

CARF The Canadian amateur

June 1978 No. 6

New Exam format proposed

In consultation with its Regional directors, DOC head office is working on a new format for Amateur examinations, probably to take effect this fall.

One important change will be one which CARF has pursued over the years with the Department and one which was informally followed in some offices; that of being able to get separate credits for the theory and code portions of the examinations.

Exams will be held only four or five times a year, on the same day across the country. The papers will be sent from DOC H.Q. to the field and when written and marked will be returned to the Regional offices.

The new exam format will tighten the standards for the Amateur certificate by replacing the multiple choice questions on theory by problem type questions. Regulations questions will still be multiple choice.

Instruction Courses with content which "programmed" students with a list of possible multiple choice questions and the minimum knowledge to answer them by rote will probably have to revamp to cover the syllabus in depth.

GRS hobby use legalized

DOC to hit illegal linears

DOC gave public notice dated April 20 of proposed amendments to the Radio Regulations which would:

1) -- make it illegal for the licensee of a General Radio Service station to possess "any device capable of boosting the output power of the apparatus of his station" (a linear amplifier) unless he (or she) is also the licensee of an Amateur Radio Station.

2) -- up date the uses for which a GRS station may be used by deleting restrictions concerning "diversionary and recreational activities" and "calls directed to stations generally". This would in general legalize some of the current illegal GRS operations. All transmissions will still be required to be restrict-

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Steve Campbell

The Canadian Amateur is the official monthly publication of the Canadian Amateur Radio Federation, Inc. It is distributed to members and is available to others for \$7.00 per year. The Federation 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.

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New deals for Clubs

The Canadian Amateur Radio Federation now has a special deal for clubs and students. This deal is designed to encourage club-sponsored courses on Amateur Radio and to gain support for your national society. For \$13.00 a student receives a copy of the Certificate Study Guide and the Regulations Handbook and a year's membership in CARF-- a saving of \$3.00. In addition, the club sponsoring the course will obtain, as a bonus, a copy of the Instructor's Package when 5 orders for the Package Deal are received and a set of 35 mm slides for use with the Instructors Package when 10 Package Deals are received.

Linears

Continued from Page One
ed to "Ground Wave coverage". Skip communication is still a no-no.

3) -- require the licensee of any radio station to permit the inspection of his station by a Radio Inspector or other authorized officer at all reasonable times. The Department, in this instance, appears to have fallen into a previously avoided trap by referring only to licensed stations, leaving the illegal, unlicensed operator unaffected by the proposed changes. CARF has brought this to the Department's attention.

Public comment on the formal Gazette notice DGTR-005-78 closes on June 20.

VE3ZS

CANADIAN INTERNATIONAL

DX Club

CIDX is Canada's largest and oldest radio listener's club, having been formed in 1962. The Club membership is 250 or so SWLs, many of whom are also Amateurs.

The club bulletin, known for 15 years as the Messenger, usually runs about 40 pages and about 40 members combine their efforts to make it possible.

CIDX looks forward to closer relations with the Amateur radio fraternity. For example, when the new printing equipment is fully operational, it will be used by the Peterborough Amateur Radio Club to print their award winning bulletin. A fine example of SWL-Ham cooperation!

(Club dues are \$11 first class to the U.S. and Canada, and \$10 third class. Send inquiries to; CIDX Club, R. Lorne Jennings, 169 Grandview Ave., Winnipeg, Manitoba, R2G 0L4.

Field Day story prize

The Canadian Amateur offers a prize of \$20 for the most unusual story of Field Day 1978 experiences. Entries must be typed, double spaced and should not exceed 1500 words.

SHORT CIRCUITS

by
Stan Hill
VE3DQ



"OK - NOW THAT I'VE FIXED ALL THE PAINS, SPRAINS, COLDS, ALLERGIES, CONTUSIONS, CONCUSSIONS, ABRASIONS, BITES, STINGS, BURNS, RASHES, PTOMAINE AND FRACTURES, WOULD YOU PLEASE EXPLAIN TO ME AGAIN THIS CAPER YOU CALL FIELD DAY??"

RAQI gets provincial recognition

Recognizing the value of Amateur facilities for emergency communication, the Quebec Civil Protection organization is assisting the provincial Amateur organization, Radio Amateurs du Quebec Inc., in organizational and communications expenditures. Last year RAQI obtained \$55,000 for repeater equipment

and linking devices to cover the lower St. Lawrence Valley and has now been given the services of two full-time, paid office employees, office space and distribution facilities in a Montreal office building, according to the new president, Jules Provost VE2BNM. In addition, a further grant is being considered for 1978-79.

ARLA wins Symposium bid

The Amateur Radio League of Alberta will host the 1978 National Amateur Radio Symposium to be convened by CARF late in September.

Details as to the date, which will be either the 23rd or 30th of September, will be announced soon.

DOC head office has agreed to Departmental participation again this year. The meeting will feature workshops on "Standards Qualifications and Examinations for the Amateur Experimental Service with a view to recommendations for overhauling the regulations governing Amateur operations and to bring them up-to-date with the present state of the art.

Radio organizations across the country will be invited to send representatives to this important gathering.

This will give the new executive, which includes Gilles Blackburn VE2RD, Bernard Leblanc VE2LC, Luc Leblanc VE2DWE and Pierre Joron VE2DV, a good start to make RAQI bigger and better in their term of office.

A Civil Protection employee has been assigned, full-time for a year, to implement a province-wide system of emergency communications using Amateur radio.

Third party agreement possible

Jamaica and Canada are negotiating a third party traffic agreement in response to requests from the ex-patriates who live on that island. All that is now required is an order-in-council by Canada.



Canadian
Repeater
Advisory Group

VE3DWL Hugh Lines

As most of you know by now, the U.S. FCC has opened up the region from 144.51 to 145.49 MHz to FM use in the U.S. and it appeared that 20 KHz channels would offer the best compromise between spectrum utilization and technical requirements. This 20 kHz band plan is proposed by some U.S. west coast repeater groups as being extended up to 147.99 MHz. This of course would require a massive change by the users of these machines to use the new frequencies. This is still in the proposal stage and hopefully Dave Powell-Williams, VE7MQ, and the B.C. FM Communications Association will keep us posted.

A new 2 metre FM club is being formed in Sudbury, and the Sudbury repeater has changed location and is now on the cable TV tower, frequencies are unchanged at 146.46/147.06 MHz. An interesting item out of North Bay is a proposal to conduct code-practice on ei-

ther the local repeater (VE3FM) or on 146.52 MHz if there is sufficient demand. An interesting way to get your code speed up for the Advanced ticket.

For Heathkit Micoder users who have been troubled by frequency stability problems, there is a modification kit with the crystal-controlled oscillator used in the Micoder II. Price is around \$12 from your local Heath dealer or the head office.

From VE5EZ via VE3DVB we hear of some Saskatchewan changes. VE5SK (Saskatoon) is changing from 146.34/146.94 MHz to 146.04/146.64 MHz and is moving to an improved location outside the city. The 146.34-146.94 MHz pair of frequencies will be used by a lower powered repeater operating from a site in the city for short-range local work. No call has been assigned yet.

From VE2BEN I have received a number of Quebec updates. There are too many to include in this column and as a result, next month CRAG will publish a new Quebec repeater listing.

Please advise us of any new or changed repeaters that you may find during your travels this summer.

Conventions & Hamfests

June 10 -- Central Ontario Amateur Flea Market, sponsored by Guelph ARC and held indoors at the Centennial Arena, Guelph.

July 8, 9 -- International Hamfest -- on the Canadian side of the International Peace Garden on the North Dakota-Manitoba border. Camping and motels. For details write; VE4RN, Reg G. Edworth, 449 7th, Brandon, Man. R7A 3S9.

August 18-20 -- SARL Hamfest at Regina, sponsored by Regina ARC, at the University of Regina.

October 13-15 -- RSO convention, sponsored by London ARC. A new gimmick; contact VE3LON/3, the club station, request the special QSL card and get a \$1 discount on your registration.

To avoid confusion and a returned cheque, please write the month abbreviation or in full ... e.g. 2/1/78 could be 2 Jan 78 or Feb 1, 78 depending on the interpretation that the banks put on it.

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Repentant
author



Egg-on-the-face Dept.

VE1CP, Jack Holman writes concerning the "Renter's Radiator" article on page 41 of our April issue, "I was particularly interested in the sketch on page 43 and wonder whether it was by accident or design that the windings on each half of the coiled doublet are reversed from one another. Perhaps this is to reduce the impedance but off-hand I seem to recall the explanation of doublet operation shows a half-wave from one end to the other broken by a feed point; in this case a coil with the windings in the same direction on both sides of the feed point."

Right on, Jack. Our author, VE3ACY, says the antenna contains 130 feet of wire on each side of the terminal which should be wound, not as in the sketch but in one

continuous spiral, split in the center by the feed point. The drawing is incorrect... but oddly enough it will work that way if a transmatch (antenna tuner) is used ... however, that is not the intent. Author Bareham is paying for his error.

Egg deserves to be splattered on one other face but it is not really easy to decide whose ... HR Report of May 12 says that the comment closing date for the Canadian WARC '79 second draft proposals has been extended to June 30. CARF News Service, in talking with the editor of the Report, mentioned both the Canada Gazette notices for the WARC comments and the proposed new code-free Experimenter's certificate ... The two got mixed up somehow ... it's the latter on which CARF asked for and got an extension to the end of June, not WARC comments which close June 1.

NEWS BRIEFS

-- The electronic genius who developed such diverse products as mobile radio, aircraft and navigation systems died recently in a Nevada hospital. William P. Lear, born in 1902, started his career with the development of mobile radio, a concept which put Motorola Corp., a name known to every Amateur interested in VHF, into the business.

-- "The Canadian Amateur Radio Award Directory" is now available from VE3GCO, Gary Hammond, 242 Inkerman St. E., Listowel, Ont., N4W 2M9. The 80 page directory is a necessity for the certificate hunters. Price is \$3.00 post-paid.

-- The prefix CH3 has been assigned to VE3ETF, Palmerston and District ARC members for celebration of the Harri- ston centennial, effective May 1. Prefix hunters had better get cracking because DOC HQ has indicated that special calls are due to be ended.

-- CARF officials in Ottawa sponsored a team of 20 local Amateurs to provide safety and administrative communications on two metres for the annual Jock River White Water Canoe Race on April 30.

-- As of April 30, there were 18,015 licensed Amateur stations.

-- A new certificate, the Canadian Islands Award is being sponsored by the Listowel ARC and VE3GCO.

Cash for stories

We pay for stories, articles and photos related to Canadian Amateur radio activities. Stories must be typed, double spaced and not more than 2500 words. Photos should be black and white glossy and at least 3" x 4". Return cannot be guaranteed. Send material to Editor, The Canadian Amateur, c/o D.R. Burrill, 151 Fanshaw Ave., Ottawa, Ont. K1H 6C8.

The success of the FCC booklet "How to Identify and Resolve Radio and TV Interference" has inspired DOC to come up with a similar (but to quote a DOC official "an even better") pamphlet. The booklet, produced with color illustrations, will have additional material suited to the Canadian scene.

Meanwhile, if you want a preview of the type of material which will be in the DOC booklet, you can look at the FCC booklet as reprinted in its entirety in "73" Magazine for this May.

DOC has more for the interference chaser. Three of the DOC Telecommunications Regulatory Bulletins have been up-dated to March 31 of this year and are now available from the Department. They are in the "Suppression of Inductive Interference" series, TRC 45 on Oil Burners, TRC 46 on Arc Welding and TRC 47 on Suppression Capacitors for TV Interference.

Public notice has been given in The Canada Gazette of the Department's intention to amend the Radio Regulations to clamp down on illegal operations, on the GRS band. The new wording will specifically prohibit the possession of linear amplifiers by GRS operators (unless the operator also holds an Amateur station licence), authorize the inspection of radio stations and require that licensees or persons in charge of radio stations permit such inspections, and would revoke some paragraphs and substitute others to clarify those provisions which now cause a problem in their interpretation and enforcement. Comments are due by the 20th of June. The proposal

seems to fall flat however in getting at unlicensed operators because it appears that these amendments only refer to "licensed stations".

Although Iraq is on the International Telecommunication Union "forbidden" list, a station billed as the Bagdad ARC with the call Y1BGD is being heard regularly on 20 metres and DOC is currently making enquiries through External Affairs as to whether the Iraqi government has lifted the ban.

The proposed Experimenter certificate has aroused such interest that the Director-General of the Telecommunications Regulatory Service, Dr. John deMercedo, was scheduled to address the Georgian Bay ARC on the 23rd of May, to detail the proposal and to answer questions on it. He will talk to the Ottawa ARC on May 24 and the Montreal ARC on May 31. Record turnouts were expected, boosted by the computer hobbyists; who far outnumber Amateurs, at least in metro centres.

DX team to St. Paul's Island

At press time it was reported from Halifax that VE1AMC, AIH, AI, AJP and MX were heading for St. Paul's Island off the Cape Breton north coast armed with a special call, VY0C, to entice the DX hounds and prefix fans. They were to leave on May 17 or 18, depending on the weather. The Halifax club also reported that, on a trip to Washington, club member Chuck Monroe learned that the club's Field Day satellite crew last year got the highest score on the continent. (Tx VE1FQ)

ATV buffs—

-- ATV buffs can obtain a directory of Ontario fast scan TV stations from the Ontario ATV Association, c/o Tom Atkins, 55 Havenbrook Blvd, Willowdale, Ont., M2J 1A7. A pamphlet on ATV, including licensing requirements, is also available. Both are free IF you send a self-addressed stamped envelope.

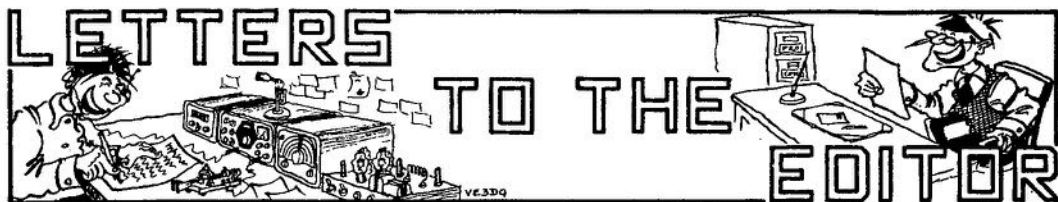
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LETTERS TO THE EDITOR



U.S. Expansion

A word about the proposed expansion of 20 metres to 14.100 as a starting point for US phone operations (currently appearing in US Amateur publications... Ed.) After having lived in the Arctic and having visited isolated regions in the Pacific where Amateur Radio provides vital services, I must express strong disagreement to the idea.

Could you imagine trying to run a phone patch from Canadian Forces Station Alert with your beam pointed at all that garbage that is now confined above 14.200? Apart from Alert, many isolated stations -- especially foreign stations -- just cannot afford expensive gear, 2 KW linears, 90 foot towers, and 4 element monoband beams. How on earth could they maintain vital services and cultural links if they had to compete with our affluent neighbours?

I believe that US hams want 'down there' on the band because that's where the foreigners (DX) are. The foreigners are 'down there' because they don't stand a chance in the US section. If our US neighbours have any self-respect for their own image -- not to mention the needs and rights of foreign Amateurs -- they should drop this proposal like a hot potato. I noted a tremendous attitude of disrespect shown by American operators on 80 metres when their

Extra class was given the upper 25 kHz in the Canadian section. By the way, did these 'DXers' succeed yet in moving the 'Chicken Junction Net'?

Finally, I am about to purchase a microcomputer and am interested in Amateur applications. I've heard tell that a few VE3's have been experimenting, including ASCII transmissions and would appreciate any information (or contacts) about developments in this field.

H.E. (Ted) King VE1BPW,
Box 285, Slemon Park, P.E.I. C0B 2A0.

Yukon News

Just a short note from the Yukon. My call sign up to April 21 midnight was VE8AD, however the new prefix call for the Yukon is VY1 ... we have been allotted the entire block from AA to ZZ. The reason for the change was that the VE8 area was from the Atlantic to the Arctic and Alaska borders, which covers some 3500 miles. The new prefix has caused some confusion and some pile-ups on our stations.

The Yukon Territorial Government will issue the VY1 Licence plates next year ... you may see some Yukon cars with the old VE8 plates on them. Collectors of licence plates can contact the Yukon Amateur Radio Association, P.O. Box 4597, Whitehorse, Yukon Y1A 2R8.

The 34/94 repeater should again be operational at Whitehorse, as some modifications have been made to our existing unit.

Two Amateurs at Watson Lake in the southeastern corner of the Yukon should have a repeater up in the near future, also on 34/94. The Amateur Radio course sponsored by the YAR should produce again about 14 new Amateurs in a few weeks. A great deal of co-operation from the Yukon Office of the DOC has made the course a success.

One more thing, the Yukon Amateur Radio Association will again be operating a Field Day and the call sign will
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QSL

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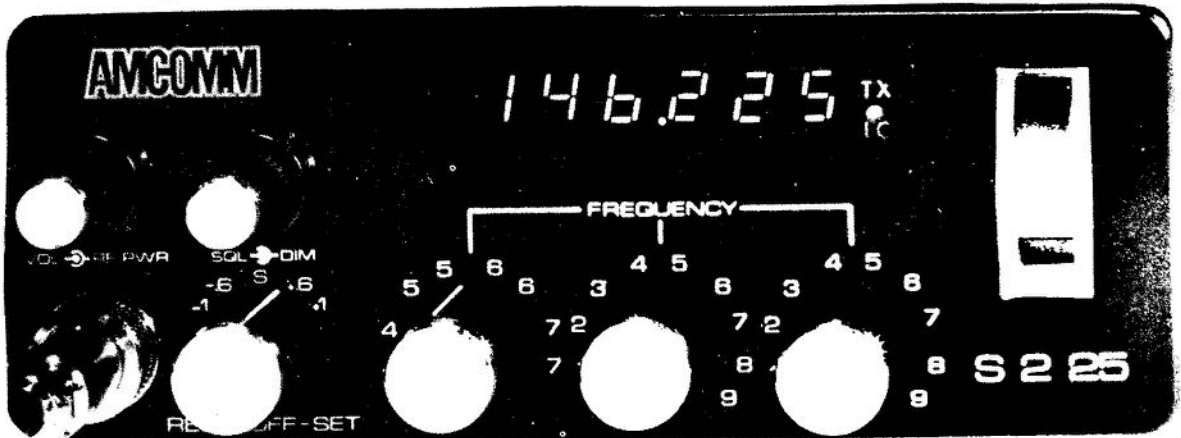
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be VY1YAR, the club call sign.

I enjoy The Canadian Amateur very much, keep up the good work, would like to see a Yukon section in the magazine, though ... and am against Packet band on 220.

Ron McFadyen VY1AD

Acknowledgement

Many thanks to the following for copies of their comments to DOC on the no-code Experimenter certificate proposal; VE3INP, Fraser Valley DX Club, Point Grey ARC, VE1OC, Cowichan Valley ARC, Vancouver Senior Citizens' ARC, VE7AZG, VE3SAT and VE3LF, received prior to press time. Some of these were notable for their in-depth technical review and suggestions.

CARF American Div.

The CARF American Division director should be fired.

He exhibited little originality in his April report as published in your May issue. In writing on Canadian Amateur Ragchewers' Federation activities under the heading of "American Newsfront" he appears to have relied heavily for inspiration on a "QRT" editorial of November 1923.

While his reference to the fact that CARF has "no territorial ambitions" was reassuring, it smacked of the political speeches of the late A. Hitler, and we all know what happened to Czechoslovakia.

Cooke E. Bustar, VE9BS

- Classified ads -

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.

Put your membership number and call (not counted), if any, 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. CARF and The Canadian Amateur accept no responsibility or liability for content or matters arising from ads.

Send to CARF, Inc., Box 356, Kingston, Ont. K7L 4W2.

FOR SALE: Wilson 1402-SM HT. Leather case, nicads, desk charger, 52/52 rocks. \$140 postpaid. VE3EYW, 15 Grandmont, Sault Ste. Marie, Ont. P6B 3W1. H-208: VE3EYW

WANTED: Ckt diagram of ARMACO TRIO 9R 59 Recvr...VE3CDC, Doug Burrill, 151 Fanshaw Ave. Ottawa, Ont. *K1H 6C8.

WANTED: Late model 101E or equivalent. FOR SALE OR SWAP: Canadian Coin collection. VE3 JIW, W. Carnes, 920 North St., Sault Ste. Marie, Ont.

FOR SALE: Heathkit HW-7 CW Xcvr, 40/20/15M, power supply, manuals - \$100.00. I. Lightbody, VE3FEQ, 177 Tarbart Terrace, London, Ont. N6H 3B3 (Ph: 519-472-5476)

FOR SALE: Heath 8 chm, grey metal speaker - \$25.00; Heath 100 kHz xtal calibrator HD-20 - \$20.00; EICO Sig Gen 75 Hz-150 kHz, Mod 315, AF 400 Hz - \$60.00; EICO Sig Gen RF 150 kHz-435 kHz, AF, Mod 324 - \$60.00; Hickok var PSU, solid state, 0-3.5A, 0-400V, model PS503 - \$125. This equipment in mint condition. R. Kilgour, VE3HPR, R.R. # 1, Grafton, Ont. K0K 2G0 (416)-349-2036.

Keeping the Junk out of the Junkbox

It takes only a short time for anyone in the electronics hobbyist field to realize that the biggest headache for the homebrewer is parts availability and standardization.

In the early days of electronics, there was not nearly the selection of parts that we have today and it was more of a problem in prices and shipping rather than simple non-availability. How many times have you become interested in a certain project published in your favourite electronic magazine only to become suddenly aware that it contains one or more "non-standard" parts and there is

either no substitution for it or if you use a substitute it requires the juggling of several other parts in the circuit to obtain the desired results.

This is probably because when the designer of the article was building it himself, he of course, used the components he had on hand or in his junk box rather than "standard values" which are obtainable by everyone.

The largest group of components that seem to cause the problems are: resistors, capacitors and inductors. Although components like transistors often cause problems there are so many books and
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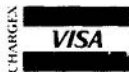


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guides to direct substitution to these items that they are not a major problem. It seems every manufacture somewhere along the line has reason to build a piece of equipment containing one or two specially made items such as a 41 ohm resistor or a 64 picofarad capacitor. And these components seem to get into the hands of every article writer.

For that reason, and also because I have never seen the standard list of components published, the following list of industry standard components are published. These components are available through most retail and wholesale electronic outlets. The homebrewing equipment for later publication should make a

point of not deviating from this list if at all possible.

For instance, years ago, this list was twice as long, but it was found that some values were used more often than others and some of the values were so close to each other, that there was no requirement for them. (You will probably still find items like 51 ohm resistors and 7.5 mfd capacitors at hamfests but if you try to obtain one from your parts dealer you are probably going to draw a blank.

So let's do as the manufacturers are now doing and standardize. It makes for much fewer headaches.

VE3ACY Rob Bareham

LIST OF ALL COMMON RESISTORS, CAPACITORS AND INDUCTORS

RESISTORS :

.1ohm	1ohm	10ohm	100ohm	1K	10K	100K	1M
.12	1.2	12	120	1.2	12	120	1.2
.15	1.5	15	150	1.5	15	150	1.5
.18	1.8	18	180	1.8	18	180	1.8
.22	2.2	22	220	2.2	22	220	2.2
.27	2.7	27	270	2.7	27	270	2.7
.33	3.3	33	330	3.3	33	330	3.3
.39	3.9	39	390	3.9	39	390	3.9
.47	4.7	47	470	4.7	47	470	4.7
.56	5.6	56	560	5.6	56	560	5.6
.68	6.8	68	680	6.8	68	680	6.8
.82	8.2	82	820	8.2	82	820	8.2

CAPACITORS :

1.pf	10pf	100pf	.001mf	.01mf
1.5	15	150	.0015	.015
2.2	22	220	.0022	.022
3.3	33	330	.0033	.033
4.7	47	470	.0047	.047
6.8	68	680	.0068	.068

INDUCTORS :

.01uH	.1uH	10uH	100uH	1mH	10mH	100mH	1H
.015	.15	15	150	1.5	15	150	1.5
.022	.22	22	220	2.2	22	220	2.2
.033	.33	33	330	3.3	33	330	3.3
.047	.47	47	470	4.7	47	470	4.7
.068	.68	68	680	6.8	68	680	6.8

.1mf	1.mf	10mf	100mf	1000
.15	1.5	15	150	1500
.22	2.2	22	220	2200
.33	3.3	33	330	3300
.47	4.7	47	470	4700
.68	6.8	68	680	6800



Once again we have a report from the intrepid Director, American Division, Canadian Amateur Ragchewers' Federation (CARF) telling us of his activities among his fellow-countrymen.

As Director Lawson C. Wrappe, N110U/2, has already told us, CARF doesn't really believe that American Amateurs, any one of them, except maybe himself, could effectively finance or manage a one-car parking lot, let alone a ragchewers' organization. CARF has therefore given Director Lawson full power to run American Amateur affairs and to ensure their purchase of CARF

publications, especially "QRT", its official magazine. His intervention with the Freaky Frequency Committee in American Amateur matters, however, is usually carried out only after consultation with the CARF head shed in Newington (Storromont County, Ontario, pop. 260).

Unfortunately for good ol' Lawson, there appears to be a large body of Amateurs in the United States who believe that running their affairs is best left in the hands of a truly and totally American organization, financed by themselves.

Lawson's latest reports comments
june 1978 - page 11

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on this fact and tells us that these ingrates have begun to ignore his American Division and have totally ignored his warning words, "don't be misled, American Amateurs!" (as reported in the May issue of this publication), and have incorporated an all-American organization known as the "American Radio Ragchewers' Federation." Pointing the finger of scorn at their efforts, Lawson writes; "that saddles these dogs with the ridiculous acronym of 'ARRF'". (Aw c'mon Lawson, at least that's not as bad as what the British Amateur Ragchewers' Federation is faced with.)

Lawson admitted that ARRF seems to have a chance of survival. He says that the funds making it a viable American national Amateur organization are coming largely from the sale of its publications which are written by Americans for American Amateurs. He has been promised by CARF H.Q. in Newington (Stormont Co., Ont., pop. 260) that each month, after "QRT" is off the Gestetner, it will be used to churn out some new publications for American Amateurs, (written by the Canadian H.Q. staff, of course) for sale in the U.S., thus chopping at the ARRF financial base.

Those who know Lawson and the Newington (Stormont Co. Ont., pop. 260) H.Q. crew also know, of course, that they have been in the ham and book game long enough to know that there are other gimmicks when it comes to putting rival

outfits and publishers in their places. It is no surprise therefore, to learn that, as Lawson tells it; "The CARF Board of Directors has come up with an excellent and unanimously-approved ploy to meet this competition. They have decided to call my American Division by the alternate name of the "American Amateur Radio Ragchewers' League. The beauty of this", he continued with apparent great relish, "is that we don't have to change a thing ... only the letterheads!"

"The similarity between the U.S. home-grown organization, the American Radio Ragchewers' Federation -- ARRF -- and the American Amateur Radio Ragchewers' League -- AARRL -- should make us look like a real American outfit and if it confuses the average American ham that will probably help us in this sacred battle for the minds and dollars of American hams."

Lawson went on to tell in some detail how he figures through a column in "QRT", he can snow Americansubscribers with enough stories about the ARRF that eventually some of it will stick, "and that", he beamed, "will be the end of the all-American, 100% home-grown American Radio Ragchewers' Federation! "We can then," he said, "kick the American Amateur Radio Ragchewers' League gag and resume operations under that old standby, Canadian Amateur Ragchewers' Federation AMERICAN DIVISION!"

WARC 1979 Report

CARF comments on the Canadian Interdepartmental Committee for WARC '79 second draft proposal for future frequency allocations were to be submitted to the CIC on June 1 but were not available at press time. They will be reviewed in the next issue. The chairman of the CARF Working Group on WARC '79 was also slated to attend the U.S. FCC Advisory Committee on Amateur Radio meeting on June 5 and will no doubt have some interesting news for us in the same issue.

After the comments from users are all in (June 1), the CIC will consider them and issue a supplementary draft proposal about July 1. Further comments on that draft will be accepted until August 1 and after that the CIC will

hammer out the final form of the Canadian position for Geneva in the fall of 1979.

Meantime, the FCC has issued its latest draft proposals (8th Notice of Inquiry) for public comment. Here is a rough comparison of how the two governments have treated the question of Amateur assignments. The comparison is shown only for Region 2 of the ITU (North and South America) and does not carry on into the exotic frequencies in the UHF and microwave range as these are not of interest to most Amateurs at this time. Only changes are shown. 'Exclusive' means only for Amateur use; 'ww' means worldwide -- all ITU Regions.

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 (MHz)
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 #18068-18168 exclusive ww
 #20950-21450 exclusive ww
 - - - - -
 #25110-25210 exclusive ww
 (MHz)
 420-450 shared (no change)
 #902-928 shared
 1240-1300 shared ww

Proposed New Band

One should remember that these are draft proposals only, although there probably won't be too much changed between now and the time these two governments carry their final positions to Geneva; they will be bargaining positions and may be greatly changed in

the final outcome of the multi-nation conference.

(We should consider ourselves lucky, if what I recall hearing lately is correct -- Canada and the U.S.A. are the only two countries which consult with radio users on WARC '79 matters by means of public notices and comments...Ed.)

CQ de Geneva

(Bob Eldridge, VE7BS, a frequent visitor to the International Telecommunications Union Consultative Committee on International Radio sessions, reports on Amateur activity on 4U1ITU, the ITU Amateur station in Geneva.)

As usual, there was a good sprinkling of radio Amateurs at the Final Meetings of Study Group 3 and 8 of CCIR in Geneva during January 1978, including HB9ABC, EA4CH, PA0XWA, JH1DGF, OX8JT, G3 HTF, VE2CV, W3JPT, VK3GH, VE7BS, SM0CKV, W5EUE, G8CXJ, W3JL, JJ1CXI (ex JA1IN), G3AYO, G8BOY, DL7IH, DJ5 DT, W4TRJ, OK1WI. There were others, but not everyone has the opportunity or the motivation to make himself known. At the meeting of the International Amateur Radio Club Tom, DJ5DT, gave a

presentation on meteor trail scatter, complete with tape recordings of exchanges of reports between Sweden and Germany on 144 MHz. There was even a record of a complete exchange of reports at about 35 wpm CW. Tom monitors 2 metres for meteor reflections every morning for about 2 hours.

Knowing from past experience of 4U1ITU that the rigs are not perfectly equipped for CW, I took an MFJ filter with me, as I intended to work 160, and the noise is a bit troublesome there. DJ5DT went further than that -- he brought his own automatic key as well as a filter. There are a couple of TO keyers in the shack, but only one paddle, and everyone seems to want to set the paddle differently. HB9AW, who makes about 15,000 QSO's a year from the sta-



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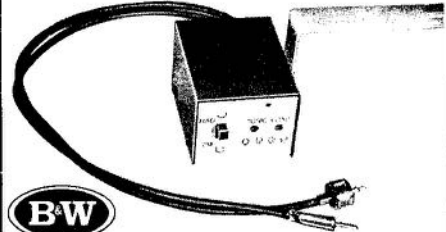
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tion, tends to set it up to about a millionth of an inch spacing and zero or less spring pressure. Any draught in the shack sends unintelligible code!

The FT101 used for CW operation there has been in use now for about 80,000 QSO's with about 80 different visiting operators handling it for about 20,000 of them (many of them unfamiliar with the Yaesu) and it still turns out 100 watts output with the original final tubes. Says a lot for the 6JS6. I try to stay off the HF bands at 4U1ITU, as it's impossible to complete a normal QSO, and difficult to QRT without feeling guilty. I would hate to be a rare DX station; you only have to make one short call to a specific station to cause such a bedlam on the frequency that you can't tell whether he ever came back or not. 160 is better, where the population is lower and the users really do seem to be more gentlemanly, so I spend most of the time there. By the way, there is a CW filter in the FT 101, but it's the standard 500 Hz or so, so a narrower audio filter is a great help in finding the weak ones.

Oh yes! The conference! We managed to get republished in CCIR Study Group 8 the document that Bud VE3UD* put together for the September meetings. It was considered together with a proposed new Question on "Preferred Bands for the Amateur Service". Our Canadian Study Group 8 is now working on answers to this Question in preparation for the Special Preparatory Meeting of CCIR which precedes the WARC. We are limited to technical and operational aspects in CCIR, but every little bit helps get the message of Amateur Radio across to the countries that are cool to it. But provided the basic draft which got us started, and people scattered across the country are now working on additions and refinements to it.

There is activity in the United States Study Group 8 on the Amateur Question too. If we don't end up on the plus side of the frequencies ledger in 1979 it won't be for lack of trying!

* "Technical and Operating Characteristics of the Amateur Radio Service", available from CARF Inc, Box 356, Kingston, Ont., K7L 4W2.

Book Review

'The Zapping of America'

Paul Brodeur is a good journalist, and two of his 1976 New Yorker articles, which were rewritten as part of the book under review, were used as source material for my pieces on r.f. radiation hazards in the February and March issues of The Canadian Amateur. Brodeur's new book provides much more detail but, as one might expect in a 'trade' book written for the general public, the evidence is incomplete and is not treated with scientific rigour.

The main point of the book is that the United States is being "zapped" with microwave radiation, that the risk is "deadly", and that research has been discouraged, and research findings covered-up or distorted by the military-industrial complex.

There is certainly a lot of truth in this, but the book would have been more

Paul Brodeur, *The Zapping of America*, W.W. Norton Co., New York (George J. McLeod, Ltd., Toronto) 1977. Pp 543. Price (in U.S.) \$11.95.

This fast-selling and much-talked-about book is reviewed here by Peter Ruderman VE1PZ.

convincing if Brodeur hadn't gone in for shock chapter headings like "The Genetic Time Bomb" for a section that refers mainly to club-footed children sired by helicopter pilots who flew down radar beams at low altitudes at Fort Rucker, Alabama. In a chapter entitled "Irretrievably Messed Up", he uses the slick propaganda device of ending a long discussion of brain tumours in the United States with a sudden mention of three technicians who died of coronaries in southeast Asia. Presumably this is to leave us associating microwaves with heart attacks on the basis of evidence that was not presented. The mysterious heart attacks in Northern Karelia are back too, with the news that the Finnish government's programme of reducing fat in the diet, smoking etc. has had some success, although Brodeur manages to leave a faint flavour of "not



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proven" about the case. A Finnish cardiologist, Dr. Pekka Puska, is going to report on the North Karelia Project at the Canadian Public Health Association meeting in Halifax at the end of May, and I'll try to button-hole him in the corridors and let you know the latest word in a 'Letter to the Editor'.

Amateurs will find a lot of the book interesting all the same. Brodeur makes the good point that 'nonionizing radiation' is too broad a word, since ultra-violet is nonionizing but can cause skin cancer. This reminds me of the elder Huxley's famous experiment in the middle of the last century when he sat for hours under a hot sun on the banks of the Nile while a servant doused him with buckets of cool water, proving once and for all that sunburn is not heatburn. At the other end of the spectrum, Brodeur notes that VLF radiation (in this case 7 Hz) changed the mental response time of experimental monkeys. Frequencies this low do not have to be electromagnetic in origin as anyone who has sat near the big B-flat organ pipe in a cathedral can tell you.

Most of the discussion relates to microwaves as used for radar, ovens and special military projects, and while Brodeur cites the work of experts who report that damage is frequency-specific most of his horror stories do not specify the frequency.

Getting down to the Amateur frequencies, there is little to worry us except one case history of women in a shoe factory who used a plastic sealing machine that radiated power at 27.12 MHz. The power is not given, however, but must have been substantial because the machine and the operators were put in a shielded room. We are not told whether the damage (mainly aches and pains) was permanent or not. Probably not.

The earlier reference to the pulsed waves of the 'Russian woodpecker' (the interference assumed to be caused by a Soviet high power radar ... Ed.) that I took from Brodeur's New Yorker piece and quoted in the March 1978 Canadian Amateur turns out in the book to be one man's carefully hedged opinion. What Dr. Milton Zaret actually said was "I would not be surprised to find that the on-off code at a repetition rate of 10 per second could have an effect on the brain's inherent alpha rhythm". Dr.

Zaret did some of the careful basic work on radar-induced cataracts, but I do not know his qualifications in electroencephalography or whether he just succumbed to the prevailing temptation of physicians to play God on all subjects.

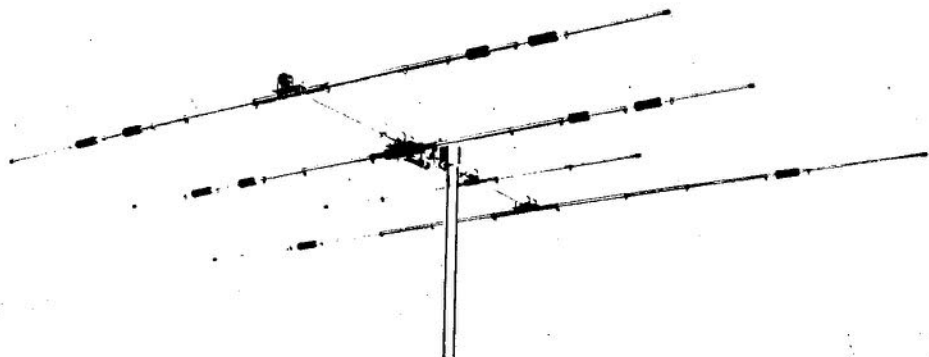
Digressing on the 'woodpecker', I have been on 10 and 15 metres quite a bit lately and it seems less bothersome than before. The Russian Amateurs get more interference and call it the 'machine gun'. The French Amateurs call it the 'moulinette a caviare' (the caviar grinder). Brodeur quotes from a summary of the US 1975 Tri-Service Research Plan to the effect that over-the-horizon back-scatter radar operating over the whole range from 3 to 30 MHz is planned for installation both in Maine (which I had heard about on the air) and in the Pacific Northwest. Amateurs in VE1 and VE7 areas will soon be getting it from both sides! Brodeur's latest info is a quote from the January 1977 Aerospace Daily to the effect that the installation of the prototype in Maine will be delayed because of performance problems.

At this point I thought that, as an Amateur, I had better get some professional guidance, so the other day I had lunch with one of our professors who specializes in radiation damage to tissue, Dr. O. Kamra. He reassured me that over the r.f. and the visible light spectra the damage is caused by agitating molecules in the body so that heat is produced. With laser surgery, for example, you see the light but it is still the heat that destroys the tissue.

With heat still the main culprit, I find that Brodeur emphasizes the frightening results by discounting the effect of distance. He has a chapter on a big RCA radar installation in New Jersey where the main complaints were TVI and BCI, but with receiver sensitivity varying from 0.5 to 2 microvolts the amount of r.f. energy that would produce a buzz in the loudspeaker or a wavering of the TV image is thousands of times below the level where tissue damage might be expected. On the other hand, if you are a technician working close to the apparatus it is grim to die in your thirties from avoidable cancer of the pancreas.

In summary, if you want a good read and are content to learn a lot about
june 1978 - page 19

ATB-34



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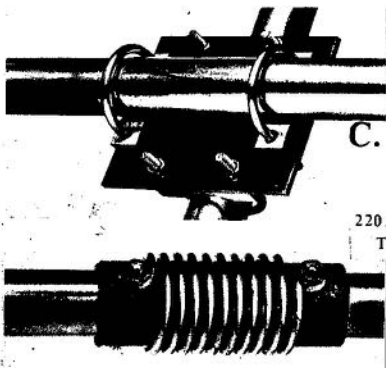
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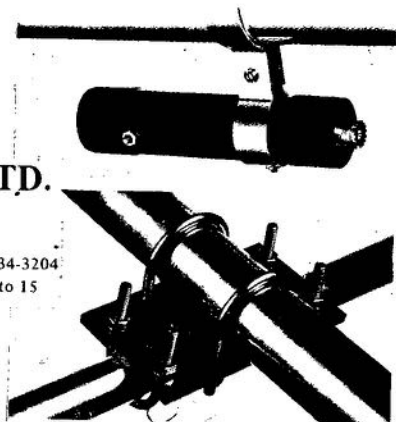
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microwaves and cover-ups and less about Amateur frequencies, The Zapping of America is well worth a few hours of your time. When he names names and agencies, I can assure you that he is absolutely on target because I knew some of the characters personally when I was

working in Washington in the mid-1960's. Journalists' books tend to be patchy and episodic like a collection of articles from the weekend supplements, but so what? I'm not a literary critic and this isn't a literary journal!

A. Peter Ruderman, VE1PZ

Equipment Review

In the February issue, we looked at a couple of Atlas 350-XLs that made their way into the Ottawa area. We were impressed with a lot of the the 350's features, but not the quality control. CARF received a letter from the President of Atlas Radio Inc. (Herb Johnson W6QKI); Herb told us that he was concerned that two Ottawa Amateurs had been the recipients of two sets with obvious faults and that Atlas sincerely intended to correct whatever problems there were. To my knowledge at this time, Stu and Mike are now a lot happier with their 350's.

I had the opportunity to twiddle with one of these sets after it came back from Atlas, and what a difference! It performed more like the brochure said it would. Also, I verified just how easy it was to add another 500 KHz band segment: just plug one crystal into the deck (the deck is labelled with numbered positions corresponding to the 10 front panel selectable auxilliary ranges). At least one handbook for the 350 has arrived in Ottawa direct from Atlas and rumour has it that the auxilliary VFO's (Model 305) are soon to follow.

If you compare earlier pictures with present advertising copy, you will note the disappearance of the 'Norm. Dual Rec.' switch, which would have allowed 'simultaneous receive on two frequencies' and I can't find any mention of this feature in the handbook. The manual incorporates several paragraphs found in the 210X manual which is to be expected since there are design similarities. Future editions of the manual should show evidence of some editorial sanitizing.

While on the subject of Atlas Radio, I had a quick look at an Atlas 210X (in

The Atlas 210X, the Atlas 350-XL revisited, and Solid State Rigs in general

by Dave Robinson VE3BTY

conjunction with the 220-CS AC Console) supplied by courtesy of Bytown Marine Limited in Ottawa. This too is a solid state transceiver. It covers the 80, 40, 20 and 15 metre bands and 1000 kHz of the ten metre band. If you buy a 215X, you trade ten metres for 1.8 to 2.1 MHz coverage (ie. the 215X covers 160 to 15 metres). The 210X (and 215X) are optimized for mobile SSB operation, and although CW operation is possible, it is definitely not as easy as phone operation (even if you use the 220-CS AC console with the VOX option to achieve semi-break-in operation).

Dead centre of the 3 1/2" high by 9 1/2" wide front panel is dominated by a large tuning knob. There are separate 'normal sized' controls for AF gain, RF gain, Band and Function (Off-Cal - Rec - Trans - CW). Two tiny slide switches allow you to dim the pilot lights and select 'Sideband Normal-Reverse'. (In 'Sideband Normal' you get USB automatically for 20 metres and higher frequencies, and LSB for the lower frequency bands.

The two remaining sets of controls are Dial Set (used in conjunction with the Calibrator) and concentric controls for ALC level and Microphone gain. As for the ALC control, the instructions suggest that the best way to monitor your output signal is by using a panoramic scanner ... or you can "try various settings and ask for signal reports until you become familiar with its effect". (The Atlas 350 has the same ALC control and caveat in its use).

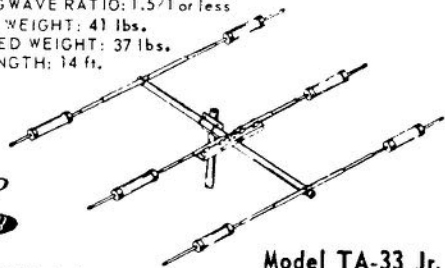
If you want to use a linear amplifier with the 210 or 215, note that they require a positive going ALC voltage from the linear. Some ergonomics went into the design of the front panel of the 210 (215): grouped left of centre near the
june 1978 - page 21

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 STANDING WAVE RATIO: 1.5/1 or less
 SHIPPING WEIGHT: 41 lbs.
 ASSEMBLED WEIGHT: 37 lbs.
 BOOM LENGTH: 14 ft.



Model TA-33 Jr.

Mosley TA-33 Jr. has quality and performance found in the TA-33. Rated to 300 watts AM and CW, - 1000 watts P.E.P. on SSB. Complete with Hdw. The Junior may be converted to MP-33 with higher power rating with MPK-3 Kit. Shipping weight 28 lbs. Assembled weight 20 lbs.

The Classic 33 10, 15, and 20 meters

Beam designed to provide the extra gain for working hard-to-reach DX. Incorporates exclusive Mosley 'Weather-Proved' traps with resonant frequency stability. Features new boom to element clamping and balanced radiation. Hardware is stainless steel. Feed with 52 ohm RG-8/U coax. Fits up to two inch mast. Use with most heavy-duty rotors. 1 KW AM/CW or 2 KW P.E.P. SSB input.

FORWARD GAIN: Full 8 db. compared to reference dipole or 10.1 db. over isotropic source.

FRONT-TO-BACK: 20 db. or better on 15 and 20; 15 db. on 10 meters.

STANDING WAVE RATIO: 1.5/1 or better.

MAXIMUM ELEMENT LENGTH: 27 ft.

ASSEMBLED WEIGHT: 42 lbs.

BOOM LENGTH: 18 ft.

SHIPPING WEIGHT: 47 lbs.

TURNING RADIUS: 16 ft.

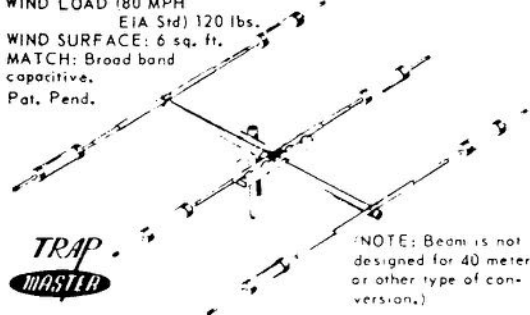
WIND LOAD (80 MPH

EIA Std) 120 lbs.

WIND SURFACE: 6 sq. ft.

MATCH: Broad band capacitive.

Pat. Pend.



(NOTE: Beam is not designed for 40 meter or other type of conversion.)

TA-33 Jr.	\$195.00
TA-33	\$259.00
CL-33	\$295.00
CL-36	\$360.00

TA-33 Jr. pwr kit MPK-3	\$63.00
RV-4C 40-10 mtr vertical	\$85.00
RV-8C 80 mtr adapter	\$55.00
DI-2, 2 mtr ground plane	\$35.50
MY-144-9 element Yagi	\$54.50
MM-144 mobile antenna	\$31.50
Larsen 2 mtr mobile	\$31.50
Larsen Magnetic mount	\$16.50

12/24 hr. .4LED 6 digit clock kit	
Complete with case	\$35.00
Pi-259 connectors \$1.00 doz.	\$10.50
Lightning arrestors \$5.00, 3/\$10.50	
RSO filters	\$35.00

ROTORS

Big Talk	\$125.00
AR-40	95.00
CD-44	159.00
HAM III	205.00
Tail Twister	379.00
Rotor Wire	22¢ ft.
RG8U coax	25¢ ft
RG8U foam	28¢ ft
RG-213 coax	39¢ ft.

KENWOOD RADIOS

TS-520S	999.00
TS-820S	1399.00
TR-7200A	285.00
TR-2200A	329.00
TR-7400A	579.00
TR-7500	429.00

All antenna orders over \$450, you can deduct 5% or have shipment sent prepaid anywhere in Canada except VE8 land and Labrador.

Prices subject to change

MacFarlane Electronics Reg'd

RR No. 2 Battersea, Ont
 Phone (613) 353-2800
 VE3BPM

mobile operator are the S meter, panel light dimmer switch (save those light-bulbs and your night vision) and the AF and RF gain controls.

The manual is a handy size and I like their method of giving you circuit diagrams. The overall schematic shows how the various modules and circuit cards are interconnected, and detailed diagrams are given separately for these modules. The controls and connectors appear in roughly the same location on the diagram as they do on the equipment. The manual gives you some good tips on feeding antennae and debunks some of the claims made by manufacturers of mobile antennae.

I had the use of a 220CS AC console along with the 210X. This gives you a snappy quick-disconnect of the 210X from the 220's AC power supply (115 or 220V operation by changing fuses) and optional VOV - CW - semi - break - in feature (no sidetone). Without rushing, you should be able to walk away with the 210, or install it in 5 to 10 seconds.

Package price for the 210X or 215X and the noise blanker, VOX/Break-in option, the 220CS and the MT-1 broad-

band matching transformer (ideal for mobiles) is around \$1500.

There are some general comments I'd like to pass on concerning rigs with broadband solid state outputs. Because you don't have 'tune' and 'load' controls to play with, you can change bands and frequency faster, but if load VSWR isn't fairly low, that's tough because you can't compensate for this to present the right load to the transistorized finals. You have two options: the first is to live with the SWR and the second is to use a matching device or 'Antenna Tuner'. If the rig has VSWR protection, as have the Atlas 210, 215 and 350, the output is throttled back automatically, thus reducing power output but saving you the trip to the store for \$100 worth of transistors!

For example, I operated the 210X into a 4 to 1 VSWR and still exchanged 5-9 reports. Because most linear amps are designed to have a relatively low SWR input, the solid state rig itself will be happy as it won't 'see' the load presented by the antenna; the PI network of the linear can take care of that within its limitations.

Happy operating.

Dave

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PART
4

GETTING IT ALL BACK TOGETHER

It was near Christmas and the first half of my Amateur radio course was over. I was not at all pleased. My affairs were back in order and I had to do something about reorganizing my efforts to get my licence before summer came. A little more than a month remained before I was to return to night school for the second term.

I decided to get away from all the Amateur radio magazines and the fantasy and distraction that goes with them. I took a hard look at the situation. There were still letters and punctuation that needed practice and a skill of five words per minute should have been accomplished by now. I was still curious about my difficulties with the ARRL tape. I played both the ARRL and the EPSILON tape and listened very closely. I had obviously been moving too fast and entered into the new sessions too quickly.

One was supposed to listen to the sounds and make sure that they were familiar for each individual letter. It was very important to have moved ahead and not to have remained in one area too long. When you have retained about 90% of the code group material you moved on.

During all of this practice there were times when I should not have attempted it at all. There were mind blocks, fatigue and periods with too much distraction. Morning was the best time to do code with theory sessions in between at half-hour intervals. The total time on good days was about two organized hours. I was still a parent, had a regular job and had also to remember to put out the garbage! When I first heard the ARRL tape, the code seemed too fast. The Epsilon tape was slower and more comfortable. Practice paid off and the situation reversed. The ARRL tape was perfect and the Epsilon too slow. More

HEAVY DUTY HAM TOWERS

DMXHD Heavy Duty Ham Towers can support a large amateur beam of up to 9 sq. ft. wind area. Guy wires must be used if larger loads are required or cross bar mounted antennas or if greater height using straight sections is needed.

DELHI DMXMD and DMXHD towers use the larger and stronger sections of our standard eight section, 68 foot TV tower, Model DMX-68. DMXMD towers have a DMX2T top section, DMXHD towers have a DMX3T top section. Both top sections have a No. 244A cast aluminum mast clamp installed on the top plate.

Each section is 8 ft. long and has beaded channel legs riveted together with "X" braces. Legs and braces are high tensile steel, heavily galvanized before fabrication. Rivets are solid heat treated aluminum. Sections fit accurately together and are joined by heat treated nuts and bolts. The uniform tapered leg design together with evenly spaced "X" braces give the tower greater strength and reliability.

NOTE: All DMXHD Series Ham towers are shipped complete with the following:

8 ft. tower sections, top plate with cast aluminum mast clamp, rotor plate, three 4 ft. concrete base stubs, special nuts, bolts and washers. (No mast is included in package).

Model No.	Height of Tower	Tower Section Supplied	Wt. in lbs.
DMXHD-32	32	DMX3T, DMX4, DMX5, DMX6	170
DMXHD-40	40	DMX3T, DMX4, DMX5, DMX6, DMX7	241
DMXHD-48	48	DMX3T, DMX4, DMX5, DMX6, DMX7, DMX8	314

DMXMD-32	\$145.00
DMXMD-40	\$185.00
DMXMD-48	\$240.00
DMXMD-56	\$299.00
BBMB BEARING	\$15.50
HD mast 2" x 8' 12 ga	\$16.50

IMMEDIATE DELIVERY

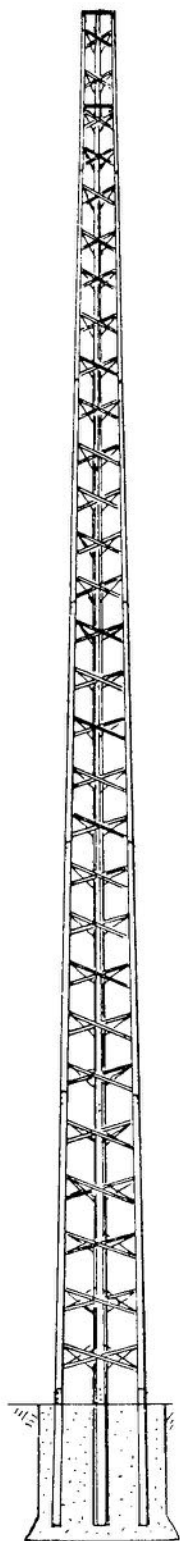
Specials package	
Ta-33 jr. antenna	\$195.00
CDE Big Talk rotor	\$125.00
Delhi DME-5 tower 44'	\$145.00
100 ft. RG-8U coax	\$25.00
100 ft. rotor wire	\$14.00

Total value - \$504.00

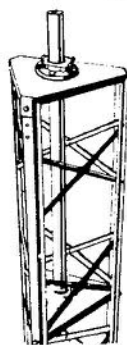
SPECIAL - \$485.00

All antenna orders over \$450.00, you can deduct 5% or have shipment sent prepaid anywhere in Canada except VE8 land and Labrador.

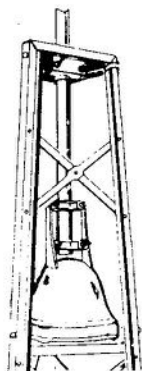
Prices subject to change



DMXHD-48



Top of tower with mast clamp plate installed.



Any make of rotor can be mounted on rotor plate.

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practice put me back in the driver's seat. I slowed up on certain numerals and letters, but with practice, learned to get friendly with them.

I practised the code letter exercises at the end of the tape and heard many times that the wizards quickly jumped over the five green boxes. This of course contains all of the letters in the alphabet and is a test at the end of the tape. Consequently, I was able to jump over the last letters, punctuation and numerals. This meant that I was familiar only with the sounds and must now know that entire alphabet at different speeds. The usual half-hour per session with breaks between them was in effect. Your brain has a tendency to complain about the constant dahdit dahdit dididahdidah type sounds coming into your ears.

I was fortunate to have met and talked with people who had studied code at one time or another. This was a great help in making me aware of the many problems that came up. It helped me deal with them. One friend who had taken code during the war years told me to be aware of the little songs I would find. I never thought of it that way before, but took him at his word and sure enough they were there. This rhythm was an important part of code learning, I was later to know. My first example came with the word for TEA, at the end of a sentence with the period. The sound was dahditdidah didahdidahdidah. I re-

peated it over and over and became aware of the song. The best one to know was 'Best bent wire', which really summed it all up. I practiced that one many times.

It was important to acquire speed, and I started at the five word per minute level. The skill of receiving the sound and retaining it, quickly writing it down and hearing the next sound, gave way to hearing them and retaining them as they passed through my mind. Writing them down as they passed by was a skill not easily learned. I practiced quite a lot.

Having an instructor gave me an awareness of myself, and of the little traps and weaknesses that one finds. I found that reviews were helpful during these times. We were cautioned on comparing letters and reminded to always reach out and not stand still too long at one level. Being with other people helped my learning processes. I soon made up for lost time. No more bridges to help me now. Those earlier methods were helpful, although no longer valid. The move to speed practice was not to come as easily as I had thought. There were to be many things that were to be harder than first anticipated. A good piece of advice that helped me along the way simply states that you should have a positive attitude and want your ticket so badly that you can taste it!

(Part 4 of a series. We continue with part 5 in the next issue.)

What is Packet Radio ?

by Bob Rouleau VE2PY

(Here is a personal view of the "packet radio" proposed by DOC as part of the new code-free Amateur Experimenter package. As the proposal now stands it would be the only mode allowed on the 220-225 MHz band.)

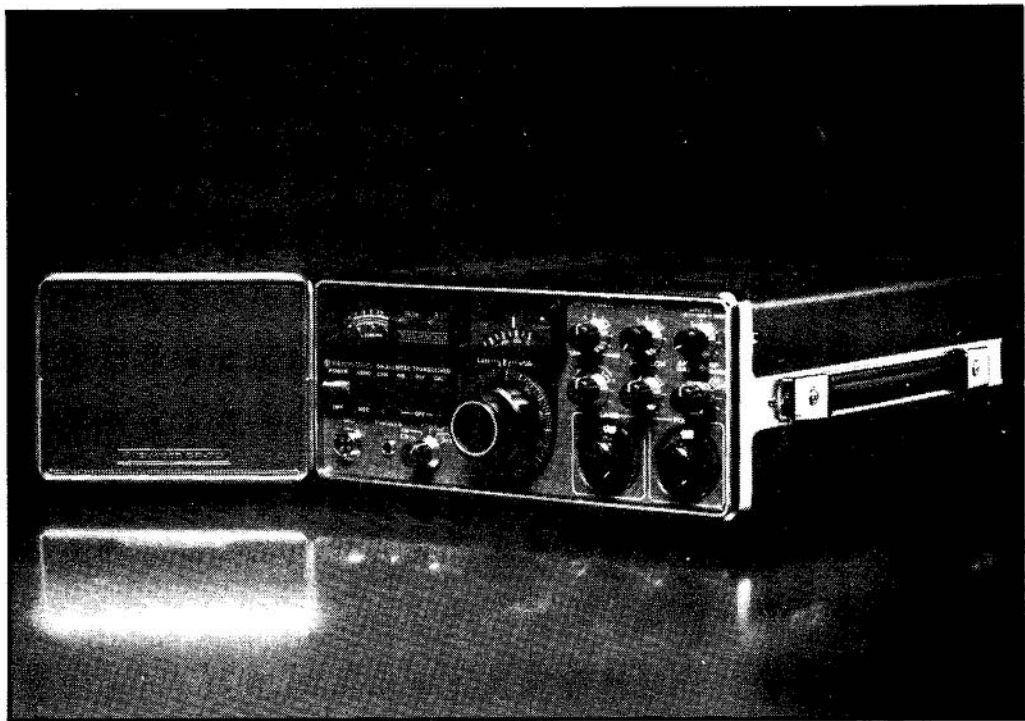
First off it is not a small pocket sized radio. In fact it is a concept. It was born out of the knowledge that our spectrum is getting more and more precious as demand increases. It is merely a system which allows us to use what we have more efficiently. It is not linked to any particular type of modulation and

is adaptable to all of the ones we now know. It can be best described by a short example. Picture two stations operating RTTY at 60 wpm. The channel is in use constantly no matter how slowly the data is being sent. If one guy is using the two-finger system then the channel capacity channel is very low. A packet sys-

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tem works on a different basis. It is sent in a burst instead of continuously. No matter how slowly you fill the packet, when it is full, it will be sent out at high speed. This leaves the channel free for other users to share with their packets.

To show how this sharing could work compare the following. To send a line on HF RTTY at 60 words per minute takes roughly 10 seconds if you can type that fast. A packet using a typical modulation scheme would wait until you had filled the line and then in the same bandwidth issue the line in about 1/4 of a second. Right off there are 9-1/2 seconds left over not counting the time it takes the receiving operator to read the line and formulate a reply. Without going into too much detail you can see that the channel could be shared with no loss of convenience to the operators sharing that channel.

The next facet of packet systems is that they lend themselves to computer type control systems. Since they are normally issued in a format that computers understand you can start to do some tricky things with them. If we substitute some "smart" terminals having microprocessors for the RTTY machines you can start to really exploit packet radio. Packets normally consist of three parts. First the "header". This contains the address of the destination and the originator along with some form of error detection scheme which enables the receiving terminal to check that there were no bits lost in transmission. Next comes the data. It is the message itself and could consist of RTTY or voice or simply raw binary data. Lastly comes another error detection scheme which determines whether the data was transmitted and received correctly.

Let's go back to our RTTY channel and see what happens with this more sophisticated scheme. Since we know that because of the reduced transmission time and the fact that the channel is occupied only when you are actually sending a packet it is obvious that more than 2 stations can share the channel. Now with several stations sending and receiving packets at the same time, it is inevitable that some packets will collide. When this happens a "smart" terminal will not get an acknowledgement from the other end and will send the packet again until it receives an acknowledgement. These ac-

nowledgements are normally automatic and controlled by the terminal microprocessor. The terminal upon receipt of a packet immediately checks the address to see if it was addressed to its station, if not it ignores it. If it was destined for its station, it checks the data portion for errors. If OK then it sends an ACK; if it finds an error it will ask for a retransmission of the packet. With this in mind you can see that, while I am typing out my message on my terminal, other packets are being sent on the channel. When my packet is ready my machine will send it several times if need be.

There are all sorts of schemes to help ensure that packets don't collide very often, and the net result is that one RTTY channel some 3 kHz wide can support about 100 packet radio users at the same time if they are using RTTY type equipment! Now that's an appreciable gain.

We aren't finished yet. Since the header contains information in a code that a computer can understand we can use a technique which is called "packet switching". Simply, this is a point-to-point link system which allows you to send a packet down a network and have it relayed to its destination with a high degree of integrity (those error detection schemes, remember?). If I wanted to issue a message from Montreal to Ottawa say, I would get on the packet repeater and issue my packet. The microprocessor at the repeater would read the address and switch on a link transmitter to Ottawa. In Ottawa, if the local machine reading an address sees it as local, no links would be turned on, and it would be repeated locally. If it was destined for Toronto, the Ottawa machine would turn on its link and send it on its way westward. The acknowledgement procedure would still apply and should an error creep in on one of the links, the next one in the chain would request a retransmission from the last point in the link where the message was received error free. This guarantees that the packet arrives at its destination intact. This sort of system is well within the reach of Amateurs today. A Cross-Canada link is somewhat more sophisticated but could eventually come.

How do you get on packet? Well it is surprisingly easy. If you have a terminal like a VUCOM and a modem you have all you need except the 220 MHz trans-

ceiver of course. If you have an ASCII encoded RTTY machine like the model 33, then you need only a buffer memory and a modem. The buffer memory could consist of 8,256 bit chips costing about a buck each. You'll need some sort of counter chip and a buffer full LED to indicate when you have reached 64 characters (the standard packet length we are proposing to use). The modem could be a Bell model 201 A,B, or C. The Bor C models are preferred as they run at 2400 bits/second and will work well too. It is more a consideration of taking what you can get. Right now there seems to be a reasonable number of these units around for \$30 or less. While it isn't fancy, this system will get you on packet without much of a cash outlay. If you already have a micro computer with a video display you are ready to go first class. You will need the modem and an interface. Since the modem is RS 232 standard, the interface won't be any problem, and the rest of the requirements you can fulfill with software. Easy isn't it?

If you ask me to get out my crystal ball and predict what will happen over the next few years, I see the following. Due to the immense growth in the personal computing field, almost every home will have one. As usual the Hams will have them first. Activity on packet will be local at first, but given the decreasing hardware costs and the relatively simple machines needed for linking control, a network will begin to develop. Around this time, sophisticated modems on an LSI chip will be available cheaply, and we will be using high speed systems using a bandwidth equivalent to an FM voice channel or more. Speeds by then will be on the order of 56,000 bits/second or more than 1000 times faster than current RTTY.

Voice packets will be in common use shortly. They are really not very hard to generate. Take an analogue to digital converter, a clock chip to generate a sample rate at around twice the highest audio frequency and feed the output into a buffer as we did for RTTY. We can also look forward to using packet systems to access some more powerful computers with our terminals. There will be high speed channels set up for rapid transfer of large amounts of data across the country. Think of it; if a friend of yours has a list of semiconductor substitutions

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you need, you can have him transfer his file to your machine. If that doesn't turn you on then consider that high-speed packet systems would allow me to beat Fred Towner at pong. Me in Montreal and Fred in Ottawa. I withdraw that; knowing Fred, he would program his machine to play pong for him, and I'd never win.

Where will we be using packets? Well after the dust settles I think that packet will have 4 MHz of 220, with 1 MHz being devoted to existing type users, as well as 1 MHz on 450 for packet to allow linking of data repeaters for the network. Shortly thereafter, we should be doing packet on HF as well using some store and forward simplex repeaters. Satellites and packets were just about made for each other, and with the possibility of a synchronous satellite around we will certainly be using it for packet.

Modulation schemes will almost assuredly not be pulse except on the super high frequency bands. The order of the day will be some version of phase shift keying, or a combination of phase shift and amplitude modulation. They are prohibitively expensive, but these schemes do exist today. Some cheap LSI chips are on the way however. Modulation techniques like Quadrature Amplitude Modulation (QUAM) allow us to send as many as 16 bits of information at once. This reduces the bandwidth required for even the high speed systems. Given the interest, it won't take our Eastern friends long to bring out the ACKOM 220 S or some such, with all the goodies built in, so if you aren't into building don't worry. One other factor which is very important. The micro computer you'll buy for this system will have all sorts of uses. When I showed my wife the teaching program for the kids and the recipe program for her, she approved my acquisition. A first! She usually looks on my radio gear as some sort of threat!

Packet radio is the newest most exciting technique of communications to come along in years. In this field Amateurs will once again be pioneers. In perfecting the system we will once more justify our use of spectrum which is much in demand by other services who claim that they need it more than we do. Advancement of the state of the art in one area where Amateurs can fulfill the public trust.

73 and see you on packet. VE2PY!

Publications:

- * Canadian Amateur Radio Regulations Handbook - up-to-date interpretation of Canadian Amateur Radio Regulations written in language you can understand, plus more useful information concerning the operation of a station in the Canadian Amateur Experimental Service.
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The Canadian Amateur Radio Federation Inc. is pleased to announce the following awards available to all Radio Amateurs, worldwide.

CANADAWARD -- A colourful certificate will be issued to any Amateur who confirms two-way QSO's with all Canadian Provinces and Territories. All Separate awards are issued for each band on which the applicant qualifies. (12 cards per band - see list below) A Mode endorsement is available if all QSO's are made on the same mode (CW, SSB, RTTY, SSTV). Contacts made after 1 July 1977 only will count for this award. Submit the 12 cards with One Dollar (\$1.00) Canadian or US funds or 10 IRC's plus sufficient funds for return postage. CARF members need send only funds for return postage.

5 Band CANADAWARD -- A special plaque will be issued to any Amateur who confirms two-way QSO's with all Canadian Provinces and Territories on each of five separate bands. (total of 60 cards - 12 cards per band - see list below) Contacts made after 1 July 1977 only will count for this award. Submit the 60 cards with Seven Dollars (\$7.00) Canadian or US funds or 70 IRC's plus sufficient funds for return postage. All CARF awards are FREE to CARF members. CARF members need send only

funds for return postage.

6 Band CANADAWARD, 7 Band CANADAWARD, etc. -- Special endorsements to the basic 5 Band CANADAWARD will be issued to any Amateur who confirms two-way QSO's with all Canadian Provinces and Territories on more than 5 Bands. Submit the additional cards with sufficient funds for return postage.

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VE1 Nova Scotia

VE1 New Brunswick

VE2 Quebec

VE3 Ontario

VE4 Manitoba

VE5 Saskatchewan

VE6 Alberta

VE7 British Columbia

VE8 Yukon Territory

VE8 Northwest Territories

NOTE -- VO2, Labrador, is part of the Province of Newfoundland and counts for Newfoundland.

All Amateur bands may be used. Each distinct satellite mode (432in/144out, 144in/29out, 144in/432out, etc.) will count as a separate band.

Mail all applications for the CANADAWARDS to: P.O.Box 76752, Vancouver, B.C., Canada, V5R 5S7.

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*-Stations XV5AA, XV5AB and XV5AC were authorized to exchange communications with Amateurs of other countries by the former Saigon regime.

**-Station XU1AA has been authorized to exchange communications with Amateurs of other countries.

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