



CARF the canadian amateur

January 1976

Number 1

ITU 1979 preparations: Canada plans position

DOC held a 'users' conference in Ottawa on Dec. 8 and 9 to exchange views and ideas for the Canadian position on requirements for the 1979 radio frequency allocation conference at the ITU World Administrative Radio Conference (WARC) in Geneva in 1979.

CARF representatives VE3UD and VE3ARS, Bud Punchard and Cary Honeywell, attended the first day general session and the Amateur discussion group on the second day. Under the chairmanship of Bill Ryan of the DOC Telecommunication Regulatory Service, it was agreed that a Canadian position for the Amateur frequencies must be worked out as soon as possible and that the Canadian and U.S. Amateurs should try to arrive at compatible positions to present a common front for North American requirements.

The CARF representatives presented the IARU

continued on page three

Prairie Ham sails the Atlantic

Christmas Day found many Canadian Amateurs in strange and faraway places but the contrast between the boys at VE8RCS in Alert, just a stone's throw from ol' Santa's QTH and a Winnipeg operator sailing the South Atlantic could hardly be greater.

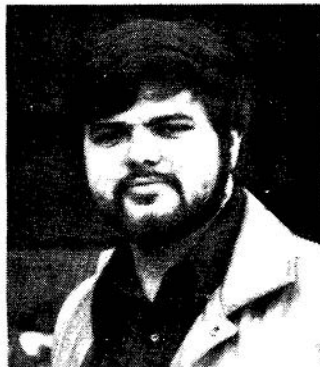
Fresh from Steve Chisolm's (VE4AI) commercial operator classes at Red River College, Alan Hooper

VE3MS is sailing aboard the Grand Bank schooner Norma and Gladys which is on a trip to European waters as a floating exhibit stressing the need for fishery conservation. Sponsored by the Newfoundland and federal governments, she sailed recently from St. John's to Boston and the Barbados, where Alan joined the crew in the middle of December, prior to the Atlantic crossing.

The original intention was for a 'round the world cruise, but various delays caused a change in the itinerary. The vessel is now slated to cruise the Mediterranean this winter and call at northern European ports this summer, and will

keep in touch with home via Amateur radio. The call is VE0MEA, and Canadians, especially Newfoundland and Winnipeg operators, are asked to keep on the lookout on 20 metres for Alan. QSL cards can be sent to the CARF QSL Bureau, Box 66, Islington, Ontario.

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Alan Hooper (inset) and the Norma and Gladys

the canadian amateur



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- Saskatchewan Amateur Radio League
- British Columbia Amateur Radio Association

From the Front Office

Your national Federation, now well into its eighth year of service to the Amateurs of Canada, looks forward to even more development as the national society in 1976. Individual support during the past year improved by more than 50 per cent and we start the year with about 2,000 individual members. Our provincial member societies have also grown in membership which indicates that the future of CARF will be determined by a very large segment of Canada's Amateur population.

Nominations for the 1976 Board of Directors are now sought with the closing date for nominees the 15th day of February, 1976. This date has been extended due to the recent postal strike. Strong, vigorous leadership is expected by the Board and all members are encouraged to consult with other Amateurs in your area and submit candidates that you feel will serve the national Federation, the membership and the Canadian Amateur Experimental Service.

The CARF National QSL Bureau, for forwarding out-going QSL cards for the membership, is now in full swing and members are requested to send their out-going QSL cards directly to the Bureau at P.O. Box 66, Islington, Ont., M9A 4X1, and not to CARF HQ. Remember also to put your membership number (the one at the top of your current address label for TCA) on the bottom left hand corner of your envelope.

At long last, By-Law No. 2 has received official approval (date - November 25, 1975) and all licenced or certificated Amateur members are now automatically FULL MEMBERS with full voting rights and privileges. New Certificates are being forwarded to all such members and please bear with us as your HQ staff ploughs through the 2,000 pieces of mail.

Meetings have been held with the Department of Communications on preparations for the 1979 ITU Frequency Conference and more are scheduled. Input from the Amateurs is vitally necessary to determine the position of Canada's representatives at the conference and your comments are solicited. As you will note in this issue, certain proposals have been recommended by Region I and III of the IARU for consideration. Do you agree with these? Should they be broadened? What justification does the Amateur service have in requesting additional frequencies? How about the bands above 30 MHz - should they be enlarged? Should new bands be allotted? For what reasons? If it comes to a trade-off, what bands are most important for future Amateur development? Why?

We start the new year off asking questions and requiring answers. We all know that the outcome of the 1979 conference will have many effects on our future as Amateurs. NOW is the time to speak up and furnish CARF with the necessary ammunition to present to the DOC.

SHORT-CIRCUITS



CARF By-Law No. 2 approved by Ministry

Your national Federation has been informed that the Minister of Consumer and Corporate Affairs has approved By-law No. 2 on Nov. 25, 1975.

This means that all CARF members who hold a Certificate of Proficiency in Radio of at least Amateur grade are now automatically FULL MEMBERS with voting rights and privileges.

Please check your address label. If you do not have a call sign therein, you will not qualify as a Full Member until you have forwarded to CARF either your call sign or your certificate number and grade.

Nominations for the CARF Board of Directors are now being sought with closing date the 15th day of February, 1976. To qualify as a candidate, the person must be a Full Member in good standing, be willing to stand for office, and be nominated by a minimum of five Full Members. Forward your candidate's name and other information to: Secretary C.A.R.F., P.O. Box 356, Kingston, Ont. K7L 4W2.

ITU preparations

(continued from page one)

Region 1 (Europe/Africa) position paper for information and discussion. That paper included the Region 3 paper (Australia/Oceania) as well. Neither Region 2 nor ARRL has yet made their respective positions known to CARF, however it is understood from ARRL vice-president Noel Eaton that ARRL Board of Directors will meet in January to approve a position paper on the U.S. Amateur frequency requirements. It is hoped that CARF and ARRL can meet to exchange views and work towards compatible Canadian and U.S. proposals which will go to their respective government agencies.

W3AAC/VE3 goes HZ1

W3AAC, America's Ambassador to Canada, Bill Porter, held a farewell cocktail party for Ottawa's diplomatic community in December before leaving (amid a hoo-haw in Parliament and the press) for his new post as the U.S. ambassador to Saudi Arabia. Ottawa officials of your national Federation, VE3-CDC, vice-president and committeemen VE3AUM and VE3UD, and VE3GRJ, Larry O'Brien from the Ottawa ARC, were invited to represent the many Amateur friends that Bill made while he was operating /VE3.

Bill greeted the boys with the news that he will soon be operating from HZ1, probably with either WT or AA for a suffix and had already sent his gear on ahead. The Ambassador's residence looked bare without the 20 metre beam!

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Canadian Repeater Advisory
Group

Two metre repeater development is reaching a saturation point in the metro area around Toronto and in Southern Ontario, and some of the resultant crowding and interference problems have arisen in B.C., Montreal metro area and in the Maritimes as well.

To date, however, these problems have been resolved through negotiation and discussion within repeater councils or similar organizations. In only one case so far (in B.C.) did the DOC reluctantly intervene at the request of one of the parties involved.

It has been a long-standing policy of DOC to let Amateurs live up to our reputation for self-regulation but south of the border the ARRL and FCC have been discussing the possibility of frequency allocation by council co-ordinators being given 'some muscle' to resolve the really few but stubborn cases that have caused trouble. This 'muscle' could be provided by means of changes in the FCC repeater regulations. Any legal steps taken in the US in this direction will have to take into consideration that frequency arrangements by existing repeater councils representing repeater groups and owners on both sides of the border will be affected and that Canadian repeaters or individual operators would not be subject to any unilateral, mandatory frequency assignments made by FCC, ARRL or other frequency co-ordinators.

With possible problems arising for both sides, CARF has requested ARRL HQ to keep both CARF and CRAG informed as to developments in this matter. This will ensure that repeater groups and councils across Canada can in turn be adequately informed so that compatible frequency arrangements, satisfactory to both Canadian and U.S. repeater users, can be maintained. If the FCC generates users, can be maintained, if FCC generates regulations concerning allocation of Amateur repeater frequencies. (It should be noted that a bilateral agreement exists between DOC and US frequency agencies which calls for co-ordination of VHF and UHF frequency assignments made within 100 miles of the border, EXCEPT for Amateur bands.)

Turning to happier news, VE5DA, Dave Appleton, notes that repeater development in Saskatchewan is proceeding well. A new repeater is on in Swift Current on 146.01-146.61. Prince Albert, VE5EE, is operational on 146.46-147.06 along with Moose Mt.-Carlyle (a regional rig) on 146.22-146.82. (Calls still missing at press time.) An innovation for the proposed Last Mountain rig on 146.25-146.85 is a wind-powered charger as its primary supply.

B.C. has a new rig at Maple Ridge, VE7RMR, 146.19-146.79. On the other coast, Dartmouth, VE1PB on 146.25-146.85 is fired up.

Repeater Classifications:
'Alligator' - big mouth and small ears (500 watts and a lousy receiver)

'Elephant' - big ears and small mouth (one watt and a super-duper receiver)

Thanks, Gary Hendrickson, FCC HQ

Frequency planning

IARU Region I News

At the Warsaw Conference of IARU Region I, it was agreed that all national societies would be asked for their opinion on the points of difference between the Region I and Region III recommendations concerning Amateur frequencies below 30 MHz.

The recommendations are:

Region I	Region III
1. Obtain Amateur exclusive segment in the band 3500-3800 kHz.	Eliminate sharing in the 3500-4000 kHz Amateur band.
2. Expand 7000-7100 to 7000-7200 kHz as Amateur exclusive	Expand 7000-7100 to 7000-7500 kHz Amateur exclusive
3. Eliminate sharing 14,250-14,350 kHz.	Expand 20M to 14,000-14,500 kHz.
4. No change.	Expand 15M to 21,000-21,500 kHz

By Sept. 1, 1975, only 15 of the 42 member societies of Region I had replied. These initial returns indicate majority support of the original Region I proposals.

When considering these results, it is emphasized that any proposal put forward by the Amateur service must be capable of logical justification to the national telecommunications authorities.

(Editor's Note: The Canadian Amateur would appreciate your personal, or club, opinions on these proposals. No word has been received from Region II IARU (North and South America) on what proposals the Region will recommend.)

Hobby band discussions planned

Some time ago the DOC proposed to permit hobby band operation on GRS (CB) channels. This raised great objections ... including a loud one from 'legit' GRS users and raised eyebrows and voices in the FCC.

Nothing came of the DOC proposal but the recent equivocal order of the FCC removing the restriction against hobby band operation in their CB service has prompted DOC to plan discussions with FCC in January to sort it all out, according to a statement made to CARF from a DOC authority at the December conference.

Interference topic of CRTPB, CSA meetings

The annual general meeting of the Canadian Radio Technical Planning Board was held in Ottawa on December 10.

The main item of interest to Amateurs during the year was the report by CRTPB's committee dealing with radio interference to home entertainment equipment. The report of the committee, of which your Federation is a member, made several recommendations which are being circulated to members for approval before being forwarded to DOC.

The recommendations included suggestions for improved liaison with the Canadian Standards Association in its efforts along this line and to encourage CSA work in establishing standards of interference susceptibility. It was also recommended that the CRTPB "determine a policy" with respect to the establishment of a centre for the analysis of electromagnetic interference (EMI).

The Longest Ham Hoax

The Christmas Day fake SOS and the resulting 24 hours of traffic involving Amateurs and US Coast Guard afloat and ashore will long be remembered by the thousands who heard it all.

If nothing else, a number of lessons were learned.

First and foremost was that if one is not directly engaged, one should listen and not add to the confusion by putting in a superfluous remark or query.

Many a lone Amateur has been called upon by circumstances to handle emergencies, but the sooner such situations can be fully turned over to competent civil authorities, the better.

As for the illegal interference which was created on this officially declared emergency frequency, the only positive thing about it was that, out of the thousands who were no doubt monitoring it, 'the sickies' were no more than four or five out of the total.

Regs Chief leaves

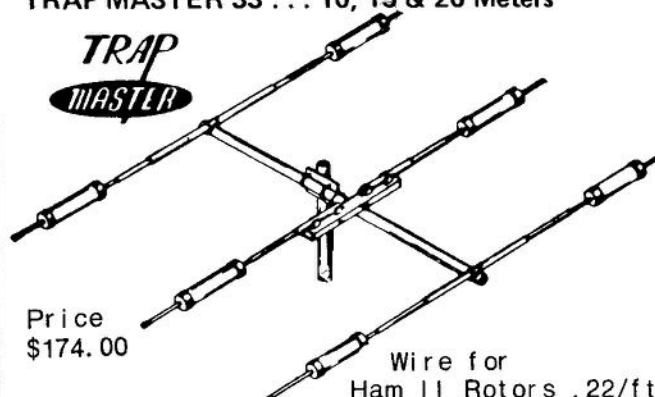
Bud Hoodspith has left the position of Director-General, Telecommunication Regulatory Service to go to a private cable TV firm in Toronto. Bud's frank, out-spoken, free-swinging style and decisiveness was something new on the bureaucratic scene in Ottawa. His style was much appreciated by Amateurs and businessmen who dealt with DOC; so much so that the Canadian Radio Technical Planning Board at its annual meeting set a precedent by unanimously passing a resolution of appreciation of his work with them and regret at his leaving. His successor has not yet been named but scuttlebutt has it that Regional Director Gary Brooks in Winnipeg is among those in line for the job.

As mentioned in earlier issues of TCA, the Federation was represented not only at the CRTPB general meeting, but also at the CSA EMI committee meeting in October by George Davis VE3BBW. The advantage of CARF being on both the CRTPB and the CSA EMI committees was demonstrated when George made the CRTPB recommendations available to the CSA meeting. The latter got down to the details of proposing what equipment should be tested for susceptibility to RF. Priority would be given to testing first AM receivers, followed by TV receivers, audio equipment and then FM receivers. It was also agreed to determine the limits for immunities and responses to RF interference inherent in these items of equipment.

Amateurs are well represented on these committees and on the CRTPB alone, six out of seven officers hold Amateur certificates. These are Bert Cosman, Board president again for 1976, from NB Telephone; Bud Punched, VE3UD; A.P. Davis, VE6KT; Bob Eldridge, VE7BS; Hal Parsons, VE3QA; and Harvey Reid.

Amateurs from Board sponsor organizations include VE3CDC and VE3ZS, Doug Burrill and Art Stark for CARF; VE1SH, Ron Hesler for ARRL; Lloyd Young, VE3BSO; Ken Harris and S. Chungyan, ex-9YLGC.

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		UNIDEN 2020	BRAND A	BRAND B
1.	Air cooled final	Yes	Yes	Yes
2.	Transmitting tubes in final (6146B)	Yes	No	Yes
3.	CW filter as standard	Yes	No	No
4.	Regulated screen voltages for stable operation of final	Yes	No	No
5.	Independent rf circuits for Tx and Rx	Yes	No	No
6.	Dual RIT control 5kHz or 1kHz	Yes	No	No
7.	Slow/fast AGC switch	Yes	No	Yes
8.	PLL VFO for excellent stability and tracking linearity	Yes	No	No
9.	Noise Blanker for pulse type noise	Yes	Yes	Yes
10.	Hybrid dial with digital analog read-out	Yes	No	No
11.	RF amp and fan switchable when receiving only — as desired	Yes	No	No

Frequency Ranges;

Bands(meters)	Frequency(MHz)
80	3.5 ~ 4.0
40	7.0 ~ 7.5
20	14.0 ~ 14.5
15	21.0 ~ 21.5
10(A)	28.0 ~ 28.5
10(B)	28.5 ~ 29.0
10(C)	29.0 ~ 29.5
10(D)	29.5 ~ 30.0
11	27.0 ~ 27.5 Receive only
WWV	15.0 Receive only

Mode of Operation;
Input Power;

LSB, USB, CW and AM
180 Watts DC INPUT SSB & CW
90 Watts DC INPUT AM

Carrier Suppression;
Sideband Suppression;
Spurious Radiation;
Distortion;
Microphone Impedance;
Modulation Method;

50 dB
50 dB at 1,000 Hz
Down 40 dB or more
Down 35 dB or more
High
Balanced modulation(SSB)
Low power modulation(AM)

Transmitter Frequency
Response;
Frequency Stability;

300 to 2,700 Hz(down 6 dB)
Less than 300 Hz drift in starting
Less than 100 Hz drift or less
after 30 minutes of warm up

Antenna Output Impedance;
Receiver Sensitivity;

50-75 ohms unbalanced
0.3µV S/N 10 dB (at 14 MHz) SSB/CW
1µV S/N 10 dB(at 14 MHz) AM

Image Interference Ratio;
IF Interference Ratio;
Receiver Selectivity;

-50 dB and more(at 14 MHz)
same as above
SSB/AM
2.4 kHz at -6 dB and
4.0 kHz at -60 dB

Audio Output;

CW
600 Hz at -6 dB and
1.5 kHz at -60 dB
2.5 Watts or more
(10% distortion at 4 ohms load)

Audio Output Impedance;
Power Source;

4 ohms
100/110/117/200/220/234 Volts
AC 50/60 Hz
13.8 ± 10% DC

Power Consumption;

AC: 350 VA at the maximum
final input
DC: 22A at the maximum
final input. 7A in receiving
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canadian capsule comment

VE3 NEWS

Metro Bulletin

WORKSHOP HINTS AND KINKS

The silver plated contacts of components - relays, switches, etc. - headed for storage in the junk box may be protected from tarnish by dropping mothballs into the compartment. You will appreciate how well this works when you next solder to the terminals of a component so protected.

Screwdrivers and other small tools which have accidentally become magnetized may be made to lose this undesirable property with the aid of a soldering gun. After the trigger of the gun has been pulled to the on position, pass the tool to be demagnetized through the hairpin shaped tip. One or two passes through the strong magnetic field that surrounds the tip will usually free the tool of its bad habits.

VE5 NEWS

QSL

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1. Contacts with RARA members ... 10 points (Max. 5 contacts)
2. Contacts with other Regina Hams...5 points ea.
3. Contacts with other Sask. Hams...2 points ea. (Min. 1)
4. Any contacts since Jan. 1, 1946. All Modes, All bands.

Send Photocopies of QSL cards or Extract of Log-Certified GCR and \$1.00 (Cdn. Funds) or 3 IRC's Free to B/H to: Award Custodian Glen Gorham VE5-GG, 2827 Abbott Road, Regina, Sask. S4N 2J9.

VE7 NEWS

Comox Valley Wireless Club News S METER READINGS

Some of the Club members were discussing the S meter and signal strength readings the other night, and from the comments that were passed, some explanation of what they mean, or are supposed to mean, might be of interest.

In the early days of radio, one of the first items of information exchanged was related to the strength of the signal being received. This could vary from barely audible to extremely strong. I think originally this range of signal strength was divided into a scale from zero to five and all reports were based on the operator's estimate of strength.

As receiving equipment became more sophisticated and was equipped with automatic gain control circuits, it became possible to measure the plate current of a gain controlled stage to give a relative indication of signal strength. The better quality communication receivers were provided with a signal strength meter, or S meter, which was calibrated in 'S' units.

By this time, signal strengths were being given over a range of zero to nine, strength nine being extremely strong.

There was no uniform standard of calibration amongst manufacturers, although several adopted a figure of 100 microvolts at the antenna terminals on the receiver being equivalent to an S9 reading. In the case of multi-band receivers this calibration usually applies only to the band it was made on, and is a relative figure on other bands.

Other manufacturers used a lower figure such as 50 microvolts to give an S9 reading, and this gave rise to the interesting misconception that a receiver was more sensitive because its S meter registered higher readings on a signal than did the neighbor's across the street.

This is rather like saying my car is faster than yours because the speedometer has been made to read higher.

If the strength of an incoming signal exceeds extremely strong, as when you have a kilowatt or two being used next door, obviously the meter will go over the S9 mark and read somewhat higher. We then revert to a more scientific measure and calibrate in decibels (purely a ratio) above S9. Most S meter scales these days read up to 60 dB above S9.

What they are trying to tell you is that, if the needle is at the end of the scale the incoming signal is 1000 times stronger than 100 microvolts, and one-tenth of a volt is indeed a strong signal.

However, there is no basic standard for S meter readings and they remain a purely relative means of comparing signal strength. Don't take what they say as gospel truth, and don't throw your receiver away because it consistently gives lower readings than the one across the street. The only important thing about radio communication is the readability of the incoming signal, and it is quite possible to copy a signal 100% on a quiet band and have no S meter reading at all.

They can be used as a basis for comparison, for example, if the other guy changes an antenna, or alters its direction or increases power, but only if you do not change anything on your end while the test is going on.

Finally, there is no relation between the zero to nine scale and the decibel portion. You cannot add 20 dB over S9 to S9 and say S29, they are two different sets of values.

Val, VE7VL

Prairie Ham

Continued from Page One

Before Alan left Ottawa, CARF officials Ron Belleville VE3AUM and Cary Honeywell VE3ARS advised him on equipment and what to expect on DX working. Ron spent a number of years at sea and gave Alan some valuable tips on marine mobile operation. Cary arranged to test the new equipment before Alan left Ottawa on December 15.

TEN-TEC

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A completely automatic electronic keyer that is fully adjustable to your operating style and preference, speed, touch and weighting, the ratio of the length of dits and dahs to the space between them. It is a keyer you control, not the other way around, to transmit your thoughts clearly, articulately and almost effortlessly. The iambic (squeeze) feature allows the insertion of dits and dahs with perfect timing. It greatly reduces manual effort, prevents errors. Full instructions are included in the manual.

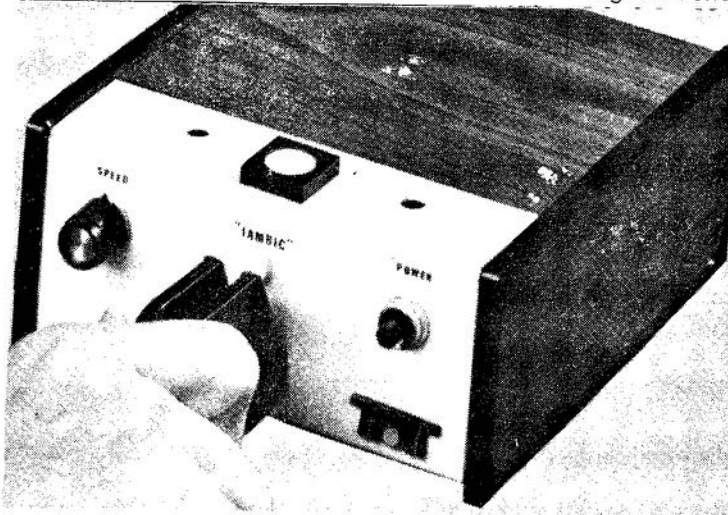
An automatic weighting system, pre-set by you, provides increased character to space ratio at slower speeds, decreasing as the speed is increased, keeping the balance between smoothness at low speeds and easy to copy higher speed. High intelligibility and rhythmic transmission is maintained at all speeds, automatically. Or, if a single preset constant weighting is desired, a switch provides it.

The paddles are the famous "Torque Drive" which are pivoted on low-friction ball bearing assemblies. Electro-magnetic return force is adjustable from nearly zero to over 50 grams. At any desired value, the "feel" is precise and smooth, for the kind of CW that is relaxing to send and a joy to copy.

Memories are provided for both dits and dahs but either may be defeated by switches on the rear panel. Thus, the KR50 may be operated as a full iambic (squeeze) keyer, with a single memory or as a conventional type keyer. All characters are self-completing, of course.

In addition, a convenient "straight key" button is provided for emphasis, QRS sending or transmitter tune-up.

The KR50 is designed to occupy a permanent place in your shack for the years, perhaps decades ahead. A permanent investment that will pay big dividends in the enjoyment of CW.



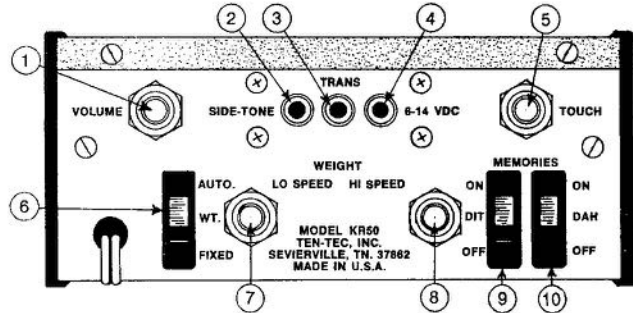
SPECIFICATIONS

Speed Range: 6-50 w.p.m.
 Weighting Ratio Range: 50% to 150% of classical dit length.
 Memories: Dit and dah. Individual defeat switches.
 Paddle Actuation Force: 5-50 gms
 Power Source: 117VAC, 50-60 Hz, 6-14 VDC
 Finish: Cream front, walnut vinyl top and side panel trim.
 Output: Reed relay. Contact rating 15 VA, 400 V. max.
 Paddles: Torque drive with ball bearing pivot.
 Side-tone: 500 Hz tone.
 Adjustable output to 1 volt.
 Size HWD: 2½" X 5½" X 8¼"
 Weight: 1¾ lbs.

REAR PANEL CONTROLS

1. Side-tone level control.
2. Side-tone output jack.
3. Keyed output jack to transmitter.
4. Input power jack for 6 to 14 VDC operation.
5. TOUCH control. Adjusts amount of electromagnetic force on paddles.
6. Weighting selection switch. In AUTO position weighting will change between preset limits as SPEED control is varied. In FIXED position, weighting will remain constant at preset amount regardless of SPEED setting.
7. LO SPEED weight control. Lengthens character ratio. Ad-

- justs weighting limit to be obtained when SPEED control is at minimum when automatic weighting is used, or sets fixed weighting on heavy side, i.e. character length longer than normal.
8. HI SPEED weight control. Shortens character ratio. Adjusts weighting limit to be obtained when SPEED control is maximum when automatic weighting is used, or sets fixed weighting on light side, i.e. character length shorter than normal.
 9. DIT MEMORY defeat switch.
 10. DAH MEMORY defeat switch.



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CARF executive meeting report

Despite the problems created by the recent postal strike, your national executive met in Kingston on Nov. 15 in a spirit of enthusiasm for your national Federation and confidence in Canadian Amateur Radio.

With the change to individual control of the Federation in the wind, membership was showing a strong increase, though the postal strike had slowed normal communications. Total membership is up 61.5% to a record total of 1800. Quebec support has increased by an impressive 125%.

Some of the Federation's normal functions have suffered during the postal debacle. QSL Bureau operations were in temporary hibernation and a backlog was created on The Canadian Amateur scene.

Meanwhile, your Federation has been active on other fronts. We have a backlog of orders now being filled for the new printing of the Regulations Handbook and work has been going ahead with the new Licensing Manual, designed to meet the revised Canadian DOC exams.

The Regulations Committee, headed by VE3ZS, has been busy with codification of the Radio regulations and active participation in CCIR committee work within the ITU dealing with Amateur Satellite operations. The distinguished CARF representative on this committee will be Bud Punched VE3UD.

Work also continues, with the DOC, in preparation

for the 1979 ITU conference on frequencies. Art, VE3ZS, asks that provincial societies and club bulletins solicit opinions on the following questions relating to the 1979 conference.

1. Should the Amateur Experimental Service and the Amateur Satellite Service be combined into one service? Why?

2. What additional Amateur HF, VHF, UHF, and SHF bands are needed? Why?

3. What new bands are needed by Amateurs above 275 GHz, in the presently 'unallocated' portion of the spectrum? Why?

4. Why are 'exclusive' Amateur bands needed?

Now that the postal service is working again, let's get behind Art, Bud, and the committee and have some grass roots input to DOC for the 1979 Conference. Send replies to VE3ZS, care of Box 356, Kingston or direct to his Ottawa QTH.

DOC News

Holders of the General Radio Regulations Part II or the CARF Canadian Amateur Radio Regulations Handbook should delete the section dealing with the minimum age for holders of Certificates of Proficiency. The legal reference is in the Canada Gazette, Part II, Vol. 109, No. 13, page 1582 and makes amendment SOR/75-371 dated June 25, 1975 legal. The amendment revokes subsection 99(5) of GRR, Part II.

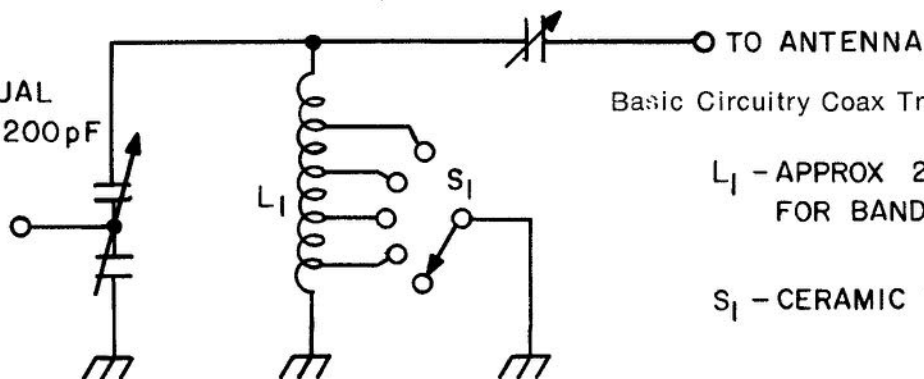
TECHNICAL TALKS



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Basic Circuitry Coax Transmatch

L₁ - APPROX 25 μH, TAPPED FOR BAND IN USE.

S₁ - CERAMIC TYPE SWITCH

A.E. Blick VE3AHU

Amateur HF transmitters/transceivers are designed to give maximum RF output and hence highest efficiency only when the load presented to the output of the transmitter is within a narrow range of impedance - normally between 40 and 90 ohms, re-

sistive. If the load presented is outside of this range, then maximum power output is not transferred to the load and efficiency is reduced leading to generation of excessive heat in the final stages of the transmitter. (Note that solid state finals usually have circuitry that will reduce the power of the final

stages so that this heat will not be generated.)

Similarly, where transmission lines are used to connect the transmitter to the radiating system, losses occur if the input to the system does not match the characteristic impedance of the transmission line. In this article, we will only deal with the problem of transferring maximum power to the transmitter end of the transmission line.

Consider the case where a dipole antenna is used for 75/80 metre operation and, because of space restrictions, this antenna is loaded by insertion of coils along its length. Assume that the antenna is resonant at 3550 kHz and, when used on 3800 kHz, a SWR meter indicates that the line has 5:1 SWR at the antenna and the coax line used is 100 feet long.

Tables found in Antenna Handbooks, etc. give the information that the transmission loss of the coax at 3.5 MHz for 100 feet is 0.3 dB. This loss means that, for 100 watts of power fed into the far end, 93 watts will be fed to the antenna. Other tables will note that, for a 5:1 SWR, there is an additional 0.4 dB loss, for a total loss of 0.7 dB, in the transmission line. If 100 watts of power is fed into the line, then 85 watts will be transferred to the antenna.

The 75/80 metre example has been deliberately chosen as this is the band where many Amateurs have to use 'shortened antennas' and contend with the above effects. But note that if you can feed 100 watts into the transmission line, the high SWR on the line will only lower your over-all efficiency by 7%. The problem remains of getting the 100 watts of RF produced by the final into the transmission line.

Some method of coupling is therefore necessary to match the 40 - 90 ohms resistive output of the transmitter to the complex impedance appearing at the transmitter end of the transmission line. Such a device is called a 'Transmission Line Matching Device' or, more commonly, a 'Transmatch'.

The author has built and used many such devices ranging from an elaborate type that would match the transmitter to the proverbial rusty door-knob using any type of transmission line - open-wire, 300 ohm parallel, 75 ohm parallel, or coax cable. Experience with this Transmatch determined that, using parallel line, it worked well up to the legal limit. But, when using coax cable, the unused portion of the circuitry developed extremely high RF circulatory voltages with consequent arcing when appreciable amounts of RF were used.

A 'new' Transmatch was constructed several years ago that would only work with coax lines and all antenna systems were changed for this type of feed. Details of this device appeared in QST in 1961 and we note that the same design is followed in the latest issues of the ARRL Radio Amateur Handbook.

The Transmatch used in the shack will handle the legal limit but the device has been copied using small components mounted on 1/2" plywood for Field Day use and has performed with no problems using 200 watt input SSB transmitters.

How does it perform? Well, one Sunday afternoon, for a demonstration, a 12-foot piece of tubing was loaded through the Transmatch and stations 300 miles away were worked with S-6 signals on 75 metre phone using a 180 watt input SSB transceiver. Oh, yes - the tubing was positioned about two feet above ground level!

BANNED COUNTRIES LIST

Iraq, Khmer Republic**, Libya, Pakistan, Somalia, Turkey, Viet-Nam*, Peoples Democratic Republic of Yemen.
* - 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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