

# BROADCAST TECHNOLOGY

NOVEMBER 1984



*Facilities:* **CBC Toronto Project; Toronto's New AM Tx Sites**

*Convention Reports:* **CCBE, OCTA**

*International:* **Radio Denmark**

*Preview:* **'Convergence'**

*Lighting:* **Rating Your Studio**

*Engineering:* **Stereo TV and ICPM; AM Stereo—The Transmitter**

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## Current

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### *The CRTC: A Tale of Two Cities...*

CRTC chairman André Bureau had some encouraging words when he spoke to the Atlantic Association of Broadcasters. He said, 'There is too much regulation... Broadcasters are spending too much time and money in things that really have nothing to do with their service.'

It is to be hoped that this is an indication of some radical new thinking in Ottawa.

It's needed. Exhibit A: Surely 1984 witnessed one of the most stupid and unnecessary episodes in Canadian broadcasting history: the case of CJMF Québec. It remains incomprehensible to this observer that the Commission was unable to remedy this situation without resorting to the non-renewal which forced the station of the air, interrupting service to listeners, and putting its 40 employees out of work — and without six applicants wasting their time and money applying for FM service in Quebec City that was returned to a re-organized CJMF. The station's rock format, while it was unapproved by the CRTC, was reported to have succeeded, in a short time, in winning the largest FM audience in Québec City.

The point is that private broadcasters are in a competitive situation and must have the flexibility to respond to their audiences.

Indeed, that seems to be what the Commission is itself saying about FM radio in Windsor, Ontario. There, two private stations, CJOM-FM and CFXX-FM, are to be given 'special consideration' to help them compete in a market where dozens of U.S. signals are available. (Baton Broadcasting recently decided to give up in Windsor, selling CKLW and CFXX to CUC Ltd., the cable TV company licensed to serve the city.)

For 65 years now — that's four times longer than the CRTC has been around — the industry has been serving the public creatively and conscientiously, and most broadcasters know their responsibilities well. However, the most public-spirited broadcaster can only spend money on great programming if he has the money to spend. Regulation has a way of killing both the spirit — and the profits.

So let's get rid of those things that André Bureau says are wasting time and money, and let's see what Canada's broadcasters can do when percentages and definitions are replaced by flexibility and incentive.

### *AM Stereo Box Score...*

Sandy Day, giving his 'CAB Report' at the CCBE Convention, had these figures on how AM Stereo is coming along in Canada: of 410 AM stations, 353 of them privately-owned, 45 are now in Stereo; Motorola has 28, Kahn 11, Harris 8, Magnavox 5 (duplication results in total of 52 systems).

There's optimism in the industry that stereo will revitalize the sound of AM and halt the trend to FM (which had already showed signs of levelling out). One of NRBA's recent publications quotes a U.S. broadcaster who has a refreshing slant on the subject: 'I think the only thing wrong with AM is what's going on in the heads of broadcasters... there's still a vast audience out there that listens to AM and doesn't even feel comfortable with FM. The key to it is how you program and promote AM...'

Kevin McKenna of CHAM Hamilton put it more succinctly in that super videotape at CCBE (see page 28): 'I never believed AM Stereo would save AM—only good programming will.'

### *Here and There...*

- *Broadcast Technology* joins in saluting Sunwapta Broadcasting of Edmonton and its founder Dr. G.R.A. (Dick) Rice — who received the 'Broadcaster of the Half Century' Award at this year's 50th anniversary convention of the Western Association of Broadcasters, and is also the recipient of the RTNDA 1984 President's Award for his pioneering contribution to Canadian broadcasting. Radio-Television Representatives — themselves something of an institution in this country — express it all very well, on the page opposite, as the CFRN group chalks up 100 years of service and success. Congratulations!

- Initial tallies from *Communications Expo* indicate some 900 broadcasters attended the event, October 21-23 in Edmonton, making it the largest broadcasting convention ever held in Canada. The delegates were about equally divided between CAB, the national organization, and WABE, the western engineering association, as the two groups joined efforts for the first time; 170 spouses also participated. The communications minister in the new Conservative federal government, Marcel Masse, made a brief appearance. Regrettably, at the last minute circumstances prevented Jacquie and I from attending, however we still expect to have lots of coverage and photos in BT's January/February issue, thanks to the co-operation of CAB's Gerry Acton, WABE's Gord Skutle, and some of the others who worked so hard to make *Communications Expo* an excellent convention.

- Much of our usual CRTC coverage has been omitted from BT lately, due to both a lack of space and a lack of time to summarize the voluminous decisions and other information from the Commission. However, these items caught our attention as we were finalizing this issue:

- January 31, 1985, is the deadline for FM applications to serve Toronto, Hamilton, London, Niagara Falls, Brockville, Chatham and the Parry Sound-Gravenhurst area. The call marks the end of the FM 'freeze' which affected the Montreal and Vancouver areas, in addition to southern Ontario.

- In northern Ontario, a number of radio stations will change hands if the CRTC approves. Mid Canada proposes to get into radio in a big way, purchasing CFBR, CHNO and CJMX-FM in Sudbury, and CJNR Blind River-CKNR Elliot Lake-CKNS Espanola. The latter group would be purchased from Huron Broadcasting, which also seeks to sell CKCY/CJQM-FM in the Soo and CJWA Wawa to CKCY 920 Ltd., a proposal previously rejected this year by the CRTC. Both Mid Canada and Huron have television stations and cable TV systems. The Sudbury Broadcasting group is owned by Baxter Ricard — also a shareholder in Mid Canada; a pioneer in the industry. Baxter, with his wife, Alma, started CHNO as a small bilingual daytime radio station back in 1947.



## stations in the news

### TELESAT TO SELL ANIK C1

The Canadian satellite Anik C1 will be offered for sale prior to its launch by NASA early in 1985. Telesat Canada has agreed to sell Anik C1 to the highest bidder over the minimum asking price of \$65 million (US) through a New York investment firm.

Telesat president Eldon Thompson said that when the C series was planned, forecasts for Canadian satellite usage were 'extremely bright'—however, conditions now require only the existing C3 (launched Nov/82) and C2 (launched June/83). Areas of business which failed to meet expectations include long-distance 'phone, teleconferencing and telemedicine, pay-TV and educational TV. Telesat lost \$2 million in income when First Choice and Superchannel ceased competing and split the Canadian pay-TV market.

### AUSTRALIA GOES C-QUAM STEREO

Australia's Department of Communications has decided to go with Motorola's C-QUAM as a national technical standard for transmitting AM Stereo. Australia is the first government to test all four AMS systems and select a single standard. Some of the country's 130 commercial AM stations are expected to begin stereo broadcasting as of December 1, 1984.

### LUXEMBOURG PLANS SATELLITE TV

The tiny country of Luxembourg has upset its European neighbors with a plan to launch its own satellite, carrying up to 16 commercial TV channels, in 1986.

According to a *Globe & Mail* report, 30 countries object to the project. The plan is also opposed by Radio Luxembourg, owned by French and Belgian interests, which had hoped to earn revenues of \$1 billion a year by leasing a French satellite channel for commercial TV.

### FCC EASES OWNERSHIP LIMITS

The FCC has increased the number of stations which may be owned by one firm in the U.S. For 31 years, the limit has been '7-7-7'—7 AM, 7 FM, and 7 TV (no more than five VHF). The FCC has voted for a '12-12-12' limit until 1990, when it will consider removing all restrictions, if there have been no adverse effects. However, a committee of the U.S. Senate is seeking to overrule the new limit for TV stations, which it wants to remain at seven.

### THREE SEEK SASK TV

Applications from three western broadcasters—Allarcom, Winnipeg's CKND-TV and Harvard Developments—for independent TV stations in Regina and Saskatoon, were scheduled for a Nov. 6 CRTC hearing in Regina.

According to Bruce Cowie of CKCK-TV, the Harvard proposal, Saskatchewan Television Network, would make use of the province's fibre optics system to link some 52 communities. Programming would include educational and agricultural material, much of it from studios in Moose Jaw. Other shareholders would include CJFB-TV Swift Current and Yorkton Television (CKOS and CICC-TV).

### CBC DEFENDS ITS BUDGET

CBC executives have defended the corporation's billion-dollar annual budget (outlined in *BT*, July/August, p. 6). Denis Harvey, vp, English TV, says the CBC is a 'bargain' compared to PBS-TV in the United States, which he says costs \$1 billion 'just for one TV service.' CBC operations include English and French TV networks, 30 TV stations, two English and two French radio networks, 46 radio centres, International and Northern services.

Recent critics include Jim Edwards, a broadcaster elected Conservative member of parliament for Edmonton South. He believes the CBC should be 're-examined' and claims its TV ad rates are undercutting those of private stations.

### Other stations in the news...

• **CJYQ St. John's** goes to the 'dogs'... The biggest crowd ever turned out for the 158th annual Newfoundland Regatta Day on Quidi Vidi Lake. Joining in the picnic spirit, Q-93 held the first annual 'Great Wiener-Eating Contest'—in which over 3,000 wieners were consumed. The most dogs eaten in 93 seconds, without buns or condiments: 12.

• **CHOM-FM Montreal** has moved along the street to join its sister station CKGM. Address: 1310 Greene Ave., 3rd floor, Montreal, PQ, H3Z 2B5.

• **CJRT-FM Toronto** has met a goal of \$145,000 in its fall fund-raising drive. Non-commercial CJRT receives 60% of its budget from Ontario; remaining 40% is from listeners and corporate sponsors. Promoting Canadian music is a priority with the station—on December 1, the 55-piece CJRT Orchestra and the 22-member Boss Brass will join in a concert of music by six Canadian composers. A tape is available to other stations through the CAB program service.

• **CKEY Toronto** was a recent NRBA choice for 'Print Promotion of the Month'. 'EY was commended for its catchy slogans, *Improve your station in life* and (for news) *No sooner done than said*. Gene Stevens is promotion director.

• **Canadian Broadcasting Corporation** was feted October 29 by the International Council of the National Academy of Television Arts and Sciences. CBC has won 10 International Emmys to date.

• The Variety Club of Manitoba has donated a van in the name of **CKND-TV** to the Children's Home of Winnipeg, in appreciation of the station's support of Variety fund-raising events.

• Sixty employees of **CKY-TV Winnipeg** (NABET local 816), after voting in favor of strike action, accepted a one-year wage increase of 5%, retroactive to June 30, 1984. The second year of a collective agreement remains to be negotiated.

• **ITV Edmonton** has won two gold medallions from the Broadcast Promotion Association. The awards were for a 'Crime-stoppers' billboard campaign and a booklet used in sales promotion.

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# CBC Toronto Broadcast Centre

by Fred Fox

*'One of the most difficult tasks is determining technology for the 1990s.'*



## Background

CBC's development since its inception has been an epic of growth and change.

Facilities in Toronto have been housed in temporary locations awaiting consolidation since 1936, when CBC Radio began in the Canadian National Carbon Company building at 805 Davenport Road. After World War II, facilities were relocated to the original Havergal Girl's school at 354 Jarvis Street—as a "temporary" location—where they remain today. With the advent of television, a TV building was constructed on the site, with Studios 1 and 2—still in use today.

In 1957, the Fowler Royal Commission on broadcasting recommended the CBC consolidate in a suburban area and a site was purchased in Don Mills. In 1962, the idea was scrapped. In 1965, Fowler again repeated the need to replace Jarvis Street facilities. From 1967 to 1969, Metro Centre project planning on Toronto's waterfront provided for the CBC consolidation. In 1971, CBC entered into discussions on a land swap for 9.3 acres adjacent to the CN tower in return for the Don Mills site and other areas in Toronto and Vancouver. Planning began on the design of the building. In 1974, the federal government introduced price controls and the project was shelved. In 1978, the federal government approved the purchase of the 9.3 acres known as the Simcoe Place Block bordered by Wellington on the north, Front Street on the south, Simcoe Street on the east, and John Street on the west. In 1980, the CBC began the process of seeking government approval to proceed with a consolidation project which resulted in an announcement on November 13, 1983, by president Pierre Juneau, that the CBC had been given approval to proceed with Phase 1 Planning and Developer Arrangements for a new Broadcast Centre in Toronto.

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## Phase I of Development

The Phase I aspect of the project is worth noting and requires further explanation.

The objective is to accommodate, on the site, facilities and personnel presently occupying twenty-three owned or leased buildings. Previous CBC consolida-

tion projects, notably Montreal, Regina and Vancouver, were all financed totally by the Corporation under government auspices. Because of the magnitude of the Toronto project and the business opportunity presented by the CBC site, it was decided that a new approach should be taken. This will result in a "multi-use" project in which a private developer will develop the site—to include the CBC

Centre as well as commercial office/retail and hotel/residential space—and finance and lease the entire project. The CBC will lease-back its portion of the development from the developer.

Phase I of the project involves a pre-qualification call, followed by preparation of development proposals by interested and qualified developers as well as detailing the costs of the technical facilities re-

quired. The intent is that CBC, drawing on appropriate government programs, will finance the purchase and installation of the technical equipment. Once the overall cost impact to the Corporation is detailed and developer and financing arrangements are complete, it is expected that Phase II development approval will be given, with excavation and foundation work targetted to start by mid-1986 and building construction in 1987. Ordering of major technical equipment is likewise targetted by mid to late 1987.

## ISC VIDEOTAPE EDITING SYSTEMS



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- Film conversion

These Canadian organizations have now purchased ISC Videotape Editing Systems:  
**CHAN-TV Vancouver (2) Access Alberta (3) CFAC Calgary (1)**  
**Crossroads Christian Communications (1) Magnetic North (2) Motion Picture Video (2)**  
**CJOH-TV Ottawa (1) Le Studio Morin Heights (1)**



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### Digital Technology for the 90s

One of the most difficult tasks facing the broadcast engineering team is determining in 1984, the design philosophy and the state of the technology for the 1990s. Trying to look that far ahead in the face of rapidly-changing technology—as well as provide detailed costs—is a significant challenge.

In that regard, an extensive survey was undertaken of major manufacturers and broadcasters in Canada, the U.S.A., England, France and Japan to obtain their views on the technology of the 1990s. The results reinforced our view that digital technology is evolving rapidly and by 1988-1990 should be far enough advanced to be seriously considered for major portions of the overall system design. In some cases, the move to digital is further advanced than others, but there is no doubt that eventually the broadcast industry will be all-digital. The transition to digital technology is just starting and will likely be fully underway in the 1990s.

Costs for the new technology are not yet clear but, at the moment, remain prohibitively high for most users. The all-digital audio console and tape recorders, for example, currently cost three to four times more than the equivalent analog units. Costs are expected to fall and eventually reach the cross-over point with analog somewhere in the early 1990s.

We feel strongly that even if some of the technical areas remain analog, we must plan for the key areas, those areas that are essential to any production plant and are difficult to change once operational, to be digital:

We are currently anticipating that the following areas will be digital:

- Some key production studios-Radio/TV
- Key post-production areas-Radio/TV
- Main routing/distribution-Radio/TV
- Network release centre
- All major production and release VTRs

To support these key digital areas, we will require all-digital technology to be available for the following main items:

- Audio consoles and tape recorders
- VTRs
- Video switchers

- Audio/video routing
- Audio/video distribution

### Challenge to Manufacturers

In announcing this project in November 1983, the President of the CBC indicated that one of the benefits of the project would be to help stimulate the Canadian broadcast equipment manufacturing industry. The CBC has traditionally supported the Canadian broadcast equipment manufacturers and that will continue. We hope that some of the key digital items mentioned above will be available from our Canadian manufacturers in the time frame outlined and at competitive prices.

Research and development for digital technology is expensive and time consuming. Development lead times are long but the window of opportunity is now open for our Canadian manufacturers to accelerate the development process. The digital products we will require need to be available as proven, commercially practical products by 1988-89 for this project. Once the products are developed, these manufacturers will be well positioned to market them to the world and help keep the Canadian reputation as a world leader in the manufacture of

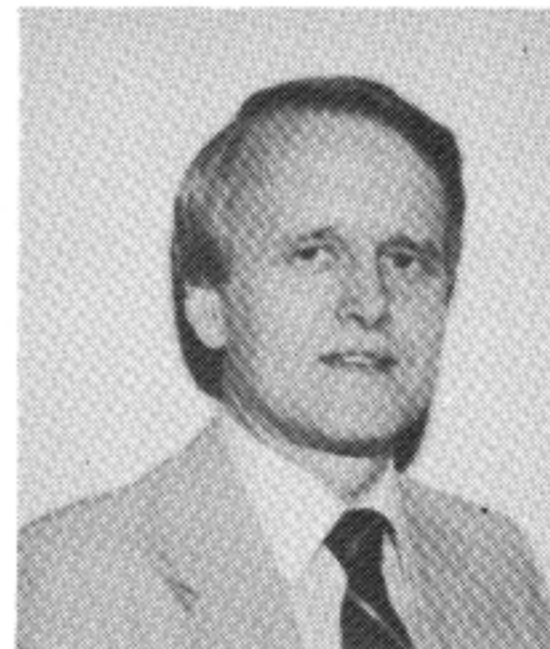
broadcast equipment. The CBC Broadcast Centre Project will be one of the largest of the decade—we know of no others of this magnitude. It will be a showcase for new broadcast technology and participation in supplying this new technology should be of significant value to any manufacturer. It remains for interested Canadian broadcast equipment manufacturers to take up the challenge and initiate action to meet the required schedule.

### Input 'Critical'

The process of determining the nature and quantity of key elements, such as production studios and control rooms and their size and relationship to the rest of the plant, is now underway. Input on requirements is being sought from all levels by a "user-group" committee process. Such quantities and working relationships are critical to the long-term success of the Broadcast Centre. Future production requirements are also being analyzed and reviewed in relationship to the CBC's broadcasting objectives and stated government policy, to assess their impact on planning.

The task of putting together all the elements that make up a successful broad-

cast centre is an enormous one. This task is presently underway by a special project team of CBC people and outside consultants, who bring to the project a variety of professional and highly specialized talents. The challenge will be to balance the requirements of the users with the space and funding available, to achieve the best Broadcast Centre facilities possible and to enable the Canadian Broadcasting Corporation to function effectively in the future in fulfilling its mandate as authorized by Parliament.



*Fred Fox is manager, Broadcast Engineering, for CBC's Toronto Broadcast Centre project.*



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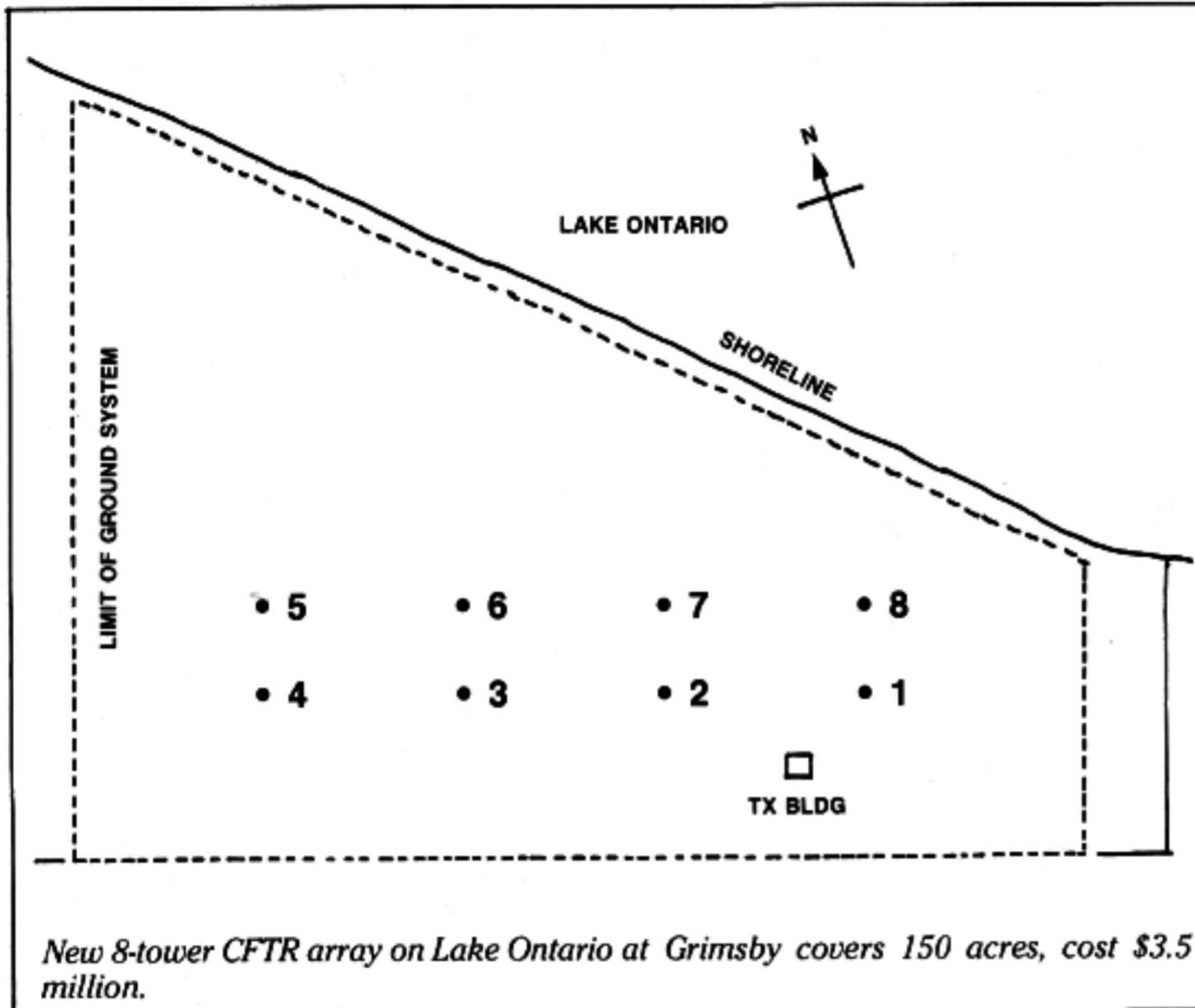
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**COVER STORY:**

# New Transmitter Sites for Three Toronto AMs



Three of Toronto's AM stations are currently completing construction of new transmitter sites. All are major projects, representing total expenditures of some \$9 million.

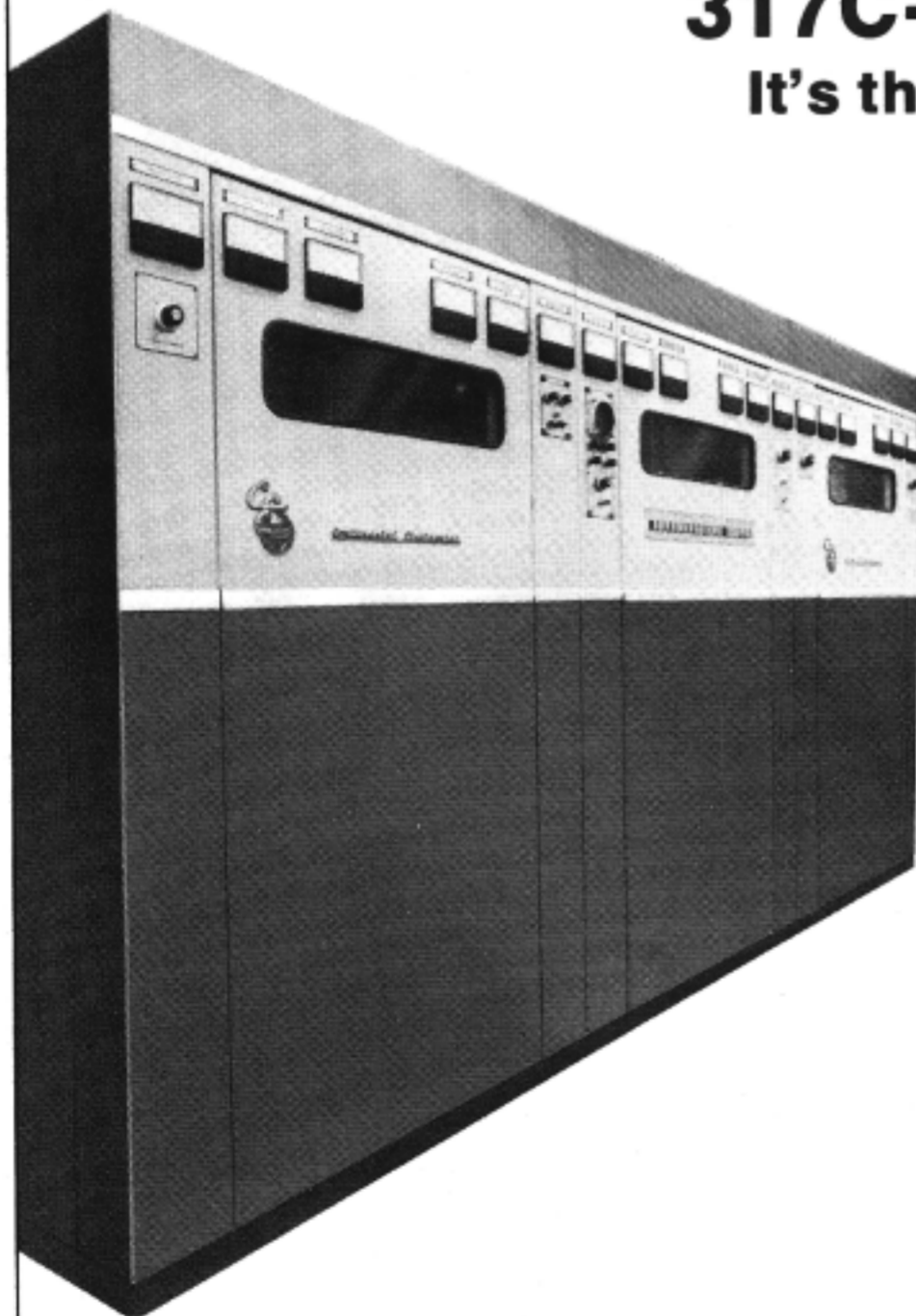
### Power Increases for CFTR, CKEY

Two of the stations, CFTR and CKEY have chosen sites at Grimsby, Ontario, more than 30 miles across Lake Ontario from downtown Toronto. The new locations allow both stations to increase power to 50 kw day and night, beaming unobstructed signals across the lake towards the metropolitan area.

For CFTR, a major aspect of the Grimsby project was the revetment of the shoreline and embankment, and beautification of the site, which is on Lake Ontario and adjacent to the Queen Elizabeth Highway, the major freeway connecting Toronto, Hamilton and the Niagara area. The installation also features a 150-foot diameter counterpoise around each tower for the daytime array.

*continued on page 16*

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—acreage	70 acres	106 acres	30 acres
—number of towers	5	13	2
—power	10 kw day & night	25 kw day & night	50 kw day only
NEW SITE—location	Grimsby	Grimsby	Toronto Islands
—acreage	260 acres	120 acres	6 acres
—number of towers	9	8	5
—power	50 kw day (9-tower array) 50 kw night (9-tower array)	50 kw day (8-tower array) 50 kw night (8-tower array)	50 kw day (2-tower array) 15 kw night (4-tower array)
Transmitter:	Harris MW 50-C (new 50 kw)	Continental C2 (new)	Continental 317C2 (new 50)
—standby:	2 Collins 820E/F, 10 kw, combined for 20 kw Motorola (proposed)	Continental C1	Continental 316 (10 kw)
AM Stereo:	—	Kahn	Magnavox
Tuning & Phasing Equipment:	BES Electronics	Harris	BES Electronics
Emergency power:	300 kw	Kohler 150 kVA	Existing Onan 45 kw propane
Tower construction by:	LeBlanc & Royle	LeBlanc & Royle	Maxtower
STL facilities:	to be determined	TFT	Bell 15 kHz stereo lines
Automated control:	to be determined	Potomac	Unitel remote control/ Symax process controller
Approx. cost of project:	\$3.5 million	\$3.5 million	\$2 million
Building construction:	—	—	Kamrus Construction
Processing equipment:	to be determined	—	CRL
Personnel—station	William R. Onn David B. Craig Robin Jackson Brian Hinz	Ron Turnpenny Les Henwood Tom Hoar	Trevor Joice Mic Druiven Blair Harley Gord Mullins
Consulting Engineer:	J.G. Elder, P.Eng Elder Engineering	Dave Wood E.W. Horrigan & Assoc. Ltd.	Elder Engineering Proj. coord: Imagineering Ltd.
Outside technical:	—	Dave Wood	Bruce Dingwall Frank Lehman
TARGET DATE:	1st quarter, 1985	Day-Sept/84; Night-Jan/85	Mid-November/84

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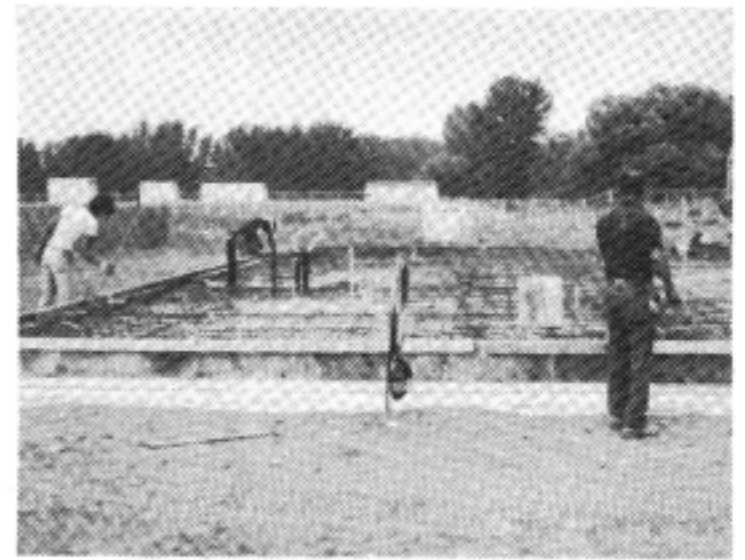
## CHIN Expands to 24-Hour Operation

For CHIN, the station's new site realizes the longstanding ambition of owner Johnny Lombardi to go to full-time operation. Daytime-only since it went on the air in 1966, CHIN was approved for 15 kw nighttime operation as a result of new international agreements covering 'clear channels'—in this case, 1540, previously reserved as a clear channel for the Bahama Islands.

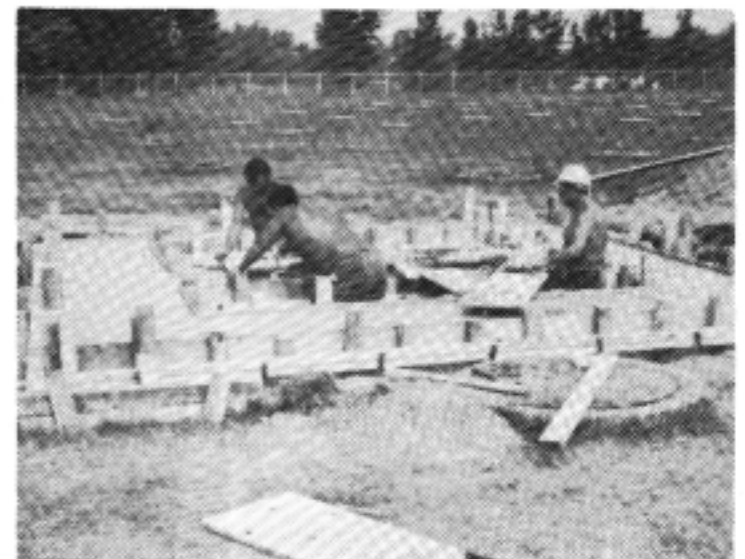
An unusual feature of the CHIN site is that four of the five self-supporting towers are built over a reservoir. The fifth is in sand and required three pylons, sunk 20 feet deep, to support the base of the tower. The location is just 700 feet from the transmitter site of another Toronto station, CJCL.

The control equipment used by CHIN enables automatic pattern and power change on a 365-day clock, and provides monitoring of the parameters for both

power and directional pattern.



Workers lay foundations for CHIN's new transmitter building.



One of CHIN's five towers required pylons 20 feet deep to support the base.

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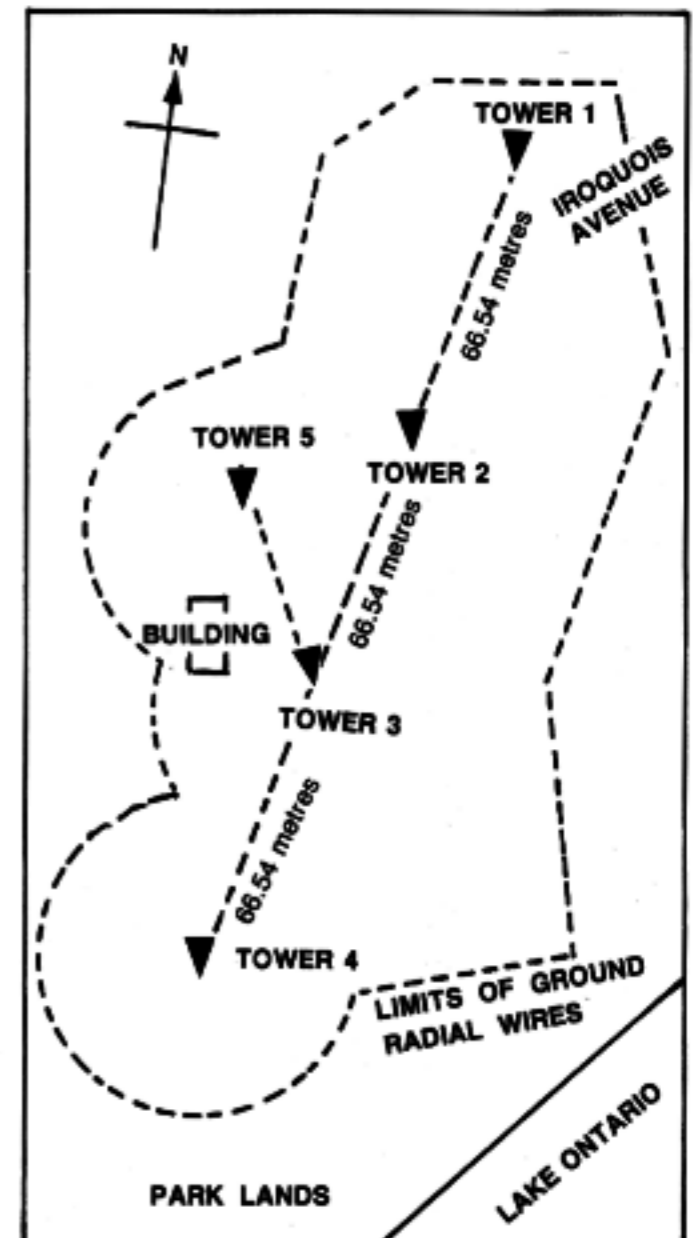
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### CHIN TRANSMITTER SITE

New CHIN transmitter site has five towers, four built over reservoir on Toronto Islands, across harbor from city's downtown area.

**A/V CONVENTION IN ANAHEIM**

The 1985 Convention of NAVA, the International Communications Industries Assn. will be held January 16-21 at the Anaheim Convention Centre, Anaheim, CA. Five groups are holding conferences in conjunction with ICIA:

Association of Audio-Visual Technicians  
 Association for Multi-Image International  
 Health Sciences Communications Assn.  
 Int'l. Assn. of Business Communicators  
 International Television Association.

The Association for Educational Communications and Technology will also hold its annual convention in conjunction with COMMTEX International, Jan. 18-21. The COMMTEX exposition will occupy more than 100,000 sq. ft., with some 450 manufacturers participating. Attendance is expected to exceed 12,000 persons.

**TTFL LIGHTING SYMPOSIUM  
 MARCH 17-20 IN NEW YORK**

*Show Light '85*, an international symposium on theatre, television and film lighting, has been scheduled for March 17-20, 1985, at the Sheraton Centre in New York City.

The event is sponsored by the Theatre, TV and Film Lighting committee of the International Illuminating Society, which last met in Orlando, FL, late in 1983. The

1985 show will overlap with USITT, the U.S. Institute of Theatre Technology, meeting in the same location, and many exhibitors are expected to extend their participation to include both shows.

Chairman for *Light Show '85* is Charles Clark of General Electric, vice-chairman is Nathan 'Sonny' Sonnenfeld, Sonnenfeld Associates, and Kenneth Ackerman of the BBC is international co-ordinator.

For further information contact TTFL-IES, 345 East 47th Street, NY, NY 10017.

**SECOND HDTV COLLOQUIUM  
 MAY 13-16 IN OTTAWA**

The Ottawa Congress Centre will be the site for the second High Definition Television colloquium, sponsored by the Government of Canada, May 13-16, 1985.

The program will examine advanced TV systems—including high definition, extended definition, improved conventional NTSC and PAL systems from image source, through production and transmission, to image displays—to determine the current state and future direction of TV development. The colloquium is chaired by Ken Hepburn of DOC assisted by a committee from government and CBC. For further information contact: HDTV '85 Secretariat, 1138 Sherman Drive, Ottawa, ON, K2C 2M4, telephone (613) 224-1741.

**NORTH AMERICAN BROADCASTERS  
 MEET IN OTTAWA**

The executive committees of the Canadian Association of Broadcasters, National Association of Broadcasters and La Camera Nacional de Radio-Television of Mexico, met for their annual meeting in Ottawa in September. Resolutions passed dealt with a variety of subjects:

- opposition to attempts by UNESCO to restrict the free flow of information;
- a request to receiver manufacturers that AM stereo radios receive all four systems;
- urged 'must carry' rules for cable TV carriage of local TV stations—considered of greater importance for stereo TV;
- urged co-operation by broadcasters to prevent FM interference to air traffic control, while stressing that aircraft should have good quality equipment to minimize the problem;
- requested their respective governments to renegotiate FM subcarrier service; and
- urged careful study before expanding the Inter-American Association of Broadcasters to include members outside the western hemisphere.

**IN MEMORIAM**

**Peter Calvert, P. Eng.**

Peter Calvert, 41, a well-known engineer in broadcasting in both eastern and western Canada, died suddenly October 4, 1984. He was stricken with a heart attack while inspecting an installation at the Allarcom facilities in Edmonton.

Peter began his broadcasting career in 1967, while a student at the University of Waterloo, as a parttime program operator for CJOE (now CJBK) London, Ontario. He also did announcing at CKWS in Kingston. Returning to his engineering studies, he earned his Professional Engineer's degree and became chief engineer at CHOO Ajax and at CJOY in Guelph.

Moving to western Canada, he was with KKNW New Westminster and Westronic Engineering Sales Ltd. before starting his own company, PC Workshop Engineering in Alberta, still operated by his partner, Neil Evans. Most recently, he was with SED Systems of Saskatoon and the Digital Video Systems division of Scientific-Atlanta in Toronto.

He leaves his wife Avril (Brandy) and two sons, Tyler and Matthew Winston.

**Michael Seniuk**

Michael Seniuk, 37, news director at CFGO Ottawa, died October 4, 1984, following a brief illness. Previously with radio stations in Kingston, Pembroke and Huntsville, Ontario, he had been with CFGO for seven years, the past three as news director. He is survived by his wife, Donna.

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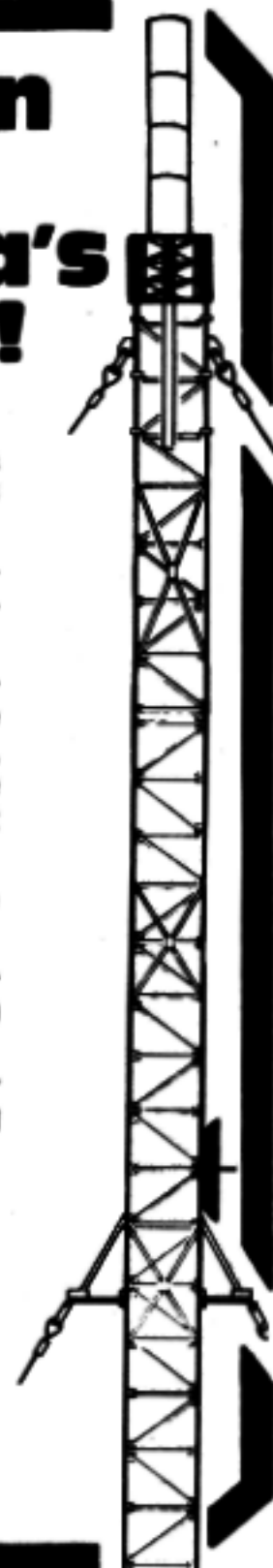
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# BROADCAST BEAT

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by Phil Stone

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ACTRA, the Alliance of Canadian Cinema, Television and Radio Artists, now has over 7,000 members. Last year, according to ACTRA research, some 88 % of all voice-overs for commercials were done by males...CFCF Inc. is expanding its facilities with a \$12 million addition that will accommodate CFCF AM & TV, CFQR-FM, CF Cable TV and Champlain Productions...**Jack Prince**, outstanding in Canadian ad agency circles, retires as president of D'Arcy-McManus & Masius on January 1...**Neil Stevens**, from CBET Windsor, is handling anchor duties on CFPL-TV London evening newscasts...**Barbara Walters** recently turned 53...**Kevin Williams**, once a DJ in Toronto, is now both a federal civil servant and an assistant Anglican priest...**Ron Andrews**, the former NHL publicity director who became sports director for CJSB Ottawa when it went on-air, is now senior editor of the evening news program on The Sports Network (TSN)...When **Bob McCown** resigned as co-host of *Sportsline on Global TV*, **Mark Hebscher**, formerly of CJCL and CKEY, took over...**Daryl Wells**, the voice of horse-racing in Ontario, who most of us first met when he was a broadcaster in Hamilton, has been at the track mike for some 25 years now. When and if he decides to call it a day, it could be that he will be succeeded by his son, **Daryl Jr.**, who already has had a fill-in role...We are grateful to **Larry Heywood** for sending us a collection of material useful for lectures, speeches, and columns such as this. For example this line by **Robert Orben**: *We're living in strange times—when luxury is being able to afford necessities*...**Dick Drew** tells us that Drew Marketing was appointed western sales rep for TSN and MuchMusic. **Doug Proby**, ex-CFUN, is now gm at the Vancouver office of the firm, also big in syndicated radio with *Celebrity Sports Report* (30 min. weekly) on 68 stations and *Discovery with David Suzuki* (6 shows a week) on 78 stations. Both are produced by Michael Morgan & Associates, Vancouver. Nice to hear things are going so well, Dick...

**Jacques Ouimette** became director of communications for CJMS/CKMF Montreal...**Peter Viner** was appointed executive vp of Telemedia Ontario...At Radio-TV Reps, named to sales vp by **Bob Quinn** were **Richard Bridgman**, responsible for radio stations in the prairies, and **John Aonso**, responsible for those in BC/Ontario/Maritimes...**Annette Groat** joined Birch Radio, Toronto, as client-services rep...**Kathy Butler** moved to director of media research and systems at the Radio Bureau of Canada...Once a top student in our Humber Radio course, **Scott Parsons** was promoted to gm at CHFI Toronto...On national p.r. for the MuchMusic team are **Cathy Hahn**, manager, and **Joan Paley**, co-ordinator, both reporting to **Nancy Smith**...**Michael Landon** was born Eugene Orowitz, son of the late **Sam Orowitz**, one-time East coast head of RKO publicity, host of his own radio show and publisher of his own newspaper. Landon is directing and appearing in a film, *Sam's Son*, which tells of his life. He is also starring in the new NBC-TV series *Highway to Heaven*...Telemedia's Toronto Blue Jay baseball network continues to grow: TBS president **Len Bramson** says the net will expand into Northern New York State in '85...

**Radio pirates are swarming back.** That was the heading of an interesting article in The Times, seen on our Scandinavian cruise. It said that, 'Despite tough new legislation, the Government seems powerless to prevent a pirate radio renaissance.' More than 50 stations are now heard regularly in London—many more operate intermittently. They range from large American-

backed offshore stations to individuals broadcasting from a bedroom for a few hours on a Sunday morning—homosexuals have their own "gaywaves" station; Radio Laser 558, begun in May, is a \$2m investment, run from New York. Last year, Independent Local radio saw its share of the audience drop by 4% —partly because of the 'pirates'...

**Statistics Dept.** A Broadcast Beat item in July said: *A survey reveals the average American spends 11.7 hours a week reading, 16.3 hours watching television, and 16.4 hours with radio.* This prompted two informative letters. **Robert L. Dilworth**, director of marketing and research, Paul Mulvihill Ltd., says the reported survey is contrary to generally-accepted facts in the U.S. The Canadian equivalents are: for TV, the average person views 23.8 hours a week—women (18+) 26.8, men (18+) 23.5, teens 20.8; for RADIO, the average person listens 18.7 hours a week—women 22, men 19.1, teens 13.2 hours. **Jim Snider**, a graduate of the Humber Radio program now research assistant at BBM Bureau of Measurement, says Arbitron in the U.S. (Fall '82) estimates the average radio listener (12+) listens 25 hours a week, an increase over the Fall '81 figure of 21 hours. In Canada, BBM estimates the average listener tunes in radio for 21 hours a week (Fall '83). We appreciate this information, based as it is on the time-proven surveys conducted by specialists in broadcast research...

New at BN: in Toronto, **Norm Jack**, ex-CKY Winnipeg news director; in Victoria, **John Weldon**, ex-CJDQ Drumheller...At CKGY Red Deer, **Kris Burkholder** resigned as n.d., successor is **Al Redel**. And **David Lang** was moved to the BN desk in Vancouver...The BN Report reveals that 11% of news directors at U.S. private stations are women, up from 8% a year earlier...Belated congratulations to BN's **Howard Christensen**, who was married this summer to **Ingrid** in Eastern Germany. The date will be remembered by me since it was August 4, my birthday... At about this time, our youngest son, **Glen Stone**, should be making his third and fourth appearances on *The Don Harron Show*. Glen, a news anchor and science editor at CKO News, was on Don's show twice last fall with his interesting and colorful science facts...We were happy to hear **Ray Carnovale** was promoted to vp of engineering at Baton Broadcasting. His successor in the same post at CFTO-TV is **Allan Morris**, previously assistant chief engineer...Philips is said to be planning 5 major projects in China, including production of color TV sets and tubes, refrigerators, telephone transmission and fibre optics equipment. Philips has an office in Peking and reportedly already does \$300 million (US) worth of business each year there.

Vidicom Ltd., owned by **Vin Dittmer** and his wife, will increase holdings in CHAY-FM Barrie to 61%. The other 39 % is owned by Markle Community Newspapers...**Bob Bales**, publisher of Adnews, is an ardent motorcyclist. This led Yamaha to hire him to write and present spots following his weekly ad news on CKFM-FM Toronto/CJAD Montreal...More hotels are offering closed caption decoders for hearing impaired guests who watch TV—this now includes the York Hanover chain...**Charlie Fenton**, president of Canadian Communications Foundation, is hoping that the broadcasting industry will contribute equipment to the Canadian Museum of Broadcasting. **Ernie DeCoste** is the curator—contact him about any donation you'd like to make. His address is the National Museum of Science & Technology, 1867 St. Laurent Blvd., Ottawa K1A 0M8, (613) 998-4566...

Pathonic Communications want to buy the Tele-Capitale group of TV stations in Quebec City (English and French), Rimouski and Riviere du Loup...The 1984 edition of *Music Directory Canada* is now on sale in book/record stores...In his days as morning man at CHUM, **Jay Nelson** was one of the funniest. Now his son **Kevin** has a comedy series, *Steve's Bank* that seems to be going well in syndication. It's a parody of sponsors who do their own commercials...The Toronto Blizzard is reported to have regained control of its TV rights from Global for a 20% equity in the NASL soccer team...Sixty-six new members were admitted to the CAB Quarter Century Club this year... Radio-TV producer **William Black** and broadcaster **Austin Clarke** were appointed to the Ontario Censor Board...Canadian Cable TV Association's 28th annual convention be held April 9-11 in Toronto's brand new Convention Centre, with a preview of CABLEXPO April 8...One of our colleagues at CHUM in days gone by was **Harvey Dobbs** who passed away after a lengthy illness. We had many memorable times together...

CKO's Ontario stations picked up The Minor League Hockey Report, formerly on CJCL...It was 40 years ago this year that **Jack Kent Cooke** took over CKCL Toronto and changed it to CKEY. **Carl Banas** is one who spent his early radio days at CKEY—we swapped stories recently at Eastern Sound and Carl had nothing but praise and admiration for Cooke...You might enjoy the book *The Thomson Empire* by **Susan Goldenberg**—unfortunately, we're told it doesn't say much about Cooke's association with the late **Lord Roy Thomson**...We first heard *Music Of Your Life* in Honolulu a few years back; in Canada, CJSB Ottawa, CHLO St. Thomas and CKMP Midland now use the format, joining CING-FM Burlington & CJCL Toronto...**Tedd Colbear** left CKTB for the afternoon shift on CHML Hamilton... Good to hear via **Betty Abrams** that **Earl Dunn** was out of hospital and was recovering from his heart attack...**John**

**Lescard**, once with CFRB and CJSB, rejoined Standard on CKFM sales...Columbia Records has released The Spitfire Band in the U.S., U.K and Brazil—and I'm certain **Jackie Rae** is delighted about that...The Ontario Motor League and Pro Drivers are marketing a special cassette featuring **Bill McVean** of CFRB—it helps people to approach a driving test with confidence... **Mike Page** has had a great year—he came back from his honeymoon, was promoted from promotion director to program director at CKTB/CJQR, where **Heather Hall** will add promotion to her sales responsibilities; also promoted is **Cairine Coulis-Brown**, from copywriter to creative services director...**Ray Sonin** has been named a Member of the British Empire (MBE). And this coming February, he'll host a Caribbean cruise for seniors—booked (honest!) through the I'm Proud to be Me Travel, Inc. agency...New president of the Radio Division of Standard Broadcasting is **Peter Shurman**...**Sydney Perlmutter** again has a top-flight course in Broadcast Advertising at Ryerson. Some of his guest lecturers include **Peter Sisam, Bob Oliver, Roy Chernoff, Laura Gaggi, Alan Butler, John Gorman, Barbara Elliott, Linda McCain, John Hylton, Morgan Earl, Carmen & Marvin Dolgay, Barry Tenhouse, Arthur Weinthal, Bill Stewart, Doug Gale, Gary Buss, Mike Hanson, Morris Saffer, Michael Hind-Smith, Ken Rodger, R.E. Godbeer, Doug Linton and Bob Pickell**...**Steve Lowe** of CFPL-TV sales was elected 2nd vp of the London Ad & Sales Club.**Charlie Sterne**, of CKSL sales, is a director...**John Seymour**, with CFTR 17 years and now retail sales manager, was named a vp of Rogers Radio...

**Rich Little** put up a satellite dish at his home in Malibu to keep up on Canadian events via TV...Where's **Larry Henderson**? He's publisher of the *Catholic Register*...And a former editor of that weekly, **Patrick McKay**, died at 65 of cancer—in the '50s, he did news and TV panel shows in Nova Scotia...Changes at CKO News: **Stan Stewart** of Beutel-Goodman, the investment firm that owns 51% of CKO, is chief executive officer; **Taylor 'Hap' Parnaby** remains as president; **Bob Holiday** is manager, editorial services; **John Gilbert** is manager, program services... A great era in on-air broadcasting ended with the retirement of **Elwood Glover** from his free-lance work with CKO and CING ...Telemedia Inc. appointed the talented **Mimi Fullerton** as manager, project planning...A 3-year, \$3 million deal by Coca-Cola has tied up weekend programming on the MuchMusic 24-hour music channel...1985 Oscar awards night is Monday, March 25th...Promoted to station managers at Edmonton are **Jack Little** at CFRN-TV and **George Church** at CFRN, both from gsm ...**Barbara Sheffield**, who as communications officer with the Ontario Arts Council supervised our weekly syndicated radio program, *Arts in Ontario*, is now pr director for Parson Associates, a combination creative design studio and ad agency...

If you run into an advertising type with "CBC" after his or her name, it has nothing to do with the Corporation. It stands for Certified Business Communicator, which comes from passing the requirements of the Business/Professional Ad Association... Among those included in the Academy of Country Music Entertainment's Hall of Fame this year are two people with broadcasting ties—**Tommy Hunter** and the late, much beloved, **Harold Moon**...In London, one of the hottest radio battlefields in the country, CFPL has had a major programming restructure. I like this quote from its press release: 'Radio 98 will find the void between rock and elevator music, with a new sound designed for the contemporary adult'...New sm at CISL Richmond, BC, is **William Waddington**, from Kamloops...The explorer **Pino Turolla**, once a journalist for the CBC International Service and a colorful adventurer, died at age 62 of a heart attack...Starring in dinner theatre in Toronto: 78-year-old **Gale Gordon** —remembered best for his role as Osgood Conklin in *Our Miss Brooks*. His real name is Charles T. Aldrich Jr. and in his early days he was leading man to Mary Pickford in the only radio series the Canadian-born star ever made...**David M. Tattle**, vp/gm, media research, was elected a director of A.C. Nielsen

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of Canada...Profits for Sony in the year ending Oct. 31 are over \$300 million (Cdn.)—more than double the previous fiscal year... **Hugh McCallum**, editor of the United Church *Observer*, joined CBC-TV as host of *Meeting Place*, now in its 13th season...**Earl Pomerantz** is co-writer with **Bill Cosby** of *The Bill Cosby Show*, widely-acclaimed as a sure-fire hit...**Dave Charles**, who has helped many a station, is radio consultant to Telemedia...What are broadcast rights worth? Toronto Maple Leafs get about \$3 million; Winnipeg Blue Bombers, \$900,000...**Rich Little** added **Brian Mulroney** to his list of impressions and did this bit at Toronto's Roy Thomson Hall: Reporter—'What does the new Conservative government plan to do about marijuana?' Mulroney—'We'll discuss it at a joint session'...

CBC-TV vp **Denis Harvey** says within five years the CBC will remove all U.S. programming from its schedule...1985 ACTRA awards will be held April 3rd at Ottawa's Capital Congress Centre...*The Tommy Hunter Show*, according to CBC-TV chief of variety, **Ivan Fecan**, is the longest-running variety show (20 years) on network TV in North America...Also notable: this is the 28th consecutive season for *Front Page Challenge*, where **Allan Fotheringham** took over from the late **Gordon Sinclair**. It's said **Pierre Trudeau** was approached and actually did mull over the offer for a while before saying no...It's reported Seiko is ready to sell a wrist-watch size color TV with a 2-inch screen and only 1/8" thick; U.S. price, about \$550...Three western firms are after TV stations in Regina and Saskatoon: Allarcom, Canwest and STN TV Network...**William Ellement** heads up a new sound recording/mixing studio in Toronto—Pro-comm Services offers bilingual radio and voice-over production...McKim's **Anne Boden** estimates 1985 TV ad rates will increase 7 to 10%, radio by 4 to 6%...**Donna Aprille**, former producer at CKO, joined CBC in a similar news position...**Samantha Taylor** left CFMT-TV's video show to host CBC's *Video Hits*...

According to *Financial Times*, the world-wide market for fibre optics technology is about \$900 million, and should increase to \$3 billion by 1989...**Ron Waters** is director of marketing for MuchMusic...**Peter Kent** rejoined NBC after two years at CBC, to become Caribbean-Central America correspondent...And **Henry Champ**, formerly of CTV's W5, is now chief European correspondent for NBC...Canadian journalist **Hilary Brown** has returned from New York to join CBC-TV news...In a profile of CTV vp **Marg Anthony**, first woman president of Toronto's Broadcast Executives Society, the Toronto Star reports she is engaged to Supreme Court justice **Allen Linden**...*History on the Run* is a new book by **Knowlton Nash** covering his 18 years in Washington. Nash often extended his noon-to-midnight work day to complete the book...Macleon-Hunter and Rogers won 10 of 37 Awards for Cable Excellence, regarded as the most prestigious U.S. cable TV award for local programming...A show produced by Rogers Cable 10 in Toronto has also won an Award for Excellence at the 1984 CCTA: *Ethnicity* is produced by **Madeline Ziniak** and hosted by **Bonnie Gross**. Other programs reflecting the quality of Cable 10 productions include *Getting Better*, a live phone-in show with **Paddy Robertson**, a 75-year-young hostess of past stage, screen and radio fame; the news team of **Hugh Innis & Bud Riley** from CJRT-FM, produced weekly by **Don Adams**; and a recent special, *Superbike '84*, sponsored by Molson's—producer **John Hart** used 6 cameras and a crew of 15 to cover motorcycle racing events...**Jim Hamm**, ex-CKEY, is now with CKSO Sudbury...After 15 years as pd at CKXL Calgary, **Greg Haraldson** is relocating, probably in Vancouver...CHSC/CHRE news director **Frank Fanstone** advises that **Bob Redmond** is back in St. Catharines to stay after the successful launch of CKRY Calgary. New CHSC p.m. drive host is **Ken Coughlin** from CJYQ ST. John's, and Loyalist grad **Neal Kelly** has joined the news team. Frank, by the way, is teaching part-time at Niagara College...When I gave up teaching broadcast management at Conestoga College, **Gary Parkhill** engaged **Paul Kells** of CBC to teach one class, and **Howard**

**English** to teach the other. Howard also teaches at Humber College (weekend course). Formerly executive editor with CKO News, Howard has joined **Ted Randall** to form TRE Associates, offering a complete range of consulting services, including a 3-day programming 'tune-up', a one-day seminar for senior staff, a 2000-record 'gold' library, and syndicated programming. TRE Associates are located at 15 Davis Drive, Newmarket, Ontario, (416) 898-1100.

It's going to be interesting to see what happens in the battle between CBC and CTV for 11 pm ratings, with CBC's *National Update* moved from 11 to 11:20...Reportedly the longest and most expensive TV mini-series, *Going to the Alamo* will air in February; the 20-hour saga covers the Mexican siege and coincides with 1985 celebrations of Texas' 150 years...Blue Bombers' centre **John Bonk** co-hosts a fitness show, *Bodytalk*, on CBWT Winnipeg...Shooting is scheduled to start in January on a new ABC-TV action series, *Behind the Crown*, with **Alan Thicke**, the Canadian comic/talk-show host, starring as an undercover spy...We hear that CBC's top-flight Ottawa man, **Mike Duffy**, is slated to become evening news anchor at CBOT...Former NHL-er **Peter Mahovlich** is commentator on New Jersey Devils telecasts...Do people from cable TV make it to conventional TV? **Alf DeBlasis** is one who did. A Ryerson grad in broadcast journalism, he did sports for Scarboro Cable for three years, is now producer/reporter for CFMT-TV's *World Soccer Report*...**Peter Clemente** is host of an hour-long review of the week's news at 5pm Saturdays on CKVU-TV Vancouver...**J. Robert Wood**, gm of CHUM AM-FM Toronto, who resigned effective Dec. 31, is expected to be an applicant for a new FM station in a major Canadian city.

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## people in the news

• Robert Bosch Corp.—**Clifford Eggink** appointed president, video equipment division, Salt Lake City.

• Broadcast News Limited—**Howard Christensen**, promoted to general executive for eastern Canada. He was with CHUM, CJAD, CFRB and CHYM before joining BN in 1977.

• CHFI Toronto—former Toronto Sun editor and unsuccessful federal candidate **Peter Worthington** has joined CHFI as a guest commentator.

• Promotions at CKIQ Kelowna, BC—**Dave Pears** to program director; **Ted Pound** to operations manager.

• CKVU Vancouver—former B.C. premier **Dave Barrett** is now host of weekly *Dave Barrett Report* news magazine.

• CRTC—**Roger Hebert** named director general of CRTC Montreal office; was

formerly with Télé-Capitale radio division, also served as vp of CCTA.

• Caelum Technologies Ltd.—**John R. Mann**, from Access Alberta, appointed sales engineer for corporate accounts; **J. Michael Barry** is purchasing manager.

• Continental Electronics Mfg. Co.—**J. Eugene Harrison** named president/ceo.

• Chyron Corp.—**William Buynak** elected vp, will direct engineering/R&D.

• Crown International—**D.B. (Don) Keele Jr.** named manager, software development, Tecron division; and **Bill Ravens** named microphone product director.

• Department of Communications—**Dr. Elmer H. Hara** to deliver paper on *Integrated Broadband Fibre Optic Networks* at Nov. 5-7 Congress on Integrated Telecommunications, Munich, Germany.

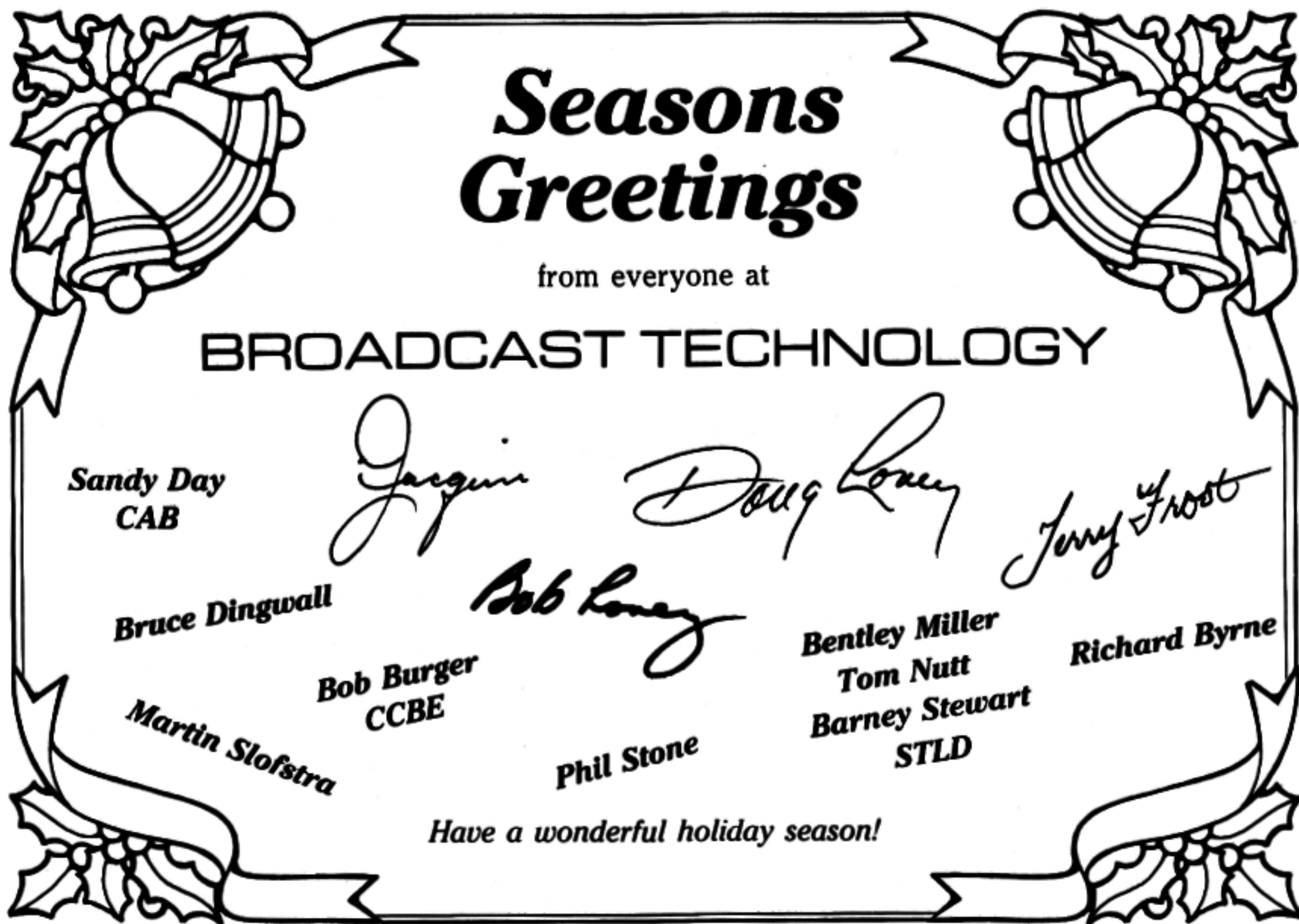
• Harris Corp.—**James F. Murphy**, ex-RCA Records, named p.r. manager.

• IDB Communications Group—**Dennis Feely**, formerly director of technical operations, ABC Talkradio, now director of engineering for satellite services firm.

• Int'l. Electrotechnical Commission—**Adrian van den Brekel**, an assistant vp at Northern Telecom Ltd., elected vice-president of world standards body.

• Rupert Neve—appointed U.S. regional sales managers are **Jeff Evans** (West) and **Geoffrey M. Langdon** (East).

• Orrox Corp.—**Sam Goodman** elected president and c.e.o., replacing **Philip B. Arenson** who remains in a senior executive position. Goodman's previous 'turn-around' assignments include Ampex. **Stanley Becker** named vp, engineering.



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*Have a wonderful holiday season!*

# AM Stereo — The Transmitter

by Joseph B. Sinton

***“We’ve made  
the decision  
to go to  
AM Stereo”***

For some broadcast engineers, this decision will mean the green light to go ahead with plans already made. For others—less prepared—it will conjure up visions of 80-hour weeks and major research for new equipment purchases.

Because of a widespread feeling that stereo will put AM broadcasting back on a firm footing, there are bound to be some concerns: Will the final result be worth the time and money? Is the transmitter suitable for stereo? Will your #1-rated mono signal suffer?

These concerns can be relieved by a wide-open airing of ideas and experiences gained in the stereo process by those who have been there. Here is a compendium of our AM Stereo experience during its first active year.

## ***Getting on the Air with Stereo***

The complete stereo system can be divided into *four major project areas*:

- 1) generating the stereo program (studio work);
- 2) getting the stereo program out to the transmitter (this may be difficult due to STL availability/Telco line costs, etc.—however some innovation is bound to be forthcoming in this area);
- 3) choice of stereo processor and stereo generating system—a well-reasoned choice here would have to be based largely on equipment specifications and, to some extent, on the subjective judgements of users;
- 4) getting the stereo signal on the air (the transmitter/antenna system).

The experience gained and the data taken in AM Stereo installations in the past year has resulted in a better understanding of what to expect in the way of stereo performance from most

transmitters. All four stereo systems have been tested in these installations and, although the transmitters involved were mainly Continental, information has been gathered from other broadcast engineers and consultants who dealt with other transmitter types.

## ***Incidental Phase Modulation***

The multiplexing of the left and right stereo signals on an AM transmitter requires angular modulation of the RF carrier in addition to the normal AM process. In order that this part of the stereo signal will be eventually demodulated in its original form, it must go undistorted through the transmitting system. This requires that any angular or phase modulation that accompanies the normal AM process be held to a minimum. This phase wobble, called incidental phase modulation or IPM, will distort the stereo information being transmitted in the RF channel, causing a degradation in stereo fidelity and separation. One of the questions more commonly asked in preparing for AM Stereo is: What level of IPM is tolerable and how do we measure it and deal with it?

This question will be answered subsequently, but there should be just as much concern about the other facets of the stereo process which are just as important as IPM, namely the main and subchannel performance. By this, we mean the capability of the audio modulator as well as the angle modulated RF channel to transmit the stereo information with acceptable distortion figures.

***“...older transmitters  
can usually produce  
very nice stereo.”***

There is quite often some concern about whether or not an ‘old’ transmitter will be suitable for AM Stereo—because of a natural inclination to think of ‘old’ as synonymous with ‘out-of-date’ or ‘ob-

solete’. Nothing could be further from fact; some older transmitters have produced stereo results superior to that attainable in new transmitters. While the older generations sometimes hasn’t the ability to supermodulate or transmit a picture perfect square wave, they can usually produce very nice stereo.

## ***Connecting the Stereo Exciter***

Preparing a transmitter for AM stereo has, in every case, meant not only retuning and fine-tuning but also some modification of existing circuits. First, the RF output of the stereo exciter must be connected into the transmitter as a substitute for the crystal oscillator. In some newer transmitters this has already been provided for. In others, the modification consists of a means of selecting either the transmitter oscillator or the stereo generator by a two-position switch and also matching the RF output levels of both sources to provide equal RF drive to succeeding stages.

The RF level from the stereo generator can be as high as 40 volts peak-to-peak and can be either sine or squarewave. This is obviously too much drive for a transistor stage and must be attenuated. For driving the grid of a vacuum tube it may be insufficient and can be increased with a broadband step-up transformer in the transmitter. Prior consultation with the supplier of the stereo generator will be helpful in this regard. Some suppliers will ship the unit with an output level that has been specified in advance by the user. The mechanical switch used for the crystal/stereo generator selection should have provision for completely disabling the crystal oscillator when operating in stereo mode, since any small amount of cross coupling can cause a low frequency beat note if the two sources are not on exactly the same frequency. The beat note will show up as a phase modulated noise in the subchannel. The crystal can be disabled either by removing the supply voltage or, in some transmitters, by grounding one of the crystal terminals.

## Evaluating your transmitter

For someone contemplating the move to stereo, one of the more troublesome unknowns can be the possible inability to meet FCC/DOC performance specifications because of transmitter limitations. A fair approximation of what to expect in the way of stereo performance can be made by prior measurement of transmitter mono performance. The stereo quality will depend upon main and subchannel performance and IPM level. The main or mono channel can be measured in terms of harmonic distortion, frequency response and noise level by equipment already available at the station. The mono, or normal AM channel, transmits the sum of the left and right (L+R) stereo program to provide compatibility with existing mono receivers. The left and right difference information (L-R) is transmitted through the RF stages in the transmitter as angular modulation which makes performance measurements impossible without some sort of PM or FM modulator/demodulator equipment. There are, however, some assumptions that can be made here:

- First, since this modulation is transmitted without any requirement for amplitude linearity, like FM, there should be no distortion or response problems.
- Second, since any amplitude variations brought on by induced noise or filament hum will be stripped off during demodulation, noise level should be no problem. Both of these assumptions are valid about 90% of the time. There is occasionally a case where power supply ripple will cause a phase modulated hum or where narrow or non-symmetrical bandwidth of tuned circuits in the transmitter will give rise to distortion and response problems at modulating frequencies above 5 kHz. The Sony AM Stereo Receiver will detect the presence of hum in the subchannel simply by listening to your mono program with the receiver switched to AM stereo mode, either A or B position. If hum is heard in stereo mode that isn't there in mono, then it is a phase noise problem. This is easy to fix with additional power supply filtering in places connected to the low level RF circuits in the transmitter.

Subchannel distortion caused by tuned circuit bandwidth problems are usually no worse than the increase in distortion and drop-off in response experienced in the mono channel as modulating frequency is increased. This is one place where older, all-vacuum-tube transmitters have a slight edge over models with transistor RF drivers. The bandwidth problem stems from the large step-up in RF voltage in the tuned circuit which provides drive from

the output transistor to the grid of the first vacuum tube. The step-up is much smaller in tube-type drivers because they operate at a higher plate voltage.

## Measuring IPM

Although RF spectrum analyzers aren't commonly included in test equipment inventory, borrow or lease one to assess the condition of your transmitter as regards IPM. A distortionless and IPM-less transmitter which is modulated 100% at 1000 Hz will display on a spectrum analyzer screen a carrier pip referenced to the top or zero dB graticule line and an upper and lower sideband 6 dB below carrier amplitude and spaced 1 kHz on each side of carrier. If the transmitter has 1% harmonic distortion consisting of pure 2nd harmonic but still no IPM, sidebands will appear at 2 kHz either side of carrier and will be 40 dB below the 1 kHz pips or 46 dB below carrier reference. If the transmitter has 3% harmonic distortion (still 2nd harmonic) and no IPM, the 2 kHz pips will rise to 30 dB below the 1kHz sidebands or 36 dB below carrier. If we measure 1% 2nd harmonic distortion on a distortion measuring device and see 2 kHz pips down only 30dB, now we have


IPM. It isn't at all unusual to see the IPM pips down only 20 dB and occasionally 10 to 15 dB.


The source of the IPM will vary from one transmitter type to another, as will the level, which means that different transmitters require different treatment. For instance, IPM can be generated almost entirely in the power amplifier stage of the Continental Type 317C 50 kw transmitter, whereas the Continental 316F 10 kw has practically no IPM attributable to the PA but can generate a considerable amount in the exciter. Generally speaking, the newer transmitters which use tetrode power tubes exclusively will generate higher levels of IPM than older transmitters using triodes. The reason for this is that careful neutralization is a prerequisite of stable triode tube operation and low IPM is the by-product of careful neutralization. On the other hand, tetrode tubes operated in the standard AM frequency band do not even require neutralization for stable operation. But since the screen grid is seldom a perfect isolating shield between plate and control grid because of constraints on the amount of screen bypass capacitance that is used, the variations in RF plate voltage during amplitude modulation will cause a detuning or phase modulation of the grid cir-



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cuit at the modulating rate. This can be prevented only by neutralization or by maintaining the screen grid at cathode RF potential by heavy capacitance bypassing or by direct connection to the cathode. This, of course, would preclude the possible use of screen or plate modulation. In the Continental Type 316F 10 kw, there is no modulation applied to the power amplifier and so the PA screen grids are heavily by-passed which then minimizes IPM. The Type 317C 50 kw is screen modulated so therefore requires neutralization to reduce IPM. Plate modulated transmitters with tetrode power amplifiers require concurrent plate and screen modulation and will also require neutralization. This is true whether or not the modulation is applied by a Class B push-pull modulator or by a pulse width modulator.

The level of IPM that seems to be generally attainable, based on the stereo systems installed so far, is one which gives about 35 dB of midband separation and about 20 to 25 dB at 7500 Hz, depending on the stereo system in use. Some Continental 316F transmitters have achieved 40 dB of midband (1 kHz) separation and better than 30 dB at 7500 Hz, as have some older plate modulated transmitters. The Type 317C 50 kw usually gets 32 to 38 dB midband separation. The Type 315R-1 5 kw transmitter has typically 32 to 38 dB of IPM. The Type 314R-1kw runs typically 35 to 40 dB IPM.

## Reducing IPM

Organizing the transmitter for stereo operation first involves reducing IPM to its lowest possible level. This can be done either with a spectrum analyzer or with a stereo modulation monitor. With a spectrum analyzer, the transmitter tuning should be adjusted to minimize the PM sidebands. To do this, the modulation frequency is best kept at about 1000 Hz because the harmonic distortion is usually lowest here and the frequency is high enough to resolve easily on most spectrum analyzers. The modulation should be kept at about 90% to keep the PM sidebands at the highest level so they won't be masked by the sidebands caused by AM distortion products; 100% is not a good level because the AM distortion products will come up rapidly if the negative peak even barely exceeds 100% either by accident or by modulation monitor error. For this reason it is good practice to always have the modulation envelope under observation on an oscilloscope.

Ninety percent modulation at 1000 Hz will rarely produce more than 1 or 2% harmonic distortion, which will keep the distortion sidebands down 35 or 40 dB below the 1 kHz fundamental sidebands. This will allow resolution of PM products down to 35 or 40 dB. Experience has shown that the midband stereo separation

will generally be from 3 to 6 dB better than the level of the highest PM sideband. In other words, if the highest PM product is down 30 dB the midband separation will be from 33 to 36 dB. The separation at higher audio frequencies will depend not only on IPM but also on whether or not the sum and difference (L+R and L-R) signals undergo equal time delays through the transmitter. Since they are never exactly equal, the stereo exciter will have provision for equalizing the audio time delays. In some cases, there will be a greater delay through the RF channel (L-R) than through the mono (L+R) channel so that the delay circuits must be capable of switching into either the main or subchannel.

The load presented to the transmitter by the antenna system can have a significant effect on stereo separation and distortion depending on the magnitude of sideband VSWR and symmetry at frequencies 10 kHz above and below carrier frequency. It is best to optimize the stereo performance on the dummy antenna (if one is available) and then trim the high frequency equalization when operating on the antenna. If the station operates with different day and night antenna patterns or if plans call for using the same stereo exciter on two different transmitter types, then the exciter should have capability for selecting separately adjustable day and night or transmitter #1/transmitter #2 equalization circuits.

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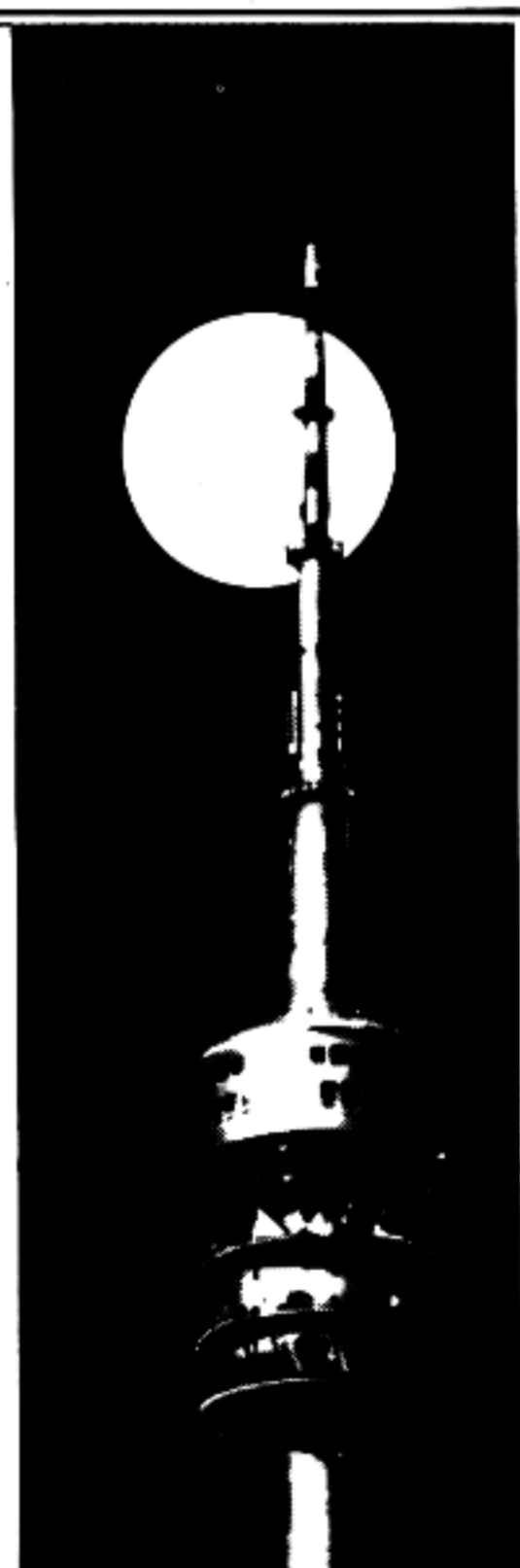
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The transmitter adjustments that mainly affect stereo performance will be the plate tuning and neutralizing circuits of the RF output stage in transmitters which are modulated in the final amplifier. In transmitters utilizing low level modulation such as the Continental 315F/316F, the tuning of the interstage coupling circuits in the exciter will generally control stereo performance. Initial adjustments can be made either with a spectrum analyzer or a stereo modulation monitor. The stereo systems which are supplied with a companion stereo modulation monitor will have a subchannel (L-R) demodulator built into the monitor. This L-R detector will, of course, also demodulate the incidental phase modulation which is present only during monaural transmission. The average level of IPM relative to the mono modulation can be measured by comparing the levels of L+R (mono) and L-R (IPM). For instance, if 100% envelope (L+R) modulation produces a reading of 10% L-R modulation, then the average level of IPM is 20 dB (ratio of 100%/10%) below 100% modulation. Some monitors have the capability of increasing the L-R meter circuit gain in 10 or 20 dB increments for resolving very low levels of IPM. The initial transmitter adjustments for AM stereo operation are made with about 90% envelope modulation at 1000 Hz. The critical tuning adjustments (plate tuning, neutralization, etc.) are made while watching the L-R meter on the modulation monitor and tuning for minimum reading. Experience has shown that the mid-frequency stereo separation will be equal to or slightly better than the ratio of main to subchannel cross-talk which is what is being observed in this condition. Experience has also shown that almost any transmitter can be optimized to produce IPM (or subchannel cross-talk) levels of 30 to 35 dB below 90% envelope modulation. By optimized, we mean that there has been no sacrifice in mono performance, efficiency or positive peak capability in exchange for good stereo performance.

### **Equalization and Audio Drive Level**

After the transmitter has been tuned for lowest reading on the L-R meter (or lowest PM sidebands on a spectrum analyzer), the time delay equalization circuits and the L+R (mono) audio level can be adjusted for best stereo operation. For maximum stereo separation, the audio level which produces 100% angular modulation (as read on the L-R meter when modulating with an L-R audio signal) must also produce 100% envelope modulation when switched to L+R. This level is normally around +10 dBm and the stereo exciter will have a control for trimming the L+R level for maximum separation. The high and low frequency

time delay equalizing circuits can then be adjusted to maximize separation at high and low modulating frequencies (7500 Hz for HF and 100 to 300 Hz for LF).

If the equalizing controls fail to maximize separation within their adjustment range, then they should be switched into the other channel; that is, from the main channel (variously called mono channel, L+R, I channel or In-Phase channel) to the subchannel (called L-R, Q channel or PM channel) or vice versa. As stated earlier, it's not unusual to have a greater time delay in the L-R than in the mono channel, especially when the mono channel group delay is very low, as in the case of the Continental Type 317C-2 50 kw transmitter.

### **Doing the Proof**

Single channel (left or right) stereo performance is usually on a par with mono distortion figures and sometimes lower distortion figures are measured in stereo mode. Stereo proof of performance measurements are now being made with up to 75% modulation of the right or left channel which in stereo operation with equal L and R would produce 150% envelope modulation. In a few cases where stereo distortion figures increased significantly in going from 60 to 75% modulation in single channel, or where

distortion at 7500 Hz was unusually high (above 5%), the problem was traced to RF bandwidth deficiency in the transmitter low level stages. A single stage RF network with a resistance ratio of over 100/1 and a loaded 'Q' of 30 was seriously degrading the performance of the angle modulated (L-R) component of the stereo signal. The cure was to decrease the 'Q' of the circuit. In some cases the stereo monitor was reading low above about 60% modulation, and in attempting to get to 75% the actual modulation depth was 100% or more. Since 75% modulation of right or left will produce 75% envelope modulation, the actual percentage can be read off the mono modulation monitor or by checking against the envelope detector (L+R) in the stereo monitor. This is why it's always a good idea to keep the RF modulation envelope under observation on an oscilloscope.

At almost every installation where a spectrum analyzer was on hand, the on-the-air stereo transmission was monitored to assure that no out-of-band emissions were present. In every case, even under extremely heavy processing and with high frequency pre-emphasis, there was no sign of illegal or excessive occupied bandwidth with any of the four stereo systems.

*Joseph B. Sinton is an engineer with Continental Electronics Mfg. Co. of Dallas, TX.*

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## BLAUPUNKT ARI TRAFFIC SYSTEM NOW IN CANADA ON CHFI, CKDS

The Blaupunkt Automatic Radio Information (ARI) system has been introduced into the Canadian market on CHFI-FM Toronto and CKDS-FM Hamilton. The system enables ARI-equipped FM car radios to receive traffic reports for a specific area. An inaudible tone activates the receiver, as long as the radio is on and tuned to the designated station—even though the volume may be down or a cassette is being played. The volume is boosted so that the driver will hear important bulletins.

Blaupunkt, a member of the Bosch group of companies, plans to introduce ARI to other parts of Canada, starting with the Windsor-Quebec City corridor. In West Germany, where ARI began in 1974, virtually every car radio now sold is equipped with the system. It was introduced last year in the U.S., where 17 radio stations now participate in the program.

**Technical Specifications:** ARI technology is completely compatible with current FM transmission equipment. Conversion of an FM station calls for the placement of a 57 kHz sub-carrier with modulations. An ARI transmission consists of three signals:

- 1) a 57 kHz pilot which distinguishes ARI stations from non-ARI stations;
- 2) a continuous zone signal to distinguish one ARI station from another;
- 3) a message indicator signal activated for

delivery of traffic/weather bulletins.

All of these signals are derived from the phase-lock to the 19 kHz stereo pilot. Through a series of dividers and/or multipliers each frequency is derived directly from the stereo pilot generated by the station's stereo generator.

With the ARI encoder it is possible to feed a composite signal into the unit with the output containing the baseband composite plus ARI signals. This composite signal can then be microwaved to the transmitter. It is also possible to feed a portion of the 19 kHz pilot into the encoder and to get out the 57 kHz ARI signal with its modulations. This signal would be fed into an SCMO input at the exciter.

Because the 57 kHz is the third harmonic of the 19 kHz pilot, the peaks of the 2-wave forms (19 and 57 kHz) do not occur at the same time. If you set the 57 kHz signal at a level 6 dB below the 19 kHz level, the total increase in modulations of the zone signal and message signal average out to a peak deviation which is no greater than the 19 kHz carrier alone. In other words, a station *does not have to turn down its modulation* in order to accommodate ARI transmissions.

Because the amplitude modulations of the 57 kHz carrier are very low in frequency (23Hz to a few hundred Hertz), bandwidth is very small. This provides total compatibility with the L-R upper sideband (53 kHz) and lower sideband of a 67 kHz SCMO (61 kHz).

mobile facilities in Toronto, Montreal, Quebec City and Edmonton. SK-970/97 series uses 2/3" pick up tubes, computer control of all set-up parameters.

- **Nautel**—has installed solid state AM transmitter at CKPR Thunder Bay; stereo to go on air at a later date.

- **Nabu Network Corp.**—will lay off most of its staff effective Nov. 13. Cable TV consumer tests in Ottawa and Alexandria, VA, will continue; Nabu says firm is viable, is seeking financing alternatives.

- **Novatel Ltd.**—will supply \$7 million mobile telephone system to Cantel Cellular Radio Group for Vancouver market; service to begin March 1986.

- **Oakwood Audio**—named first Canadian dealer for Logitek Electronic Systems, Inc. of Houston, TX.

- **Omnibus Computer Graphics**—has opened computer animation facility in Hollywood. With facilities in Toronto and New York, Omnibus becomes the only company with three computer animation facilities in North America; claims its F-1 computer resolution capabilities exceed quality of 35mm film. Future plans include joining all three facilities via satellite.

- **Sound Ideas**—has introduced *Production Ideas*, a collection of 1,000 musical themes, logos, newscast openers, stings, etc. Info: Brian Nimens, 86 McGill Street, Toronto, ON, M5B 1H2, (416) 977-0512.

- **TC Electronics**—named Canadian distributor for Marantz audio products, formerly handled by BSR (Canada) which recently ceased operation. TC is at 87 Brunswick Blvd., Dollard Des Ormeaux, PQ, H9B 2J5, (514) 683-7161.

- **Telesat Canada**—marked 15th year Sept. 1—now has 530 employees, five operational satellites and more than 135 major earth stations. 'World firsts' include: domestic communications satellite Anik A1 (1972), extensive use of unmanned earth stations, dual band satellite, Anik B (1978), commercial use of the 14/12 GHz band (1980), commercial DBS (1982).

- **Triple Crown Electronics Inc.**—has purchased Cable Power Inc. of Redmond, Wash., maker of standby power supplies for cable TV systems; is negotiating purchase of Rediffusion interest in Delta-Benco Ltd. (99%) for 270,000 Triple Crown shares. New U.S. facility is to be constructed at Deerfield Beach, Florida.

continued on page 76

## CANADA

- **Abroyd Communications Ltd.**—new name for the Abroyd Construction division of Dahmer Steel, now owned by former Dahmer employees A.J. Nightingale, P.Eng., and J.T. Verlis, P.Eng.

- **Atlas Sound**—has expanded catalog of mic stands, adding new models for current trend to smaller, lighter microphones.

- **Blackburn Group**—new name for London Free Press Holdings, owners of CFPL AM-FM-TV, CKNX AM-FM-TV and the London Free Press.

- **Caelum Technologies Ltd.**—awarded contract to supply and install satellite receive systems for TSN and Global TV in Toronto, designed in conjunction with Imagineering Ltd. TVROs include multiple 4.5 metre Andrew motorized antennas, SED electronics and Caelum switching devices in both 4 and 12 GHz.

- **Caveco Equipment Ltd.**—appointed exclusive western Canada distributor for Eimac tubes; new branch office at

10215-178 St. Edmonton, AB, T5S 1M3, (403) 483-2213, Tx 037-42883. Western sales rep: Rick Popescue.

- **Comfort Sound**—has moved to a new 2,000 sq. ft. facility at 26 Soho St., Suite 390, Toronto, Ont., M5T 1Z7, (416) 593-7992; has added a SMPTE Videolock system with a JVC 3/4" Video Recorder for full audio post-production for video, also a synthesizer suite.

- **Downtown Studio**—low-rental 40'x50' production facility at 142 George St., Toronto, re-activated under management of Bob Rodgers and Bill Somerville of Bellair Communications (927-1121).

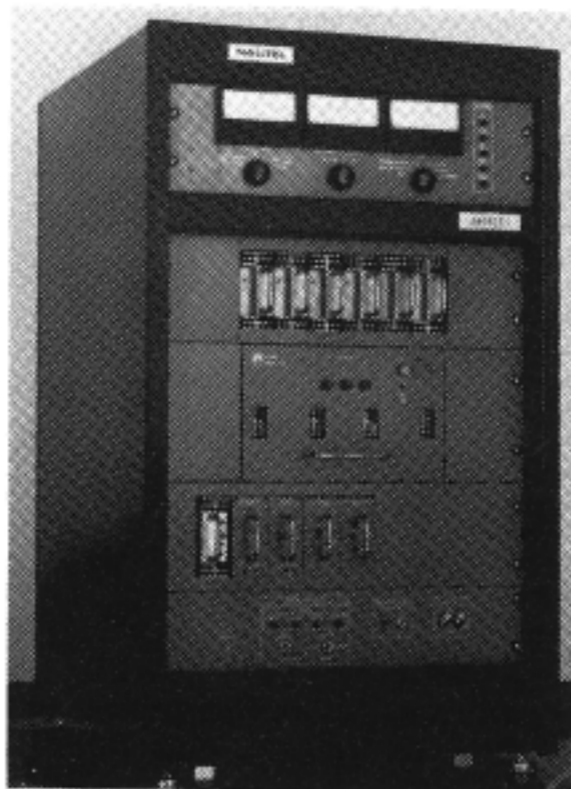
- **Gerr Audio**—appointed distributors for Countryman Associates Inc. line of microphones and accessories.

- **Glentronix**—new address is 90 Nolan Court, Unit 7, Markham, Ont. L3R 4L9, (416) 475-8494; same tx: 06-986741.

- **Hitachi Denshi Ltd.**—supplying CBC with 20 SK-970 mobile field cameras and 10 SK-97 EFP hand-held cameras, for

## Why Broadcasters are Buying Nautel Solid-State Transmitters

- *No modification needed for AM Stereo.* AMPFET transmitters need NO MODIFICATION to incorporate any of today's AM stereo systems. Modular design means that the customer merely has to pull out the RF Driver module, which contains the Crystal Oscillator and low level RF Drive stage for monaural operation, and replace it with a plug-in AM Stereo Interface module, which provides an RF Interface for any of the AM stereo systems on the market with NAUTEL's Class D Power Amplifier system. This is an added advantage in the event of any problem within the Stereo system: it is quick and simple to revert to monaural operation, provided a spare RF Driver module is purchased.



- *Economy of Ownership* The AMPFET 1, since it is totally solid state, does not contain any electronic components which wear out unlike a vacuum tube transmitter. Your savings with an AMPFET 1 (1 kw) can be in the order of \$715 a year—much more for higher powers!

- *Reliability*

The table shown indicates the results of field reliability data gathered over a one-year period (1983-84). The sample included all AMPFET transmitters in operation for 1000 hours or more—some in operation for over a year.

Tx type:	Number:	Cumulative On-Air Time:	Failures:	Mean Time Between Failures:
AMPFET 1 (1 kw)	13	58,320 hours	2	29,160 hours
AMPFET 5 (1 kw)	6	26,160 hours	0	26,160 hours
AMPFET 10 (10 kw)	9	41,520 hours	1	41,520 hours

- *Backup*

Nautel offers installation and commissioning services to ensure smooth installation; and a complete set of spare modules is virtually equivalent to having a backup transmitter!

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## NEC TV Transmitters for CBC Edmonton, CBC Winnipeg

Installation and check-out of new NEC television transmitters is being completed by MSC at four major CBC facilities in western Canada:

CBWT Winnipeg (ch. 6, English) - 2 PCN-1213-AL (10 kw)  
 CBWFT Winnipeg (ch. 3, French) - 2 PCN-1205-AL (5 kw)  
 CBXT Edmonton (ch. 5, English) - 2 PCN-1225-BL (20 kw)  
 CBXFT Edmonton (ch. 11, French) - 2 PCN-1213-AH (13 kw)

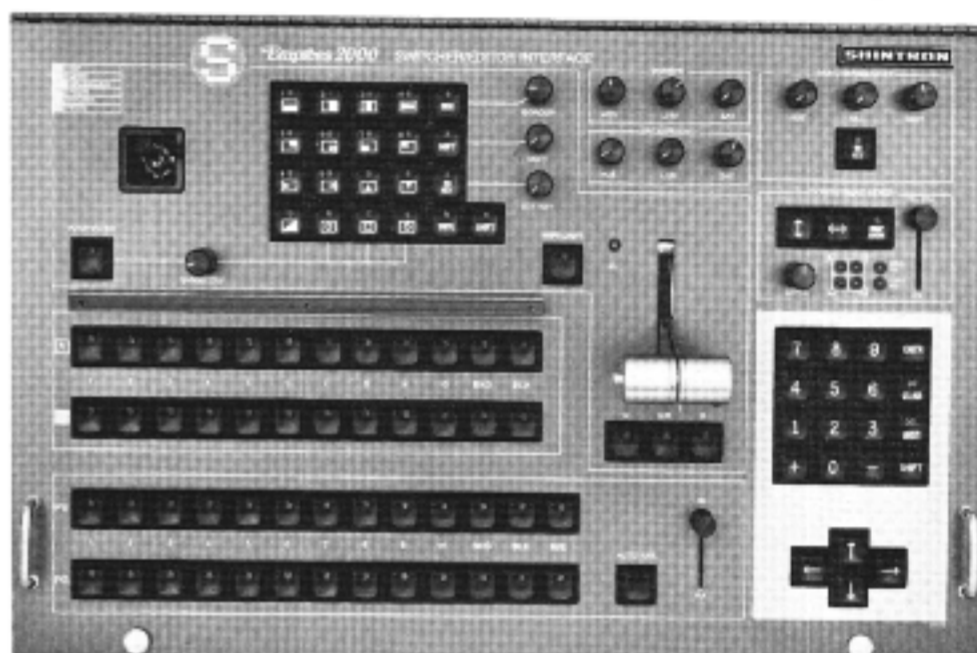
At all four sites, the transmitters are in a parallel arrangement, and at CBWT, the installation includes automatic exciter and output switching.

All systems use combining equipment supplied by COMARK, specially selected by MSC for integration with the NEC transmitters in the interest of economy.

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 CFTM-TV Toronto

### A52 DIGITAL EFFECTS SYSTEM

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 CBC-TV Toronto/National News  
 Global TV Toronto/News Dept.  
 TSN—The Sports Network, Toronto  
 Spectra Video Ltd., Winnipeg