CARF

the canadian amateur

Volume Three January 1975 Number One

The FCC Restructuring Plan for U.S.

The Federal Communications Commission has given the pertinent details of Docket 20282 (not released at time of writing) in Report 10112. The Docket is a proposal to change the structure of the US Amateur Radio Service in an effort to double the numbers of US Amateurs and to open up Amateur radio to the "hobbyists" of the US Citizens Radio Service.

The proposal is to divide Amateur radio into two parts - Series "A" for the HF bands and Series "B" for VHF and above, with the dividing frequency 29 MHz. Each individual Amateur can hold one Operator licence in each series and the grades do not have to match.

Series "A" will consist of the Novice, General, Advanced and Extra classes; Series "B" of the Communicator (new), Technician, and Experimenter (new) classes, with all licences requiring renewal at five year periods. Conditional licences, granted to Amateurs who can not readily appear at the regular examination centres, would not be renewable.

The 'new' Communicator class would only be licenced to operate on F3 (FM) on all Amateur frequencies above 144 MHz and is a "no-code" class. The Experimenter class would be the equivalent of the HF Extra class on VHF and present Extra class Amateurs could obtain this licence by application.

On the HF bands, Advanced Amateurs would have the same frequency allottment as Extra class (3775-4000 kHz, etc.) and this will significantly increase the number of US Amateurs using these frequencies. Note that your national Federation has requested the DOC to expand the Canadian phone sub-bands on 75 and 40M and trusts that the announcement of this Docket will hasten some action in this regard. No change is evident in the present frequencies and by Novice and General class Amateurs.

On the VHF bands, the Technician class would be permitted use of all Amateur frequencies above 50 MHz, the new Communicator class all above 144 MHz, and the Experimenter class, all above 29 MHz. Note that General and Advance class Amateurs would not be permitted to use frequencies above 29 MHz. However, present Amateurs of both these classes would receive VHF privileges by applying for them but new Generals and Advanced Amateurs would have to take separate examinations for operation above and below 29 MHz.

Power for Amateur transmitters would be restricted to power **OUTPUT** except for the Novice and Communicator class which has restriction to 125 watt input. Extra, Experimenter and Advanced Amateurs could run 2000 watt PEP output (a significant increase to the present 2000 watt PEP input); General and Technician Amateurs would be restricted to 500 watt PEP output.

Restrictions on emission modes are contemplated. Extra, Experimenter and Advanced classes would be permitted all authorized modes on frequencies they can use; General and Technician classes restricted to A1, A3 and F3 only; Novice class to A1 only; and Communicator class to F3 only. This implies that the General and Technician class could not work with RTT and ATV.

The general philosophy behind the sweeping changes in Docket 20282 appears to be the encouragement of progression to the Extra and Experimenter class (Incentive licencing), to create a new group of VHF oriented Amateurs of high calibre, and to greatly increase the numbers of US Amateurs.

(continued on page 2)

Canada—Poland Reciprocal Agreement

A reciprocal Amateur arrangement between Canada and Poland has been concluded, dated 10 Dec. 1974, under which Amateur station licencees of either country may be authorized to operate their Amateur stations while temporarily in the other country.

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Vol. 3 January 1975 No. 1

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From the Front Office

Looking back over the past twelve months, 1974 can be classified as a "marking time period". It was a year of solidification of the position of the Federation as the national society of the Amateurs of Canada, improvement and strengthening of our many activities on behalf of the Amateur service, and steadily increasing support, both for the national Federation and the provincial societies.

THE CANADIAN AMATEUR, under the capable direction of its editor, Steve Campbell, shows marked improvement in appearance, content and format but did meet with several publishing problems causing a delay in certain issues. Circulation is now well over the thousand mark and shows no sign of ending the steady climb of the last three months. However, due to the increased costs of printing and publishing, it was necessary to raise the membership fee to $5.00 per year.

The Canadian Repeater Advisory Group, sponsored jointly by your national Federation and the A.R.R.L., is now accepted as a viable organization and has done much valuable work in publicising the Canadian Channel Plans for VHF repeaters and circulating, through the column in T.C.A., news and views of the licencees and users of Canadian Amateur repeater stations.

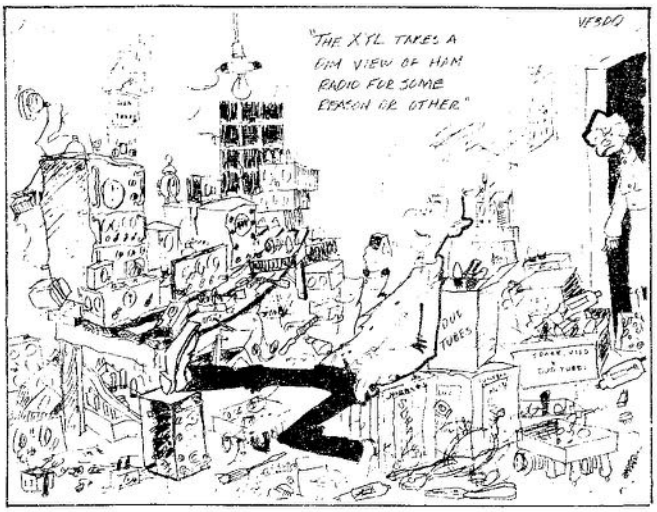
The CARF Regulations Advisory committee, under the chair of Art Stark, VE3ZS, has been actively working to codify the Radio Regulations, Part II, that pertain to Amateur radio to bring these regulations under one heading and, where necessary, to up-date. Previous to undertaking this task, the 1st edition of the Canadian Amateur Radio Regulations Handbook was edited, amended, and enlarged by the committee and the 2nd edition was published late in the year.

Several requests were made to enable the individual member to have more say in the control of your national Federation and a proposal to this effect will be put before the 1975 Annual meeting. And one club - the Arrowsmith A.R.C., Port Alberni, B.C. - now boasts of 100 per cent membership in the Federation. We look forward to hearing of many more in this position!

The year ended with the Director of the A.R.R.L. (Cdn Div) agreeing to the request of the Federation to meet to discuss Canada's membership in the IARU. Canada's current membership in the international Union is the major stumbling block to "mutual support and co-operation" between the League and the Federation and CARF, in our position as the national Amateur society, can not accept, nor support, the continuance of the membership now in effect. Hopefully this transfer of responsibility will be resolved amicably and quickly so that both the League and CARF can continue to work together in the best interests of Amateur radio and to develop the role of the Amateurs of Canada in the scheduled I.T.U. Frequency Conference in 1979.

FCC RESTRUCTURING PLAN continued from page 1

At first glance there will be two major effects on Canadian Amateurs. The first would be the greatly increased number of US Amateurs using the 'shared' phone segments on 75 and 40 M; the second would be the tremendous increase of activity on Two metre FM by the Communicator class and the effect on Auto-repeaters located in border areas. We are quite confident that there will be a large volume of comment made to the DOC on changing the Communicator class frequencies to those above 220 MHz before the FCC dead-line of 16 May 1975.



OUR ERROR

In the story on the 1979 ITU Frequency Conference appearing in our October issue the writer missed some of the fine print in the Radio Regulations Part II.

Actually there is mention of emergency operations in the Regulations in a subsection dealing with what may be transmitted (52.5). It states that Amateur stations "may be permitted to provide communications on behalf of recognized relief agencies during peacetime emergencies where no other communications is available". It is not however, as the article suggested, a requirement or purpose laid down by DOC that Amateurs should provide such communications, as it is in the FCC Rules applying to U.S. Amateurs.

The Editor has sentenced the culprit to write out that section 1000 times.

Your National Executive

Lorne Doreen, VE3SZ

Lorne Doreen, VE3SZ, is CARF's Ontario director and is also the newly elected President of the Radio Society of Ontario, Inc.

From his home station in Deep River, Ont., Lorne operates SSB and CW on all bands, as well as 2 metre FM. He also works 75 and 2 metres mobile.

He received his call in 1933, got his Commercial certificate, and worked as a Radio operator on shipping during World War II. He also flew with the Royal Air Force Ferry Command as a radio operator for four years.

He now works with Atomic Energy of Canada in the Radiation Safety Branch at the nuclear plant in Chalk River.

Orbital Data on AMSAT-OSCAR 7

Operating Schedule:

Mode A days (two-to-ten meter repeater and 435.10 MHz beacon ON) on odd numbered days of the year, GMT. (For example, Dec. 7 is day 341 and therefore an odd day.)

Mode B days (70 cm-to-2m repeater ON) on even numbered days of the year, GMT. (For example, Feb. 3 is day 34 and therefore an even day.)

Experiment days - All Wednesdays, GMT are reserved for experiments, and operation is NOT permitted even though the repeaters will be on.

AMSAT-OSCAR 6 Operating Schedule: Mondays, Thursdays and Saturdays GMT ON for ascending node (south-to-north, evening) passes. Sundays ON for descending node (north-to-south, morning) passes. During weekday mornings, the repeater will be on over the USA on EVEN numbered days for education bulletins only and not for general use. Operation is not permitted at other times, even though the repeater may be on.

QSL cards for AMSAT-OSCAR 7 have recently been donated by K5RZU and the Hesse Envelope Co. and are now available in return for your A-07 report.

PERFORMANCE NOTES

1. Because of improvements in the sensitivity of the 70cm-to-2m repeater receiver, the maximum ERP needed for the Mode B repeater is 80-100 watts instead of the higher values reported previously. All stations are therefore asked to keep their ERP below 100 watts. (If you prefer to use a power amplifier, we recommend that you use very low antenna gain.)

2. The AGC in the AMSAT-OSCAR 7 two-to-ten meter repeater is set to activate at lower uplink power levels than the repeater in AMSAT-OSCAR 6. As a consequence, stations using more than 200-500 watts ERP are depressing the gain of the Mode A repeater, with the result that users having lower power are suffering. The 100 watt ERP rule (200 watts if using LINEAR polarization with AMSAT-OSCAR 7) must be adhered to by EVERYONE if we are to achieve best results with the repeater.

3. The 435.1 MHz beacon occasionally drops off

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CRAG Canadian Repeater Advisory Group

At the time of writing there has been a prolonged DX propagation phenomena on two metres which as repeater operators wondering just how long there equipment can stay turned on. Fantastic distances were covered by some hilltop repeaters in Eastern Canada. The Burlington, Vermont repeater consistently worked Ottawa stations loud and clear and even worked Cobalt; about 450 miles airline. The DX hunters utilizing repeaters sometimes tripped more than one and did not endear themselves to repeater operators or to local users. Which may be a good time to remind all and sundry that the intent of providing repeaters is **TO EXTEND THE RANGE OF MOBILE STATIONS**. Base stations can utilize beams and high power to work simplex frequencies during openings and thus not intrude on repeater operation.

CHANGES TO CRAG REPEATER LIST

A new repeater is in operation at Base Line Mountain, 50 miles west of Red Deer, Alberta...VE6VHF 6.28-6.88. All Alberta repeaters outputting on 147.00 will go to 147.06 on April 1, 1975. Amateur Radio League of Alberta VHF Committee is masterminding the change, including purchase of a huge bulk order of xtals for users. They thus get a whopping discount from a U.S. supplier. (source; VE6ATA).

Charlottetown, P.E.I. has an experimental repeater on 146.10-147.00, owned by VE1AC, according to the VE1RPT news bulletin. VE3VCR, Ingleside, Ontario, is off for a period due to a location move.

Bathurst, NB, VE1PL has a repeater working on 22/82. They are looking for a mountain site across the Bay of Chaleur in VE2 land.

Sydney, NS, VE1JD is now on 6.34-6.94. Yarmouth, NS, VE1GM was scheduled for the end of December on 6.34-6.94.

Victoria, BC, VE7BEL is changing to 6.25/6.85 out from 6.22/7.54.

Sudbury, Ont., changed to 6.16/6.76 in December.

Since the end of October, CRAG repeater directories have been distributed by various means and some editions have two Quebec stations with mixed-up call letters. Joliette should be VE3AMM and Mt. Buckland (Quebec City) should be VE3ASU. The call sign for St. John's, Nfld., which was omitted from some copies, is VO1GT.

B.C. REPORT

Reports from British Columbia note that new repeater groups are being urged to go to the 220 and 450 bands due to the overcrowding in the coastal areas of both B.C. and Washington state. The only unused pair on the Coast is 7.99-7.39 which is just a little too close to the band edge to be a popular choice. B. C. simplex frequencies in the coastal area are 7.33, 6.76, 6.58, 6.52 and 6.70 in that order, according to the B.C. FM Communications Association.

There is some use of 6.55 and a couple of clubs are assigned 6.40 and 7.60 for their own use. The DX club uses 7.90. At the risk of being repetitious but of some benefit to newcomers, here are some extracts from the B.C. FM Bulletin on "do's and don'ts", ..."DO keep your repeater QSO short and QSY if possible...DO remember that a repeater is basically a calling channel. Establish contact and then QSY...DON'T overidentify..."

THE NEED FOR COUNCILS

The congestion problem is not peculiar to the West Coast--Southern Ontario is in a similar bind. Without a council and a provincial repeater frequency co-ordinator there would be utter chaos. The recent unusual propagation conditions proved that. The formation of councils in Quebec has been very effective and a number of voluntary adjustments are being made in frequency assignments. A central Maritimes council or some form of structured frequency co-ordination in the three provinces would probably head off a number of incipient problems in frequency management in that area.

Repeater councils and VHF committees were recently canvassed as to the addition of more channels to the two metre Canadian plan and for some suggestions as to 220 and 460 450 channels for Canada.

NORTHERN ONTARIO REPEATER COUNCIL

Two new stations will be on the air in Northern Ontario. VE3TIR, Ramore, 6.46-7.06, will be linked to VE3TIM in Timmins. The other repeater is VE3WAW, Wawa, on 6.34-6.94. Two others are in the planning stage in that area. One is to serve Rouyn-Noranda-Val D'or, just over the provincial boundary in Quebec, on 6.16-6.76. No call is available yet. A second repeater for the Sudbury area is planned for Chelmsford: no information yet on call and channel.

Correspondence or calls concerning repeaters in the area roughly bounded by Algoma district on the west, north of 46th parallel, north central Quebec adjacent to Rouyn-Noranda, Val D'Or, should be addressed to Gerry Spooner, VE3DQL, Drawer 130, Timmins, Ont.

MIDWEST CANAM COUNCIL

A report from the chairman of the Midwest CANAM Repeater Council VE4QI, Sonny Gray, says that he is currently setting up a repeater at Canadian Forces Base SHILO, Manitoba, on 6.25-6.85.

The station, near Brandon, will have a mobile range from 75 to 125 from its antenna atop the 250 ft. parachute jump training tower.

This council has a forward looking program which allocates the frequencies to geographical areas to accommodate future requests for channel allocations.

SARL VHF (REPEATER) COMMITTEE

At least three new repeaters are planned for Saskatchewan, at Melville-Duff (6.22-6.82), Arcola-Carlisle and Prince Albert. No calls are yet assigned.

"LOCKED-ON" REPEATERS

From the RSO Frequency Co-ordinator comes word of a recent incident in Toronto when VE3RPT was tuned out during a 12 hour period by an unknown carrier. It was suspected that the carrier was not intentional, but was a "Carrier-on" switch used in conjunction with the touch-tone pad (VE3RPT has tone access). It is wise to turn off all power to your rig when operation is finished.

Operating an Automatic Repeater

There are NO D.O.C. REGULATIONS covering automatic repeater operations. Licensees are expected, however to follow the DOC 1971 guidelines which are reproduced here. These are for the use of DOC personnel in issuing and monitoring repeater station licenses. They are published again in response to inquiries from interested Amateurs.

DEFINITION

1) An amateur automatic repeater is a station in the amateur experimental service providing for the automatic reception and retransmission of amateur radiocommunications.

2) For the purposes of these guidelines, the term amateur automatic repeater refers to "terrestrial" repeaters only and does not include "satellite" repeaters or "remotely controlled base stations".

RESPONSIBILITY OF THE LICENSEE

1) Responsibility for the technical operation of an amateur automatic repeater lies with the licensee and shall include the maintenance of a technical log showing malfunctions, servicing and on-the-air tests, etc.

2) For purposes of continuity of operation and maintenance of more effective control over the repeater, the licensee may, in consultation with the local Telecommunications Regulation office, designate not more than three qualified persons to share with him the responsibility of controlling the amateur automatic repeater.

3) The licensee, or persons so designated by him, shall provide a means to automatically disable any repeater transmitter, regardless of frequency, when on-the-air time exceeds five minutes and shall be responsible for its reactivation by physical or remote control means.

4) Unless specifically authorized by the Department of Communications, the licensee of the amateur automatic repeater shall not permit the repeater to be used for the delivery of traffic to or the acceptance of traffic from external points by means other than radio.

5) Amateur automatic repeaters may be controlled by means other than radio where it is practical to do so.

IDENTIFICATION

1) All emissions from amateur automatic repeaters on 50 - 54 Mc/s or 144 - 148 Mc/s shall be identified by a keyed tone transmission of the station call sign at reduced amplitude at intervals not exceeding two minutes. Such identification is not required on point-to-point circuits between repeaters (above 220 Mc/s).

2) Users of the repeater shall continue to identify their respective stations in the usual manner.

FREQUENCY BANDS AVAILABLE

1)Amateur automatic repeaters shall transmit in the 50-54 Mc/s or higher frequency amateur bands.

2) Remote control emissions shall be within the 50-54 Mc/s of higher bands.

3) Point-to-point circuits between repeaters shall use the frequency bands 220-225 Mc/s, 420-450 Mc/s or higher frequency bands.

The Department of Communications will apply these guidelines to all automatic repeaters authorized after February 1, 1971 but will exercise discretion in applying them to repeaters authorized before that date.

AMSAT-OSCAR 7 continued from page 3

drastically in power to a few milliwatts output, but can be copied under this condition by suitably equipped stations.

4. Morse code telemetry channel MC-1B, 1C, 1D and 2A (the solar panel currents) also appear to be affected by RF and tend to read in the 70's in darkness. This represents an offset, which changes with repeater loading.

6. We are sometimes running the teletype telemetry on the 29.502 and 145.972 MHz beacons in a "space-only" (rather than AFSK) form. Many stations equipped for teletype reception should be able to copy the data with slight modification of their terminal units. The data sounds to the ear like very fast keyed pulses (A1).

TECHNICAL HINT

If you are using salvaged wire from surplus coils and wish to splice two pieces of No. 12 wire to wind your own tank coil, a splicing ferrule can be made by cutting about 3/16 inch from an empty ball-point cartridge. Clean out the ink with alcohol or thinners and sweat the two wire ends into the ferrule, by capillary action from one end and until solder appears at the other end.

UNDERSTANDING SOLID STATE ELECTRONICS

For those who wish to learn more about I.C.s, logic and digital techniques, linear amplifiers, etc., without getting into the mathematics, - Radio Shack have an excellent programmed learning book, prepared by Texas Instruments Learning Centre. This little gem is called "Understanding Solid-State Electronics" and cost is $1.95.

canadian capsule comment

NOVA SCOTIA NEWS

Bret Fader VE1FQ, Lower Sackville, was elected president of the **Halifax Amateur Radio Club** this month at their monthly business meeting. Bret has been an amateur radio operator for many years also being the "VE1" QSL Manager since 1939.

Other officers elected were Bill Delahay VE1BAD, 1st Vice president; Barry Mouzar VE1AZX, 2nd Vice President; C.G. Fisher VE1AFN, Secretary; H. Grimmer VE1MX, Treasurer.

The above officers will hold their post for the year 1975.

"HAM" RADIO OPERATORS PLAY VITAL ROLE DURING EMERGENCY

Thus read a FRONT PAGE article in one of the Province's Newspapers on November 8th.

Ham radio operators established an Emergency Communications Net throughout the Atlantic Provinces on November 7th, within an hour of the accident which cut off long distance service.

Dave Pike VE1EJ, New Glasgow, formed the net which was eventually joined by at least 30 other stations in major centres throughout the four Provinces. Dave would like to thank all the Hams, whose co-operation was necessary to make the Net operational, and said, That he just happened to be the first aware of the situation because of his job. He is employed with Eastern Telephone at their Microwave facility on Hardwood Hill, just outside of Pictou. He became aware of the Communications breakdown when his company lost all their Telephone and Television Transmissions.

By 15:30 hrs. Z a radio net had been established between hams in: New Glasgow, Halifax, Dartmouth, Sydney, Kentville, CFB Greenwood, Florence, Port Hawksbury in Nova Scotia, and CFB Summerside, and Charlottetown on Prince Edward Island, Moncton, Fredericton, New Castle, Andover, and Bathurst in New Brunswick, and Amateurs in South Newfoundland. The hams in each area then contacted local R.C.M.P., Emergency Measures Organizations, Hospitals, and Maritime Tel. & Tel. Offices to let them know that communications were available via the net.

The most important service provided by the operators was enabling various M.T. & T. offices to contact each other to co-ordinate and speed up restoration of services. With the assistance of members of the radio net, Television Transmissions were restored early in the afternoon by rerouting the signals from Newfoundland via satellite. The Television service was restored through normal channels later in the afternoon.

Gordon Reid of Maritime Tel. & Tel. said that he would like to express appreciation to the Radio operators for their assistance, and for standing by on the air until the situation had been restored to some degree.

The Net remained on standby until 02:15 hrs. Z, November 8th. but was re-established at 14:00 hrs. Z, the same day because of intermittent fade out of partially restored Maritime Tel. & Tel. long distance services, and when it was learned that there were only 3 two-way trunks operational out of the New Glasgow-Pictou Co. Area (there are around 70 two-way trunks out of the area normally) the net remained operational until 16:00 hrs. Z, on Saturday November 9th, when the net was at that time informed that M.T. & T. had placed an additional 30 trunks into service out of the New Glasgow area.

ONTARIO NEWS
REPORT ON THE BOY SCOUT JAMBOREE ON THE AIR 19, 20 OCTOBER 1974

VE3JW at the Museum of Science and Technology was able to participate in this event for the first time. The station was operated 1.30-4 PM Saturday and Sunday by Gord Mitchell, VE3GIN, a Scout Master and Doreen VE3CGO a Ranger Leader and Guide/Brownie leader trainer. Gord and Doreen were resplendent in their uniforms, Ed VE3GX also participated as a civilian. The Museum PRO and Scout HQ gave the event lots of advance publicity. The Museum end of the operation attracted many scouts, cubs, brownies/guides and rangers

The operation generated a lot of publicity for VE3JW and Amateur Radio generally. Prior to the event VE3GX was asked to participate in the Cable 3 television interview program "The Way It Is". During the event Mr. Ian Street of the CBC International Service visited the Museum and recorded an exchange between Jamaican scouts and our girls and boys. He also interviewed some of the scouts. The material is to be used for the CBC International Shortwave Service.

A Citizen reporter took a picture and gave the event a short write-up. The Guardian, a weekly paper also had a write-up from the girl guide point of view.

NEW BRUNSWICK NEWS

The month of Nov. was a busy one for the North Shore Amateur Radio Club. On Nov. 11, they took part in a search and rescue in the Hart's Lake area of Northeastern N.B. for two young hunters lost for two nights in the woods.

Hams involved were VE1AQH, VE1AZR, VE1DI, VE1YE, VE1VC, VE1AGZ, and VE1ASG. The message regarding the boys lost was sent down by VE1BFC with VE1VC operating and all arrangements were made for ground and air rescue as well as a dog and dog master. The radio message when boys were found safe was relayed by VE1BFC with VE1AQH operating to VE1AGZ and on to interested parties.

On Nov. 26, an emergency arose in Bathurst in respect to a very heavy snow fall with winds to 60 MPH. Some roads were barely passable, and others completely snowed in. The hams were called upon to handle emergency traffic. VE1AGZ commandeered 4 two meter rigs, one used as a base station, set up in the police station at city hall, and three units mounted in 4 wheel drive vehicles, manned by VE1BA, VE1AQH, VE1AGZ, also VE1VC used his 4 wheel drive vehicle already equipped with two meters. The base station was manned by VE1DJ, VE1PM, with VE1AZR manning another base station. The NSARC was active in communication and rescue until 2 A.M. Nov. 27 when storm cleared, and police vehicles could again travel on roads.

D.O.C. NEWS

MOBILE POLICE DATA TERMINAL

A project aimed at extending the power of a national police computer to every patrol car officer in Canada is to be developed jointly by D.O.C. and the R.C.M.P..

It will give the patrolling constable his own, direct access to the computer through a mini keyboard and small teleprinter or TV screen mounted under his dashboard or on his car's transmission hump.

The unique, standardized mobile radio data communications terminal will eventually eliminate the time-consuming necessity of radio dispatchers acting as middlemen for inquiries directed to the computer by voice from police cars. D.O.C. and R.C.M.P. will co-operate in a two-year program to design, develop and produce a prototype of the modular system.

The projects entails an integration of the hundreds of local voice communications systems linking patrol vehicles with radio dispatchers and the nation-wide, computerized police information service (Canadian Police Information Centre - CPIC) operated from Ottawa since 1972 by the R.C.M.P.

The mobile terminal could also be incorporated into computer-aided dispatch systems (CAD). Such systems permit high speed digital signalling to replace routine voice messages between police cruisers and dispatchers, thereby dramatically reducing the load on scarce voice communications channels. CAD systems are now being considered by most urban police forces in Canada.

NEW DISTRICT OFFICE

The Department of Communications has opened a new district office in Windsor, Ontario

The office which began operations November 1, 1974, is responsible for the administration of radio regulations and provides service in radio station licensing, inspections and investigation of radio interference in Windsor, Chatham and the counties of Essex and Kent. The area was previously serviced by the District Office in London.

Mr. Stanley (Stan) Ribee, formerly with the Toronto District Office has been appointed District Manager, and he has a supporting staff of three Radio Inspectors.

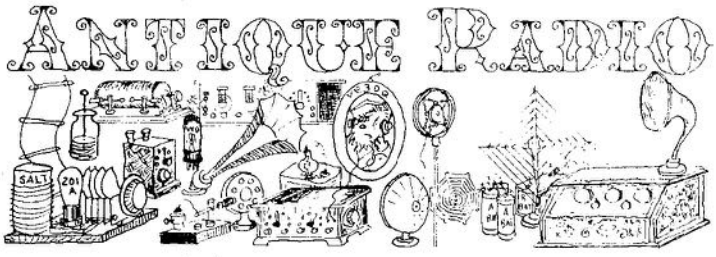
All licensing enquiries, interference problems, and related requests from the area should now be directed to the Windsor District Office, located on the 8th floor of the Trade and Commerce Building, 880 Ouellette Street, Windsor, Ontario. Telephone number: 254-4335, 254-4336

I.E.E.E. 25TH VEHICULAR TECHNOLOGY GROUP CONFERENCE

The 25th Vehicular Technology Group Conference will be held at the Royal York Hotel, Toronto, Ontario with registrations commencing at 6:00 PM, Monday 20 January. Technical sessions will be held from 9:00 AM to 5:00 PM on the Tuesday and Wednesday and Exhibit booths will be hosted by many firms active in the Vehicular Communications field.

Sessions include - Antennas, Propagation and Spectrum Management, The Future in Vehicular Communications, Mobile Radio System Engineering, and Vehicular Electronics and Equipment Design.

The Theme of the Conference is "The Future in Vehicular Communications", a fitting one for the **silver anniversary** of this event.



1AAW - The Bootlegged Call

VE3DQ

In 1912 Radio Amateurs were legislated out of the long waves of the radio spectrum and were assigned the unexplored, supposedly "useless", short waves below 200 meters. With characteristic inventiveness, the Amateurs redesigned their equipment to operate in the newly assigned bands and proved the frequencies to be much superior for long-distance communications than the ones they had been evicted from. Whereas on the old frequencies many Amateurs were hard put to work out of their own immediate areas, they found that the magic qualities of short waves permitted them to work great distances. But by 1921 one barrier remained unhurdled; no Amateur signal had been heard across the Atlantic.

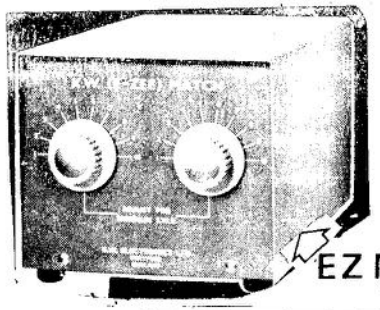
The first attempt to span the Atlantic was organized by Everyday Engineering Magazine, but ARRL took over the event due to the financial failure of the magazine. In the test, North American stations transmitted pre-arranged signals while British Amateurs listened. After the test, Wireless World in England studied thirty logs submitted by British listeners but, sadly, could not find any copy that matched messages transmitted from North America. The first test was a washout!

The Second Trans-Atlantic Test took place December 7th to 16th, 1921. The test was divided into two parts; a 200 meter free-for-all by U.S. districts for all Amateurs, plus a second part comprising a group of stations in each district assigned special wavelengths. These latter stations had qualified for the test by transmitting a thousand miles during qualifying runs; something akin to the Indianapolis 500 qualifying runs! Seventy-eight stations competed and twenty-seven made the grade.

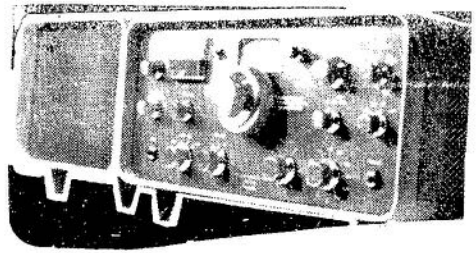
Paul C. Godley, the designer of the famous Paragon variometer, three-circuit tuners set up in Wembly Park, London, but found that European harmonics, the interference from British Amateurs, and the massive QRM from high-power commercial Poulson arcs made the Trans-Atlantic reception attempt utterly impossible at that location. Hence, he moved his receiving site to the storm-swept coast of Scotland; at Ardrosson, a fishing village on the West Coast. There he set up his receivers in a small tent and, instead of his intended vertical, strung a 1300 foot Beverage Wire favouring reception from North America, and which almost entirely eliminated the interference from European stations.

Listening intently on December 7th, the first night of the test, Godley heard, through the crashing atmospherics a 60 cycle synchronous spark that signed off with CUL, but he missed the call due to a burst of static. His heart leaped, for this was surely an Amateur signal. Nothing but static emanated from the phones for the next five minutes. Then

continued on page eleven



EZ Match



KW2000B

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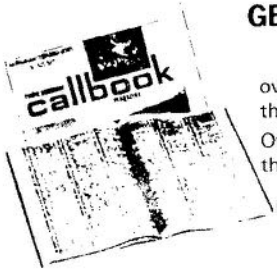

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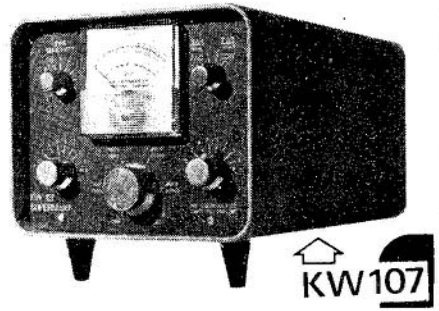

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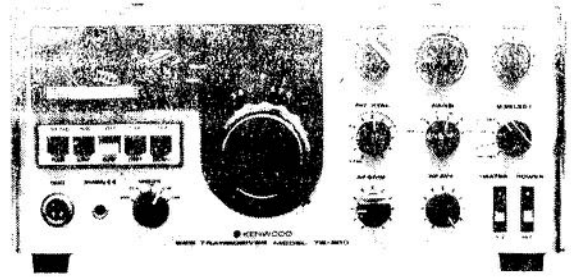

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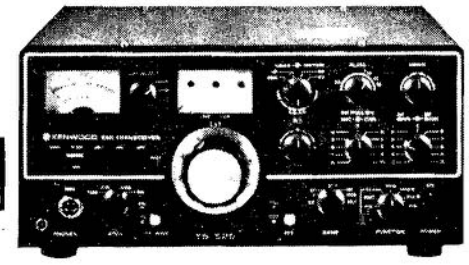

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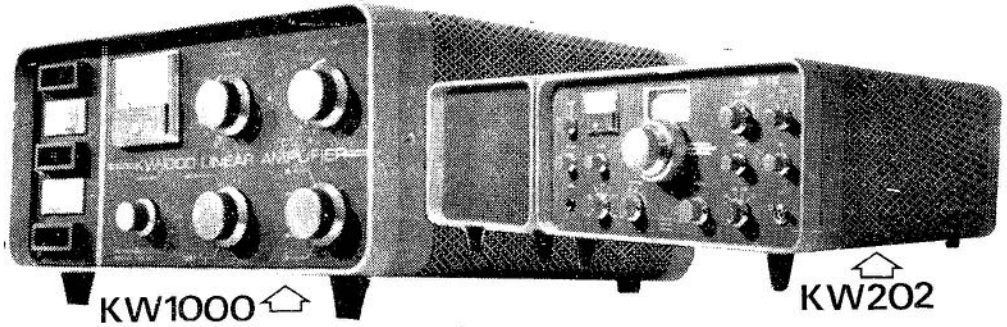

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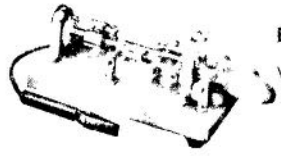

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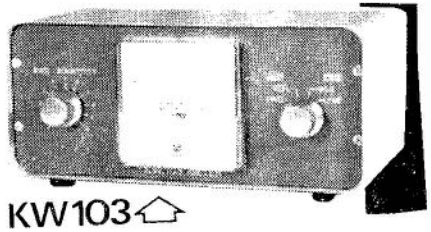

KW103

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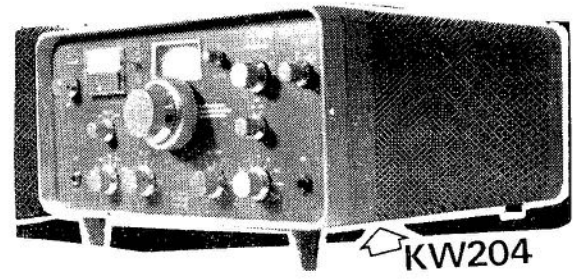


KW204

ITU Frequency Allocations

VE3ZS

When it comes to frequency use and allocation on a world-wide basis it must be borne in mind that ITU has divided the world into three regions. Very broadly speaking, Region 1 consists of Europe, northern Asia and Africa; Region 2 the Americas; and Region 3 consists generally of Australia and southern Asia (Iran, India, Malasia, Japan, Pakistan, etc.). Frequency allocations may (and usually do) vary from region to region; they can also vary from country to country within a region depending upon the decision of the administration concerned.

There are three categories of allocations - primary, permitted and secondary. Primary and permitted services have equal rights, except that in the preparation of frequency plans, the primary service shall have the prior choice of frequencies. Stations of a secondary service shall not cause harmful interference to stations of a primary or permitted service and cannot claim protection from harmful interference caused by stations of a primary or permitted service. They may, however, claim protection from harmful interference caused by stations of the same or other secondary service (s) which have been assigned frequencies at a later date.

The following is a brief run-down of the general use of Amateur frequencies by various countries applying the ITU Allocation Table. It has been developed from the ITU Radio Regulations currently in force.

160-m

The band 1800-2000 kHz is NOT allocated to the Amateur service in Region 1; however Austria, Denmark, Finland, Ireland, the Netherlands, F.R. of Germany, Rhodesia and Nyasaland, United Kingdom, Switzerland, Czechoslavakia and the Union of South Africa and the Territory of South West Africa may allocate up to 200 kHz to the Amateur service; the mean power may not exceed 10 watts.

In Regions 2 and 3 the band is shared with the Fixed, Mobile (except aeronautical mobile) and Radionavigation services on a primary basis. In Canada and the U.S. the band is shared with LORAN stations with frequency and power limitations being set for Amateur stations in various areas of the country.

80-m

In Region 1 Amateurs share the band 3500-3800 kHz on a primary basis with the Fixed and Mobile (except aeronautical mobile); between 3800 and 4000 kHz the frequencies are allocated to the Fixed, Aeronautical Mobile, Land Mobile and Broadcasting services, all on primary bases.

In Region 2 alone does the Allocation Table permit Amateur operation between 3500 and 4000 kHz, where it is shared with the Fixed and Mobile (except aeronautical mobile) on a primary basis. In Canada the band is allocated to the Amateur service exclusively.

In Region 3 the Amateur allocation is from 3500 to 3900 kHz shared with the Fixed and Mobile services on a primary basis. Frequencies between 3900 and 4000 kHz are shared by the Aeronautical Mobile, Broadcasting and Fixed services on a primary basis. In Australia the band is restricted to 3500-3700 kHz, while in India it is only 3890 to 3900 kHz.

40-m

In Regions 1 and 3 the band 7000-7100 kHz is allocated exclusively to the Amateur service. 7100-7300 kHz is allocated to Broadcasting exclusively. The Union of South Africa and the Territory of South West Africa has restricted Amateur service allocation to 7100-7150 kHz, but it may NOT be used for communications with Amateur stations outside Africa or Europe.

In Region 2 the band 7000-7300 kHz is exclusively allocated to the Amateur service.

20-m

The band 14000-14350 kHz is allocated exclusively to the Amateur service in all regions. The U.S.S.R. has, however, also allocated the band 14250-14350 kHz to the Fixed service.

15-m

The band 21000-21450 kHz is allocated exclusively to the Amateur service in all regions.

11-m

While the band 26100-27500 kHz is allocated in all regions to the Fixed and Mobile (except aeronautical mobile) services, Australia and New Zealand permit Amateur operation between 26960 and 27230 kHz. The previous Canadian allocation of 26960-27000 kHz has been withdrawn.

10-m

The band 29.0-29.7 MHz is allocated exclusively to the Amateur service in all regions.

6-m

In Region 1 the band 47-68 MHz is allocated exclusively to the Broadcasting service; however Rhodesia and Nyasaland, the Union of South Africa and the Territory of South West Africa have allocated the band 50-54 MHz to the Amateur service.

In Regions 2 and 3 the band 50-54 MHz is allocated exclusively to the Amateur service, except that Malaya, New Zealand and Singapore have allocated the band 50-51 MHz to the Fixed, Mobile and Broadcasting services. India, Indonesia, Iran and Pakistan have allocated the entire band to the Fixed and Mobile services. In Australia the band is allocated to the Fixed, Mobile and Broadcasting services except that 56-58 MHz is allocated to the Amateur service.

2-m

The band 144-146 MHz is allocated exclusively to the Amateur service in all regions.

In Region 1, 146-149.9 MHz is allocated to the Fixed and Mobile (except aeronautical mobile) services.

In Regions 2 and 3, the additional band 146-148 MHz is allocated exclusively to the Amateur service, except in China, India and Japan where it is allocated to the Fixed and Mobile services.

220-225 MHz

In Region 2 alone the band 220-225 MHz is allocated to the Amateur service where it is shared on a primary basis with the Radiolocation service. In Canada it is exclusively allocated to the Amateur service.

420-450 MHz

In Region 1 the band is restricted to 430-440 MHz which is shared on a primary basis with the Radiolocation service except in the United Kingdom where the full band is allocated on the same basis.

In Regions 2 and 3 the whole band is allocated to the Amateur service on a secondary basis to the Radiolocation service, except that the band 449.75-450.25 MHz may be used for Space telecommand and Space research. Indonesia has allocated the whole band to the Fixed and Mobile (except aeronautical mobile) bands on a secondary basis to the Radiolocation service; while in Australia the band is also allocated to the Fixed service pending re-assignment of existing frequency assignments.

1215-1300 MHz

This band is allocated in all regions to the Amateur service on a secondary basis to the Radiolocation service. In the F.R. of Germany the band is restricted to 1250-1300 MHz. In Belgium, France, Norway, the Netherlands, Portugal and Sweden it is allocated to the Fixed service. In China, India, Indonesia, Japan, Pakistan, the Portuguese Overseas Provinces in Region 1 south of the equator and in Switzerland the band is allocated to the Fixed and Mobile services exclusively.

In Canada, distance measuring equipment (DME) usually employed in aeronautical navigation may be used on a non-interference basis to other services.

3300-3500 MHz

This band is allocated in all regions to the Radiolocation service, but in Regions 2 and 3 is also allocated to the Amateur service on a secondary basis.

In China, India, Indonesia, Japan and Pakistan it is also allocated to the Fixed and Mobile services.

5650-5925 MHz

The band 5650-5850 MHz is allocated in all regions to the Amateur service on a secondary basis to the Radiolocation service.

In Region 1 it is shared with the Fixed-Satellite (earth-to-space) service.

In Region 2 the band extends from 5650-5925 MHz where it is shared on a secondary basis with the Radiolocation service.

10.0-10.5 GHz

This band is allocated in all regions to the Amateur service on a secondary basis to the Radiolocation service. The lower 25 GHz of the band may also be used by weather radar on meteorological satellites. In Japan and Sweden the band is also allocated to the Fixed and Mobile services. In the F.R. of Germany and Switzerland the band is split - 10.0-10.25 GHz to the Fixed and Mobile services and 10.25-10.5 GHz to the Amateur service.

In Canada the band 10.1-10.45 GHz may also be used for DME on a non-interference basis.

21-22 GHz

This band, previously allocated to the Amateur service, has been moved, to make way for Earth Exploration Satellite (space-to-earth), Fixed and Mobile services, to 24.0-24.25 GHz.

24.0-24.25 GHz

In all regions the band 24.0-24.25 GHz has been allocated to the Amateur and Amateur-Satellite services. In Albania, Bulgaria, Hungary, Poland, Romania, Czechoslovakia and the U.S.S.R. the band is allocated to the Fixed and Mobile services. The frequency 24.125 GHz is designated for industrial, scientific and medical (ISM) purposes with the provision that emissions must be confined within the limits of plus or minus 125 MHz of the frequency.

There are at present no Amateur allocations above 24.25 GHz, however the bands 48-50, 71-84, 200-220, 240-250 and above 275 GHz have not been allocated. It is understood that Japan will, at the next ITU Conference, advocate the allocation of frequencies above 275 GHz.

From the above it will be seen that the only true world-wide exclusive Amateur allocations are:

7000-7100 kHz,
14000-14250 kHz,
21000-21450 kHz,
29.0-29.7 MHz,
144-146 MHz.

Exclusive allocations in Canada are:

3500-4000 kHz,
7000-7300 kHz,
14000-14350 kHz,
21000-21450 kHz,
28-29.7 MHz,
50-54 MHz,
144-148 MHz,
220-225 MHz,
24-24.25 GHz.

Bootlegged Call

continued from page eight

at 1.42 the spark signal came through again, this time at double strength. The operator on the sending-iron called an eighth district station and signed 1AAW clearly. Godley shouted with joy! A North American Amateur signal had winged 3000 miles through the Atlantic night to become the first to span the Atlantic! But to qualify, the call had to be heard by both Godley and the English observer, Pearson, also in the tent. Busied making coffee, Pearson had not heard the full call; only "AW". Godley manipulated the dials, straining to hear again the elusive spark. The static eased a little and the deep drone of the spark came through faintly. Would he send his call sign again and confirm the copy for Pearson? They listened intently but the faint murmur receded gradually beneath the roaring sea of static, never to be heard again.

Godley heard no other signal until the third night when at 12.50 am the CW signal of 1BCG of Greenwich, Conn. came through. This was a station built especially for the test by Edwin H. Armstrong and a group of Amateurs of the Radio Club of America. It featured a M.O.P.A. transmitter using a UV-204A escillator driving three UV-204A's in parallel, spread out on a huge bench top, powered by a motor-generator supplying 2000 volts to the plates for 990 W input. Thereafter signals began coming through frequently. Godley heard a total of 27 North American transmitters including 8 spark rigs. The only Canadian copied was the spark of 3BP of Newmarket, Ontario.

Ironically, when ARRL tracked down the legal 1AAW, they found that his station had not been operational for six months. It was then that the truth dawned; the spark station operator signing 1AAW bootlegged the call! Amateurs in the Boston area confirmed that the call 1AAW was used on the night of December 7th, 1921. We will never know who's hand fashioned the morse heard spanning the Atlantic on that memorable night!

Transceiver Audio Filter

FRANK MERRITT, VE7AFJ

Most facets of Amateur Radio operation are changing along with the world around us. One problem that has been with the cw operator for a long time is that of using headphones. Prior to World War II, headphones such as the Brandes and Cannonball dominated the field. To be conservative, they were miserable to use. The continuous side pressure on the ears quickly made operating a painful experience. With the Second World War a new generation of headphones came into being. The significant improvement was the foam rubber or solid rubber ear protector. The larger foam rubber protector headphones were almost comfortable to use. The Korean War resulted in the development of a new generation of headphones that featured ear protectors that kept most of the pressure off the ears. This was a great improvement. Of recent years the supply of these headphones has virtually dried up.

The great interest in stereo audio operation by "hi-fi" types has created a market for a comfortable headphone unit with wide frequency response. Today these headphones are available just about anywhere for a modest price. The ear protectors of these headphones commonly rest on the area around the ears with **NO** pressure on the ears themselves. This new light design makes them comfortable to use for protracted periods of time. As with most things, there is a problem. In this case the problem is the wide frequency response of the headphones.

The audio spectrum that is of use in communications is between the arbitrary figures of 300 and 3 kHz. These numbers are subject to some interpretation by various authorities and specific requirements. For at least 50 years various technica' journals have presented papers dealing with audio bandwidth subjects. In most general terms, the consensus of opinion is that a restriction of audio bandwidth to about 2.7 kHz centered between 300 Hz and 3 kHz results in a minimum reduction of intelligibility and an optomization of coherent intelligence in the presence of noise. Obviously this is in direct contradiction to what the stereo headphones provide with a bandwidth of something like 20 Hz to 10 or 15 kHz.

It is of significance to survey the requirements in Amateur Radio for headphone operation. As it turns out, most operators use headphones for cw operation mainly. This makes discrete changes in our thinking regarding the adaption of stereo headphones for Amateur Radio operation. Since the minimum bandwidth requirement for a cw signal is rarely for more than 100 Hz, it is of little value to listen to ALL other signals within the normal communications bandwidth of 2.7 kHz. This logic begins to frame a basic requirement for not only a restriction in bandwidth to 2.7 kHz but to further restrict the bandwidth to permit the passage of only one cw signal. A limit of cw bandwidth might be 80 Hz at -6 dB and 400 Hz at -60 dB.

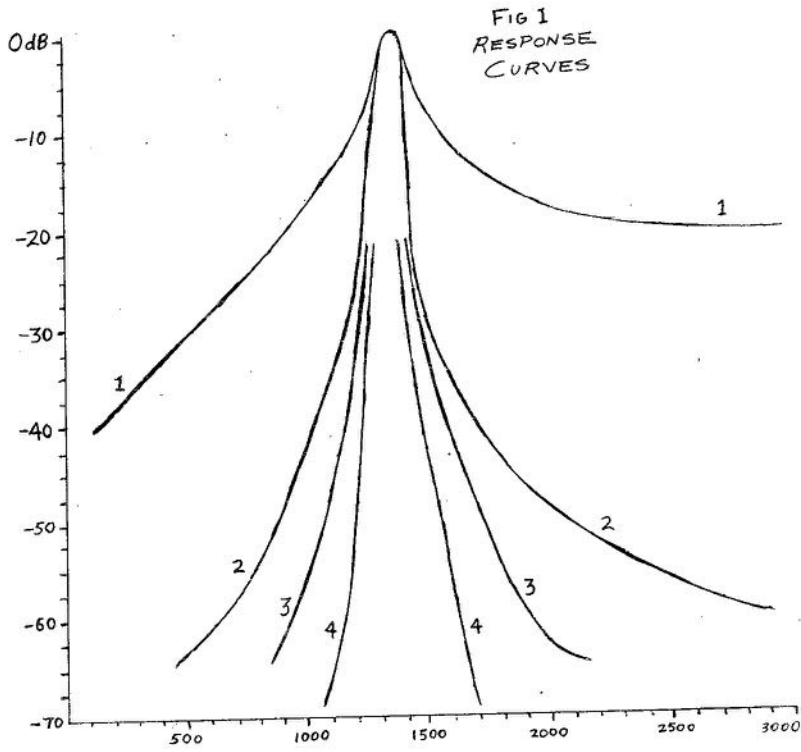
IF filters have been developed that satisfy this general cw bandwidth requirement. Unfortunately they are very expensive and hard to acquire and very often do not easily interface with the equipment in use. An audio filter that would satisfy this type of requirement could be used externally to the receiver with no modification required that often affects the resale value of the equipment.

In practice, during quiet band conditions there is no real requirement for extreme bandwidth restriction. This would indicate that some form of a minimal filter would be satisfactory. This minimal filter would provide adequate rejection of all frequencies out of the communications passband with some reasonable peaking at a selected frequency. The selected frequency is subject to considerable discussion.

Over the years the writer has heard that frequency values of 750 or 800 Hz are optimum for cw reception for the average ear. It is the preference of the writer to have a center peaking frequency of something around 1.2 kHz. This selection was simplified to coincide with the sidetone frequency of the transceiver in use at the station of the writer. This sidetone frequency is 1.35 kHz. Accordingly, this frequency was selected as the peaking frequency of the minimal filter.

Over a period of time considerable research was made into an easy and cheap method of achieving the desired Q at low audio frequencies (such as 1.35 kHz). Today toroid inductors are available at 44 and 88 mHz that are very commonly used by RTTY operators. The nature of the minimal filter begins to become defined when it is considered that virtually all modern receivers have a low-impedance audio output. Also, it will be remembered that the terminal impedance of the stereo headphones is 8 ohms characteristically. This would indicate a filter with a low-impedance input port and a low-impedance output port.

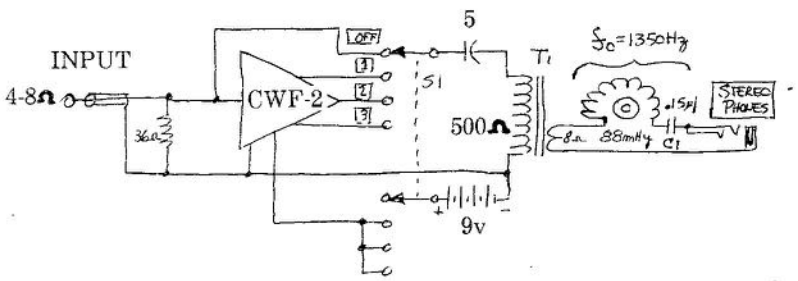
Parallel tuned filters were experimented with usually resulting in excessive coupling between the input and output windings on the toroid. This effect was minimized by using two 44 mHz toroids in series with the input winding on one toroid and the output winding on the second toroid. Filters with skirts extending beyond 20 dB were very difficult to realize with parallel-mode tuned circuits. The answer was found in the series-tuned filter.



The series-tuned circuit works best when both the input and output terminations are low impedance. With this type of tuned circuit, curves such as illustrated in Fig. 1, Curve 1 are typical. The curve illustrated is adequate to perform the function of the minimal filter.

One of the more sophisticated approaches to audio selectivity is represented by operational amplifier inductance-less filters. In its most simple form the operational amplifier can be thought of as a very high gain amplifier that can be connected to perform a number of functions in addition to straight amplification. In our usage the operational amplifier circuit is designed to pass a single frequency. It is obvious that by cascading tuned operational amplifier filters the shape factor may be improved. The shape factor is the ratio of the -6 dB width of the filter or stage to the -60 dB width of the filter or stage. Experience indicates that tuned operational amplifier filters are not easy for the average Amateur to create or reproduce with little or minimum test equipment. Quite fortunately, a product is on the market that solves the problem completely. MFJ Enterprises markets an operational amplifier filter that is available either in kit or completed form that provides the required selectivity at a reasonalbe cost. As constructed from a kit or purchased complete the MFJ, CWF-2 filter is tuned to 750 Hz. The active filter is very easily "retuned" by replacing the 24 K resistors (four of them) with resistors of 7.2 K value. Since 7.2 K is not a conventional RMA value, the resistance can be created by paralleling an 8.2 K resistor with a 62 K resistor. Experimentation indicates that the stages are very symmetrical and the change of the resistors completes the "retuning". In the event that the builder desires to use the filter at 750 Hz, no change in the active filter is required.

FIGURE 2
SCHEMATIC DIAGRAM



Notes:
1 C1 tailored for 1350 Hz
2 CWF-2 Modified f_o from 750 Hz to 1350Hz by changing 24 K resistors to 7.2 K (8.2 K shunted with 62 K)
3 Switch S1 Centralab PA-2003 or equiv.
4 Transformer T1 Hammond 144-G or equiv.
5 Passive filter 88 mHz Toroid, M. Weinschenker, (5/$2.50)
6 CWF-2 Filter, MFJ Enterprises ($12.95 kit or $14.95)
7 Mounted in 4x4x2" aluminum chassis, Hammond 1444-6 or equiv.

It would immediately seem that the construction problem is only that of installing the small 2" x 3" Printed Wiring Board (PWB). A bit of experience sophisticates the design a bit. The manufacturer recommends the use of two switches. One switch is a power switch and the other switch is to select the desired selectivity. As the result of experimentation the writer determined that it was considerably better to use a single switch with both functions included. In the active filter "off" position the passive filtering was desired so the series-tuned filter was used tuned to 1.35 kHz. It is interesting to note that active filters characteristically generate wide-band noise at their output. This noise into high-fidelity headphones is very annoying. The inclusion of the passive filter AFTER the active filter eliminates the problem completely. The arrangement of the passive filter is such that the input and output impedances are low and not critical. Figure 2 is a schematic of the finalized design of the filter unit.

Power is provided by a 9-volt battery. At 9 volts the active filter draws 3 to 4 ma so battery life is not a problem as long as the active filter is off when not in use. The writer has found it convenient to build the entire unit (including battery) in a 4 x 4 inch aluminum chassis.

It should be noted that in Figure 1 curve 1 is the passive filter in the unit OFF position. Positions 1, 2 and 3 of the unit are represented by curves 2, 3 and 4. The extreme position of selectivity (switch position 3) exhibits an ultimate width of about 600 Hz at -70 dB.

The ultimate evaluation of any device involving the ear is very subjective. In use in all operating conditions the writer has at long last found a filter unit for use with hi-fi headphones that is completely pleasing. This is interesting especially when the relatively low cost is recognized. Happy cw.

AUTHORITY TO OPERATE IN THE USA

The national Federation has copies of the FCC Form 410. This form, properly filled out and stamped, is necessary for Canadian Amateurs to operate their equipment while in the United States. Send a self-addressed, stamped envelope (marked U.S. FORM) to CARF, Box 356, Kingston, Ont. K7L 4W2.

BANNED COUNTRIES

NOTE: There are two "Yemens". The People's Democratic Republic of Yemen, which has call letters 70A to 70Z bans Amateur communications. The Arab Republic of Yemen Amateur Stations using 4W1, 4W2 or 4W3 may be worked by Canadians.

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

* - Stations XV5AA, XV5AB, and XV5AC have been authorized to exchange communications with Amateurs of other countries.

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

THIRD PARTY TRAFFIC AGREEMENTS

Bolivia, Chile, Costa Rica, Dominican Republic, Guyana, Honduras, El Salvador, Israel, Nicaragua, Peru, Trinidad, Tobago, U.S.A. (Territories and Possessions) and Venezuela.

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Belgium, Brazil, Dominica, Dominican Republic, France, Ecuador, Federal Republic of Germany, Guatemala, Israel, Peru, Luxembourg, Mexico, Netherlands, Norway, Nicaragua, Poland, Portugal, Republic of Panama, Senegal, Sweden, Switzerland, U.S.A., Uruguay, Venezuela and Denmark.

Note: All Commonwealth countries are eligible for reciprocal Amateur operating privileges unless evidence that a country does not grant reciprocal operating privileges to Canadian Amateurs.

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