Some code tapes were recorded and distributed as well to those who requested them.

At present, the committee has promoted a beginners course in Amateur Radio which started on Jan. 7, 1985 and is run by Spud VE1BC, and Dan, VE1JV. At least one student there learned of the course through NARC.

On Feb. 15, NARC will be hosting the first Amateur Radio Day at Queen Elizabeth High School with club members working portable on 20 metres. We hope to interest as many students and staff as possible during the seven hour event. We will be seeking media coverage at this time as well. Δ

KDK

MAXPAC STACK



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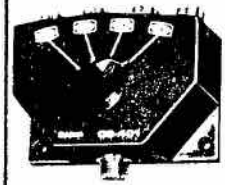

CS-401

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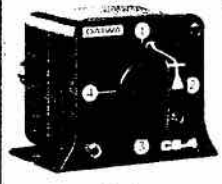
CS-4 NEW 4 Pos BNC Conn $49
The CS-201G is used by many for UHF and Satellite work.



CS-4

	CS-201/CS-201N	CS-401	CS-4
FREQUENCY	600MHz	600MHz	1500MHz
VSWR	below 1.1:2		
POWER RATING	2.5kW PEP 1kW CW		500W PEP 250W CW
IMPEDANCE	50 ohm		
INSERTION LOSS	Less than 0.2dB		
ISOLATION	better than 50dB at 300MHz better than 45dB at 450MHz adjacent terminal		better than 60dB
CONNECTORS	SO-239 (N type)	SO-239	BNC
OUTPUT PORT	2	4	4
	"Unused terminals grounded"		

PRE-AMPLIFIERS

RX-430G
$119.95 159.95

Reliable VHF/UHF Ga-As FET design for outstanding sensitivity and low noise. Can be placed directly into the antenna feed line.
RF activated/Manual T/R switching.

	RX-110G	RX-430G
FREQUENCY	144 - 148 MHz	430 - 440 MHz
GAIN	15 dB min.	13 dB min.
INPUT/OUTPUT IMPEDANCE	50 ohm	
RF POWER BYPASS RATING	30 W CW (FM)	
POWER SOURCE	13.8 V DC 100 mA	
DIMENSIONS (W x H x D mm)	90 x 25 x 92	

LINEAR AMPLIFIERS

LA-2035 2M FM,SSB+CW 2½ IN 30 OUT-$109.95
LA-2060 2M FM,SSB+CW 2½ IN 60 OUT-$179.95
LA-2155 2M FM,SSB+CW 25 IN 150 OUT$379.95
LA-4030 430-450 FM,SSB+CW 2½--35--$229.95

FT-230R/F

Specially designed LCD viewing system provides an exceptionally wide viewing angle of the large digits, even with no external illumination; this you have to see to believe.

3-position switch for standard repeater offsets, or for simplex operation.

Main Dial with selectable tuning steps.

Concentric Squelch and ON/OFF-Volume controls for extraordinary convenience.

Momentary contact push
for choosing tuning ste
Main Dial and Scanner.

Tone Squelch ON
model), or Powe
Switch (European

FT-230R 2M 25W FM Mobile

FT980 CAT SYSTEM

AC Power Supply, Full Break-in CW, SSB/AM-FM/FSK, RF Speech Process

List Price $2495
CALL FOR SPECIAL PRICE

FT-209RH
NEW High Tech 2mtr HT
5 Watt Output
NOW IN STOCK
CALL FOR YOUR SPECIAL PRICE
List Price $419

FT-270RH
New 45 watt 2M mobile.
List $599
Call For Your Special Sale P

NEW FROM YAESU !!

FT-270R 2M 25W FM $529
FT-270RH 2M 45Watt$599
FT-2700RH 2M+440 $799
FRG-8800 Receiver $899
ABOVE PRICES ARE LIST
CALL FOR YOUR SPECIAL!

FRG-8800 has optional built-in VHF Converter covering 118-174MHz ! 8800 comes with 12 Mem and CW AM & FM Filter

730R CLOSEOUT Specials!

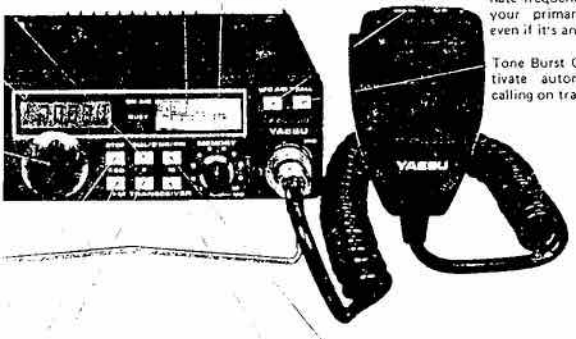
YAESU

Brightly lit meter and Liquid Crystal Display illumination give extra clear readability under every possible lighting condition, from total darkness to direct sunlight.

lector for choosing be- al tuning or scanning.

Memory Selector chooses between the 10 memory channels or scanning of all of the memories.

Choose between two independent VFOs for working odd repeater splits or checking alternate frequencies without loosing your primary frequency pair—even if it's an odd split!



Tone Burst Calling switch to activate automatic special tone calling on transmissions.

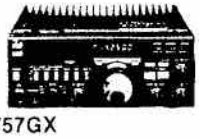
U.S. Low

Function activator to initiate special functions. Special function status indicated on Display along with frequency.

Memory Recall and Priority Recall command switch.

Memorize command switch to store displayed frequency into selected memory.

$439 NOW $369/379 FT-730R 440MHz FM Mobile LIST $499 NOW $399/419



T757GX

with General Coverage RCVR includes CW keyer, AM/FM, CW filter

List Price $1199
CALL FOR SPECIAL PRICE

FT726R

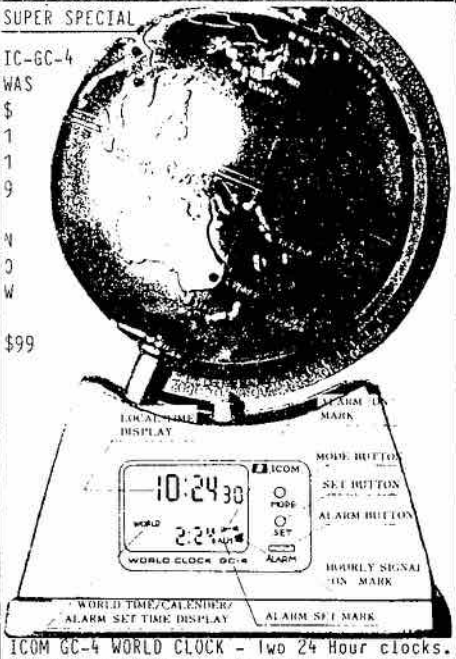
Optional modules for 6m, 430, 440 MHz) Great for Satellite Work

List $1249
CALL FOR SPECIAL PRICE

FT-230R 2mtr FM.. $369/379
FT-730R 440 MHz FM $399/419
• 10 Memories • Two VFO's
• LCD Readout
• Memory of Up/Down Scan

SUPER SPECIAL

IC-GC-4 WAS $119 NOW $99

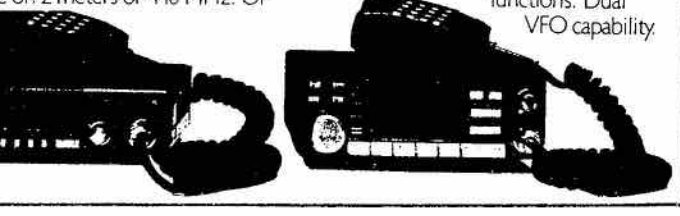


ICOM GC-4 WORLD CLOCK - Two 24 Hour clocks. One set to LOCAL or ZULU time, the other is showing the time of the city that has it's LED flashing on the turnable globe. ALARM.

The FT-270RH is a 2-meter, -watt rig that conveniently packs 45-watt punch into just about y small space in your car.

The FT-2700RH is a 25-watt M dual-bander that lets you oper- e on 2 meters or 440 MHz. Or combine the two for cross-band, full-duplex, telephone-style operation.

Either way, both rigs are simple to operate. You get ten memory channels. Flexible band-scanning functions. Dual VFO capability.



MFJ ANTENNA BRIDGE MFJ-204 $129.00

Trim your antenna for optimum performance quickly and easily. Read antenna resistance up to 500 ohms. Covers all ham bands below 30 MHz. Measure resonant frequency of antenna. Easy to use, connect antenna, set frequency, adjust bridge for meter null and read antenna resistance. Has frequency counter jack. Use as signal generator. Portable, self-contained, 4x2x2 in. 9 V battery or 110 VAC with adapter, MFJ-1312, $9.95.

MFJ PORTABLE ANTENNA

MFJ's Portable Antenna lets you operate 40, 30, 20, 15, 10 meters from apartments, motels, camp sites, vacation spots, nearly any electrically clear location where space for a full size antenna is a problem.

A telescoping whip (extends to 54 in.) is mounted on self-standing 5½x6¾x2¼ inch Phenolic case. Built-in antenna tuner, field strenght meter, 50 feet RG-58 coax. Complete multi-band portable antenna system that you can use nearly anywhere. Up to 300 watts PEP.

MFJ-1621
$129.00

HAND MOLDABLE PLASTIC COAX-SEAL

SEALS COAX FITTINGS FROM MOISTURE AND CORROSION

- Stays Flexible At Any Temperature
- Permanent-Long COAX Life ... **Provides Years of Protection**
- Insures Low SWR
- Forms and Seals Over Odd Shaped and Difficult COAX Fittings
- Fast-Easy Seal for All Antenna Connections
- Non-Contaminating
- Non-Conductive

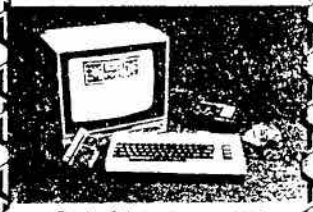
60"x½" roll does about 9 fittings
$4.00 S&H FREE with any order...

USED GEAR

YAESU FT-102 HF XCVR MINT---$899
YAESU FV-101B VFO for 101B,E$169
KENWOOD TS-530SP HF XCVR----$799
KDK-2033 2M FM 25W Demo-----$349
KDK-2025 2M FM 25W 10 Mem.--$249
YAESU MMB-10 Car Hanger-----$ 10
YAESU PA-2 DC-DC for FT-207R$ 19
AEA MBA-TEXT FOR 20/64 Demo-$ 99

10 DAY FULL REFUND GUARANTEE....

Presenting DOCTOR DX™ Work The World With No Antenna



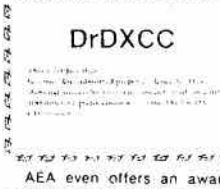
Doctor DX simulates real H.F. CW band conditions. All the stations you will work are generated by the computer. As you tune up and down the particular band you have selected, you will hear realistic sounding stations in contact with other stations (some within your skip zone).

All you need is a Commodore-64 computer, a key (or keyer), and a TV set.

~~$249.00~~

For the active CW operator, there is nothing more fun than operating with the "Doctor DX" CW DX simulator. For the person who has never liked CW, Doctor DX will show you what real fun is.

Doctor DX is more than the most sophisticated CW trainer ever developed. It is your DXpedition ticket to anywhere in the world at a very affordable price.



AEA even offers an awards program to owners of Doctor DX that work all zones, 100 countries, 5 band Dr DXCC, or Doctor DX Honor Roll.

SPECIAL !!

$159

Brings you the Breakthrough!

INSURED SHIPPING AND HANDLING: Ontario and East add 2% - MINIMUM $3.50; Manitoba and West add 3% - MINIMUM $4.50; UNLESS OTHERWISE STATED..... IF TWO PRICES ARE SHOWN THE LOWER PRICE APPLIES TO ALL ORDERS WHICH ARE PREPAID BY CASH, CHEQUE, MONEY ORDER OR BANK TRANSFER. THE HIGHER PRICE APPLIES TO ALL OTHER ORDERS INCLUDING COD, CREDIT CARDS, CHARGES, ETC... FOR INFORMATION OR PRICE REQUESTS PLEASE SEND 64¢ IN STAMPS. THANK YOU...

ATLANTIC HAM RADIO LTD.

HOURS: Mon-Fri 1p.m.-9p.m.
Saturday 1p.m.-5p.m.
Sunday 1p.m.-5p.m.
ATLANTIC TIME PLEASE !!

MINIMUM CHARGE CARD ORDERS $50

P.O. Box 755
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Canada E2L 4B3
(506) 652-5753

Social Events

Jocelyn Lovell Trust Fund

Many radio Amateurs are collecting Dominion foodstore cash register tapes to donate to a fund for Jocelyn Lovell, the champion cyclist who was hit by a truck while on a practice run, and is now a quadriplegic.

Here is the Jocelyn Lovell Trust Fund December Report.

JOCELYN LOVELL TRUST FUND
Grand Total as of Dec. 31, 1984—
$327,268.36 or $688.99 Credit

December Breakdown

Scarborough A.R.C.	$2,761.55
Chatham-Kent A.R.C. (Bell Pioneers)	13,681.47
Nortown A.R.C.	2,180.31
Metro A.R.C.	2,878.60
Thornhill R.A.C.	6,147.07
Northshore A.R.C.	17,212.16
Ministry of the Environment (per VE3NAH, Roger Clarke)	10,102.06
Lady, Cancer Patient, Neighbour of VE3BWF & XYL	24,671.40
Individual Amateurs and friends	7,612.95
Total tabulation Dec. Only	$87,247.57
Dominion Credit:	$183.68

The above grand total (327,268.36 in tapes) which is $688.99 in Dominion Cash Credit, when added to the Jocelyn Lovell Trust Fund which the Thornhill Radio Amateurs' Club has opened for Jocelyn and contains $316.00, means that we now have a total of $1,004.99 set aside for Jocelyn.

Anyone wishing to send a cheque for Jocelyn may make it out to the Thornhill Radio Amateurs' Club, Jocelyn Lovell Trust Fund and mail it to Libby Stevens VE3IOT, 21 Ida St., Thornhill, Ont. L3T 1X4.

Jocelyn does not at this time require a wheelchair, but he has expressed a wish for radio equipment instead. He hopes to start studying for his licence soon after he gets moved into his 'new' renovated house this winter.

An excellent documentary on Jocelyn was aired on the CBC programme, 'The Fifth Estate' in December. Libby has a VHS video tape of the programme, 30 minutes in length, if any club or individual wishes to borrow it. It is an excellent insight into Jocelyn, the person, his extreme courage, perseverance and determination to succeed in spite of his quadriplegic disability.

Food City Tapes For Jocelyn Lovell
As of December 31/84

Food City stores will credit us with $1.00 for every $350 worth of tapes. A small number of Amateurs have been sending in Food City tapes. Please keep them coming as they will come in very handy for such items as antenna wire, connectors and other accessories.

Breakdown

Scarborough A.R.C. - Oct.	877.51
Scarborough A.R.C. - Dec.	846.12
Assorted individuals	1,468.17
Thornhill R.A.C.	108.12
Grand Total as of Dec. 31/84	$3,299.92

or $9.43 Food City Credit.

HALIFAX-DARTMOUTH FLEAMARKET

The Halifax-Dartmouth Amateur Radio Clubs will be holding their fourth annual fleamarket on May 11, 1985, from 9 a.m. to 3 p.m. at St.Andrew's School, Bayer's Road, Halifax, N.S. admittance $2 per person. More information from Wayne King VE1CBK, Box 32, Site 35, RR1 Windsor Junction, Nova Scotia, B0N 2V0.

CALENDAR

April 13: 4th annual Durham Region Fleamarket. Details March *TCA*.
April 17: DOC licence examination.
May 11: Ontario Trilliums 20th Anniversary Dinner, Howard Johnson's Hotel, Progress Court, Scarborough.
May 11: Halifax-Dartmouth ARC's fourth annual fleamarket. St. Andrew's School, Halifax. Details April *TCA*.
May 19: Southern Ontario Repeater Team Fleamarket, Medway High School, Arva.
June 19: DOC licence examination.
June 21, 22, 23: RCN Reunion, Hotel Nova Scotian, Halifax. Write P.O. Box 297, Dartmouth B2Y 3Y3. Details January *TCA*.
June 27-30: YLISSB Convention, Sugarloaf/U.S.A. Write P.O. Box 805, Presq'ile, ME. 04769. Details January *TCA*.
July 27 and 28: 33rd Annual Pacific North West DX Convention, Richmond Inn, Richmond B.C. Details April *TCA*.
Sept. 27-29: RSO/CRRL Convention, London, Ont., P.O. Box 73, Hyde Park N0M 1Z0. Details January *TCA*.
October 16: DOC licence examination. Δ

Publicize your get-together here. Write the Editor, TCA, Box 855, Hawkesbury, Ontario K6A 3C9.

DX CONVENTION

The 33rd Annual Pacific North West DX Convention will take place at the Richmond Inn, Richmond, B.C., Saturday and Sunday, July 27 and 28, 1985. This year's convention is sponsored by the British Columbia DX Club.

Start to make your plans now for this meeting. DXers from all over the world will be here to visit, learn and swap stories about our favourite avocation. Plan to come early and stay on after the convention and take the opportunity to enjoy our Beautiful British Columbia.

Andy Ponzini VE7AHA,
Publicity
4551 Arthur Drive
Delta, B.C. V4K 2X4

See you in British Columbia!

Happy Birthday CLARA! 10 Years Old in 1985

YL NEWS & VIEWS

By Cathy Hrischenko VE3GJH

Sister Rosetta VE5FK

Her story as told to VE3GJH

I was born and raised on a farm near Denzill, Saskatchewan, the youngest of 10 children. After completing High School in 1954 I went to Teachers College. After teaching for three years I joined the Ursuline Congregation of Prelate, Saskatchewan. Since that time I have been in teaching and administrative positions as Principal and Superior and again back to teaching .

In 1968 I was selected as a member of a mission team to go to Brazil. This is when the idea of Amateur Radio came. I remembered an article I had read where missionaries communicated with one another via radio. Furthermore, I recalled that as a child my father and older brothers often talked about the hotel owner in our hometown who had a radio with which he talked to people all over the world.

Also, as a very young child, I played with a toy telegraph set that my brother had given to me. He had been in the signal corps in the Army. Another brother and I spent hours sending signals from one room to another in Morse code.

After obtaining permission from my Convent authorities, I contacted CHAT radio station in Medicine Hat and Mr. Bell, an Amateur operator, gave me some basic information. He directed me to Emma VE6AAI.

Hers was the first Amateur radio station I saw. Mr. Bell and Emma advised me to contact the Department of Transport. I wrote them in April or May of 1968. A few days later I took ill with the flu and was promptly put into the hospital after collapsing in the Doctor's office.

I had been in bed about one hour when a visitor arrived. He was a man from the D.O.T. in Regina. He proceeded to explain how to obtain a radio licence, etc. He even offered to send me his copy of the ARRL handbook. I greatly appreciated his help, even though I was ill at the time.

Sister Rosetta VE5FK, 1970.

In June of that year I received the set of records for learning Morse code and also the oscillator kit and telegraph key. With the help of Emma VE6AAI we put the oscillator together. Being a teacher, the month of June was very busy, so code studies had to wait until July.

In July I attended a week's Theology course in Edmonton. I had taken a small record player with me and during every spare moment I was studying code. From Edmonton, I proceeded to Ottawa for a three week course in Philosophy, which was taught by a Father Mole. He happened to know a radio Amateur and put me in touch with George VE3BNO.

To George, I owe my ticket! For about 10 days, he spent an hour each day explaining the fundamentals of Amateur radio. His explanations, plus much memory work on my part from the books, helped me to pass the theory.

About the middle of August, I made an appointment with the D.O.T. in Regina for my test. I was filled with joy after I made the test. Soon I had my station call VE5FK. My next step was to obtain the station equipment. Off to Edmonton I went, in rather ignorant fashion, since I knew little about the different radios and brands. I knew only that a store named Audiocom handled ham equipment.

But, Providence provided. I met the owner Gene VE6TP. After I explained my situation he helped and advised me— not as a salesman but as a friend and fellow Amateur. I came home to Prelate, Sask. with a Swan 350 and a 14 AVQ Hygain vertical antenna.

However, I could not set the station up the since I was soon to be off for further studies at Antigonish, Nova Scotia to attend the Coady International at St. Francis Xavier University. My boarding place at Antigonish was to be the Convent of the White Sisters. This site was chosen for me because it was a fairly high building and had a flat roof.

I obtained permission to work my VE5FK call portable VE1. But how was I to begin to set up my equipment? God provides as usual. Another student attending Coady was a tall Texan named Joe Head and he was an Amateur. So

Continued on next page ▷

one Saturday in late October we went to work and up to the roof.

After carrying cement blocks and wood up the ladder with many trips we finally accomplished the task. The lead wire we put through the window of my room and by evening Mr. Head sent out the first signal (I was too excited!) I was now on the air and could work 10, 15, 20 and 40 metres.

The local newspaper editor heard about our exploits on the roof and became very interested. He made us go back up to the roof to pose for a picture— Nuns up on a roof. (Three other Sisters came up with me for a picture as well as Mr. Head.) The picture, with the explanation, appeared in the paper called 'The Casket'.

The only active ham in Antigonish at the time was Joe VE1AGE. He made a dipole antenna and we set up a post in the back yard and soon I was operating 80 metres. I spent a great amount of time on the air that year. It was delightful and educational.

In May I returned to Saskatchewan and in August obtained my Advanced. However, our plans to go to Brazil did not materialize and so I was assigned to work at our Girls Academy at Prelate, Saskatchewan.

One day one of the townspeople of Prelate must have thought of the 'Flying Nun' as I climbed up and down the four story building to set up the equipment with some help from the Convent janitor and a couple of fellow Sisters. In my work, I move around from place to place a great deal and so I have become accustomed to setting up and taking down my equipment, which has grown to include a beam antenna and a 30-foot tower.

The other Sisters in the Convent found my new hobby intriguing. On occasion, I would use it to contact relatives or friends of the Sisters so that they could give greetings. I recall one evening a number of the Sisters were in my hamshack as I made various calls and contacts. Finally one Sister, who was watching for the first time, said, "are all the operators named Roger?" Imagine my laughter. Another time while in a QSO I mentioned that "I was running barefoot." One Sister looked at my feet. Later she said, "when do you run barefoot and why?"

The first time I attended a Saskatchewan Hamfest, I had Sister Adelaide, a friend, with me. As we walked around to see the displays, she suddenly tugged at my arm and seemed quite alarmed. "Sister," she said, "they have HOMEBREW here. I don't think we should stay." I chuckled as I explained to her what homebrew meant in our language.

Later another Amateur was speaking to us and asked Sister Adelaide, "Are you going for your ticket?" " Did we not park in the right place?" She thought he was referring to a parking ticket.

To mention all the interesting contacts I have made would mean to re-write my log books. All I can say is that I am grateful and proud to be an Amateur.

(I thought you would enjoy hearing Sister Rosetta's own story as she told it to me. She is quite the person. Thoroughly enjoyed meeting her and the many contacts we have had over the years.

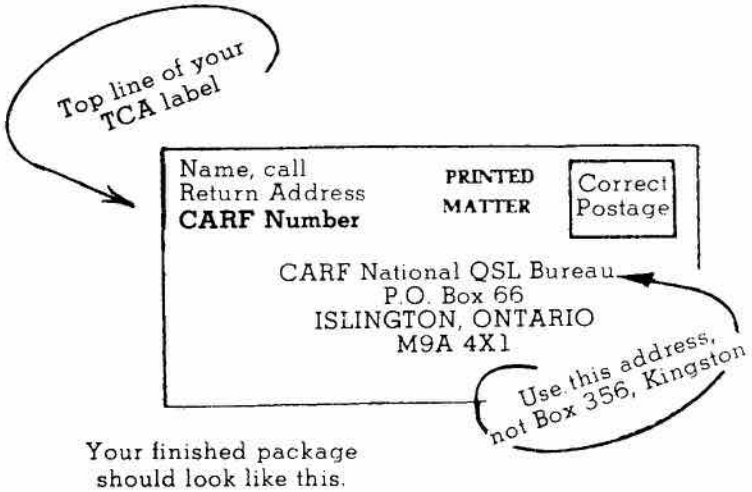
I'd be happy to hear from any of you with an interesting story such as this. Till next time, 73/33/88 as the case may be.)

Δ

Free QSL Service

The CARF Outgoing QSL Service will forward your QSL cards to anywhere in the world. This service is **free to CARF members.**

1. Sort cards alphabetically by prefix
2. Sort Canadian cards numerically by call area.
3. Place small lots of cards in strong, heavy envelopes and seal securely. Include the label (or copy or facsimile) from your current copy of **TCA**. Wrap heavier packages in strong paper or put in a cardboard box. Tie securely. **Do not staple.**
4. Address your package as shown in the diagram.
5. **Do not register the cards!** This only delays them, costs more and is not really necessary.
6. If you want proof that CARF received your cards, enclose a self addressed, stamped postcard or envelope with 'Receipt' marked on it.
7. If a package should be damaged on arrival (very rare), CARF will send you a list of cards received so that you can check to see if any were lost.



Your finished package should look like this.

Amateur Radio in the Okanagan

The formation of VARCOM, Valley Amateur Radio Communicators, was the brainchild of a few Amateur Radio Operators in Penticton B.C. (pop 25,000). The Amateurs saw a need for radio communications for the city and surrounding community, especially helpful for parades, athletic events and festivals.

They saw the opportunity to promote Amateur Radio as a public service to the city and district. A group consisting of Don Fleming VE7BOR, Al Miller VE7KC, Russ Rippin VE7EHJ and Tony Scott VE7LG, agreed to demonstrate to the citizens that Amateur Radio was more than DX-chasing, rag chewing, creating television interference and erecting unsightly antennas. So, in 1983, VARCOM began to flex its muscles.

Communications were provided for the Kiwanis Walkathon, a three mile swim meet for the Heart Fund, and for the very first Ultra Triathlon ever held in Canada.

Although young in experience but not in years, it was a great learning experience for all who participated and the efforts were greatly appreciated. Requests started coming in from various community organizations, evidently VARCOM was being recognized. In May 1984, Penticton was chosen to host the B.C. Festival of the Arts, quite an honour for our city. Attendance exceeded 10,000 for the week-long event. This was an excellent opportunity for VARCOM to supply communications.

Summer provided the Heart Swim Meet, the Penticton Pounders Run, the Horse Endurance Run at Oliver and the Kiwanis Walk-a-long. VARCOM people were right in there providing communications for these events.

Then came September, with the second Ultra Triathlon. Patterned after Hawaii's Iron man Triathlon, it consisted of a swim of 2.6 miles, followed immediately by a bicycle race of 112 miles, followed by a run of 26.2 miles.

VARCOM people realized additional Amateurs would be needed for this 18 hour event. How do you enlist more help on the last holiday weekend of the summer? A call went to Marg Taylor VE7BNU in Summerland and Art Petterson VE7BEI in Oliver to recruit Amateurs in their areas. In all, 35 Amateurs volunteered. They came from as far north as Kelowna, and as far south as Osoyoos, a total distance of 70 miles.

Communications were provided at 22 'Aid' stations, located at intervals along the race routes. Amateurs with hand-helds manned the supply trucks, medical and First Aid stations and some were shadowing the VIP's. We also worked in close co-operation with the RCMP.

Three 2M frequencies were used; the local repeater on Mt. Kobau for emergencies and distance and two simplex frequencies for the shorter haul traffic. Some Amateurs spent the previous night at the transition area. The event started at 7 a.m. and the last athlete crossed the finish line just short of midnight. What an endurance test for both the athletes and the Amateurs!

Was it all worth the effort and fatigue? All those involved responded with a resounding 'yes'. Many new friendships were made with fellow Amateurs and people in the community.

We are offering a Radio Communications Service to any non-profit organization in the Community, and we expect to have increasing requests for our services. Δ

Marjorie Rippen VE7EHI
from Clara 'Clarion'

News Briefs

BANNED COUNTRIES LIST

The following countries have notified the International Telecommunications Union that they forbid radiocommunications with Amateur stations under their jurisdiction: Democratic Kampuchea, Iraq (Republic of), Libya (Socialist People's Libyan Arab Jamajiriya), Somali Democratic Republic, Turkey, Viet Nam (Socialist Republic of), Yemen (People's Democratic Republic of), Zaire (Republic of).

THIRD PARTY TRAFFIC AGREEMENTS

Canada has concluded agreements with the following countries to permit Amateur radio operators to exchange messages or other communications from or to third parties: Australia, Bolivia (Republic of), Chile, Columbia (Republic of), Costa Rica, Dominican Republic, El Salvador (Republic of), Guatemala (Republic of), Guyana, Haiti, Honduras (Republic of), Israel (State of), Jamaica, Mexico, Nicaragua, Paraguay (Republic of), Peru, Trinidad and Tobago, United States of America, Uruguay (Oriental Republic of), Venezuela (Republic of).

Negotiations for the establishment of similar agreements or arrangements with Ecuador and the Federal Republic of Nigeria have been initiated.

Amateurs who wish to operate in Commonwealth countries other than those listed above should apply to the embassy in Canada or directly to the appropriate regulatory agency.

FROM THE CLUBS

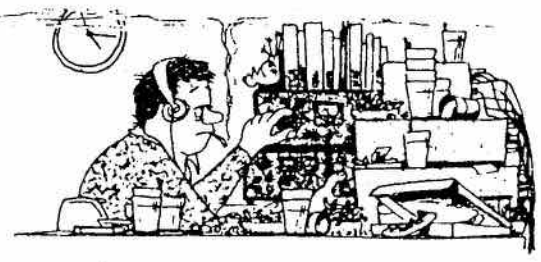
Last winter the Heritage Amateur Radio Klub arranged a storm road watch between Toronto and Kingston— Highways 401, 2, 35 and 115, 7, 37 and 14. The object was to pass information and to assist any needy mobile ham on stormy days.

They operated through the repeaters or 146.520 simplex. Some of the members have Chicken Band rigs and monitored channel 9 or 37 LSB.

The OPP detachments on Highway 45 and 30 were notified of these arrangements.

CONTEST SCENE

By John Connor VE1BHA



This month we will continue last month's discussion of the CQ WPX contest with a look at the CW records. In addition, we will look at some contests for late April and early May.

The CQ WPX CW Contest will be held on May 25 and 26 this year. Rules were given in last month's *TCA*. A list of the current records is provided in Table I. The records on the higher bands should be quite safe, but it will be interesting to see how the records on the lower frequencies hold up. If you plan on making a serious effort to set a new mark, check last year's results in CQ first, since these records don't include results from 1984 contest.

The QRP ARCI is seeking some publicity for their annual spring SSB contest. Anyone may participate, but only those using 10W PEP output or less are eligible to win awards. A summary of the rules is printed below for those who are interested.

Another contest that some of you might enjoy is the CQ-M contest, sponsored by the Krenkel Central Radio Club of the U.S.S.R. This can be a good contest for picking up some of those rarer Russian countries, such as UH, UI, UJ, etc. Rules are given below. We will have to wait and see how the propagation gods treat us in this one this year.

Speaking of propagation, it wasn't too kind to the Radiosport contest last year, as can be seen by the results in Table II. Let's hope for better conditions this year.

CQ 160M Contest Review

This column is being written two weeks after the CQ 160M CW Contest. Your humble scribe spent five hours operating in this contest, embarrassing myself to the tune of 25 QSOs and 11 multipliers. Someone has since suggested to me that one half of a 40 metre dipole is not the best antenna for 160. Could be that he has something there.

Apr. 20-21: QRP ARCI SSB Contest
May 11-12: CQ-M Contest
25-26: CQ CW Contest

Activity from Canada seemed to be quite good, as I heard at least a dozen VEs, mostly from VE3 of course. In fact, I even worked VE3OME! Wow!

My operation in this contest did remind me of one point that applies to all contests. That is the importance of being able to hear people. As a rule, I worked the 'Big Guns' with one call. But some of the other people on the band who heard me gave up after one or two QRZs, because they decided they simply couldn't hear quite well, so the difference is mostly on the receiving end. I think that is one of the reasons the 'Big Guns' win contests— they hear very well. So if you are looking to make some improvements in your station over the summer, you might well give serious thought to improving your overall receiving capability. You can't work them if you can't hear them.

Well, I think that is the closest that I have come to a speech since I started this column eight months ago. So with that, I'll finish up for this month, and start worrying about what to write for next

I. CQ WPX CW Contest
Canadian Records

CATEGORY	CALL	SCORE	QSOS	MULT	YEAR
All Band	CY60U	2,563,081	1789	487	1983
28 MHz	VE3BMV	113,412	317	156	1980
21 MHz	VE3BMV	1,534,669	1263	461	1981
14 MHz	CY3BMV	2,541,680	1627	528	1983
7 MHz	VE3KZ	649,288	516	277	1981
3.5MHz	VE3IY	91,304	213	113	1981
1.8MHz	VE3ABG	1,824	30	19	1983
M/S	VE1DXA	3,728,256	2147	584	1983
M/M	CY3PCA	4,977,817	2703	611	1983

II. Canadian Results
Radiosport 1984

MODE	CALL	SCORE	QSOS	MULT
MIXED	VY4MG	14,200	228	20
	CZ1CM	5,486	112	13
CW	XO3OMU	3,406	82	13
ONLY	VE5AAD	2,511	93	9
PHONE	VE4CCC	35,088	338	34
ONLY	VE2FJR	14,168	138	28
	VY7RG	13,472	101	32
	CZ1CBF	8,602	121	22
	VY6AGV	7,126	163	14
	KB2XP/VE2	5,200	76	20

month.

How did you make out in the ARRL Contest?

Oh yes, I had fun anyway in the 160M Contest. At least, I think I did.

QRP ARCI SSB Contest Rules

Dates: 1200Z April 20 to 2400Z April 21. Operate a maximum of 24 hours.

Exchange: Signal report, province and power output. If member of QRP ARCI, give number in lieu of power.

Points: Each contact with a non-member is 2 points in North America; 4 points if outside North America. Contacts with members worth 5 points regardless of location. Work stations once per band.

Multipliers: Sum of states, provinces and countries from each band. There is also a power multiplier, based on PEP output power: 8 to 10W, x 2; 6 to 8W, x 4; 4 to 6W, x 6; 2 to 4W, x 8; less than 2W, x 10; the highest power used for any contact determines the multiplier.

Also a bonus multiplier of 2 for natural power such as solar or wind power. As well, a multiplier of 1.5 if battery power is used.

Frequencies: 1810, 3985, 7285, 14285, 21385.

Send logs by May 21, 1985 to Eugene Smith KA5NLY, PO Box 55010, Little Rock, AR 72225.

CQ-M Contest Rules

Dates: 1200Z May 11 to 1200Z May 12, both CW and SSB.

Exchange: Signal report plus three digit serial number. Receive signal report plus oblast number.

Points: One point per QSO with other North Americans; otherwise three points. Canadians may work other VEs for multiplier credit, but no point value.

Multiplier: Countries per band.

Score: QSO points times the total multiplier from all bands. Usual categories and awards. Mail logs by July 1 to CQ-M Contest Committee, PO Box 88, Moscow, U.S.S.R. △

CHARGE IT!

It is now more convenient than ever to join CARF and to order CARF publications. When ordering, simply send your name, address, card number and expiry date, with your signature.

Canadaward Report

By John Brummell VE3JDO

As we enter 1985 and the real doldrums of cycle 21, I can only hope that through the efforts of so many avid *TCA* readers and CARF members that Canadaward applications will continue their steady increase. It is one of the more beautiful awards that is available to Amateurs around the world. 1984 was a busy year here at the Canadawards desk and I anticipate 1985 will be also.

First off, I offer my heartiest congratulations to Barry G. Seigfried K2MF for qualifying for 5 Band Canadaward #6. I am sure we can all appreciate the hours of work and dedication that goes into scouring the bands for those contacts that help to capture this prestigious award. Overall, there was a healthy increase in award applications during 1984 with both 14 MHz and 28 MHz seeing the issue of certificate #100. The recipient of #100 on 14 MHz was W4DDP and on 28 MHz VE2DWH.

New Award

In the near future this column will carry details and information regarding a new CARF Award. The CARF executive recently approved expansion of the Canadaward horizon by opening it up to Short Wave Listeners. This would involve, of course, a new type of certificate and some changes in the rules to reflect the addition of this whole new group of award hunters. I would appreciate hearing from any SWLers regarding this new service.

At this time I would ask you to bear with me as I correct an error made in last year's annual report. Apologies to Brett Lockerbie VE3KBF (28 MHz Canadaward), and to Bert Morgan VE3XK (14 MHz Canadaward). Brett's award #60 and Bert's award #55 were unfortunately duplicated and left out of last year's annual report.

Award Qualifications

I must commend all applicants for the minimal amount of mistakes in their applications or the QSLs sent in. To earn this very attractive award, QSLs confirming QSOs with all ten provinces and two territories must be supplied. All QSOs must be on one band only. Separate awards are issued for each band on which the applicant qualifies (12 cards per band). A mode endorsement is available if all QSOs are made on the same mode (CW, SSB, RTTY, SSTV). Contacts made after July 1, 1977, only count. Submit the 12 cards with two dollars ($2) Canadian or U.S. funds or 10 IRCs plus sufficient funds for return postage. CARF members need only supply their CARF membership number and funds for return postage.

5 Band Canadaward

A special plaque is available to any Amateur who confirms two-way QSOs with all Canadian Provinces and Territories on each of five separate bands. (Total of 60 cards— 12 cards per band). Contacts made after July 1 1967 count. Submit the 60 cards with $25 Canadian or U.S. funds plus sufficient funds for return postage. Because of problems in the postal system PLEASE register your QSLs.

Use of Contests for Canadaward

In recognition of the difficulties some of you have in collecting the necessary cards, credit will be given for QSOs made during the Canada Day, Canada and CARF Phone Commonwealth contests, provided logs are received by both stations. That is, if you manage a Canadaward during the contest period, and both you and all the 12 stations you work submit logs then credit will be given for all QSOs. You can pull QSOs out of any running of any of these three contests. When you make applications, be specific about which QSOs from which contests you wish to claim, including QSO serial numbers sent and received.

If logs are received by you and the stations you worked, then credit will be given.

Continued on next page ▷

QRP Applications

SSB endorsements still outdistance the CW with as yet no applications for RTTY. I look forward to receiving some applications for the QRP mode, this is increasing in popularity among Canadian Amateurs. QRP endorsements will be given to any station whose application was made while running 5 watts DC or 10 watts PEP input or less. A note accompanying your application with details of how your power was maintained at QRP level will suffice. If you and the 12 stations you work were running at QRP levels, then you can ask for a two-way QRP endorsement. QSL cards received should show that the other station was running QRP.

Satellite Canadaward

When the award was first conceived, each distinct Satellite transponder mode (A, B, J) was considered as a separate band. After consulting with some Satellite fans, it became clear that this was much too restrictive. Later, we changed the requirement so that all Satellite activity would be considered as if on one band. Each transponder mode could be an endorsement, but you can collect the 12 necessary QSOs on any combination of satellite modes to earn the award.

The awards program is a major success thanks to all who have applied for the award and all those who have been good enough to make QSOs and hand out useful QSL cards. I hope to see more interest in 160, 80, 40, 15 RTTY or QRP on any band. I would appreciate any comments you have on how the award may be improved. Again, a final reminder, information about the award can be obtained through the Kingston office, myself directly, or via P.O. Box 2172, Station 'D', Ottawa, Ont. K1P 5W4. Good Luck and Good Awards hunting. Δ

Keep Us Informed!
Call the
TCA NEWSLINE
613-824-3467

(For TCA Subscription problems, call the Kingston office 613-544-6161 anytime.)

Canadawards

Awards issued to February 1985

1.8 MHz
1. VE5XU CW

3.5 MHz
1. VE3GCO SSB
2. VE7IX SSB
3. VE3XK SSB
4. VE3JPJ SSB
5. K2MF SSB
6. W9IH SSB

7MHz
1. VE3GCO
2. VE3JPJ SSB
3. VE3KPR
4. WØJIE SSB
5. VE3XK SSB
6. K2MF

14MHz
1. VE3ET SSB
2. VE3GCO SSB
3. VE2QO SSB
4. W9VWV SSB
5. W6BZ CW
6. K6UY CW
7. WB8YXT
8. WD8CYR CW
9. VE3IUE
10. WD9ACQ
11. DAIHO SSB
12. VE6PW SSB
13. W3TUB CW
14. VE7CNE CW
15. VE3ITU
16. VE3JIJ
17. VE3DMC
18. VE3IPR
19. WA8VDC
20. VE3JPJ SSB
21. VE3HLL SSB
22. WA4SKE
23. VE2DZT SSB
24. EP2LI SSB
25. VE7IX SSB
26. VE3KK CW
27. 7X2LS SSB
28. VE7DEN SSB
29. VE7MH CW
30. PI1PT CW
31. VE7BAK SSB
32. I8YRK SSB
33. JH1VRQ
34. OE5AHL CW
35. VO2CW
36. VE3CZJ
37. HI8XGF SSB
38. HI8XJO SSB
39. K8EK SSB
40. VE3DIJ SSB
41. DL7CS CW
42. VE3YE SSB
43. VE3OCU SSB
44. WA2FUM SSB
45. WA7GVM SSB
46. VO1KO CW
47. VE3AHB CW
48. VE3GRW SSB
49. VE3JPP
50. VE3JPJ SSB
51. VE3LWL CW
52. JA1VWK SSB
53. WA1ZIC CW
54. K2MF
55. VE3KUC
55. VE3XK SSB
56. G4CNT SSB
57. VE1BWP CW
58. KD6LB SSB
59. VE5ADO SSB
60. YS9RVE SSB
61. VE3MFP CW
62. VE2ZP CW
63. VE7CRU SSB
64. KØLST CW
65. VE5AE
66. KA6CJL
67. K9AYK CW
68. VE3LRB CW
69. KCØAM
70. VE3LCZ
71. KA2APZ SSB
72. VE3LQJ SSB
73. WA4NEU CW
74. VE3MRX
75. WD9GQV SSB
76. VE5AE
77. VE3CKR SSB
78. VK3CIW SSB
79. VK2DEJ SSB
80. VE3HRC SSB
81. JA2AH SSB
82. VE1DX SSB
83. WØJIE CW
84. VE3MSA
85. DK4SY
85. VE5ABV CW
86. DU9RG SSB
87. VE7DYX
88. VE3FDP SSB
89. 4Z4AB SSB
90. SM5BDU
91. K4FPF
92. K3AQH
93. PAØGT CW
94. VE4AEX CW
95. VE3CEY SSB
96. VE3JDO SSB
97. VE3GQV SSB
98. WØSFU SSB
99. JH8NYK SSB
100. W4DDP SSB
101. VE4AMP CW
102. VE3MWR

21 MHz
1. VE3GCO SSB
2. 9H4G SSB
3. WA2FUM SSB
4. VE3JPJ SSB
5. KAØFAR CW
6. G4CMT SSB
7. VE2ZP CW
8. VE1BWP CW
9. VE3XK SSB
10. JG1RDD
11. JF1SEK SSB
12. DL8QS SSB
13. JA1FVE SSB
14. JH2PYX SSB
15. WA4NEU CW
16. W3TVB CW
17. WØJIE CW
18. DK4SY
19. JJ1KTI SSB
20. JH8MFS
21. K2MF
22. K5BDX CW
23. VE6PW SSB

28 MHz
1. VE3GCO SSB
2. WB9WFZ SSB
3. VE1BNN SSB
4. VE6KZ SSB
5. WB7UCK
6. WB0WAP
7. WB2RLK/VE1 SSB
8. VE7CER SSB
9. VE3KXE SSB
10. WA4QMQ SSB
11. VE5BEU SSB
12. WB5RQM SSB
13. VE3KIF SSB
14. PAOPCA SSB
15. DA1QR SSB
16. VE3DAX SSB
17. VY1BR SSB
18. VE7DRI SSB
19. DA1MH SSB
20. VE3HOM
21. VE7CUF SSB
22. VK2NSE SSB
23. VE3KRX SSB
24. VE1BNN CW
25. VE7DOG SSB
26. JA7GB SSB
27. WA3FUM SSB
28. VK2NOG SSB
29. VE1BBS SSB
30. VE4AFO SSB
31. W2JBZ SSB
32. K8IXU SSB
33. VK2NYI
34. PAOSMU SSB
35. N6BOI SSB
36. N4BBY SSB
37. WB3DKY SSB
38. VY1AL SSB
39. WA4NOM SSB
40. VE3JPJ SSB
41. G4FXS SSB
42. JH1IFS SSB
43. JG1FJT SSB
44. VE5ABJ SSB
45. VE3IPR SSB
46. VE7FAO SSB
47. VE7EDA SSB
48. WD9FOE SSB
49. K6PKO SSB
50. WBØPPR SSB
51. WA1YRB SSB
52. KC4OH
53. AJ1L SSB
54. KB6CO SSB
55. WD6DRM SSB
56. KA8ECT SSB
57. K6CID SSB
58. W8BCE SSB
59. VY1AU SSB
60. VY1BF SSB
60. VE3KBF SSB
61. PAOMA SSB
62. VK3NXQ SSB
63. VE7FCK SSB
64. VE6AYA SSB
65. VE2AJX SSB
66. VE3GTB SSB
67. VE6CKD SSB
68. G4CMT SSB
69. VE3LCJ SSB
70. VE1CAW SSB
71. VE1BWP SSB
72. JA7EPO SSB
73. JA2MTM SSB
74. WD4SII CW
75. VE2PD SSB
76. VE5ADA SSB
77. VE2FSU SSB
78. WA6DTG SSB
79. VE3KHI SSB
80. VE3KOY SSB
81. XE3FP SSB
82. WB9TNQ SSB
83. DF2NJ SSB
84. K2MF SSB
85. VE1BKC SSB
86. WB2DND SSB
87. K9VIQ SSB
88. JA1EF SSB
89. VE2ZP CW
90. K4KYI SSB
91. JA1WVK
92. KF4FO SSB
93. VE7YW SSB
94. WA2VUY SSB
95. JA2FDC SSB
96. VE3XK SSB
97. VE7DZD SSB
98. VE6PW SSB
99. K3AQH
100. VE2DWH SSB

50 MHz
1. VE1AVX SSB
2. KA4AOK SSB
3. N3AHI
4. VE1ASJ SSB
5. W7WKR SSB
6. N7D8
7. KA1BRD SSB
8. W2UTH SSB
9. WA7HQG SSB
10. W7ZTT SSB
11. WB1FVS SSB
12. WD2AKA SSB
13. WA7GCS SSB
14. K8WKZ SSB
15. W2IDZ SSB
16. W7IDZ SSB
17. K7LED SSB
18. VE6CX
19. N4CD SSB
20. K4GOK SSB
21. W1AIM SSB
22. WB2WSV SSB
23. K2QIE SSB
24. W4CKD SSB
25. WB7AJP SSB
26. K3QMX SSB
27. K7LYT SSB
28. WB8BKC SSB
29. K8EFS SSB
30. WB8WXZ SSB
31. WA4MCP SSB
32. K2YOF SSB
33. KS2T SSB
34. WA1AYS SSB
35. WA1UQC SSB
36. VE3LNX SSB
37. W2RTW SSB
38. W1QXX SSB
39. N3BBI SSB
40. VE7AFB SSB
41. WD8BRE/8 SSB
42. K1LPS SSB
43. KA1A
44. N9CEX SSB

Five-Band Canadawards
1. VE3GCO
2. VE3JPJ SSB
3. WA1UVX
4. VE1ASJ
5. VE3XK SSB
6. K2MF

SATELLITE
1. VE5XU

The CARF Phone Commonwealth Contest

When: From 1200 Z Saturday to 1200 Z Sunday second weekend of April. Contestants can use all 24 hours of contest.

Eligible Entrants: Only Amateurs within the British Commonwealth.**Contacts:** SSB only in the 10-80M bands. Suggested frequencies are plus or minus 20 kHz of 3600; 3780; 7080; 14180; 21200 and 28400 kHz. Only one contact per band per station worked is all right. Duplicated contacts must be clearly marked and not claimed for points. Contacts may be made with any station using a Commonwealth call sign, except within the entrant's own call area. e.g. a VE3 should not work another VE3. U.K. stations may not work each other for points.

Exchange: A contact consists of an exchange and acknowledgement of an RS report and a three figure serial number from 001. Do not send a separate series of serial numbers on each band.

Scoring: Each completed contact will score five points. In addition, a bonus of 20 points may be claimed for the first, second and third contacts with each Commonwealth call area on each band. See the accompanying table for a list of Commonwealth call areas.

Logs: Separate logs are required for each band. Each band log should be separately totalled and should include a checklist of call areas worked on that band.

Entries: Entries can be multi or single band. Single band entries must show contacts for one band only. Only single operator entries will be accepted. Each entry will consist of the separate band logs, call area checklists, a summary sheet and dupe sheets. Entries should be sent to:
CARF Contest Committee, c/o N. Waltho, Box 1890, Morinville AB T0G 1P0.

Under no circumstances will entries for this Phone contest be sent to the RSGB which sponsors the CW Commonwealth contest.

The closing date for entries is June 1. The CARF Phone Commonwealth Contest Plaque will be awarded to the top-scoring station in the multi-band class. Certificates will be awarded to top-scoring station entrants in each class in each Commonwealth call area.

The results will be published in *TCA* prior to the next contest. Non-members of CARF may wish to include an SASE with their entry for a copy of the results.

The decision of the Contest committee shall be final in all cases of dispute.

Summary sheet

*Callsign:*_____ *Operator:* _____

*Class of entry:*_____ *Multi-band*

_____ *Single-band*_____ *MHz*

Score Summary:

Band	Valid QSOs	Bonus QSOs
3.5		
7		
14		
21		
28		

*Total valid QSOs*_____ *X 5 =* _____ *QSO points*

Total bonus QSOs _____ *X 20 =* _____ *bonus points*

QSO points + bonus points = _____ *TOTAL CLAIMED SCORE*

Station: Equipment: _____

_____

*Antennas:*_____

_____

Comments: _____

_____

Name: _____ *Callsign:*_____

Address: _____

_____

I declare I have operated my station within the conditions of my licence, and in observance of the rules of the CARF Phone Commonwealth Contest.

Signature: _____ *Date:* _____

CARF Phone
Commonwealth Contest

CALL: VE
CALL AREA CHECKLIST FOR_____MHz

Enter QSO serial number sent for each of the first three QSOs with each call area. Please use separate sheets for each band.

A2				VK8				ZK2			
A3				VK9N				ZL1			
A5				VK9X				ZL1/k			
C2				VK9Y				ZL2			
C5				VK0/h				ZL3			
C6				VK0/m				ZL3/c			
G				VO				ZL4			
H44				VP2A				ZL4/a			
J3				VP2E				ZM7			
J6				VP2K				3B6/7			
J7				VP2M				3B8			
J8				VP2V				3B9			
P2				VP5				3D2			
S2				VP8/f				3D6			
S7				VP8/sg				4S7			
T2				VP8/se				5H			
T3				VP8/sa				5N			
V3				VP8/sh				5W1			
VE1				VP9				5X5			
VE1/s i				VQ9				5Z4			
VE1/sp				VR6				6Y5			
VE2				VS5				7P8			
VE3				VS6				7Q7			
VE4				VU2				8P6			
VE5				VU/a				8R			
VE6				VU/1				9G1			
VE7				VY1				9H			
VE8				YJ8				9J2			
VK1				ZB2				9L1			
VK2				ZC4/5B				9M2			
VK2/1h				ZD7				9M6/8			
VK3				ZD8				9V1			
VK4				ZD9				9Y4			
VK4/w				ZE				Ant.			
VK5				ZK1/c							
VK6				ZK1/m							
VK7											

MICROWAVES

By Michael Ross VE2DUB 988 Hudson,
St. Bruno, Quebec J3V 3Y2

In the past few columns, the construction of a complete 10 GHz station has been described, to allow the average Amateur to get on the air on this microwave band. With Gunnplexer in hand and spring fast approaching, the question becomes, "How far can I work?"

Starting with reliable 'line of sight' contacts over relatively short distances will allow the familiarization of the operator with the new equipment and the development of antenna aiming and frequency tuning skills necessary for those DX long hauls.

To avoid early disappointments on the first DX attempts, a few simple calculations of the distance to the horizon, which is the most significant limiting factor, will be required. By adding the distances to the horizon of the two stations, you can tell if they are able to see each other.

Assuming a smooth round earth, the formula

$$D(\text{miles}) = \sqrt{1.5 \times \text{Height (feet)}}$$

approximates the distance to the horizon. However, the distance to the radio horizon is usually greater because of refraction of the signal.

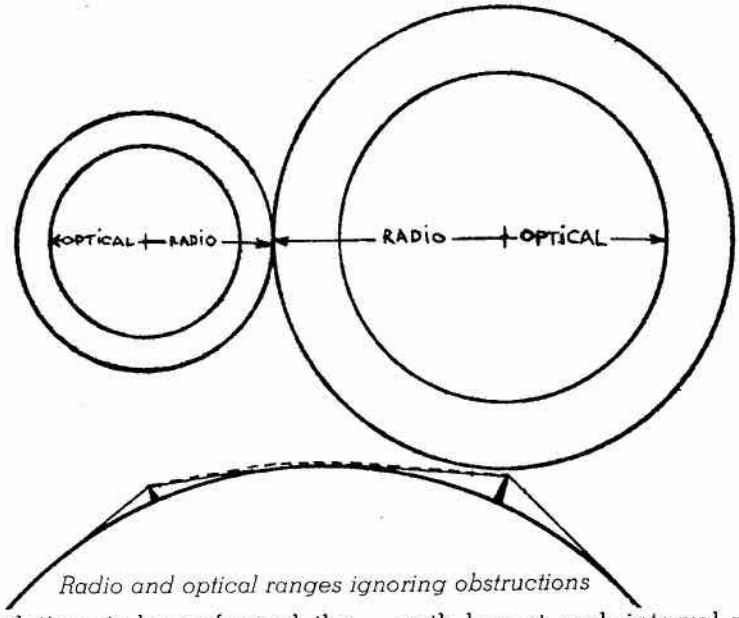
On average, the effective earth radius factor, denoted k, is 4/3. This means the radio horizon is 1.33 times the optical horizon. The formula

$$D(\text{miles}) = \sqrt{2 \times \text{Height(feet)}}$$

reflects this extended range.

In planning the first few contacts, you may want to use the optical formula to guarantee success. In any case, one further element must be taken into account before heading up the mountains; obstructions. Microwave signals don't like things getting in the way!

With a multitude of path calculations to be performed, the minicomputer comes to the rescue with a simple program to do the work. First appearing in July 1983 *QST* by W6ZGN, the program accepts the two antenna heights in feet, the distance between the two stations in miles and the k index, producing signal heights above mean sea level at convenient intervals along the path. These results can be plotted in graph form and the terrain added to check for obstructions.

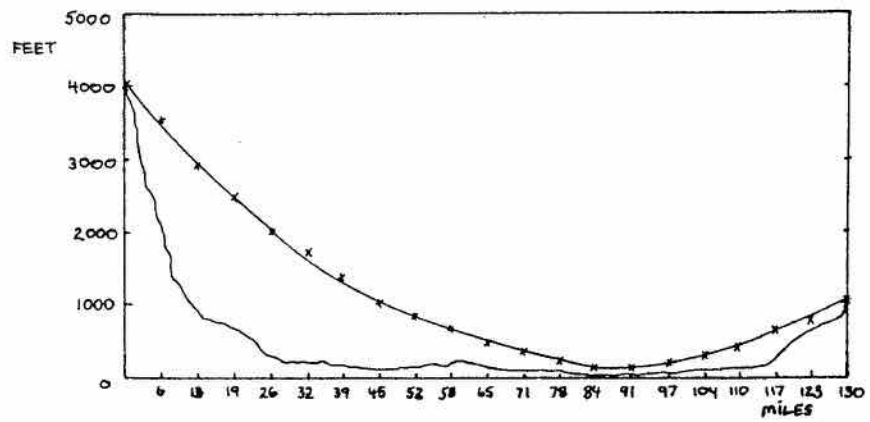


Radio and optical ranges ignoring obstructions

A modification to the original program was made to print the path loss at each interval point. As path loss varies with frequency, lines 135 and 195 should be changed to the desired frequency of operation, if other than 10.25 GHz. While the resulting output may be on the conservative side, it will allow you to start making more reliable contacts over greater distances than the trial and error method.

As these calculations do not consider enhanced propagation modes, much further distances can be obtained, as already demonstrated in Europe and the southern U.S., over water paths. △

Path Profile



Program listing in Atari Basic

```
  1 PRINT"PATH PLOTTER PROGRAM"
  5 PRINT"ENTER HEIGHT OF ANTENNA 1 IN FEET"
 10 INPUT H1
 15 PRINT"ENTER HEIGHT OF ANTENNA 2 IN FEET"
 20 INPUT H2
 25 PRINT"ENTER DISTANCE BETWEEN ANTENNAS IN MILES"
 30 INPUT DØ
 35 PRINT"ENTER K INDEX"
 40 INPUT KØ
 50 DH=H1-H2
 60 K1=1.5*KØ
 70 K2=(DØ^2)/K1
 71 OP=SQR(1.5*H1)
 73 PRINT"OPTICAL RANGE IS",INT(OP),"MILES"
 75 PRINT"DISTANCE HEIGHT DB LOSS"
 80 IF ABS(DH)>K2 THEN 170
 90 D1=.75*KØ*DH/DØ+DØ/2
100 HØ=H1-D1^2/K1
110 IF HØ<0 THEN PRINT"LOS NOT POSSIBLE"
120 FOR N=0 TO 20: D3=N*DØ/20
130 H3=HØ+(D3-D1)^2/K1
135 DB=96.6+20*CLOG(10.25)+20*CLOG(D3)
140 PRINT INT(D3),INT(H3),INT(DB)
150 NEXT N
160 END
170 K3=DH/DØ+DØ/K1
180 FOR N=0 TO 20: D3=N*DØ/20
190 H3=H1-K3*D3+D3^2/K1
195 DB=96.6+20*CLOG(10.25)+20*CLOG(D3)
200 PRINT INT(D3),INT(H3),INT(DB)
210 NEXT N
220 END
```

Conversion notes:

```
CLOG = log base 10
^2   = exponent 2
SQR  = square root
*    = multiplication
```

Antenna Height (feet)	Optical Range (miles)	Radio Range (miles)
0	0	0
10	3.9	4.5
20	5.5	6.3
30	6.7	7.7
40	7.7	8.9
50	8.7	10.0
60	9.5	11.0
70	10.2	11.8
80	11.0	12.6
90	11.6	13.4
100	12.3	14.1

Optical and radio horizons for antennas less than 100 feet high (K=1, K=4/3)

Antenna Height (feet)	Optical Range (miles)	Radio Range (miles)
1000	39	45
2000	55	63
3000	67	77
4000	77	89
5000	87	100
6000	95	110
7000	103	118
8000	110	127
9000	116	134
10000	123	141
11000	129	148
12000	134	155
13000	140	161
14000	145	167

Optical and radio horizons for antennas over 1000 feet high (K=1, K=4/3)

AMSAT NEWS

By Gordon Wightman VE5XU
Regina, Saskatchewan S4T 1M4

During the period when AO-6 and AO-7 were in operation, it was possible to make crosslink QSOs by relaying through both satellites. This was another 'first' accomplished by Amateurs. Periodically both satellites would be positioned in view of each other while still above horizon to both ground stations. Station A transmitted Mode B on 432 MHZ to AO-7 creating a downlink on 2 M. That was picked up by AO-6 generating its own downlink on 29.5 MHz to which both stations were tuned. Station B operated straight Mode A, up on 146 and down on 29.5.

This feat was duplicated last year via RS-6 and AO-10 with the following report courtesy AMSAT's newsletter *Amateur Satellite Report.*

First Crosslink

Using a combination of AO-10 and RS-6, G3IOR and G4CUO have laid claim to a significant first. The duo claims that on May 7 they became the first ever to establish contact using a two-satellite relay of which AO-10 was an element. Both stations used the now classic Mode B-to-Mode A relay, the QSO occurred between 0705 and 0711 UTC on 7 May with signal reports of 559 exchanged for a full two-way, two-satellite QSO.

With an uplink to AO-10 of about 435.085 MHz, RS6 picked up the 145.920 MHz AO-10 downlink. RS6 then retransmitted the CW signal on its 10 metre downlink at 29.413 MHz. Crosslinks may become important to future OSCAR users as geostationary systems of global coverage satellites are envisioned for later in this decade.

AMTOR

From *ASR* comes another report of a satellite first.

What is claimed to be the first AMTOR QSO on AO-10 came, according to 9M2CR, on Mar. 2 '84 when he and DC8AM QSOed on orbit 450. It worked but the question is "Why?"

AMTOR has stringent timing requirements. A short series of characters is sent by one station. It then waits for an acknowledgement. The timing of the transmission and acknowledgement is precise. The delays involved in AO-10 would seem to preclude use of AMTOR.

But what Colin 9M2CR, and his contact, Horst DC8AM, found at 0140 UTC on Mar. 2 was that the propagation delay for the stations involved with AO-10 near apogee having sub-satellite point of 23N, 267W was just right for AMTOR because the 'handshake' control signals were slewed "neatly one time frame later." The total roundtrip propagation delay of about 500 milliseconds compares favorably with three-character block time of 450 milliseconds, says 9M2CR.

However, when errors cause retransmission, the delays involved cause a double retransmission.

Colin is quite pleased with the results of his early tests. Tests with YB0AQT have shown most errors are caused by local 2 metre QRM.

AMTOR is a digital communication mode between RTTY and packet in complexity and efficacy. Like packet, it provides virtually error-free copy because of the ACK/NAK (acknowledge-/not acknowledge) feature which prompts immediate retransmission of the lost characters. Like RTTY, AMTOR is a slow mode designed to be used over HF channels where vagaries of propagation fading (primarily due to multi-path effects) are significant.

With the introduction of AMTOR to the AO-10 venue, it joins other modes such as SSTV, RTTY, packet as well as SSB and CW on the bird.

Tapes Available

This tape information also courtesy of *ASR* should be of interest.

Roger Johnson WB0GAI tells that numerous tapes are available through the AMSAT Video Tape Library which he administers for AMSAT. The available tapes are as follows:

#1— OSCAR, the Satellite You Can Use: a narrated slide program outlining the history of Amateur satellites. Also includes a silent film of the attempt to launch Phase III-A. Available in VHS and BETA II.

#2— KA9Q Orbital Simulation Tape: A computer simulation of the earth as it would appear from OSCAR 10. Simulation runs 60 seconds only. VHS only.

#3— Amateur Radio's Newest Frontier: the original ARRL tape of the W5LFL STS-9 flight in December 1983. VHS only. (Fol-

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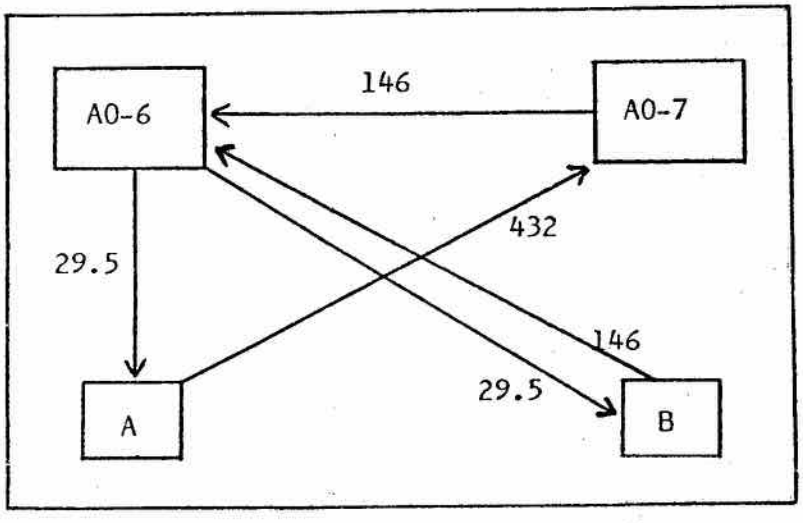

lowing tapes were originated at the 1983 AMSAT Annual Meeting/Space Symposium).

#4— OSCAR 10, its design technology and construction, W3GEY and the Mode L transponder, W3GEY. Runs 1:49, VHS only.

#5— OSCAR 10 operations and ground tracking requirements by K05I. Map-based tracking by K2UBC. Personal computer-based orbital predictions and tracking programs by N5AHD. Runs 1:42, VHS only.

#6— Independent Space Project Committee by Ron Molz. Solar Sail Project by K8OCL. Amateur Space Telescope by Jesse Eichenlaub. Amateur satellite programs worldwide by W3IWI. Runs 2:03, VHS only.

#7— Packet Communications: PACSAT, UoSAT B. Circularly polarized antennas by K2UBC. Runs 1:49, VHS only.

#8— Analysis of engineering problems facing AO-10 by KA9Q. Space-craft technology status; panel discussion by W3GEY, W4PUJ and KA9Q. Runs 2:00, VHS only.

All tapes are available for a non-refundable fee of $6. Please also send a SEPARATE cheque for $25 per tape in U.S. funds. The second cheque will be returned when the tape borrowed is received at the library. Tapes may be retained by the borrower for up to three weeks from the time of receipt. Correspondence may be addressed to: AMSAT Video Tape Library, 1627 36th Avenue Court, Greeley, Colo. 80634.

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B.C. Frequency Coordination Report

By Robert Smits VE7EMD
202-13640 67 Ave.
Surrey, B.C. V3W 6X5

At the December meeting of the British Columbia VHF coordinating group, the Pacific Region Amateur Radio Frequency Coordination Association (or PARFCA for short) dealt with four requests for new frequencies or extensions of coordinations and two requests for frequency changes. A new position, that of Northern B.C. Representative was also created to provide for more input from northern areas of the province.

The following requests for frequency coordination were dealt with:

1. A request from Ray Clark of the North Island Amateur Radio Society to move their Newcastle Ridge Repeater from 146.08/.68 to 146.02/.62 was not approved due to the fact that 146.02/.62 is still a Western Washington 'only' frequency. Further information was to be requested from Ray to see what other frequencies might by useable.

2. A request from the North Island Amateur Radio Society for a low level repeater on 145.49 MHz at Port McNeil was approved.

3. A request from Ernie Funk, acting for the Kamloops Amateur Radio Club, to recoordinate their existing 146.34/.94 machine to a new wide coverage site on 146.36/.96 was approved.

4. Fred Neveroski was granted a 90-day extension of his coordination for 147.38 at Shalath, and also coordinated 147.30 for another repeater at Bridge River.

5. Don Fraser VE7DTI was coordinated 146.16/.76 for a repeater in Prince George, B.C.

6. The BCFMCA was coordinated 1291.940 MHz (1271.94 input) for an FM repeater on Mt. Seymour.

Following reports that some northern interior repeater operators felt left out of the decision-making process due to the distance involved, Don Fraser VE7PGR of Prince George was appointed Northern B.C. Representative. Don will advise PARFCA on all Northern coordinations. It was also pointed out that meetings had been alternated between the Lower Mainland and Vancouver Island to enable more hams to attend.

Elections of Officers were held for 1985, with the following results:

Chairman: Al Muir VE7BEU
Vice-Chairman: Bob Smits VE7EMD
Treasurer: John Nightingale VE7AOV
Secretary: Robert Skegg VE7AII

The following appointments were confirmed for 1985:

1.2 GHz Coordinator Robert Skegg VE7AII
900 MHz Coordinator Daniel Collier VE7DES
440 MHz Coordinator Murray Gjernes VE7MBG
220 MHz Coordinator Robert Kuse VE7BKU
Northern B.C. Representative, Don Fraser VE7DTI

In other business, PARFCA adopted the report in principle of the Long Range Planning committee that recommended methods of 'vertically stacking' repeaters when the two metre band became saturated. George Merchant VE7CHU will head up the committee, which will now examine ways to implement the report.

In what was potentially the most controversial item on the agenda, PARFCA unilaterally declared that all frequencies previously denoted as B.C. only by agreement with hams in Washington and Oregon were now to be 'shared' status, and could be utilized by coordination councils in those states subject only to non-interference since the main reason for having them (to get a reasonable share of repeater channels) had been fulfilled.

A 90-day extension for the coordination of VE7TOK (primarily because of illness of the chief operator) was granted.

A discussion regarding the 147.04 and 146.00 repeater systems was held. it was decided that, pending technical verification and approval by WWARA, that the Surrey group would utilize 147.34, VE7EX would move to 147.04, and the frequency of 146.00 would not be reused (due to interference with RS satellite users). It was carried with the proviso that VE7EX would bear the costs for the frequency change of the Surrey repeater to 147.34.

The next meeting will be held on Mar. 2, 1985 at 1 p.m. at the TRIUMF building in Vancouver. Talk-in on 146.94 or 146.52 simplex.

The mailing address for PARFCA is Pacific Region Amateur Radio Frequency Coordination Association, 804-2233 Allison Road, Vancouver, B.C. V6T 1T7.

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TECHNICAL SECTION

Section Editor
Frank Hughes VE3DQB

A possible explanation for our poor band conditions

Diurnal Phase Shift

By Ralph D. Cameron VE3BBM

In 1867, Sir Isaac Newton published his famous gravitational theories in *Principia,* a highly regarded periodical of the time. Newton proved that for every reaction there was an equal and opposite reaction. We have since learned that many phenomena have negative counterparts. Consider the counter EMF generated by a collapsing magnetic field. Accounting for losses, the two fields are equal and opposite in effect.

Antenna RF currents can be shown to exhibit similar characteristics. The transformation is done through density displacement. VE3BHW and myself have proved this several times and on several bands, 80M through 10M and even 2M over a ten year period.

Jack VE3BHW and myself have held many schedules with antennas run at various elevations and the conclusion was reached that almost complete signal cancellation (ground wave) occurs by means of diurnal phase shift. (Pronounced dye-urnal)

Ephemeris data for the last ten years (or the last sunspot maximum) shows almost perfect tracking with today's predicted minima. In fact, a simple computer program for the VIC-20 will display this phase shift for any selected or projected period.

Jack and I first noticed considerable signal phase shift at two specific locations— both being close to our homes. When one end of an 80M dipole was lowered at my QTH the received signal four miles away became both distorted and finally dropped into the noise.

It was as if some ether absorbing feature prevailed. We did this experiment countless times. Jack uses an inverted Vee with axis almost in line with my QTH.

We found that steadily lowering the inverted Vee by as little as five feet was enough to restore signals to their 9+ level. On humid summer evenings the opposite was true. The worst signals occurred during those evenings when a 'paper mill' smell was in the air. Coincidence? We doubt it. (There are several mills on the Ottawa River.)

20, 40 and 15M showed varying degrees of phase shift but all occurred on paths tangent to a double bell shaped parabola, i.e. one being the mirror image of the other. This can be well understood from the conclusions reached by Sir Newton. You've got to hand it to Newton, he knew a force when he felt one.

Fig. 1 shows the reciprocity existing for summer and winter conditions.

The interesting thing to observe is that the plane actually changes from two dimensions to three dimensions during periods of high sunspot activity. Remember what was said about density transport?

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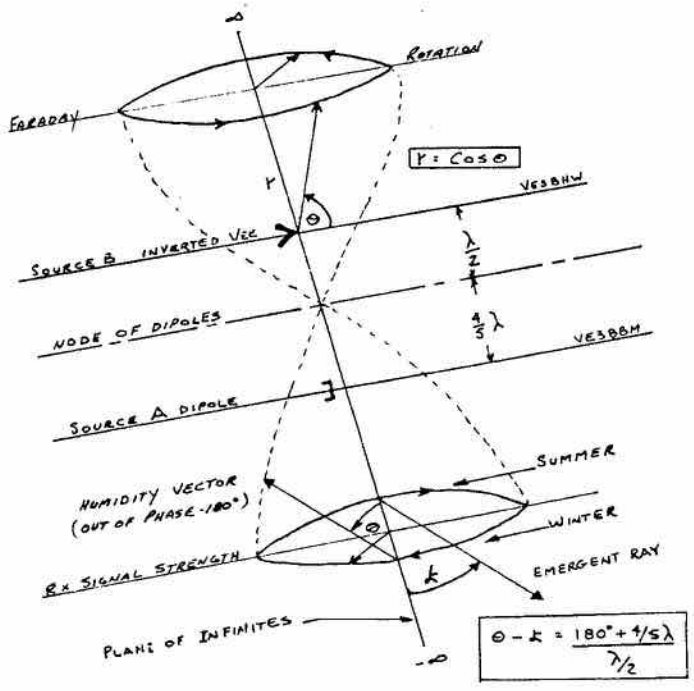


Fig. 1 Diurnal phase shift relations for two obtuse sources.

There have been many transient results occur during our tests so that a much more prolonged period of observation is planned. We believe the random drop out during satellite tracking is caused by the counter electromagnetic wave component (CEMF) phased diurnally from the source. This shouldn't be difficult to prove if necessary. There are all sorts of satellites to monitor. Indeed, all exhibit dropouts for random periods. (Ask the man who owns one.)

Other examples of diurnal phase shift occur between two mobiles when $\theta - \lambda$ is not a whole number. It took considerable effort with floating point math to prove this because round off errors often exceeded the phase shift. Fortunately, a VE1 confirmed the double shift on a double hop 2M transmission. It otherwise may have gone unnoticed. Because severe distortion and attenuation occur (usually simultaneously) when diurnal phase shift is acting we were really astonished to receive 14 SWL reports from Bermuda when one test antenna was used which countered the CEMF. While this all happened on 2M, there should be no reason to not expect it on lower frequencies. Remember to take diurnal phase shift into account. More tests are planned for periods when Uranus is aligned with Pluto in order to randomize and minimize the effects of echoes.

It is with some satisfaction that we state diurnal phase shift is random but predictable, and now the mechanism is more easily understood it will provoke others to expand our knowledge. It is hoped that provocative (counter) revolutionary antennas may some day eliminate this propagating null or CEM Nihilism.

We believe a rare treatise entitled, *Grampian Waves Undulata* co-authored by the DX forecasters of the early 1800's exists in the main DOC library. Should anyone possess a copy of this early work, please contact the author. It is believed the ultimate key to this phenomenon is contained within the pages of this gem.

At the risk of creating a mountain out of a molehill, we also believe that digital transmission will overcome what is essentially due to analog features.

Who knows, your last lost QSO may have been due to diurnal phase shift. Many more observations are needed to fill the gap in our knowledge.

Authors note: A symbol appearing on Fig. 1 is not of Greek origin as it represents a dimensionless quantity. It is known in the Hiragana character set as 'ho'. Δ

Part 4

Amateur Design of Printed Circuit Boards

By John Iliffe VE3CES

You don't have to make very many or very complicated circuit boards before you realize that the actual transfer of the circuit pattern to the copper is the most time-consuming and error-prone part of the whole process.

In addition, slight traces of grease or oil on your skin or other contaminants may leave unetched spaces on the copper of the finished board. If the resist fails to adhere properly to the copper or if the board is left to etch for an excessive length of time, it will be ruined. The traces may be undercut and fracture, a problem that can be repaired but makes a less than professional looking job.

A better method of construction is to prepare the pattern independently of the copper board and to transfer it photographically. This has the advantage that many copies of a successful design can be made easily.

Photoresist is available from several manufacturers, in two types, positive and negative. Positive resist needs the traces to be opaque and the areas where copper is to be removed to be transparent on the master. Negative resist works the other way, somewhat like the negative for a photograph.

In terms of cost there is not a great deal of difference, except in the additional step of making a negative for negative type resist. This installment will describe negative type processing, which the author always uses, and if you wish to go the positive route just leave out the irrelevant steps.

Before making a decision, consider whether you many want to make many copies of your board. If the original pattern is used to make the board, as in the case of positive processing, then it may be damaged or destroyed and you will have to go back and lay out a new pattern.

If negatives are in use, it is quite easy to make a new one. In fact, if many boards may be produced, it would be wise to make a second negative when you make the first one.

An original pattern has to be made first, on a transparent material, the exact size of the final board. The easiest way to do this is to take the layout that you made last month on squared paper and tape it down to a good hard surface, say the top of a desk.

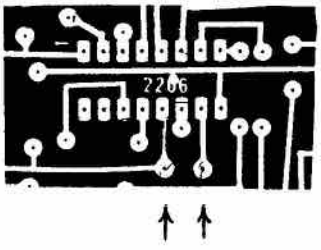
Take a piece of acetate or mylar and tape it down over top of the diagram. The acetate will be your positive. Art stores are good sources of both acetate and mylar, but be sure it is not kinked or you will not be able to maintain your dimensions on the finished work. If you have trouble finding this material, the five and dime will have protective covers for binder pages which will serve as well.

Be sure the acetate is well fas-

tened down with no bubbles and cannot slide on the pattern.

Now, using your transfers, place the pad locations and transistor or IC outlines exactly over where they show on the pattern. Burnish them down well with either the paper that comes with them or a piece of vellum finish writing paper.

Make a note of any places where the transfer may have covered a trace or pad on the pattern as, unlike last month, you will not be able to see the original pattern again until it is too late to fix any errors.



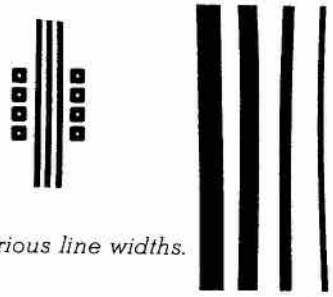
Illustrating hairline cracks.

Be sure that the dry transfers actually go completely and do not show hairline cracks. If any fail to stick, do not attempt to remove them, but transfer another similar one over top of the first. The common etch-proof dry transfers are not the best for this but they are considerably cheaper than the ones made for drafting.

The best transfers are ones made by GC Chemicals or Bishop Graphics (be sure you get 1:1 and not 2:1 when you buy them) which are specially made for photographic work. These latter kind have each pattern type as a unit and you lift them off the backing with a hobby knife ('X-Acto Knife') and stick them down where you want them to go.

The carrier is transparent and you can place other pads if necessary on top of the first ones. They have the advantages of accuracy, they don't lift off the acetate, and there are no hairline cracks. The tradeoff is that they are substantially more expensive.

When you pick it up off the desk, the acetate will certainly bend and this makes it impossible to use the various width lines included with packages of dry transfer patterns. Letraset makes lines which come on 200" rolls in



Various line widths.

widths from 1/64 to 1/4 inch. A selection of 1/32, 1/16, and either 1/8 or 3/32 will be all you will need. They are relatively inexpensive and will last for many projects. Use these to lay out all the traces on the pattern. Use the widest size that will fit as this means less etching so chances for fewer errors. Be sure you do not cover the holes in the various pads as you will need these to guide the drill later.

If several pads to be connected lie in the same line, cross the edge of all the pads with one run of line. The line material is too tough to cut on the edge of the container, you must use a sharp knife. Try to do as little damage as possible to the acetate since knife marks may transfer to the completed board.

The lines will not bend, you must cut and rejoin the material where you need a bend. If at all possible do not run one line up and over another since the upper one will not then be in contact with the acetate and the line will be reduced in width when the board is finally made.

You can run a line over a pad since the pads have effectively zero thickness, but if you used dry transfers be careful, the line will remove the transfer if it is disturbed in cutting. Where lines abut each other, place another layer over the joint to avoid having a microscopic gap.

When the transfers and lines are all on the acetate, check the work again and if satisfied, remove it from the desk and hold it up to the light. Find any cracks or unintentional overlaps and correct them. If you are using a positive process, this is your master, if you are using negatives, we now have to make one.

There are three widely known ways to get a negative. First, if you know someone who works in the electronic manufacturing business, have one made on the machines they use. This is not only easiest, it is best because the machines are very accurate and reliable. If not, and you live in a small town with a local newspaper, see if they will make a negative the same way they would to make a printing plate. Emphasize that the dimensions are critical.

The third and final technique is to make one yourself. Find a photography store that serves hobbyists and order the smallest box of 'Kodalith' or 'Ilfolith' film you can get. This is quite expensive material, and one box will be a lifetime supply, so see if they may know some Amateur photographers who may be willing to share. If you do buy the whole box, it should be kept in the deep freeze when not being used. It comes in many sizes, but for practical purposes 7" by 10" is the biggest you will ever use and it can be cut down for smaller sizes. This is a very slow film and can be handled in reasonable light, I place a flashlight under the table when I am handling it and have never had a problem. The safelight is red it you happen to have one around. Also, buy the proper developer and some fixer at the same time. The developer for both film types is the same, but it is not the same as used for snapshots.

What we are going to do is make a contact print of the master on the lith film. Warn the family not to turn on the shack lights and take out one sheet of film. If it is to be cut, do so now and put the

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remainder back in the box. Put the box out of harm's way. Place the cut film in an envelope so it will not be exposed, and turn on the lights. You should now have a good feel for how things are going to look in the dark.

Prepare a place to make the print by placing a piece of white paper on a flat surface and tape it down. Mix up the developer according to the directions. you will get two one quart bottles, label them 'A' and 'B' as marked on the packages. These two bottles will last a long time if not mixed together, about four hours after mixing. Also prepare a small tray of fixer according to the directions and a tray of water with about 10% vinegar in it. Mix enough of A and B to cover a sheet of film in a tray. The order the trays will be used in is:

Tray containing A and B, for a period of 2 1/2 minutes.

Tray containing water and vinegar for 15 seconds

Tray containing fixer for 2 minutes.

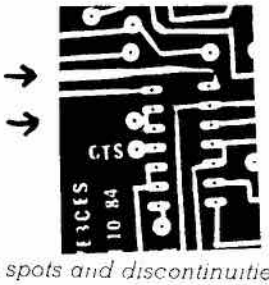
Memorize the sequence and times as you will not be able to read your notes in the dark. You may turn the lights on only after the film is in the fixer. The trays may be either plastic or glass, pie-plates make a good choice.

You will also have to rig a light, a 60 watt bulb, about four feet above where you are going to make the print with a separate switch and a piece of glass to hold the acetate tightly to the film.

Turn off the room lights and place the acetate pattern firmly in contact with the film, with the film down, on the white paper. The emulsion side of the film should be up (the dull side) but if you can't tell then use either side. Place the glass on top to hold everything together.

The exposure will be three seconds (I said it was slow film.) Turn on the light and count it out, the exact time is not that critical, but if the bulb distance or power changes, you are on your own. Now remove the film and place it in the A and B developer mix. It takes about 2 to 2½ minutes, depending on the exact exposure length. Again it is not critical. You will see the pattern on the film under the light of the safelight.

Remove the film from the developer and let it drain then place it in the vinegar for 15 seconds. Do not wipe the film as the emulsion is very soft. Now place it in the fixer. The function of fixer is to clear the transparent parts of the film (they are cloudy when developed) and harden the emulsion. Two minutes is usually enough, but as you can turn on the room lights after the film is in here, leave it long enough for the film to clear. When clear, wash the film in lukewarm water (gently) and hang it up to dry. The emulsion on lith film is not particularly hard and will scratch if it is not handled carefully.



Thin spots and discontinuities.

After the negative is dry, check it carefully for errors. If a trace is not tightly on the acetate you will find that the image is narrowed, and this may affect its usefulness. There may also be hairline cracks in the pad images if the dry transfers were flexed after transfer.

If any errors are found, carefully scrape the emulsion off the negative. This is easily done with an X-Acto Knife, or a sharp scriber. Try to do as little damage as possible to the film. There is no good way to cover unwanted clear spots.

The next step is to sensitize the circuit board. You can buy presensitized board of both persuasions, but the cost is quite high. Several companies also make a spray-on photoresist in quantities and types that are useful for Amateur experimenters. I have tried several types and have standardized on GC Electronics type 'B'. There are some types that have a dye in them that allows you to see the image after it is on the board (GC type 'A' for example) but this reduces the shelf life of the material considerably. The exact shelf life is indeterminate, but a letter from GC states that: "all photosensitive materials have years... the older type 22-231 was good for 2-3 years... we have discovered that adding dye shortens the shelf life... the new type B material should have a considerably longer life." The lack of dye does, however make it hard to see if your board is correctly exposed.

Whatever type of sensitizer you select, clean the copper carefully, using either a plastic scouring pad or a household scouring cleanser. Do not use the presoaped type of kitchen cleaning pad. Dry thoroughly. Now follow the directions on the can. If you are using the recommended GC material, set the board up against a wall and spray carefully from side to side, overlapping the ends so as not to get a buildup there. Pick up the board carefully by its edges and tip it horizontal. Place in a dust-free cupboard to dry overnight. If there is any sign of running or excessive material, clean it off and start again, the print won't work anyhow.

All photoresists are ultraviolet sensitive. I have tried many ways to expose the boards and the easiest and cheapest is this.

Use a number 2 photoflood bulb in a ceramic socket. This bulb is widely available at hobbyist photography stores for a few dollars. A commercial photographer may also be willing to sell you one. They last about eight hours. (There are alternatives, black light and the GE 'Purple-X' bulb used for causing rocks to fluoresce, but these are more expensive. I know of one manufacturer who puts the boards in the EPROM eraser too.)

Assuming the number 2 bulb and the GC material, set up the board on a flat surface. Place the negative on top of it and hold down with a piece of glass. (Thin glass, as glass absorbs ultraviolet.) Hang the bulb about eight inches above the glass. Be sure it is directly above. If you want to try sunlight, the exposure can vary from 10 to 20 minutes depending on how bright the day is. I don't really recommend it. You can handle the sensitized board under normal room light as there is no ultraviolet in it. Expose the board under the bulb for about 16 minutes. Be careful at this point, excess heat will cause the negative to ripple, destroying it and also the exposure. (For this same reason, I don't recommend that the reflector type bulbs such as type EBR be used, the reflector

tends to put too much heat on the negative.)

Now dunk the board in whatever type of developer is appropriate for the resist you used. All negative type materials use the same developer, a compound of xylene that smells horrible. Positive developers are different. For the GC material, the developing time is about a minute. Take the board out and after dripping off the excess developer, shake it dry. The pattern will be visible if you hold it the right way to the light. Find a pad with a hole in it at each of the edges of the board and in the centre. See that the hole is well formed. If not, but overall the pad looks OK, then put the board back in the developer for about 10 seconds. You can repeat this as required until the pads dissolve. The pattern on the copper is rather soft so be careful of it. There is no need to wash the board at this point.

After drying, the board is ready to etch as described last month. With a transparent resist you can verify it before the board becomes a loss, by etching for about a minute, then removing it and examining the tracks. The pink part is what will ultimately disappear and the shiny copper is what will be the tracks. At this point the contrast is good and you can see any errors. If a minor error shows up, wash the board carefully, and let it dry, then fix the problem with a resist pen or scriber as required.

One word of warning, xylene is nasty stuff, it cannot be used in a plastic tray, which will dissolve, and you should use it with adequate ventilation. It will also give you a rash if you have sensitive skin.

Next month in the wrap-up of this series I will give you a few helpful hints and suggest some equipment to make your task easier and the boards better.

Δ

Chapter 2: Action at a Distance

Antennas

By VE3DQB
Box 855
Hawkesbury K6A 3C9

An electron is a tiny body that pushes other electrons away from itself. When an electron moves, it affects a nearby magnet. These two facts are all that is needed to understand antenna theory.

Antennas take many forms— most of which will be discussed in the later chapters— but the commonest is probably a single wire, supported between insulators. It is just a larger version of the wire we put into a glass jar. The first antenna ever deliberately made was a kite string sent up by Benjamin Franklin nearly 250 years ago, during a thunderstorm. The tremendous flow of electrons during the thunderstorm affected his kite string, and he was able to draw inch-long sparks from it. By the good fortune that attends genius, he survived.

A simple antenna can be a wire 10 metres (about 30 feet) long, supported away from other objects by two insulators. Any insulator will do— the commercial porcelain ones, a piece of plastic with two holes in it, a length of rubber tied to the wire and to the cord— or the wire can be made of tubing stiff enough to support itself. (Figure 4).

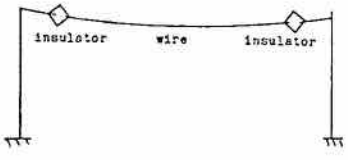


Figure 4: A simple antenna. A 10 metre (30 foot) wire is suspended away from the ground and insulated from it.

If a negatively charged body is brought close to one end of the wire, the electrons in the wire are repelled, distributing themselves as shown in Figure 5. There are few electrons near the negatively charged body: they have pushed down the wire, like passengers on a bus, and have crowded into the farther end.

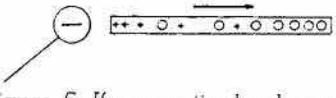


Figure 5: If a negatively charged body (a ball on a handle in the figure) is brought close to the wire, the electrons in the wire crowd towards the far end.

Quickly remove the negatively charged body. There is now no charge to repel electrons from the end of the wire, so they rush back to their neutral position. They possess electrical momentum: as the electrons rush from one end towards the other, they overshoot and the end that was positively charged becomes negatively charged. The opposite end, formerly negative, becomes positively charged. (Figure 6.) Having passed their position of equilibrium, the electrons now start to swing in the opposite direction. If we were able to watch one electron, we would see it swing backwards and forwards like a pendulum along the wire.

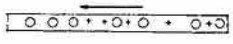


Figure 6: If the charge is then taken away, the electrons in the wire return to their even distribution.

This does not go on for long. Each time the electrons rush from one end of the wire to the other, they lose some energy, and the swings back and forth become shorter and shorter. Eventually the electrons stop. (Figure 7.)

A sufficiently fast-moving electroscope near one end of the wire would show these changes in electron distribution, as would a sufficiently sensitive compass needle.

Put another wire, ten metres long, close to the first one. What

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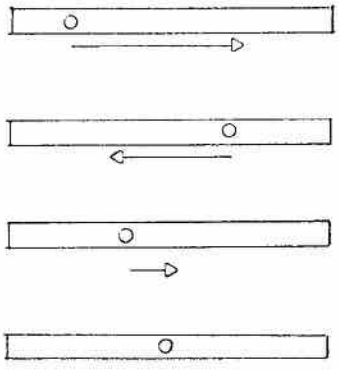

Figure 7: When the charge is removed in an instant, the electrons in the wire swing back and forth, in smaller and smaller paths, till they finally stop.

happens to the electrons in this wire as the electrons travel back and forth in the first one?

When the electrons are crowded at one end of the first wire, they repel the electrons in the nearest end of the second wire. As the electrons in the first wire move towards the positive end, the electrons in the second wire respond by rushing in the opposite direction. (Figure 8.)

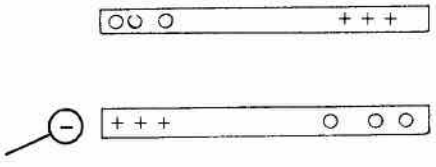

Figure 8: If a second antenna is put up near the first, when the electrons in one are pushed to one end (as by a charged body) the electrons in the other wire respond by crowding to the opposite end.

When the electrons are moving from one end of the wire to the other, they cause a magnetic field to build up about the wire. As this magnetic field touches the second wire, it drives the electrons along it, just as the electrostatic field did. A sufficiently sensitive compass would show the changes in the magnetic field.

If the second wire is moved away from the first one, the movement of the electrons in it naturally becomes more feeble as the distance increases. It is an astonishing fact that the electron swing is detectable with suitable instruments if the antennas are separated by great distances. This "action at a distance" is one of the mystifying things in all our experience. We *hear* distant *sounds*, but there is a material thing— air— which mechanically transmits the energy from the source of the sound to our ears.

But there seems to be nothing which carries light and radio signals over immense distances— distances far beyond our understanding. We detect the most distant objects in the universe simply because their electrons are in motion, and the resulting changes in the electromagnetic properties of antennas— or photographic plates— are sufficient to detect them on earth. We know of nothing in space that could convey such an effect.

Sufficiently fast-acting electroscopes and magnets do not exist to detect the current changes. However, a simple diode in the second wire will reroute the electrons travelling in it so that they go only in one direction. Then the current in the antenna can be measured with a sensitive meter— an ordinary multimeter— if the transmitter is close. (Figure 9).

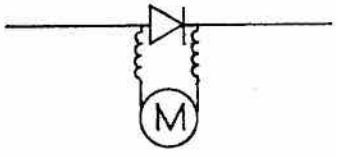

Figure 9: Electron movement in a wire can be detected by placing a diode in the wire. This allows the electrons to pass in one direction. To go back, they have to go through the meter, making it deflect.

Nor is it practical to take the charged body away from the antenna suddenly. In radio's early years, the charge was applied to and removed from the antenna by a fast-acting switch, the sparking at its contacts being enough to excite the antenna to give 'damped trains' of oscillation. (Figure 7 above). This procedure was called spark transmission, and is never used now (it is illegal). There are far better ways of setting the electrons in the antenna in motion. We sometimes hear sparks on a radio even today, from unshielded spark plugs or electric motors.

A simple oscillator, using a transistor, can swing the electrons back and forth continuously, not in the 'damped trains' of a spark transmitter. (Figure 10.) This steady, consistent alternating current uses a minimum of spectrum space, and makes reception possible at great distances.

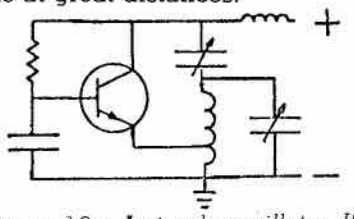

Figure 10a: A simple oscillator. If the coil-capacitor combination is tuned to 14 MHz, and the coil is coupled to the 10-metre-long wire, the electrons in the wire...

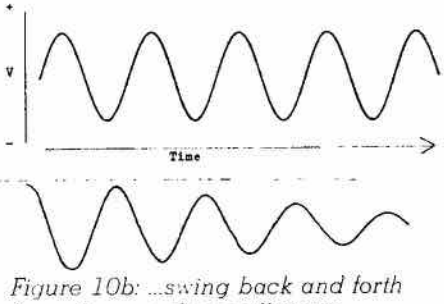

Figure 10b: ...swing back and forth for as long as the oscillator is switched on, not, as with the shock-excited antenna, dying away.

How fast do radio waves travel?

An Amateur listening to his own signal on the 20 metre band (using a transmit-receive switch operated by the telegraph key), can sometimes hear his own signal after the switch has been thrown from transmit to receive. The signal is delayed by about one-seventh of a second.

How can the Amateur hear his own signal after the transmitter is no longer sending out a signal? The answer is that the signal heard has travelled all the way around the earth: a distance of 40,000,000 metres, by the original definition of the metre. (Figure 11.) The signal has travelled this distance in one-seventh of a second, or 280,000,000 metres in one second. Accurate measurements show the speed is close to 300,000,000 metres per second. This speed is constant for all radio and light moving through empty space, and is commonly referred to as the speed of light.

Taking the signal sent out by the 10 metre wire, we now know its speed. How many times do the electrons in the wire change direction?

Figure 11: A radio signal completes a circuit round the earth (24,000 miles) in about one-seventh of a second.

We can find this out by counting these changes. Governments help by putting on the air transmitters whose count is accurately known, and accurately controlled. WWV continuously sends a signal out at 5,000,000 Hz, abbreviated to 5 MHz, the 'M' standing for mega, meaning one million. Other WWV frequencies are 2.5, 10, and 15 MHz.

Any frequency can be compared to the standard with some simple equipment. A secondary standard is needed, usually a 0.1 or 1.0 MHz crystal in an oscillator circuit, putting out the crystal harmonics. Such an oscillator can be heard on a receiver at every multiple of 0.1 MHz or 1.0 MHz. Tuning to 5 MHz, both WWV and the oscillator can be heard. The crystal circuit can be adjusted to exact coincidence with WWV. This allows the receiver dial to be most accurately calibrated.

Standard crystals are obtainable with counting units included. These have readouts which display the frequency of any signal applied to them. The standard crystal is adjusted to WWV, or other standard frequency station.

Comparing the signal from WWV with that from a 10 metre-long wire shows that the frequency associated with this length of wire is near 14 MHz. Dividing this freqency into the distance the vibrations traverse in one second gives the length of one vibration in space:

$$\frac{300{,}000{,}000 \text{ metres}}{14{,}000{,}000 \text{ vibrations}} = 21.4 \text{ metres per vibration.}$$

This length (21.4 meters) is called the **wavelength** of the vibration.

Careful measurement shows that the length of a thin wire antenna when vibrating at its natural frequency is about 95% of half the wavelength of the signal sent out.

Summary:

If the electrons in a wire are made to vibrate back and forth along it at their natural frequency (determined by the length of the wire) the electrons in another wire, at any distance from it, will also vibrate.

If a complete vibration takes 1 second, the **frequency** of the vibration is called 1 **Hertz.** One million vibrations per second, one million Hertz, is abbreviated as 1 MHz.

It takes time for the movement of electrons in one wire to affect the electrons in another. The delay is related to the distance between the two wires. This time-distance ratio is a speed: 300,000,000 metres (186,000 miles) a second.

The distance between two consecutive waves in space is called the **wavelength**, found (in metres) by dividing 300,000,000 by the frequency.

To be continued △

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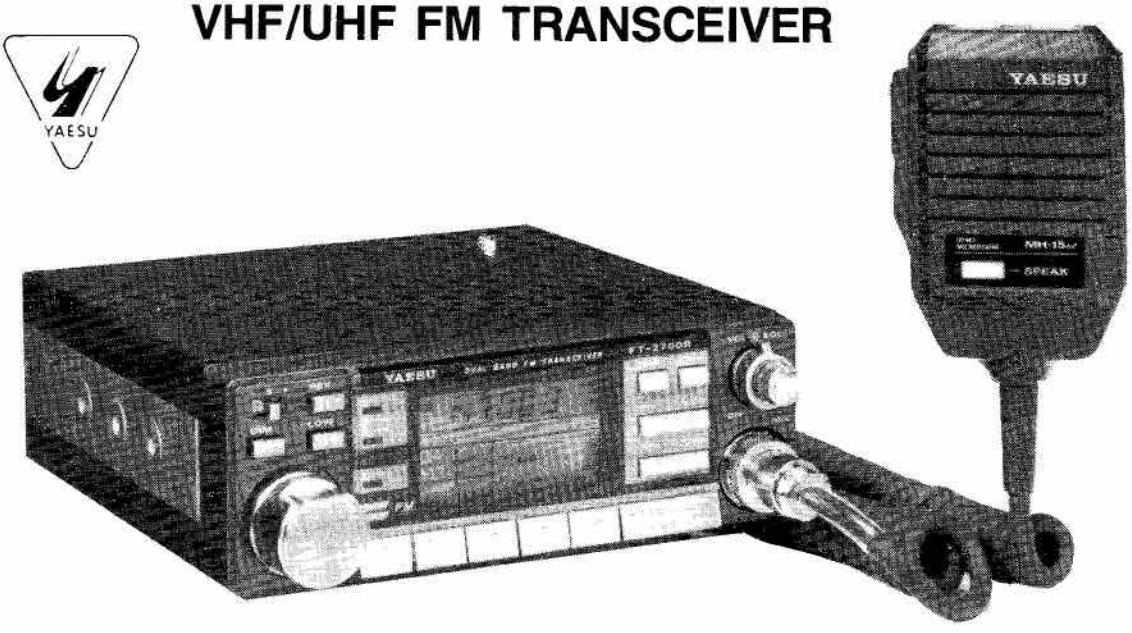

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