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The Canadian Amateur Radio Magazine

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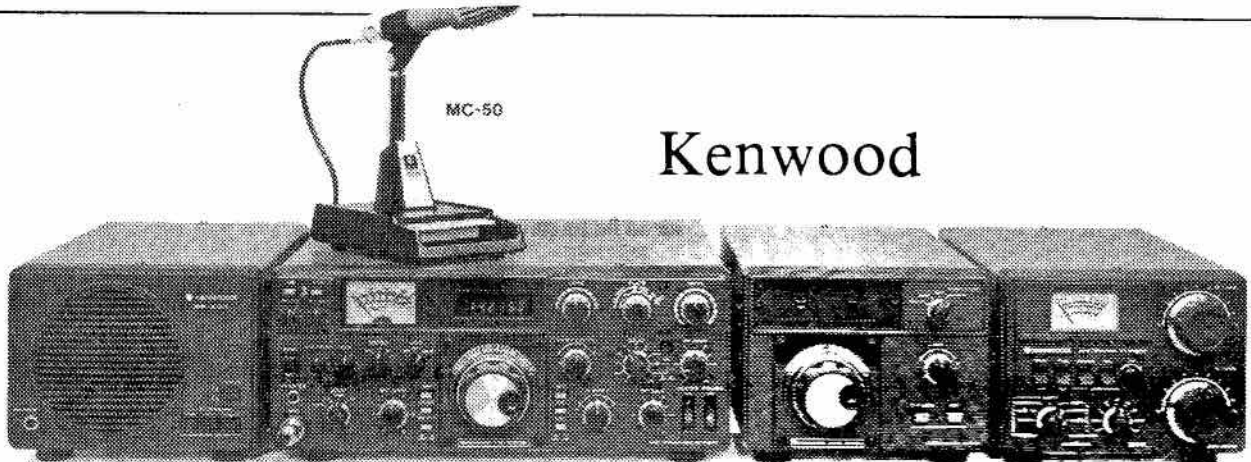
May 1982

Inside the Department of Communications

How to find your way around in the maze of Canada's D.O.C.
Headquarters

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Plus
Contests
DX
VHF/UHF News



Kenwood

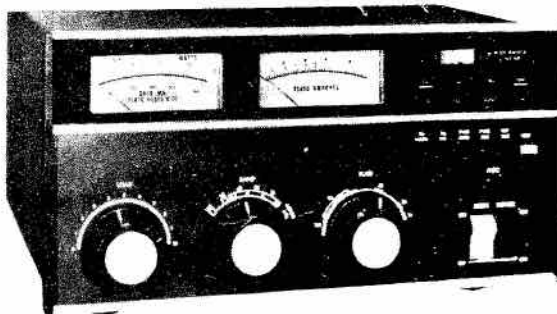
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TCA—The Canadian Amateur is published in Canada 11 times per year to provide Radio Amateurs, those interested in radio communications and electronics and the general public with information on matters related to the science of telecommunications.

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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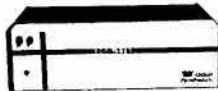
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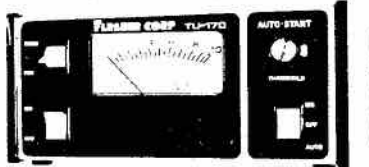


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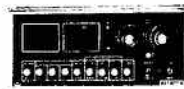
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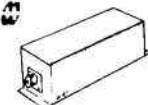
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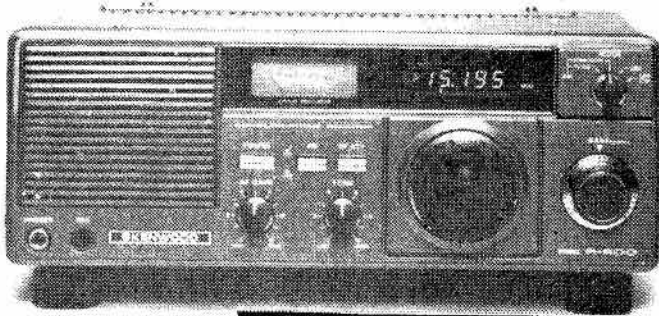
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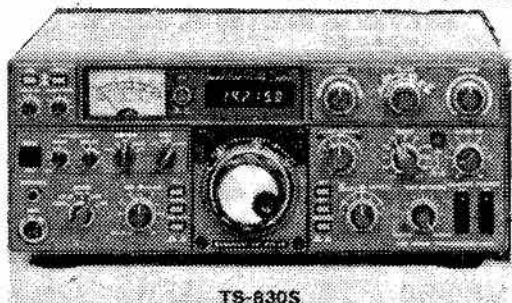
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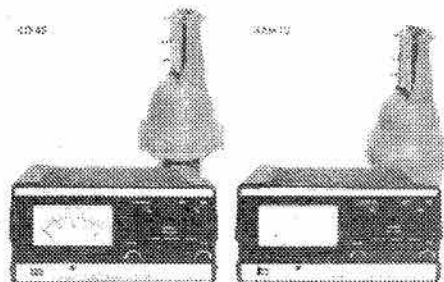
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Classes of Entry: Single operator, all bands; single op, single band; multi-op, single transmitter, all bands. There are separate single operator QRP (5w DC, 10w PEP out) and single operator non-Advanced Amateur classes.

Contacts: All contacts with Amateur stations are valid. The same station may be worked twice on each band, once in CW and once in Phone. CW contacts must take place in the agreed CW-only parts of each band. No crossmode contacts are allowed.

Exchange: Signals Report and consecutive serial number starting with 001. VE1 stations must also send their province.

QSO Points: 10 points for each contact with a station in Canada. 1 point for each contact with others. VE0 counts as Canada. 10 bonus points may be claimed for each contact with any CARF official station, using the VCA or TCA suffix.

Multipliers: Multiplier is the total of Canadian Provinces and Territories worked on each band, on each mode. The Provinces and territories are: VO1/VO2, VE1-PEI, VE1-NB, VE1-NS, VE2, VE3, VE4, VE5, VE6, VE7, VE8, VY1.

Suggested frequencies: CW-1810, 3525, 7025, 14025, 21025, 28025, 50.1, 144.1

Phone- 1810, 3770, 3900, 7070, 7230, 14150, 14300, 21200, 21400, 28500, 50.1, 146.52. We suggest Phone during even hours, and CW during odd hours, Z.

Entries: A valid entry must contain log sheets, dupe sheets and

a cover sheet showing claimed QSO points, a list of multipliers and calculation of final claimed score. Cover sheets and multiplier checklists are available. Entries should be mailed within one month of the contest, with your comments, to: CARF, P.O. Box 2172, Stn. D, Ottawa, Ont. K1P 5W4.

Awards: A plaque will be awarded to the top-scoring single

operator all-band entry. Certificates will be awarded to high scorers in each entry class in each Province and Territory, USA call area and DX country.

Results: Results will appear in TCA, The Canadian Amateur magazine. Non-members of CARF may wish to include an SASE with their entry for a copy of the results.



National Capital Award

Sponsored by the Ottawa Amateur Radio Club, the National Capital Award is issued upon proof of contact with stations located in the National Capital Region of Canada. The award is issued to SWLs on a 'heard' basis. The National Capital Region consists of the cities of Ottawa (Ontario), Hull (Quebec) and the surrounding area.

Stations located in Canada and the lower 48 United States

require 20 contacts, while all others require 10 contacts.

The attractive certificate will be endorsed for band or mode upon request. Fee for the award is \$2 for stations in Canada and the United States and \$3 (or 8 IRCs) overseas. Do not send QSL cards. Send list of contacts giving callsign and QTH of station worked, date, band and mode to: Award Manager, Ottawa Amateur Radio Club, P.O. Box 8873, Ottawa, Ont. K1G 3J2, Canada.

Letters:

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Does your society put out news transmissions for Amateurs, like the RSGB (Radio Society of Great Britain)?

If so can you send me the times and frequencies on the HF bands as I wish to try and DX them.

Colin Watson BRS 465980
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Cumbernauld, Dumbartonshire
Scotland

Yes, Colin, CARF sponsors the CARF News Service which puts out a biweekly news bulletin originating in Ottawa. It is broadcast every Sunday over two key stations which alternate weekends. VE3TCA uses the facilities of the Carleton University club VE3OCU, in Ottawa and the bulletin is repeated over VE2TCA the following Sunday from the QTH of Dave Goodwin VE2ZP in Aylmer, Que. It is then mailed to some thirty official bulletin stations across the country for them to put on various HF nets and local VHF repeaters.

The sked runs every Sunday from about the first week in September to the end of May, when Amateur activity sort of slopes off for the summer. VE3TCA uses all modes and frequency bands from 75 metres to 450 megs. Its VHF/UHF sked, which includes a packet radio hookup with Montreal, is only of

local interest in the National Capital Region and is not detailed here. VE2TCA does not have a teletype facility.

DIGITAL SIGNALS

A friend pointed out to me an article in Dr. Dobb's Journal relating to the radio transmission of digital signals. I would be interested in hearing what work your members have been doing in this area.

I presently live one mile from the University of Waterloo campus. I would like to investigate the possibility of setting up some form of full-duplex link between a home terminal/computer and the larger computers at the University. To be practical, the link would have to be faster than that currently possible using the telephone network. A first approximation would be something like an RS-232-C line operating at, say, 4800 baud. The most ambitious project would provide a radio extension of the current Sytek Local Net 20 Local Area Network. The Sytek system is similar to Ethernet and uses co-ax cable and a bandwidth of several hundred megahertz! It may not be possible to provide this much bandwidth in a radio link.

A project which also caught my eye was the October 1978

P.E. article on microwave communications using the Gunnplexer in the 10GHz band. It would seem a very easy project to apply a digital signal to this device to provide Frequency Shift Keying at a high baud rate. Combining the basic microwave devices with new circuits designed for satellite television reception might provide a simple line-of-sight digital channel. Unfortunately, there is a small hill and a stand of trees between by apartment balcony and the computing centre! It would appear that I need to transmit at a lower frequency, which is why your article on communication at about 200 Mhz is interesting.

I'd like to correspond with any and/or all of your members who are interested in digital radio transmission.

Ian D. Allen
No. 10-326 Erb St. West
Waterloo, Ontario N2L 1W3

WHERE ARE THEY?

Anyone knowing the present whereabouts of the following radio Amateurs is asked to communicate this information to: Mr. J. Nosotti, Supervisor - Enforcement, Government of Canada, Department of Communications, 55 St. Clair Ave.

Sundays

1745Z 14.140 MHz SSB

1830Z 14.070 MHz CW 15 wpm

2000Z 21.078 MHz Teletype: Baudot at 60 wpm followed by ASCII at 100 wpm (VE3TCA only)

2130Z 14.078 MHz Teletype as above

2300Z 3755 kHz SSB

2330Z 3630 kHz Teletype as above

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

East, 9th Floor, Toronto, Ontario, M4T 1M2.

Amateurs: James Melvin Christian ME3JTY, Declan Patrick MacKell ME3MQQ, William Clifford Osborne VE3DTK, Glen Steven Emo VE3EME, David Philip Baskin VE3AYQ, Peter Traynor VE3EFM, Irving Robert Mudrick VE3HKM, John Scott Whittaker VE3KQP, Albert Harold Miller VE3DOA, Harry Thompson Aird VE3AWD, Noble W. Bowes VE3LNB.

DX CONVENTION

The 1982 Northwest DX Convention will be held July 31 and August 1 at the Richmond Inn, located near the Vancouver International Airport. A major door prize will be awarded. Additional information and a program will be forwarded when available. For further information, contact Box 3112, Langley, B.C. V3A 4R3.

G. Hamilton, Sec.
Fraser Valley DX Club
Langley, B.C.

China on the air

Amateur radio will again be on the air from China. According to Tom Wong VE7BC, the first operation began April 1 using the call sign BY1PK on CW only. Tom received the information from the Consul-General of the People's Republic of China in Vancouver. He plans to be in Peking himself on April 7 or 8 along with Noel Eaton VE3CJ and Dick Baldwin W1RU of the ARRL. The three of them will be entertained by the president of the JARL in Tokyo on the way to Peking.

The BY1PK operators are top CW men who took honours in the recent international CW competitions in Korea. They will use English in their QSOs.

Pioneer Club aids in snowmobile rally

Once again the Pioneer Amateur Radio Club (Ottawa) was asked to provide communications for the annual Sno-do 100. This is a 100 mile snowmobile rally run by the Centennial Civitan Club. This is the eleventh year for this rally which supports Diabetes Research in Ottawa, International Special Olympics, P.A.N.D.A., TELCI and other local community needs.

The rally started at 8 a.m. from Lakeside Gardens and proceeded up the Ottawa River to Fitzroy Harbour and returned to Lakeside Gardens. Check points were set up at the "Y" Camp, Baskins Marina, Miss Bayview Store in Bucham Bay, Ferry Landing for the Quyon ferry and Fitzroy Harbour. There were 177 snowmobiles registered in the event. Eleven of these broke down and required transportation back to Lakeside Gardens. One of the eleven caught fire and was completely destroyed.

Approximately \$35,000 was pledged. The people from our club who participated were as follows:

Organizer, Wayne Gethchell VE3CZO; Control (using club call VE3NA at Lakeside Gardens) Joe Blanchett VE3BAD, Geoff Clarke VE3JBD, Brian Wollenschlager.

Check points: Dick Jestin VE3EYJ, Marg Jestin VE3CAM, Barc Dowden VE3TT, Scott Hendry, Alex Milne VE3KIY, Alexis Milne, Bill Cousins VE3GPR, Murray Gold VE3KHG, Eli Desson VE3PI, Judy Mackay VE3KJM; Mobile 1 (worked with transport trucks for disabled snowmobiles) Erik Christensen VE3KIH, Loren Christensen, Bill

Reed VE3JSR. Back-up operators on call Floyd Heney VE3KKA, Brian Martin VE3FXS.

Murray Gold VE3KHG was a back-up operator who had to be called in to replace Bill Cousins VE3GPR on the morning of the event. Bill had a last minute call to report to work at 1300 hours that day.

Communications were handled over our 2 metre repeater VE3TEL. The transmitter location was equipped with two 13 element beams in order to give us coverage for the event. The receiver at the Stittsville ADCOM site provided adequate coverage. Four members - Geoff VE3JBD, Eli VE3PI, Erik VE3KIH and Alex VE3KIY braved the elements to install the beams on top of 160 Elgin Street.

Many thanks to all concerned for participating in this worthwhile event.

Alex VE3KIY

In the January 82 issue of TCA we failed to mention the participation of two Pioneer ARC members in the Canadian Canoe Championships held in Ottawa during the month of August 81. To Paul Williams VE3FHR and Don Stalkowski VE3HUR we extend our regrets. Participation must be rewarded.

Falklands Amateur

Subsequent to the invasion and seizure of the Falkland Islands by Argentina, the last communication was, according to the BBC, a VP8 Amateur. He has not been heard since.

DX

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

I hate to begin a column on a sour note, but it would appear that it is just a matter of time before we have to tolerate an additional 50 kHz of QRM from U.S. Amateurs on the 20 metre band. Initial fears of U.S. phone expansion were dispelled earlier this year, when CARF received a letter from the DOC stating that they had been informed by the FCC, that there were no intentions at the present time of expanding any of the Amateur band allocations. However, in a Notice of Inquiry and Proposed Rule Making, released on February 24, 1982, the FCC has proposed expanding the U.S. 20 metre phone band down to 14.150 MHz for higher class licensees. Interested parties have until July 1, 1982 to file comments, and until August 2, 1982 to reply comments. It will be sometime after this final date that the Commission will make a final decision. This Docket number 82-83, also invites comments on how our recent phone expansion on 40m should influence any American phone expansion on that band.

Among the reasons cited for the proposed expansion are overcrowding, and the fact that with the trend towards transceive operation, using an integrated transceiver, the effect on non-U.S. Amateurs would not be great. I suspect that a lot of those individuals making the decisions have not sat on 20m during a major DX'pedition, and listened to the absolute bedlam, otherwise, they would not have made such an assinine statement. Without the use of split frequency operation during such events, it would be next to

impossible to work the DX station! Further, most of the panic is generated by those higher class licensees to our South—the same ones who will get the benefit of any expansion. Perhaps it might behoove us to get off our collective apathetic derrieres and let the FCC know that there are more than just a few of us who seriously object to such an expansion, and further, object to the rather high-handed approach they have used. Docket no. 82-83 makes very interesting reading, and if you don't want to take my word for the tone of the document, in addition to the implications of such an expansion, I suggest that you acquire a copy, either from the FCC, or from the CARF office.

About the only positive thing that can be said for the proposal, is that it could have been worse. Basically, it was the ARRL plan which was adopted, and it is much milder than some of the proposals. One suggestion had the expansion going all the way down to 14.100 MHz on 20m, and others had similar large phone allocations proposed for 10, and 15 metres. All of these proposals are documented in the Notice of Inquiry, and once again I strongly urge everyone to obtain a copy of the document, and read it carefully.

On a more positive note, we should be able to get on 30m very soon now, perhaps within a few weeks. The band will be available for CW only, and although I disagree with the implementation of a specific mode restriction, in real terms it doesn't matter, as the rest of the world, with the exception of a

few Australians, are all operating CW only (although I might hasten to add that many do have the choice of working phone if they so desire).

Bits & Pieces

A92 ... Bahrain ... To comply with the ITU regulations, A9X had followed the lead of many other nations, and the new prefix is A92. Look for A92CE on CW around 14.005, between 1300-1400 GMT. QSL's go via the CBA, or buro.

BY ... People's Republic of China ... Thanks to the tremendous efforts of Tom VE7BC, and others, BY1PK finally made its appearance on the HF bands. First heard during the week of March 28, between 0200-0300Z, on 20 and 15 M CW. Hopefully this station will soon be joined by others. The operator is a Chinese national, and apparently operates most frequently during his lunch hour. BY1MA was a phoney.

FW8WG ... Crozet ... Georges remains very elusive. U.S. nets seem to draw him occasionally, but will not take any Canadian check-ins, claiming that we can work him later, below 14.200. Naturally, when later arrives, Georges is tired, and goes QRT. If you still find Crozet on your wanted list, better get moving, as Georges is reported to be leaving soon. Exactly when, and whether he will be returning to the Island is not known.

VE1AI/1 ... Sable Island ... Dick will be going to Sable around May 9th for a few days. How much time he has to operate will be determined by

how much work he has to do. (With luck, he will have Walter, and Harley with him, and inclement weather will keep them all from making it back to VE1DXA in time for the WPX CW contest -- I'm only kidding fellows -Hi!) QSL's go to VE1AI's CBA.

XV5ZV ... Vietnam ... Another phoney! N6ZV who was supposed to be the operator, and to whom QSL's were to be directed is apparently furious over the use of his call.

S9 ... Sao Tome ... 5R8AL is going to S9 at the beginning of May for one month, and hopes to have a licence. No further information is available at this time.

TL8 ... Central African Republic ... TL8RC and TL8GE are still active. TL8JM has left, as has TL8CN. TL8WH has gone to TR8 for three years.

The recent Yasme operation from FYOFOL netted 11,000 QSO's in 24 days. QSL to Yasme.

If you think that the Russian 'Woodpecker' is bad, then wait until the American counterpart becomes operational sometime in 1983. It will have a power output somewhere in the 1.2 megawatt ERP range, and operate in the 5-25 MHz part of the HF spectrum. It is located in Maine, near a small town, coincidentally named Moscow. Bye-Bye 40M. (And 20,15, etc.).

QSL Information

CALL QSL Via

H44SH AD1S
 HS1AMM VE3GCO
 HKOBKX WB4QFH
 T32AE PA0GMM
 T30DB G8LGB
 T30BD PA0GMM
 T30AT G3XZF
 T30AE KB7SB
 T32AB N7YL
 VS6IC W2PD

VS6BT DL2GU
 VP5WJR KA5BPE
 VP5JCR N4CTC
 VP5GCM NF2AF
 V2AMK N0DH
 VS6IC W2PD
 VQ9CW WB1DQC
 VP2MO KA4MOT
 VP2MMP N0DH
 VP2MKD N0DH
 VP2KBC W2QM
 VP2EX WB9VFA
 VP2EDX WABCZS
 VP2ED AD8J
 VP2EC KM5R
 VP2EB WB8DQP
 VK9NYG VK6NE
 VQ9BP N2BIM
 VS6DO K4CIA

VK9XT VK3OT
 VK9ZH VK6YL
 VK9NM/LH DJ5CQ
 VQ9JB WD5BHP
 XV5ZV N6ZV
 YBOPG KB5AS
 ZD9BV W4FRU
 ZD8MW G3G1Q
 ZD8DM G4HJV
 ZF2FU W2LZX
 ZF2FL N6RJ
 ZF2CK WB9QPN
 ZD8JGN W9CN
 ZD8TC N2CW
 4K1A UA3AEL
 5N9GM I8XIU
 5NOKUY JI1IMI
 7Z2AP I8YCP

DX Activity- Band by Band

Band	Call	Time(Z)	Freq.	Band	Call	Time	Freq.
10M	Z21AR	1640	28.446	20M	XV5ZV	0200	14.001
10M	5N9GM	1635	28.553	20M	TG9GI	2346	14.189
10M	VK9NYG	1330	28.510	20M	EA9GN	2338	14.194
10M	VK9NM/LH	0215	28.505	20M	VQ9BP	1200	14.211
10M	TR8IG	2150	28.024	20M	3B8DA	1155	14.221
10M	VK9ZH	0157	28.516	20M	ZLOAEO	1150	14.208
10M	VK9NM/LH	0123	28.505	20M	7Z2AP	0548	14.230
10M	ZD8TC	2020	28.030	20M	HS1AMM	1520	14.160
15M	6D5J	1317	21.248	20M	YBOPG	1510	14.202
15M	FG7XL	0409	21.262	20M	ZK1CG	1411	14.198
15M	HKOBKX	1455	21.030	20M	HS5AID	1545	14.161
15M	DU1TDY	1600	21.253	20M	BV2B	1440	14.216
15M	5NOWRH	2145	21.025	20M	FR7BP	1422	14.004
15M	6Y5SH	1611	21.288	20M	9V1VL	1457	14.195
15M	QD5RZ	1714	21.306	20M	YBBAEG	1457	14.195
15M	5NOWNL	1955	21.310	20M	VS6CT	1355	14.224
15M	5NOKUY	2140	21.287	20M	JD1BAX	1321	14.021
15M	CN8BX	2030	21.301	20M	VS6DO	1310	14.204
15M	VQ9JB	2005	21.297	20M	YB7AAU	1310	14.193
15M	9X5MH	1955	21.166	20M	CT3BM	1050	14.209
15M	9J2TJ	2322	21.276	20M	4K1A	1038	14.209
15M	A22DC	2045	21.240	20M	T32AB	1032	14.209
20M	VU2UGI	0136	14.001	20M	VU2AVG	0105	14.203
20M	UI8OK	0105	14.020	20M	VS6KV	1256	14.201
20M	OY7ML	0011	14.020	20M	UG6GBM	1457	14.020
20M	UM8PAA	2057	14.014	20M	VK9XT	1145	14.203
20M	VK9XT	0015	14.024	20M	4S7WP	2305	14.008
20M	YB3DC	1306	14.202	40M	J3AE	0557	7.005
20M	YBOPG	1306	14.201	40M	3B8CF	0226	7.004
20M	H44SH	1253	14.214	40M	VK2PY	0840	7.083
20M	6D5J	1249	14.198	40M	HC1NFK	0835	7.085
20M	FR7BX	1244	14.013	40M	EABXS	0832	7.085
20M	VS6KV	1256	14.201	40M	FKBCR	0814	7.085
20M				40M	6W8DY	0824	7.085
80M	HC1BI	0430	3.797				

I would like to thank Bob Eldridge VE7BS, for his kind letter. I will incorporate his comments on 160m into an updated column on that band later this year. I would also like to praise VE3INQ for his back-breaking efforts to stimulate, and report activity on 160m. For further information, I

suggest writing to VE3INQ at his CBA.

Thanks go also to Pierre VE2FOU for taking time away from his studies to send all his very useful DX information. Pierre has been a regular contributor to this column. By all means Pierre, send along a photo. Good luck with your

course.

I would like to acknowledge the contributions of VE3JLP, VE2ZP, VE3FRA and DX Report, Long Skip and the Canad-X Net, and the DARC DX information net for much of the information appearing in this month's column.

Some comments on DGTR-026-81

The new proposed regulations changes bring good news to the Canadian Amateur fraternity.

The new regs. would permit 160 Metre mobile operation and a complete restriction lifting in the 1.8 to 1.9 MHz spectrum. The top end of the band remains usage restricted until the remaining three LORAN stations are closed on the east coast.

The new section 48.1 exempts the visiting Amateur from requiring a Canadian license if their country offers reciprocal arrangements while they are operating in **Canada**. They must still receive written permission from the DOC and the mode and spectrum commonality requirement is still in effect except on two metres. They will now be allowed to use the 146 - 148 part of the spectrum.

This raises an interesting problem case. What's the rule when the visiting Amateur finds themselves talking over a linked radio network using the 220 (only Amateur in North Am.) or the 902 - 928 Mhz Amateur bands (only in Canada now)?

It must be remembered the U.S. Amateurs are exempt from the above due to a long-standing treaty but they do not have a 902 MHz band yet.

Language clarification in section 58 says that the call sign of the visited station must be used by a visitor. Further refinement of the operating requirements are clarified.

The revised section 64.x deals with power and bandwidth concerns and the good news is bandwidth increases for TV to 6 Mhz and FSK back to 900 Hz as it was several years ago. These are a couple of the requests from the Winnipeg Symposium. Digital users will love 900!

Still not clarified in these revised regulations is a concise definition of bandwidth. A 3db bandwidth with certain pulse modes is a bit of a joke when you consider the sidebands which theoretically extend across the **entire spectrum**. The required definition is probably stated elsewhere but for clarity could be reproduced in this section.

The way is opened for ten metre repeaters by a modification of the carrier suppression requirements between 29.5 to 29.7 Mhz in section 64.5 (a) but because of section 64.5(b) it better have no tail! Also no changes were done to the bandwidth of signals on 10 metres, so 6 KHz of ± 3 KHz deviation is all that's allowed from a FM transmitter. In fact

there may be no real need to increase it.

These were other items from the Winnipeg symposium.

I am quite surprised to find that the 902 - 928 Mhz spectrum is only listed with AM (ssb etc.) and FM modes. At the Winnipeg symposium I thought I had caught the comment that all the other 'regular' modes were also permitted and were accidentally left out during the last TRC25 printing. As the revised schedules were included to show the new international mode designators beside the bands I hope it's a case of simply translating from the misprint on TRC25 to the new proposed changes.

The new mode designators seem strange as I have never seen the full table of mode designators from the International Frequency Registration Board. One would assume that there is some meaning to each of the suffixes used i.e. A, E, F, C etc, and a full table would include others as well. I see that the intended definition of F3C corresponding to the old facsimile also includes Slow Scan TV which can have up to a 6 KHz bandwidth.

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Waterloo, Ont. N2L 4R5

VHF/UHF News

John Dudley VE5JQ, 3125 Mountbatten St., Saskatoon, Sask. S7M 3T3

This month we continue our introduction to the various VHF-UHF bands. Our focus is on two metres.

TWO METRES

Two metres is the first VHF band that many hams encounter. The popularity of two metre FM throughout the world is unsurpassed. FM and repeaters dominate the upper part of the two metre band. However, there is an interesting world of activity between 144 and 146 MHz which is non-FM.

A general band plan of the lower two MHz of two metres is CW from 144.000 to 144.100 and above this one finds single side-band from 144.100 up to 144.500 and higher. At present, 144.2 is the calling frequency on two metre side-band. Weak signal work including EME generally is in the lower part of the band between 144.000 up to 144.100.

There are almost as many different propagation modes on two metres as on six metres. The bread and butter DX mode on this band is tropospheric propagation. This is a weather-related phenomenon and includes such things as thermal inversions and tropospheric ducting.

A thermal inversion occurs when a warm air mass is sitting above an area of colder air. The region between the two bodies of air can refract or bend radio signals. If a high pressure system stays in one place for more than a day, this is a good indication that inversions may occur.

Tropospheric ducting is a similar phenomenon, but is the result of wind-shears which produce two different masses of air. This can produce a duct

with either end of the duct being at different elevations. Ducts are often quite frequency selective and may only pass certain frequencies while thermal inversions are less fussy.

Aurora, discussed in last month's description of six metre propagation, is also used on two metres to good effect. The aurora must be more intense to produce reflection of the radio signal at two metres than on six metres. For stations in Canada and the northern United States, it is a good mode for DX contacts. During the intense auroras of April 11 and 12, 1980, your writer worked stations in the neighbouring provinces using just 10 watts and a simple beam antenna. High power and bigger antennas, of course, will allow the observant operator to milk this mode for all it's worth.

Sporadic E propagation, the bread and butter DX propagation of six metres, is also a useful mode for DX contacts on two metres. It occurs much less frequently, however, on two metres than on six metres. For a sporadic E cloud to reflect two metre signals, it must be a very densely ionized one. These clouds do occur, but quite infrequently at these latitudes. Constant monitoring of the 144.2 MHz calling frequency during the summer months will allow one to catch these rare events. Signals can be very strong and low power and simple antennas can make contacts out to 1200 miles quite easily. As there is much more activity on FM, FM stations and repeaters can serve as very useful beacons for band openings.

Meteor scatter is a widely

used propagation mode to conduct DX contacts on two metres. Hundreds of thousands of meteors enter the earth's atmosphere every day. At times throughout the year, the earth on its course around the sun passes through the trails of various groups of meteors and their associated debris. This produces a greatly increased number of meteors entering the earth's atmosphere. As meteors enter the atmosphere, they leave a trail of ionized air as they burn up. This ionization can reflect radio signals and the larger the meteor, the greater the ionization.

The ionization the meteor produces is very short-lived and thus only a word or a few CW characters may be reflected to the receiving station at any one time. However, with persistence and scheduling, enough information can be passed between two stations to make a contact. Many contacts are made by prearranged scheduling; each operator agrees to transmit during alternate 15 second periods. When calls have been identified, signal reports usually just consisting of signal strength are exchanged. Rogers, following the completion of exchange of signal reports, complete the contact.

As you can see, this is a difficult and often laborious way of making contacts, but is a much more reliable way than waiting for sporadic E or auroral or tropospheric openings. Larger stations are able to sometimes work other stations on meteor scatter by calling CQ randomly. To work meteor scatter, stations should have at

least 100 watts output and a good 12 to 15 dB gain antenna.

EME is also very popular on two metres. The two metre band is probably the most popular for this exciting mode of communication.

In the last few years, there has been a proliferation of stations operating two metre EME, some of them using very large antennas. Some of these stations have upwards of 25 dB antenna gain and can work stations with a relatively small antenna such as one or two long boom yagis. For consistent results, four long boom yagis and a kilowatt in addition to an antenna mounted pre-amp will provide many contacts. I shall cover EME in more detail in the coming months.

Equipment for two metres as for six metres varies from complete transceivers through to transverters to be used with existing HF equipment. The 10 watt output Japanese transceivers are quite popular and make fine starting units. A two metre beam is relatively small, so even those Amateurs with not much room and who would consider mounting an HF beam, may be able to put something decent up for two metres.

Amplifiers are available in the solid state variety up to 150 watts or so. Beyond this, vacuum

tubes are still the only way to go and there are numerous designs available. I have a list for reference of two metre amplifiers for anyone wishing to consider such a project.

RUSSIAN SATELLITES

In December, six Russian satellites designed specifically for Amateur radio, were launched. Apparently they all went up on one rocket and have been numbered RS3 through RS8. They are somewhat higher in orbit than the now-defunct Oscar 7. At the time of writing, all of these satellites have beacons which have been heard.

RS5 through RS8, in addition to beacons, also have a transponder to allow two-way communication via the satellite. All of these transponders are of the so-called Oscar Mode A variety, that is, a two metre uplink with 10 metre downlink. Please refer to the table for more specific information.

In addition to the transponders and beacons, RS5 and RS7 have an autotransponder. This is a computer-based unit within the satellite which will conduct a QSO with a station. These units have been referred to as robots. Please refer to the Table for the appropriate uplink and downlink frequencies for the robots.

The appropriate procedure to contact the robot is to listen to the satellite and, if it is calling CQ, eg. "CQ de RS7", then transmit on the uplink frequency and you should hear your downlink at the appropriate frequency. Transmit in the following format: "RS7 de VE5JQ AR". If the satellite has copied your call correctly, it will repeat your call and thank you for the contact. If you are sending too slow or too fast, you may be sent a QRQ or a QRS. I have also heard reports that the satellite will also respond with QRM or QRN while it is attempting to identify a call sign. This certainly is an amazing feature of this latest series of Russian satellites.

As you can see from the Table, the period, or length of time it takes to orbit the earth, is almost two hours. This results, of course, in an increment of about 30 degrees as, of course, the earth turns about 30 degrees every two hours and thus the satellite on its next orbit is going over a path some 30 degrees west of its last orbit.

For up-to-date information concerning specific times for various equatorial crossings for the satellites, tune in to the AMSAT Net on Sundays on 14, 282 at 1800 GMT or 21, 282 at 1900 GMT. On Tuesday evenings

TABLE - RUSSIAN SATELLITES

Satellite	Beacon (MHZ)	Transponder (MHZ)		Robot (MHZ)		Period (Minutes)	Increment (degrees)
		Uplink	Downlink	Uplink	Downlink		
RS3	29.321/29.401	--	--	--	--	118.5	29.76
RS4	29.360/29.403	--	--	--	--	119.4	29.98
RS5	29.331/29.452	145.910-145.950	29.410-29.450	145.826	29.331	119.6	30.02
RS6	29.411/29.453	145.910-145.950	29.410-29.450	--	--	118.7	29.81
RS7	29.341/29.501	145.960-146.000	29.460-29.500	145.835	29.501	119.2	29.30
RS8	29.461/29.502	145.960-146.000	29.460-29.500	--	--	119.8	30.07

local time on 3850, a series of AMSAT Nets progressing from the east coast to the west coast take place. All of these Nets provide up-to-the-minute orbital data for the Russian satellites and also Oscar 8 and UOSAT-9.

The transponders in the Russian satellites have good sensitivity and 10 watts and a simple antenna can allow for some contacts. The signals at times seem stronger at night because the MUF is lower than 10 metres and there is not the attenuation of signal that often

occurs during the daylight passes. The height of these satellites will allow intercontinental DX to take place depending on your location in North America. Most of Canada should be able to work Europe. The stations as far east as Ontario might be able to work Japan and indeed the western provinces should have no trouble doing so. For more information about the telemetry which is sent on the beacon frequencies, consult Orbit Magazine for June/July of 1980, page 19.

REFERENCES

1. Propagation, Chapter 2 in VHF-UHF Manual, third edition, Evans and Jessop, RSGB, 1976.
2. Meteor Scatter, page 68, QST, July 1981.
3. VHF Meteor Scatter Propagation, Ludlow, Radio Communication, February 1978.
4. Meteor Scatter: Theory and Practice, Danboldt, VHF Communications, 6, pg 194, (1974).
5. Satellite DX and Propagation, Gowan, Orbit, June/July 1980, pg. 19.

Why I like CW

CW grows on you. It has all the lure of a musical binary coded asynchronous digital bit stream. It has expression and it has character and it tells a lot about the operator. It is a man to machine -- machine to man interface. It is the original machine language.

CW conserves spectrum and many times secures privacy. Some people use it as a form of relaxation -- to get away from the splatter and catcalls of SSB -- or just to communicate. The thrill of an answered CQ is never lost with CW as your mind races to guess who's at the other end.

CW can be easy for some. Think of all the ways you can send CW: car horn, boat horn, flashlight, buzzers, whistles, drums, tubas -- even an open pop bottle. How about two stones under water? Two hams can really have fun on a double date or at a house party! Bilingualism doesn't matter -- it all sounds the same on CW -- in any language. You can even sneak a laugh on CW and the uninitiated would never know the difference. Silent mirth.

All these modern fancy paddles, oars, squeezers and

even RAM with buffered keyboards scarcely manage to replicate CW -- the real McCoy or McElroy (if you remember when). Beware of imitations -- they say computers can even synthesize the stuff. Why don't they put a keyjack on computers? I can't think of a cheaper keyboard.

Shaped keying may not improve signal to noise but slow keying can. It really shines in weak signal reception -- when the chips are down -- in an

emergency -- how many ways to send an S.O.S.?

CW is communication without the voice, yet the accents are there -- finger talking is the mettle of the Amateur -- the CB/Amateur separator -- the Amateur's fingerprint -- a common denominator.

There are those who would propose licensing Amateurs without a code requirement. I wish they would try CW -- it sure grows on you.

Ralph Cameron VE3BBM

VE3UD goes Silent Key

I was saddened to learn of the recent death of one of Canada's most revered Amateurs. Bud Punchard VE3UD was felled by a heart attack at his residence in Central Ontario during March. I knew him for only a relatively short time, but during that time I came to respect the knowledgeable, personable and open aspects of his personality. He was enthusiastic about Amateur radio in a way that would make most of us look selfish by comparison. He was the inventor of the 'Iceless Antenna' (using wax for the

antenna wire).

For many years Bud had provided Amateur Radio with a presence that made outsiders view us with envy. He was chairman of the WARC '79 committee for CARF, and was asked to represent Canadian Amateurs for the DOC in Geneva. Canadian Amateurs never had better representation on an international basis.

Professor, lecturer, executive, worker, participant, all these and more were Bud Punchard; but most of all, a gentleman. VE3ARS

Contests

Dave Goodwin VE2ZP, 4 Victoria Place, Aylmer, Quebec J9H 2J3

CONTEST CALENDAR

May

8 World Telecom Day SSB*
8-9 USSR CQ-M*
9 DARC RTTY
15 World Telecom Day CW*
29-30 CQ WPX CW**

June

12-13 ARRL VHF
19-20 All Asia SSB
26-27 ARRL Field Day

July

1 **CARF Canada Day Contest**
10-11 IARU Radiosport
17-18 International QRP

August

7-8 ARRL UHF
14-15 European DX CW
21-22 All Asia CW

* see April TCA

** see Feb. TCA

The ARRL DX SSB has come and gone, and there seemed to be a fair deal of Canadian participation. Among the all-band front runners are VE6OU and VE3BVD. VE1BRB appeared to carry 20 metres single band by himself, and there was a fair number of Canadians who were found only on 10 or 15 metres. There may be some real competition in these two classes. So far, no word about scores has been heard.

The following weekend, the RSGB Commonwealth CW Contest saw a very high level of Canadian participation. In fact, there was a high level of participation from all over the commonwealth. Plenty of VKs, ZLs and a super turnout of Gs served to make this a very pleasant contest. As well, some quite rare countries showed up, like C53, T30, Z2, ZB2, 9V1, VK9N, VS6 and certainly some others. Among the Canadian high scorers are VE3BVD, VE6OU and VE7CC, all with scores over 7000

points.

Following at a respectful distance were VE2ZP, VE2QV, VE3JKZ and several others. VE7CC will probably take first place not only in Canada, but for all the commonwealth.

In the Bermuda Contest, where the prize for the top entrant in Canada, USA, UK and West Germany is a trip to the RSB annual dinner in Bermuda, VE3KZ, VE2QV and VE1BRB were featured contestants. I apologize for not getting the rules into print, and I promise they will appear here next year.

The WPX SSB results for 1981 have come out in March CQ magazine, and 1981 appeared to be another 'year of the Canadians'. Canadians showed up in the top ranks of every class except Multi-Multi (for lack of entries) and 28 MHz single band. A new world record was made by Tom VE3MFT on 1.8 MHz single band, and he remains as the sole Canadian on the World records list in this contest. CK7WJ's multi-multi record remains as the other North American record

from Canada, it being set in 1979.

On the Canadian records table, six new records were set in the ten classes of competition, leaving the oldest record only two contests old. Perhaps by the time this is read, those records not beaten this year will be rewritten.

VE7BTV came seventh world high to beat his old VE all-band mark by about 200k. VE7ZZ nosed out VE7CML to set the new VE record on 21 MHz, almost 500k better than CML's effort last year, and they earned sixth and seventh places worldwide for their efforts.

VE3KZ, placing second world high, moved up the 40 metre record by about 80k, and VE2ZP updated the old 80 metre mark, set by VE3KZ 11 years before. Both VE1DXA and VE6OU beat the standing Multi-Single mark, and came within 50k points of each other. 1981 was certainly a good year for the WPX. Another noteworthy score was VE3KKB's 5th World High QRP score, beating out 9 other high-powered VE all-band entrants!

VE7BTV and VE7ZZ are the winners of the only two trophies

Canadian Records, WPX SSB Contest			
Class	Call	Score	Year
A	VE7BTV	3,328,654	81
28	VE3BMV	2,796,255	80
21	VE7ZZ	3,463,185	81
14	VE7IG	1,788,825	79
7	VE3KZ	560,976	81
3.5	VE2ZP	405,144	81
1.8	VE3MFT	84,906	81*
QRP	VE3KZ	507,210	79
MS	VE1DXA	5,671,485	81
MM	CK7WJ	16,545,370	79**
* World Record			
** North American Record			

Tnx VE3KZ in Long Skip

going to Canadians in this contest. One bad bit of news that came with the results was that we will have to wait around until the May CQ for the CW results.

Results of the Canada Day Contest of last July should appear elsewhere in this issue, as well as the rules for this year's contest. The results speak for themselves, and I must say I was pleased to see so many entries make it through

the postal strike. I don't think we will have that kind of problem this year, so there should be no excuses for not sending in your log on time. This contest, by virtue of the high number of Canadian participants, should really have a profound effect on anyone's standing in the Canad-x Canadian Contests Championship, and I hope some of this country's top contest talent will show up.

Social Events

The Southern Ontario Repeater Team, Inc. of London, Ont. proudly presents the first annual **SORT Fleamarket and Computer Faire**. Sat., May 15, 1982, Medway High School, 75 Medway Road, Arva, Ont., 3 mi. north of London. Hours 9 am to 3 pm. Admission \$2.00. Indoor and outdoor booths, demonstrations, commercial displays, food service, Prizes. Enquiries to P.O. Box 73, Hyde Park, Ont. NOM 1Z0. Talk-in on VE3TTT 147.78/147.18; VE3TTT 449.40/444.40.

Plan to attend the **Eighth Annual Ontario Hamfest** hosted by the Burlington Amateur Radio Club at Milton Fairgrounds, Saturday, July 10. Fleamarket, displays, auction, contests and prizes. Admission \$3 per person and \$2 for pre-registration. Camping will again be available and grounds will be open on Friday night for early campers. For pre-reg., contact Mike Cobb VE3MWR at P.O. Box 836, Burlington, Ont. L7R 3Y7.

Central Ontario Amateur Radio Fleamarket sponsored by the Guelph ARC, VE3ZM, will be held Sat., June 5 at Regal Hall, 340 Woodlawn Road West, Guelph, Ont., corner of Woodlawn and Hanlon Pkway. Admission \$2. Age 12 and under free. 8 am to 4 pm, vendors from 6 am. Vendors additional \$3. Tables available at \$5 ea. Commercial displays, surplus dealers, computer software and hardware. Indoor and outdoor displays. Contact Bob LaCombe VE3IYE 1-519-843-4618; Rocco Furfaro VE3HGZ 1-519-824-1157.

1982 Northwest DX Convention will be held July 31 and August 1 at the Richmond Inn near Vancouver International Airport. A major door prize will be awarded. Further info: Fraser Valley DX Club, Box 3112, Langley, B.C. V3A 4R3.

Canadian Results, CQ WPX SSB 1981.

Class	Call	Score	QSOs	Mult
A	VE7BTV	3,328,654	2481	511
A	VE3GCO	2,295,510	1510	510
A	VE1CCC	949,424	912	392
A	VE3IY	713,700	781	305
A	VE5GF	410,726	524	274
A	VY1CM	246,820	537	176
A	VE7ZB	206,640	365	210
A	VE4AIV	144,180	328	180
A	VE7BSM	130,162	323	151
A	VE3FEA	74,823	194	147
A	VE3EZU	52,700	160	124
A	VE3GWM	52,500	153	140
A	VE7AJ	25,810	118	89
A QRP	VE3KKB	419,176	503	302
28	VE7DXC op. W7ZR	1,223,365	1744	295
28	VE1BNN	530,060	589	340
28	VE7CYT	116,090	360	130
28	VE2FMH	17,176	84	76
28	VE3MCL	5,421	48	39
28	VE2FWE	1,836	27	27
21	VE7ZZ	3,463,185	2690	453
21	VE7CML	3,437,625	2786	445
21	VE3BMV	2,821,522	2019	554
21	VE7IN	2,753,752	2322	428
21	VE6UD/3	2,021,820	1613	465
21	VE6MP	976,800	978	400
21	VE6CJR	6,048	57	48
14	VE3ICR	1,277,991	1193	429
14	VE7WJ	813,694	881	361
14	VE3EEW	663,324	863	334
14	VY1DV	1,540	28	22
7	VE3KZ	560,976	572	232
7	VE3UOT op. VE1BCZ	258,136	385	164
7	VE3MAC op. VE3JTQ	50,572	137	94
3.5	VE2ZP	405,144	506	204
1.8	VE3MFT	84,906	252	89
MS	VE1DXA	5,671,485	3044	645
MS	VE6OU	5,618,314	3560	562
MS	VE7UBC	4,662,930	3180	510
MS	VE7ZZZ	3,796,348	3328	454

DOC Letter on Special Prefixes

Dear Mr. Slater:

Following a lengthy review, our policy establishing the conditions governing the issue of special prefixes has been finalized. This review included consideration of the comments received from Mr. Wilson on behalf of CARF in a letter dated December 2, 1980, as well as those received from other Amateurs and from our Regional offices.

A copy of the policy is enclosed for your use and distribution to Amateurs across Canada. The assistance provided by your Association in the development of this policy is appreciated.

L.G. Nelson
Acting Manager
Operations Division
Telecommunication
Regulatory Service.

SPECIAL PREFIXES

Requests for special prefixes will be considered when they qualify in one of the following categories:

a) to honour significant national events and anniversaries a national special prefix will be assigned for use by all Canadian Amateurs for a period not to exceed two months. No individual or club station request to mark the same event with a different special prefix will be considered;

b) to honour significant provincial or territorial events and anniversaries a provincial-territorial special prefix will be assigned for use by all Canadian Amateurs residing within the province/territory for a period not to exceed one month. An event/anniversary will be considered significant when the appropriate provincial/territorial government issues a proclamation marking the event. No individual or club station

request to mark the same event with a different special prefix will be considered;

c) to honour significant municipal events or anniversaries a municipal special prefix will be assigned for use by all Canadian Amateurs residing within the boundaries of the municipality for a period not to exceed two weeks. An event will be considered significant if it has a historical or cultural concept. It does not need to pertain solely to Amateur radio. A proclamation issued by a municipal body should not be considered as automatically qualifying the event named therein as being significant for special prefix purpose.

For an anniversary to qualify in one of the three above categories it must be one of the following: a golden (50th),

diamond (60th), 75th, centennial (100th) anniversary, or at each 25th increment.

The following are examples of national events or anniversaries that would be considered as being significant:

1) Historical event of national impact, e.g. signing of the constitution, repatriation of the constitution, or selection of a national flag.

2) Sponsoring a National or International World class sporting event, e.g. Olympics, Pan Am games, or Commonwealth games.

3) Sponsoring other International events, e.g. Expo 67, or Economic Conference.

Consideration will not be given to events that do not qualify under one of the foregoing categories for a special prefix.

Canadian Awards Update

Garry Hammond VE3GCO and Eric Walden VE3HLL are co-authors of the Canadian Awards directory. This awards directory priced at \$4.00 is a 75 page booklet containing rules, checklists, maps, application forms of approximately 60 different Canadian Awards.

Orders for the Directory should be sent to Eric Walden VE3HLL, R.R.#1 Gowanstonn, Ont. NOG 1Y0.

The authors are presently updating their awards booklet. Amateur Radio clubs or individuals who are sponsoring new Canadian awards are requested to send the rules to VE3HLL as well, some clubs may no longer want their award to be published in the directory or they may want certain changes made to existing awards such as rules, QSL information, cost etc.

Please advise Eric Walden VE3HL of any changes.

Canadaward News:

Send all applications now to Dave Goodwin VE2ZP, 4 Victoria Place, Aylmer, Quebec J9H 2J3.
New Canadian Awards: HOWL Award

Amateurs must work four operators in Western Labrador. All QSOs must be after Dec. 31, 1980. No charge. Send 8½ x 11 SASE and log data to: R. White, 119 Howley Ave., Labrador City, Labrador A2V 1Z6.

Ski Canada Award

Amateurs must work two stations in each of the four main skiing provinces of British Columbia, Alberta, Ontario and Quebec. All QSOs must be after Jan. 1, 1978. Send log data and \$2.00 to Eric Walden VE3HLL, R.R.#1 Gowanstown, Ont. NOG 1Y0.

A Wide Area Linking Idea

The method that I am presenting here is but one of several approaches to wide area VHF/UHF analogue linking. As only one repeater pair is being used, there would be no infringement on others. This type of system has only been feasible in the last few years due to solid state switching devices that can operate in the RF transmission path.

Basically the system uses a standard 220 MHz repeater pair, and a 440 MHz direct frequency for the linking and either a 2 metre 'remote base' or a repeater as an input channel.

At each node of the system there are two receiving frequencies. Receipt of a signal on one frequency locks out the other receiving frequency. There is only one transmit frequency that could be beamed towards each other site or situation depending, just radiated by a vertical. Antenna switching electronics could be employed for signal optimization. My node architecture is a non loop system but an entry in the center would travel in both directions to each end station.

This type of system would not have been done earlier because the total switching time due to each node would have been in total, far too great for normal speech exchange. The solid state devices of today are more than an order of magnitude faster than electromechanical relays

thus we could now have a worst case path turn-on delay of better than half a second over 10 nodes which is better than some delays experienced over one mechanical COR repeater.

I will not attempt to elaborate on control system design and specific operation in this article but I will examine the three types of stations which compromise the node chain. Each node doesn't necessarily have a two metre input. Subaudible tone is only one of several methods to command stations to link. A recent idea is to have a digital data repeater system in parallel at the same site for data traffic and control purposes.

There are three types of stations, 'A' stations are useable as regular in-band 220 Mhz repeaters. When the 220 receiver is not busy, antennas can be scanned between a local omnidirectional and link beam at a 50ms or faster rate. The transmitter antenna need only be switched when necessary. A signal received locally over 200 will not have a subaudible tone and thus both TX and RX antennas would be switched omnidirectional. If the power is available, the transmitter could simply go through passive splitters to the various antennas. When accessed by a link command on two metres, the receiver and transmitter could select beam antennas and send out a subaudible tone to set up

the link.

'B' stations are used only as links on 220 MHz with or without two metre inputs and would require two Band Pass Filters (Cavities) for 220. Antennas need only be beams pointing at the two nodes on either side.

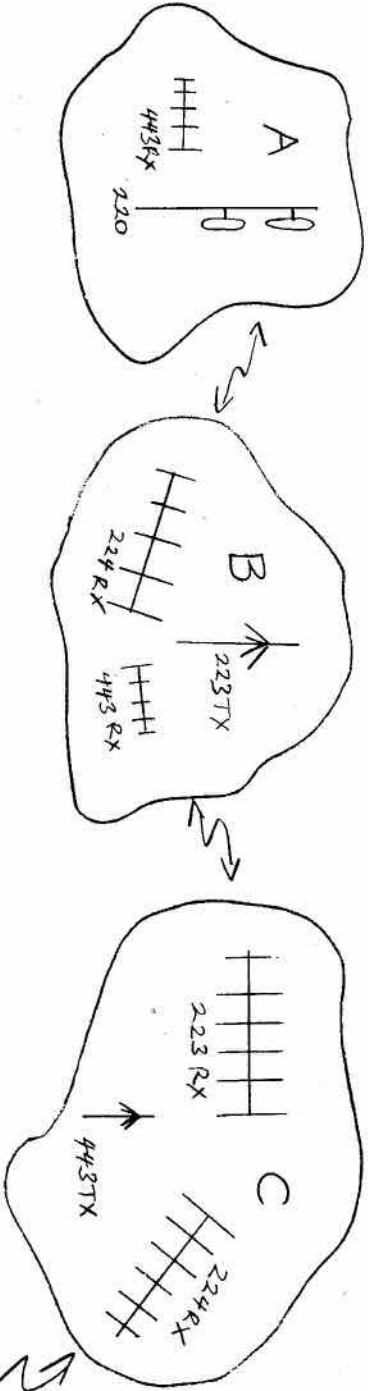
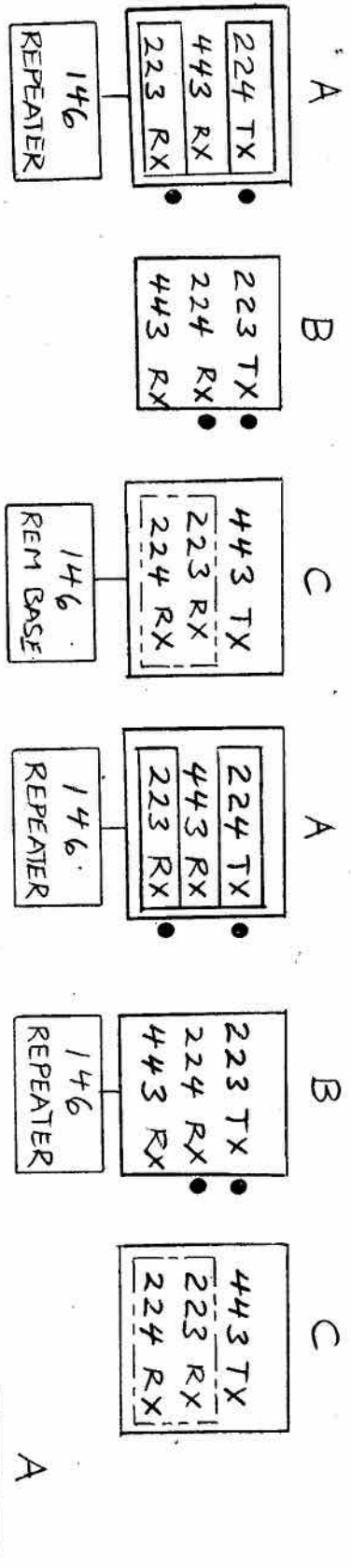
'C' stations need not have any fancy cavity filters at all and need only one 220 Mhz receiver with a channel scanner.

Notice that receive antennas need only point one way at each node. This will help prevent inversion skip of buffer stations. No doubt this system would require a fair amount of on site antenna system and power adjustment. There is a two node isolation between identical stations but by using a 440 MHz repeater pair this could be increased to three or four node separation between similar stations.

This could even be used directly on two metres if the current radio guidelines were changed however there are distinct advantages to leaving two metres as the sole input/output band or in conjunction with the little used six metre band.

I invite comments on this system idea or alternates, and would like to talk with people interested in pursuing such a system or similar concept.

Craig Howey VE3HWN
#304 598 Silverbirch Rd.
Waterloo, Ont. N2L 4R5

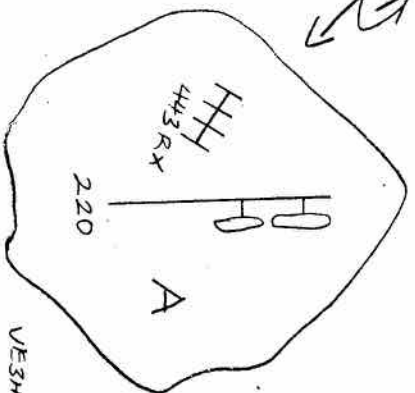


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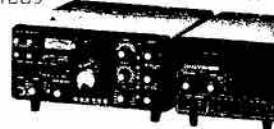
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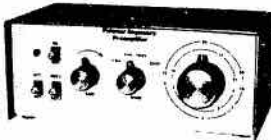
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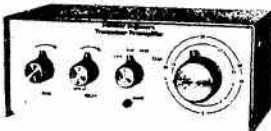
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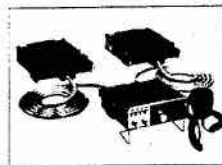
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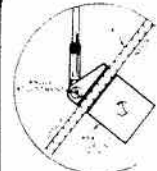
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Independent Military Option

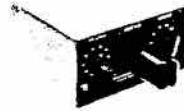
Military time format clocks by Benjamin Michael. Independent of power lines these units are energy efficient, secure, and free to provide accurate quartz controlled time in any setting. Used by the Military and U.S. government agencies as well as many municipal law enforcement and public safety departments, these units won't quit just because commercial power did.

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NYE VIKING

IAMBIC KEYSER No. SSK-1-K \$159.00



The Nye Viking Iambic Keyer combines all the excellent features of Nye's popular Super Squeeze Key with the superb reliability of CMOS integrated circuitry. The exclusive form-fitting, extra-long paddles make for tireless keying and provide an easy "change of pace" without changing key adjustments.

A Nye Viking 404 audio oscillator and speaker is included for monitoring and practicing keying. The unit will key either negative or positive keyed transmitters up to 200 ma. at 250 volts. A switch on the rear of the chassis determines the polarity. Output is terminated in a shielded cable with standard 1/2" phone jack. A switch is provided to allow tune-up and slow speed hand keying with the dash paddle. It also simulates the old-fashioned bug keying when in the test or "tune-up" position.

The keyer operates on an internal Nicad 9V battery that is rechargeable with a plug-in 115VAC charger.



"MASTER" KEY

Nye's popular new SPEED-X Key has a "stay put" heavy duty die-cast base and features an isolated contact assembly that keeps the keying circuit separated from the base, the key arm assembly and all exterior metal parts. Has gold-plated silver contacts and adjustable-action key arm with Navy knob.

No. 330-001
\$37.00

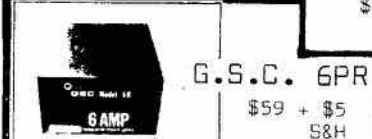
Larsen

- LM-K HOLE MOUNT \$43
- LM-TNB TRUNK MOUNT \$48
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ASTRON POWER SUPPLIES IN STOCK

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PCS-3000 IS STILL THE LEADER IN 2M RIGS !!

25 Watts, 8 Memories, Memory scan, Band Scan (programmable), 142-150MHz, Offsets stored in memory, Repeater input check, complete with touch tone pad KIT \$429

Extra DC cord \$7, Service Manual \$5, Remote cable & mount \$65, Assembled TT Pad in extra mike back \$65, Extra TT Pad KIT \$19, GSC 6 amp reg. P.S. \$59 & \$5 S&H
ASTRON RS7A 7amp reg & crowbar P.S. \$95

THE ALL NEW PCS-300 HandHeld

All features of PCS-3000 above, 3 Watts/1/2 Watt, NO rep. input check, Programmable offsets, S/RF meter, Optional PL tone.

PCS-300 with nicad pack, charger, rubber duck, and stand \$429

Speaker Mike \$45, Leather Case \$49, DC-DC charge cord \$25, DC-DC charge & TX Cord \$55
Extra nicad pack \$44, HT-PT dual PL Tone Encoder/Decoder \$60, 1/4 Wave telescoping Whip \$12, 5/8 Wave telesc Whip \$15

Finally - a properly decoupled antenna with superior performance at a reasonable cost. Raise more repeaters or increase your simplex distance!



MODEL	MHz	POWER in out	amps	PREAMP NF	GAIN	PRICE
6M10-120P	50	10 120	22	1.5db	12db	\$369
2M4-40P	144	4 40	6	1.9db	9db	\$175
2M2-100P	144	2 100	22	1.9db	9db	\$365
2M10-80P	144	10 80	12	1.9db	9db	\$265
2M10-150P	144	10 150	24	1.9db	9db	\$399
2M10-200P	144	10 200	32	1.9db	9db	\$485
2M25-150P	144	25 150	24	1.9db	9db	\$379

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 - GALICN (1) 3-5002-----\$ 945
 - GLA-1000B (4) 0-50A-----\$ 895
 - CLIFFERTON V (1)4CX250B \$ 525
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Inside the Department of Communications

Most of us Amateurs, once we get our certificates and licenses, worry little about the Department of Communications (DOC). By osmosis we get to know something about our nearby District DOC Office. As long as we pay our license fees and do not create harmful interference to others, we never hear from it. We are told that there are DOC Monitoring Stations but, like the District Offices, we seldom if ever hear from them either.

The DOC's Regional Offices and, still higher up in the hierarchy, DOC Headquarters in Ottawa are mysteries to practically all of us. Those of us on the CARF Executive and at CARF Headquarters have come to know the DOC Headquarters Staff and their organization very well. Because DOC resolves problems of competition for radio spectrum (Amateur versus all the other radio services for frequency bands) and develop Regulations which govern our use of the Amateur bands as well as the flow of new Amateurs into the service through its examination and certification procedures, CARF has to know DOC well if it is to represent Canadian Amateurs effectively and ensure that their views are taken into account in all regulatory matters.

The purpose of this article is to tell the readers of TCA and the members of CARF something about how DOC Headquarters is organized and works, as far as Amateurs are concerned.

Because not every branch in the DOC Headquarters' organization has something to do with Amateur radio, we have simplified the organigram to show only

those which have some responsibility, be it large or small. Wherever there is a 'stub' that ends in nothing you can safely assume that there is a branch or group of branches that we do

not need to worry about just now. We say 'just now' because the organization is changed from time to time. This organigram is up to date as of the end of January, 1982.

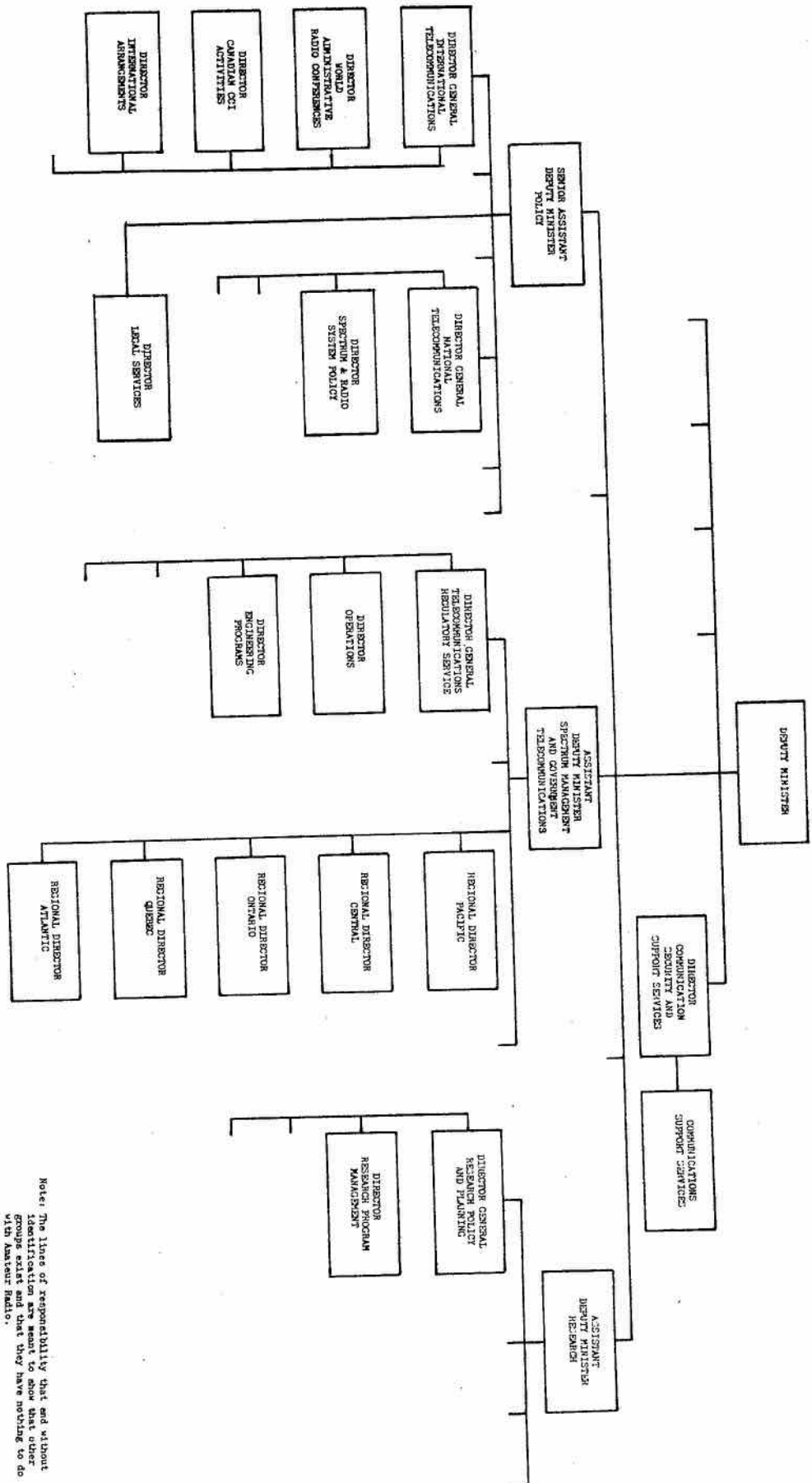
Minister and Deputy Minister

Let's start at the top of the chart and see what each part has to do with Amateur radio. The Deputy Minister, Pierre Juneau, is responsible to the Minister, Francis Fox, for everything that goes on in the Department -- for the decisions that are taken and the Regulations that are recommended for Ministerial or Cabinet approval under the Radio Act. There are some basic differences between the way a business and a government department is run. In a business, duties and responsibilities are delegated down to appropriate levels and staff is held responsible for making decisions and getting things done. In a government department such as DOC the same thing applies but to a much more limited extent. Because the government organizes and regulates the activities of all Canadians, the Government in power and the Minister have to take into account the views of those concerned and/or affected or ensure that their staffs do. Thus where a decision is made in the hierarchy depends on the issue, the magnitude of its impact on the public, the views of those

concerned and/or affected and the political factors related to it, if any.

This is the second time that you have seen the phrase "those concerned and/or affected". By "those concerned" we mean people who may not be directly affected by the proposal but are worried enough to express some opinion on its economic, cultural, social, ecological, moral, etc. aspects. Fortunately, DOC seldom gets comments of this kind on Amateur radio proposals. On the other hand, we Amateurs may be "affected" if our method of operation, the frequency bands we may use or our eligibility to use certain bands, for example, are involved in the proposal.

The Deputy Minister has one small group reporting to him through the Director of Security and Communication Support Services -- the Communication Support Services section. One of its responsibilities is the organization of communications in times of emergencies, including those provided by Amateurs. It has staff in the Regional Offices to support it but it is limited and it will be some time before it will even look at Amateur radio.



Note: The lines of responsibility that end without identification are meant to show that other groups exist and that they have nothing to do with Amateur Radio.

DEPARTMENT OF COMMUNICATIONS
 ORGANIZATION
 SHOWING THE GROUPS THAT HAVE A RESPONSIBILITY FOR
 AMATEUR RADIO

January 1982

Senior Assistant Deputy Minister Policy, International and National Branches

Out of five Assistant Deputy Ministers (ADMs) three have responsibilities that cover Amateur radio. The Senior ADM Policy, J.T. Fournier, has seven groups reporting to him of which two interest us. The International Telecommunications Section under Mr. G.I. Warren is responsible for organizing participation in World (WARC) and Regional (RARC) Administrative Radio Conferences as well as those of the International Consultative Committee on Radio (CCIR). These tasks are allocated to two appropriately named directorates. The Director of WARC does this through committees of government people and of industrial people while the Director of CCI Activities has the continuing Canadian National Organization for CCIR. Both these groups were the recipients of CARF proposals during the preparations for WARC '79. Between WARC's these two groups have little to do with Amateur radio. The International Arrangements Directorate has a number of different tasks which includes bi-lateral arrangements with other countries such as the United States and Greenland, special international activities such as World Communications Year celebrations, Plenipotentiary Conferences and administrative affairs of the ITU. (Canada is a member of the ITU's Administrative Council.) While the likelihood of this directorate having much to do with Amateur radio is remote, it is mentioned because there is the possibility.

In the National Telecommunications organization whose Director General is Vincent Hill, one branch - the Spectrum &

Radio Systems Policy Branch - is the branch for Amateurs to watch. It deals with problems of competition for radio spectrum, of course, within the framework of the ITU Table of Frequency Allocations and the Regulations. Because most Canadian radio activity is in the spectrum above 30 MHz, this branch is giving priority to the VHF, UHF and SHF bands in the development of national radio policy. Their most recent proposal covered the band from 890 MHz to 10.0 GHz and CARF has already commented on this. While Amateurs do not make much use of the bands above two metres, we should watch very carefully the proposals put out by this branch because future Amateur growth will take place in the higher

bands. The staff of this branch works very closely with the staff of the International Branch just mentioned and especially with the staff of the Telecommunications Regulatory Service to be described next. Like "Telecom Regs" it provides members for Canadian delegations to ITU radio conferences.

Finally, there is the Legal Services Directorate. It is really a section of the Department of Justice, seconded to DOC and staffed by lawyers. Its tasks include reviewing all proposed changes in regulations, providing legal guidance in the preparation of acts and regulations and advising on prosecutions for breaches of the Radio Act and Regulations.

Assistant Deputy Minister Spectrum Management and Government Telecommunications, the Telecommunications Regulatory Service and the Regions

Mr. K.T. Hepburn, ADM Spectrum Management and Government Telecommunications has under his direction three Branches, one Directorate and all five Regional Directorates. These latter directorates are, in turn, responsible for the 43 District Offices, four monitoring stations and the various monitoring facilities that each district office has to support its work.

Of greatest importance to the Amateurs is the Telecommunications Regulatory Service. Often known as "Tel Regs", this branch is the largest in the

Department. Dr. John deMendoza is its Director General and in his branch two directorates are of importance. Mr. Gary Brooks, Director of Operations, is responsible for the development and implementation of regulations and policies within the framework of the ITU Regulations and Allocations, the Radio Act and government policies. These include the criteria and examinations which determine the eligibility requirements for holding Amateur Operator Certificates; procedures for the issuance of licenses and the collection of

fees; the frequency bands and sub-bands and the various modes that we can use within these bands; procedures for the resolution of harmful interference to all users of radio and for the enforcement of the Regulations. This directorate also issues circulars to keep people informed about radio regulation matters and keeps statistics.

The Operations Directorate works very closely with the Regions because the Regions provide advice on the development of Regulations and policy and, in fact as we know, carry out its implementation through direct contact with licensees and the public.

Proposed Regulations are always published in the Canada Gazette, Part I, for comment prior to their being submitted to the Minister or Cabinet for approval. Policy recommendations may not always be published in the Gazette; they depend on many factors such as the preparatory consultation that has taken place and the impact of the proposed policy.

The second directorate of importance is that of Engineering Programs under Mr. Nisar Ahmed. While the work of his engineering group relates largely to the commercial and industrial uses of radio, one of his tasks concerns us very much -- the control of electromagnetic compatibility and of electromagnetic interference. The dividing line between these two activities is rather blurred but they involve ensuring the compatibility of radio stations, one with the others; preventing problems due to the operation of consumer and industrial electronic equipment in a spectrum loaded with radio stations and controlling interference from electrical equipment. People working on these use the abbreviations EMI and EMC and the key words 'susceptibility' and 'immunity' quite often.

Consultation regarding these

activities is conducted through the Canadian Radio Technical Planning Board and the Canadian Standards Association. CARF is active in both these organizations. Barc Dowden VE3TT, is CARF's representative

Name	Headquarters	Director	District Offices
Pacific	Vancouver	W.H. Haliday	7
Central	Winnipeg	W.A.R. Johnson	6
Ontario	Toronto	W.D. Lyon	13
Quebec	Montreal	J. Lyrette	9
Atlantic	Moncton	M. Chase (Ms)	8

It is through the Regional Offices, supplemented by the District Offices, that DOC interfaces with the public. Accordingly, the offices in each Region reflect not only the Department's and the Government's interests but also the interests of the people that they serve in their region. Thus we find that the organizations vary according to needs, DOC interests, priorities, resources available, etc. Also the way they

on both the CRTPB and CSA and attends EMI/EMC Committee meetings. CARF's Bill Wilson VE3NR, is on the CRTPB's Executive.

Now to the Regional Offices which are as follows:

deal with Amateurs tends to vary from one regional office to another. Ultimately their job is to implement the requirements of the Radio Act and Regulations and DOC policies.

If an Amateur has a problem and is not receiving satisfaction, his recourse is to take it to the District Manager. From there he can go to the next person higher up in the organization and so on until he is satisfied.

Assistant Deputy Minister Research and Research Policy and Planning Branch

There is an important directorate in the organization of Mr. D.F. Parkhill, ADM Research, that should be mentioned. It comes under the Director General of Research Policy and Planning Mr. S. Wagner. In the event that an Amateur or group of Amateurs wants to undertake some research that has promise of benefit to Canada, they can contact Mr. Jean-Jacques Rousseau, Director of Research Program Management, for assistance. The procedures for

getting government aid are quite complicated and the criteria quite limiting. His office can get Amateurs on the right path if they are interested.

John Oliver, Premier of British Columbia in the early '20s, said, "It is not the business of the Government to maintain the people -- it is the business of the people to maintain the Government." I hope that, with this article, I have given you some idea of what you are maintaining. □

Bill Wilson VE3NR

Random Thoughts on a Convention

[and I do mean random...]

As you may have gathered, the RSO convention this year was held in the Kitchener/Waterloo area. Merrick Jarrett VE3BCZ, writing in the K/W club bulletin gives us an inside view, in brief, of what really goes on at a convention.

...having that nice feeling on Friday, seeing it all come together, from over a year ago when Harold Braun, DWH, gave us the go-ahead ... everybody, Chairman Paul Cassel, AVY and his XYL Marg, BLJ; Paul Modray, CHM, and his XYL, Judy; Ron Gimbel, DBD, and his XYL Jean, CBQ; John Enns, AIM, John Riddell, AMZ, Don Matheson, COE, and yours truly, BCZ, 'brainstorming', working out ways to have the best convention ever ... the monthly meetings, then the weekly meetings, and finally 'The Day' ... Harold's calm and steadying influence as we hit the inevitable problems and crises ... phone calls, letters, more letters, more phone calls, more letters ... programs jelled, advertisers contacted, companies persuaded to give, give, give for prizes, door prizes, etc.... the co-operation of the various firms in the 'ham' business giving us good deals ... particularly the generosity of Fred Hammond ... sitting around wondering how we could 'sell' the convention and what did we have that nobody else had ... 'Gemutlichkeit!' ... what else? ... an area rich in German and Mennonite heritage, good food, and our prize possessions, Lawrence and Jonas Bingeman ... and all of

you who sampled the Bingenman's hospitality at the Friday night 'do' and the Saturday banquet will remember the spread they put on for us...

...the mail strike ... and how that completely QRM'd our mailings, our registrations, and everything else that relied on the postal service (?) ... hoping that our publicity would get out to the clubs before the strike set in ... the delays in getting out the TOA with convention publicity and registration forms, again because of the strike ... the generosity of the Guelph ARC in making ready cash available to us when our advance registration money dried up because of the strike ... our computer set-up for advance registrations run by Ron Gimbel, DBD and Jean, his XYL, CBQ ... the hours burning the midnight oil entering registrations and setting the convention program on the electronic composer at the Gimbels...

... and finally, 'Der Tag' ... everybody flowing smoothly through the registration desks ... the superb cooperation from the Waterloo Motor Inn, where all we had to do was to ask for something and there it was ... and how many people know that the Inn gave us the meeting rooms free, taking the risk they would make their profit from the Friday and Saturday night affairs ... the mouth-watering commercial displays, especially for someone like the writer who is hanging in there with his old RME 4200 and Johnson Viking Ranger until his ship comes in and he can splurge on Drakes,

Icoms, Yaesus and Kenwoods ... the Friday evening buffet and entertainment ... who will forget the Almrausch Schupplattlers with their great dancing and their marvellous presentation of life in a Bavarian village, with dancing, anvil-pounding, chopping, clapping, whistling, and general 'joie de vivre', all in perfect time with the accordion ... the food! ... a joint of beef nearly as big as Murray Gross, the man carving it ... pigtails, shoofly pie, etc., all area specialties ... Lawrence Bingenman turning pale as he watched the Schupplattlers chopping wood on his ballroom floor ... the certainty that Murray was triplets, since he seemed to be everywhere at once, smoothing things for us and making things appear out of thin air that we needed ... the other dance groups showing us some of the ethnic variety of dancing this region has to offer ... watching all the elder ham generation, lecherously ogling the girls as they can-canned ... the nice warm feeling that is there when things are going well, everybody is having a good time, the food is good, and old friends are eye-balling and new friends who have met only over the air are meeting and cementing new friendships...

... the excellent forums, only one of which I was able to attend, but George Collins didn't disappoint me, or anyone else, for that matter ... very funny and informative ... Sid Horne, EGO, taking over the antenna forum as if he had done it all his life,

when Yuri Blarovich, was a 'no-show' ... he must not have been listening to our 'talk-in' stations and made the wrong turn at Punkydoodle's Corners and vanished into the 'Kitchener Triangle', to be seen no more ... yep, Punkydoodle's Corners is for real and is just outside Waterloo ... driving along, listening to the talk-in station saying 'contact your local control on 52' ... how much more professional can you get? ... Rex Hygate, IXC, and his gang, highly organized with all sorts of maps, photos, etc. so they could give visitors really clear directions on how to get to the convention QTH ... bad directions or poor service from talk-in stations can colour one's whole attitude to a convention, so our boys are to be congratulated...

... and the ladies' programs at the other end of town at the Valhalla Inn on the Trail of the Black Walnut ... a good lunch by the pool ... excellent professionally run forums on all those things that interest the ladies ... the bus tour in the morning, ending up in Elora, with the unbelievable happening when 45 ladies all arrived back at the bus on time after shopping around in all those neat little arts and crafts stores and boutiques in Elora that just invite one to browse around for hours ... nice going, girls ... and our visit on the way to Elora to the bridge at West Montrose, the last covered bridge in Ontario ... the announcement by the tour guide, one VE3BCZ, that it was also known as 'the kissing bridge', and waiting for the action to start, since he was the only male on the tour ... with no luck...

... and the Saturday night banquet ... the head table piped in by Roger Hildesheim, LPQ ... the joy of being a head table guest and getting first crack at the buffet tables, groaning with Bingeman goodies ... the lights

going out and the staff parading in with the flaming baked alaskas (at least, that's what I think they were) ... Bruce Jones, GYC, and his inimitable MC'g, both Friday and Saturday evenings ... one of the rare occasions where programs were run dead on time ... Jonas Bingeman turning up in his lederhosen to welcome our guests, a very nice touch ... the very moving RSO Clifford Marsh Memorial Trophy award to the Ontario Amateur of the year, Dorothy Aldridge, QEH ... again, the nice feeling of coming to the end of an enjoyable convention, knowing that things have run as smoothly as they can be, people have enjoyed themselves, the food has been good, excellent entertainment and technical forums ... and all that work, the hours put in by all concerned have really been worth it.

... Marshall Killen, KK, our brass-pounder from 'way back', shoving through traffic for the convention as if his life depended on it ... listening to our visitors as they departed for home, saying nice things about the convention to our talk-in stations ... the heart-warming sigh of our white caners and those restricted to wheelchairs turning out, proving once again that you can lose some facilities and it makes no difference at all in being part of the world-wide brotherhood of Amateur radio ... listening to ONTARS and hearing Eric Enns, BB, Bill Birchall and the other NCS pushing the convention...

...the head table dais Saturday night when about half a ton of weight represented by Chairman Paul Cassel AVY, Bruce Jones GYC, and the two Bingemans got together to have their picture taken ... Tony Lelieveld, DWI, the convention photographer, wondering if he could get 'em all in one picture ... not sure whether to christen them 'The Fabulous Fatties',

'The Groaning Board' or ship 'em all to the Argos for their front four on the offensive line ... a personal thank you to Al D'eon, AND, for putting me on the right path re publicity, etc ... convention visitors from VK, VE7, VO and VE2 land dropping in on us, and over-the-border as well, and a warm welcome to them ... and if I've missed any, the same to them ... hotel visitors wondering what all those strange VE3 licence plates represented...

... and the Sunday morning flea market ... no ham gathering is complete without one ... one day all the hams who come to the flea market will also come to the convention, and won't that be something ... tables loaded with just about everything anyone could want (well, not quite, but close enough) ... the DOC truck sitting in the corner of the parking lot, with an antenna mast that looked about 100 feet high ... more whips around than you could shake a stick at...

... and so the end of what we would like to think of as a successful and enjoyable convention, and now on to the 1982 convention, wherever it may be ... QRU and 73 from VE3BCZ.

by Merrick Jarrett VE3BCZ

CARD COLLECTORS

The Smith's Falls, Ont., ARC will operate a special events station CZ3SFR on all HF bands and two metres from May 22 to June 7. It is to commemorate the 150th anniversary of the opening of the 123-mile Rideau Waterway and Canal system linking Ottawa and Kingston. Special QSLs are available for a business size SASE to P.O. Box 215, Smith's Falls, Ont. K7A 4T1.

RECIPROCAL ARRANGEMENT

Jamaica and Malta now both have reciprocal operating agreements with Canada. Malta, however, does not permit mobile or hand-held operation.

Canada Day

The 1981 Canada Day Contest was first-rate success with over 80 logs received. Congratulations to the winner, Dave Goodwin VE2ZP, who handily defeated fellow contest committee member and runner-up VE3KKB. (Were the results fixed?)

The most outstanding single band effort was VE2CUA who made over 22k points on 80 metres. VE3MFT was the clear winner in the non-advanced category and came 10th overall, even without all those phone multipliers. Almost half the contest entries were from non-Canadians, with 7 entries from Yugoslavia alone! W9PE had the highest VE score all band and VE3CDP/W9 made second place on single band 14 MHz.

It is amazing how many entries are from Amateurs who have never entered a contest before. Many of them discover just how much fun contesting can be and enter again the following year with greatly improved scores. This contest is excellent for getting your feet wet. Try it, you'll like it.

VE7AB

SOAPBOX

Good contest, lots more activity than last year -VE3KZE

This was my first contest and I enjoyed it very much -VE5BAF

Thanks for a super contest -K8AQM

Many thanks for running this contest. It was my first and it was fun -VE3LRB

Really enjoyed it -VE7EGO

Sure is a hard contest to work from a mobile station -VY1DD

The time is nice. 24 hours is long enough for any contest -VE1AJJ

This was only the second contest I have participated in -VE3LQJ

Very good activity -AA6EE

Good contest, but need more VEs participating -VE3DDU

I enjoy contests very much as it is

class	call	score	QSO	pnts	mult
A	VE2ZP	314,789	476	3839	82
A	VE3KKB	221,544	406	3258	68
A	VE7SZ	177,059	344	3001	59
A	VE3UOT	139,584	277	2181	64
A	VE2NI	117,304	275	1892	62
A	VE3DAP	109,330	280	1885	58
A	VE3VCA	99,862	264	2038	49
A	W9RE	87,696	307	1827	48
A	VE3LQJ	75,150	224	1670	45
A	VE3MFT	74,808	420	2078	36
A	VE3DDU	73,226	259	1929	38
A	VE1ATJ	67,218	311	1977	34
A	VE4QZ/4	63,771	223	2199	29
A	VO1AW	52,022	205	1406	37
A	VE7EGD	35,904	152	1496	24
A	VE5AE	34,587	192	1281	27
A	NE4L	34,128	227	1264	27
A	W3ARK	27,375	211	1095	25
A	VE5ADA	26,496	176	1656	16
A	VE6AMY	21,360	111	1068	20
A	VE4RF	18,625	103	745	25
A	VE3LRD	18,181	66	627	29
A	N5CEM	18,088	150	952	19
A	VE3LNY	15,709	78	683	23
A	VE3LHS	15,656	91	602	26
A	VE5AAD	14,700	133	700	21
A	KA2AEV	12,224	121	764	16
A	VE2WA	11,666	100	614	19
A	KAØHDB	10,592	110	662	16
A	VE8XO	10,089	53	531	19
A	VE4QST	9,680	80	605	16
A	VE1CAK	8,240	55	515	16
A	W6YMH	6,375	55	425	15
A	K8AQM	6,253	39	481	13
A	K4FPF	6,000	40	400	15
A	VE1DX	5,712	85	816	7
A	VE3GWM	5,415	46	361	15
A	VE7AMJ	3,920	41	392	16
A	VE3DVB	3,576	57	447	8
A	W6MUL	3,564	36	324	11
A	KA1CZF	3,080	56	308	10
A	LU1EWL	3,050	53	305	10
A	VE3LRB	3,024	41	284	11
A	VE3KFZ	1,910	38	191	10
A	WD9GGY	1,211	20	173	7
A	VY1DD	1,170	13	130	9
A	PY8ZLC	880	11	110	8
A	EA2CR	804	17	134	6
A	YU7SF	132	8	44	3

Contest Results

class	call	score	QSO	pnts	mult
MS	VE7ZZZ	376,060	696	5358	70
MS	VE3FKK	160,020	634	3556	45
50	WA7HQG	85	40	85	1
50	W7ZTT	74	29	74	1
14	VE7FY	22,212	193	1851	12
14	VE3CDP/W9	17,964	171	998	18
14	VE7EDA	14,454	82	803	18
14	N6DFY	8,340	169	834	10
14	VE7CEZ	8,085	79	539	15
14	G4HBI	7,975	76	725	11
14	VO1QU	6,588	137	732	9
14	VE7EGR	7,821	124	711	11
14	VE8YQ	5,388	52	449	12
14	VP5IW	5,598	73	622	9
14	YU1KQ	5,088	87	636	8
14	K4CNW	4,707	118	523	9
14	VE5BAF	1,610	60	322	5
14	GI3GTR	1,530	18	153	10
14	WD8RNQ	1,446	43	241	6
14	JA9YBA	1,190	76	238	5
14	YU3EO	1,155	41	231	5
14	AA6EE	440	16	88	5
14	WB1GLH	201	31	67	3
14	YU3TCM	171	12	57	3
14	JE1CKA	43	16	43	1
14	JH2QAY	13	4	13	1
14	YU7ORQ	12	3	12	1
7	KC3N	6,525	166	725	9
7	VE7BS	4,771	52	367	13
7	VE3KZE	3,437	113	491	7
7	VE3CES	3,066	77	438	7
7	VE7CNQ	844	31	211	4
7	W7DRA	80	4	40	2
3.5	VE2CUA	22,872	210	1906	12
1.8	VE3INQ	198	12	66	3
CK	W5NR				
CK	SM5BDV				
CK	LA9FY				

MS Operators:

VE7ZZZ: VE2EUB VE7s EMX ENF ENI SK VX
 VE3FKK: + VE3IFS

an opportunity to meet a lot of very nice people on the air -G4HBI This is my first entry to the Canada Contest -LUIEWL

Band was open to North America, but no VEs -JE1CKA

Users of 1.8 MHz have been trying to get SSB operators to use 1830 and up -VE3INQ

Enjoyed the contest especially since it was in the middle of the week -W9RE

Expected more activity -PY8ZLC Unusual to have the big guns and the beginners show up in the same contest as they do in this one -VE1BCZ

I worked twice as hard as last year and didn't do nearly as well -VP5IW

Fishing must have been good on the east coast -VE7ZZZ



VE7ZZZ

NEWSLETTER FOR 160M FANS

The first issue of *Canadian Top Band Newsletter* is available for a self-addressed stamped envelope from its editor and publisher, Ivan Payne VE3INQ, Box 276, Station 'A', Weston, Ont. M9N 3M7. It will be a special issue with the focus on the proposed DOC amendments to the 160 metre frequencies (Schedule X of the Regs).

Technical Section

Two gallons by the bootstraps

An outline design for a grounded grid All-Band Linear Amplifier
in the 2KW PEP Class

By M. Mac Gregor VE7CGM

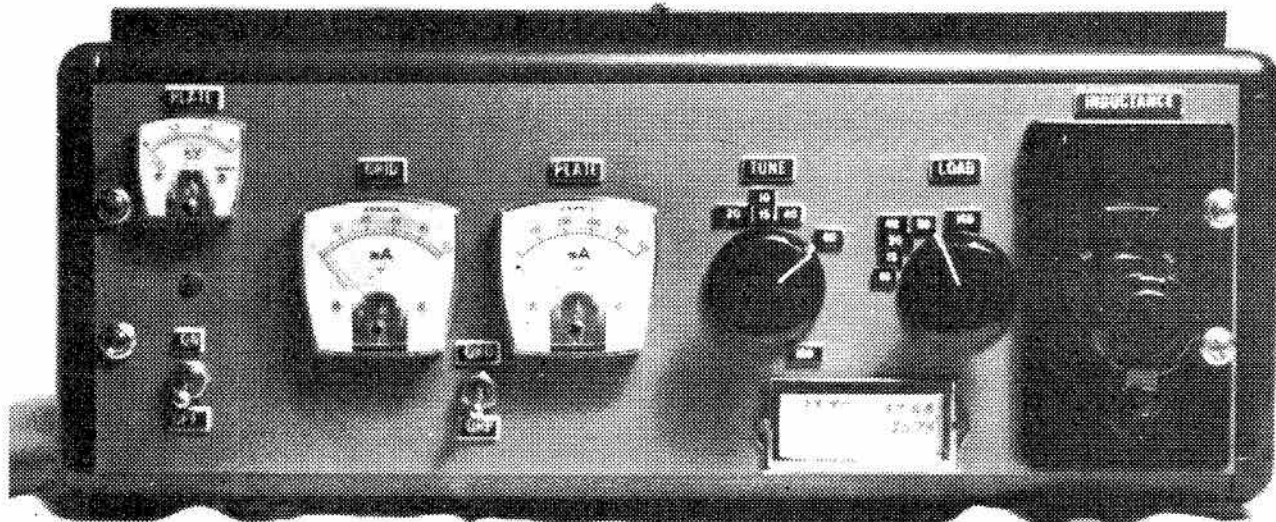
Various previously published Linear designs were potentially unfeasible for the author, often due to the overall design intricacy, or the total component expenditure, either of which would have rendered construction impractical!

The following design tries to be less demanding and seeks to produce a practical, economical, utility amplifier design capable of that now almost essential continuous 1.8-30 MHz coverage.

Some of the design is plagerised from many sources and a few concepts will possess scant appeal for the purist. The intent is simply to produce those clean watts that can be required in current HF band conditions. Components are then primarily selected based on low cost and ease of availability, at least inexpensively from common commercial sources. Additionally and quite deliberately, only a typical construction layout is

shown. It is not really a project intended for a complete novice at 'home brewing'. It certainly is though for someone with a modicum of manual dexterity and technical competence, wishing to upgrade their construction experience beyond the commercial kit level.

Using the article's guidelines, there is possibility for considerable personal creativity, both in component selection and mechanical



design. The text aims to positively indicate those areas that really are critical, and not to dwell on those portions of the circuit or mechanical design that are either obvious or irrelevant.

In recent years the grounded-grid mode has won popularity in many commercial and home-constructed amplifiers. Some of the factors producing this are:

a) Zero-bias operation of high-mu triodes and triode connected tetrodes in Class B eliminates the need for grid-bias packs and screen supplies.

b) Adequate exciter loading is achieved due to the feed-through property of grounded grid operation. A measurable proportion of exciter output contributes to the total amplifier output.

c) The inherently highly

degenerative circuit ensures good linearity and seldom will require extensive neutralization.

d) Plate voltage is not critical, which allows flexibility and economy in power supply component selection. The power supply is potentially an expensive portion of the circuit in other classes of tube operation.

The amplifier is designed around the 813, and is intended to be a companion amplifier to a CW/SSB transceiver in the 50-100W output range. The 813 is capable of exemplary service in a linear amplifier; when operating as a zero-bias triode, the third order distortion products are typically better than -30dB at maximum rated output. With so many 813's still in circulation, perhaps this simple and economical concept

will promote a new lease on life for them.

Manufacturer's characteristics for a single 813 in SSB linear service; cathode driven, grounded grid are as follows:

Filament Ratings	10V 5A
Rated D.C. Plate Voltage	2500VDC
Zero-Signal Plate Current	30ma
Peak-Signal Plate Current	225ma
Peak-Signal Grid Current	50ma
DC Input Power	560W
RF Output Power	340W
Maximum Input Power	14W
Anode Load Impedance	6000ohms
Driving Impedance	270ohms
Output Capacitance	14pf
Maximum Frequency (above ratings)	30MHz

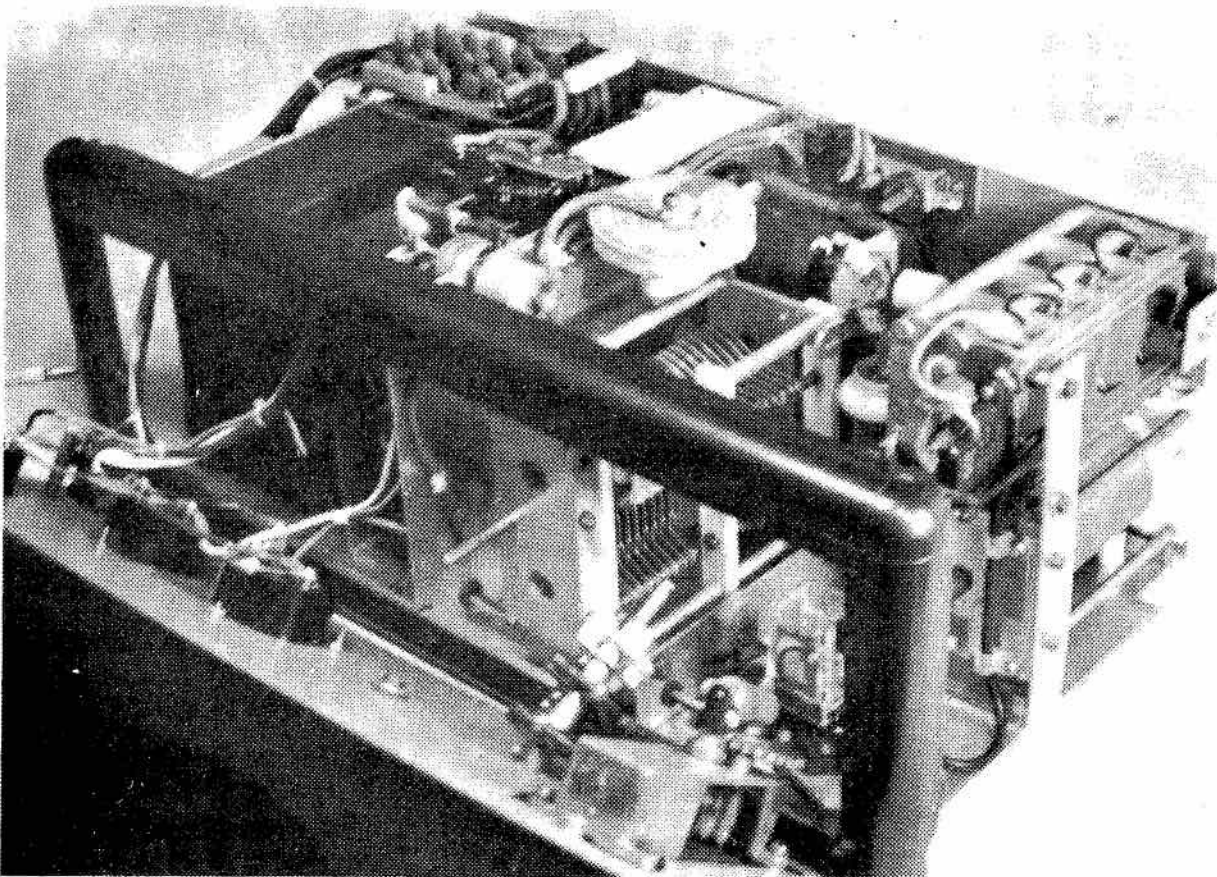
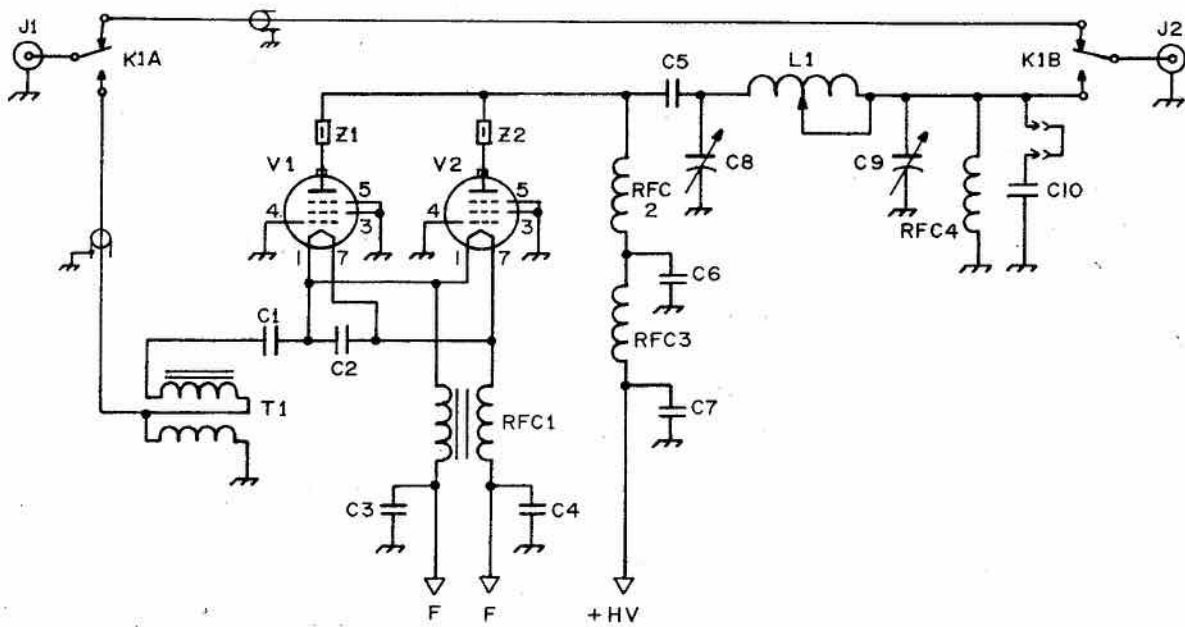
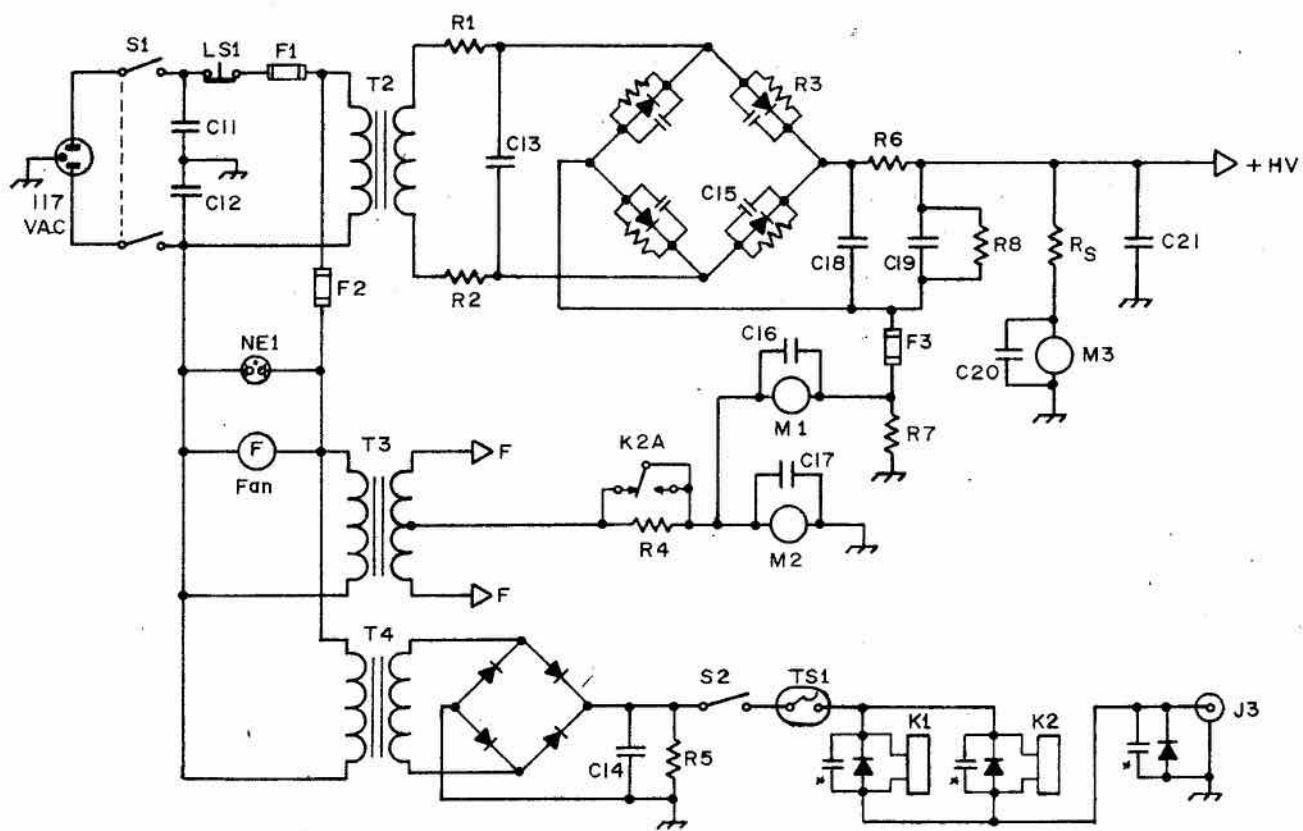


Photo 2: Removed from its cabinet, here is an overall view of the amplifier with the front panel down. The on-chassis construction used is seen on the 21"x12"x8" frame. Notice that the 813's when mounted horizontally should have their filaments vertical. RFC1 may be seen in the centre of the picture with the RF cage to the right, power supply compartment and input/control circuitry to the left. K2 is located in the front right corner of the chassis.



In fact these really are an impressive set of characteristics, notwithstanding a 40-year-old tube design. Maximum frequency, Output Capacitance and Filament Power are the poorer parameters. Modern tubes overcome these limitations and are more compact, but the 813 will tolerate abuse which would render many current tubes a glowing ruin! This ruggedness means that increasing plate voltage in SSB/CW service will result in proportionately increased output power, without disastrous results, provided an adequate air-exchange is maintained. This version utilized a plate voltage of 3.75KV which provided excellent control at the maximum inputs allowed by the licence conditions as applicable to the various bands.

INPUT CIRCUITRY

In practice, RFC1 will prove to be a remarkably non-critical component. This is due to the more than adequate levels of drive available from most modern excitors. The function is to conduct filament power into the tubes and present the RF drive watts with a relatively high impedance compared to the tube input impedance.

A 7"x3/8" PVC taped ferrite rod, with a permeability of about 125, was wound with 25/30 bi-filar turns of No. 12/16 enamelled copper wire. It is connected directly to the paralleled 813 filament pins, or as close as layout allows. If problems are encountered with input SWR, or low grid current on M1, experiment with rod length, diameter and permeability, or alternatively the number of turns. Cases of pure desperation may resort to textbook reference, where exact winding details will be provided for a totally unobtainable ferrite rod!

Matching the 52 ohms of an exciter to the approximate linear input impedance of 200 ohms theoretically allows several solutions, namely:

a) LC networks with excellent

power transfer at a low SWR. However, they require considerable front panel and chassis space.

b) R networks have the same advantages but are lossy and equally large.

c) Direct connection which works at varying SWR's across the bands. However, the impedance mismatch is not suited to the sweep-tube or transistorised finals typical in modern excitors.

d) The practical solution utilizes a 4:1 impedance ratio transformer as T1, constructed from about ten bi-filar turns of No. 14 wire wound onto an Amidon T130-2 toroid or equivalent.

Depending on plate voltage and circuit layout, the actual input impedance for two parallel 813's is about 150-250 ohms. If so desired, an improved SWR may therefore be achieved by adjustment of the turns on T1 to suit the circuit.

Proper matching of exciter to linear is needed, for the Q imparted by matching is valuable in suppressing the waveform distortion which arises from non-linear loading over the input drive cycle.

OUTPUT CIRCUITRY

RFC2, the plate choke, is critical in value and can often be difficult to construct. Builders should equip themselves with an adequate selection of enamelled wire, wound close spaced over 4" on a 5/8" diameter porcelain former proved successful. It is located such that the 813 plate caps are in close proximity to the choke. The high voltage feed is dressed back against the chassis via RFC3 and hence to the power supply.

In series, RFC3 should be of generous proportions so as to be sufficiently rugged to tolerate the stresses that can be placed on it at various operating frequencies. Resonated RF knows little mercy at these power levels!

Further details concerning the plate choke really are academic, each and every change in coil dimension or component location radically affects where any resonance may occur.

The commercial components listed should normally perform admirably in the circuit— but beware! Plate chokes have always

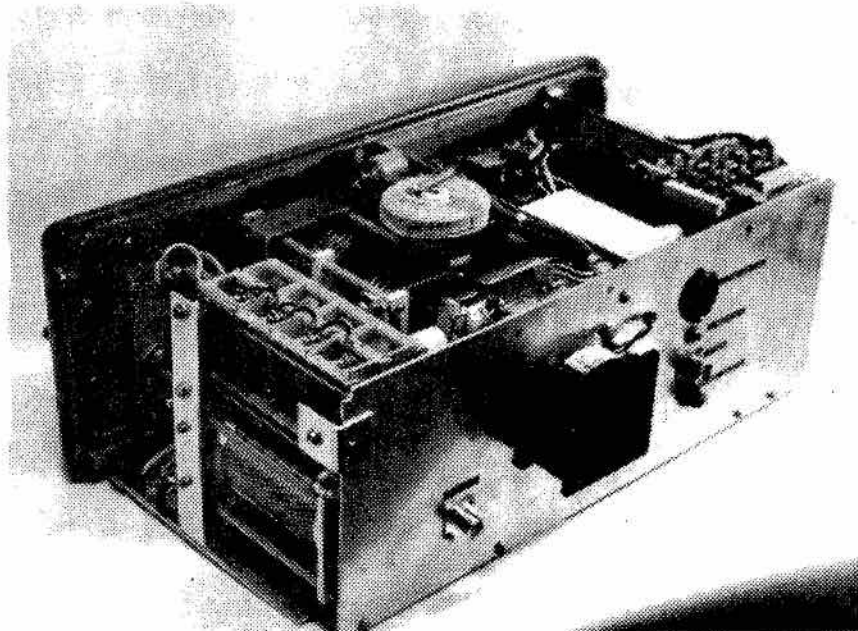


Photo 3: In this rear view of the amplifier, note the fan location surrounded by input, output, power and control jacks. The PA compartment is in the left foreground.

plagued RF amplifier constructors, both commercial and amateur. Mathematically proven designs can prove somewhat temperamental in the harsh environment of an actual linear!

Parasitic chokes Z1 and Z2 are added to dampen any tendency to self-oscillation that may occur. The wide frequency coverage promotes the possibility that some instability may occur at a compound LC ratio. They are constructed by passing a single turn of each plate connection through a LF miniature toroid or ferrite bead. Mounted as close to the top-cap as is practical, the copper braid used for all RF connections is passed through them. The plate connections of the 813's, C8 and L1 are then mounted as closely together as possible and bound together with the braid.

The actual Pi-Network inductor used is the essence of continuous 1.8-30 MHz operation, at deliberately optimistic power levels over a wide range of circuit conditions. Every possible watt is coaxed from the 813's by the facility to make fine inductance adjustments to the roller inductor L₁. The inductor actually had 28 turns taper spaced over 4" on a 2½" diameter porcelain former. The taper is oriented such that the widest spaced turns are operational at the higher frequencies. Porcelain formers are preferred as at higher frequencies losses in the system can be observed.

The total output capacitance of the 813's is around 30 pf. The other strays and the minimum value of C₁ will easily add an additional 20 pf. As we could demonstrate this 50 pf will push the pi-network Q, at higher frequencies, considerably away from a typical target value of 20—another reason to make the complete output network fully adjustable at each component.

The Plate Resistance in the circuit will vary with the applied plate voltage, but as C₁, C₂ and L₁ can be varied the calculation is no

longer critical. All three can be varied for optimum power transfer in the system.

From the formulae:

$$R_L = \frac{(0.57 \times VHT)^2}{P \text{ (output watts)}}$$

(this assumes the peak RF voltage is 80% of VHT, the applied voltage)

$$\text{or} \\ = \frac{464 \times VHT}{I_{ma}}$$

(this assumes a 70% amplifier efficiency which varies with VHT)

As is so often the case, neither of these formulae can be used without a correctly functioning amplifier to take measurements from; or a full set of tube curves to extrapolate from!

So empirical results were applied to these formulae and used to obtain a typical value of about 5000 ohms for R_L. This value is used for the pi-network calculations; however any variation in

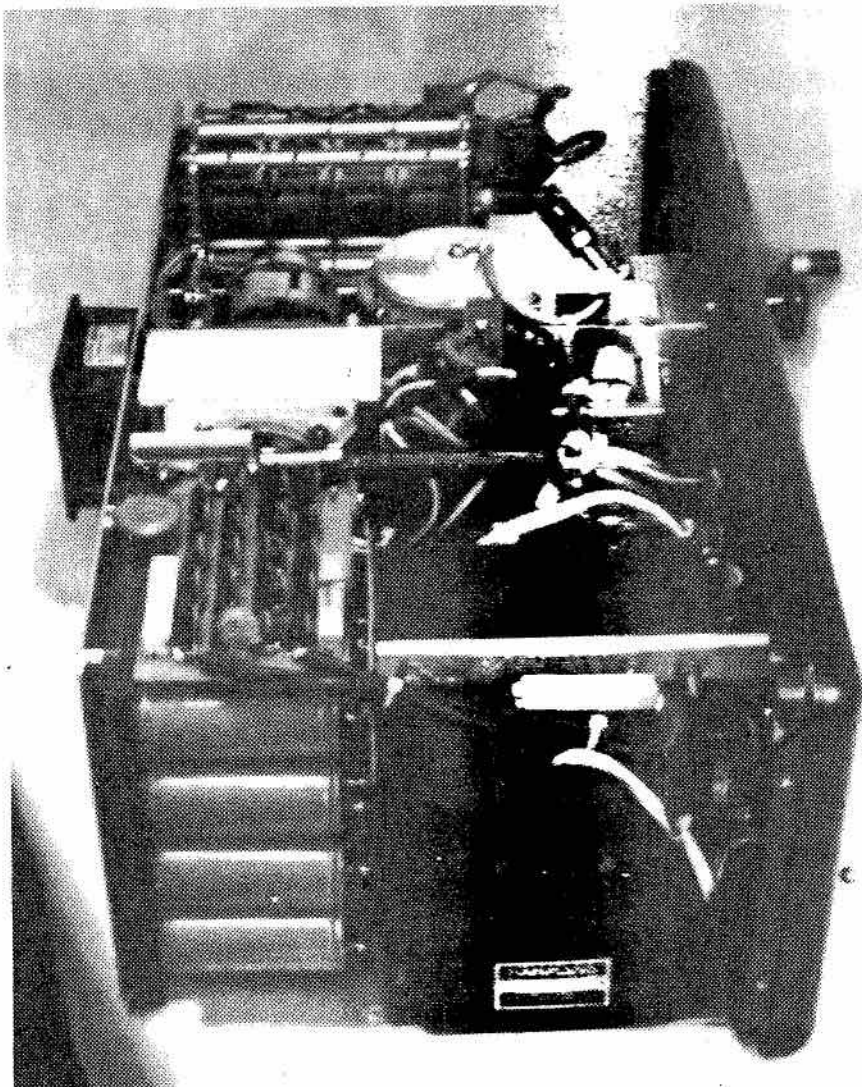


Photo 4: An overall view of the amplifier across the power supply. The HV transformer, capacitor bank and diode board are in the foreground. The RF input transformer T1 (with screen removed) is in the picture centre. To the left of T1 is the 813 base screening assembly. The chassis is divided in four sections, power supply, control, input and output which are shielded from each other. RFC-1 and F3 are seen in the centre of the picture. T4 is to the right of T1, the toroidal input transformer. To the back is C10 mounted on C9.

VHT varies P_{out} and I_{ma} in. Understand R_L not to be definitive, it is a variable based on circuit parameters.

Using the approximations:

$$\text{Now } X_{C_8} = \frac{R_L}{Q} = \frac{5000}{20} = 250 \text{ ohms}$$

$$\text{But } X_{L1} \approx X_{C_8} \approx 250 \text{ ohms}$$

$$\text{Now } X_{C_9} = \frac{X_{C_8}}{(X_{C_8}:X_{C_9})}$$

$$\text{Since } (X_{C_8}:X_{C_9}) = \sqrt{R_L/R_{out}}$$

$$= \sqrt{5000/50} = \sqrt{100} = 10$$

$$\text{Therefore } X_{C_9} = X_{C_8}/10 = 250/10 = 25 \text{ ohms}$$

The approximate values which equate to these reactances, at extremes of band coverage, based on the assumed parameters, are as follows:

Frequency	C_8	C_9	L_1
1.8 MHz	350pf	4000pf	25uH
30 MHz	22pf	220pf	1.5uH

It is obvious from the above that operation at 30 MHz requires some constructional care. The theoretical value of C_8 compared to total strays will need specialized techniques if resonance is to be achieved at any Q !

At 30 MHz, stray inductance also becomes significant. For this reason, all RF and ground connections are made with RG-8 coax braid, as directly and securely as possible.

The 813's themselves are screened below envelope level by chassis design. Attached to the tube sockets are spring clips, positively grounding the metal base shell of each tube. (See photo No. 5)

Grids, Screens and Beam Plates are connected together by soldering a common loop of coax-braid around the bases, each corner of this loop is positively grounded to the base mounting bolts.

The result of these construction techniques should enable the amplifier to function satisfactorily to 30 MHz. While a compromise

does exist, routine checks have shown harmonic content well down and the classic output patterns can be displayed during the normal two-tone tests.

This extra capacity is used at 1.8 MHz, where C_8 as installed had a maximum capacity of 300pf. The unwanted stray capacitance and inductance are now used to achieve resonance. C_9 (as available) was a 4x500pf 'receiving type' unit; additional capacitance C_{10} being switched into circuit as required to enable 160M to be loaded. If space is available, C_9 could be fitted as a 4000pf device, or C_{10} can be switched in automatically as C_8 , C_9 or L_1 approach maximum values; by the use for example of a suitable shaft switch.

Should 160M coverage not be required and 80M is the extent of LF coverage, C_8 may be reduced to 200pf and L_1 to about 15uH, in this case C_{10} will become redundant.

The vital point to appreciate is that at any operating frequency or voltage C_8 , C_9 and L_1 are adjusted in the classic pi-network procedure for maximum output; consistent with acceptable linearity, adequate harmonic suppression and IMD characteristics. Appropriate settings are then noted for future excursions around the frequency for which a set of satisfactory operating points have been determined. The actual grid and plate currents observed will depend on the band, plate voltage and the operating points selected for the network components. Current will also vary with output efficiency, which varies with plate voltage; efficiency being typically 60% at 3.5 MHz degenerating to 50% at 28 MHz. In fact, the efficiency rises with plate voltage, the ideal tube being one that would pass infinite current at zero voltage!

It is beyond the object of a constructional article to describe these basic checks and tune-up procedures in any detail, when they are covered so well in standard handbooks. However, they

must be applied if only for the sake of your own on-air reputation and the most effective operation of the amplifier.

POWER SUPPLIES

If 120V or 240V is used for the HV transformer supply, in either case a separate supply line is needed from the house panel to the operating location. This version utilizes 120V for design convenience, safety and ease of component availability.

One 15A fuse F_1 protects this main supply; however, theoretically this will not co-ordinate with any good quality 15A MCB at the house panel. Provided the supply is wired in number 12 cable, a 20A breaker and receptacle can be used to prevent nuisance tripping at the panel during prolonged heavy output cycles. A 5A fuse F_2 is branched off to protect filament, fan and control supplies. The main transformer T_2 should have a secondary winding in the range 2KV 400VA, to 5KV 800VA; SSB and CW duty cycles will not overstress any good quality units in this range. Naturally, the higher the VA, the better regulations and linearity; and within reason the higher the voltage, the higher the output. Though not recommended, 813's have been used at plate voltages up to 6KV in SSB duty! Naturally, tube life is considerably reduced and the other components required upgrading to suit these conditions.

The rectifier stack is designed around economical IN4007's. For each KV available from the transformer, an IN4007 plus one was used i.e. 4K VAC across the entire bridge would comprise a total of 20 diodes. The 390K resistor R_3 and .01 uF capacitor C_{15} across each diode serve to effectively even up inverse voltage and subdue any transient voltage effects.

R_1 , R_2 , R_7 and C_{13} , C_{14} usefully limit surge currents and control the potentially destructive voltage spikes that may circulate in the

power-pack at turn-on; or equally those that may be caused by random backfed resonances during tune-up procedures.

The 1A fuse F_3 protects the HV pack against downstream failures. It can easily assume HV potential and great care must always be exercised. Disconnect all power and discharge the capacitor bank C_{10} before replacing the fuse or making other adjustments to the amplifier. It is mandatory that appropriate HV interlocks be incorporated into your design. Each constructor will recognize the area where his design and layout needs to offer people protection, as LS1 provides in this layout.

The capacitor bank C_{10} needs to have a total capacity of 12-20 μF rated at 120% of the working voltage. In this version, 12x200 μF 450 VDC electrolytics were connected in series; resultant capacity being about 16.5 μF at 5.4 KV. Across each capacitor C_{10} is R8, a 47 Kohm 5W resistor to even up the applied voltage and provide some 10 ma of bleed current. Ideally, if space allows, a 25Kohm 10W resistor per 500v should be used; improved regulation and evening up of the voltage across each device will result. In practice, though, this was not found to be critical, despite the classic doctrines!

The filament transformer T_1 is rated at 10V 10A centre-tapped. Should this prove difficult to obtain, any minimum 100VA LV transformer with an accessible secondary can be reworked. The number of turns required can be calculated using the formula:

$$\frac{\text{Known Turns of Secondary}}{\text{Known Secondary Voltage}} = \text{Turns/volt}$$

Often turns can simply be judiciously added or removed from a unit until 10V results under load.

The control circuit transformer T_4 as used was a 12.6 VAC device rated at .3 amperes, sufficient to

operate the relays selected. Not called for on the parts list, but marked * on the circuit diagram, are .01 μF 600 VDC ceramic capacitors and IN4007 diodes. They are used to remove optimum

levels of RF and inductive spikes from the relay control line. Not only do they optimize interstage RF decoupling, but the driver change-over relay contacts benefit from the inductive spike suppres-

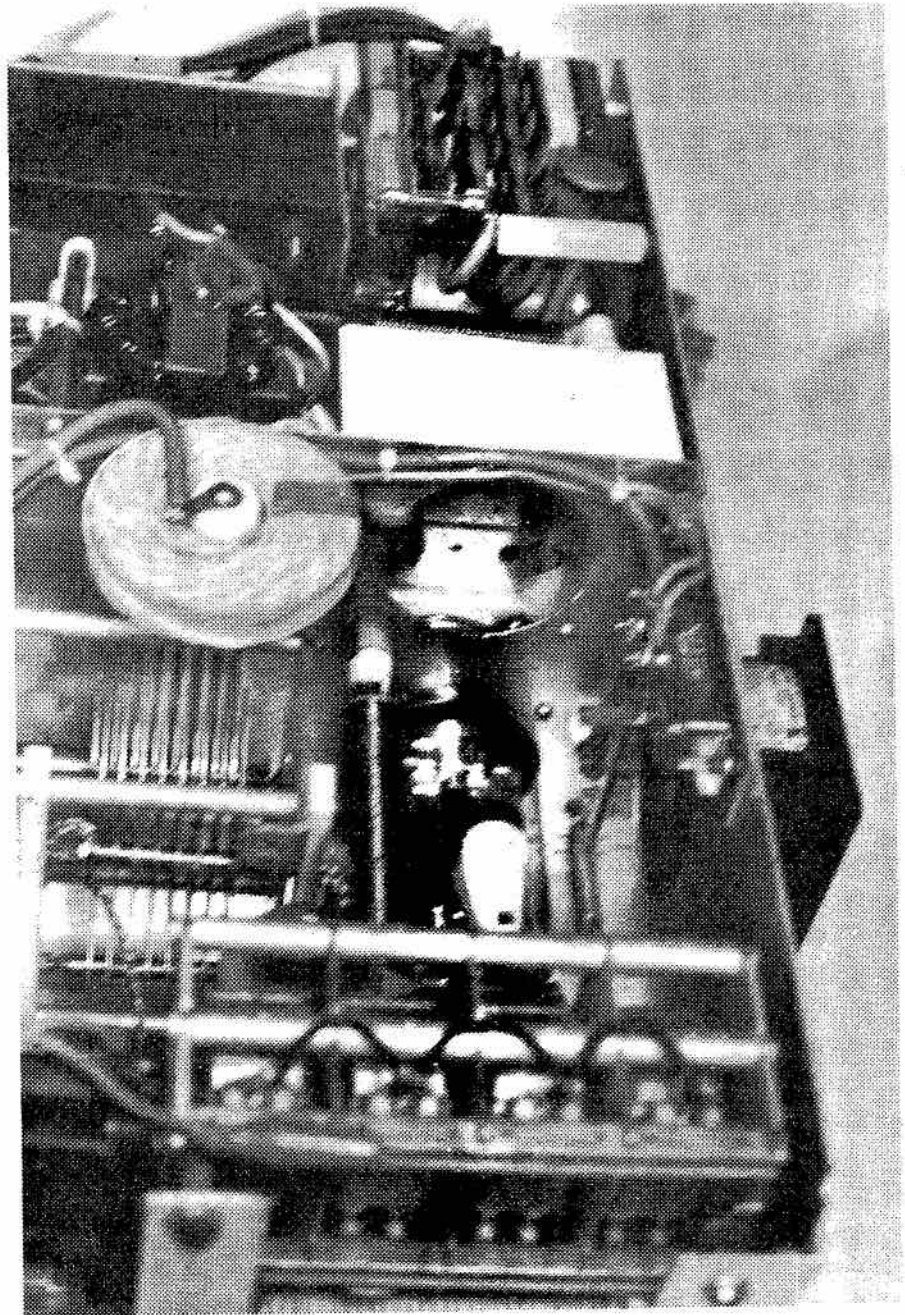


Photo 5: A close-up of the R.F. cage showing the tune capacitor in the left foreground. Minimum plate spacing should be 5/64". (Ground to RF.) The screening and grounding technique used on each 813 can be observed. Under T_1 , the toroid, T_3 and K_1 are mounted. The overheat switch TS_1 is seen immediately above the fan. RFC-2 may be observed in the picture centre, above the 813 and below the socket.

sion. 12 VDC is a compatible control voltage with most transceivers; any voltage may be utilized though, depending on relay availability and personal choice.

For purposes of tune-up information, grid and plate current are monitored separately by M₁ and M₂. The addition of M₃ meets the regulations requiring power input to be continually monitored. The meter used was a 1 ma movement scaled to read 4.5 KV. The series resistors R_s were calculated from the formula:

$$R_s = \frac{\text{volts FSD}}{\text{amps FSD}}$$

(assuming a negligible meter resistance)

The 'resistor' should comprise a string of 1% resistors; at least one resistor per KV owing to the insulation ratings of standard components. Checks should also be run concerning power dissipation (from the standard formulae).

RELAY CIRCUITRY

If available, co-axial relays are naturally to be preferred for K₁ and K₂. Experimentation has shown however that conventional octal-based relays with gold contacts demonstrate acceptable characteristics for the frequencies envisioned.

Basic antenna change-over apart; the function of K₂ when energized is to short out R₄, in this state some 70 ma of plate current will flow. In circuit R₄ biases the 813's to virtual cut-off so reducing amplifier temperatures and subduing diode noise in the receiver during periods of reception.

Included in the control line is S₂ providing an instant QRO/QRP control; and TS₁ the overheat switch.

Since intelligent mistreatment is being inflicted on the 813's, TS₁ is mounted strategically close to same. By experimentation, it is set to drop out the amplifier should temperatures exceed some empirical maximum. Traditionally, this is judged to be as the 813's

reach dull red heat. If adequate air-exchange is provided, utilizing a heavy duty fan (100 CFM or better) in the proper location, the tubes should not overheat except under conditions of improper amplifier operation.

The essence of effective air exchange is to move quantities of cool air directly onto the tubes and then right out of the enclosure. In this version, the fan draws air directly down onto the tubes and out. The input vent is located right above and beside the 813's. Additional cabinet perforation is provided in appropriate areas of heat generation or accumulation.

In conclusion, this is not a State of the Art amplifier. It has, though, proven itself in operation for four years at the writer's sta-

tion; idling along during routine operation, or brutalized by unfamiliar operators in field day conditions!

Neither is it an Alpha, but the cost should be about 10% of one! Time can be well spent planning the mechanical and electrical layout; search for those components and never treat any electrical or electronic value, or design, as being carved in tablets of stone! Do not be afraid to experiment with a circuit and a concept; what about different tubes? Let this project be an enjoyable experiment for you— a real learning experience. Good DX!

Martin MacGregor VE7CGM
945 Ranch Park Way
Coquitlam, B.C, V3C 2H5

Parts List

- C1, C2 - .01 uf 600 vdc (mica)
- C3, C4 - .001 uf 600 vdc (ceramic)
- C5, 7, 13, 18, 21 - .001uf 10 kvdc (ceramic)
- C6 - .0001 uf 10kvdc (ceramic)
- C8 - 300 of variable (see text)
- C9 - 2000 of variable (see text)
- C10 - 2000 of 600vdc (mica)
- C11, 12, 15, 16, 17, 20 - .01 uf 1kvdc (ceramic)
- C14 - 470 uf 25vdc (electrolytic)
- C19 - See text
- R1, 2, 6 - 10 ohm 10w w.w.
- R3 - 390k 1w carbon (see text)
- R4 - 25k 10w W.W.
- R5 - 2.2k 1w carbon
- R7 - 500 ohm 10w W.W.
- R8 - See text
- R9 - See text
- F - fan
- NE1 - Neon panel indicator
- S1 - 15A 120vac DPST switch
- S2 - 1A 12vdc SPST switch
- K1 - DPDT relay (see text)
- K2 - SPDT relay (see text)
- I1, 2, 3, 4 - See text
- L1 - See text (Multronics coil/Bauman counter)
- F1, 2, 3 - See text
- LS1 - Safety Interlock switch -to suit, see text
- RFC1 - B & W FC25A (see text)
- RFC2 - B & W 600
- RFC3 - 2.5 ml 500ma H.V. style
- RFC4 - 2.5 ml 500ma L.V. style
- TS1 - 100-300 deg. F. Thermal switch (Fenwal Thermoswitch No.30000-000)
- J1, 2 - female coaxial receptacle S0239
- J3 - phono jack
- Z1, 2 - see text
- V1, 2 - 813
- M1 - 500 ma F.S.D. min., 750 ma max.
- M2 - 100 ma F.S.D. min., 250 ma max.
- M3 - see text
- Diodes - 1N4007

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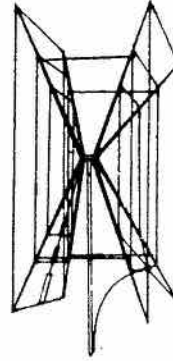
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VE3GDZ

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LONDON, ONTARIO, NSW 2B7

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Confirming QSO of _____ IS _____
At _____ T On _____ MHz
Ur 2 way cw am fm ssb sigs R S T PSE QSL INK
rtty atv fax pkt

FILE 10 - BLUE PRINTING ON LIGHT BLUE BRISTOL

CANADA

VE3GDZ

BRUCE MCCOY
1128 BRYDGES STREET
LONDON, ONTARIO, NSW 2B7

Amateur Radio _____
Confirming QSO of _____ IS _____
At _____ T On _____ MHz
Ur 2 way cw am fm ssb sigs R S T PSE QSL INK
rtty atv fax pkt

STYLE 11 - RED PRINTING ON CANARY YELLOW BRISTOL

CANADA

VE3GDZ

BRUCE MCCOY
1128 BRYDGES STREET
LONDON, ONTARIO, NSW 2B7

Amateur Radio _____
Confirming QSO of _____ IS _____
At _____ T On _____ MHz
Ur 2 way cw am fm ssb sigs R S T PSE QSL INK
rtty atv fax pkt

FILE 12 - BROWN PRINTING ON BUFF BRISTOL

CANADA

VE3GDZ

BRUCE MCCOY
1128 BRYDGES ST.
LONDON, ONTARIO
NSW 2B7

Amateur Radio _____
Confirming QSO of _____ IS _____
At _____ T On _____ MHz
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FILE B - RED MAP/BLUE PRINTING ON BUFF BRISTOL

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Infosection

Special Prefixes

Here is some good news for testers, card collectors and wallpaper enthusiasts: special Canadian call prefixes to celebrate the patriation of the constitution were effective April 1. Despite the inauspicious beginning date, DOC really did okay the use of the following optional prefixes valid until May 31: VO stations may use 'CY', VE1 through VE8 can use 'VC' and VY1 operators can use 'CK'.

Special call collectors may be happy to hear that Regina has revelled in the use of XK to celebrate the 100th anniversary of the C.P. Railway reaching that city. Moose Jaw Amateurs, not to be outdone, have the use of CG to mark the town's 100th birthday.

10 MHz in Spain

Spain is the latest Region 1 country to open up 10 megs. According to a Spanish short wave broadcast, Amateurs may use CW from 10.1075 to 10.1135 MHz.

Swap Shop

Single insertion is \$1.00 (minimum charge) for 10 words and \$1.00 for each additional 10 words. To renew, send copy and payment again. Deadline is first of month preceding publication (e.g. Jan. 1 for Feb. issue). Put your membership number and call (not counted) at the end of your ad. Print or type your ad and include your address with postal code. If using a phone number, include the area code. TCA accepts no responsibility for content or matters arising from ads. This feature is for use of members wishing to trade, buy or sell personal radio gear. It is not open to commercial advertising. Send to: TCA Swap Shop, Box 356, Kingston, Ont. K7L 4W2.

FOR SALE: Antennae for sale. 20M 5 el High Gain Monobander 205BA; 15M 5 el High Gain Monobander 155BA. Both 1/2 List Price. VE3GO Chuck Miller 613-542-2693.

FOR SALE: Hal ST6000 Mod/Demod with scope. Mint condition. \$650.00. Call: Stan VE2FMI (514) 695-9799.

WANTED: Trylon B200 Free Standing Tower (72') or equivalent. Call: Stan VE2FMI (514) 695-9799.

FOR SALE: Heath HR10 Receiver with Xtal calibrator and matching speaker. DX60 transmitter with HG10B VFO. All good clean cond. All with manuals. Included is a desk and hand mike. TR switch. Some spare tubes and Tenco SWR bridge and field strength meter. Complete station \$250.00 Contact Bert VE3JFQ in call book or phone 519-542-3701.

SPRING CLEANUP Commercial tower, 150 feet, suitable for large Amateur arrays, broadcasting or TV, with guys and insulators, recently removed from service, pictures on request. Heath HW101 transceiver, PS23B, MFJ Grandmaster memory keyer and 520BX speech processor. All guaranteed AI working condition. Renwick, P.O. Box 50, Clavet, Sask. S0K 0Y0. 306-373-1988.

FOR SALE: Over 400 issues, QST's, CQ's, 73's, RadioNews, Radio Television, others, 1924-1982. List SASE. VE2OU, 2785 Valcourt, Ste. Foy, Quebec G1W 1W2.

WANTED: Service Manual or photocopy for FT7B. Crystal filter for VHF Engineering receiver. 2 metre helical resonator. VHF Engineering Equipment. **FOR SALE:** Glenwood SC1 touch tone decoder \$50. HW8 \$200. Converted SSB CB \$125. Rob VE3ACY, 488 Cameron Ave., Windsor N9B 1Y7. 519-256-5143.

FOR SALE: FT101 cw filter, fan, mike. Asking \$500. Dave VE3GZX, Richmond Hill L4C 2Y5 (416) 884-8398.

FOR SALE: Kenwood TS830S, VFO-230, Mc50, HS4. Asking \$1500.00. Jim Nazar VE4NC, 20 Main St., Flin Flon, Manitoba K8A 1J4 (204) 687-5185.

FOR SALE: Swan 350, power supply and speaker. Decca KWE-2ec Match, ant. tuner. Heathkit HD-1410 Elec. Keyer plus coax and more. Complete package ideal for new ham \$450. David Ney, 2044 Floralynn Cres., North Vancouver, B.C. (604) 987-9570.



Canadian Amateur Radio First!

WHAT IS CARF?

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

1. To act as a coordinating body for Amateur radio organizations in Canada;
2. To act as a liaison agency between its members and other Amateur organizations in Canada and other countries;
3. To act as a liaison and advisory agency between its members and the Department of Communications;
4. To promote the interests of Amateur radio operators through a program of technical and general education in Amateur matters.

OFFICERS

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BOARD OF DIRECTORS

If you want to contact the Federation, write or call a Director in your Region or write to CARF, Box 356, Kingston, Ont. K7L 4W2.

VE7AB Peter Driessen, 13142-69'A', Surrey, B.C. V3W 6N9. 604-732-3298.

VE5AE Norm Waltho, 1547 Glendale St., Moose Jaw, Sask. S6H 7B3.

VE3HWN Craig Howey, No. 304 598 Silverbirch Rd., Waterloo, Ont. N2L 4R5 519-885-4545.

VE3KCE G.R. (Geoff) Smith, 7 Johnson Rd., Aurora, Ont. L4G 2A3 416-727-6672.

VE2BIE Raymond Mercure, 208 Bourque St., Hull, Que. J8Y 1Y4. 776-6495.

VO1NP Nate Penney, Box 10, Shoal Harbour, Nfld. A0C 2L0. 709-466-2931.

Operating Information

RECIPROCAL OPERATING AGREEMENTS

Canada has concluded agreements or arrangements with the following countries to permit licensed Amateur radio operators to operate radio stations while temporarily in the other country: Australia, Austria, Barbados, Belgium, Bermuda, Botswana (Republic of), Brazil (Federative Republic of), Chile, Colombia (Republic of), Costa Rica, Denmark, Dominica, Dominican Republic, Ecuador, Finland, France, Germany (Federal Republic of), Greece, Guatemala (Republic of), Haiti (Republic of), Honduras (Republic of), India (Republic of), Indonesia (Republic of), Iceland, Ireland, Israel (State of), Luxembourg, Netherlands (Kingdom of the), New Zealand, Nicaragua, Norway, Panama (Republic of), Peru, Philippines (Republic of the), Poland (People's Republic of), Portugal, Senegal (Republic of the), Sweden, Switzerland (Confederation of), United Kingdom, United States of America, Uruguay (Oriental Republic of), Venezuela (Republic of).

Negotiations for the establishment of similar agreements or arrangements with the Republic of Bolivia, Cuba and Italy have been initiated.

How to use the CARF QSL Service

The CARF Outgoing QSL Service will forward your QSL cards to anywhere in the world. This service is **free to CARF members**. If you send a lot of cards, a CARF membership will soon pay for itself in view of the high cost of postage when cards are mailed direct.

Please observe the following rules when using the CARF Outgoing QSL Service:

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

(For an explanation of QSL Bureaus in general, see the CARF Regulations Handbook chapter on QSLing.)

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BANNED COUNTRIES LIST

The following countries have notified the International Telecommunications Union that they forbid radiocommunications with Amateur stations under their jurisdiction:

Democratic Kamuchea, Iraq (Republic of), Libya (Socialist People's Libyan Arab Jamahiriya), Somali Democratic Republic, Turkey, Viet Nam (Socialist Republic of), Yemen (People's Democratic Republic of), Zaire (Republic of)

THIRD PARTY TRAFFIC AGREEMENTS

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

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

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

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Go Canadian!
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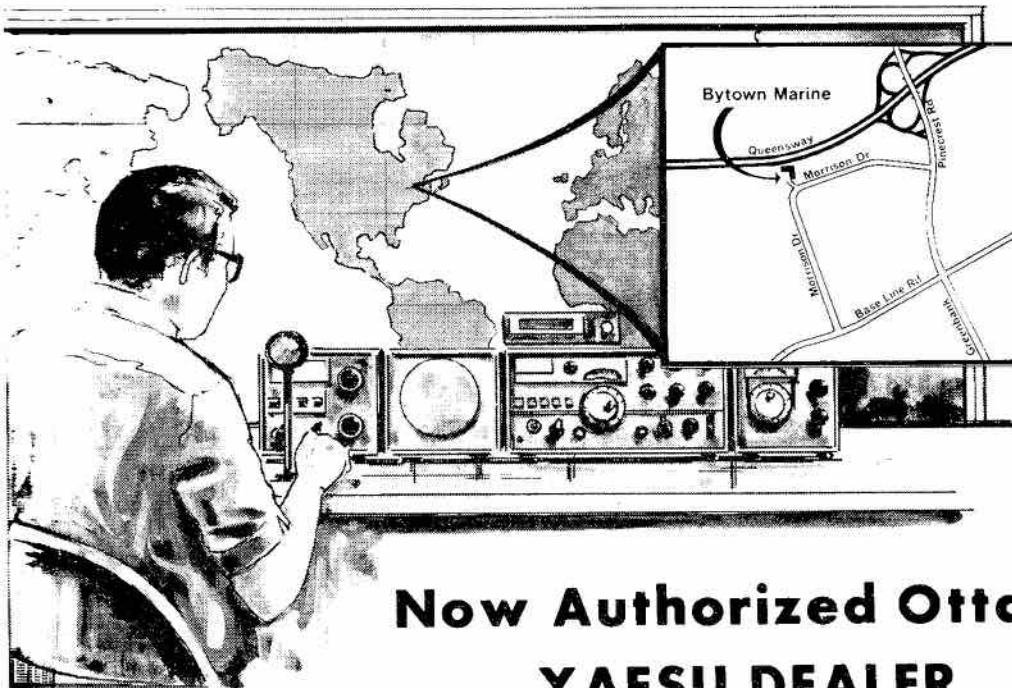
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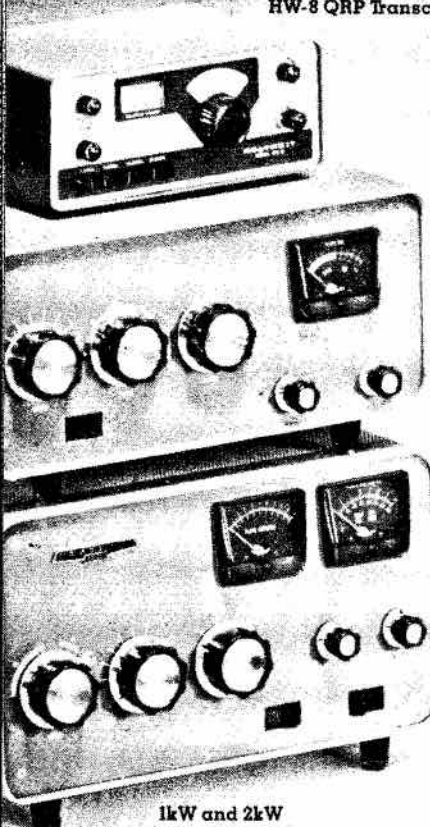
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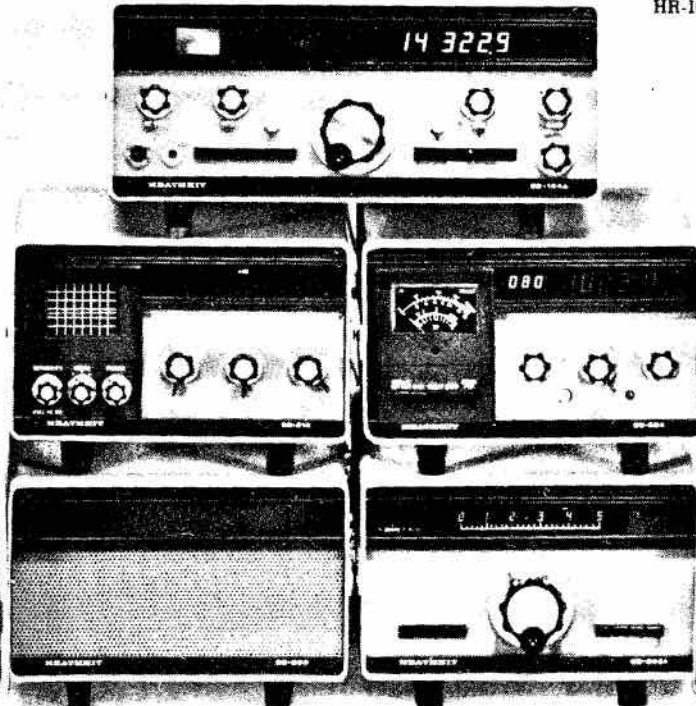
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