current

GOODBYE TO DELETION

It appears that we can say "good riddance" to the CRTC's controversial policy of deleting commercials from U.S. programs carried by Canadian cable television systems.

Commercial deletion, first proposed by the CRTC in July 1971, was intended to repatriate the $20 million a year in Canadian advertising spent on U.S. border stations. Although it came into effect only in Toronto, Calgary and Edmonton, deletion was made a condition of licence for many other cable systems, who were told to work with local TV stations to prepare plans for the required deletion facilities.

Last October, however, the word came to hold off: and now the government and the CRTC are examining the results of Section 19.1 of the Income Tax Act, which last fall disallowed advertising on U.S. stations as a deductible business expense.

The effects have already been apparent to any viewer: a drastic decrease in Canadian-placed ads on the border stations.

The CRTC—and others—had been recommending this tax change for years. All the expense and controversy over the deletion issue could have been avoided, if the government had acted much sooner.

CRTC: "NOT BOUND BY DOC DEAL"

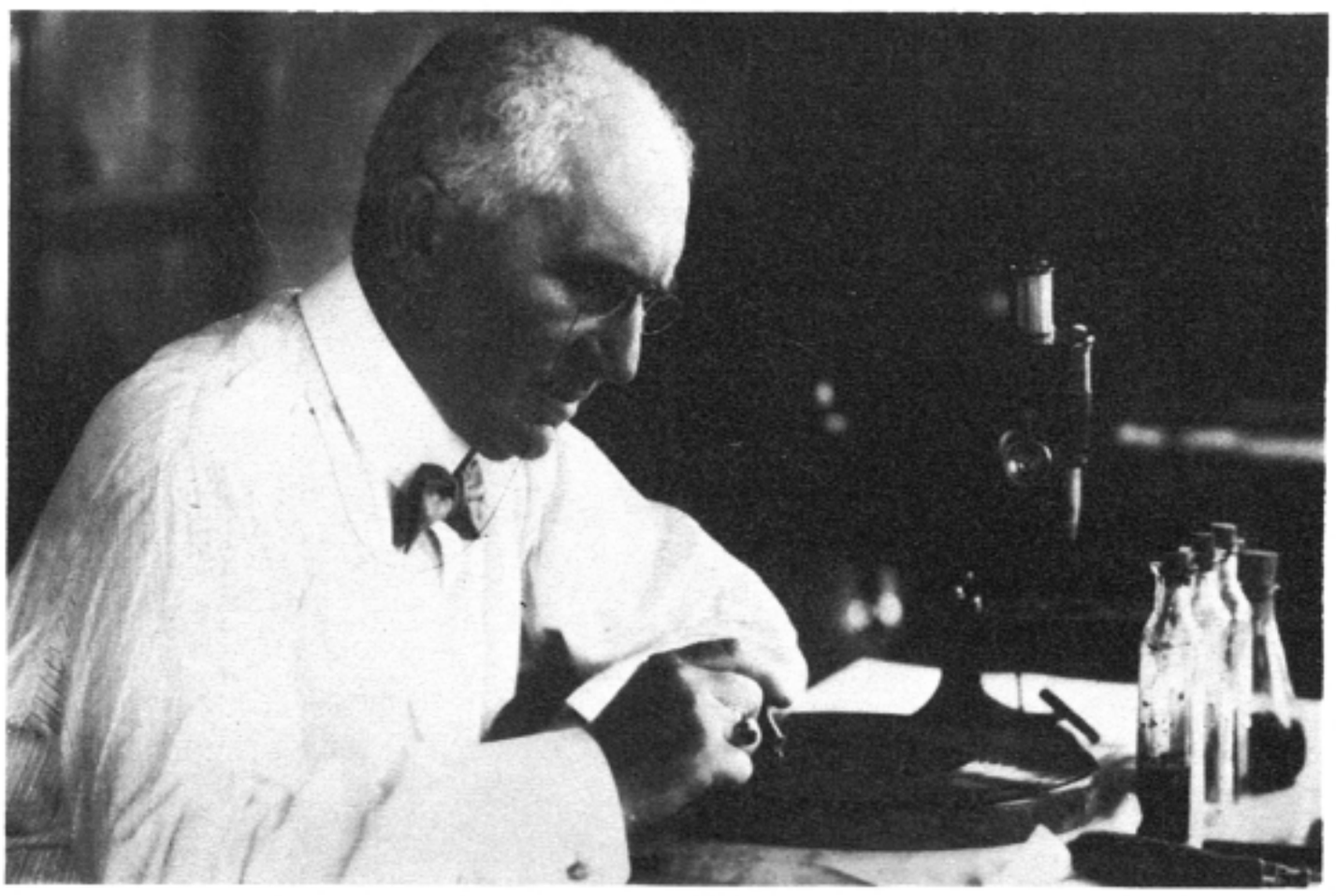
As noted here in our Jan/Feb issue, an agreement signed last November between the Department of Communications and the Government of Manitoba would discard—in that province—the CRTC policy which requires cable operators to own certain hardware, including amplifiers and drops. Instead, these would be owned by the provincial Manitoba Telephone System.

In a statement issued December 30, the CRTC noted that it was not a party to the agreement and is not legally bound by it. It called for comments (deadline March 31) as to how cable systems can retain control over their operations if the agreement goes into effect. Ten potential problem areas were listed, for starters, and the matter will be aired at a Winnipeg public hearing on June 7.

Quite properly, the CRTC has placed the onus on Mme Sauvé to justify her political interference. The independence of the Commission is essential for fair regulation of the industry, and ultimately for the freedom of the broadcast media.

Doug Lowery

MICROPHONE INVENTED 100 YEARS AGO



It was in April, 1877, that the microphone was invented by Emile Berliner. Berliner, a penniless immigrant from Germany, was 25 years old at the time. His invention, acquired by the Bell System, then a small company struggling for survival against powerful Western Union, made the telephone a practical reality. The loose-contact principle he introduced is still in use throughout communications today. Berliner went on to develop the disc record and player, mass-production of discs from a single master, and the famous "His Master's Voice" trade mark.

BROADCAST SATELLITES—Part 2

CRTC's Zeitoun, CBC's Siocos: The Technology is Advancing Rapidly

Introduction

The Canadian Association of Broadcasters is urging the industry to plan now for its future satellite requirements.

Broadcast satellites offer great potential for the distribution of both television and audio programming, not only to community receivers but even to individual homes.

But the broadcasting industry could lose this "option on the future" unless sufficient bandwidth in the spectrum and orbit positions in space are reserved for broadcast purposes.

The following article reports on a special briefing held in Toronto to alert broadcasters to the situation.

Part 1, in the January/February issue of BROADCAST EQUIPMENT TODAY, page 8, summarized the remarks of A. G. (Sandy) Day, engineering consultant for the CAB. Day warned that broadcasters could find themselves totally dependent on the common carriers or the government for future satellite transmission—unless they become involved in satellite planning now. So far, broadcasters have had little input into the important decisions to be taken in 1979 by the World Administrative Radio Conference (WARC)—a conference which will determine spectrum uses for the next 20 to 25 years.

Part 2, which follows, is based largely on the remarks of Ralph Zeitoun, formerly with the Department of Communications and now with the Planning and Development Branch of the Canadian Radio-television and Telecommunications Commission, and Dr. C. A. (Chris) Siocos, chief consultant engineer for the Canadian Broadcasting Corporation.

Readers may find it useful to refer to the charts showing frequencies allotted to fixed and broadcast satellites on page 8 of our January/February issue, and also to the article on the CTS satellite which appeared in our March/April 1976 issue, page 30.

WHY USE SATELLITES?

One of the concerns of the CRTC is that all Canadians receive broadcasting services. Ralph Zeitoun observes that although a very high percentage of the population is being reached, only one-third of Canada's area is being covered. "Satellites can make it virtually 100%—instant, total coverage".

The greatest problem in extending coverage to remote areas by conventional means is cost: satellites make possible total coverage, all at one price.

A single broadcasting satellite would be able to serve half of Canada, using three or four individual beams covering provincial or time zone regions. A rough estimate of the total cost is $60 million, including launch. It would be capable of feeding about four separate TV programs plus a number of high-quality sound programs, and each beam could contain optionally the same or differing programs. But Zeitoun points out that this is not excessive when compared to conventional means: for example, the CBC's Accelerated Coverage Plan is costing $50 million to cover 250,000 people. And satellite broadcasting is the *only* way to cover the last four percent or so of Canada's population—too scattered to be reached by terrestrial facilities.

Zeitoun outlines three types of satellites:

1. Low Power

Satellites of low power—the Anik series now in use is an example—require large earth receiving stations. Equipment for these receivers costs $25-80,000 and can be obtained only through Telesat at an annual rental of $15-40,000. Other operating expenses double the cost. The CBC has about 50 of these earth stations in operation.

2. Medium Power

While no system is presently in operation, the technology is available to make possible reception from medium power satellites using antenna dishes of 2-4 metres in diameter, costing $5-15,000. These would be well-suited for relaying programming via cable TV systems or broadcast transmitters, or for reception in larger buildings such as schools, auditoriums or apartment buildings. A pilot project in Japan will be operational this year or next, using a fairly powerful satellite of the medium class.

3. High Power

These Direct-to-Home Broadcast Satellites (DBS), having forty times the power of Anik, will make possible reception by antennas of less than one metre in diameter. Augmented home receivers, costing between $200-1,000 will convert the signals from 12 GHz to VHF, UHF or FM frequencies—and would also be suitable for reception by cable TV systems. The technology for these "transmitters in the sky" is now available but is undergoing refinement and will likely be in widespread use in the 1980's.

An Antenna in Every Attic?

Pilot projects for the production of compact, small-dish receivers have been undertaken by RCA and the Department of Communications in Canada, by Philips interests in Europe, and by a consortium of six Japanese manufacturers.

The CBC is currently experimenting with dishes of one and two metres in diameter and with one Japanese receiver having a dish only 2 feet in diameter and costing less than $400. A feature of some of these antennas is the elimination of wave guides by having the receiver input stage at the focal point of the dish.

Reception Problems Are Few

One aspect under study is the effect of fog, rain and snow.

Intense rain can cause noise, and while snow apparently does not cause degradation, a build-up of snow in the dish does. This can be overcome by adding a heating element—even a light bulb could be sufficient—for outdoor antennas. The few technical problems that have arisen appear to be easily solved.

SATELLITE DEVELOPMENT

Canada a Pioneer

The CBC's Dr. Chris Siocos recalls that Canada was the first nation in the world to use satellites for domestic communications. Prior to satellites, we were limited to microwave—reaching only to the horizon; shortwave—its signals reflected by the ionosphere and subject to fading and interference; or land lines.

The first Anik (1972) and its two successors were launched by NASA, but designed and largely built in Canada. In orbit over the equator, they travel at the same speed as the earth's rotation. Their power is low to avoid interference with terrestrial services using the same band so receiving antenna dishes as large as 30 feet in diameter are required.

The CBC accounts for almost half of Anik's present use, feeding some 50 earth stations connected to CBC transmitters.

The United States has three systems similar to Anik, and PBS, the Public Broadcasting System, plans 150 earth stations. Its programs will be receivable in many parts of Canada. Other satellite uses developing in the U.S. transmit programming for cable TV and pay TV.

The technology for communications satellites is advancing rapidly: circuit channel capacity is now 12,500; the weight of satellites has grown from 68 kilograms to 1,869 kg, and radiated power per RF channel is also greatly increased.

The CTS Experiment

Dr. Siocos describes the Communications Technology Satellite (CTS), launched early last year, as essentially a technological experiment which demonstrates the potential of broadcast satellites.

With the Canadian-U.S. agreement to use the 12 GHz band only for space purposes, broadcast satellites having up to 100 times the power and with direct-to-home capability are now feasible. CTS, a Canadian experiment in cooperation with the U.S., is the forerunner of this new technology. Fed by power cells which always face the sun, its power output is near 60 dBW or 1,000 kilowatts, made possible by NASA's 200 watt travelling wave tube amplifier, and this high gain brings CTS close to the power required for home reception.

CTS's two antennas may be directed to any of eight regions in Canada from a control centre in Ottawa. Videotapes of reception using a 5-foot dish show excellent color and definition, and current tests by the CBC are using antenna dishes of only 0.6, one and two metres in diameter.

Places in Space

The positioning of satellites in space is another vital factor in providing broadcast services to Canada.

To cover the entire country, with its vast area and seven time zones, two satellites are needed. These would be placed 10-15 degrees west of the area to be served, so that they will continue to derive power from the sun long after the area served is in darkness. Battery power is required for operation after the satellite itself is in the earth's shadow and powerful broadcast satellites cannot afford battery weight sufficient to continue operation during these eclipse periods. These occur spring and fall for about one hour maximum periods.

Ideally, satellites would be placed over the equator at 95 degrees west longitude to cover eastern Canada, and 145 degrees west to cover western Canada.

Other services and nations will be competing for satellite positions. For example, the common carriers would like to use earth receivers as close together as at each telephone exchange to supplement long distance trunk lines. They now use the fixed, low-power Anik satellites positioned at 104, 109 and 113 degrees west, operating in the 4 and 6 GHz bands. They would like to have additional fixed satellites in the 12 GHz band, which would not leave room for broadcast satellites to cover eastern Canada.

Aggravating the situation is the fact that satellites require "elbow room" in their orbit positions. High power broadcast satellites, with beams serving adjacent areas, require 14 degrees orbit separation; medium power satellites for community reception require 9 degrees separation; while the low power fixed satellites used by the common carriers require only 4 degrees separation.

Private broadcasters, warns Sandy Day, must show definite interest to strengthen the case for broadcast satellites, even though they are not yet able to submit specific applications.

Chris Siocos agrees; Canada needs multiple program capacity to provide English and French, CBC and private broadcasting services via satellite. For example, if TVA or Global were to be distributed coast-to-coast, terrestrial facilities would take years to build. With satellites, it can be done overnight—at half the cost.

"We have a new tool: it is up to us, as broadcasters, with government planners, to see if and how it can be used".

AM STEREO

by Ray Carnovale

Comm, Kahn, Motorola, Sansui—scratch RCA—are vying to hasten the dubious future of AM Stereo broadcasting . . .

The spectacular success of FM in the United States has many AM stations worried.

With stereo standard on FM—and quadraphonic broadcasting waiting in the wings to add new dimensions—fidelity-conscious listeners are increasingly tuning to FM, rejecting AM with its interference and fading problems.

AM needs a gimmick—and AM stereo may be just the thing.

At the fall convention of the National Radio Broadcasters Association, Harold Kassens, chairman of the National AM Stereophonic Radio Committee, moderated a panel discussion on the state of stereo for AM.

In the fall of 1975, the committee approached the U.S. Federal Communications Commission, and was encouraged to evaluate information on AM stereo—without making recommendations—to assist the FCC in coming to a decision.

The committee has established four panels:

1. Systems specifications: defines systems as proposed by their proponents and directs the activities of the other panels.

2. Transmitting systems: studies every system proposed from microphone input to antenna output; decides the problems of meshing the transmitting generator into a standard AM transmitter, getting the program from the studio to the transmitter.

3. Receiving systems: methods of modifying existing and additional necessary equipment, the means used to demodulate the received signal, standardized receivers for comparison purposes—i.e., from receiving antenna to speaker output.

4. Field test: will field test each system and submit results to FCC.

All panels are involved in setting up field tests, the selection of transmitting and receiving sites, and items to be tested.

The committee hopes to complete its work by spring. The FCC will then take the results, issue notice of proposed rulemaking, get comments in and study them.

At the time of the NRBA panel discussion, five systems had been proposed to the committee—by Comm Associates Inc., Motorola, Inc., RCA and Sansui Electronics (two systems).

Comm Associates

William A. Hayes, president, described his company's "FAM" system.

"We have two systems to broadcast music and voice—AM and FM. We also have single sideband suppressed carrier, but it is unsuitable for music. We are proposing a new method for stereo broadcasting using a compatible single sideband suppressed carrier system having broadcast quality. This is called Frequency Aperture Modulation (FAM).

"The present sideband receiver now in use obtains its signal by phase-cancelling of the carrier; that is, to re-inject at the receiver end. The phase of this re-injected carrier has to be exactly that of the transmitted signal and it has to be highly stable for good voice intelligence. With FAM, reception at the receiver does not require re-injection as the carrier is keyed by the audio, all harmonics included.

"In our present single sideband suppressed carrier, all the harmonics are cancelled out, making it unsuitable for quality music broadcast.

"We propose that two of these FAM signals be placed back to back, one for each stereo channel. Each channel is 9 kHz wide, requiring a total bandwidth of approximately 18 kHz of the broadcast spectrum.

"The receiver would have two separate IF and audio channels for stereo reception. To generate an FAM signal for each channel, we first amplitude modulate an inaudible subcarrier of 50 kHz with audio that ranges from 50 Hz to 9,000 Hz. This signal then passes into a reactive modulated amplifier and combines with a higher frequency of 500 kHz, derived from a crystal oscillator.

"The result is a carrier and two sidebands 500, 450 and 550 kHz. The lower sideband frequency, 450 kHz, is then passed through a filter and carrier, and upper sideband frequencies are eliminated. The 450 kHz signal is then multiplied to a much higher frequency.

"The reason for this is to get a greater frequency deviation that is required. We now have a very high frequency signal that is frequency modulated with 50 kHz in audio. This signal can now be heterodyned with another carrier, the difference being a frequency that falls in the AM broadcast band.

"The resultant signal is then amplified and passed into a filter that is 9 kHz wide. The filter, being only 9 kHz wide, filters out the 50 kHz subcarrier and only permits RF components with audio to pass. With no audio modulation, of the 50 kHz, there is no energy getting through, therefore no carrier. Please note that the frequency of the heterodyne signal places one side of the sidebands of the subcarrier such that it falls in band pass of the 9 kHz filter.

"The 50 kHz is also frequency modulated and the centre should not fall into the filter passband as some distortion will result.

"This is the same as tuning an AM receiver to an FM signal. Note also, the 9 kHz filter determines the frequency transmitted.

"The advantages of transmitting a FAM signal are the same as those for our present single sideband suppressed carrier. Many commercial communication companies and radio amateurs are using single sideband suppressed carrier. The efficiency is very high and energy is saved as the amount of power required is far less.

"The space required in the radio spectrum is one-half that of AM and FM systems. Due to the filtering, the chances of spurious radiation are reduced and interference of stations is at a minimum, as the carrier is not transmitted. Distortion that occurs in AM and FM due to phase cancellation of signal caused by two different transmission paths is mostly eliminated.

"Reception of the FAM signal is compatible and can be received on the conventional AM receivers now in use.

"If one wants stereo immediatley, two separate receivers can be tuned, one to the upper, one to the lower frequency. One receiver will act as Channel One, the other as Channel Two. Most of the circuitry used in conventional receivers is applicable and greater improvement is possible with a new design having two IF strips and two audio strips, one for each channel. Due to narrow bandwidth, reception noise figures improve.

"Overseas broadcasting of stereo on the higher frequencies is possible. Another advantage is that, with no carrier transmitted, there is a great reduction of birdies caused by heterodyning within the receiver itself.

"Tonality of FAM is excellent, as all the audio harmonics are transmitted. This feature is not possible with our present sideband system."

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AM STEREO

RCA

Randy McCallister, RCA's spokesman, began by quipping that there is another system on the horizon—"something to do with a revolving disc" . . .

He recalled that the original intention of the National Stereophonic Radio Committee in 1958-59 was to include AM and TV, but that work in these areas dropped behind with the emphasis on FM stereo, which was approved in 1961.

Stereo, he said, is needed to add realism and quality to AM, which has been suffering from poor quality.

Criteria for an AM stereo system must include stereo performance, very low harmonic distortion, favorable signal-to-noise ratio, compatibility with existing AM receivers, and out-of-band radiation must be controlled. Transmitter design is also very important: not all transmitters may be suitable for stereo which will require a transmitter with a good response, a wide audio frequency response.

Some of the systems being presented use an angular modulation component on the L-R channel, which means the carrier is shifting frequency. Some AM systems are going to work better in AM stereo than others and the system which will be approved will be the one which requires fewest changes in existing receivers.

Separation on RCA's AM-FM system is in the order of 25-30 dB. The highest modulating frequency allowed to maintain bandwidth is between 8-10 kHz. Spectrum analysis indicates that most of the energy is contained within the ±10 kHz bandwidth.

The most frequent question about the RCA system is: what will the adapter cost? Between $4-5,000. Probably the studio investment will be larger than the transmitter investment.

RCA's system uses two (L and R) audio channels feeding into an audio matrix. "We developed an L plus R and L minus R component, with L−R modulating a phase-lock loop directly on carrier frequency. This could also have been done with phase modulation L + R takes this deviating carrier and modulates it in amplitude fashion."

The receiver side of things requires a basic diode demodulator for L + R. L − R is an FM discriminator. The primary problem with an FM-AM approach is being able to pull the signal of the L − R out of the noise. There's very low deviation of the carrier, therefore it's very tricky to pull out a good signal-to-noise ratio.

The question is, how much to deviate the carrier? Increasing the deviation produces several desirable effects: it improves s/n ratio, reduces AM to FM crosstalk, reduces incidental phase modulation, and it simplifies the stereo receiver since less gain will be required.

But increasing the deviation also produces undesirable effects: it increases the distortion in the sum and difference in the modulation components, increases FM to AM crosstalk, and decreases compatibility on narrow band receivers.

RCA's compromise is approximately a 1.2 kHz deviation at 5 kHz audio input.

McCallister concluded by predicting that AM stereo would be much more than a "gimmick": it would improve the quality of the medium and make more use of AM channels. Television audio also needs to be improved, he added, and "after AM stereo, television stereo is next".

Editor's note: RCA announced in November that it was withdrawing its system, but would continue to support the concept of AM stereo.

Motorola

Norman W. Parker, staff scientist with Motorola, Inc. of Chicago, discussed his company's C-QUAM (Compatible Quadrature Modulation System), conceding that it is probably the least known system.

AM stereo fits very well into Motorola's efforts to promote FM stereo in cars, Parker said, stressing that the system adopted must be completely compatible with existing AM broadcasting.

General Description

Because of the severe restriction on bandwidth for each broadcast channel, a practical stereo system in the AM band cannot afford the luxury of transmitting a second signal on a separate carrier or subcarrier, and the system accepted by the FCC will be required to transmit both signals on the same carrier.

One of the most convenient ways of transmitting two signals on one carrier is to separately modulate two carriers at the same frequency but chosen to be in phase quadrature with each other. (This method is probably best known as the method by which the two separate color signals are separately transmitted on a single subcarrier for color television.)

The method of transmitting two separate signals (left audio and right audio) can be accomplished by splitting the phase of the existing broadcast carrier into two separate components displaced angularly by 90 degrees and separately modulating each component with one of the audio signals.

This method of transmitting and receiving stereo signals provides a relatively simple modification of existing transmitters, and stereo receivers which derive the left and right audio signals by simple product detectors, one for each channel.

The simplicity and elegance of this system are marred by the fact that when the left and right audio signals have significantly differing signal content, distortion can occur in monophonic receivers using signal current rectifiers or envelope detection to derive the monophonic signal.

The Motorola proposal is a method of slightly modifying the radiated quadrature signal so that the distortion which normally appears in the monophonic receiver is transferred from the monophonic receiver to the stereo receiver. There it is corrected to restore the original quadrature signal and decoded by a pair of product multipliers to derive directly the left and right audio signals from the compatibly modulated quadrature signals.

The transmitter uses the carrier frequency oscillator signal to supply a signal to the modified exciter. The modified exciter splits the carrier oscillator into two components in phase quadrature. The first component is modulated by L + R and some of the oscillator bypasses the balanced modulator to provide a residual carrier of L + R phase.

The second component is modulated with L − R to provide a suppressed carrier signal in quadrature with the first.

The two signals are added and limited to provide an output signal to drive the high power transmitter stages which is phase modulated with the same phase information contained in the composite of the two modulated signals in quadrature.

The transmitter modulator is supplied with L + R to provide a compatible envelope signal for detection by a signal current rectifier or envelope detector.

The receiver is similar to one used for the reception of two signals in quadrature, with the exception of the carrier level modulator which restores the received signal to its original quadrature carrier form where the left and right signals can be taken directly from two product detectors. The in phase detector can be used for squelch or auxiliary controls in addition to controlling the gain.

Using C-QUAM has the following claimed advantages:

1) The system provides the advantages of a quadrature modulation system but with no distortion in envelope detectors.
2) The system provides a minimum of monophonic coverage loss due to sky-wave sideband distortion of low frequency audio signals.
3) The system provides the best stereo signal performance in the presence of sky-wave sideband distortion (selective fading).
4) The power spectrum at the transmitted signal closely resembles monophonic for the most stable compatible performance on monophonic receivers.
5) The system provides direct recovery from the demodulators of Left and Right signals without the requirement for matrixing sum and difference signals.
6) The system is compatible with monophonic receivers using envelope detection or synchronous detection (for best performance with synchronous detectors a corrector circuit is desirable but reasonable performance can be obtained by an unmodified synchronous receiver).

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AM STEREO

Sansui Electronics

Jerry LeBow, the New York ad man who is spokesman for Sansui, which proposes two systems, reviewed the development of AM stereo.

In 1960, RCA announced an AM/FM broadcast system involving frequency modulation and amplitude modulation of a single carrier. This followed field tests over WNBC New York. In 1962, Radio Tokyo performed on-air tests of an FAM (or FM/AM) System.

In 1970 Lenord Kahn developed a single sideband technique which is being broadcast experimentally on XETRA in Tijuana, Mexico.

A similar system called ISV has been proposed by Siemens Electronics of West Germany: it involves separate modulation of the upper and lower sidebands of an AM wave, and was developed to make more effective use of Europe's medium wave frequency band.

With the Sansui AM-AM system, when stereo input signals are fed into the transmitter, the modulated wave consists of a carrier and a pair of double sidebands containing the L and R input signal on a ±45 degree plane with the carrier. When a mono signal is fed into the transmitter, the modulated wave consists only of a carrier and single sideband.

In other words, during mono transmission, Sansui's AM-AM system occupies only half the station's bandwidth. When the same signal is fed into both channels, the output is composed of upper sideband only.

The maximum occupied bandwidths of the sidebands with the AM-AM system are no more than those required for present AM broadcasting, even when it's desired to transmit the entire audio spectrum.

LeBow commented that there is no "typical" AM receiver, and that is why Sansui proposed two systems. A great deal of second harmonic distortion is expected in receivers when stereo is broadcast.

Sansui's FM-AM system is designed to be free of distortion when reproduced by a theoretical ideal envelope detector.

The disadvantage of the FM-AM system is that the output signal does not become a perfect single sideband system during mono transmission. This feature, says LeBow, is one of the very strong points of Sansui's AM-AM system.

Kahn System

Although not under examination by the National AM Stereo Committee, one of the contenders for the new system standard is Kahn Communications of Freeport, New York. Kahn filed a petition with the FCC for rulemaking on July 17, 1976.

The Long Island firm is a developer and manufacturer of communications, telephone, and broadcasting equipment. The petition stated that its patented AM Stereo System, which has been developed over a 16-year period, is:

(a) Completely compatible with standard AM broadcasting and will in no way degrade present broadcast service; and

(b) Will allow radio listeners to enjoy stereophonic reception with little or no additional investment in receiving equipment.

This system was used in on-the-air experiments by WFBR, Baltimore, and XETRA, Tijuana, Mexico, over a total period of 3½ years. The modulation technique was described in *Stereophonic System for Amplitude-Modulated Broadcast Stations* by L. R. Kahn (I.E.E.E. Transactions on Broadcasting, Volume BC-17, Number 2, June 1971, pp. 50-55).

Kahn's system essentially generates two separate sidebands, the lower for the left channel, and the upper for the right. These sidebands are generated by combining a phase modulated L − R carrier with an amplitude modulated L + R carrier.

The signal is theoretically compatible because a mono signal generates two identical sidebands, while a stereo signal generates different AM sidebands which are contained within the normal bandwidth and consequently summed in the envelope detector of a conventional receiver. Stereo reception, to be perfect, would require IF filtering with almost infinite slope when approaching carrier. Such filters are not attainable, and thus the degree of separation achievable will be largely a function of filter component cost.

Comments On The Proposed Systems

All of the systems claim compatibility because the sum (L+R) signal is contained within the current receiver bandwidths, and is identical with, or closely resembles, a conventional AM-modulated carrier.

All of the systems assume distortion-free transmission by the antenna, and this, I feel, is cause for concern.

Most AM stations employ directional antennas utilizing 2 to 12 vertical radiators in phased array. Generally, the greater the number of radiators, and the lower the carrier frequency, the greater the likelihood that the common point impedance will deviate drastically from 50 ± j0. I have seen some common point impedances, at stations at the low end of the broadcast band, become only three or four of ohms between 10 and 20 kHz from carrier. There are not many transmitters around that appreciate delivering a lot of power into close approximations of short circuits.

Depending on the modulation system employed, it is conceivable that, for L−R, left channel information might be transmitted with reduced amplitude compared to the right channel. (This would happen with the Kahn system).

With the Sansui AM-AM system, L + R and L − R information might be passed non-linearly, resulting in a form of cross-talk on demodulation. The effect on performance of AM-FM or C-QUAM systems is less predictable, but must be investigated.

The narrow bandwidth of AM antenna systems implies a varying delay of information removed from carrier, and this again might result in frequency-sensitive distortions.

The shape of the directional pattern of some AM antennas varies drastically at frequencies removed from carrier. Deep nulls exist only at carrier, and tend to fill out as the exciting frequency shifts away from carrier. This causes the antenna to act as a form of double-sideband suppressed carrier modulator in the null regions. Consequently, performance of the stereo systems may suffer drastically outside the coverage area of the major lobe of an antenna.

Another problem may arise at night because of co-channel and adjacent channel skywave interference. Co-channel interference manifests itself as a slow fade or a low frequency flutter accompanying the interfering program material. This fading or fluttering can be tolerable if the rate is constant. But with FM-AM systems, such as RCA's, the interfering carrier will be deviated up to 1.2 kHz, at an audio rate. This may result in the fading or fluttering becoming a squeal. In addition, adjacent channels which normally experience 10 kHz whistle interference may have 9 kHz beats if the other station is transmitting mono, and 8 kHz beats if stereo. Studies have shown that the tolerance of adjacent channel interference is much less at 9 or 8 kHz than at 10 kHz. Again, the interference will not be a steady tone, but will vary at an audio rate, and therefore be much more irritating. While these forms of interference will not be serious in the high field strength areas of a station's coverage, some of the fringe coverage previously free of interference, will become unusable.

Note that observation of the RCA system at the NAB convention in Chicago revealed full amplitude carrier being deviated 500 Hz and considerable energy (no more than 5 dB down) being dispersed out to 1.2 kHz.

What are possible solutions?

Transmitters might be modified with feedback loops to make power output track audio input over a wide range of load impedances. Phasing equipment might be designed with compensating circuits to improve bandwidth. And new interference criteria might be developed to rationalize the resultant reduced coverage.

Only full scale field testing will determine which proposed system will give the best results. Compatibility with existing receivers is only one of the criteria. The service areas of stations, particularly at nighttime, must not be significantly altered. We must ask ourselves: Is all this really worth the effort? What price to hear 5 kiloHertz audio emanating from a pair of four-inch speakers?

Ray Carnovale is chief engineer for the Ontario Educational Communications Authority in Toronto.

happenings

• Fifteen former RCA scientists and technicians will staff a new research and development company, MPB Technologies Inc. MPB is headed by **Dr. Morrel P. Bachynski,** previously vice president of R & D at RCA Montreal. The team will continue to use the RCA labs at Ste-Anne-de-Bellevue and will fulfill existing contracts, subcontracted by RCA. MPB also expects to generate new business in such fields at digital technology, lasers, optical communications, plasma technology and energy. Initial production will include digital character generators and laser communications systems. Bachynski, who joined RCA in 1955, anticipates that MPB will expand its staff to 50-60 people within the next few years.

• *CKJD Sarnia, Ont., expects to move to its new transmitter site in mid-April. The station, which now operates with 1 kw on 1250 kHz, was forced to relocate when construction of an industrial complex nearby caused severe re-radiation problems. (See article in BET, March/April, 1976, page 8.) The Rogers station moves to 1110 kHz, boosting power to 10 kw.*

• The annual **Canadian Television Commercials Festival,** which gives recognition to the producers of Canadian TV commercials, happens April 21 at the Toronto Sheraton Centre. Entries, which compete for gold, silver and bronze "Bessy" awards in various product categories, must be prepared for national advertisers and telecast in Canada during the year ending March 31. As French commercials are recognized by the Coq d'Or awards, only English commercials compete for the Bessies, sponsored by the Broadcast Executives Society (BES) and the Television Bureau of Canada (TVB).

• *The federal government is contributing $9 million to a five-year plan to provide basic local and long-distance telephone service to some 28 communities in the Northwest Territories. Bell Canada and CN Telecommunications will invest a similar amount in the project, which will make use of both satellite and terrestrial circuits. Where satellite earth stations are installed, they will be designed to accommodate CBC radio and TV services as well.*

• Los Angeles' new Hotel Bonaventure will be the site of the third **Videoshow,** sponsored by Education & Industrial Television magazine. It takes place May 4-5. Further information from Box 565, Ridgefield, CT 06877, (203) 438-3774.

• *IEEE's biennial Conference & Exposition in Toronto will be held September 26-28 at Exhibition Place. Sponsored by the Canadian Region, Institute of Electrical and Electronics Engineers, the conference includes technical papers on a wide range of topics, including telecommunications.*

• **CBC's Engineering Newsletter** recently described the new facilities slated for Regina, Sask., and Sept-Iles, Que., to be ready in 1979-80. Editor **Mel Stauffer** says the Regina complex will accommodate both English and French radio and TV studios, with the existing TV studios, originally a private station in Moose Jaw, 40 miles to the west, being moved to Regina. Custom designed both architecturally and technically, the Saskatchewan broadcast centre will include TV studios of 3500 and

1800 sq. ft., a packaging studio, two automated on-air booths and a central equipment room. There will be seven remote EFP (Electronic Field Production) Units, three electronic editing suites, six quad VTRs, three telecine chains, character generators and electronic slide store units. Radio facilities will include nine studios, multi-track mixing consoles, 16 listening/editing rooms and automated switching systems. At Sept-Iles, a new two storey building will accommodate the CBC's first radio and television studios in the community.

• *Formerly of RCA, Fred W. Huffman has been appointed president and chief executive officer of Richmond Hill Laboratories Ltd., Toronto. In eleven years with RCA, Huffman had extensive experience in Broadcast Systems sales, product management and engineering.*

• The **Video Communications Show** to have been held in February has been rescheduled for September 27-29 at the Toronto Sheraton Centre. Key factor in the postponement was the illness of seminar co-ordinator Clayton J. Miner. Further information from David Courtin, 254 Lesmill Rd., Don Mills, Ont. M3B 2T5, (416) 445-6450.

• *Sony of Canada Ltd. recently introduced its Betamax videocassette system designed for the institutional market. Betamax uses a new azimuth color recording system that eliminates the need for guardbands, allowing more video information on a ½ inch tape than on the standard ¾ inch tape. Each videocassette weighs only 7½ oz., costs about half as much as standard videocassettes, and records up to 60 minutes. Betamax was introduced to the consumer market in Japan two years ago, in the U.S. a year ago (sales there are running over 5000 units per month), and in Canada last summer. The institutional product, which consists of the SLP-100 player and SLO-260 player/recorder, is designed for business, educational, hospital and government purposes. In introducing the line, Sony of Canada president Albert D. Cohen observed that "the ability of video systems to improve training and communication has not really even begun to be utilized". Initially, duplication service will be available at Sony in Toronto, later supplemented by independent duplication operations across Canada.*

• The **National Radio Broadcasters Association** (NRBA) has moved its annual convention from Chicago to the Hilton Hotel in New Orleans. New dates: October 9-13. No doubt exhibitors influenced the decision: many were fed up with the bribery and corruption practiced by Chicago's unions at last year's NAB. However, it's rumored that member stations also prefer the southern hospitality. Meanwhile, NRBA has moved its office from NYC to Washington, where Al King and Suzanne Bishop are minding the shop.

• *RCA Limited of Canada is supplying a $3 million turnkey color television facility to Haiti, including cameras, VTRs, TV film system, mobile unit, microwave link, 3 kw transmitter and antenna. The contract followed RCA's installation of a satellite earth station, with 105-foot antenna dish, in the Caribbean nation.*

• The on-again, off-again **Canadian Education Showplace** is definitely on. Show manager Al Spencer reports that exhibitors want a buyer-oriented show, to be held in the fall, despite a "drastically changed and in some fields, diminished" educational market. So, CES will be held October 18-20 at the Queen Elizabeth Building, Exhibition Place in Toronto.

• *Herbert A. Hoyles of Vancouver has formed Hoyles Associates, a new consulting firm which will offer specialized services to consulting engineers and others, particularly in the electronics field. One of the founders of Hoyles Niblock, Hoyles recently retired after 18 years as a consulting engineer. The new firm is located at 975 Sherwood Lane, West Vancouver, B.C., V7V 3Y1, (604) 922-2121.*

CFBC PURCHASES HARRIS MW-50

J. H. Turnbull, president of Fundy Broadcasting, Saint John, N.B., signs contract for the station's new 50 kw Harris transmitter, while Bob Lockhart of CFBC and Leo Gilbeau, Canadian manager for the Broadcast Products Division of Harris Corporation, look on. Gord Miller is chief engineer at CFBC, which is increasing power from 10 to 50 kw with the new installation.

• *CKJD Sarnia, Ont., expects to move to its new transmitter site in mid-April. The station, which now operates with 1 kw on 1250 kHz, was forced to relocate when construction of an industrial complex nearby caused severe re-radiation problems. (See article in BET, March/April, 1976, page 8.) The Rogers station moves to 1110 kHz, boosting power to 10 kw.*

directions

A review of current policies and decisions of the Canadian Radio-television and Telecommunications Commission.

HEARINGS

JAN. 25—VANCOUVER

In addition to the cable television applications previously announced (see Directions, Jan/Feb, page 45), the following items were scheduled to be heard:

• **Twin Cities Radio Ltd.**—change in frequency for CFJC Kamloops from 910 to 550 kHz, relocating antenna site and increasing nighttime power to 5 kw (daytime power remains at 10 kw). CFJC also would disaffiliate from the CBC when a local CBC rebroadcaster, CBYK-FM, commences operations. Twin Cities also seeks FM rebroadcasters at Cache Creek/Ashcroft (125 watts on 95.3 MHz) and Williams Lake (176 watts on 97.5 MHz) to rebroadcast CFFM-FM Kamloops.

• **Fraser Valley Broadcasters**—change in frequency for CKGO Hope from 1490 to 1240 kHz, increasing daytime power to a kw.

• CBC—new AM rebroadcaster at Gold Bridge, B.C., 40 watts on 860 kHz; change in transmitter site for CBRZ Bralorne, B.C.

• CBC—new TV rebroadcasters at Houston (98 watts), Burns Lake (117 watts) and Smithers (27 watts).

• Community groups—5 watt TV rebroadcasters at Kitwanga, Legate Creek and Ocean Falls, B.C., and Beaver Creek, Haines Junction, Destruction Bay, Burwash Landing, Carmacks, Pelly Crossing, Stewart Crossing and Carcross/Tagish, Yukon Territory.

• Cable applications included rate increases for systems in Powell River and Oliver, B.C., and an increase in service area for Valley Televue, Chilliwack.

• S. W. Davis Broadcast Technical Services Ltd. seeks to purchase 11,000 common shares (27.5%) and 4,000 preferred chares (5%) of Prince George Broadcasting Ltd., licensee of CJCI and stations at Vanderhoof, Fraser Lake and Fort St. James. B.C.

FEB. 1—REGINA

THREE BIDS FOR AM AT MEDICINE HAT

Applications heard at the Regina Inn included bids for an AM station at Medicine Hat, Alberta, from Cypress Broadcasting Co., for 10 kw on 1380 kHz; John P. Hamilton of Saskatoon, for 10 kw on 1390 kHz; and Monarch Broadcasting Co., for 10 kw on 1460 kHz. Monarch, licensee of Medicine Hat's existing AM station, CHAT, would use the second station to rebroadcast CBR Calgary.

Other AM applications were from Palliser Broadcasting Ltd., for 10 kw on 1280 kHz at High River, Alta.; Northwestern Broadcasting Co. (CJNB North Battleford) for 1,000 watts day, 250 night, on 1240 kHz at Meadow Lake, Sask.; Soo Line Broadcasting for a power increase to 10 kw for CJSL Estevan, Sask., remaining at 1280 kHz; and transfer of control of CJOI Wetaskawin, Alta., from Parkland Radio Ltd. to N.L. Holdings Ltd.,

Also heard:

• **Harvard Developments Ltd.**—purchase of CKCK-TV Regina and its four rebroadcasters (see BET, Jan/Feb, page 43). A concomitant application by CTV would transfer CKCK's share in the co-operatively owned network to Harvard also.

• **New cable television systems** for communities in Alberta: Milk River (Milk River Cable Club); Pincher Creek (Crowsnest Cablevision Ltd.); and Jasper (Paul Corlett, on behalf of a company to be incorporated). QCTV in Edmonton requested an increase in service area.

• CBC—TV rebroadcaster at Etzikom, Alta., 27 kw on ch. 12.

• CJUM-FM, University of Manitoba, Winnipeg—relaxation of restraints on the amount and character of advertising permitted.

• Greater Winnipeg Cablevision—new local head end at 930 Nairn Ave., replacing the St. Norbert head end; change of reception of WDAZ-TV to the distant head end at Tolstoi, Man.

• CBC—FM at Edmonton, Red Deer, Fox Lake and Jean d'Or, Alta., French TV at Red Deer.

• Yellowhead Broadcasting—50 watt AM at Hinton, Grande Cache and Whitecourt, Alta.

• Tarmigan Club—5 watt TV rebroadcaster at Rabbit Lake, Collins Bay, Sask.

MARCH 1—RIMOUSKI

As reported in the Jan/Feb issue of BET, page 45, the Rimouski hearing was scheduled to consider the purchase of CJBR AM-FM-TV Rimouski by the CBC, and the application of Télé-Capitale Ltée for TVA outlets at Rimouski and Sept-Iles.

Other TV proposals include:

• Marc Simard*—for TVA rebroadcasters at Rivière-du-Loup (49 kw on ch. 9) and Edmundston, N.B. (2 kw on ch. 5).

• CBC—for new facilities at Matane, Ste-Anne-des-Monts (45 kw on ch. 8), Mont-Louis-en-Haut (3.35 kw on ch. 19), Grand Vallée (power increase to 587 watts on ch. 6 with increase in antenna height from 200 to 796 feet), Causapscal, Murdochville (power increase to 1.6 kw on ch. 10 with change of antenna site and increase in height from 70 to 1276 feet) and Baie Comeau (1.59 kw on ch. 7—French; 3.5 kw on ch. 28—English).

Radio applications:

• La Voix Laurentienne—10 kw on 1000 kHz; also FM at Mont-Joli—100 kw on 95.1 MHz.

• André Lecompte*—10 kw on 1000 kHz.

• Leon LeBreton and Marcel Castonguay*—10 kw on 1110 kHz; also FM at Amquie—2.47 kw on 97.3, and Causapscal—82 w. on 98.3.

• Radiodiffusion Mutuelle*—10 kw on 1220 kHz.

• Benoit Santerre*—1 kw on 960 kHz at Mont-Joli.

• CBC—3 kw on 99.7 at Baie Comeau, replacing CBMI.

• CJRS Sherbrooke—daytime power increase from 10 to 50 kw.

• Telmed Ltée—changes in 22-station French radio network for Expos baseball games.

(*On behalf of a company to be incorporated.)

SCHEDULED HEARINGS

April 4-7:	**Montreal** Loew's La Cité
May 3-5:	**Vancouver** Four Seasons
June 6-9:	**Winnipeg**

MARCH 1—OTTAWA

COLIN JAMIESON SEEKS NEW AM FOR ST. JOHN'S

Among applications scheduled for the CRTC March 1st hearing in Ottawa was a bid by Colin C. Jamieson for a new AM radio station in St. John's, Nfld. It would operate with 25 kw on 850 kHz. Jamieson, brother of federal cabinet minister and one-time CAB chairman Don Jamieson, was formerly president of Newfoundland Broadcasting Co.

Other radio applications:

• Moffat Communications Ltd., for 100% control of CKOY/CKBY-FM Ottawa.

• CFML Radio (Cornwall) Ltd., for transfer of 100% ownership to Pierre A. Belleau. CFML also seeks to add part-time local programming on CHPR Hawkesbury, from its Cornwall studios.

• Community Communications Inc., for transfer of 100% of CHOO Ajax, Ont., to Southern Manitoba Broadcasting Co. (CFAM Altona, CJRB Boissevain, CHSM Steinbach). CHOO is also requesting a change in daytime radiation pattern.

• Middlesex Broadcasters Ltd., for transfer of 2/3 control of CJBK London from Baron Communications to Bruce Communications.

• CHNO Sudbury, Ont., for an increase in nighttime power from 2.5 to 10 kw.

• CBC rebroadcaster CBOI Ear Falls, Ont., for local studios.

• Multiple Access Ltd., for modified English radio network for Expos baseball.

FRENCH FM FOR TORONTO

FM applications include:

• CBC, for a station in Toronto, 38 kw on 89.5 MHz, to rebroadcast the French FM network.

• CHIC Radio, for a power increase from 857 to 100,000 watts for CFNY-FM Brampton, with change of antenna site. (A previous application was denied by the CRTC.)

• CKLC-FM Kingston, for a power increase from 47.7 to 95.5 kw.

GLOBAL TV: IWC OUT?

An application by Global Communications Ltd. would transfer the holdings of IWC Communications in Global to its partners, Global Ventures Western Ltd. and Seymour Epstein. IWC triggered the deal by offering to buy out the partners, who came back with a counter-proposal which, under the terms of their contract, must be accepted by IWC. The CRTC says that it will examine "the consequences which will flow from either an approval or denial" of the application.

Other television bids:

• Huron Broadcasting, for a station at Sault Ste. Marie, Ont., 100 kw on channel 2, to provide CTV service. Huron's CJIC-TV, a CBC affiliate, would move from ch. 2 to 5 and increase ERP from 28 to 100 kw with a change of transmitter site.

• OECA, for a decrease in power from 170 to 122 kw at Kitchener, Ont.

• A community association, for a 5-watt rebroadcaster at Petty Harbour, Nfld.

• Newfoundland Broadcasting, for a power increase to 4.22 kw on ch. 4, for CJON-TV-5.

• ATV, for a network to broadcast *Atlantic Loto*.

• CBC, for French rebroadcasters at Dryden (10 kw on ch. 6), Kenora (3.8 kw on ch. 2) and Vermilion Bay, Ont. (10 watts on ch. 74); and 5-watt rebroadcasters at Sunnybrae, Garden of Eden and Blue Mountain, N.S., and Port Hope Simpson, Nfld. The CBC also proposes a slight increase in power and antenna height for CBNAT-10, Fox Harbour, Nfld. At Hudson Bay and Norquay Sask., the CBC would acquire the existing rebroadcasters of CKOS-TV Yorkton.

Cable Television: Applications included the following new facilities—

• W. J. Simpson—new cable system for Gananoque, Ont.

• Classic Communications, Richmond Hill, Ont.—change of antenna site.

• Kingston Cable TV—increase of service area.

Maclean-Hunter Rapped

The CRTC has expressed criticism of the London, Ont. Maclean-Hunter Cable TV system on several counts. It says the licensee's unauthorized distribution of a signal and lack of response to community programming requirements are part of a failure to communicate with subscribers, "whose needs, interests and rights must be taken into account". A rate increase was denied and M-H told to continue efforts to improve reception of CHCH-TV Hamilton.

For comment on other cable matters, see Current.

DECISIONS

Radio

The following AM and FM applications have been approved:

• **Ville Dégelis, Que.**—1 kw on 1370 kHz. Licensed to Emilien Nadeau, representing a company to be incorporated, the station will be operated by local residents for 21 hours weekly, rebroadcasting the CBC's CHGB La Pocatière at other times.

• **Lac Etchemin, Que.**—1kw day, 250 watts night, on 1240 kHz, to Radio Beauce Inc. Programming, which will originate at CKRB St-Georges, is to include four hours daily oriented to the Lac Etchemin area.

• **Toronto, Ont.**—25 watts (carrier current) on 820 kHz, licensed to Alan Lysaght representing a company to be incorporated, to serve residences at Glendon College.

• **Jonquière, Que.**—423 watts on 92.5 MHz, to Radio Communautaire de Jonquière Inc.

• **Club Social La Grande**—four rebroadcasters in Quebec:
Duplanter: 297 w., 100.1 MHz
Petite Opinaca: 146 w., 100.3 MHz
Eastmain: 59 watts, 105.1 MHz
Lac Boyd: 59 watts, 95.1 MHz

• **Sault Ste. Marie, Ont.**—acquisition of CJIC AM/FM by Russell Hilderley on behalf of a company to be incorporated.

• **Longueuil, Que.**—the frequency of 98.5 MHz has been assigned for the FM station previously granted to Stephane Venne, on behalf of a company to be incorporated.

• **Radiomutuel**—addition of five Quebec stations to news network.

• CHML Hamilton, Ont.—power increase from 5 to 50 kw, with change of antenna site to 12 miles northwest of Hamilton.

• CFLS Levis, Que.—power increase from 250 to 1,000 watts, with change of frequency from 1240 to 920 kHz.

• CHER Sydney, N.S.—transfer of 1,000 common shares from Highlander Press to G. S. Marsh and D. MacDonald.

• CHTK Prince Rupert, B.C.—added to Jack Webster network, ex-CJOR Vancouver.

• Radio NW Ltd.—Vancouver Canucks network amended to delete CKOK Penticton, CKGF Grand Forks, CJDC Dawson Creek, CKKC Nelson, CFKC Creston, CFTK Terrace and CKTK Kitimat, while adding CKQR Castlegar, B.C.

• CBEO Rolphton, Ont.—change of program source from CBLToronto to CBO Ottawa.

• The following FM rebroadcasters have been licensed to the CBC:

Location	watts	MHz
Dryden, Ont.	100,000	100.9
Dryden, Ont. (Fr.)	1,500	102.7
Kenora, Ont. (Fr.)	20,000	93.5
Osnaburgh, Ont.*	81	104.5
Pickle Lake, Ont.	83	105.1
Pikangikum, Ont.*	34	100.3
Sandy Lake, Ont.*	37	101.1
Savant Lake, Ont.*	78	104.9
Sioux Narrows, Ont.*	1,300	95.7
Chateh, Alta.	122	103.5
Church Pt., N.S. (Fr.)	68	95.9
St. Albans, Nfld.	78	99.1
Ramea, Nfld.	779	95.5

* Facilities to be included for local access by incorporated broadcasting associations representative of the community.

Television

CHOV-TV TO LAVIGNE

The purchase of Ottawa Valley Television, Pembroke, Ont., by J. Conrad Lavigne Ltd., licensee of CFCL-TV Timmins, has been approved by the CRTC.

Lavigne will change the transmitter site to Foymount, Ont. and establish an additional studio at Ottawa. Until the new facilities are completed, CHOV-TV will continue to re-broadcast CBOT Ottawa full-time.

The Commission noted that the new Ottawa studio, mainly for the production of public affairs programming, would benefit residents of the Ottawa Valley, and also provide a useful program source to Lavigne's Mid-Canada network serving northern Ontraio.

The CHOV-TV licence was also renewed for six months to allow time for preparation of a renewal application.

Lavigne also won recent approval for power increases at Chapleau, Hearst and Kapuskasing.

Other TV approvals:

• Cambrian Broadcasting (CKSO-TV Sudbury)—separate news and local programming for the Timmins/Kearns/Kapuskasing area.

• Atlantic Television (CJCH-TV Halifax)—renewed; improved service to be provided for Annapolis Valley, Truro and Canso areas and Yarmouth, where a change of channel is under consideration.

• In Newfoundland, a 5-watt CTV rebroadcaster has been licensed to a community association at LaScie, while CJWB-TV Bonavista has been permitted to remain on channel 10 rather than implement a previously approved move to ch. 9.

• CFCF-TV Montreal—renewed to Sept. 30 pending renewal hearing, postponed by CRTC.

• Eleven rebroadcasters on Vancouver Island will be changing their program source from CHEK-TV Victoria to CHAN-TV Vancouver, to provide CTV service, as CBC rebroadcasters commence operations in the same area. They will revert to CHEK-TV when that station becomes a CTV affiliate.

CBC-TV approvals:

Sarnia, Ont.—39.7 kw, ch. 68 (Fr.)
Hermitage, Nfld.—6.48 kw, ch. 4
Ramea, Nfld.—1.2 kw, ch. 13
Chateh, Alta.—151 w., ch. 5
Five-watt rebroadcasters: Big Trout Lake, Osnaburgh, Pickle Lake, Pikangikum, Sandy Lake, Savant Lake and Sioux Narrows, Ont.
Power changes: Driftwood, Ont., 1.22 kw; Sioux Lookout, Ont., 30 kw with change of antenna site; Kenora, Ont., reduction from 9.3 to 8 kw with an increase in antenna height.

Cable Television

New Systems:

• Approval has been given for a new cable system at Glovertown, Nfld., licensed to Hayward Burry. The application of Aubert Poisson for Gentilly, Que., was confirmed, following filing of necessary documentation.

• February 28 was the deadline for applications to serve Agassiz and Harrison Hot Springs, B.C.

• Applications by Lakeshore Community Television Ltd. and George E. Young for Wawa, Ont., have been deferred until the applicants submit a viable plan for supplying distant signals.

New facilities:

• Northern Microwave Ltd.—addition of systems in Barrie, Orillia, Parry Sound, Gravenhust, Bracebridge and Huntsville, Ont. WGR-TV to be received at Hornby; Global TV to be received at Orillia until Foymount head-end in operation to receive both Global and CFVO-TV Hull, Que.

• Gravenhurst (Ont.) Cable—change of antenna site and increase in service area at Bracebridge.

• Maclean-Hunter Cable TV—community channel to be developed at Huntsville; changes in service area at Thunder Bay, Ont.

• Norwont Ltd., Fort Frances, Ont.—rate increase to cover improved microwave service; licensee is to acquire the community channel production facilities.

• Nor-Video Services, Atikokan, Ont.—remote head-end to pick up Thunder Bay stations.

• Fundy Cablevision Ltd., Saint John, N.B.—increase in service area.

• Seaside Cable T.V. Ltd., Glace Bay, N.S.—change of head-end site.

Ownership changes:

• Calgary Cable TV Ltd.—transfer of shares resulting in 100% ownership by Cablecasting Limited.

• Telecable l'Annonciation (Que.) Enrg.—transfer of 50% interest from G. Larocque to Guy Charette (100%).

• Cablovision Baie Comeau (Que.) Inc.—purchase of system from Isidore Beaudoin; $3.00 rate increase approved for microwave service.

• Prince County Cablevision Ltd., Summerside, P.E.I.—transfer of shares resulting in 40% ownership by Gerald J. Kazma, with 60% retained by Mrs. Frances Phipps and Mrs. Patricia Schurman. The system has not yet commenced operations.

msc newsletter

Breakthrough in FM signal processing

By combining compressor, limiter, and stereo generator in one integrated system, OPTIMOD-FM has achieved the first real breakthrough in FM signal processing in fifteen years. With OPTIMOD-FM, manufactured by Orban/Broadcast, you get 2 to 3 dB more loudness, absolute peak modulation control, tight bass, detailed midrange, and an open and transparent high end.

OPTIMOD-FM will operate with just about every exciter or STL. Installation is easy, and delivery prompt. Among the many stations already using OPTIMOD-FM are CKY-FM Winnipeg, CKFM-FM Toronto, CHFM-FM Calgary, CKTB-FM St. Catherines, CKGL-FM Kitchener, CKKW-FM Kitchener, CHQM-FM Moncton, CHEZ-FM Ottawa, and CHIQ-FM Winnipeg.

Write 151 on reply card

Shively antennas

Shively antennas continue to be popular choices with Canadian FM stations. Among recent stations to order Shively are:

CHAY-FM Barrie, Ontario, model 6813-10.

CHIQ-FM Winnipeg, model 6810-10.

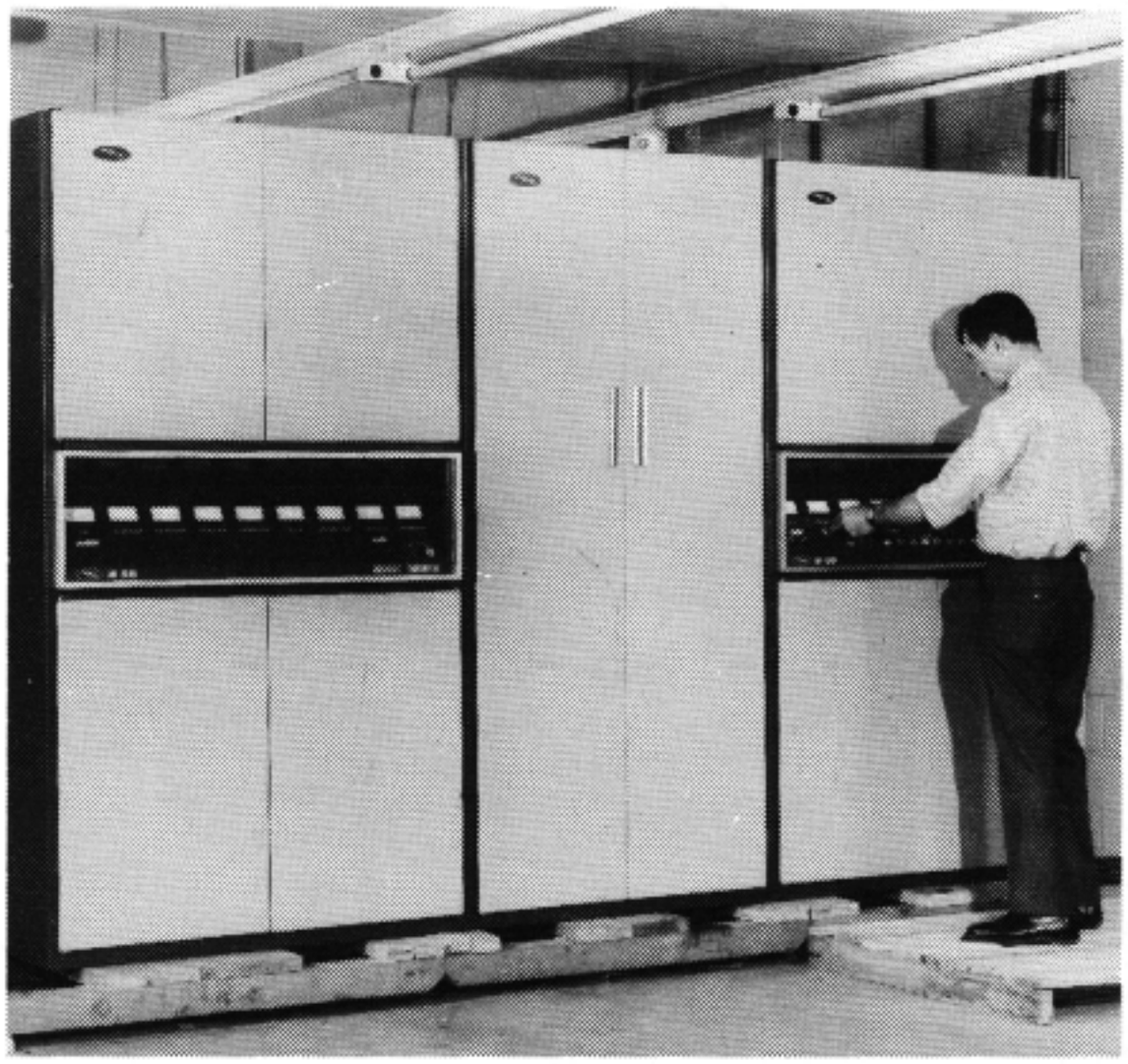
CKCW-FM Moncton, model 6813.

CIEL-FM St. Bruno, Quebec, model 6813-10.

CHEZ-FM Ottawa, model 6810-10D. This is a dual-channel antenna to handle both CHEZ-FM and the Canada All News Radio network station.

CBC Saskatoon, model 6810 dual channel.

Write 146 on reply card



AEL 50 KW AM transmitter model AM-50KD during final test procedures prior to shipment to CKSO, Sudbury, Ont.

AEL transmitters selected

A large number of Canadian broadcast station engineers and senior management personnel have selected AEL transmitters for installation by their stations. Here is a partial list of the latest to purchase AEL transmitters:

CHCM, Marystown, Nfld., Reg McCausland, Chief Engineer, an AEL model AM-10KD, (10 KW).

CHIQ-FM, Winnipeg, Bruce Edgar, Chief Engineer, an AEL model FM-25KE (25 KW).

CKCW-FM, Moncton, Jack Schoone, President of Eastern Broadcasting, Bob Oke and Brian Hooper, an AEL model FM-10KE (10 KW).

CHAY-FM, Barrie, Ont., Vin Dittmer of Communications Associates, an AEL model FM-25KE (25 KW).

CFOS, Owen Sound, Ont., Jim Hutching, Chief Engineer and Paul Firminger Chief Engineer of CHYM, Kitchener, Ont., purchased as part of CHYM's site change, an AEL model AM-5KD (5 KW).

CKSO, Sudbury, Ont., Ken Houzer and Helmut Frauscher, an AEL model AM-50KD (50 KW).

CBC, an AEL model FM-25KE each for Quebec City, Saskatoon and London, Ont., and an AEL model FM-5KE for Sept Iles.

Write 147 on reply card