

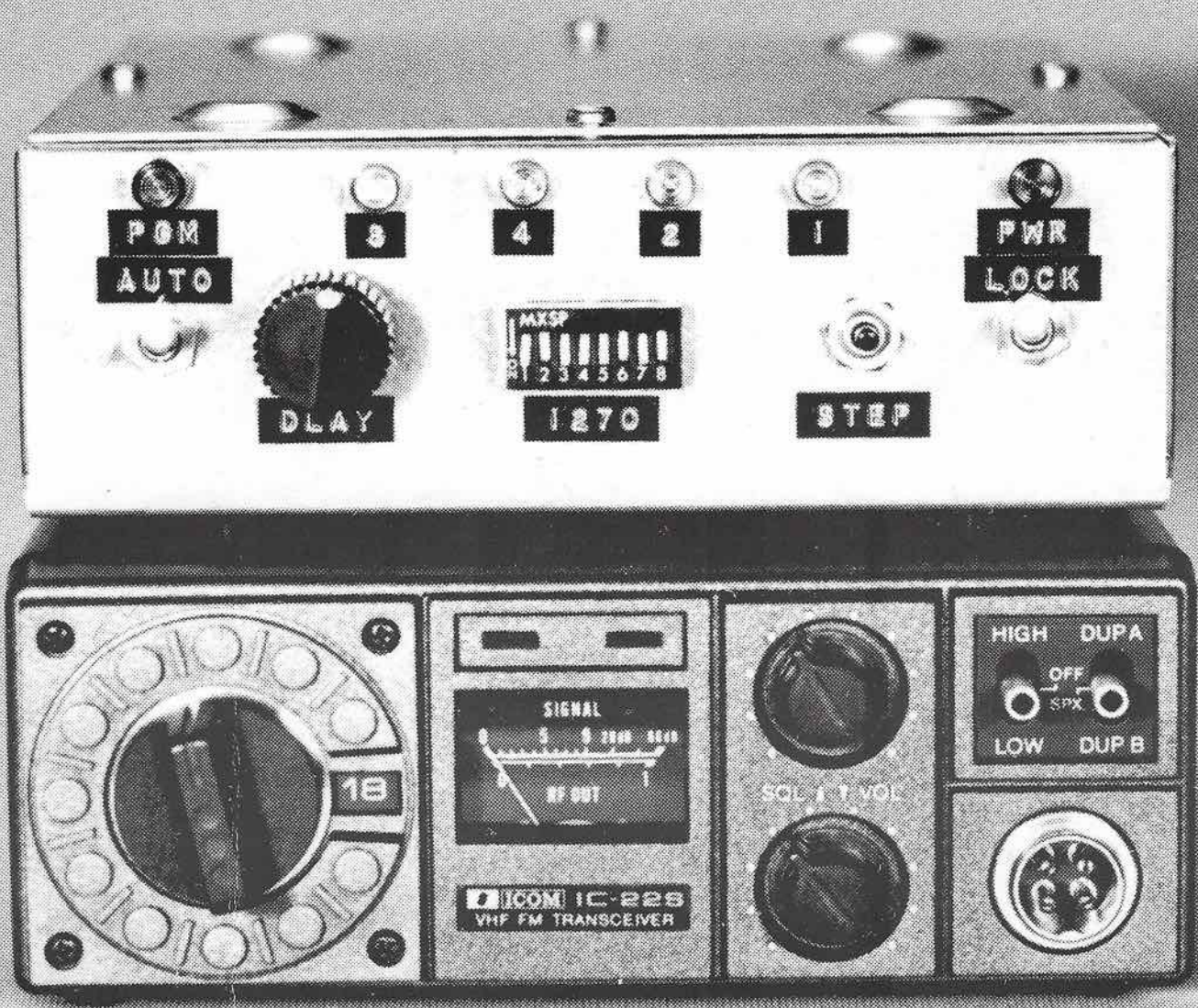
TCA



\$1⁰⁰

APRIL 1981

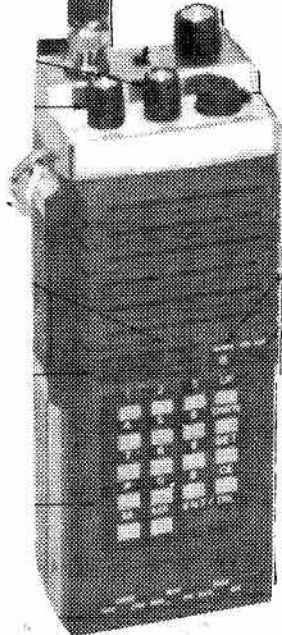
The Canadian Amateur Radio Magazine



The Auto Step Scanner



Yaesu

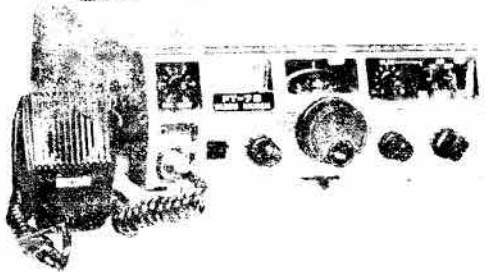


FT207R

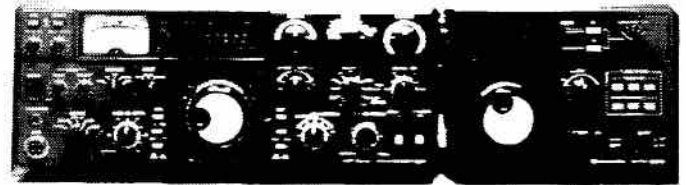


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Kenwood



FT-7B



TS-835S

FC-230

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TCA

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April 1981

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

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

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THE NEW OMNI-SERIES C

The best of TEN-TEC. OMNI-C—with all 9 hf bands, new 3-mode offset tuning, new optimized bandwidth with 7 response curves, new built-in noise blanker, new "hang" AGC and all the features that have made this impressive series famous throughout the amateur world. And with all 9 hf bands, OMNI-C is ready to roam the entire amateur hf world from 160 through 10 meters including the three new bands, 10, 18, and 24.5 MHz (all crystals included excepting 18 and 24.5 MHz).

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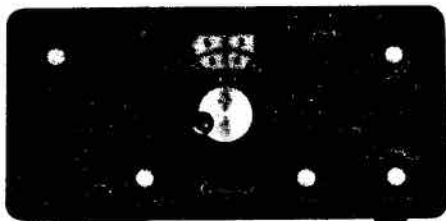
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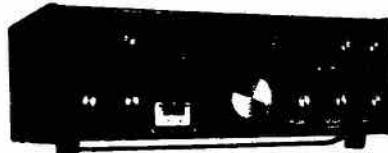
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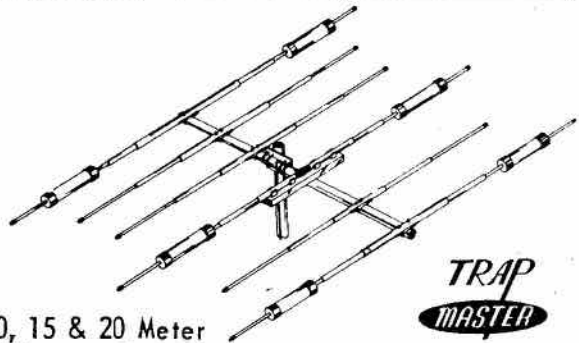


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20 db. Front-to-back Ratio

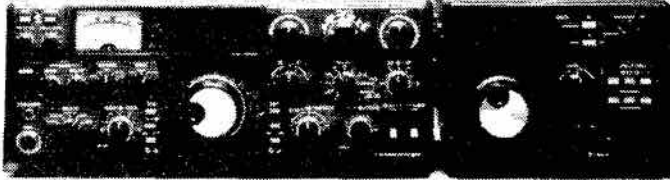
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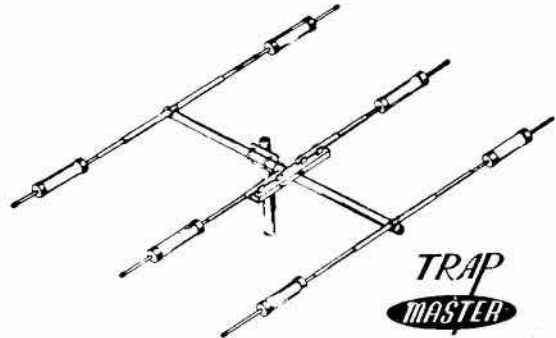
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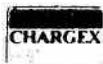
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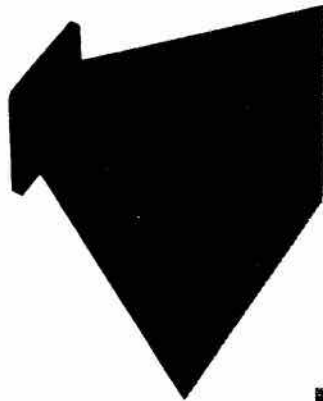
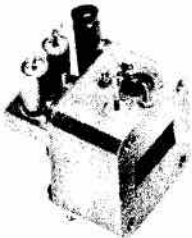
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for Amateur Applications



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- LOW OPERATING
VOLTAGE

Description

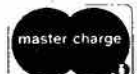
The MA-87127 series of frequency modulated transceiver "front ends" using GUNN oscillators and Schottky mixer diodes has been specially designed to operate in the amateur 10.0 to 10.5 GHz band.

The rear portion of the unit consists of a GUNN oscillator which directly converts dc to RF energy. The oscillator, unless otherwise specified, is delivered preset at 10.250 GHz (oscillators preset to other frequencies are available on request). When supplied in pairs, one unit is preset at 10.250 GHz and the other unit is preset at 10.280 GHz. Mechanical tuning is available to shift the center frequency ± 100 MHz. A tuning varactor is mounted close to the GUNN diode which will deviate the fundamental frequency typically 60 MHz when the proper tuning voltage is applied. FM, including both audio and video, can be applied to the tuning varactor input. In the front of the transceiver, a Schottky diode mixer is provided. The GUNN diode acts simultaneously as a transmitter and local oscillator with a portion of its energy (approximately 0.5 mW) being coupled to the mixer diode. The receiver noise figure is approximately 12 dB depending on auxiliary equipment used. A ferrite circulator has been integrated into the waveguide mount to isolate the transmitter and receiver functions.

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 Option: FR6707 Relay Box



FT-1012D High Performance Digital Readout HF Transceiver
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FT-480R 2 Meter Computerized All-Mode Transceiver
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The Scanning Memorizers
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902 SERIES



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 Modes: AM (M, W), USB, LSB, CW, AM, FM
 Power requirements: AC 100/110/117/200/220/234 V, 50/60 Hz DC 13.5 V
Features:
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 * CPU Digital Clock & Timer
 * Twelve Memory Channels (Optional)
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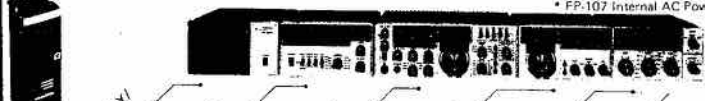
FT-202R 2 Meter Hand-held FM Transceiver
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 * S-meter and battery condition indicator
 * Flexible built-in whip antenna



FT-107M Solid State HF Transceiver
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 All solid state construction makes instant band changes possible, in addition to providing high reliability.



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FT-720RV
 Power output: 10 watts (RV model)
 25 watts (RVH model)
 Frequency coverage: 144.00 - 147.99 MHz

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- (3) S-72 SWITCHING BOX
- (4) Remote cables E-72S (2m), E-72L (4m)

FT-720RU
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 Frequency coverage: 430 - 439.975 MHz
 440 - 449.975 MHz
 (per local regulations)



FT-207R Microprocessor Controlled PLL Synthesized 2 Meter Handie
 Power output: 2.5 watts/400 mW FM
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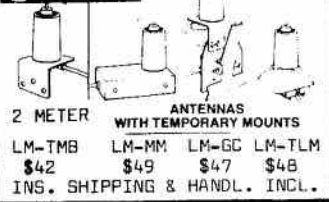
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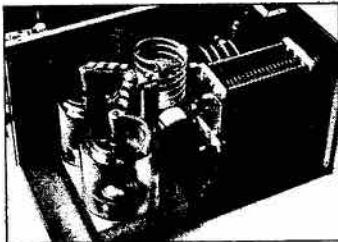
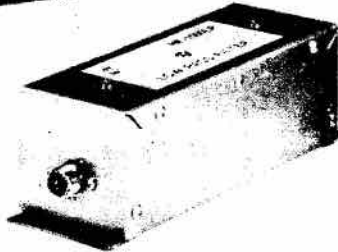
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HL-2000A LINEAR AMPLIFIER

Hammond POWER BAR

HF-1000LP LOW PASS FILTER



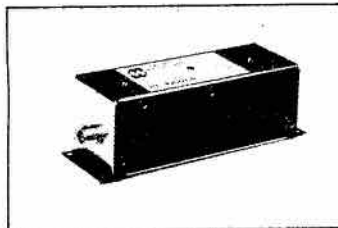
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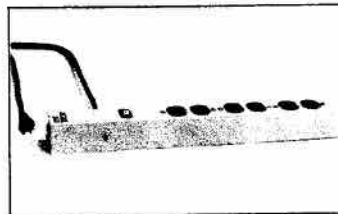


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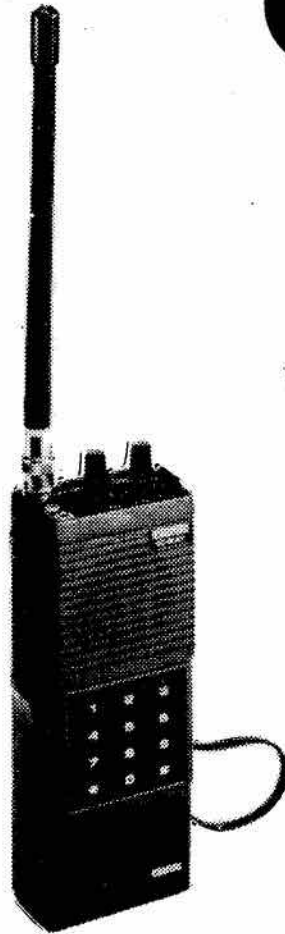
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2A Fever- Catch it!



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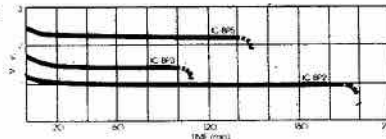
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You can vary your power output or longevity by snapping on various Nicad Bottom Packs. You can take it anywhere since the IC-2A is at home in a shirt pocket or unobtrusively on a belt, and its clean handsome styling always makes it the centre of attention.

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IC-BP2	39mm	BC-25 or BC-30	N-250 AA (x7)	8.4	15	No	Standard Power/Standard Range (15W)
IC-BP3	49mm	"	UM-3 (x6)	9.0	15	Yes	Standard Power/Standard Range/Standard Charge (15W)
IC-BP4	49mm	BC-30	N-425 AA (x6)	7.2	10	Yes	Low Power/Long Life/Standard Charge (15W)
IC-BP5	60mm	BC-30	N-425 AR (x6)	10.8	23	No	High Power/Long Life/Standard Charge (15W) Non-Range (10W)



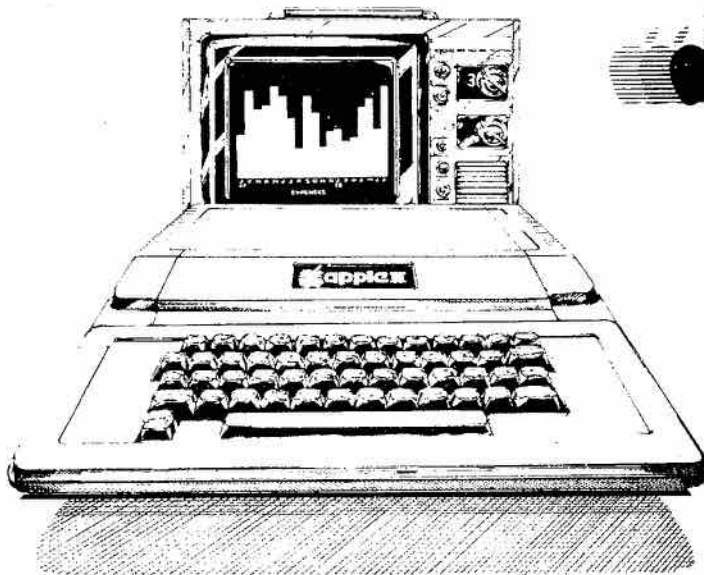
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To display frequency (both receive and transmit) and memory channel.

Selectable power output

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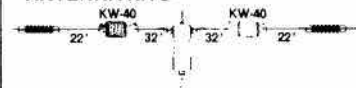
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|-----------------------------------|-------------------------|--------------------------------|-----------------------------------|
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| <input type="checkbox"/> YM-24 | speaker microphone | <input type="checkbox"/> NC-3 | 4-hr. quick charger |
| <input type="checkbox"/> LCC-7 | leather case | <input type="checkbox"/> NC-9B | wall charger |
| <input type="checkbox"/> FSP-1 | external speaker | <input type="checkbox"/> PA-2 | mobile battery eliminator/charger |
| <input type="checkbox"/> MMB-10 | mobile mounting bracket | <input type="checkbox"/> FBA-1 | battery sleeve |
| <input type="checkbox"/> FTS-32E | CTCSS/burst encoder | <input type="checkbox"/> NBP-9 | battery pack |
| <input type="checkbox"/> FTS-32ED | CTCSS encoder/decoder | <input type="checkbox"/> FEP-1 | earphone |



From Art VE3ZS in Ottawa comes word that VE3ROB in the Hull/Ottawa area (147.780 3.540) has terminated operation, and that call has been re-assigned. Also in Hull/Ottawa, the autopatch on VE3OEA (146.070 146.670) is no longer operational.

John VE3EZU in Toronto sent along a nice letter with some good information and ideas. First, VE3TTY (146.100 146.700) in Toronto is *not* an RTTY machine, but does have a very reliable autopatch, so change the 'R' in your listings to an 'A'. The patch is normally available to members only, but most of the time visitors can be accommodated.

John also advises that in recent trips to the East coast, the following repeaters appeared to be inoperative: VE1BGK (146.220 146.820) and VE1KMT (146.460 147.060) both in Perth, N.B. and VE1ASQ (146.190 146.790) in Bear Harbour, N.S. Any information on these three machines would be appreciated.

John also mentions that it would be nice if it were possible to come up with a concise method of describing the areas of repeater coverage for travellers. One possible way would be to give the repeater location as the nearest city or town that is on a map, rather than the actual location, and include in the listings a figure giving an approximate radius of coverage, i.e. VE3RPT Toronto (80).

Any ideas or suggestions are welcome, and I will try to implement some method with the summer listing publication. In the meantime, please look at the machines in your areas on the listing, and if the published location is not one that would readily be found on a map, i.e. Crabbe Mtn., please let me know the nearest city or town and a radius

of operation so that I can change the listing.

Remember, in order to make the July/August issue, I must have the information to me no later than May 5. Also, if there are any special turn-on requirements (i.e. audio is required before it will come on), please include them.

Paul VE3DDW called from Toronto with the following information. Add these repeaters to your Ontario listing: VE3ZAP, Shelburne 146.220 146.820 and VE3WHO, Toronto 144.750 145.350. Change the listing for Whitney to read Whitney Park VE3WPR. Unfortunately, the frequencies of VE3WPR are still unknown. Also Paul advises that the following repeaters are all linked together via UHF, so please add the note 'L' after each one:

Hamilton	VE3DRW
Hamilton	VE3TVI
Collingwood	VE3MTR
Shelburne	VE3ZAP
Bancroft	VE3TBF
Whitney Park	VE3WPR
Toronto	VE3RPT.

ADDITIONAL REPEATER ON THE LINK

The Whitney park Repeater, VE3WPR, located at the east gate of Algonquin Park is now accessible via the link. You may be interested to know that, in fact, VE3WPR is linked via VHF to Bancroft from where it is fed into the UHF linking network. The access codes are:

ON	251
OFF	250

While the Bancroft (VE3TBF) site is used to downlink from UHF to VHF, one can link with either of the two VHF repeaters (VE3TBF or VE3WPR) without activating the other.

Michael, VE3LWS

From North Bay, Joe VE3VQ writes about a new machine in that area. VE3NBR is owned and operated by the North Bay ARC. It operates on 147.750 147.150 with 25 watts of power and an autopatch, and went on the air in November 1980.

Any ideas or suggestions that would enable the listing to be of more use to you would be most welcome, and please keep the up-to-date information coming.

LEGAL NEWS

In January of this year a Toronto area Justice of the Peace ruled against an Amateur operator, contending that he had offended against a town anti-noise by-law by causing hi-fi interference to a neighbour. It is hoped that this decision, reached in spite of a clean bill of health from DOC, will be appealed successfully to a higher court.

On the other hand, a recent Toronto Globe and Mail article reported that, after a two year battle up to the Supreme Court of Ontario, it was ruled that a by-law of the town of Grimsby could not stop Mississauga broadcast station CFTR from erecting eight 400-foot towers at a new location in Grimsby.

The court stated that the zoning by-law could not prevent the station from putting up its towers in accordance with its federal licence. As it was reported that the town would not be appealing this decision, it might therefore become a useful precedent for Amateurs in their own hassles over towers and the like.

NEW SIX-METRE BEACON

Where: Whitehorse, Yukon Territory; Call: VY1AU; Frequency: 50.85 MHz.

Letters:

WORKING OSCAR

I read with interest the article on the CANADAWARD and as I work Oscar, I am most interested in trying to complete it on that mode. The only problem is that I haven't yet heard any VE1's, VE8's or VY1's on Oscar. All the other provinces are quite active.

I would appreciate very much if I could hear from anyone in VE1, VE8 or VY1 with whom I could arrange skeds on Oscar. At present I work both modes A and B. I hope to get on mode J once I get a desensitization problem solved.

Also if anyone needs a VE4 on Oscar I'd be happy to arrange a sked to accommodate them.

James N. Roik VE4UX
11 Pembroke Bay
Winnipeg, Manitoba R2M 4H1

VE1 CALLS

Seems to me that many months ago (could be over a year now) a proposal was made to split up the call prefixes in VE1 land i.e. VE1, VY2 and VY3 or something like that.

I believe I filled out a ballot on the issue.

Anyone know what the outcome was?

Mel Lever VE1BSH

No, but I will find out and publish the information in a later edition of TCA.

OSHAWA ATTRACTIONS

I am co-editor of 'Sparks' a monthly bulletin for the North Shore Amateur Radio Club in the Oshawa, Ontario area.

At the present time I am trying to put together a list of attractions for Amateur radio operators on vacation away from the Oshawa area during the spring and summer

months. I am interested primarily in radio museums or special interest places pertaining to Amateur radio. Could you please send me a list of these places along with pertinent information such as the time they are open, admittance fee, and content of the display.

Randy Hill
37 Brant Court
Oshawa, Ont.

Those of you who have direct access to this information could send it to Randy card of TCA, or direct it to the above address.

CANADIAN SSTV

Could you let me know what the present operating particulars are as to what frequencies, schedules or nets would be for Amateur facsimile, SSTV, fast-scan TV plus any news on medium scan, with regard to Canadian operations?

I would enjoy hearing of other activities in SSTV, fax and satellite picture reception.

D'Arcy Brownrigg
Chelsea, Que.

Any takers to inform D'Arcy? Not much is known about these activities in Canada and TCA would like to receive articles on them — authors won't get rich but they will be rewarded and inform the rest of us about their branch of the hobby.

**TCA WELCOMES LETTERS
TO THE EDITOR. PLEASE
SEND ALL CORRESPONDENCE
TO EDITOR TCA,
1082 APOLYDOR AVE.,
OTTAWA, ONT. K1H 8A9.**

CANADAWARD ERROR

I have been asked to point out an error in the January issue of TCA.

CANADAWARD No. 36 -- VE3CZJ, should be SSB and not mixed.

Ron Walsh VE3IDW

MERGER

I did not wish to pursue this matter further in TCA, but letters are still flowing in here at a great rate. Because we had extra space in this issue and the major portion of our mail deals with the merger, I cannot help but publish the occasional letter or comment. This one represents the major portion of the comments I have on hand.

The CARF/CRRL merger raises many interesting points. I look at some current Canadian-American 'interrelationships' in education and in finance/technology to bias my point of view. I note the following:

1) Technology has been given away to foreign interests by politicians/governments who were not forward-oriented enough to look at the consequences (long-term not short-term) of their actions. A Manitoba based computer firm is/has gone belly up because of lack of funds to develop their product. Consequently they are in the process of being purchased by a foreign firm. The result? Simple: No Canadian Control due to less than 50 per cent ownership of stock, profits directed out of Canada, technology patents now going to other countries, etc, etc.

In my school I see that two Canadian magazines "Owl" and "Chickadee", are in danger of collapse because of a lack of sup-

port. We are incessantly receiving U.S. publications with each delivery of the mail. Lots of U.S. bias. Lots of U.S. relevant material. Our kids live in Canada. Where the hell is the Canadian relevant material and the Candian bias? Our texts and lab materials come from the U.S. Development and production of such materials seldom occur in Canada. What does this mean in terms of Canadian input? I'll let you the reader, answer that one.

3) This last point concerns technology again, interspersed with some emotionalism, economics and nostalgia. The book 'There Never was an Arrow' is a sickening reminder of situations which occur in Canada. It's a sickening reminder of what I feel the CARF/CRRL merger will lead to -- an inferior organization.

In conclusion, I voice disapproval to the merger proposal. I joined CARF as a life member to receive a Canadian voice in a Canadian organization with Canadian accountability, offering a Canadian product. Likewise, I joined ARRL as a life member to receive QST for life, knowing full well that CRRL was one tiny voice (with little-if-any-clout) in the large U.S. organization. Do not change the rules of the game for members like myself who joined CARF, expecting all the good Canadian stuff I just mentioned. I realize too, that utopia does not exist -- why bother looking for it? Next thing you know, someone will seek a merger of the Canadian government with the U.S. government. My opinion to the merger is still NO.

Ken Picichko VE4ZD

BUILDING OWNERS AND ANTENNAS

In past issues of TCA, there appeared some articles dealing with owners of public buildings such as high rise apt. and townhouses who objected to their tenants installing Amateur anten-

nas while residing in those premises and that a court case or cases have set a precedent so that this rule cannot be enforced by the owners.

I would appreciate receiving all possible information regarding this subject as it seems imminent that I will soon be faced with the same in the foreseeable future here in London. Since my wife passed away last December, I have decided to sell my house and move into smaller quarters such as an apartment or a townhome. A number of agencies I have already contacted have indicated that they have a company policy prohibiting the construction of outdoor antennas. I have no intention of giving up my hobby of some 35 years.

Any assistance you can provide

in this matter will be very much appreciated.

Rene Levasseur
415 Coombs Ave.
London, Ontario N6G 1J3

The March issue had a good article on how an antenna is installed. Let us see if anyone comes up with the necessary information to answer Rene's question.

MORE FROM THE WEST

I am enjoying TCA in my first few months in the Fraternity.

I have only one wish and that is that a few more of our knowledgeable Amateurs from the West would take the time to contribute.

Keep up the good work.

O.A. Strandquist, VE7AOW
Kelowna, B.C. V1Y 6R3

1981 Amateur Symposium

The 1981 National Symposium, sponsored by the Amateur Radio League of Manitoba, will be held on Saturday, May 23, 1981 in Winnipeg, Manitoba, preceded by an informal get-together and registration on the Friday evening in the Airliner Motor Hotel.

The Symposium will be conducted at the Red River College from 0830 to 1630 — Forums until 1230 with the Plenary Session commencing at 1400 hours. A listing of the Forums has been widely publicized and includes:

Amateur-type illegal operations;

Amateur examinations and procedures combined with an instructors' forum;

Amateur Emergency communications;

Increased Amateur use of the VHF/UHF spectrum.

Group rates have been obtained at the Airliner Motor Hotel at \$25⁰⁰ single and \$30⁰⁰ double occupancy plus a 5% Manitoba tax. The Registration fee is \$2⁰⁰ to cover the costs of coffee and donuts supplied during the event. A group booking has been obtained for the Saturday evening meal and floor show at the International Inn, a very popular entertainment spot. It promises to be a memorable weekend to those attending!

Please send advance registration and accommodation bookings to: The 1981 National Symposium Committee, A.R.L.M., P.O. Box 475, Winnipeg, Manitoba R3C 2J3... *not to CARF!*

VE3AHU

Report on EMI/EMC Standards

Electromagnetic Interference (EMI) and Electromagnetic Compatibility (EMC) standards writing activity has almost ground to a halt in Canada. However, as reported to TCA readers a year ago, there is still hope.

The requirements for alleviation of unwanted emissions from power lines, light dimmers, power tools, etc and unwanted interference into devices such as radios, hi-fis, telephones, etc., is still the same, i.e.:

i) we must have a commonly agreed method of measuring how good or bad a device is to EMI.

ii) we must set limits to the emissions from or the susceptibility of a device, and

iii) ensure that devices meet the limits by monitoring performance and for imposing controls on import and manufacture.

How is Canada getting on with the work? Very slowly! Mostly because of no funds to get on with the job of setting methods and limits standards.

Nearly a year ago the CSA called a halt to EMI/EMC activity in order to set priorities of standards committee work. The result is a publication entitled "Recommended Program for EMI/EMC Standards Writing Activities in Canada". (CARF is arranging distribution to provincial Societies and the larger clubs in each province.)

The publication covers the harmful effects of EMI in all areas, eg. medical life support, transportation automation, data services, dumping of products in Canada that don't meet EMI regulations in the country of origin, consumer complaints. At-

tention to the immunity performance of medical, transportation, and industrial control systems gets highest priority followed by immunity of domestic devices. The report recommends that Canada continue to develop EMI standards now in parallel with the standards activities of international bodies. (TEC, CISPR)

The bottom line is an appeal for funding to set the standards. About \$400,000 for the first year and about \$250,000 per year up to 1984. CARF is 'contributing' the time of members on CSA and CRTPB EMI committees. The members attend meetings and contribute time to standards writing work.

We believe that the federal government should provide national reference test sites and laboratory facilities to help in developing and determining of methods and limits of EMI. The reasons for suggesting that the government pick up the tab is that first, the public who use the consumer electronic devices are most affected by the nuisance and dangers of EMI and they have no effective organization that can provide technical help or lobby to influence the EMC work.

Second, the bulk of consumer electronic equipment used in Canada is not made here. Therefore, any attempt to get funds directly or indirectly from Canadian manufacturers or to alleviate the EMI situation by improving Canadian products will be ineffective.

What can Amateurs do to support the programme?

Here are some suggestions.

1.) At every opportunity tell

people, particularly your M.P., of the potential seriousness of the problem so that the politicians will encourage and provide funds to DOC, DITC etc. to get on with it.

2.) Assist the EMI Committee in your club with information on interference cases, who in turn will (hopefully) provide a summary to CARF for DOC negotiation work and for support to CARF's CSA, CRTPB committee work.

Barc Dowden VE3TT

TRANSATLANTIC COLOUR

Perhaps the first Amateur colour TV signals between Canada and England have been sent from VE3KIF to G3NOX, a 3,500-mile path, on 29.150 MHz. The contact was so good that G3NOX recorded the SSTV signals, sent them back to VE3KIF, who, for good measure, retransmitted them.

CARF news

UHF NEWS

Phase IIIB Amateur satellite components are being ordered, and work is proceeding for a hopeful Feb. 1982 launch. Amsat can use contributions and memberships to offset Phase IIIB costs. Oscar 7 (mode 7-B) is still performing well to the surprise of many, and Oscar 8 is working normally.

Recent successful contacts were made between Calgary and Washington, and Calgary and Idaho on 144.10, and between Edmonton and Saskatoon, Edm. and Calgary, and Lethbridge and Calgary on 432 MHz.

adapted from 'Northern Alberta UHF Society' Newsletter.

VE2HI of the PL Net

It is not TCA's policy to publish obituaries. I have turned down several in the past year, but here is one I cannot refuse. VE2HI, Ethel Pick was very well known in Canadian Amateur circles. Bud VE3UD knew her well and writes the following.

Amateurs in the Montreal-Ottawa-Toronto area were saddened when Miss Ethel Pick VE2HI Montreal became a silent key on Jan. 26, 1981 in her 84th year. Ethel obtained her operating licence in 1933 and held the same call the rest of her life, operating mainly on C.W. until the advent of SSB about 1960.

She was well known as the net controller of the PL (Professional Loafers) Net which meets twice daily on 3787 kHz, 8-9 a.m. and 4-5 pm EST. The earliest mention of this net being called the 'PL net' is in October 1964, but it existed long before that. Beginning just after World War II, Alec Reid VE2BE and Tommy Letts (both silent keys) and many others met on the air at regular intervals for 'round table' discussions. The PL net grew out of these early get togethers. At that time there were a few traffic nets on C.W., but general rag chew nets on phone were not very common.

Ethel took over as net controller in 1968 and was well respected and loved by the many dedicated Amateurs who faithfully checked into 'her' net. For the last ten years or so the PL net has enjoyed 'Ethel's Annual Picnic' at Long Sault Rapids on the St. Lawrence with as many as 70 in attendance.

In latter years when Ethel was confined to her home, the net became her life and the check-ins became her family. She was the most consistent and reliable net

controller, keeping her 'boys and girls' in line with her kindly manner, compassionate comments and broad sense of humour. She had great concern for the activities and

well being of her followers.

Those of us who knew her personally loved her very much and she will be greatly missed.

Bud Punchard VE3UD

The Sound of Light, The Speed of Reaction

Currently, radio waves travel at the speed of light, not at the speed of sound. When radio was invented, this was an excellent idea and the founders of radio should be congratulated.

Just look at the effects. If radio waves travelled at the speed of sound and you transmitted to Europe, it would take five hours for the signal to get there and another five for the answer to come back.

At the speed of light, the return signal is back in about a 30th of a second. This is about the time it takes Newt VE1UE to remove his fingers from the hot end of a soldering iron. (After repeating the feat several times he was unable to improve on either his time or his vocabulary. This proves that you can't teach a new dog old tricks.) The wails of anguish heard over an area of 20 km travelled at the speed of lound (light + sound).

In case your theory is rusty, audio frequencies travel at the speed of sound while radio waves travel at the speed of light. There is a point where the frequency is too high to be audio and too low to be radio. This is the Lound frequency.

Newt's comments upon burning his fingers radiated on this twilight zone frequency with great vigor. His emissions, designed for

space, have resulted in a drastic reduction in UFO sightings. Apparently UFOs operate on this frequency and what they heard so clearly convinced them that it would be sheer folly to tangle with billions of earth creatures who possessed such varied and surprising vocabulary.

Russian scientists, using their woodpecker, have discovered that lound freq. signals radiate outwards in the form of a concave sphere. Polarization is strictly metric. The mode of transmission is married sideband which tends to produce more harmonics than single sideband.

- Doug Cormier VE1BCN

COMMENTS, PLEASE

DOC headquarters has invited instructors and any other interested parties to comment on a proposed examination schedule for 1982. Suggested dates are: February 10, April 21, June 16, and October 20, 1982. Comments may be addressed to CARF, or to the DOC head office. DOC HQ address for Amateur matters is: Operations Branch, Telecommunications Regulatory Service, Department of Communications, 300 Slater Street, Ottawa, Ontario K1A 0C8.

If you wish to call, their number is (613) 995-3155.

PARC aids in ski event

By William G. Care VE3MEW
P.A.R.C. Executive

Feb. 7 and 8 saw 10 members of the Peterborough Amateur Radio Club heading north of Peterborough to Apsley and the surrounding woods early in the morning. Their purpose was to set up stations and provide communications at several checkpoints for the Kawartha Nordic Ski Club cross-country event.

Some stations were set up in the bush country between Apsley and Haultain. Access to these areas was achieved mostly by skidoo and toboggan. Quite a variety of radio gear, antenna types and sundry accessories were used, from mobile rigs and beams to handi-talkies and small omniantennas.

Almost as soon as we were set up and had checked out the signal reports on 146.520, traffic between the checkpoints began to flow. The ski officials were kept in touch with the various checkpoints as they tracked down supplies and people, to insure everyone was ready for the human flood of skiers that were now on their way. Throughout the day's events, the 2m communications by the Amateurs helped track-down lost skiers, arrange for sick or exhausted ones to be transported out of the bush and back to Apsley, and relayed all the official's questions and replies from one to another as needed.

About 700 cross-country skiers and some well known racers took part in the 2-day event, covering distances from 5 to over 25 kilometers through the rough terrain from Apsley south to Haultain.

The Ski Club had not had the services of Amateurs before. C.B. had been tried before and it failed

miserably. Results achieved by the Amateurs of P.A.R.C. were met with much appreciation, satisfaction, and in many cases, utter amazement. Everyone could hear with ease what was happening over the complete course and the event was able to proceed smoothly and efficiently.

We Amateurs enjoyed ourselves. VE3ACD reported items like a tablecloth, wine and candlelight at his location; VE3IQZ and myself got a charge out of showing some of our checkpoint volunteers the wonders of Amateur Radio—like being able to hear and work into Peterborough direct, or into RPT: "unbelievable", "fantastic" one volunteer responded.

The Ski Club expressed their

appreciation and thanks to the Amateurs at a wine and cheese party held at the chalet at Devil's Elbow Ski Hill. We all had a great time and we are looking forward to next year's events. We may even gain some recruits from the Ski Patrol Skiers who expressed considerable interest in our communication abilities, especially as it would apply to their activities.

The following members of P.A.R.C. actively demonstrated their communicating skills in true ham fashion to make this event a complete success and show those who were unaware, the capabilities, resources and opportunities of Amateur Radio.

VE3ACD, CRT, IQZ, FDP, KQH, JNG, IRW, BAU, KXB, and yours truly VE3MEW.

CARF Annual General Meeting

Notice is hereby given that the Annual General Meeting of the Canadian Amateur Radio Federation Inc. will take place on Saturday, June 13, 1981 at 9.00 a.m. in room 211, Commons Building, Carleton University, Ottawa, Ontario.

The meeting is for the purpose of receiving and considering the operating report and financial statement, approving a new general by-law consolidating changes to the existing general by-law (by-law No. 2) which changes were approved at previous annual general meetings, appointing auditors and transacting such other business as may properly come before the meeting.

CARF members are urged to attend. Please advise the CARF

office in Kingston if you plan to be present. This is to ensure adequate meeting room facilities.

Dated at Ottawa this 12th day of February 1981.

Don Emmerson VE3KJW
Secretary

DON'T MAKE AN ASH OF YOURSELF!

Every year in Canada a number of people erecting antennas of one kind or another are killed when their antenna accidentally touches a power line. While Amateurs seldom fall victim to such accidents, it is a sobering thought that should be in every Amateur's mind when he plans and puts up an antenna.

Bill Wilson, VE3NR

Regulations and Common Sense

The radio spectrum is like many electronic highways. As with any highway, you need a licence for its use. Licensing brings you into contact with the system of rules and regulations necessary to make any scarce and valuable shared public facility work well.

Licensing embodies a system of identification and controls to identify and locate you if the need arises. Typically, this might involve resolution of an interference problem -- whether your set is the cause or the victim! (You might not know it if your set is causing interference. Without identification, the task of locating you and correcting the problem is that much more difficult). Licensing also allows you to pay your fair share of the cost of maintaining these electronic highways.

The radio spectrum is a resource to be shared -- among nations and among individuals.

Before you assemble your station, remember the importance of good relations with your neighbours. The very fact you have an antenna in your back yard will make you automatically suspect in the minds of some, if they experience almost any kind of interference.

Try to avoid interference complaints before they arise, by making sure your station is in order.

Keep all connections snug and ground towers and antennas. Try to keep both your radio transmitters and antennas as far as possible from neighbouring TV or FM antennas and places where hi-fi and similar equipment is being used.

Note that on antennas, the higher it is, the more inviting a target it is for a lightning strike and the greater the importance of

precautions. Keep all antennas clear of high voltage power lines. Make certain that if any part of your antenna structure fell over, it would not touch a hydro wire. Disconnect the antenna from your set if you are leaving home for an extended period of time.

When on the air remember that anything said on the radio can be easily overheard by an unknown number of other people. Two-way radio does not offer the privacy of the telephone.

.....

It is natural to want to help someone in need. But you should never be so anxious to provide help that you interfere with the

station best able to handle the situation. The station with the best communications to the area from which the call originates should normally provide help.

Pass information along to the responsible agency quickly. Don't tell them what to do, or try to second guess anybody. Care should be taken to repeat information exactly as received.

Give priority to emergency communications.

All of the above advice is indicated by the DOC in The New General Radio Service Handbook published by the Government of Canada. Does it not apply to Amateur radio operators as well?

(SARL News)

Exam Improvements in sight?

A series of events originated by CARF culminated in a recent (Jan.) Ottawa meeting with DOC officials at which CARF and CRRL officials co-operated to review the proposed requirements for Amateur certificates before the Department finalizes them in the new Telecommunications Regulation Circulars dealing with the Amateur service. (These should be in publication by this June).

The day-long session, held at DOC headquarters, found the officials of the two Amateur organizations to be in full agreement on recommendations to the Department, although no decisions or commitments were made by the Department at the time.

Among the recommendations were ones to allow three errors in the three-minute code test, and both multiple choice and essay questions on exams. For the Amateur exam, a conceptual and

practical knowledge of radio would be necessary, while the Advanced tickets would require more detailed knowledge. As for regulations, it was recommended that candidates for the Amateur and Digital certificates should only have to know those regs applicable to their class of ticket. Advanced Amateurs would have to cover all of the regulations pertaining to the Amateur Service except those unique to the Digital certificate.

CARF President Bill Wilson VE3NR and CRRL President Mitch Powell VE3OT headed their respective teams. The senior DOC official present was Mr. Jean-Jacques Rousseau, Operations Manager of the Spectrum Management Division. It was, all in all, a good example of the consultative process which can reap benefits for both government and users of the radio spectrum.

DX

Douglas W. Griffith VE3KKB
33 Foxfield Drive,
Nepean, Ont. K2J 1K6

April should prove to be an excellent month for working DX. Generally speaking, Spring and Fall are the two best seasons for DX propagation. Ten and 15 metres should be the optimum daylight bands, with 20 metres running a close second. From sunset to midnight, 20 and 40 metres share top honours, and

from midnight to sunrise, 40 and 80 metres should provide some interesting openings to many parts of the world.

A few months ago, I ran a list of DX Nets currently in operation. A more complete list appeared in a recent copy of Long Skip, and it is reproduced here.

DX NETS

Arctic/Norwegian Net: Tuesday/Wednesday 14207 at 2100,
Friday 7085/7195 at 1500 and 2330
Saturday 14297 at 0900, 21345 at 1400
Sunday 28750 at 1100.
Afrikaner Net: Daily 21355 at 1700.
Arabian Knights Net: Friday 14250 at 0500.
Brown Sugar Net: Daily 14310 at 0330.
Caribbean-Pacific DX Net: Daily 14175 at 1000.
DK2OC DX-to-DX Net: Daily 28750 at 1130.
DK9KE DX Net: Daily 21155 at 1100.
JA DX Net: Daily 21220 at 1400.
Latin DX Net: Sunday 7095 at 0600.
Novice DX Net: Saturday 28103 at 1430.
P29JS Net: Daily 14220 at 0630 (now VK9NS Net?)
Pacific DX Net: Tuesday and Friday 14265 at 0530.
Round Table DX Net: Daily 14175 at 2030.
Safari East African Net: Daily 14174 at 1700.
South East Asia (SEANET): Daily 14320 at 1200.
Triple H Net: Daily 7250 at 0900.
USSR Net: Daily 3645 at 0000.
VK DX Net: Wednesday/Friday/Sunday 21180 at 0600.
VK/European DX Net: Daily 21183 at 1200.
WA2NHE DX Net: Daily 21275 at 1800 and 14280 at 2200.
WB6LED DX Net: Thursday/Saturday/Sunday 14285 at 0500.
W7PHO Family Hour: Daily 14250 at 1500, 14225 at 2300,
28575 at 2315 and 21345 at 2330.
40M DX Net: Sunday 7180/7080 at 0200.
75M DX Net: Saturday/Sunday 3795 at 0630.
Zone 18 and 19 USSR Net: Friday/Saturday/Sunday
7072-7085 at 1900.

BITS & PIECES

AP2SA - Pakistan. Salim is quite active from 0300 GMT above 14.200. QSL to Box 526, Rawalpindi, Pakistan.

CN8CO - Morocco. This station was worked during the recent ARRL DX Contest. He is apparently an extremely active contesteer, and should provide plenty of activity from that country.

'EM6' - EM6 was a special prefix for UG6, commemorating the 50th anniversary of Soviet Georgia. QSL's can go to: Judges' Collegium, DOSAAF Radio Technical School, 12 Bochorm St., 380044, Tbilisi 44, USSR.

JW9QH - Svalbard. On 28.500-28.700 MHz daily around 1800 GMT. QSL to LA9QH.

LU3ZY - S. Sandwhich. This station will be QRT until sometime in mid-April. If he receives permission to go back on the air, listen on 14.205 at 2300 GMT. QSL's go to LU2CN.

SU1AL - Egypt. Lotfy has been quite active from 0000 GMT on or about 14.202 MHz. QSL to Box 109, Giza, Egypt.

YK- Syria. VE7AAZ/4U is with the UNEF in the Golan Heights, and will be there until mid-June. He is active on 10, 15 and 20 metres, listening for VE/W from 1700 GMT. QSL to VE1BWV.

VK9NYG - Cocos Keeling. Looks like there is an Australian novice on the island now. He has been found fairly regularly on

28.430, between 1300-1400 GMT.

VK0JS - Heard Island. So much for Heard Island! Lack of operators, and reluctance on the part of the shipping company to

allow one of their vessels into those waters at this time of the year, has forced cancellation (again) of this latest Heard DX-pedition. Don't despair, another

operation is planned for early January, 1982.

VK4NIC/3X - Rep. of Guinea. Newington has finally approved Ian's operation for DXCC, and the first batch of QSL cards is already in the mail. Cards for Ian go to W4FRU. Karl K4YT operated from Ian's QTH in late February, and cards for this latter effort go to W2TK.

WB4ZNH/5X and WN4FVU/5X - Uganda. The Uganda operation of Carl and Martha Henson has been accepted for DXCC credit. WB4ZNH/5X QSLs go via K4PHE, and to N4NX for WN4FVU/5X

7Q7 - Malawi. A surprise DX-pedition from this now rare African nation was supposed to have taken place on Feb. 27. That it is not in your logs is not much of a surprise — the operation never got off the ground.

9U5 - Burundi. Apparently, only 9U5AV is acceptable for DX-CC credit at this time.

According to the JY group, all plans for DXpeditions to 4W, 70 and YI are off, due to problems in that part of the world.

QSL Information.

STATION	QSL via
VR6TC	W6HS
FW0VU	DL1VU
FC9UC	F5RV
TL8CN	W5RU
J28AI	W3HNK
D68AM	WB2OHD
CN8AN	WB3DNA
A6XJA	PA0LP
9X5AB	ON8RA
HH2VP	N4XR
CR9C	KB9N
KH0AC	K7ZA
9J2WS	W4LF
9G1RT	KB7HB
VP2EX	WB8VPA
FH8CL	Box 50, Mayotte.
TR8MX	Box 177, Libreville, Gabon.

For those interested in 40/80M DX, here is a sample of what has been around:

40 Metres			
A4XIH	7083	0133	
HK0EHM	7080	0143	
FC9UC	7080	0553	
KC6DX	7013	1200	
ZK1AC	7095	0700	
VR6TC	7061	0800	
OX3KF	7080	1145	
C21BS	7205	11-1300	
FM0FCL	7010	0140	
EC9AQ	7025	0110	
JA1KUL/JD1	7011	1230	
JA1NPX/JD1	7005	1200	
OE6BUG/KS6	7007	1200	
80 Metres			
HK0EHM	3790	0300	
VS6DO	3500	1220, 3795	1230.
FW0VU	3518	1230	

Many thanks to Long Skip, HR Report, LIDXB and DX Report for some of the material appearing here.

Director Nominations

Due to unforeseen circumstances, the write-up for nominations for the position of Western Director of CARF, did not appear in March TCA. I express my regrets to Peter Driessen VE7BBQ and Art. Spencer VE7DKY for this mistake. It should be noted, however, that CARF members in that area received notification of the nominations. The material included in the notification would have been the same as that which would have appeared in March TCA.

Hammond Antique Radio Museum opens in new location

The Hammond Antique Radio Museum in Guelph has been moved from the old location on College Avenue to a new building on Curtis Road, which is the new home of the recently formed electronic division of the Hammond Manufacturing Company.

On Wednesday, Jan. 14 1981, Mayor Norm Jart of Guelph in the presence of a large number of guests and factory workers, cut the traditional white ribbon to declare the museum and the factory officially open.

Fred Hammond VE3HC, the founder and owner of the museum, has for years been collecting and assembling what we now think is one of the finest and probably the largest private collection of antique radio exhibits to be found anywhere. Fred needs no introduction as he is known worldwide, both for his activities in the Amateur radio field, many of which are philanthropic.

The museum is to the left of the reception area and it just about took our breath away. It is actually another building constructed inside the main one. Fireproof, burglar proof, tornado proof, in fact it is every kind of proof one can think of, just so that the contents are safe. The exhibits are mounted on polished wooden stands around the walls; down the centre of the room and on the walls.

The exhibits are all well labelled, easily viewed and in many cases show the approximate date of manufacture and period of operation. The floor of the museum is carpeted throughout and the two main aisles are so wide that a large number of viewers can move without crowding. An immense amount of work has gone into refurbishing all the various

items which now appear to be in mint condition.

As we viewed the various exhibits, we noticed items dating back to the late 1890's, such as an old galvanometer and a coherer, on through World War I and World War II, enemy and allied radio and radar equipment, right up to the quite modern, such as the various models of the famous HRO and National receivers. In one corner stands a complete and working AT3 twin-channel transmitter that brought back memories to those of us who served in the radio sections of the armed services during World War II.

Fred is the proud possessor of a real antique fixed spark transmitter. He might just switch

it on momentarily to let you see the spark and smell the lovely ocean-like odor of ozone.

While looking over the various exhibits, we noticed some that aroused our interest: an old receiver dated 1912; a small acorn tube and a 100KW monster; an automatic morse sender dated 1917; a 204 transmitting tube and a 1907 Deforest triode.

Fred is supposed to be retired but he doesn't much behave like it. He says the museum is open to any Amateur or group of Amateurs by just letting him know in advance so that he can be there to welcome you. His telephone number is (519) 822-8323.

Marshall Killen VE3KK
KWARC Coffee Club

To My Neighbours

Notice concerning alleged interference from this transmitter...

1. You have called to my attention the fact that transmissions from my station are causing interference to your TV reception.

2. Interference such as you describe is not caused by HAM operations, as Ham stations cannot and do not cause TV interference. Nor is this interference the result of any malfunction of my equipment or poor operating habits, for my station is not a Ham station.

3. Be advised that your Government is placing a \$500 per year tax on all TV receivers. Because it is difficult at this late date to obtain a listing of TV set owners for taxation purposes, our government has established a vast network of TV jamming installations with the goal that TV set owners will make themselves known to these jamming stations

so that their names can be added to the tax rolls. This station is just such an installation.

4. Your Government greatly appreciates you turning yourself in. You will be one of the first to be taxed. You have also verified that this first TV jamming equipment is functioning properly.

5. We have also made a note of this time and channel and reported this jamming. This information will be given to several TV program rating services.

6. You have therefore provided a valuable service to the entertainment industry and to your government.

7. So that you will not be the only one taxed, please be patient as we continue our TV jamming operation.

- Ottawa Groundwave



Canadian Forces Affiliated Radio Service

By Ron Walsh VE3IDW



Some of the Eastern CFARS operators had one of their great get-togethers at the RCAF Association Hall in Smith Falls. The party provided a chance for North American and overseas operators to meet. After running a few thousand phone patches it seems almost essential to see just whom you were talking to. As usual, the meeting had some official presentations based on the number of phone patches handled and presentations by the operators.

Most of this traffic is handled on CFARS frequencies. These are just outside the normal Amateur bands. Many military patches are still handled inside the Amateur bands especially those from C.F.G. Alert N.W.T. and the Golan Heights, Syria.

The amount of traffic handled is exceptional. The flow has been reduced of late due to the closure of Ismalia Egypt but it should increase now that CFB Lake Germany and CFB Baden Germany can use the service. As an example Scott MacLeod VE1ASC ran over 6000 patches out of Ismalia and

350 per month when he was in the Golan Heights.

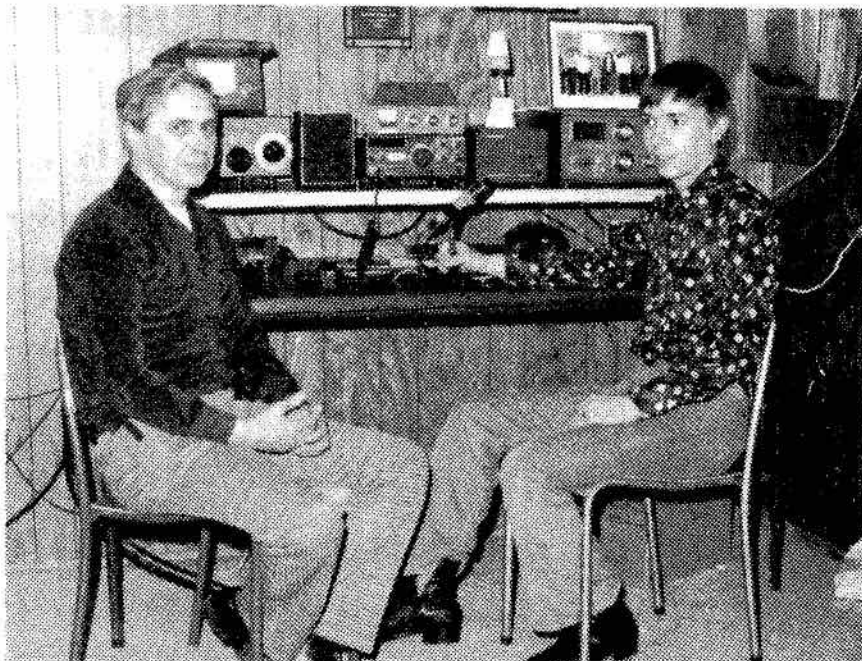
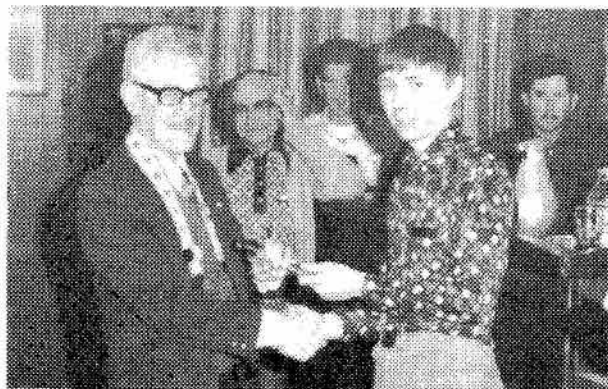
The CFARS System is organized by the Canadian Armed Forces. Most of the military stations are run by Amateurs but any non-military station must be a licensed Amateur station! There are over 60 stations in the service now.

This dedicated group seldom encounters a phone patch they can't handle in some manner. In 14 years of operating Pat and Barry Baggs VE3IWI and VE3IVV have handled 1700 through Gananoque. In three years, Vince Williams VE3ER estimates he has made over 5500 through Ottawa.

At this meeting Scott MacLeod VE1AJC was the guest of honour. He had just returned from his third overseas tour of duty. He made several presentations and

received one from the group. A very special guest was Scott's father Doug, VE1AIZ. He had come all the way from New Glasgow N.S. The meeting and refreshments were arranged by Fred Arsenault VE3HHK and family.

It was my pleasure to attend this meeting on behalf of CARF. This very personal and dedicated group of operators is providing a great public service in an efficient manner. They are running a truly Canadian traffic system, daily, and with stations from coast to coast. They link overseas stations and Canadian ships to home! They have only a few specific frequencies. Perhaps we can learn from this effort that a Canadian Traffic System on the Amateur Bands could become a reality.



Opposite, above: CFARS Military Radio Operators with Canadian Forces Overseas. Back, l to r, Bill Bell (Ismalia), Mike Smialowski (Golan), Charles Brocklehurst (Damascus); front, George Fournier (Cyprus), Gary Presnail (Lahr), Scott MacLeod (Golan), Dick Gowan (Damascus). Opposite, below: CFARS ops who operate from Canada, back row, Barry Baggs VE3IVV; Gary Presnail, CFB Kingston; Doug MacLeod VE1AIZ; Jack VE3LH; Art Sylvah VE3FMB; Ralph Hindle VE3BNH; Al Olfield VE3ANO. Front row: Fred Arsenault VE3HHK; Pat Baggs VE3IWI; Bill Bell VE3HYU. Right: Father and son meet after six months, Doug McLeod VE1AIZ and Scott McLeod VE1AJC. Above: Presentation, Ralph Hindle VE3BNH and Scott VE1AJC.

The Plight of AC3PT

Garry Hammond VE3GCO
Listowel, Ontario N4W 3K1

The ARRL Countries List now has AC3, SIKKIM, as one of the deleted countries. Only contacts made before May 1, 1975 count for this country. Contacts made May 1, 1975 and after, count as India.

One of the most famous Amateurs was Palden Thondup (The PT in his call was his initials) Namgyal, the former king of Sikkim.

For ten years I tried to make contact with AC3PT. I heard him on three occasions but could never break the pileup. hi. Some of our VE Amateur friends did make contact before circumstances changed so dramatically and drastically for the chogyal or king. The K-W Record carried this story in its December 4, 1980 issue.

MODERN FAIRY TALE SOURS FOR FORMER SIKKIM KING

GANGTOK, Sikkim (AP) - In a modern-day fairy tale gone sour, Palden Thondup Namgyal, former king of Sikkim, is a lonely, powerless man who has lost his country, his beautiful American wife Hope Cooke, their two children and the ham radio that served as a link to the outside world.

When he and his wife were crowned king and queen of Sikkim in 1965, they vowed to make the tiny, remote Himalayan country "a paradise on earth."

The king, or chogyal, as he is called, was the handsome heir of a more than 300-year-old dynasty.

His young queen, the gyalmo,

was a wealthy, well-educated, New York debutante. And Sikkim was an independent country tucked away among the mighty peaks of the eastern Himalayas; India to the south, Tibet to the north.

But India has taken over the country.

"I seem to be vegetating, slowly going to seed," the greying, 57-year-old chogyal said in an interview at his hilltop palace above Gangtok, Sikkim's capital and only town.

After a separation period, he and his wife were divorced last summer. She and the couple's two teenage children live in New York City.

Wangchuk, a British-educated son by his first marriage to a Tibetan noblewoman who died in childbirth, lives with the chogyal in his turn-of-the-cent-

ury, 15-room palace. His oldest son from the first marriage was killed in a car accident in 1978.

Five years ago, Sikkim was incorporated into India as its 22nd state after long and complicated political struggles during which the chogyal lost his temporal power.

A Buddhist, the former king retains his role as a religious leader, takes part in religious festivals and has been allowed to keep some of the former royal estates.

He maintains a quietly stubborn attitude towards New Delhi, and has never lowered the old national flag of Sikkim which flutters above his palace grounds. He has refused offers by the Indian government to accept the governorship of Sikkim state.

Given his sensitive position, the former king doesn't like to talk about politics.

But a member of Sikkim's pro-chogyal circle says "He was put under house arrest, threatened and robbed of his power, but the chogyal has never given in to the Indians. His conscience would not let him betray Sikkim."

Following the Indian takeover, the chogyal lived in virtual isolation. He has been allowed greater freedom in the last two years, and has travelled within Sikkim, a state of 350,000, as well as to the United States and Britain.

Some Sikkimese, especially those close to the chogyal, accuse the former queen of having hastened the takeover by



THONDUP NAMGYAL

first fostering Sikkim nationalism and then deserting her husband after he lost his crown.

One confidant of the couple believes that some of the former king's own 'bad habits', which the confidant said included spells of heavy drinking, led to the couple's breakup.

The chogyal himself does not blame his former wife for leaving.

"I still love her very much," he said. "We were divorced without acrimony." He said she writes him from time to time.

U.S. courts ruled this year that the couple's two children could return to Sikkim for temporary visits with their father, and they spent eight weeks with him last summer.

He said he spends most of his time in the palace. Its 20-member staff – about half as many as in happier days – is paid out of his own pocket, he said.

The chogyal rises early, prays and then looks after his private affairs. He said he keeps up with world events by reading newspapers, although they were usually a few days old.

In the evenings, he and his son retire to an all-purpose room where, he said, "our family lives and dies."

To the best of my knowledge only two heads of state are presently radio Amateurs ... they are JY1 King Hussein of Jordan and EA0JC King Juan Carlos of Spain.

RESULTS OF TRILLIUM WEEKEND CONTEST Nov. 7 and 8, 1980.

The non Trillium Station making the most contacts: Marjorie McKenny VE3IKC received a lovely engraved trophy.

Runner up: Thelma Woodhouse VE3CLT ... certificate. Draw from all the logs submitted: 1st draw -- \$5 Thelma VE3CLT; 2nd draw -- \$3 Marg Huston VE3AIZ; 3rd draw -- \$2 Mary Hedges VE3COH.

Are Amateurs a Radiation Hazard?

Lee, VE7BHS, passed along an article which appeared in the Vancouver Sun, titled "Radiation Statistics Starting to Leak", by Linda Hossie.

The article points out that exposure to certain levels and frequencies of RF radiation can produce mysterious blood abnormalities, even cancer. (This is 'proved' by quoting statistics involving U.S. personnel in the embassy in Moscow who were subjected to microwave radiation emitted by the Russians – there is no indication whether diet and being subjected to life in a foreign, hostile environment had anything to do with it).

Hossie says "Almost every citizen of an industrialized country receives some kind of microwave and radio-frequency radiation – the two types of radiation at the low-frequency end of the electromagnetic spectrum that penetrate deep into the body." (She could have meant short-wavelength but as Lee points out, it does leave her veracity in doubt).

Singled out as perpetrators of this citizen-radiating crime are: the U.S. Department of Defence with 20 million radar and microwave devices, the 30 million microwave ovens, 30 million CB (US) operators, 250,000 Communication towers, 15,000 shortwave radio transmitters and 15,000 medical diathermy units. She also says there are 35 million radio frequency sources in U.S. industry, with an estimated 21 million U.S. workers potentially exposed to radio frequency and microwaves on the job. (N.B. the only facts presented in this

article are based on figures available in the U.S.).

Lee notes "No Hams? Thank God, we're okay!" I also notice that no where does she mention the millions of broadcast radio and television receivers which all radiate a little bit of RF, not to mention all the computers with their video terminals, the small hand calculators, etc. etc. Almost everything electronical radiates!

Low-level radiation, measured in microwatts per square centimetre or milliwatts per square centimetre, is everywhere of course. The U.S. standard is 1 mW/cm², while in Canada it is 1mW/cm².

Much ado about nothing? Well, not exactly. There have been enough radar technicians zapped, plenty of microwave engineers damaged beyond repair, and enough studies done to prove that RF can be harmful to your health. There is even a study to show how much skin heating there is when you hold your two metre Amateur handheld up to your head to talk into it (measurable, but, apparently, not significant). The biggest hazards would appear to be to the people who work around high-power UHF and microwave equipment. Most microwave ovens, your neighborhood CBer – even your own rigs – don't. I feel anyway, present a problem when used as they were intended. You are more likely to sustain injury falling off your tower or monkeying around with the power supply than you are from the RF!!

– FM Bulletin

The 'Old Buzzard' Rigs

You don't have to spend a lot of money to get on the air. There are many good old receivers and transmitters around that can be bought cheaply and put back into service with a small amount of restoration and work.

First, what do you look for? Well, that's a function of several variables. How much do you want to spend? You can get an old Hallicrafter's receiver and an old Johnson transmitter for less than \$100 at a hamfest or flea market. Or, you can go all the way with a Collins 75A4 receiver, worth some \$500 in good condition and a kilowatt Collins KW1 which fetches around \$1000 in reasonable shape. Somewhere in this spectrum is a station that you can afford and will give you the performance you want.

Now, the rigs I'm talking about are from the Golden Age of Amateur Radio - the 'fifties'. These 'Old Buzzard' rigs were the last word in radio equipment in their time. Remember that - they are 25 years old -, so don't expect them to do everything a Japanese rice-box of today is capable of. However, these rigs still perform very well on CW and, if you're interested in AM, they will do a fine job there, too.

A short word on AM. There still is some operation on AM. You can hear activity on or around 3.885, 7.290 and above 29.0. Sidebanders often are present on these frequencies too, but the AMers don't like it very much. This is like someone using phone on the part of the band customarily used for SSTV. I am happy to report that activity on Am is actually

increasing. W2NRM, Howard Jack of Ramsey, New Jersey publishes a newsletter called the Press Exchange which is devoted entirely to AM and 'Old Buzzard' radios.

First of all, let's talk about receivers, I bought a beautiful National HRO 60 in mint shape for \$100. This receiver sold for close to \$1000 in the early sixties. There are equally good Collins, National and Hammarlund rigs around as well as the famous Hallicrafter receivers. You can easily locate one for around \$100. Look in the classified section of QST or get the 'Yellow Sheets' which is full of old gear. If you are not familiar with this old stuff, look at the ham mags of the period. You'll be able to choose one to suit your needs. Some oldies but goodies include: Hallicrafters SX 71, SX 101, National HRO 50, HRO 60, NC 300, Hammarlund SP 600 and Collins 75a3 and 75A4.

Now, the transmitter. The best ones of the period were made by E.F. Johnson and Collins Radio. They're all big and heavy. The Collins 32V3 transmitter was a real goodie in its day, but I do not recommend it for two reasons. The VFO is stable as a rock, but if it craps out, you're out of luck. Same for Modulation or Plate transformers. Collins wants an arm and a leg for replacements. The final amplifier uses a 4D32 triode and they are getting scarce.

The Johnson line is a much better bet. Space limitations prohibit extensive description of the Johnson line, but the two most popular models in their day

were the Viking Ranger and the Valiant. The Viking uses a single 6146 modulated by a pair of (real) 807's and the Valiant has three 6146's in the P.A. modulated by a pair of 6146's. The Johnson Viking 500 uses a pair of 811A's to modulate a 4-400A final and the top-of-the-line Johnson Viking Kilowatt amplifier (rare) uses a pair of 4-400A triodes. The latter two transmitters are still worth a few dollars today, as they can be used to amplify a low power SSB signal to high output levels.

Whichever rig you find, take the time to carefully examine it. Look for signs of abuse on the cabinet. If the exterior checks out, look inside for indications that may show how the rig was run. Rust around transformer housing indicates that it was probably stored in a damp place. Wiggle the wires coming out of the transformers. If the insulation cracks, this indicates that the rig was run hot. Avoid it! Look for wax splats around capacitors and under the chassis.

Assuming the radio checks out, you may have the opportunity to fire it up into a dummy load. This is obviously the best way to see what's what.

Once the deal has been made and you get the treasure home (past the XYL!) there are a few minor mods you should make immediately. Change all the paper electrolytics as the old ones are probably dried out and not very efficient. Replace tube rectifiers with diodes, or more modern tubes. A 3B28 Xenon tube is a good replacement if you don't want to go solid state.

Clean up the cabinet with auto finish restorer and give it a coat or two of auto paste wax. When you fire it up, don't be alarmed if you smell burning dust.

Once you have your 'Old Buzzard' receiver and transmitter operating, you'll need a TR switch to complete the installation. E.F. Johnson made an electronic TR switch that will allow you to operate full break-in on CW. Use a good low-pass filter to avoid TVI. If you want to use the AM mode, use a scope or absorption wave meter to indicate per cent of modulation.

Finally, if you really want to get into AM, consider a few modifications to the audio section of the transmitter. I love the sound of hi-fi AM and there are many stations on the air that will show you what good audio is like. If you want more information on 'Old Buzzard Radio', a subscription to the Press Exchange, mentioned earlier is an excellent source.

Mike Crestohl VE2BDM.

AMATEURS HELP SKIERS

Twenty-two Amateurs from the Fredericton, N.B., Woodstock, N.B., and Oromocto, N.B. Radio Clubs got together and helped the Maritime Marathon Ski Tour with two metre communications this year again during their two day 60 mile cross country skiing event, held between Woodstock, N.B., and Fredericton, N.B. on Feb. 7 and 8.

Sixteen mobile and base stations were set up at the check points, and 22 ops participated in the exercise.

This is the third year handling this event. Ski Tour Officials, after having used several other types of communications in past years, are still amazed at the efficiency which Amateur Radio Operators are capable of.

Gerald G. Sharpe
VE1BGQ

Manuals Available

Your Federation has acquired copies of manuals for several receiver and transceiver models that were used by Amateurs. The following are held in quantity and, while supplies last, can be obtained for \$1.00 per copy to cover cost of handling and mailing:

National NC 109, Racal XX RA 17 (L & C models), TMC GPR90 RXD, PYE Transceivers PTC 2001/2002 and PTC 2007.

Single copies of many other receivers are also held and copies can be obtained for the cost of copying and mailing. Details can be obtained from the CARF Office.

1. National - HRO-500; RCD;

HRO-60; RCF; RCF-2

2. Racal - RA 117

3. Marconi - CSR-5 & 5A

4. Hammarlund - HQ-145A; SP600 J; SX-62.

5. Eddystone - 990R.

VE3AHU

UPCOMING EVENTS

1981 RSO Convention

When: October 2, 3 and 4, 1981.
Where: The Waterloo Motor Inn, Waterloo, Ontario. Note: Pre-registration forms will be available in the February issue of 'The Ontario Amateur', according to the chairman of this year's convention publicity committee, Merrick Jarrett VE3BCZ. Further details will be published when they become available.

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TCA and the Canadian

TCA, The Canadian Amateur, The Canadian Amateur Radio Magazine, continues to survive. At last, a unique publication of, for, and by the VE population. Long may it flourish!

Having said that, can it rest on its laurels? Not by a long shot; no publication ever can. What's missing? Well, when you check out the average issue, with its thirty pages, or so, of articles, usually twenty-five pages or thereabouts, are dedicated to what might be called news and views. Something like five pages are written under the heading: "Technical." Now, the news on operating, rules and regulations, events, DX, human-interest stories, contests, etc. is of great interest to us all, and much enjoyed, but there is an imbalance in the overall content of the magazine that I truly think needs to be corrected. High time the technical section was expanded to fill around fifty per cent of the magazine's pages, without cutting down on the present amount of other coverage. If I'm correct, that would seem to throw the ball right in the laps of all the VE builders and experimenters!

Somewhere, I forget just where, I heard that about five thousand Canadian Amateurs belong to the CARF and, therefore, receive TCA magazine, monthly. Now, let's take what, I hope, are wildly conservative figures. Let's suppose that of the five thousand subscribers to TCA about half build or experiment with one electronic project every year. Hopefully, it is one that has direct or indirect application to

Amateur radio. Now, if just ten per cent of these twenty-five hundred Amateurs would put pen to paper once each year, the Technical Editor of the magazine should receive two hundred and fifty articles, annually. Let's further suppose that only half of these articles are deemed of sufficient interest for publication - and we're now down to one hundred and twenty-five manuscripts. Still, that's over ten technical articles per issue, and the Technical Editor and the Amateurs of Canada would be deluged with interesting and thought-provoking data on what is, after all, the guts of our hobby. All that, if just ten per cent of us write up one pet project, once a year! Surely, it's worth it!

Yep, I'm back beating the drums for more 'Radio' in Amateur radio. Things are quiet right now, so it's time for the annual attempt to stir things up and, besides, the need is so glaring.

Just for argument's sake, why can't every Canadian Amateur (or, at least, most of them) lead a dual existence? Dr. Jekyll operates a commercially designed and built transceiver, and never does more than dust it so as to maintain the resale value, while keeping on hand a ready, reliable, radio-communications setup. Mr. Hyde, on the other hand, occasionally turns to a 'breadboard' of integrated circuits, transistors and parts, where he generates signals, knowledge, articles for TCA and, sometimes, smoke! Why not?

I can't help but wonder

about today's Amateur radio newcomers. Are they rich? All of them? Are any of them being turned off by the impression that they must have kilobucks for a commercial H.F. transceiver, beam antenna, two-metre rig, etc.? Amateur radio has always been elitist, in the sense that a certain amount of electronics theory, Morse, plus some government rules and regulations had to be mastered to put a radio station on the air and operate it (hopefully, fairly intelligently!) What a sad day if the hobby is now becoming elitist in a 'money' sense, as well. Are there no kids out there, with paper routes, who hanker to send out a CQ? Are we closing our hobby to a lot of young and not-so-affluent beginners, as well as the experimentally inclined, and thus laying the groundwork for our own extinction? (I may be influenced by fond memories of carrying a 6L6G for my first r.f. oscillator, in my lap in the back seat of a model-A ford, from Spokane, Washington, to Regina, Saskatchewan.) One thing is sure, with all the words generated recently over a few technical articles published in the U.S.A. and dealing with the construction of simple, transistor, CW transmitters, built in various seafood cans, there must be a lot of Amateurs or would-be Amateurs still ready to heat up a soldering iron if given a little encouragement. After all, the price is right, and you don't really need a linear amplifier when you are restricted, or restrict yourself, to CW-only operation!

Amateur

By James Park VE7IW

This might be a good place to say a word about government radio examinations. There has been a lot written, lately, about this contentious topic, even in the 'Letters' column of TCA. If you have recently written an exam, or intend to in the future, perhaps it would be well to sit quietly for a few minutes and think about the matter in the context of the entirety of Amateur radio. Why are you asked any technical questions at all? Is there any reason why you should be exposed to this side of the hobby? Is it possible that people feel there are good reasons for Radio Amateurs learning a few electrical and electronic principles? Guess it all depends on how you look at it. Is the exam and the preparation to write it strictly a barrier to be overcome, or is it part of a learning process, one that just might lead to other things? You don't get examined on the internal-combustion engine when you go to your local driving-licence office - for an operator's permit. Is there a difference between an operator (car) and an operator (radio)? Why?

Now, for the chap who said that using entirely commercial equipment meant we wouldn't have Amateurs getting electrical shocks, anymore. You won't get caught in the fan if you never lift the hood of your car - but neither will you ever learn much, of a practical nature, about the engine.


To the fellow who remarked that we would never get onto the new radio bands without the help of the equipment manu-

factureres; surely you must be kidding! I have a proposal. Let's restrict one new band to homebrew equipment, only, and see just how long it takes for the QRM to be as bad as on any other band. We could call this the "Homebrew Band". Let's restrict another new band to QRP. We could call this the "Antenna Band". The small sizes of these bands would make them eminently suitable for this. Who knows? It just might help save Amateur radio. It would certainly delay the onset of rigor mortis!

Now, about parts. Did you realize that collecting electronic parts can be just as much fun as collecting postage stamps? (A little bulkier, I realize.) What's missing? Why, the trading, of course. Isn't it a pity we can't trade parts the way an avid collector trades stamps. Oh, in a big centre, perhaps it's possible. Out here in the wilds it's a little more difficult. What a help it would be if we had a swap and shop for parts, like we do for complete equipment. It couldn't be on a net or in a magazine, as it would be just too cumbersome to handle. What we need would be one Amateur per province, (someone retired, with time on his hands? Don't look at me!) who could put out a mimeographed sheet of what's needed and what's surplus to requirements. A small charge could be made, to cover printing and mailing costs. There must be lots of experimenters with stuff they'll never use, but which, in the hands of another Amateur, would allow him to build that desired piece of equipment. How

about someone working out a way of getting the two together? When you go to 'Silent Keys' why not donate your parts to those experimenters who need them? The XYL will just chuck them into the garbage, anyway!

Now, what technical articles to write for TCA? Well, I recall reading about a club in Eastern Canada, who were building digital frequency sources for two-metre transmitters. Apparently, it was done as a group project. With all the initial work that must have been done, why not drop the schematic, a few paragraphs on construction, testing, and operation, and a photo (if possible) to the Technical Editor of TCA? There must have been a master circuit-board layout, so why not include that as well? I, for one, would be fascinated. Surely, an hour or so spent on the write-up would do. If one picture is worth a thousand words, one schematic must be worth ten thousand, and the literary effort can be minimized.

Somewhere, out there, is a Canadian Amateur with some metal-working expertise. How about an article? How about something on a cheap, simple, effective metal bender and/or shears? Where do you get your aluminum, now? What thickness? What hardness? What size? What cost? What availability? Any new ways to build a box that will hold perf. board, p.c. board, etc? Where is a good, current, Canadian source of round and square punches, adjustable-wing cutters, nibblers. Or is it all extinct? 

Someone, maybe in the business, or an avid, active, long-time experimenter should be able to do an article on reliable, small-quantity parts suppliers, with emphasis on those available across Canada. (If any)

Surely, there can be no shortage of topics – only a shortage of writers! You might recover the cost of the parts for a project, by writing it up for TCA. Why not do it?

The Amateur, to me, is the guy (or gal) who thinks: "I can do it!" whether it be long ago, sending signals around the world on two hundred metres and up – when nobody believed it could be done; or, later, building and operating a half-kilowatt transmitter, using war-surplus parts and an 813 and doing it for \$29.95 and a bit of barter; or, now, taking some cheap, surplus transistors and whatever can be bartered, or scrounged from an old tv set, and putting out a clean signal on 80, 40, 20, or what have you.

Well, time to end the diatribe for another year. I'll try and crank out a couple of technical articles this year. Why don't you do the same?

I'd like to close with some

UP, UP, BUT NOT AWAY

In spite of galloping national inflation, CARF has been able to hold the line on membership fees to \$10 for the past two years but, like everything else, the rising costs of the services provided to the CARF membership and the costs of publishing TCA and the like, have forced the national executive to reluctantly recommend to the Board of Directors that membership dues be increased to \$12 per year. The prices of some CARF publications will also have to show a small increase. Such changes, if approved by the Board, would not take place until June of this year.

words I wouldn't have minded writing.

"Two things worry me about ham radio. They worry me not just because I can see them happening, but because I see them happening and don't know what to do about it. We don't build any more. The number of hams who build any of their own gear is dwindling into one over infinity squared. And don't you try to count kit assembling as building either it isn't and you know it. As our ranks of

home constructors thin we also fall to a lower technical level as a group. In this our own growth is annihilating us by providing a large enough market for our commercial exploitation ...etc."

Well, this is just an extract from an editorial by Wayne Green, W2NSD, in the November, 1958 (Annual) edition of CQ magazine. Perhaps now, over two decades later, we can evaluate the accuracy of these statements and, maybe, try and turn it around – just a little.

Preparations underway for Conference

Francis Fox, Minister of Communications recently confirmed that preparations are underway for a federal-provincial conference of Ministers of Communications in late spring or early summer.

In accordance with the decision made by federal and provincial Ministers of Communications at their last meeting, in Toronto, on October 17, 1979, the conference will take place in Winnipeg and will be co-chaired by the Manitoba Minister, the Honourable Donald Orchard, and the federal Minister of Communications.

The 1979 federal-provincial conference requested working groups of federal and provincial officials to prepare reports on competition and industry structure, the industrial impacts of communications policies and the sharing of responsibilities over cable. These reports are not yet final. Mr. Fox said he was encouraged by the co-operative approach to deal with these matters and felt that the reports

will be invaluable to a meaningful conference.

Mr. Fox also emphasized that co-operative endeavors between federal and provincial governments would continue to be a priority of his department. He expressed satisfaction with the results of recent federal-provincial co-operation in relation to Telidon field trials, Anik-B pilot projects, the use of satellites for educational purposes, establishment of a clearinghouse for regulatory decisions and the extension of radio and television services to underserved area.

Mr. Fox noted that federal and Manitoba officials will meet later this month to discuss the time and agenda of the proposed conference. "I look forward to a productive ... conference," said Mr. Fox, "and I would want such a conference to be planned well enough beforehand, so that it can be positive and yield concrete results."

Contact: Mike Bryan, Information Services, (613) 995-8185

Property Rights

Recently, during a spell of mild weather, an Amateur living in a small town not far south of the nation's capital, found his entire property inundated with water and his telephone service washed out by the rising water.

He discovered that a neighbour on the next lot had constructed a dam along the property line, which prevented any run-off to the nearby river. Pleas to the neighbour to at least break the dam at some point to create some drainage were curtly refused. All attempts to resolve the problem through discussion were rejected.

With water now entering his house, he contacted the town works personnel who claimed they were unable to do anything unless authorized by council. An approach to the Mayor was equally unproductive as he was only willing to bring the matter up at the next council meeting, one week away.

A call to Hydro, who has a transformer on the Amateur's property, was also useless as the power company claimed the high water would have to rise several inches above the height of the dam to affect their equipment.

We can imagine the feelings of the Amateur, after making a major investment in a home, to find he has little or no protection from the thoughtless (or were they?) actions of a neighbour.

Perhaps this all arose from real or imagined BCI or TVI from the Amateur station, or, was it a form of aesthetic protest against an antenna tower? Who knows. What is distressing though, is the obvious unwillingness of the part of elected officials or township employees to take any action to help in the protection of a taxpayer's property.

The legalities of this case are quite clear. No one, regardless of whether on his own property, or not, may alter or interrupt normal land configuration without approval by Provincial ecological authorities, and then only if it can be shown there will be no adverse effect on neighbouring land.

It would appear therefore, that since, in this instance, the 'friendly' neighbour was so ill-advised as to construct his dam on the easement between the two properties, the aggrieved party would have been quite within his rights to breach the dam himself. Nevertheless, it would probably be better

now for him to consult his lawyer. We believe it would have been quite in order for him to hire someone to remove the dam at the expense of the party who constructed it. With this confirmed he would have pretty strong bargaining power to force the neighbour to remove his handicraft.

As for the Mayor, one can only assume he does not plan to run for re-election, as a groundswell against him would be easy to arrange. Perhaps the aggrieved party should attend the next council meeting with his lawyer and blister a few eardrums.

VE2's Artificial Aurora

Recently, scientists at the Siple Station in the Antarctic have been beaming radio waves into the earth's magnetic field in an effort to produce a shower of light at the other end.

The experiment worked, and an artificially induced aurora borealis appeared over Roberval, Quebec.

According to a story in the Toronto Globe and Mail, the purpose of these tests were related to the prediction of magnetic storms which seriously affect communication and navigation systems. To produce the aurora, researchers transmitted a LF signal from a 13-mile long wire antenna along poles erected on the Antarctic ice.

Over the past 12 years, Canada's airspace has been used by University of California researchers for the launching of over 100 instrument-laden balloons in their quest at probing the mysteries of the aurora. The last balloon launches in the project took place

before Christmas near Val D'Or, Quebec.

Since what goes up, must come down, you could add the \$50 standing reward for the return of these instrument packages to that 'new-rig' fund, should you ever find one.

Their actual value is estimated to be in the \$4,000 range.

SENIOR CITIZEN AMATEUR STATION

The Senior Citizen Amateur Radio Club station, VE3LMB at Thunder Bay, Ontario situated at Grandview Lodge has an 'On the Air' schedule each Tuesday from 1330 EST to 1530 EST for Senior Citizen participation. Operation is mostly in the 20 and 15 metre bands.

All Canadian Senior Citizen stations as well as other Amateur stations are invited to check in during these hours.

Les VE3AYZ
Hi-Q Lakehead ARL

Robert H. Fransen VE6RF

The Auto Step Scanner

**A Scanner with some special features
for the ICOM 22S**

It is generally agreed that a scanner is nice to have on the two-metre band for keeping an eye on band activity, propagation conditions, etc. Having seen in the various publications many modifications for the 22S, I just could not find anything suited to my requirements.

However, adapting a 22S to what I wanted became a bit of a challenge after I really looked into it. I had some rather specific ideas as to what I wanted in a scanner, as listed below, not necessarily in order of importance.

1. Should scan at least 10 channels.
2. Capable of scanning short (less than all channels).
3. No defacing or major surgery on the 22S.
4. If possible, an increase in the overall channel capacity of the 22S and scanner.
5. Capable of scanning in simplex-duplex A & B (more later on this).
6. In case of a repeater hang-up or a channel busy more than usual, we would want the scanner to stop on that channel to hear what's going on, but the scanner should not get stuck on this channel or need manual operation to get past the busy channel.
7. Not use very much power, so the present power supply could handle it.
8. It had to be a channel

scanner, not a band scanner (more later on this).

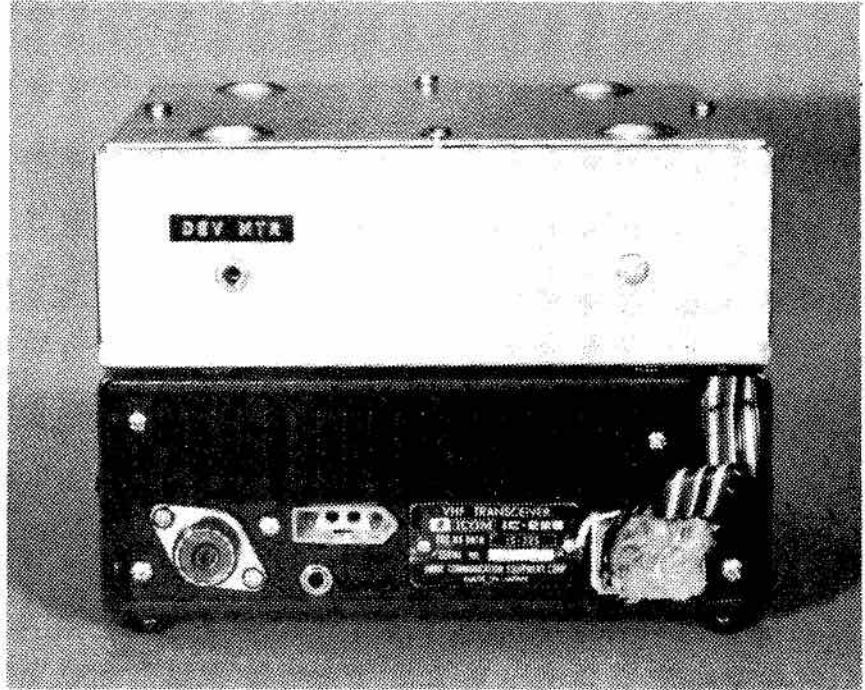
9. One of the scanned channels should be externally programmable so one could keep an eye on any channel within the capability of the 22S just by flipping some switches.

10. It must never scan when transmitting, even when not locked up.

11. Signal hysteresis, in other words, if the scanner stops on a signal just readable, it should not resume scanning until the signal practically disappears into the noise (no stuttering).

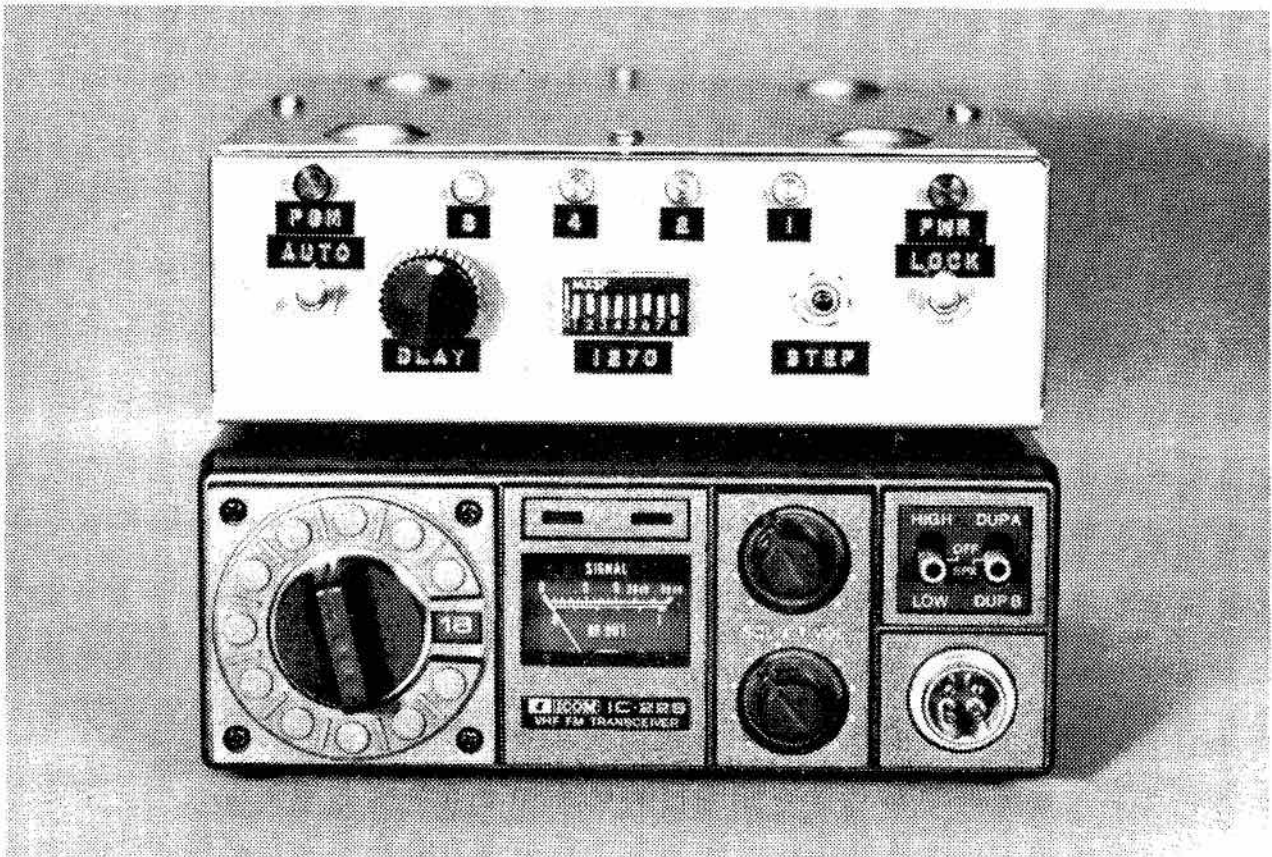
12. Use standard parts, not too expensive and, last but not least, idiotproof.

All in all, I wanted a few things I have not seen anywhere yet.



THE CIRCUIT

Looking at the circuit, some of the circuitry is rather



conventional, like the decoder, but the oscillator/control section is not and has five timers. It does not operate like the average scanner, due to the design of the 22S.

Going into more detail, just switch channels very slowly on the 22S in duplex A-simplex-duplex B, and you'll notice something special. You'll see that between channels in the simplex and duplex B mode, the meter lamp goes out and the background noise disappears (open squelch); in other words, the 22S goes dead. This poses a special problem since practically all scanners are controlled by the carrier being off or on (noise on or off) and the average scanner connected to the 22S would stop between channels because no noise would be interpreted as a carrier. This caused some head scratching and a re-assessment of just how to get around this characteristic.

The circuit of this scanner sets up the diode matrix for a channel, waits for about 100ms for the synthesizer to lock up (the manual says it takes 50 ms but, being familiar with Japanese specs, we wait twice as long) and then it searches for a carrier (noise or no noise) for 1 ms and it either stops or disconnects the channel and goes on to the next channel. In short, one scanning sequence is made up of 100 ms for connection and lock-up, 1 ms for carrier search, and a few milliseconds for safety and parts tolerance and a 5 ms disconnect period.

Proper timing of the timers is the secret of the correct operation of this circuit. The total time of the connect and search periods *must* be less (in timers 3 and 4) than the HI period of timer 2, and this is the only thing that takes a bit of work.

Basically the timers reset and toggle a flip-flop with 3 inputs and 2 outputs: one of the outputs for channel stepping and the other (optionally) for automatic compulsory channel stepping after

a preset period. This is F-F 6A (4027).

The various timers are interlocked to prevent false triggering and faulty operation. Timers 1 and 2 are astable; timers 3, 4 and 5 are monostable (one-shot). The diagram explains it better than I can do here.

The Auto step feature, if used, will step the scanner to the next channel after 3 to 30 seconds, depending on the setting of the Delay pot, and either wait 3 to 30 seconds if the channel is busy or resume scanning at the normal scanning speed of 8 channels per second until it hits the same channel again and repeats the same procedure. The scanner will never get stuck on any one channel and move over the non-occupied channels at standard speed.

The Auto switch also takes out the delay feature (set here for about 4 seconds) so the scanner resumes scanning the moment the carrier drops. The noise picked off the collector of Q14 is amplified by a RCA CA3140 BiMOS op-amp, rectified, and this DC in turn controls Q2 and Q3. They in turn control a Schmitt trigger latch with dual output.

Two sections of the 4011 IC are used for a bounceless step switch, the other two sections are used as inverters. The decoder (4514) is controlled by four flip-flops and I used a nibble (4 bit BCD) read-out for channel indication. It saves power and is interesting to look at, and it also gives a good reason to explain what BCD stands for.

The channel scanning runs from 0 to 15 down through 1, so channel 0 is always number 1 even on short scan. Channel 0 is indicated by a green LED, the other 15 channels by 4 red LED's. The 0 channel (green LED) is the programmable one, so there is no doubt as to what is what.

The 723 regulator gets its shut-off control and reference voltage from lug 23 in the 22S (this lug is not used in the 22S), so the scanner

runs only when the channel switch of the 22S is on channel 23 (a dot on the channel dial). On all other channels of the 22S (1-22), the 22S is just that: no fuss, no bother, no scanner!

The 8 wires from the scanner matrix fit neatly into the top of the 22S matrix board on position 23 (not used either). The feed-back diode across the 723 regulator transistor is to prevent momentary feed-back from the scanner into the 22S synthesizer IC's when switching the scanner in or out. Drive on the 22S synthesizer lines with no V+ on the 22S IC's could do serious damage.

TECHNICAL DETAILS

The pass transistor on the 723 regulator is a 2N3053 or similar. All other transistors are 2N2222's or similar. The diodes in the noise rectifier are germanium, 1N34's or similar; all other diodes are silicon, a 1N4006 on the regulator, the others 1N914's.

All timers are 555's, the other digital IC's are CMOS with the types as per diagram. The electrolytic capacitors are all tantalums. The resistors can be all 1/4 watt types, but if possible use either matched or 5% types on the regulator, the two 3.9 Kohms and the two 2.7 Kohm ones.

The .22 uFD timer caps should really be polystyrene types (I could not get them) for maximum stability, but other types will do as long as one realizes their value may change a bit in time and upset the timing, particularly if they are fresh off the shelf. If possible, try to get some that have been in the bin for some time.

All selected resistors are marked with an S in the diagram and may or may not have the indicated value, but if possible all resistors on the timers should be carbon film for maximum stability.

All CMOS IC's should have a 0.1 uf by-pass capacitor from the

+V pin to ground; these could save you some real headaches. V10 and U11 are CMOS 4027's.

The maximum short current from the regulator is about 200 ma and with a heat sink on the 2N3053 no damage will result if the output is shorted for any reason.

The lug 23 line has two ferrite beads on them inside the 22S, one right at the channel switch and the other one at the accessory connector. The 10 uFD tantalum is mounted with one lead on the No. 23 lug. The ferrite bead size is about 13 mm long and about 5 mm O.D., mix unknown. All this is to keep the synthesizer RF out of the regulator.

The Auto and Lock switches are DPDT toggles. Watch the connections here, it may be a bit confusing. The DIP program switch is epoxied on the front and this switch *must* have a correct channel programmed into it, otherwise the scanner will stop in simplex and duplex B.

The Auto step feature, when used, charges and discharges the 10 uFD capacitor on pin No. 4 of timer No. 1 continuously via the Q output of F-F No. 6.

However, on signal lock-on, Q is LO and \bar{Q} is HI, the capacitor voltage level goes up high enough to trigger timer No. 1 for (about)

130 mS high pulse that, via the 4011 inverter, steps the scanner to the next channel.

PRACTICAL DETAILS

Be very careful, it is very easy to damage the 22S synthesizer IC's by mistake. *Never* apply drive to the 22S synthesizer lines without having the 22S powered.

The 24 pin accessory socket, both halves, and the nice mounting bracket came from ICOM West and are mounted as pictured in the manual. The 9-pin tube socket and dummy plate may be discarded. The wiring between the 22S and the scanner is 16 wire ribbon cable No. 24 stranded. For minimum cross-talk use the wiring arrangements as shown.

The scanner board is made from .1" grid Vector board and so is the Matrix board. The sockets on the board are glued on with a hot glue gun; it works very nicely!

The diode matrix board lines are made from No. 18 wire on both sides of the board and it is mounted above the scanner board itself in the same fashion as the matrix board in the 22S. Leave the wires long enough so it can be lifted out for program changes.

The selected (S) timing resistors on timers 1-2-3 are mounted on terminals above the

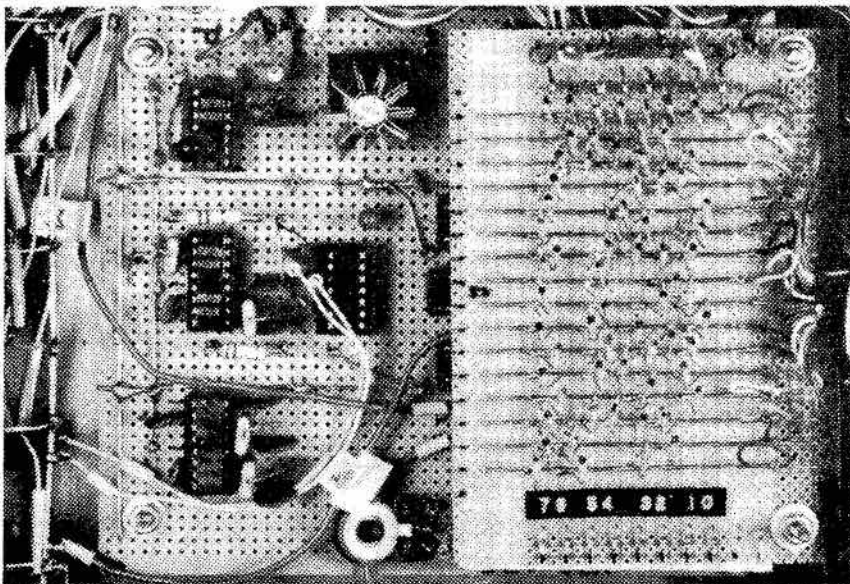
board for ease in selecting and soldering. If all 16 channels are wanted, leave the short scan line from F-F's 10 and 11 floating (open), but if e.g. 10 channels are needed, connect this line to 11th line (output No. 6 on the matrix). Remember the scanning sequence is from 0 to 15 down to 1 (see diagram). The noise line has two capacitors in series. The .1 uFD is inside the 22S, so an accidental short to ground will not do any damage to Q 14 or other parts.

To set the 723 voltage regulator correctly, connect 13.8 VDC to the input of the regulator and a 9 volt battery to the lug 23 control input and set the regulator output voltage exactly to the same voltage as the control (battery) input voltage. By connecting a voltmeter between the battery + and the regulator output + and switching to a low voltage scale on the meter, one can get it very close. Just be sure the regulator output never exceeds the control input voltage. What we now have is a tracking regulator preventing damage to the 22S.

If one cares to use a digital channel read-out, the information can be picked off the four BCD lines, but an arrangement will use more current than the rest of the scanner. With BCD read-out, the maximum current is only 105 ma.

The No. 2 and 3 timers must be set correctly (see timing diagram) with either a good scope or a frequency counter capable of measuring period and time interval. E.g. Timers 2 and 3 have the same period but different HI intervals.

Make Q3 plug-in; by pulling this transistor out, the scanner *must* scan, a good check for performance and when adjusting the timers. It may happen that the scanner stops every time on the same channel with no signal input. If so, put a scope on the noise line from the 22S and if a strong pulse shows once every complete scanning cycle, a minor modification in the 22S is needed.



Look under the matrix board of the 22S and locate C8, the integrating capacitor on Q4 and very carefully parallel a small capacitor (say about 5 uFD) on this capacitor. Watch polarity. Be sure you have the right capacitor because the synthesizer of the 22S is not as per diagram, at least not the ones I've seen.

Make this capacitor just big enough for the scanner to run correctly but not any bigger, otherwise you may have to start the 22S sometimes by flipping the on-off switch when switching channels too slowly in simplex or duplex B. Either add to the one in the rig or replace it, whatever is best.

Do not leave any floating inputs on the 3 unused 4050 buffers. Ground them, the same for No. 6 F-F B, ground all inputs here. On the two 4011 sections used as inverters, both inputs are in parallel for maximum performance. The scanner is mounted in a 2"x6"x8" Bud chassis on the top lid of the 22S with the same 1/2 studs that hold the board inside the chassis. Watch that these studs coming through the top lid of 22S do not cause any shorts.

CONCLUSION

This modification is not exactly a step by step beginners project, as a matter of fact a good

understanding of the circuit action is a must because, due to the timer interlocks, troubleshooting could take some time.

This mod. does not really alter the 22S, and pulling the acc. plug leaves you with a 22S again.

Coming back to our requirements at the beginning of this article, I think we've got it all and then some:

1 = 2 to 16 channels; 2 = yes; 3 = no; 4 = 16 channels added; 5 = yes; 6 = yes, the Auto step feature; 7 = only 105 ma more for the power supply; 8 = see comment below; 9 = yes; 10 = stops scanning on transmit regardless or scanner is locked; 11 = due to the Schmitt trigger latch (IC9) behind the noise rectifier, there is a 3 dB difference between latch on and drop out, just right.

Living in an area with many commercial repeaters and less than a mile from an Amateur one (VE6HM), a normal band scanner is, during working hours (high RF activity), forever stuck on intermod products, spurs, etc. and rather useless. However, a channel scanner can be programmed for specific channels, and if too much trouble shows up on any particular channel, it can be re-programmed.

In addition, the Auto step feature makes it a pleasure,

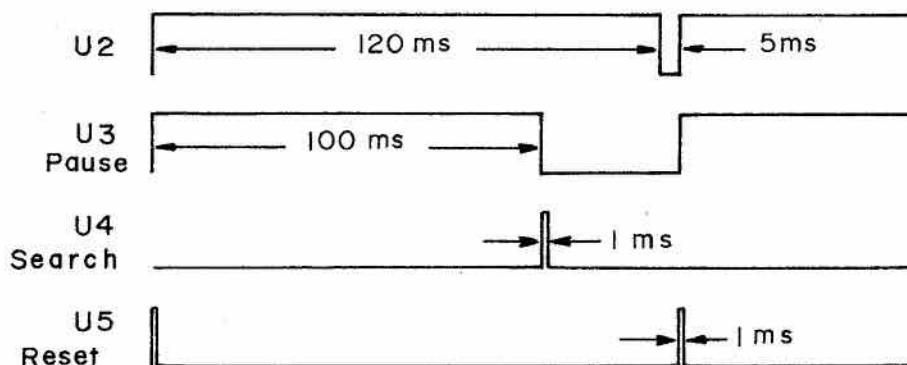
because you'll know what goes on but the scanner won't hang up. Of course, the scanning principle used here could also be used on other synthesized rigs having digital read-out, etc. if suitable modifications are made.

As to requirement 12, I like to think so; it's still going strong.

The accompanying pictures are by Peter VE6PM. He also supplied me with the accessory socket and bracket, truly a man with many connections.

TABLE 1
RIBBON CABLE
CONNECTIONS

Wire	22S Matrix
1	0
2	1
3	2
4	3
5	4
6	5
7	6
8	7
Wire	22S Matrix
9	Gnd
10	Gnd
11	+13.8v
12	+13.8v
13	Lug 23
14	Dev. Mtr.
15	Spare
16	Noise



Pulse Timing Relationship (n.t.s.)

A Note on Saving Tubes

Frank Reeves VE7CT

VE1AKQ's September 1979 article 'Save your Transceiver Tubes' caught my eye because the Central Electronics 100-V xmtr here has 23 tubes. Because I had been trying to 'solid-state' the power supply rectification to reduce internal heat, I experienced breakdowns at turn-on.

The power supply is 120-volt only, and I found that 200 watts of lamps in series gave the suggested 50% heater voltage, but decided an inductor would be better because lamp bulbs are comparatively low resistance until heated up.

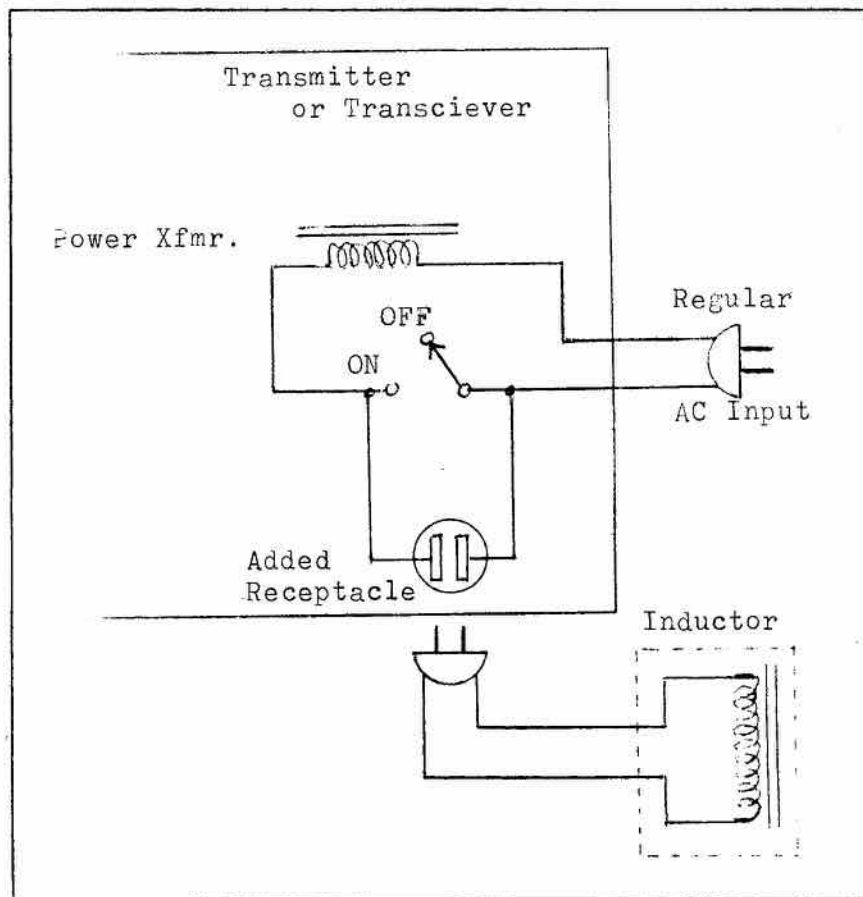
I searched the junk box for a suitable inductor and found a hefty-looking power transformer that had been re-wired with a centre-tapped 140 volt winding. One half of this winding connected series-opposing to a 6.3-volt winding, all in series with the AC feed to the transmitter, gives the required 50% voltage starting condition and starts the two cooling fans turning over slowly.

The 'choke' is mounted externally and connects to a female receptacle wired across the 'AC on-off' contacts of the function switch in the transmitter, see sketch. When shutting down, the Function switch is moved to 'Off'

AND the transmitter AC plug is pulled or its outlet switched off. Then when starting up, the AC cord is plugged in and 30 seconds later the Function switch is operated.

For safety the inductor used

should be of heavy enough wire so that there is no danger of overheating should it be accidentally left on. My operating table shows a prominent red pilot light whenever its heavy 3-way cord is plugged into the AC outlet.





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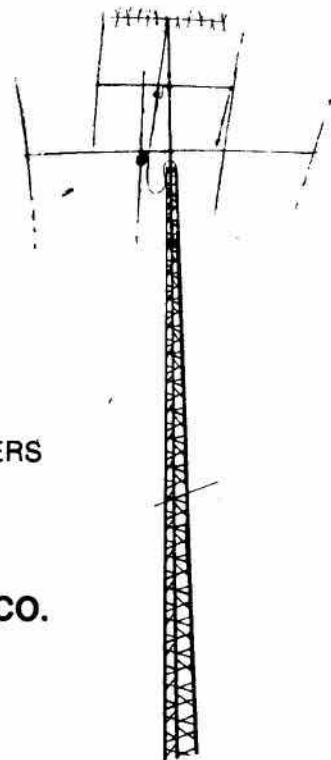
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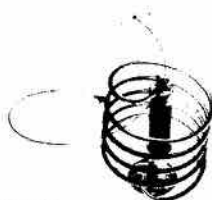
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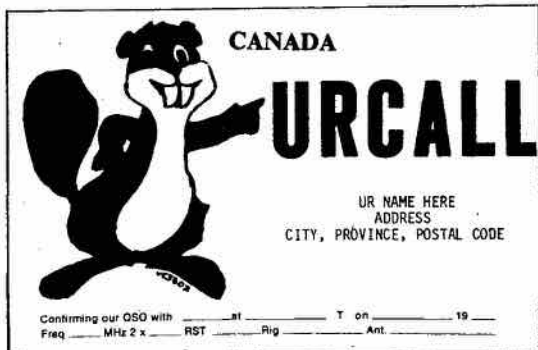
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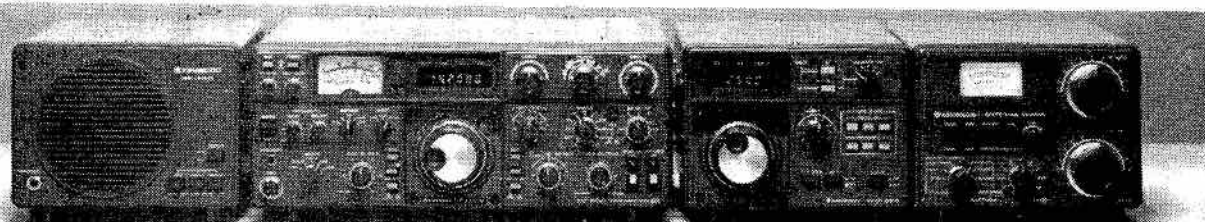
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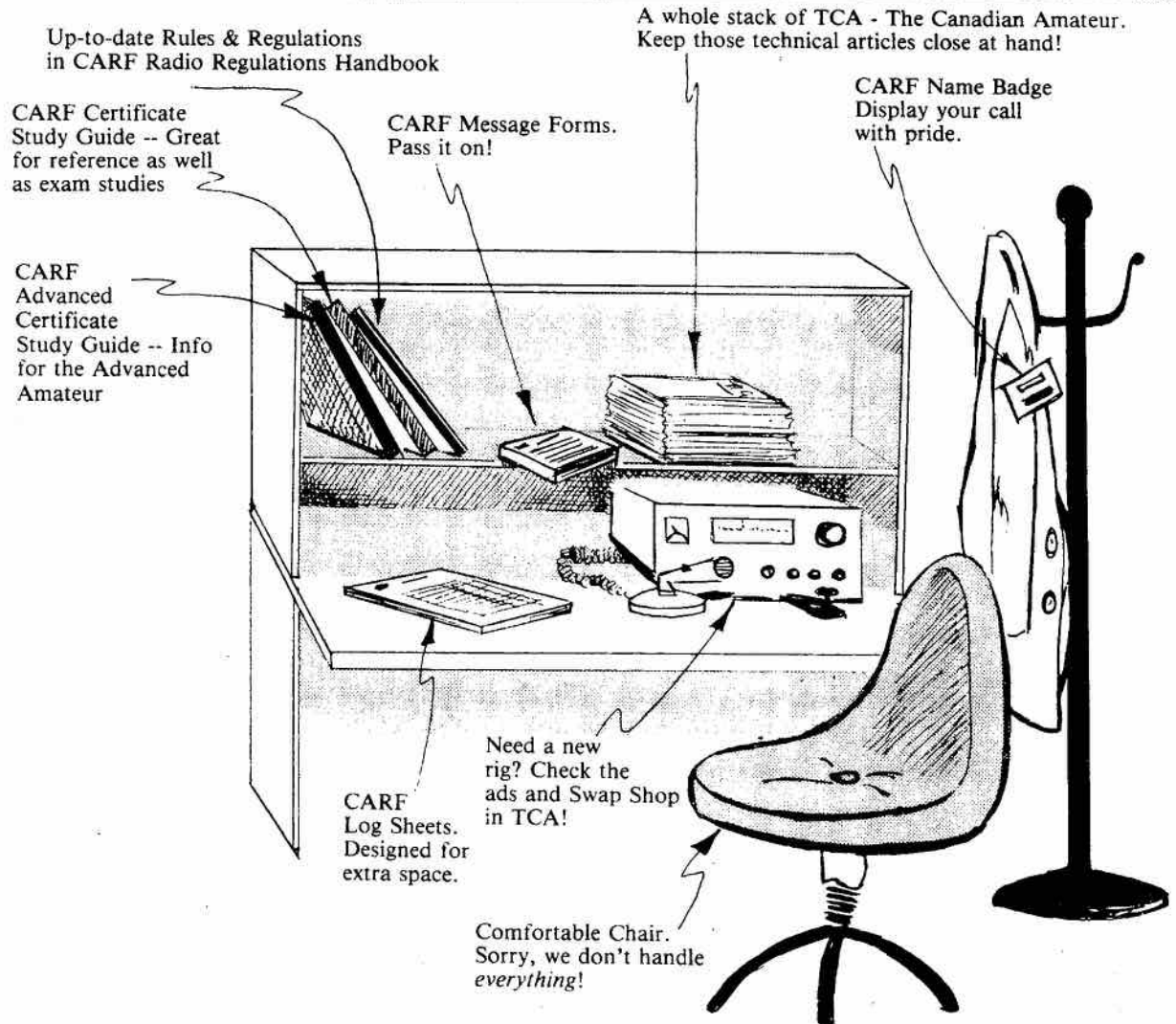
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6. Si vous désirez recevoir une preuve que FRAC a reçu votre envoi de carte QSL, veuillez inclure une enveloppe pré-adressée ou une carte postale avec timbre avec le mot 'Receipt' imprimé.
7. Si un colis était endommagé sur réception (très rare), FRAC vous fera parvenir une liste des cartes reçues de sorte que vous pourrez vérifier s'il y en a eu de perdues dans le courrier.

Traduisé par Jack VE2SF

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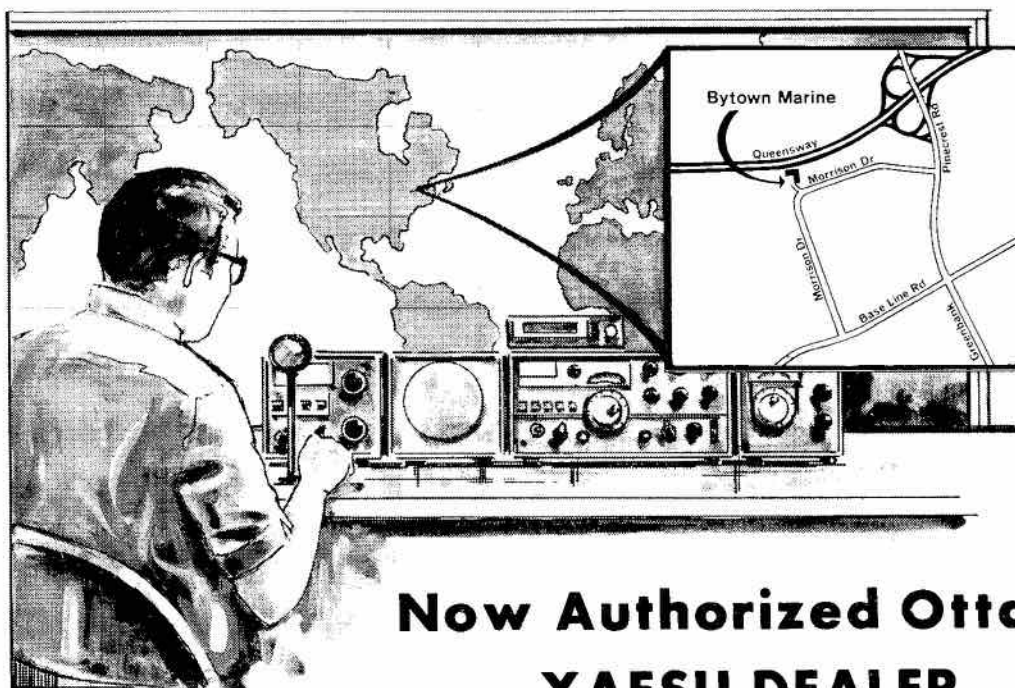
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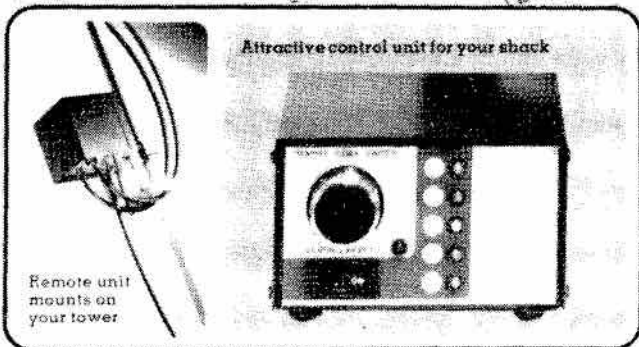
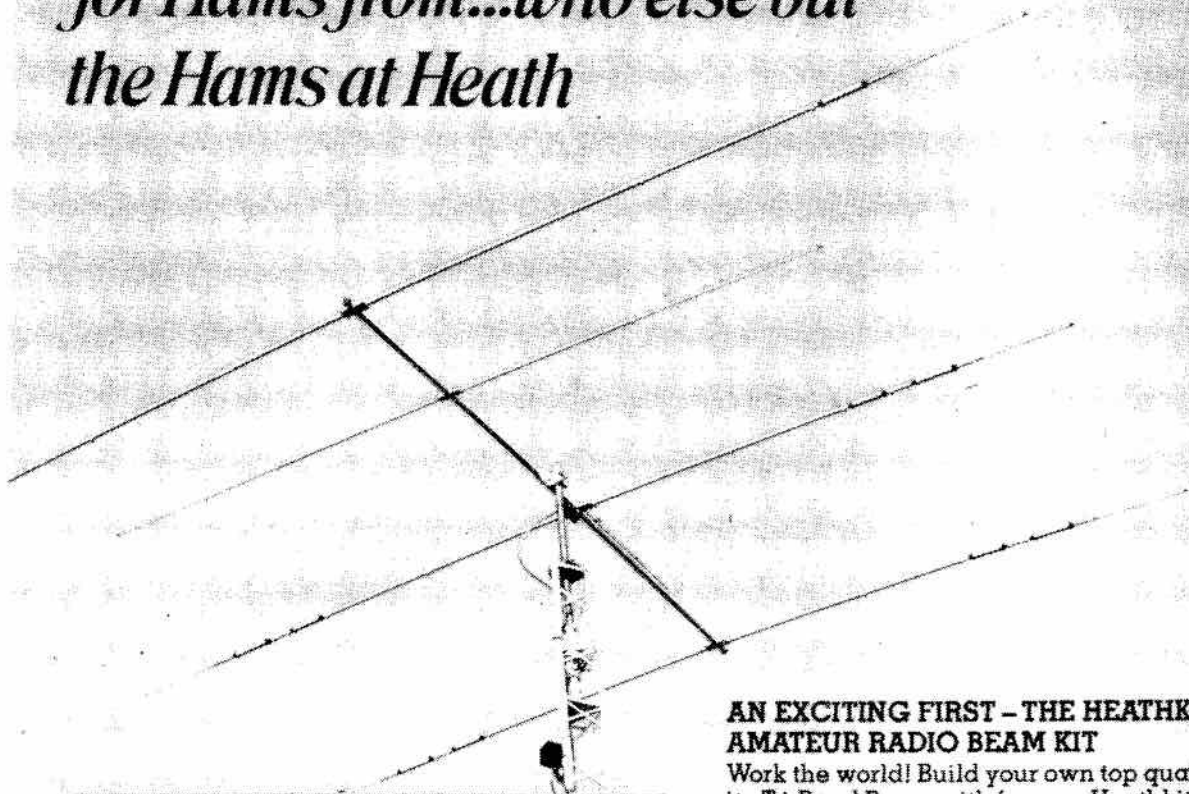


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