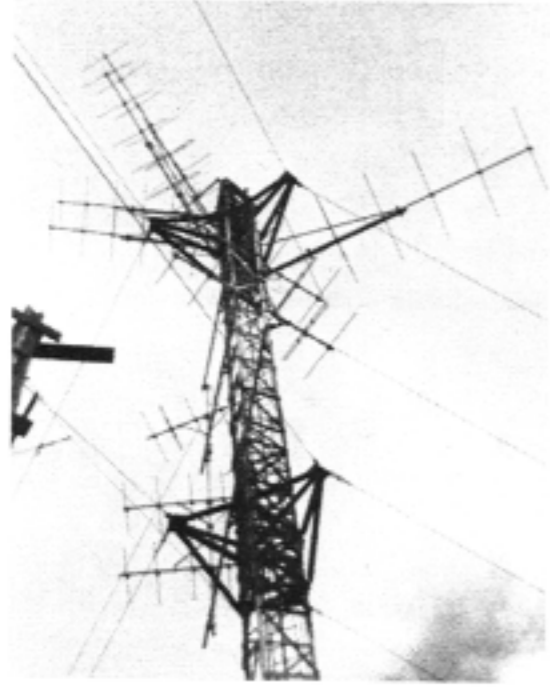


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# happenings

● *Mutual Broadcasting System plans to use satellite transmission to link its nationwide U.S. radio network. Broadcasts will be carried from Mutual's headquarters in Arlington, Virginia, via the Western Union "Westar" satellite. They will be received by 500 earth stations—to be supplied by California Microwave at a cost of \$3.5 million—using a 10-foot antenna with frequency conversion and audio program channel equipment. The earth stations will carry two 15 kHz full fidelity channels. Receive terminals operate in the 3.7 to 4.2 GHz band, and provide 50 to 15,000 Hz output at a signal-to-noise ratio greater than 65 dB and a total harmonic distortion less than 1%. System parameters include satellite EIRP per channel of +22 dBW and receive G/T of 15 dB.*

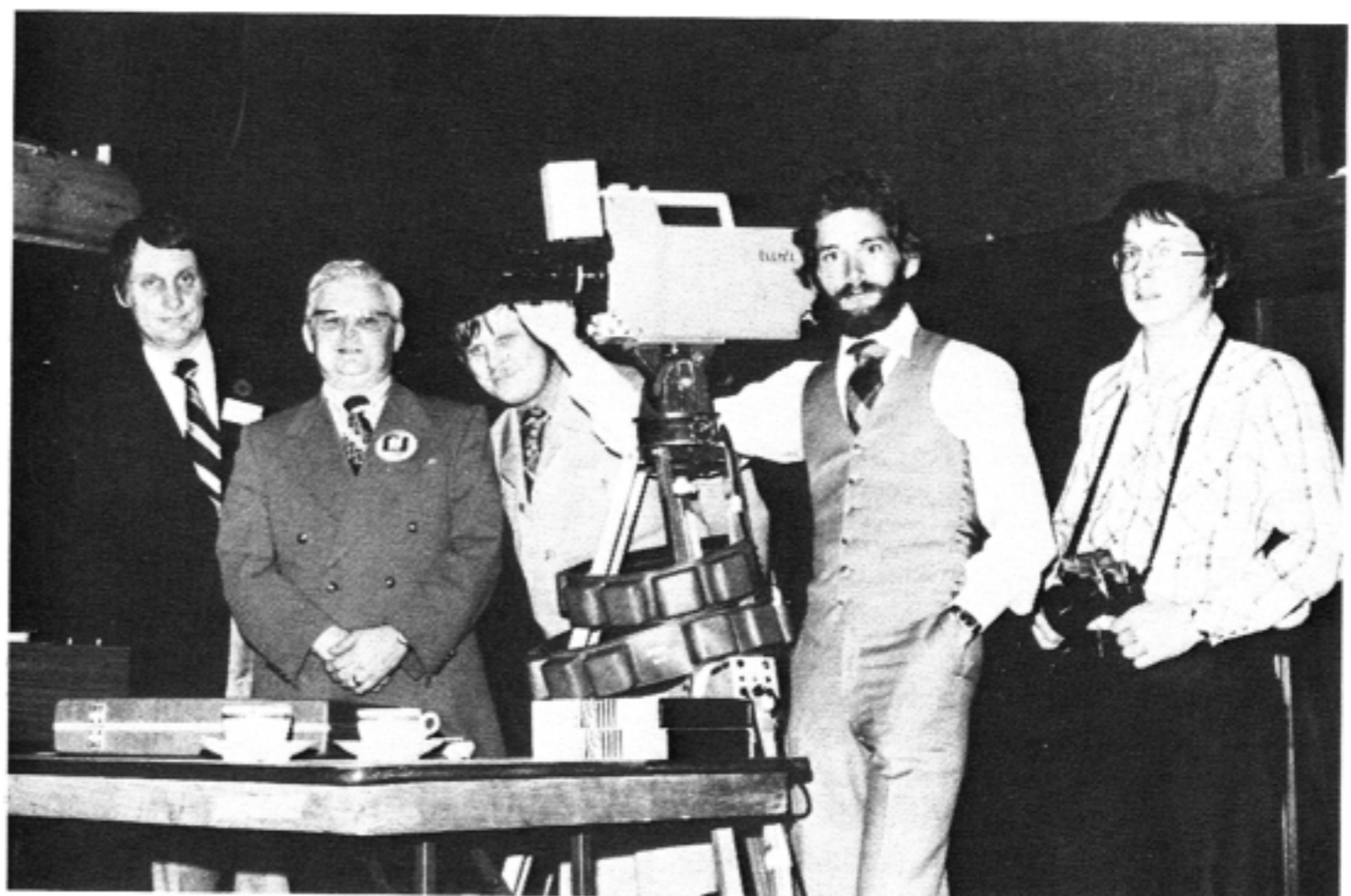
● When 850 people turned out for TV Day on November 8th at the Royal York Hotel, including 65 presidents of companies using the television medium, the Advertising & Sales Club of Toronto was mighty happy. The day was planned by a committee from the Association of Canadian Broadcast Representatives Inc. TV section, in cooperation with TvBureau Canada, ably assisted by a behind-the-scenes crew that included (photo—left to right): **Peter Lighthall**, Leo Burnett Advertising Agency, production co-ordinator & producer; CHCH-TV technicians **Bill Vollick** and **Dave Sillett**; **Paul Sampson** and **Al Joyner**, School of Radio & Television on Arts, Ryerson Polytechnical Institute. (Story and photo courtesy of Andy McDermott.)

● *Newsradio, headquartered at CKEY Toronto, has contracted with the TransCanada Telephone System for a full time voice quality network to relay voice reports to 24 stations in 22 cities from Vancouver to Cornerbrook. It will also provide a five-city news gathering network to feed reports to Newsradio's editors in Toronto and Ottawa.*

● **Lee Jourard**, of Cablevue (Quinte) Limited, has been elected chairman of the Ontario region Program Directors committee of CCTA. Vice-chairman is **Scott Colbran** of Classic Communications, Richmond Hill, and secretary is **Michelle Perron** of Quinte Cablevision, Picton.

● *The Television Academy of Arts and Sciences has awarded a citation for "outstanding achievement in engineering" to Varian Associates. The award cites Varian for improving the efficiency of UHF Klystron tubes, reducing power consumption by 10%. A second award went to American Broadcast Corporation Systems for its work on polarized antennas for TV.*

● The International Conference on Communications will be held in Toronto, June 4-7, 1978, at the Sheraton Centre. The event is sponsored by the Communications Society Conference Board of IEEE and will include papers on such subjects as microwave, digital and satellite systems, and spectrum utilization. The exhibits chairman is **John Root** of ROR Associates, 21 Rolark Drive, Scarborough, Ont. M1R 2S7.



## happenings

● *Anik-B*, Telesat Canada's newest satellite, is undergoing testing at RCA in Princeton, N.J., in preparation for launch later this year. The 2000 lb. satellite is the first to combine both 6/4 and 14/12 GHz frequency bands. Its antennas will provide for spot beams to serve four major regions of Canada on the 14/12 GHz frequencies, which are suitable for broadcast use and require relatively small earth receivers.

● **TV Ontario** has taken 17 awards, to place second in the NAEB Graphics and Design Awards. TVO was the only Canadian winner in the U.S. educational broadcasters' competition, with first place going to WGBH-TV Boston.

● Reports from the 1977 convention of NAEB (National Association of Educational Broadcasters) held in Washington November 13-17 indicate that while equipment displays were fewer in number, there was greater opportunity for delegates to talk with exhibitors. One-inch video tech-

nology was a feature of both the exhibits and the engineering program.

● A survey of mobile radio on the prairies, conducted by **Roger Schindelka** of the University of Saskatchewan, indicates that citizen's band users doubled during a recent 10-month period, and that 75% of them use CB for agriculture or other business purposes. As elsewhere, congestion in urban areas is becoming a problem. Meanwhile a U.S. report says that CB manufacturers will soon be offering such features as selective calling, priority channel scanning, channel memory storage and digital keyboard entry, and the U.S. Coast Guard has announced it will use CB equipment in all its search and rescue stations to improve contact with small boaters.

● **CFPL-TV London, Ont.**, has purchased the TeleMation dual Compositor I Graphics System, at a cost of \$73,000. The package includes a CM-3002 Expanded Font Memory and CO-3001 Expanded Edging

Options, as well as training in Salt Lake City.

● NAB has sold a record amount of exhibit space for the 1978 show at the Las Vegas Centre—233 exhibitors, compared to 188 in 1977, occupying 30,000 more square feet than last year. Among the personalities to appear at the convention are former California governor **Ronald Reagan** and country singer **Charley Pride**.

● **Farinon Canada Ltd.** has been awarded contracts with Alberta Government Telephones for the supply of 8-GHz Digital Radio and associated Digital Multiplex equipment. This is the first Canadian application of medium capacity digital radio in the 7.725-8.275 GHz band. Delivery of the three-hop system is scheduled for late 1978, and will initially provide 16 protected T1 lines, switched on a hop-by-hop basis between Red Deer and Stettler. Further use of such systems is anticipated on spur or feeder routes from the higher capacity 8-GHz Trans Canada and Interprovincial digital routes, as well as in the more remote areas of the country where traffic volumes will not economically justify higher capacity equipment.

● Veteran traffic reporter **Eddie Luther** has joined CKEY Toronto. Licensed to fly both fixed and rotary wing craft, Luther was previously with CFRB and CHFI/CFTR.

● **RCA** introduced its new PM-85SL dual magnetic reproducer system at the Los Angeles SMPTE. The system interfaces with a variety of film and tape machines and is available in configurations capable of recording up to six tracks or reproducing up to 12 tracks. For telecine operation, the system can be locked or referenced to TV vertical sync.

● Campus broadcasters from over 100 stations attended a recent regional conference of the **Intercollegiate Broadcasting System** in San Francisco. Over 40 workshops were held to meet the growing needs of the campus broadcasting scene.

● A 56-page guide to producing effective magnetic sound tracks has been prepared by Kodak to coincide with the 50th anniversary of sound motion pictures. The title is *Sound—Magnetic Sound Recording for Motion Pictures* and it lists at \$6.25.

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# GREAT MOMENTS IN NETWORK RADIO HISTORY.

**The date: July 1st, 1927.  
Canadian Network Radio is Born!**

On that Confederation Day in 1927, commemorating the country's diamond jubilee, a feeling of national unity gripped Canadians as they "listened in" to the first coast-to-coast radio broadcast in Canada.

An estimated five million listeners jammed store fronts, sidewalks and parks, wherever loudspeakers were located, to hear this historic broadcast live from Ottawa. At Jeanne Mance Park in Montreal, for example, 20,000 people gathered for the broadcast.

Among the voices heard on that historic occasion were those of Prime Minister William Lyon Mackenzie King and Colonel Charles Lindbergh, who had made aviation

history a few months earlier. Singing by various choral groups and playing of the carillon were also heard.

Jacques Cartier, the French language commentator from CKAC in Montreal, was so moved by the proceedings that he remarked "I can't help but bring to your attention the real sense of unity that exists in our country . . ."

The National Broadcast Committee, which co-ordinated the bilingual broadcast, received generous support from Canadian National Railways, Canadian Pacific Railways, and other telephone and telegraph companies. Together, these companies made available about \$3 million in equip-

ment and co-operated in the co-ordination of some 23,000 miles of circuitry needed to link the country electronically.

The CNR, a pioneer in radio broadcasting, was responsible for arranging the actual pick-up and feed from Ottawa to participating stations, including its own in Moncton, Ottawa and Vancouver.

In addition to the CNR radio network, twenty stations participated in this first national hook-up. They included WWJ in Detroit, for the benefit of listeners in southwestern Ontario, and the Marconi beam station in Drummondville, Quebec, which relayed the broadcast to the British Isles and on to the continent.

From a technical standpoint, listeners termed the first nation-wide broadcast an "unqualified success" with favourable responses coming from every part of Canada, as well as the U.S., South America, Great Britain and even New Zealand.

Among those listening to this historic first were passengers travelling throughout Canada on CN trains equipped with radio and telephone cars.

CN began radio broadcasts on its trains in the summer of 1923 and, later, "listening in" became so popular that all main line trains in the system were equipped with radio cars.

Sir Henry Thornton, the first CNR president and a principal proponent of radio's development, regarded the new medium as a complementary part of the communications complex he headed. Such was his commitment to radio that he said, "it is only through nation-wide broadcasts that we shall accomplish the encouragement of a feeling of kinship between all parts of the country, to bring home to all sections more vividly our common aspirations and achievements."

The CNR, operating from its own studios and stations, provided Canadians with a number of broadcast innovations during its ten years of operation, such as the first radio broadcast on a transcontinental train and the first network programming in Canada.

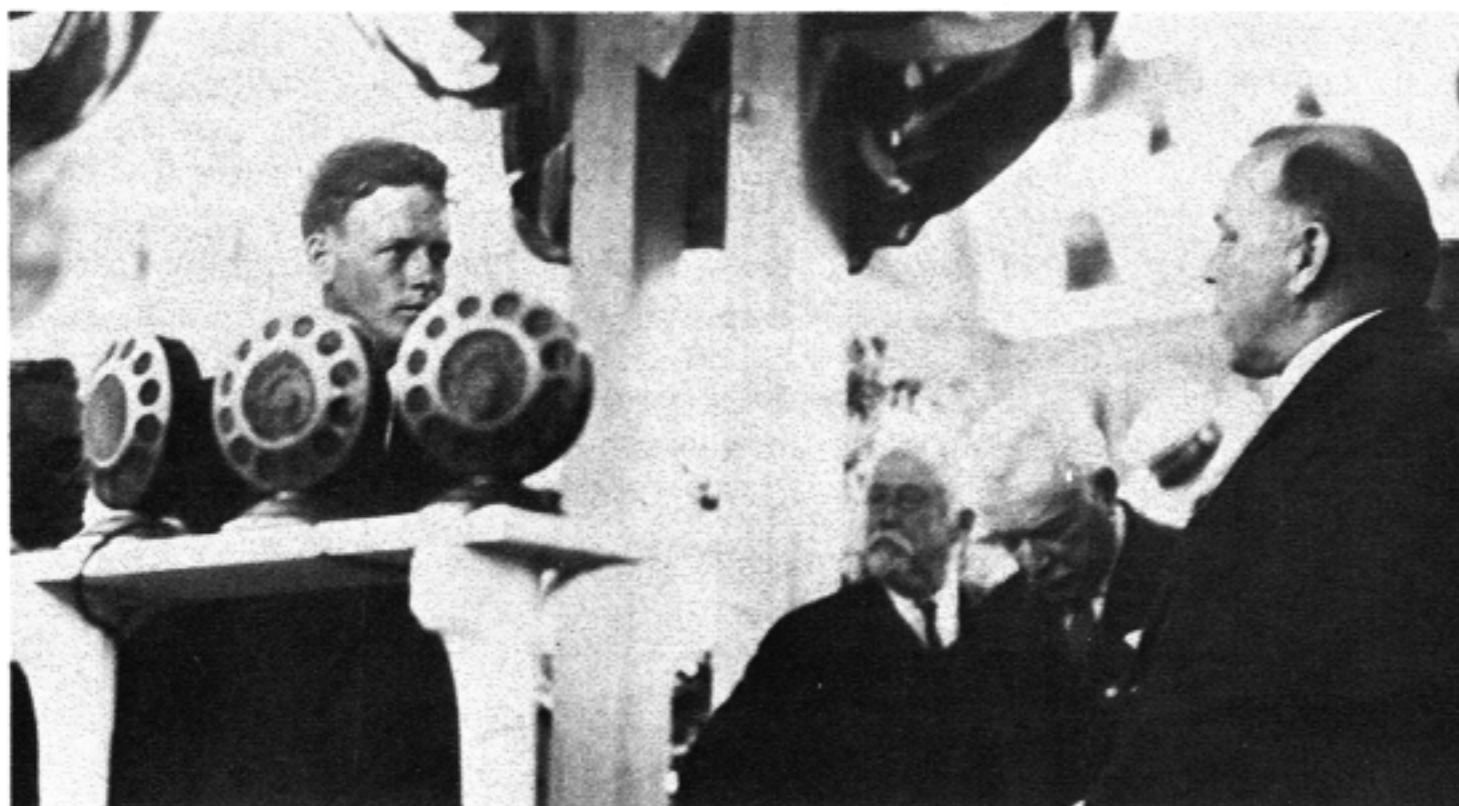
Its programming—including broadcasts of the Toronto Symphony Orchestra and the dramatization of Canada's early history in the "Romance of Canada" series—made a significant contribution to the development of Canadian culture and talent.

Despite its broadcasting successes, CNR was forced to drastically reduce its radio service during the depression. At the same time, public agitation for a national radio service resulted in the creation of the Canadian Radio Broadcasting Commission in 1932. A few months later, the railway's sale of its radio facilities to the CRBC effectively ended the first era in Canadian radio broadcasting and paved the way for the CBC.

And although CN is no longer directly involved in radio broadcasting, CNCP Telecommunications is providing the necessary electronic links for many of Canada's broadcasters.



*Passengers in Canadian National radio-equipped cars were among five million Canadians who listened in to the first national radio broadcast in Canada. The occasion was the country's Diamond Jubilee, 50 years ago.*



*Prime Minister Mackenzie King (r) welcomes aviator hero Charles Lindbergh at Canada's Diamond Jubilee celebrations in Ottawa, July 1, 1927. The event was the first national radio broadcast in Canada, carried by 23 stations including the CNR network, later part of the CBC.*

# AM NULL FILL

by Bill Jones

## Introduction

Null fill is a term more normally applied to TV and FM. However, nulls do occur in AM coverage—often just where they are not wanted.

With any AM pattern, blind spots occur due to:

- topographical screening in hilly terrain
- artificial screening in built-up areas
- electrical interference.

Nulls are generally more prevalent with directional antennas, in direct ratio to the number of towers used in the array.

## Null Filling

The only way to fill a null is to put a signal into it.

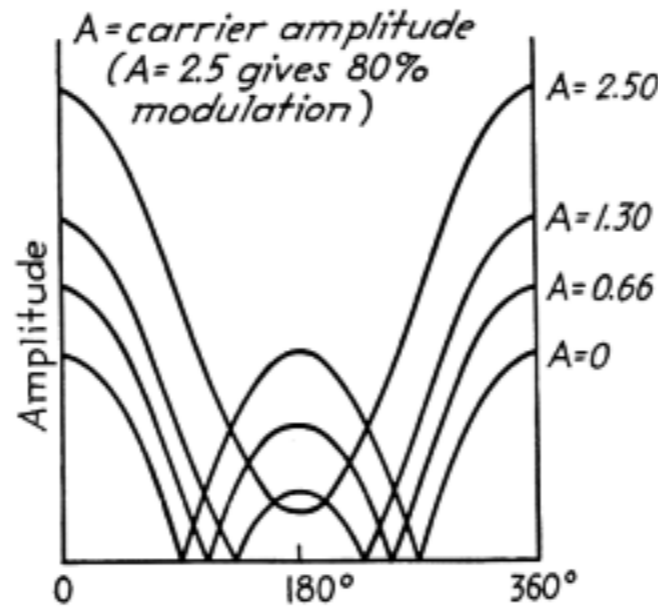
This requires transmitted power which is not forthcoming from the base transmitter. Therefore, it is necessary to put a "booster" transmitter in that null, on the same frequency and in the same phase—in other words, synchronized and phase-locked.

It may be a temptation to attempt an off-air pickup and retransmit at the required power. A little thought will soon dispel this idea, since in zero or low signal strength areas, noise becomes an immediate problem.

Of more serious import is the condition which exists in nulls resulting from multiple tower arrays—a common situation. The ideal is a common impedance point  $50 \pm j0$  over the band. This ideal is never achieved, with some systems varying widely within the 10 kHz. This results in the directional pattern varying at frequencies different from the carrier, so that sharp nulls at the carrier frequency do not exist for the sidebands.

In this circumstance reception in the null becomes double sideband suppressed carrier, with resulting distortion in the receiver. This effect is noticeable listening to a car radio when driving through a null or mistuning a home receiver. Reintroduction of the carrier at this point, similar to insertion of a carrier in single sideband receivers, could be considered a solution. But, whereas single sideband transmission in communications modulated other than by narrow band speech is extensively used, the case for broadcast is somewhat more difficult.

Distortion caused by variations in carrier amplitude is shown in Fig. 1. The curves relate to an envelope shape for one modulation cycle. It is obvious that serious distortion occurs as the carrier level drops.



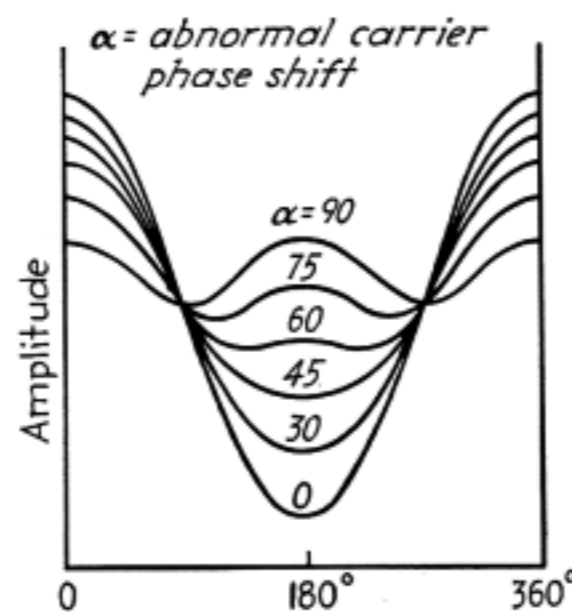
(b) Effect of carrier amplitude

Although the technique of ultra stable crystals is well advanced, it should be noted that a shift of a few cycles from the carrier frequency, not too important with narrow band operation, becomes extremely so for the transmission of music.

Take a 250 Hz fundamental music note with harmonics of 500, 750 and 1000, etc. Transmitted on 1 MHz, the sidebands produced would be  $1 \text{ MHz} \pm 250$ ,  $\pm 500$ ,  $\pm 750$ . If the new carrier is introduced say 10 Hz off, we have sidebands with audio components of 240, 490, 740 and 990 on one side, and 260, 510, 760 and 1010, none of which are in harmonic relation to each other, hence producing noticeable distortion.

Assuming there is a fully synchronized carrier, that is a carrier exactly on frequency, there still exists the problem of carrier phase, which if not in phase with the sidebands as per the original transmission, can produce high levels of distortion in the modulation envelope.

Fig. 2 shows how carrier phase affects the envelope.



(a) Effect of carrier phase

Two major considerations therefore exist to re-insert the carrier:

- accurate synchronized frequency,
- accurate synchronized phase.

These could probably be achieved by manning a reinsertion transmitter with personnel sufficiently skilled to maintain frequency and phase within the necessary parameters, but the cost would be prohibitive.

The above has been somewhat of a theoretical discourse dealing with extremely sharp nulls within a radiated pattern where the carrier is attenuated to zero or close to zero.

However, many nulls do not demonstrate this peculiarity but are basically broad in Q (wider bandwidth), attenuating the total signal including the sidebands. Here the total signal has to be boosted. Nevertheless, the same requirements concerning carrier phase and frequency apply, since in areas adjacent to the null, where the booster is operating, will also receive the parent transmission, and any variation in frequency between the two will create heterodynes or flutter.

Assume the difference between the two carriers is less than 20 or 30 Hz—a reasonable assumption that the carriers will be that close—the detector output of the receiver will show the difference frequencies formed by the carrier of one, the desired or stronger one, beating with the sidebands of the other, giving rise to sideband noise.

If the carrier frequencies are taken closer together, this noise causes flutter, notably when nighttime skip signals are received from a co-channel station.

The above demonstrates the necessity for frequency synchronization. A more difficult problem is establishing the phase relationship between the two carriers.

Fig. 2 demonstrates the order of distortion which can exist with a carrier out of phase with the sidebands.

There is now the condition of two modulated carriers having a phase difference and the effect on the detector of the receiver.

With synchronized carriers of similar amplitude but phased incorrectly, some sideband frequencies will cancel out, others will be augmented, while others will have levels altered. It is therefore essential that any gap fill transmitter should not only have the same frequency, but also the same phase.

The problem is related to propagation paths. Assuming that the parent transmitter and the local transmitter are phased correctly, there exists at any reception point, other than the local source, phase difference due to the varying paths—with the exception of that on line through the two physical locations of the transmitters in the outward direction.

In the worst situation, the carriers could cancel, generating a suppressed carrier double sideband signal (as already discussed). It can be shown with linear detectors in a receiver that a capture effect exists when the detector is fed with two signals which differ in some characteristics when one signal is stronger than the other. Considering the worst circumstances for interference, the strong signal should be a minimum of four times that of the weaker signal if distortion is to be discernable.

This is an extremely useful factor, as it dictates what power should be allocated to the local transmitter and its siting within the null, related to the field strength of the parent transmitter. Interference contours, similar to nighttime limitation contours, can be plotted to determine whether the local transmitter should have some directivity, etc.

**Practical System**

The simplest method to achieve these conditions is to employ a Telco feed modu-

lating the local transmitter. To ensure correct frequency and phase, a pilot tone derived from the main carrier frequency can be sent down the line, say at 8 kHz for an 8 kHz equalized line (15 kHz if desired). With this system, it is necessary to delay the audio modulation to the main transmitter in order to compensate for the delay in the Telco line.

The second method is to use STL's. Delay within the STL transmitter and receiver is constant, and can be compensated; transmission time from the parent transmitter to the local and from the STL transmitter to the local is the same, if both STL and parent are co-sited; therefore multiple null filling can be accomplished without group delay variants. The pilot frequency, derived and phase locked to the parent frequency, can be transmitted via SCA (SCMO). The disadvantages of the STL system are:

- capital cost
- availability of frequencies
- limited range in the 400 and 900 MHz bands (could be surmounted by multiple

hops, but at the risk of compounding the capital cost. Multiple hop on one leg, but not on another, would necessitate group delay adjustments.)

The most serious disadvantage would be the siting problem. AM transmitter sites, by choice, invariably are located on flat, low-lying land with a minimum of obstructions and high ground conductivity. This is not usually the ideal site for an STL transmitter antenna, and certainly not for numerous STLs radiating in differing directions. To use an STL at the studio presents, in most cases, a worse situation, as studios tend to be downtown where buildings block direct line of sight. A solution would be to locate on existing TV and FM towers. Any location other than the parent AM site would require group envelope delay compensation.

Both Telco and STL systems are point-to-point feeds, with disadvantages of excessive delays, siting and cost.

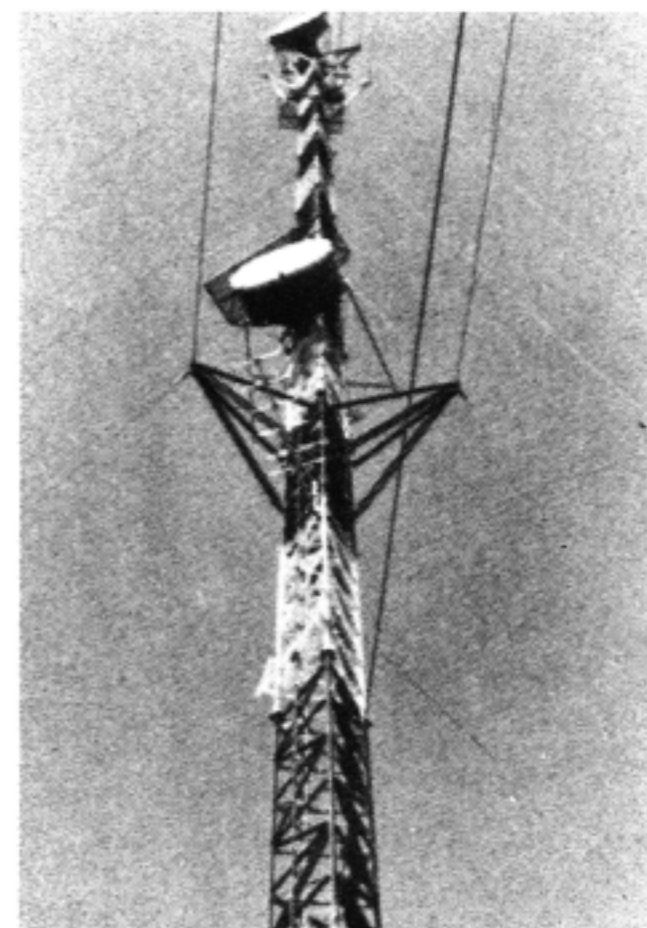
To avoid the point-to-point concept, it is necessary to "broadcast" the local signal. FM broadcasting provides a means for

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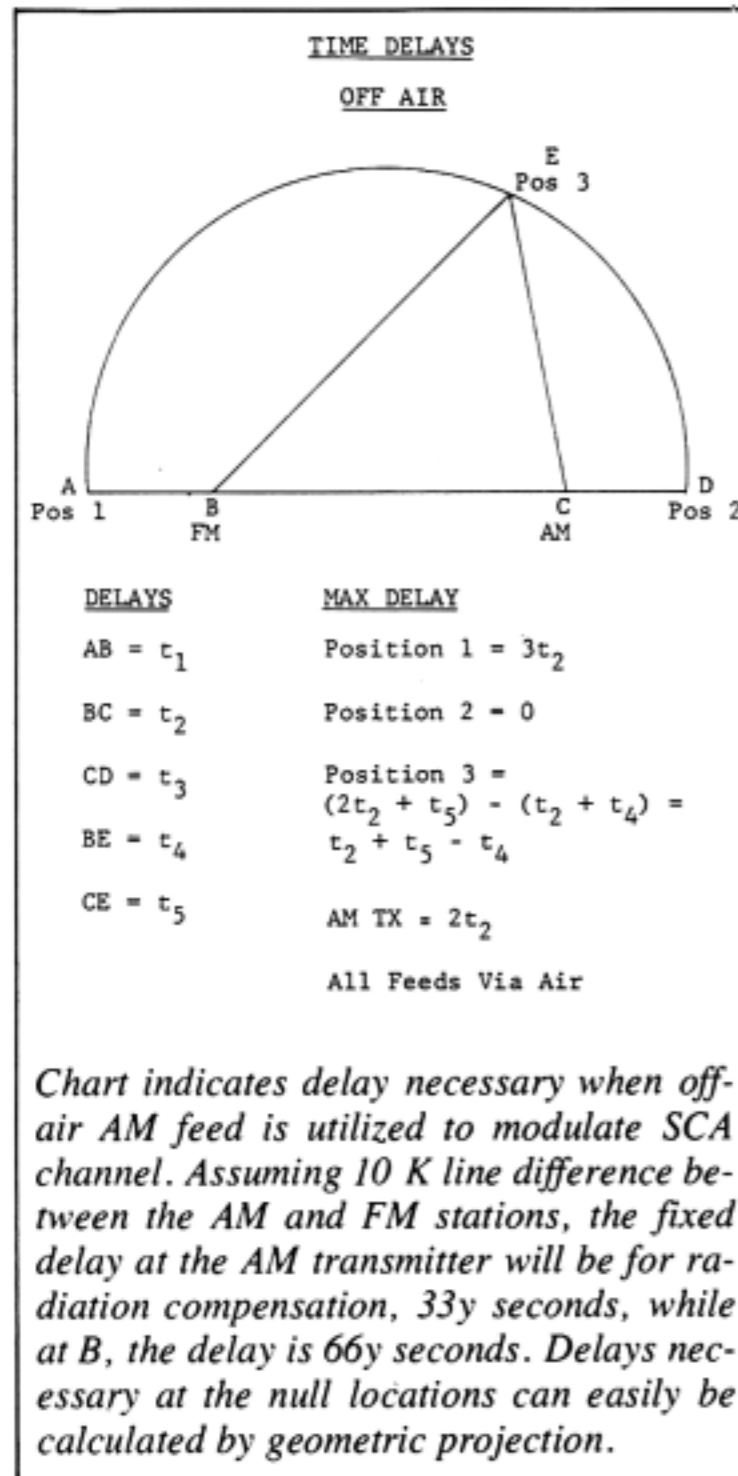
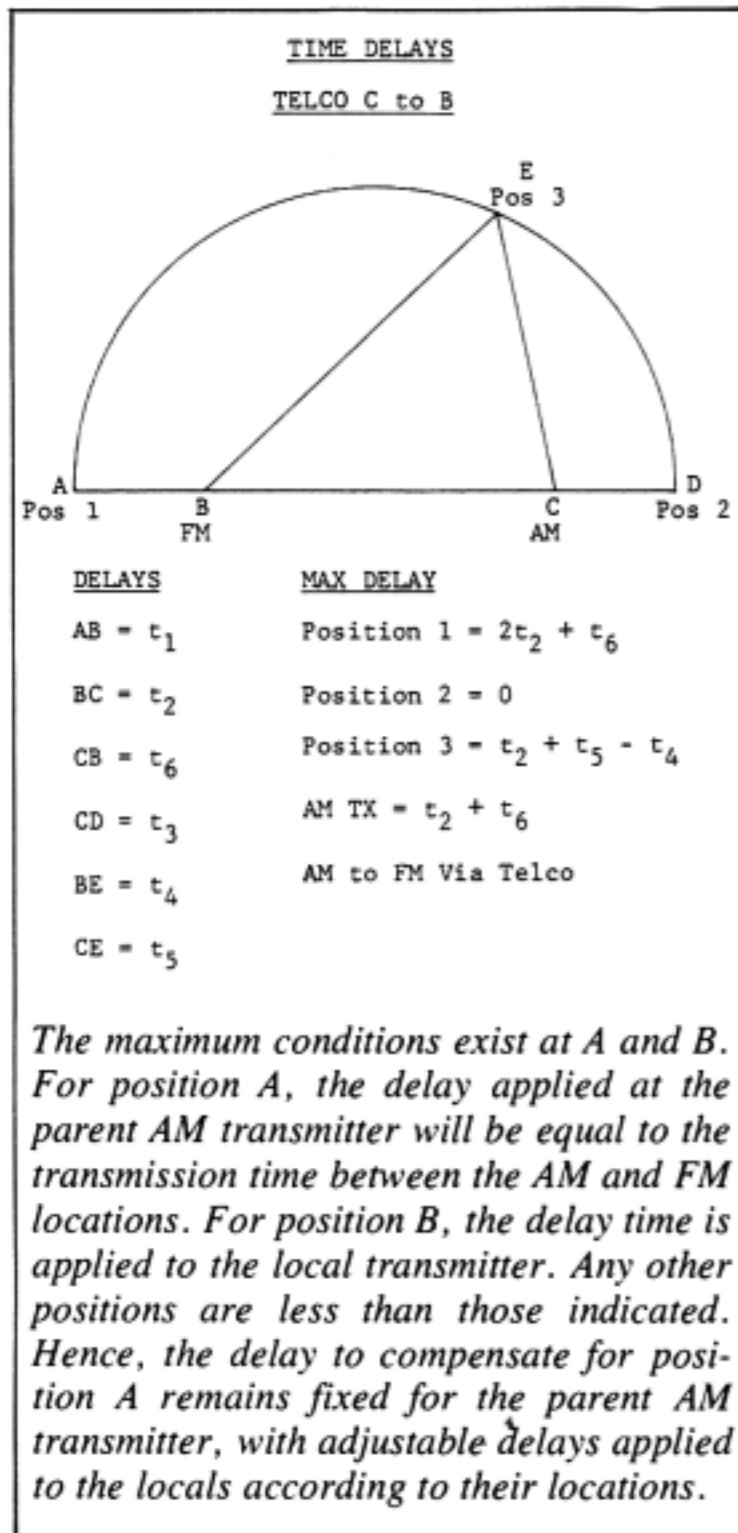
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# AM NULL FILL



transmitting the local signal, which although not ideal is feasible under certain conditions and in certain areas.

In most cases, AM and FM facilities are under the same ownership, which simplifies the joint use of both systems. Where FM is owned separately, the possibility exists to rent service. The advantages of using FM broadcast to feed the local null fill transmitter are:

- height of the FM tower
- relatively noise-free transmission
- freedom from night limitations
- circular polarization, and
- well defined coverage area.

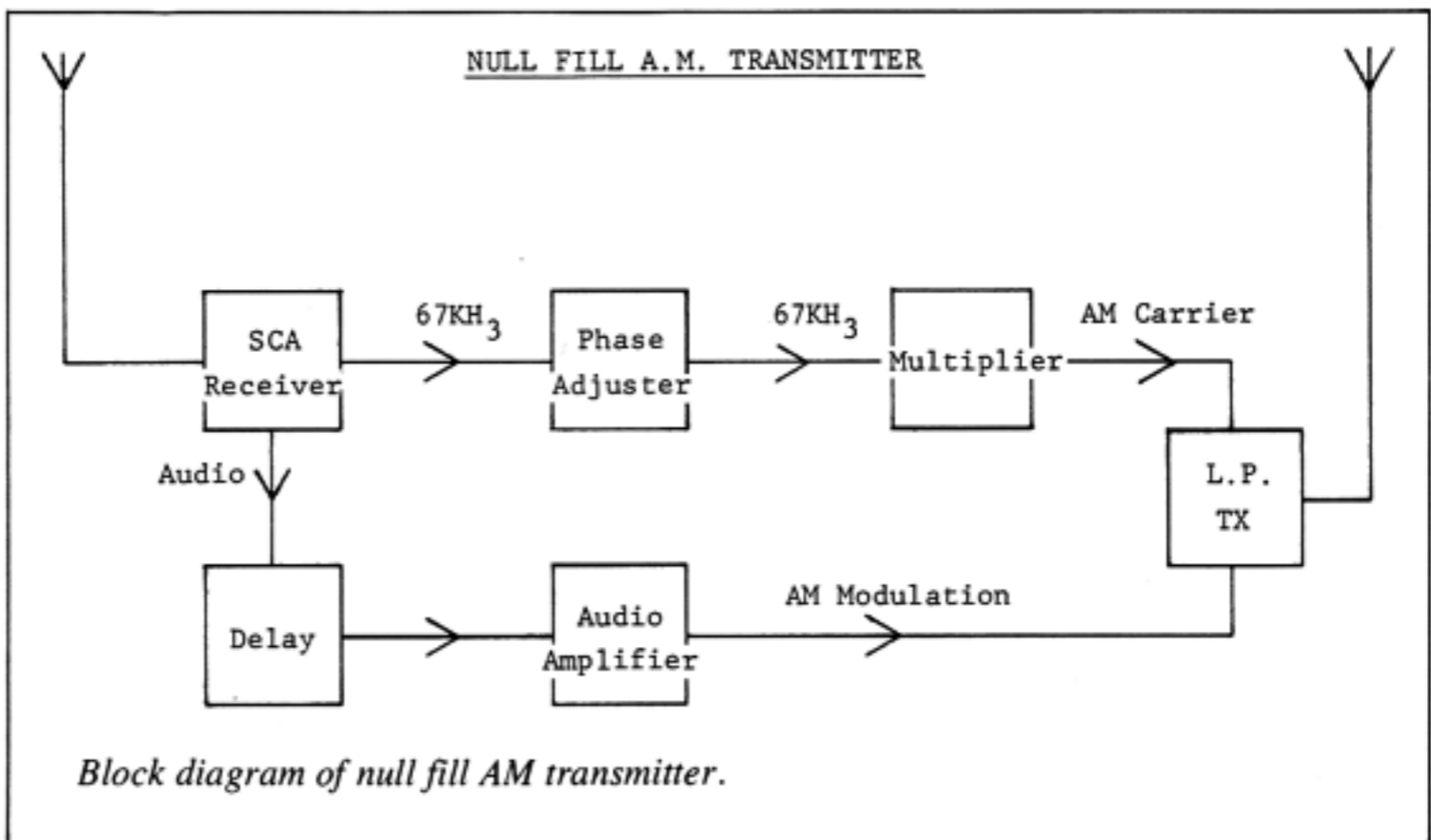
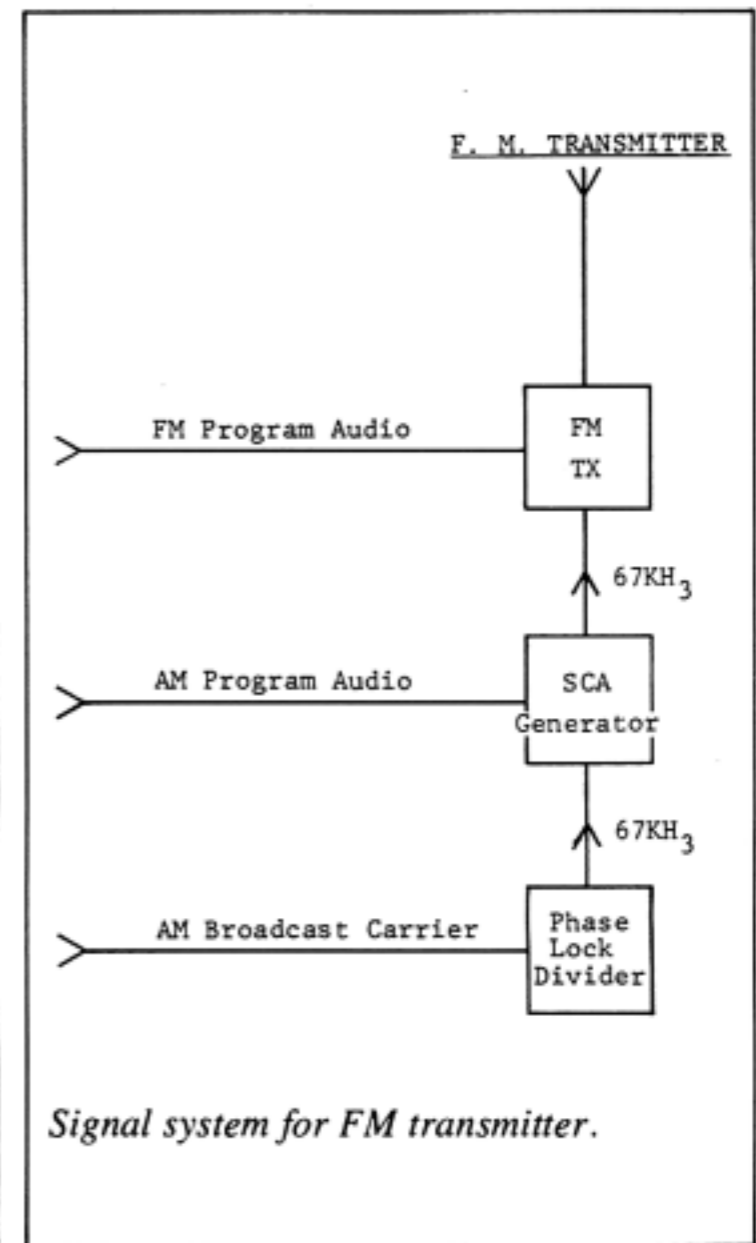
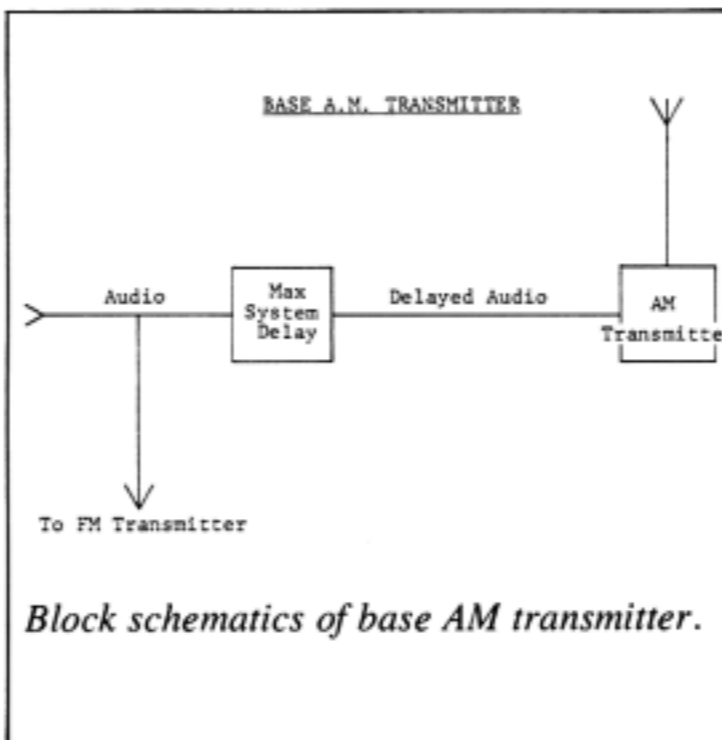
The statistical odds are that, with a different site from the AM, FM will cover the blind spot. However, topography which inhibits AM signals may also inhibit line-of-sight VHF signals.

The advantage of FM is its SCA capability to carry extra information. Let's assume the usage of 67 kHz as an SCA frequency, derived from the phase locked to the AM frequency, and amplitude modulated by the AM audio signal. This wide coverage broadcast signal can be received on an SCA receiver at the null site, where the original carrier can be regenerated, accurate in frequency and phase, modulated and retransmitted. Group envelope delays have

to be calculated, but all, with the possible exception of the audio feed from the AM to the FM station, are of a minimum order. If the AM audio is fed via Telco to the FM, then delay has to be introduced in the audio feed to the AM. Additional compensating delays for the difference in on-air paths have to be introduced at the AM parent or the locals.

Combined with the almost universal availability of FM, there are now obtainable low power solid state AM transmitters capable of unattended operation, even to the level of being pole mounted and weatherproofed for outdoor use. This range of powers (10 to 100 watts) provides ample selection for null fill operations.

*Bill Jones is president of TranSonic Ltd.*

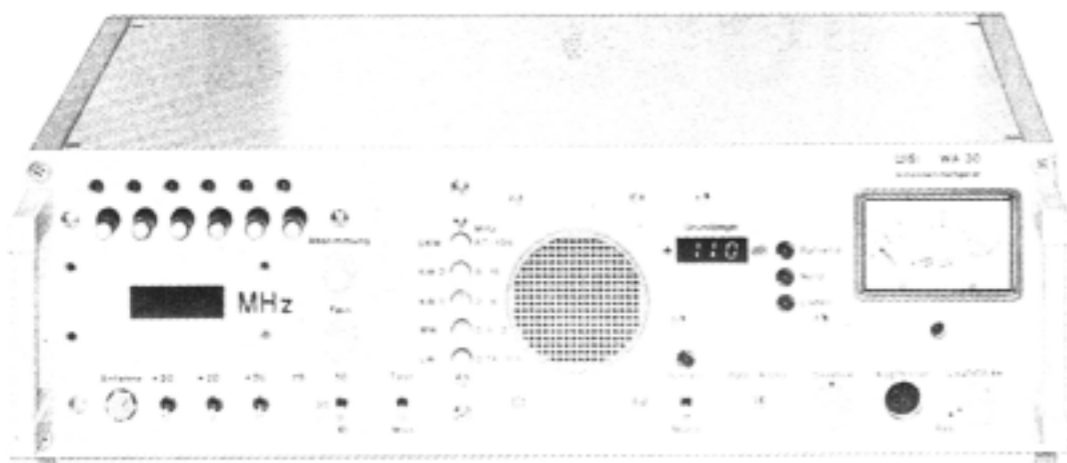


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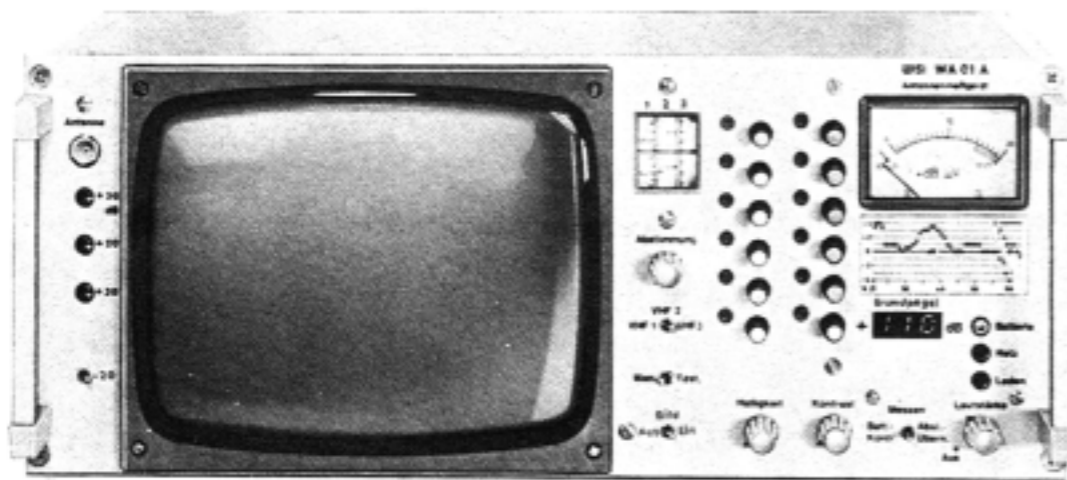


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# CCBA NEWSLETTER

with Warren Parker

## C-100 HALIFAX ON-AIR

Halifax's new FM station, C-100, went on the air November 1, 1977. It's at 100.1 MHz with a power of 100 kw ERP.

Chief Engineer **Walter Labucki** says that excellent reports are being received on the station's coverage, including points as far away as Moncton, N.B., and Prince Edward Island.

C-100 uses a Collins transmitter, with Shively 10-bay antenna, located on its own 160-foot tower on Geizer's Hill. Halifax's TV stations and two other FM stations, CBH-FM and CHFX-FM, share a nearby tower.

Excellent equipment has been used throughout the CHUM Limited station, including McCurdy SS-8600 console, Neumann microphones and four Studer B-67 tape machines.



*"In the beginning," says Walter Labucki, "there was chaos!" But it must have been like Christmas to open up all those boxes of shiny new equipment! Eventually they took the shape of a modern, functional control room for C-100, which went on the air Nov. 1, 1977. Wall along left side has four windows, providing view of street.*



**NEW CAMPUS STATIONS**

**John Forrest** of Tele-Tech Electronics has brought us up-to-date on two new campus radio stations in Ontario:

**Radio Waterloo**

CKMS-FM at the University of Waterloo went on the air October 15th. It operates from 9:00 am to 3:00 am daily with 50 watts ERP on 94.5 MHz. Equipment includes a Wilkinson 100-watt totally solid state FM transmitter, Wilkinson stereo generator and 2-bay circularly polarized Phelps Dodge antenna. The tower is atop the University's library building. CKMS has two full-time staffers, **Bill Wharrie** and **Dave Assman**.

**Radio McMaster**

Scheduled to go on the air January 13th, Radio McMaster also operates with 50 watts ERP, using a Wilkinson transmitter and 2-bay circularly polarized Phelps Dodge antenna. Equipment supplied by Tele-Tech includes frequency monitor, modulation monitor and RF amplifier.

**CFBC ON 50 kw**

A power increase to 50 kw day and night at CFBC-930 Saint John, N.B., approved over a year ago, went into effect in December. The installation uses a Harris MW-50 transmitter. **Brian Sawyer** was consulting engineer for CFBC, where **Gord Miller** is chief engineer.

**How about your news?**

BET has readers everywhere in Canada and they enjoy reading about stations everywhere in Canada! Send your news and/or photos for the CCBA Newsletter (eastern Canada) to:

**Warren Parker**  
c/o CKTB, Box 610,  
St. Catharines, Ont. L2R 6X7

Stations in western Canada are requested to forward news or photos directly to BET, Box 423, Station J, Toronto, Ont. M4J 4Y8.

**WABE**

**CALL FOR PAPERS**

The Western Association of Broadcasters, Engineering Section will be holding its 28th annual conference at the Hotel Saskatchewan in Regina on May 2, 3, 4, 1978. Plans for the technical sessions are now underway and papers are being sought. Topics should cover equipment or techniques of interest to Broadcast Engineers in Radio or Television. Persons interested in presenting papers should write to the Papers Chairman, Richard Niebergall, CKOS-TV, Box 280, Yorkton, Saskatchewan S3N 2B9 or telephone (306) 783-3685.



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# DECISIONS

## AM Radio

- In approving a restructuring of ownership for CKCH Hull and CHLN Trois-Rivières, Que., The Commission rapped the Hull station on several counts: major changes were made in the programming of CIMF-FM without prior approval; CKCH newscasts were reduced; and an authorized power increase to 50 kw had not been acted upon. The station was instructed to either go to 50 kw or apply for 10 kw to improve its signal.
- Licences have been approved for the CBC, acting for Parks Canada, for 5-watt stations at Banff National Park on 1490 (English) and 1230 kHz (French). Also approved is a 4-watt carrier current operation for Ryerson Polytechnical Students' Union, Toronto, on 970 kHz.
- The licence of CJVA Caraquet, N.B., has been renewed to March 31, 1982. Originally licensed in 1973, CJVA commenced broadcasting only on September 15, 1977, due to financial and technical problems. The proposal by Arthur Houde for a daytime station to serve the same area was subsequently withdrawn.
- In renewing the CBC's licences in New Brunswick, the CRTC notes the CBC's commitment "to give foremost consideration to the establishment of a production unit in Saint John".

- Ownership transfers have been approved for: CKJD Sarnia and CHYR Leamington, Ont., from Dancy Broadcasting to Rogers Management Services, and CJJD Hamilton, from Radio Rogers to 30429 Ontario Ltd.; and Evangeline Broadcasting Co., Kentville, N.S., (66%) from the estate of A. M. Bishop to W. A. Bishop.
- Unless interventions force a public hearing, the following applications are scheduled for early approval by the CRTC:
  - CKGY Red Deer, Alta.—change in day-time pattern;
  - CFLN Goose Bay, Labrador—change in program source;
  - CBPA and CBPB Jasper Park, Alta.—power increase to 5 watts;
  - CJAT Trail, B.C.—complete disaffiliation from CBC network, now provided on CBTA-FM;
  - Radio NW Ltd., New Westminster, B.C.—changes in Vancouver Canucks hockey network to delete the CHNL group (Kamloops, Merritt, Princeton and Clearwater) and CKOK Penticton; while adding CHUB Nanaimo, CHPQ Parksville, CKGF Grand Forks, CFJC Kamloops, CFTK Terrace and CKTK Kitimat.

## FM Radio

- The following CBC stations have been approved:
 

City	MHz	Watts
Fort Hope, Ont.	101.5	41

London, Ont.	100.5	22,500
Manning, Alta.	100.5	13,500
Peace River, Alta. (Fr.)	92.5	732
Spence Bay, N.W.T.	105.1	82
Sept Iles, Que. (Eng.)	96.9	15,000
St-Georges-de-Beauce	96.7	84

- Changes in facilities have been approved for CJBQ-FM Belleville, Ont., to 50 kw; for a change in frequency from 105.1 to 105.9 MHz for CBKA-FM La Ronge, Sask.; and for community access programs on CBQV-FM Sandy Lake, Ont.
- **Tillsonburg Broadcasting** will be called to re-appear before the CRTC, probably in April, for further consideration of its FM licence. The Commission ruled that violations had occurred in the spring of 1977 with respect to simulcasting on CKOT AM and FM, excessive commercial content on CKOT-FM, and insufficient foreground and mosaic content on CKOT-FM; however further consideration is to be given in view of difficulty in separating FM operations from that of the daytime AM station, the fact that the licensee did not receive previous notice of violations, and the commitment by CKOT to complete the necessary changes and facilities to comply with CRTC requirements.
- Unless interventions require a public hearing, CHAS-FM (Gilder Broadcasting) Sault Ste. Marie, Ont., will move its antenna site to the CN-CP Telecommunications tower, increasing height from 10 to 103 feet.

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## ALL-NEWS NETWORK

Here's an up-date on the status of the CKO All-News Radio network:

City	On-Air Date	Frequency	kw
Ottawa	July 1, 1977	106.9	100
Toronto	July 1, 1977	99.1	100
Montreal (AM)	Sept. 19, 1977	1470 kHz	10*
London, Ont.	Oct. 21, 1977	97.5	50
Calgary	Nov. 7, 1977	103.1	100
Vancouver	Nov. 21, 1977	96.1	100
Edmonton	Feb. 1978	105.9	100
Regina	Mar. 1978	94.5	100
Winnipeg	Apr. 1978	99.1	100
Halifax	Fall, 1978	—	—
Saint John, N.B.	Fall, 1978	99.7	100
St. John's, Nfld.	Fall, 1978	101.9	100

\* licensed for 50 kw.

## Television

● CBC rebroadcasters have been licensed, as follows:

Quebec	Ch.	Watts
Thetford Mines (Eng.)	32	1,300
Magog (Eng.)	30	15,000
Sherbrooke (Eng.)	50	1,100
Clermont	31	6.7
Notre-Dame-des-Monts	40	38
St-Rene-de-Matane	30	390
Deception Bay	11	5

### Newfoundland

Bay L'Argent	8	5
Brent's Cove	10	5
Coachman's Cove	8	5
Fleurs de Lys	5	8.9
Harbour Mill	13	5
Harbour Round	12	5
La Scie	9	5
Ming's Bight	10	5
Pacquet	6	5
Port Blandford	6	5
Roddickton	11	850
Seal Cove	7	5

Springdale	13	290
St. Bernards	6	5
St. Lawrence	12	5
Swift Current	5	5

### Ontario

Attawapiskat	12	10
Fort Albany	8	491
Fraserdale	7	10

### N.W.T.

Spence Bay	9	8.9
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● Other approvals for CBC facilities: at Garden of Eden, N.S., a power increase to 350 watts, changing to ch. 17; at Trois-Rivières, Que., a channel change from 16 to 28 (Eng.); at Temiscaming, Que., a change in feed from Sturgeon Falls, Ont. to Fabre/Bearn, Que., and at Salmo, B.C., a change to channel 10 and 10 watts.

● In renewing CKWS-TV Kingston, the CRTC called for improved news coverage, either by upgrading film facilities or by using ENG equipment similar to that used at CHEX-TV Peterborough.

● **ATV New Brunswick Ltd.** has won approval for a power increase at CKCW-TV Moncton, from 25 to 56 kw (video) and for establishment of a studio at Saint John. In renewing ATV's 11 licences, the CRTC commended ATV for its efforts to extend services, including local news for CKLT-TV Saint John and its two rebroadcasters. The Commission also called for local programming for northern N.B., and a greater contribution from ATV to the CTV national network.

● Renewal was also granted to **New Brunswick Broadcasting's** seven TV licences, and approval given for a low power rebroadcaster at Parker Ridge. The company is now providing separate regional programming for northern N.B. from its studios in Saint John, and is to improve the signal of CHCR-TV Campbellton in the Bathurst area.

● Renewal has been approved for three stations rebroadcasting CKAM-TV Upsalquitch Lake, N.B.—which switched from CBC and CTV network affiliation over a year ago. As a result of the switch, the three communities, Murdochville, Gaspé and Percé, Que., no longer receive CBC service. Murdochville will continue to carry CTV, but may move from channel 2 to 7 to facilitate establishment of a CBC rebroadcaster; whereas Gaspé and Percé are to change their program source to CHCR-TV Campbellton, a CBC affiliate.

● A network has been approved to carry Wednesday night NHL hockey over CHAN-TV Vancouver, CFAC-TV Calgary and CITV Edmonton.

● Unless interventions require a public hearing, approval will be granted for CHEK-TV Victoria, B.C., to reduce ERP from 100 to 60 kw, and for CICO-TV-19 Sudbury, Ont., to increase ERP from 62 to 186.5 kw, with a change of antenna site.

## Cable Television

### PARLIAMENT ON CABLE

The CRTC has outlined the following procedure for cable systems wishing to carry coverage of the House of Commons in Ottawa:

1. Systems already authorized to provide a Special Programming channel need only advise the CRTC and submit details of feed.
2. Those systems not authorized for a Special Programming channel must apply, outlining the method of feed.
3. Systems without a channel available may apply for revisions, to be considered on a case-by-case basis; however, under no circumstances will use of the community

## COMMISSIONER APPOINTED

R. MacLeod Rogers has been appointed a part-time commissioner of the CRTC for a term of five years. Rogers, 51, is a lawyer from Digby, N.S.

### STAFF MOVES AT CRTC

Dr. Pierre Camu, chairman, has announced the following appointments within the CRTC:

**Peter McDonald** becomes regional director for western Canada (B.C., Alberta, Saskatchewan, Manitoba, Yukon and N.W.T.), based in Vancouver. Before going to Vancouver, however, he will coordinate preparations for hearing CBC network renewal applications in the spring.

**Germain Cadieux**, director of research, succeeds Mr. McDonald as director general, broadcast programs directorate.

**Ralph Hart** assumes added duties in the broadcast programs directorate, while retaining industry liaison responsibilities.

**David Osborn** is appointed general counsel.

**Guy Lefebvre** takes on a special assignment related to the effect on broadcast regulations of laws pertaining to federal elections, particularly the Election Expenses Act.

In making the announcement, Mr. Camu also paid tribute to **Jean Baby**, former director general of telecommunications, who has been appointed a vice-president of Telesat Canada.

channel be considered for this purpose.

A statement by the Canadian Cable Television Association proposes that the proceedings eventually be carried live via satellite to cable companies throughout the country.

### NEW SYSTEMS LICENSED

Cable facilities have been approved for the following centres:

- Grande-Vallee, Que., area—CATV Lebreux Electronique Enr.
- Chatham-Newcastle, N.B., area—Miramichi Cable Ltd.
- Grand Falls, N.B., area—Wm. R. Duffie, representing a company to be incorporated. (Competing applications by Wm. Stanley and E. K. Jones were denied, as was an application by J&K Enterprises for Perth-Andover, N.B.)
- Dalhousie, N.B., area—Leo Barthelotte, representing a company to be incorporated. (Application by North Shore Community TV denied.)
- Bathurst, N.B., area—Robert De Grace, representing a company to be incorporated. (Applications by North Shore and Cablevision Chaleur Ltd. denied.)

### Other cable decisions:

- In renewing the licences of numerous systems in the Maritime provinces, the CRTC has called for uniform distribution of CBC on channel 11, CTV on channel 8, and Radio-Canada on channel 2, wherever feasible technically and economically.
- Carriage of AM radio stations in Quebec City and Trois-Rivières has been approved for Video Déry Ltée, St-Raymond, Quebec, in view of poor local off-air reception.
- Télè-Câble Charlevoix Inc. is to provide centrally located studios at La Malbaie, Que., to facilitate access to its community channel.
- Cable Service Ltd., Moncton, N.B., is to establish a separate French language community channel, along with upgraded equipment for production of community programs.
- Woodstock (N.B.) Community TV Ltd. has been granted an increase in service area and other changes, but microwave reception from a headend at Green Mountain, N.B., was denied. The CRTC ruled that the Chamcook head-end must be used to receive signals from Bangor, Maine.

● A DOC inspection, as a result of complaints by subscribers, has cleared J&K Enterprises of Nackawic, N.B., of technical faults. Poor reception is blamed on distance and other interference factors.

● Increased service areas have been granted to Joseph Shannon, Port Hawkesbury, to Dartmouth (N.S.) Cable TV, and to Telediffusion Ste-Adèle (Quebec).

● CESM-TV Thompson, Man., has been renewed for one year only. The company is to contract with Manitoba Telephone no later than February 1 for wiring and partial reconstruction of the system, and must meet DOC technical standards as prescribed in BP23 and BP24 by August 1, 1978.

● A change in head-end site has been granted for Cablevision Lethbridge (Alta.) Ltd.

● The transfer of ownership of Graham Cable TV Ltd., Toronto, to Cablecasting Limited, has been approved.

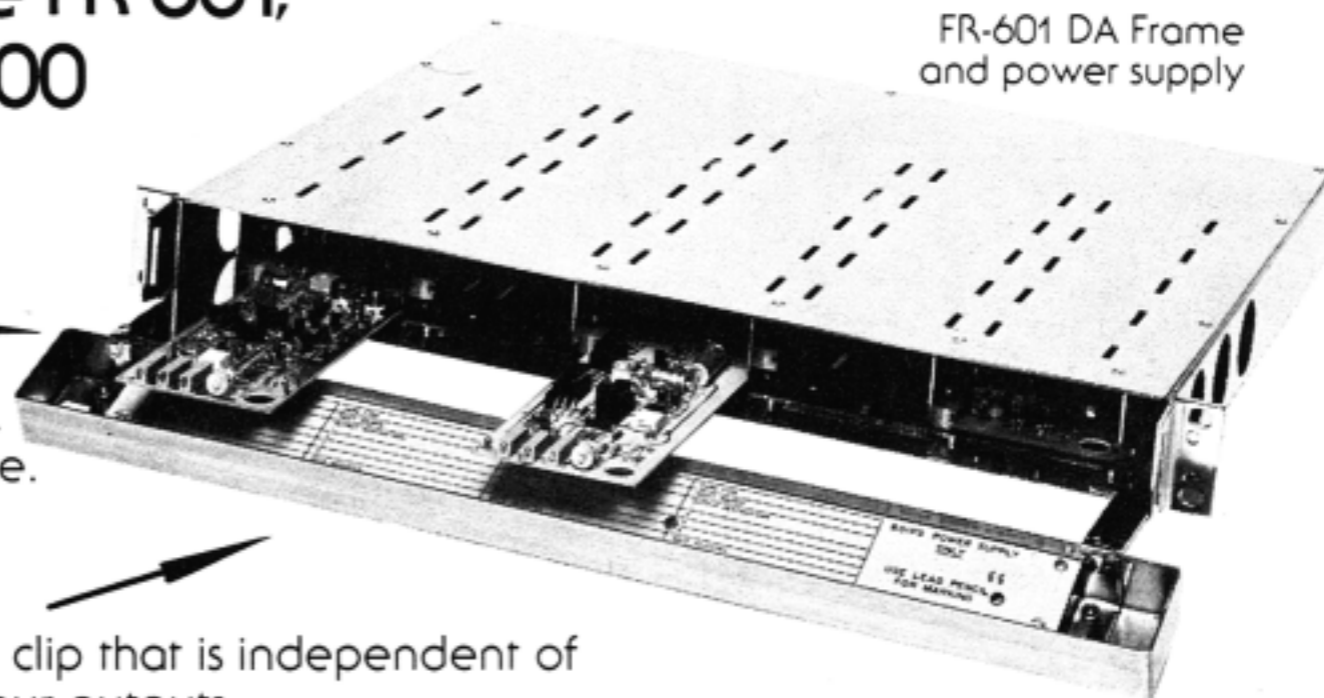
● The Grand Forks (B.C.) Cable TV Co-Operative Association, licensed on June 28, 1976, has returned its licence to the CRTC. New applications to serve the area are to be heard at the public hearing scheduled for Feb. 21, 1978, in Kamloops.

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**VEA-600 and VCA-600**  
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# MSC newsletter



Phase shift which degrades conventional duplicating has been eliminated in a system using UMC Beaucart type 10 reproducers, developed by Ron Turnpenny vice president of engineering at CHFI-FM, Toronto.

## CHFI transfers program material to cartridge

A new process for the transfer of program material to cartridge has been developed and adopted by CHFI-FM, Toronto.

Described as a quality breakthrough in broadcasting, the stereo station has now converted to total cartridge use.

The transfer system is said to eliminate much of the phase shift in conventional duplicating which can seriously degrade stereo recordings received over monaural radio. If phase discrepancy is severe, significant portions of the program can be lost or distorted to the listener.

The key to the new system, developed by Ron Turnpenny, vice president in charge of engineering for Rogers Radio Broadcasting Ltd., is the use of UMC Beaucart type 10 reproducers supplied by MSC Electronics Ltd.

Individual azimuth adjustments are made on the duplicating record head to compensate for cartridge response.

The station is now completing the transfer of more than 3000 cartridges using phase compensation, bringing the total number of treated units to over 6000.

*Circle #4 on reply card.*

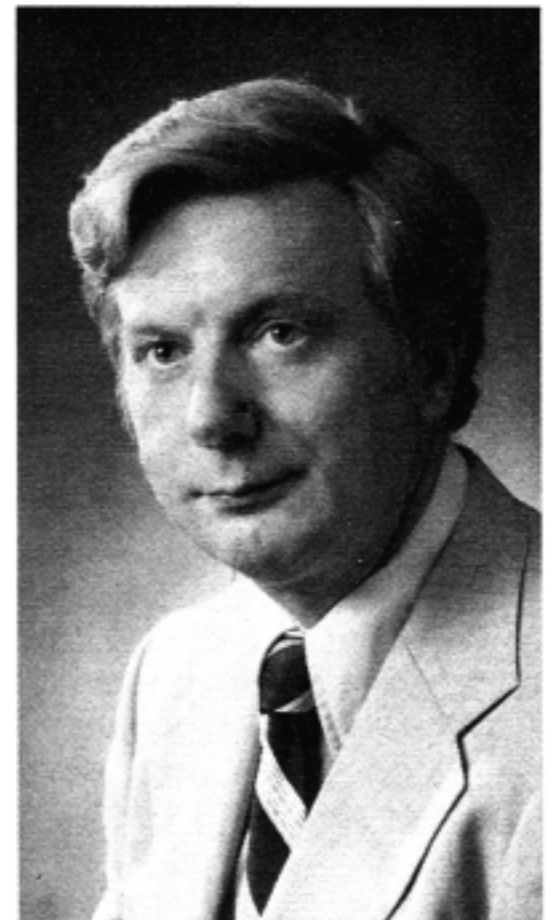
## Duncan named manager at CATV Systems

Norman Duncan has joined MSC Electronics as Manager CATV Systems Products.

Rapid growth in MSC's CATV Systems Products Division has resulted in the creation of this new position along with an expansion in the division's product line.

Norman Duncan will have overall responsibility for all activities of the division which is devoted exclusively to serving the CATV market.

Norm has over 10 years experience in the CATV industry, most recently with Anaconda, and is well known and respected throughout the industry.



## Universal frame system

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- PSG-311 Digital color sync

- generator
- PGS-315 Sync generator substitute
- PCO-317 Automatic sync changeover switch
- PCB-320 NTSC color bar generator
- PBB-321 Black burst/background generator
- PBD-322 Bar dot/visual reference generator
- PMB-323 Multiburst/sweep generator
- PSS-324 Stairstep/ramp generator
- PSD-340 System delay module
- PPA-343 Pulse distribution amplifier
- PVA-350 Video distribution amplifier
- PFO-364 Universal amplifier

*Circle #5 on reply card.*