

AM Goals Get FCC Priority

by Alex Zavistovich

Washington DC ... The FCC has decided to give top priority to several AM improvement issues, including a synchronous transmission inquiry and a rulemaking to relax duopoly and "one-to-a-market" ownership rules.

The prioritization effort was approved by the FCC during its 15 January meeting. It came in response to the Mass Media Bureau's April 1986 "Report on the Status of the AM Broadcasting Rules," which proposed sweeping changes aimed at halting the overall decline in popularity of the AM band.

The Commission also targeted possible relaxation of the main studio and program-origination rules, along with an investigation of whether the FCC should regulate devices such as appliances and electric motors that have been shown to

cause RF interference.

While the synchronous transmitter and multiple ownership items were intended for immediate action, the latter two were targeted as actions that would be addressed in the "near term."

In the longer term, the FCC said it will review technical standards for interference protection and will launch a proposal to permit reduced power night operations for AM daytimers. New antenna design and AM stereo standard development has been deferred by the FCC-pending further study.

Commissioner Dennis Patrick stressed that the FCC has now provided "a listing of the set of priorities in which (the FCC) intends, at the present time, to address (the) issues." He added that the notice "does not bind the Commission in any way as a substantive matter with respect to those topics."

In the first of the FCC's near-term actions, a Notice of Inquiry has been launched into the use of synchronous transmitters for improved AM coverage, as an alternative to such standard methods as station power increase, transmitter relocation or antenna system redesign.

According to Bernard Gorden, Mass Media Bureau staff engineer, conventional means of extending the broadcast signal "do not always provide stations with sufficient flexibility to economically improve their service in areas where they need it most."

Gorden maintained that synchronous transmission, which uses two or more transmitters on the same frequency broadcasting the same material, causes "negligible or no interference to adjacent or co-channel stations." However, he noted, some level of interference is gen-

erated in the station's own coverage area.

The FCC has requested comments pertaining to the use of these transmitters, including technical standards for their operation, interference protection criteria, and possible distortion from frequency or phase synchronization.

Other topics for comment include use of night-time synchronous transmitters for reduction of skywave interference, and the treatment of the transmitters under multiple-ownership rules.

Mass Media Bureau Chief Jim McKinney said that the FCC has yet to determine how much interference occurs "at the fringes" of the coverage area, but noted that synchronous transmitters have already been used successfully in Europe.

Experimental licenses for testing of synchronous transmitters have been granted by the FCC to KROL, Laughlin, Nevada, and KKOB, Albuquerque, New Mexico. Several other synchronous applications are pending Commission approval.

At the 15 January meeting, the FCC also established a Notice of Proposed Rulemaking on multiple ownership of broadcast properties, relaxing the radio duopoly rule and a portion of the "one-to-a-market" rule.

Under the duopoly rule, common ownership had been prohibited of two or more AM stations whose 1 mV/m contours overlap. The prohibition also extended to ownership of two or more FM stations with similar contour overlap.

In the one-to-a-market rule, ownership of commercial broadcast services in the same market had been restricted to one AM-FM combination, or one TV station, or one daily newspaper per market.

Cross ownership of radio and TV properties was prohibited if the service contour of the purchasing facility completely encompassed the community of

Mixed Reaction For Fowler Exit

by David Hughes

Washington DC ... Praise for attempts to deregulate technical rules and criticism about the lack of an AM stereo standard were the reactions of the radio industry in the wake of FCC Chairman Mark Fowler's announcement that he would step down.

After almost six years as head of the FCC, Fowler announced in a letter to President Reagan 16 January that he will resign, effective this spring.

Fowler, 45, gave no reason for the action; he would not say if he had another job lined up. However, sources say that the chairman would like to get back into "entrepreneurial broadcasting," as opposed to a position in communications law.

Fowler completed his first term last June. He was expected to be renominated for a second by Reagan early this year. At the time of his resignation, he was serving in an interim period between terms, which is allowed by the FCC.

There had been industry rumors that Fowler would not run for a second term. That speculation increased when, last November, the Democratic Party took control of the Senate. While it was assumed that Fowler would come under fire in Congress, particularly over his telephone industry deregulation policies, most sources believed he would have been approved to serve a second term.

In reports, Fowler pointed out that he headed the Commission longer than predecessors, most of whom resigned after serving an average of three years.

Deregulation praised

Many in the broadcasting community contacted by RW praised the wide ranging technical deregulation efforts

that took place during the Fowler years. They covered everything from reducing proofs requirements and instituting intermediate AM power levels, to simplified license renewals and lax signal quality standards.

"Broadcasting has done well under Fowler," said NAB VP/Science and Technology Tom Keller. "While deregulation was not started with Fowler, he certainly helped remove a lot of useless paperwork and allow broadcasters to focus on what they should be doing."

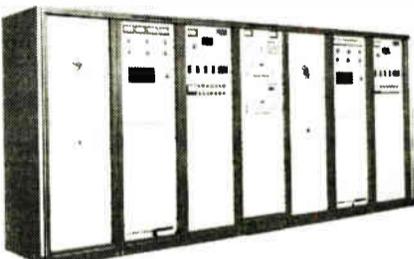
"Fowler was a radio person, a DJ, he was familiar with problems at small sta-

tions," added Jim Wychor, past president of the Daytime Broadcasters Association, which eventually merged with the NAB to become the NAB Daytimers Committee.

"The Fowler years were fantastic for daytimers," Wychor said. "Under Fowler the FCC accomplished more in the past five years than during the whole previous history of the Commission." Wychor pointed to expanded pre- and post-sunset authorizations, and nighttime power levels on foreign clear channels.

Yet, Wychor maintained that some

(continued on page 4)



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FCC Prioritizes AM Improvement

(continued from page 1)

license of the station to be purchased.

Both rules were adopted, the FCC said, to "promote diversity of viewpoint and economic competition on a local level by encouraging diversity in the ownership of stations."

Since then, however, the Commission has noted "demonstrable benefits resulting from group ownership of broadcast stations," said Andrew Rhodes, an attorney with the FCC's legal branch.

Rhodes said the FCC has seen "substantial growth" in various markets, which has increased diversity of viewpoints to a level where multiple ownership restrictions "may no longer be necessary."

The Commission also questioned whether diversity of programming necessarily follows from diversity of ownership, and speculated that "significant public interest benefits" might result from cost savings in joint ownership of broadcast facilities.

Supporting a Mass Media Bureau recommendation, the FCC concluded that AM-FM-UHF combinations should be permitted. Relaxation of the one-to-a-market rule also applies to combinations of AM stations and either UHF or VHF stations.

Comments are also sought "on the specific benefits of joint operation of radio and television stations in terms of economies of scale and cost savings," the FCC said.

The Commission also proposed relaxation of the duopoly rule, prohibiting common ownership of two or more AM's whose 5 mV/m groundwave contours overlap. Further, ownership is prohibited of two or more FM stations whose 3.16 mV/m contours overlap.

McKinney said that the revised ownership rules would reduce the minimum distance between two commonly-owned class B FM stations from approximately 65 miles to approximately 40.

On the agenda for longer-term consideration are a review of technical standards relating to interference protection (including protection ratios and RF bandwidth limitations), and possible permission of reduced-power nighttime operation for AMs which are currently daytime-only.

The proposed latter action, the FCC noted, would be "coupled with a proposal to terminate the licensing of new daytime-only stations."

Other AM improvement issues, including changes in current limitations on station power, channel and station classification, and new antenna design have been deferred pending additional study.

For additional information on the FCC's rule prioritization, contact Steve Selwyn at the FCC's Mass Media Bureau: 202-254-3394. For information on synchronous transmitters or multiple-ownership rules, contact Andrew Rhodes: 202-632-7792.

License Form Sparks Concern

by David Hughes

Washington DC ... The FCC's Mass Media Bureau (MMB) is considering whether to issue a public notice to broadcasters advising them not to be confused about "official looking" applications they may receive in the mail from a private firm.

The applications, which apparently were for the renewal of remote pick-up (RPU) and land mobile licenses held by broadcasters and not for the renewal of the broadcast station licenses, were sent to at least one Washington DC broadcaster by a Gettysburg, PA, based firm called "Federal Licensing."

The document from the firm features the words "Federal Licensing, J.V., Modification Division." In smaller letters in the lower right hand corner of the cover letter is the disclaimer: "not affiliated with US government/agencies." The letter also claims that Federal Licensing's offices are located "adjacent to the FCC in Gettysburg, PA."

FCC MMB Engineering Policy Branch Asst. Chief John Reiser told *RW* that the Federal Licensing letter could be confused by broadcasters as being an official FCC document.

While he said that no decision had yet been made, the MMB may issue a notice to broadcasters pointing out the potential for confusion.

Ted Simms, CE of WHUR, Washington DC, said that although he "surmised it was not FCC connected," the Federal

Licensing form his station received looked too much like an FCC form. "I think there are some people who might be fooled by it."

The Federal Licensing document features a letter that says "our review of FCC records" indicates that your land mobile "radio authorization—LICENSE" is about to expire.

The document indicates that renewals with changes, such as the relocation of base stations or power increases, cannot be handled through the Commission's "automated renewal program."

The letter instructs the applicant to fill out the supplied forms, enclose a "preparation fee payment" of \$85, and mail the documents to firm's Gettysburg office. Reiser pointed out that the FCC does not charge a fee for filing an application.

Federal Licensing VP Paul Damico said that he saw no reason for the MMB to issue a notice to prevent broadcasters' confusion. He stressed that the envelope the document is mailed in and the document itself repeatedly mention that the organization is not connected with the FCC.

Even though the letter and application in question was sent to a broadcast station, his firm does not handle broadcast license applications, added Damico.

He maintained that Federal Licensing handles only amateur and land mobile license reinstatement applications. The reason the application was sent to a broadcaster was because the station probably had a land mobile operation for

maintenance or security reasons, he added.

He compared his Federal Licensing's processing of amateur and land mobile operations for a fee to the service offered by H&R Block for tax preparation.

Damico added that he was upset the FCC decided to inform the press about what it perceived to be a problem before informing his company, which has been offering the services since 1982.

If the MMB issues a notice about Federal Licensing, it would follow a similar notice issued by the Commission's Private Radio Bureau (PRB) on 16 December. That notice informed amateur license holders that the Federal Licensing mailings are in no way connected with the Commission.

The PRB advised licensees in the amateur service that "official-looking notices are being sent to amateur operators from "Federal Licensing, J.V., Amateur Radio Division." The PRB stressed, "This firm is not affiliated with the FCC."

However, Damico said the PRB never notified his firm about the alleged complaints or even sent him a copy of the notice. He also maintained that his firm's notices are sent for the "reinstatement" of amateur licensees, as opposed to "renewals," as the PRB mentioned.

"We have had good and very close relationship with the FCC," Damico noted.

For more information contact John Reiser at 202-632-9660, the Commission's Personal Radio Branch at 202-632-4964, or Federal Licensing at 717-334-9262.

FCC Clips

Felker Named P&R Deputy Chief

Alex Felker has been named deputy chief of the Mass Media Bureau's Policy and Rules Division. He previously worked with the Office of Plans and Policy where he specialized in spectrum management issues.

Felker recently completed a study that examined the possibility of using auctions rather than lotteries or hearings to select licensees in non-mass media services.

He has also worked with the Field Operations Bureau, including a position as senior engineer in the Norfolk FM/TV/CATV enforcement unit, and with the Common Carrier Bureau.

For more information contact the FCC news media information office at 202-632-5050.

Authorization Speed

In a report released in late 1986, the FCC said it took 39 days to process 90% of the equipment type acceptance applications it had before it.

The figures represent the Commission's speed of service time for equipment authorizations.

The FCC also reported that it took 47 days to process 90% of the equipment certification applications and 37 days for 90% of the notification procedures to be processed.

The information is provided in order to aid "manufacturers planning to bring new products to the market," the FCC said.

For more information contact the FCC's news media information office at 202-632-5050.

EBS Script Change

The FCC has issued an optional change to its weekly Emergency Broadcast System (EBS) script.

WLIF-FM, Baltimore, had asked the Commission to substitute the station's call letters in the portions of the script that refer to "this station."

After reviewing the matter, along with a favorable recommendation from the Maryland State Emergency Communications Committee, the FCC said that it would grant the request.

"All broadcast stations now have the option of either using the present weekly EBS test script, or substituting their call letters, as authorized in their FCC license, in the portions of the test script worded 'this station,'" the Commission said.

For more information, contact the FCC's Management Planning and Program Evaluation Office at 202-632-3906.

Station Totals

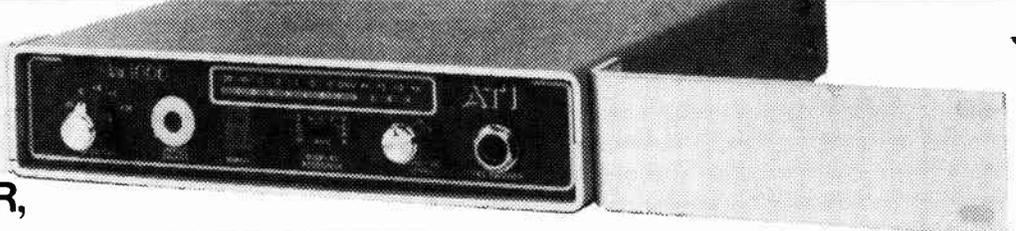
The FCC has released its latest broadcast station totals, current as of 31 December 1986.

The figures indicate that there were 4,863 licensed AM stations, and 5,205 FM stations (3,944 commercial, 1,261 noncommercial).

The totals are up from mid-1986, when the Commission reported that there were 4,839 AMers and 5,170 FMers.

For more information contact the FCC's news media information office at 202-632-5050.

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NRSC Standard Gets Approval

by Alex Zavistovich

Las Vegas NV ... A year-and-a-half long effort by the National Radio Systems Committee (NRSC) to get broadcasters and receiver manufacturers to agree on a voluntary preemphasis-deemphasis standard for AM has come to fruition.

Their work culminated in the recent approval by the group of an interim voluntary national standard for AM transmission and reception.

The standard also has the support of processing manufacturers, who are expected to introduce products to implement the standard at this year's NAB convention.

The committee authorized the NAB and Electronic Industries Association (EIA) to publish the interim standard on 3 January, during a meeting held at the Consumer Electronics Show, according to NAB staff engineer and NRSC member Mike Rau.

Rau said that the measures, which had been approved in draft form before last September's NAB Radio '86 show in New Orleans were "far and away" supported by the group.

Included in the standard are a 75 μ S AM broadcast transmission preemphasis and a complementary 75 μ S receiver deemphasis, a 10 kHz AM transmission bandwidth provision and a five-year review stipulation.

The preemphasis curve recommended by the NRSC is "a single zero curve with a break frequency at 2122 Hz," similar to the 75 μ S curve used for FM broadcasting. A single pole with a break frequency of 8700 Hz was suggested to reduce peak boost at high frequencies.

The standard also recommends a deemphasis curve for AM radios which is "the precise complement of the preemphasis standard"—a single pole at 2122 Hz and a single zero at 8700 Hz.

The NRSC had set a 15 December deadline for public comment on the pre-

emphasis proposal. Although reaction to the proposal had been predominately favorable, some broadcasters expressed dissatisfaction, noted Susquehanna Broadcasting VP/Engineering Charles Morgan, chairman of the committee.

Press Broadcasting, Morgan said, suggested that the committee "should have adopted or become involved in" standards for AM stereo. In November 1986 Press Broadcasting submitted a petition to the FCC, asking for a requirement that AM stereo receivers all be multimode.

Morgan, while acknowledging that AM stereo is an "important issue" in AM improvement, pointed out that the matter is not part of the NRSC charter, and was therefore not addressed.

In addition, Morgan said, separate comments from Bonneville International Corporation, a multiple station owner based in Salt Lake City, spoke against the 10 kHz bandwidth limitation and the magnitude of preemphasis recommended in the standard.

While Bonneville indicated the NRSC proposal was a good compromise, acceptable to the vast majority of broadcasters and receiver manufacturers, the company's comments maintained that the AM transmission bandwidth should not be reduced from 15 to 10 kHz, according to Morgan.

Morgan pointed out, however, that currently, "in reality, AM receivers have only a 2½ to 3 kHz band path."

He admitted the NRSC standard's 75 μ S preemphasis was large, but that changing the standard at this time was "impractical." However, the committee "should and will address the issue in five years," during the proposed review period, he added.

A Bonneville International spokesman decline to speak on the record about the objections.

The NRSC has recommended publication of the interim voluntary standard as soon as possible after editorial revisions, Morgan stated. He anticipated that the

standard should be available "within the next two months, prior to the NAB show."

The NAB has agreed to "make an effort to publicize the standard and make broadcasters aware of its desirability," said Morgan, who is also chairman of the association's AM Improvement Committee. He noted that many receiver manufacturers have "pledged to incorporate the standard" into their products.

Bill Gilbert, staff engineer of electronic design for Delco Electronics, commented that the company's AM stereo receivers will be made to operate at 10 kHz bandwidth. However, the receivers should have the capability of narrowing the bandwidth to compensate for first adjacency problems, he said.

Delco's first step in complying with the standard would be to make their 6 to 7 kHz bandwidth receivers compatible with the deemphasis curve and then to widen the bandwidth, Gilbert maintained. He added that the company has no plans to widen the bandwidth on their mono receivers.

"We're looking for good quality (AM) stereo," he stressed.

Gilbert would not speculate on when Delco would fully implement the standard, commenting that an audio design incorporating the deemphasis curve has not yet been drafted.

New City Communications VP/Engineering John Marino, co-chairman of the NRSC, said the committee has also decided on the characteristics of a low-pass audio filter which would help to attenuate transmitted frequencies above 10 Hz.

During the September NRSC meeting, committee members discussed the relative merits of so-called "brick wall" and "gentle rolloff" filters.

In Las Vegas, the group decided on a compromise between the two—"a good, sharp, useful filter, easily realized by processor manufacturers," Rau commented.

The filter calls for a station's signal to be 15 dB down at 10 kHz, and 30 dB down at 10.5 kHz. The specs also call for the signal to be 50 dB down at 15 kHz.

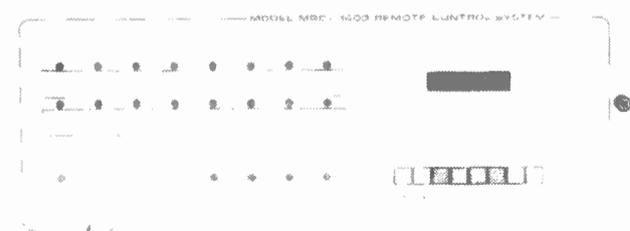
Marino added that the filter has been accepted by audio processor manufacturers for retrofit into their equipment.

Orban Associates' Chief Engineer Robert Orban commented that his company will have an official showing of 10 kHz filter devices at the NAB exhibit in March. Orban's display will also include retrofit modules for both stereo and mono 9100 Optimods.

The preemphasis curve plug-in module will be exhibited at NAB, Orban said. He noted that processors currently be-

(continued on page 8)

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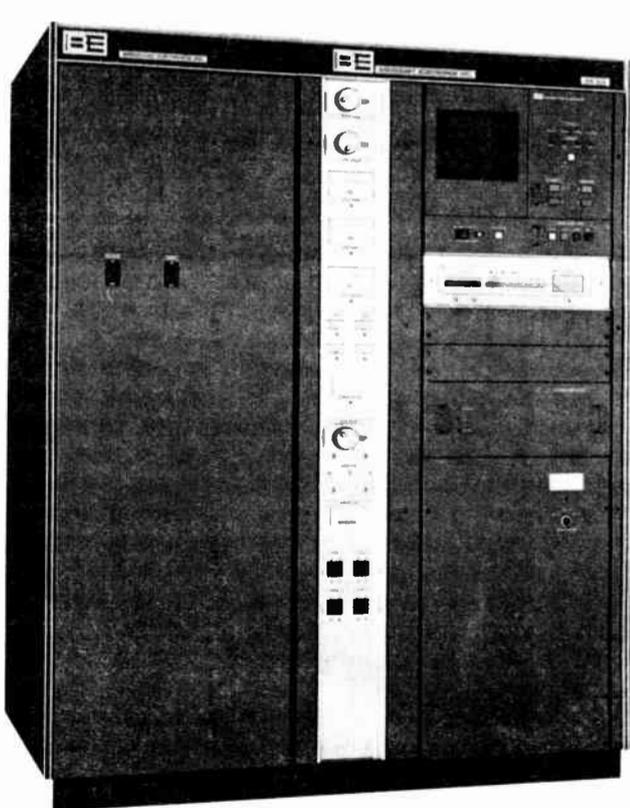
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Exit Draws Reaction

(continued from page 1)

daytimers' problems persist, including the issue of allowing AM stations to use FM translators. He called for "a further examination of the clear channel stations' roll in today's society" to allow the more than 500 daytimers located on US clear channels to add nighttime operations.

Pendulum swung too far?

While many, like Keller, say that Fowler went just far enough in his deregulation efforts, Washington DC-based consultant Bob duTrel, of duTrel-Rackley, said that "the pendulum may have swung too far."

While praising some of the changes, duTrel said that the removal of some regulations has encouraged "a tremendous change" in the industry that has diminished the "family of broadcasters" in order to make it "more of a business."

duTrel said that many "frivolous" applications are filed by groups with business interests who have little interest in actually creating quality broadcasting. Regulations need to be reinstated to more carefully scrutinize applicants' financial qualifications and to "limit speculators," he said.

While Keller agreed that he has also noted a distinct "business-oriented shift" in the overall broadcasting industry, he added, "I can't say it is bad."

duTrel added that the Commission has also been more concerned with the quantity rather than the quality of stations. Rather than creating 700 new FMs in the Docket 80-90 case, he said "it would have been wiser to improve (conditions for) existing broadcasters."

AM stereo

One of the low points of the Fowler years, many pointed out, was the lack of a decision on an AM stereo standard.

"The FCC should have made a decision. It can't leave technical standards completely to the marketplace," duTrel said.

Keller agreed: "The AM stereo issue

has not been a highlight for Fowler." However, he said the Commission's action to pick a TV stereo standard was one of the Fowler administration's great pluses. He admitted that part of the fault on the radio side and the credit on the TV side rests with the industry in general.

In listing the failures of the Fowler team, Maryland-based public and minority interest broadcast attorney David Honig also cited the lack of an AM stereo standard.

"It's sad. The Commission released an omnibus AM improvement report with 25 little things listed, but they ignored the big thing—an AM stereo standard.

"It would have been better to flip a coin to decide a system," he added.

Honig, who stressed that he was speaking on his own behalf and not for the various organizations he has represented before the Commission such as the National Black Media Coalition (NBMC) and the NAACP, said the Fow-

ler FCC has been too concerned with technical deregulation, and has not focused enough energy on the economic and social impacts of its decisions.

He was critical of the Commission's current inquiry into whether its various application preferences for minorities and women should be continued. "This is very troubling. The FCC is telling civil rights groups to reinvent the wheel."

Honig also maintained that the Fowler FCC has not enforced equal employment opportunity (EEO) rules at stations as strictly as it should have.

However, Honig also had kind words for Fowler's minority stance. He praised the FCC's 1981 ruling which reduced the amount of time during which an applicant had to pledge that a station could be operated without outside revenue. Honig said the decision encouraged minorities, particularly those with "less wealth," to apply for stations.

Successor

Although FCC officials would not comment, industry sources indicated that former White House staff member

and current Commissioner Dennis Patrick, 35, would be Fowler's most likely replacement.

Commissioner Mimi Dawson, a Republican from Senator Robert Packwood's staff, has also been mentioned as a successor, as has James Hughes of BDM International, a defense contractor based in northern Virginia.

Many of the broadcasting industry representatives contacted by RW said they doubted that Fowler's policies would change if the FCC reins are given to Patrick, who has frequently supported the outgoing Chairman at FCC meetings.

Yet there may be surprises. Honig said that Patrick, at previous FCC meetings, has departed from the majority and taken a firmer stand on the enforcement of EEO regulations.

If Patrick or Dawson is chosen to fill Fowler's shoes, a slot for a new commissioner would also open.

At press time, FCC officials indicated that a decision would be made on Fowler's successor "soon," perhaps in February.

Dingell Blasts FCC Practices

by Alex Zavistovich

Washington DC ... The chairman of the House Energy and Commerce Committee, John Dingell, has criticized the deregulatory practices of the FCC, claiming that scaled-down federal involvement has become the Commission's "sole guiding principle and motivation."

Speaking at the 15 January luncheon of the Federal Communications Bar Association, Dingell, a Democratic representative from Michigan, noted that "almost all" Commission actions over the past six years have been to reduce government control over some part of the broadcast industry.

He acknowledged that "unbending belief in universal deregulation can sometimes lead to correct results, in the way a broken clock gives the correct time at least twice a day."

Dingell suggested that the FCC's credibility has been called into question by the deregulatory trend. The Commission cannot be seen as an "unbiased source of technical expertise and information for the industry and Congress," he said.

Dingell said the FCC is being driven by a "marketplace ideology" which fundamentally contradicts the statutes the agency is supposed to administer. The airwaves are public resources, he said, to be managed by the FCC and used by private broadcasters as "trustees" acting in the public interest.

He labelled as "neither correct nor responsible" objections that the "public trustee" concept as applied to broadcasters violates the broadcasters' right to "put on the air anything they see fit."

Where there are more individuals who want to broadcast than there are frequencies to allocate, it is impossible to have an "unbridgeable First Amendment right to broadcast which would be comparable to the right of every individual to speak, write or publish," he noted.

Dingell said that an increase in the

number of broadcast stations and the growth of alternative radio distribution technologies have also been given as reasons to do away with government regulation. However, these changes have done nothing to "alleviate scarcity in the industry," which is indicated by "continued increase in price and value of licenses," he said.

Dingell also took the Commission to task for having "openly encouraged" mergers within the industry, claiming the FCC has developed "new and highly questionable procedures for circumventing full public review of transfers of broadcast licenses." He criticized the agency for "abandoning" full review of transfers of licenses arising from property fights.

Dingell also noted that the broadcast industry's minority employment record could be bettered. Although he acknowledged that the FCC's existing preference policies have enabled women and minorities to "improve their situation in the industry," Dingell maintained that minorities only own two and women only nine percent of the total broadcast properties.

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Approach for Class IIs

Dear RW:

I am writing as a follow-up to the letter of Mr. Freitag, of WHNC in your 15 December 1986 issue.

Amen!!! The plight of the Class II daytimer on a US clear seems to have been lost in the praise heaped upon the efforts to improve the first of the Class III's, the Class IV's and those Class II's on Mexican clear channels.

The broadcast environment for all of us has changed. Gone are the days when simply being *the* local station was good enough.

People want to set their clock radios at night to get up in the morning. People want to hear some local news as they shave in the morning. People want to be able to hear their local school concerts and sporting events.

When they want to listen to a local station they want it to be *local* . . . yet to fit within their normal work habits of getting up in the morning and driving home at night.

Ever try to set your clock radio to a station that's not on the air? Ever try to get a school closing from a station that can't sign on until 7 AM? Or a meeting change from a station that went off at 4:30?

When people in our area want regional news and entertainment, they have a number of choices, but when they want local news and entertainment, they want to get it at very limited hours.

Gone also is the day when the "national" station made some sense. And, if you listen to any station on a US clear, there is no major effort to program to the theoretically potential skywave audience with but minor exceptions, like WHO's rebroadcasts of Iowa football.

On the other hand, we found great local interest in Iowa football since our own Minnesota Gophers play half their

games at night. Now, ironically, the local Iowa fans want us to carry Iowa basketball which is mostly played . . . you guessed it . . . at night!

Local interference from many sources makes protection to the 0.1 mV/m contour of the skywave an academic issue at best in most populated areas.

Therefore, I suggest two approaches to the problem, a short-range one and a long-range one:

1. For the short-range, let all Class II daytimers on US clears operate with daytime facilities full-time.

During this period, double-blind tests would be conducted to determine what, if any, objectionable interference would be encountered within the 0.5 mV/m groundwave contour of the US clear's current nighttime pattern.

The US clears would be prohibited from disclosing the details of the test other than to state that technical tests are being conducted and listeners are invited to forward their comments to a neutral party.

In addition, the practice of allowing eastern Class I stations to operate with their daytime facilities until sundown on the west coast should cease. This merely contributes additional interference during the critical drive-time hours to those stations "in-the-middle" without significant benefit to anyone.

2. Ultimately, the classes of stations could be established local stations and regional stations. AM stations would be defined by the actual coverage they propose to serve, rather than a specific "city of license."

The key would be the establishment of a normally protected, groundwave coverage area. Station ID's would simply identify the main studio and office location (of the public files).

Consideration could be given in the future to a "marketplace" approach to allowing stations to negotiate skywave rights with other stations.

In the meantime, it is important that we continue to the efforts to extend a fair opportunity for the existing Class II's on US clears to compete effectively in the marketplace.

Raymond Voss, VP/GM
KSMR Radio
Shakopee, MN

Overlooked requirement

Dear RW:

After reading David Hughes' article, "FCC Rejects DA Proof Requests" in the 1 December issue of *RW*, and then the "Reader's Forum" letter from Eric Stone titled "Safe and Legal?," I can see that there may be some serious problems in the future.

Somehow, through the procedures of deregulation, a lot of folks have missed one very crucial phrase, which appeared in Mr. Hughes' article. For those who missed it, I repeat the qualification on "Need sufficient to ensure compliance with the station authorization."

It appears that a lot of station operators

The final stamp of approval by the NRSC to the voluntary interim preemphasis-demphasis standard for AM stations is welcome. The fact that all sides involved were able to reach an agreement is a feat worthy of praise in itself. But now that the standard has been approved, AM stations should be thinking about the next step.

Three major processing manufacturers have promised to have NRSC standard additions to their units available in time for this year's NAB show. The NAB is working to find a way to allow stations that can't afford to buy new equipment to conform to the standard at relatively low cost.

Unfortunately, there are no precise estimates of when new, wideband AM radios that incorporate the standard will be available. Estimates range from a few to as many as ten years.

AM stations should not wait. The NAB is right when it says the preemphasis-deemphasis standard is "not-a-chicken-and-egg situation."

Don't Delay NRSC

Stations should implement the voluntary standard now so they can send a clear and unified message of support to receiver manufacturers. This will encourage them to speed up the design and production of wideband, high-fidelity AM radios.

But there are two other equally important reasons why stations should

begin conforming to the 75 μ sec preemphasis curve and the 10 kHz stopband as soon as possible.

First, there are a number of wider band radios already in the marketplace. Many stereo AM radios already in the market have a better frequency response than 3 kHz.

AM stations using preemphasis greater than the new standard will sound too harsh or "bright" on the new radios. Those who use the standard, however, will reap some benefit of high fidelity sound immediately on the better receivers.

Even more importantly, conforming to the 10 kHz bandwidth specification will have an instant effect in eliminating second adjacency interference problems. By voluntarily limiting themselves to 10 kHz, AM stations actually stand to enjoy wider *interference-free* bandwidth than many of them have now.

On one side, the hard work has been done. Now it's up to AM broadcasters to show their commitment to the standard if they hope to convince radio manufacturers—and listeners—that high fidelity is the future of AM.

—RW

and management perceive that deregulation means that we don't have to do it anymore. The bottom line at some stations is replace Parts 73 and 74, along with good engineering practice.

It's up to the station operator now; you either do what is required to maintain compliance, or you don't. How you do it is up to you. Don't be lulled into a false sense of security with the phrase, "We don't have to do it anymore." That phrase now belongs to the FCC.

Norman Beaty
Broadcast Technical Associates
Indianapolis, IN

Where are good AM radios?

Dear RW:

It is obvious to almost everyone that AM radio is in trouble; lack of innovative (or just interesting) programming, lack of stereo, and low-fidelity receivers all combine to cause listeners to switch to FM.

However, there are still many very good AM stations around—stations that put a lot of effort into their programming and engineering—stations that deserve to be listened to.

Which brings me to my complaint: I cannot find a good AM receiver, let alone a good AM receiver for a reasonable price.

As an engineer for a college carrier-current station, it disturbs me that I cannot find a good AM monitor for the station.

As a consumer, it upsets me that the so-called "modern" receiver that I can

buy at my local stereo store has an AM tuner that doesn't even begin to compare with my old Fisher 500-S . . . a receiver that has never even had a tube changed!

Stereo is not really the problem—most people probably wouldn't notice stereo or lack of it as long as the sound was "good."

However, when manufacturers talk of a "lack of consumer interest" in AM stereo, is it due to a true lack of interest, or a lack of receivers? Or possibly a lack of working demonstrations? (I have seen a few AM-stereo car stereos, but I have yet to find a display which allows the AM to be heard over the buzz of fluorescent lights.)

In my search for home AM receivers, the only ones I have found are a small tuner from Radio Shack (retail: approx \$60) that is not true high-fidelity, and a tuner in a JC Penny system that must be purchased as a complete system (of course they had no working demonstration for AM anyway). Other stores give me blank stares when I mention AM stereo.

So I ask you: where can one find a good AM receiver, and does anyone have one that the average consumer can afford and/or be willing to buy?

AM has been cast aside for too long . . . it's time for radio manufacturers to give consumers true value—good FM tuners and good AM tuners.

Richard Wagoner, Engineering
Consultant
KLA AM/FM
Los Angeles, CA

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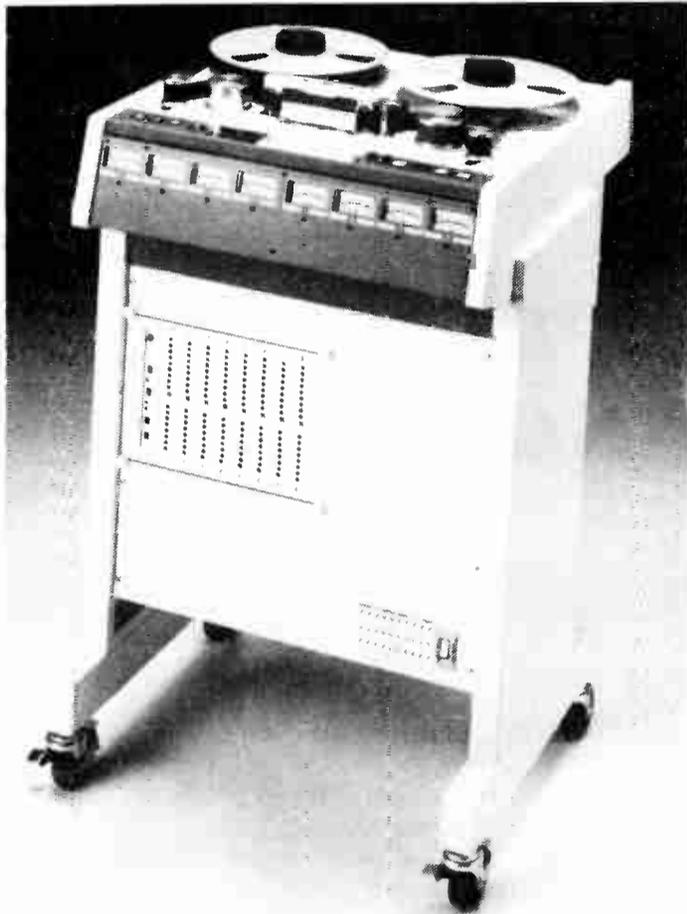
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SBE Decides Against Fee Hike

by Alex Zavistovich

Washington DC ... The Society of Broadcast Engineers (SBE) has decided against raising certification fees for its members, choosing instead to absorb increased administrative costs through the society's general fund.

Other items of business addressed during the executive board meeting 15 January included frequency coordination and a resolution of the dispute between SBE and the National Association of Radio and Telecommunications Engineers (NARTE) regarding certification programs.

The board discussed increasing certification fees for its members, but opted instead to "hold the line," according to SBE Executive Director Andy Butler. In the past year, the SBE saw "considerable" increase in the cost of administering the certification program, he said.

The board chose to "avoid burdening the membership and the engineering community with extra costs," said SBE President Richard Rudman.

SBE's certification committee was also directed to "begin developing questions specifically addressing areas of safety," Butler said. He noted that "the Commission is stepping out of the arena (of workplace safety)," and has deleted regulations governing safety equipment,

such as interlocking.

Rudman stressed that the SBE was not proposing a "safety committee," but pointed out that "certification is an educational process." The executive board asked for a safety area in certification questioning "to make members aware of safety needs," he said.

Frequency coordination

The executive board also received a report from the National Frequency Coordination Council (NFCC), an all-industry group established to help organize voluntary frequency coordinators. The main item on the report, Butler said, was an agreement on a standard database layout. He noted that the database will be "a common way for each of the 100 coordinators to store information."

Rudman said that SBE considers frequency coordination a "vital chapter activity." He also indicated that some coordination committees, in particular the New York and Los Angeles committees, while not directly supported by the SBE, work within the SBE system.

The next NFCC meeting will be held during the NAB convention, Rudman stated. The SBE's frequency coordination committee and chapter chairmen's meeting will take place 28 March.

The SBE will hold a chapter liaison conference on 17 March, 9 PM Eastern,

on the Broadcast Professional's Forum of CompuServe, Butler said. The conferees will discuss "suggested bylaw revisions for the society," he said.

The revisions are "being reviewed with an attorney," Rudman said, to ensure they are legal and conform with District of Columbia codes. He urged participation in the conference, noting that the re-

“The board chose to avoid burdening the membership and the engineering community.”

visions will be voted on in the fall.

Use of the Broadcast Professional's Forum was a response to concerns from members about difficulty in two-way communications with SBE national, Butler said. Approximately 500 members regularly participate on the CompuServe Forum, he noted.

Other business

The SBE and the Radio and Television News Director's Association (RTNDA) have begun talks about "possible cooperative educational ventures in the future," Butler said. The discussions build on similar conversations already held with AES and SMPTE, he added.

At press time no additional details could be provided about the talks, but Rudman noted that a second meeting with SMPTE was scheduled in San Francisco in early February.

Members of the executive board met earlier in the month with NARTE President Ray Throter to discuss certification, Rudman said. He added that "as far as SBE is concerned, any controversy over NARTE's promotion of its certification program is dead, and resolved."

Last year, NARTE prepared advertisements which said that the FCC endorsed private certifications. The SBE objected to the advertisements, maintaining that readers of the ads might have inferred that the FCC endorsed the NARTE program.

The two groups have offered a mutual exchange of information on their certification programs, Rudman said, noting that "10 percent of SBE's members are NARTE-certified."

Rudman also explained that tax-exempt status had been applied for for the Ennes Foundation, which administers SBE's technical educational scholarship fund. He said that the foundation, which is prohibited by law from political activity, can apply more easily for grants and aid than can the SBE itself.

The SBE was in the process of "ensuring we have earmarked every penny from the convention," Rudman said, to guarantee a clear audit trail when the status was approved.

On 12 January, the Ennes Fund received a check for \$5,000 from the profits raised by the SBE's 1986 national convention, held 14-16 October in St. Louis, Butler said. The check will be placed in a certificate of deposit to generate the actual scholarship fund.

The balance of the convention profits, approximately \$32,000, will go to the Ennes Foundation, to administer the fund, Butler said.

For additional information, contact the SBE at: 317-842-0836.

Manual on Frequency Set For Coordinators

by David Hughes

Washington DC ... The newly organized National Frequency Coordination Council (NFCC) is working to produce a policy and procedures manual for voluntary frequency coordinators by October, while a database is also being created.

The NFCC, which is made up of representatives from the NAB, SBE, ABC, NBC, CBS, Mutual, the Radio-Television News Directors Association (RTNDA), the National Cable Television Association (NCTA) and other organizations, met in Washington in early January to discuss its plans for 1987.

According to NAB staff engineer Mike Rau, the NFCC is "up and running now." It has been described as an organization that will coordinate the voluntary frequency coordinators around the country. "Our goal at this point is to get the (organizational) work done and not get stuck on bylaws," he said.

Outline discussed

At the January meeting, the NFCC "discussed an outline" for the policy and procedures manual, Rau said, which will cover a wide range of issues including how to properly solve disputes and the guidelines for entering a market's broadcast auxiliary spectrum.

A directory of frequency coordinators will also be provided in the document, which is due to be released in late 1987, perhaps October, he added.

The SBE, meanwhile, is working on an NFCC standard computer database layout that will be accessible to many IBM-type personal computers, according to SBE President Richard Rudman. The

database will be available to "any coordinator who wants it," he added.

No central NFCC office has been set up, however Rudman said that Jerry Plemmons, VP/Engineering with Outlet Communications, who serves as NFCC chairman, is handling most administrative matters. (Plemmons could not be reached to comment for this article.)

The creation of the NFCC comes after the FCC repeatedly announced its intention to remove itself from auxiliary service coordination procedures.

Response to SBE request

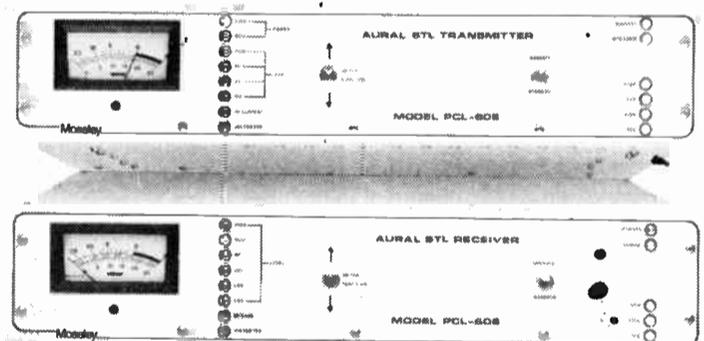
In late 1985, the SBE asked the Commission to require that broadcast auxiliary band users certify coordination of frequencies with local users or frequency coordination committees.

At the same time, the SBE also proposed that if the frequency coordination committee could not be contacted or did not operate, the operator of the new broadcast auxiliary facility should be required to certify, via an engineering study, that the channel is available on a non-interference basis to existing users.

However, in October 1986, the FCC rejected the SBE plans, calling them "unnecessarily burdensome to licensees." The Commission maintained that existing voluntary frequency coordination efforts have been successful in achieving effective spectrum usage.

The next meeting of the NFCC is scheduled for late March at the NAB Convention in Dallas. For more information on the NFCC's activities contact Mike Rau at 202-429-5346, Richard Rudman at KFWB, 213-462-5392, or Jerry Plemmons at 401-276-6200.

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AM Stereo Action Awaits NTIA Study

by David Hughes

Washington DC ... The FCC's actions regarding two AM stereo petitions filed in late 1986—one for the selection of a single AM stereo standard, and the other for a multimode receiver standard—continue to remain on hold pending the release of an AM stereo status report from the National Telecommunications Information Agency (NTIA).

At RW's mid-January press time, NTIA spokesperson R.T. Gregg said that the report would probably be released by early February.

The NTIA's report will examine whether a defacto AM stereo standard exists in the US, and whether the FCC should abandon its "marketplace" approach to become active in setting a single standard.

The first part of the study done by the NTIA was answered by some 900 broadcasters—about twice the number needed for accurate results, according to an NTIA source.

AM stations broadcasting in stereo were asked which of the two competing systems—Kahn or Motorola's C-QUAM they use, and their reasons for the choice.

Currently, only ten percent of all AM stations are broadcasting stereo. Motorola claims some 300 stations use C-QUAM, while Kahn claims about 80 stations.

Manufacturers queried

The second part of the NTIA's study focused on receiver manufacturers, including auto makers that produce their own radios.

In September, Texar Inc., a Pittsburgh-based manufacturer of audio processing products, asked the FCC to abandon its "marketplace" approach to AM stereo and select a standard. Texar did not express a preference as to which system should be selected.

Texar President Glen Clark told RW in mid-January that his petition is "on hold" at the FCC until the NTIA report is released.

Also on hold, FCC officials have indicated, is a petition filed in November 1986 by Asbury Park, NJ-based Press Broadcasting.

Request for multimode

The Press filing asked the Commission to require that AM stereo receivers be equipped with a multi-system chip so that AM radios could receive stations on either system in stereo.

In a related issue, the Canada's Department of Communications (DOC) is not expected to rule until March or April as to whether C-QUAM should be that nation's AM stereo standard. In October, the Canadian Association of Broadcasters (CAB) recommended that the DOC pick the C-QUAM standard.

For more information on the NTIA report contact R.T. Gregg at the NTIA, 202-377-1551.

Preemphasis Standard Is OK'd

(continued from page 3)

ing shipped by Orban have the preemphasis module installed.

Texar will be incorporating both the filter and the preemphasis curve in all their current and future products, according to Texar Senior Design Engineer Dave Van Allen. The company plans to redesign its AMC-1 modulation controller; the new controller, AMC-2, will include the NRSC recommendations, he said.

Van Allen mentioned that CRL has al-

so agreed to the audio filter proposal, but at press time the company could not be reached for comment.

In future meetings, Marino said, the NRSC will examine transmitter output bandwidth, to determine the "RF emission mask," or RF complement to the standard. The NRSC standard currently defines only the signal going into the transmitter and attenuation on the receiving end.

RF emissions into and out of the trans-

mitter will be scrutinized for "anything spurious which might cause interference," Marino commented. The worst case, based on the 10 kHz bandwidth limit, will be the mask, he said.

For additional information, contact Mike Rau at 202-429-5346, Charles Morgan at 717-848-5500, or John Marino at 203-333-4800. Contact Bill Gilbert at 317-451-7525 or Dave Van Allen at 412-856-4276. Contact Robert Orban at 415-595-1266.

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Assessing Station's Fire Safety

by Ronald F. Balonis

Wilkes-Barre PA ... The topics of the engineering sessions at the big national conferences get all the headlines, and the publicity. But conference size, I think, has little to do with the impor-

Ron Balonis is CE at WILK, Wilkes-Barre, PA and a frequent contributor to RW. He can be reached at 717-824-4666.

tance or relevance of a topic.

Take, as an example, the topic of one of the engineering sessions at the 54th Annual Pennsylvania Association of Broadcasters Convention (Hershey PA, 6 October 1986): *Fire Protection—Are You Safe & Sound?* by Bob Good of WGAL-TV.

The topic sounds rather mundane when compared to preemphasis curves, or maybe AM improvement, or even AM stereo.

No doubt that in the long run those topics merit the importance given to them today, but in the day-to-day operation of a radio station, fire protection and prevention is as important, if not more so, to both the station and its engineer.

Fire protection and prevention is something usually taken for granted, until it happens. And, engineers are like most everyone else in that they, too, seldom plan for what to do before, during,

or after a fire.

The reasons for planning or thinking about fire prevention at a radio station are several, but essentially the same as for any business or home. The first concern, of course, is the safety of life. And, the second, of course, is to minimize property damage.

However, it is with the efforts to minimize property damage that a fire protection plan and the methods used to fight a fire at a radio station become the concern of a station's engineer.

Because of the after-effects of the fire, the methods and the chemicals used to fight it, if the fire didn't completely devastate your equipment and facility (the property), you'll wish it had.

Most all fires and most of the chemicals used to fight them produce toxic, caustic and corrosive fumes and gases. These gases and the fire fighting chemicals themselves can, do, and will condense on and in your equipment.

Your fire may be out, but in time, with these reactants inside and on the surfaces of your equipment, your troubles as the engineer are just beginning.

Chief Engineer

And that's why fire protection and prevention planning, besides helping to prevent loss of life or property, should be a high priority item on the list of engineering concerns.

Thinking up a plan

In fire protection, a plan-thinking exercise may be as valuable as the plan itself. Part of the planning should include an inventory of fire extinguishers, an inspection for fire traps, a review of the accessibility of exits, and the testing and/or installation of smoke and fire detectors.

The complexity of a plan depends on the complexity of your station: small station, small plan; big station, big plan. But, since it's designed for a time of emergency, simplicity should prevail, regardless.

Basically a plan should detail the location of fire extinguishers and exits; how to call the fire department and the station management; and the sequence of when to do what.

First, warn others in the building. Second, call the fire department. Third, notify the station's management. And then, decide whether to fight the fire or just flee and await the arrival of the fire-fighting experts.

If it's a small, confined, and just beginning fire, then your efforts have a chance of putting it out or, at least, delaying its spread until professional help arrives.

Use a fire extinguisher, but, it is extremely important not to underestimate the scope or size of the fire, and it is important to remember to have an escape route since a fire extinguisher gives you only a minute or two of fire fighting ability.

It's complicated

Fire protection and prevention is like most things these days. When you get to the particulars, there's usually much more to know about a thing than you generally need to, want to, or can know. That's true in the case of fires too.

(continued on page 11)

Here's what broadcasters say about THE HARRIS CONNECTION:

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Joseph A. Carriere, President
Roswell, NM/Lubbock, TX:

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"Our VHF equipment from Harris gives us the best quality money can buy. And Harris really stands behind its products."

"Over the years, Harris has treated us very well. Other manufacturers may make good equipment, but not all can give the kind of support we get from Harris!"

KNOB, FM-RADIO

John R. Banoczi, General Manager
Anaheim, CA:

"When it came time to buy a 35 kW transmitter, we found that Harris had the right product with the right features at the right price—so we went with the Harris FM-35K."

"Besides—Harris has an excellent reputation for backing and servicing the products it sells."

KCOB, AM-RADIO

John Carl, General Manager
Newton, IA:

"Our SX-1A, 1 kW AM transmitter performs as advertised. It gives us a stand-out presence on the dial—especially in our fringe areas."

"And Harris' SunWatch has completely solved our PSA/PSSA power scheduling problems. I don't know how a station could do it otherwise."

"When we've needed service, Harris has always come through."

WEAT, AM-RADIO

Bert Brown, Chief Engineer
West Palm Beach, FL:

"Most AM broadcasters who have upgraded their facilities in this part of the state have gone with Harris SX transmitters. As you are well aware, this is a lightning prone area of the country, and our SX-5A has performed well about our expectations in the area of maintenance and downtime."

"We chose Harris for its professional service and support. I have a good rapport with Harris people."

WSTQ, FM-RADIO

Al Moll, General Manager
Streator, IL:

"Before we switched to Harris, we were barely on the air with a poor signal. Our FM-3.5K, 3.5 kW transmitter makes us a stand-out on the dial."

KHBS, UHF-TV

Don Vest, Director of Engineering
Sigma Broadcasting, Fort Smith, AR:

"KHBS is our first Harris installation, and I'm very glad I did it."

"What impresses me most about Harris is the service and parts support. In 19 years of broadcasting, it's the most cooperative and helpful in the industry."

"Harris knows how to treat its customers. Harris is going to win!"

WOMA, FM-RADIO

Dale Eggert, General Manager
Algoma, WI:

"Our FM-3.5K, 3.5 kW transmitter has operated flawlessly since our sign-on last November."

"And our Harris representative not only helped us put our equipment package together, but stayed on duty after the sale to see that we met our critical air date!"

WKNO, VHF-TV

Pat Lane, Chief Engineer
Memphis, TN:

"Before I ordered our two new transmitters, I tested three service departments. Harris was the only one with an engineer on duty at 10:30 p.m. the Fourth of July. With the others I got a recording and an answering service."

"What impresses me most about Harris is the attitude and the people."

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Leadership Key to Managing

by John M. Cummuta

Chicago IL ... "Leadership is the very heart and soul of business management. No one really manages a business by shuffling the numbers or rearranging organizational charts or applying the latest business school formulas. What you manage in business is people."

That statement was made by Harold Ganeen. Some say he was the greatest manager to ever hold the title.

Ganeen applied his leadership to ITT Corporation for 17 years, and all he did

John Cummuta is RW management editor and GM at WCFL, Chicago. Call him at 312-963-5000.

was increase sales from \$766 million a year to over \$22 billion, and through 58 consecutive quarters showed an annual—uninterrupted—growth rate of more than 10%.

So it's obvious, at least in Ganeen's case, that leadership has some bearing on the outcome of a business. It also has a strong bearing on the performance of an engineering department, or an entire station.

"Management" is something objective. That is to say that the pure act of management is one of following procedures, methods and formulas, and observing certain tangible results by which success or failure is measured.

Management is a systems approach to

a process or job. Much like a piece of electronic equipment. If each circuit or function along the way is operating properly, the end result should be according to specs.

However, "Leadership" is much less tangible. It is purely subjective, difficult to define and impossible to measure. It is also unteachable in the sense that it cannot really be captured from the pages of a book, yet it is there in each department or company, setting the personality of the operation.

And it is unquestionably the most important ingredient in the recipe for business success.

Leadership is the ability to inspire other people, not only to action, but to

follow you in your actions. It is the ability to mold a diverse group of individuals into a team, for the purpose of accomplishing a predetermined goal, by the sheer force of your personality.

Now that makes it sound like leadership qualities are something you're born with, doesn't it? The answer is yes and no. I believe that what you're either born with or acquire from your upbringing is a desire to develop leadership abilities.

But I do believe that those abilities are learned. They are learned, however, because a person sincerely desires to learn them and become a leader.

On the other hand, some of what makes a good leader is instinctive. It is a facet of his or her personality. I believe that if you have that instinct, you know it.

If you're reading this article and you feel something stirring inside you that says, "Yeah ... that's me," then you probably have the instincts. But those instincts, like the facets on a diamond, must be cut and polished by the experiences of life and work.

The leader welcomes the challenges and obstacles of life and business, because he knows that this is the factory that manufactures his potential for success.

Engineering— Manager—

A leader also feels a certain rush and delight at the successful overcoming of each challenge—a feeling that others apparently don't recognize. He senses that he may be an "Achieveholic," in other words—a leader.

A true leader carries the flag. He or she doesn't just say, "do this and this and this, and I'll be back later to check on your progress."

A true leader points the way, gives the vision for the organization, then rolls up his sleeves and gives the example of what it will take to get there.

This concept of giving the vision is critical. The Bible says, "Without a vision the people perish." That is the absolute essence of real leadership.

The troops look to their leader for a sense of the corporate goal; that for which the group exists. That vision can only come from the top, and only from a leader.

A leader can make work fun. He can show that the pleasures and even joys of successfully accomplishing a difficult task can be as rewarding as—and longer lasting than—those from eating a sundae or playing golf or dancing, or almost any recreational activity.

Work can be a great adventure, and the leader transmits that feeling to his subordinates.

One way leaders achieve this environment is by creating a climate of growth and opportunity. A sense that not only the individuals can grow and be re-

(continued on page 19)

ADCOM's synthesized frequency agile 7550 satellite SCPC receiver now has the capability of receiving any channel on any transponder on any satellite at the touch of a finger.

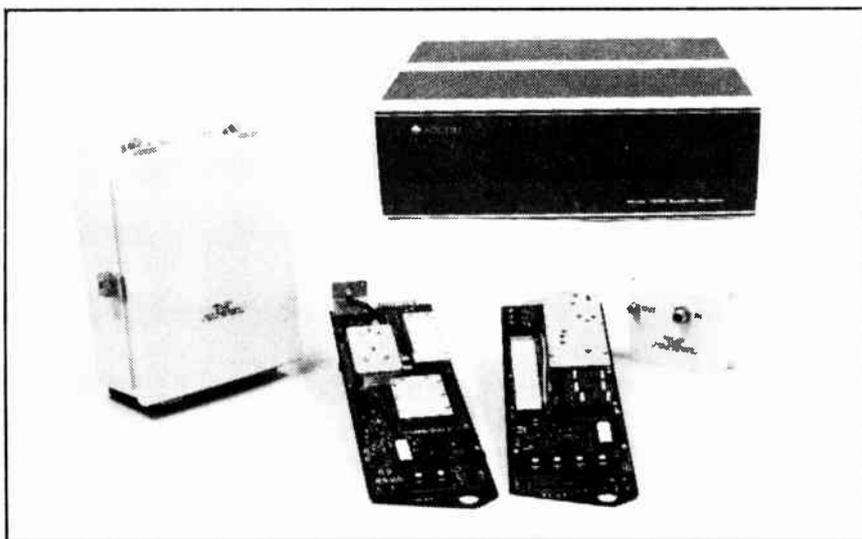
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Circle Reader Service 34 on Page 22

Protection from Fire Damage

(continued from page 9)

What follows is just a small part of a mountain of information about what is neither a mundane nor a cut-and-dry subject.

Fires are classified as to the type of material burning. Three of the classifications are common: Classes A, B, and C, and one is less common: class D.

Class A is a fire involving ordinary combustible materials—trash, wood, paper, etc. Class B is a fire involving flammable or combustible liquids—gasoline, oil, grease, solvents, etc. Class C is a fire involving live electrical wiring and equipment caused by overheating, short circuits, component failure, faulty wiring or design, etc. And, Class D is a fire involving a combustible metal such as magnesium, titanium, zirconium, sodium, potassium, etc.

Why classify?

Classification of a fire is important because each class of fire requires the right kind of fire extinguisher. That's the reason for the emphasized letter and unique background—A (with a triangle), B, (with a square), C (with a circle), and/or D (with a star)—on a fire extinguisher's label.

For the most effective fire fighting potential in a fire extinguisher, you have to match the extinguisher with the fire classification. The wrong type can do more harm than good.

For example: A B/C rated extinguisher is not effective on a Class A fire. Fires in combustible materials need the wetting and cooling effects of water for effective extinguishment.

And, a Class A rated extinguisher is not effective on a Class B/C fire. In fact its use can be extremely dangerous since water on a flammable liquid fire spreads the fire, or water on a live electrical fire could cause severe shock or death.

Fires in a radio station can have their origin in all of the three common classes. But I think Class A and C fires are the most likely. The Class A can result from careless cigarette smoking habits or butt disposal. The Class C can result from shorted fluorescent light ballasts, shorted equipment transformers, or expedient hay-wiring.

In a radio station, having the right class of fire extinguisher at the right location isn't all there is to a fire protection and prevention plan.

For your own engineering self-interest, the fire extinguisher must also use chem-

icals that are the least damaging to your equipment, too.

All fire extinguishers contain either liquid or dry chemicals under pressure as their extinguishing agent. The chemicals put the fire out by interfering in the fire's combustion process.

The chemicals, or the by-products created by them and the heat and combustion of the fire, are all *toxic* and *corrosive* to some degree and extent.

Toxic and corrosive fire chemicals

Some of the chemicals commonly used in fire extinguishers today are: water (under pressure), carbon dioxide (CO₂), sodium bicarbonate, ammonium phosphate, and halogenated hydrocarbons (Halon 1301, 1211 and 2402).

Some of the toxic gases created by a fire are: carbon monoxide, carbon dioxide, hydrogen sulfide, sulfur dioxide, ammonia, hydrogen cyanide, hydrogen chloride, etc.

Fires are a chemical reaction. The actual toxic or corrosive gaseous compounds produced depends on the fire and the fire fighting chemicals.

There is no "safe fire" for people or property; all fires and fire extinguishing chemicals are dangerous to some extent.

Most all of the dry fire extinguisher chemicals are either acidic or alkaline, or become so after application on fire. That means, in today's radio station composed of ICs, PC boards, connectors and switch contacts, these chemical compounds are hazardous to most all of a radio station's equipment.

The hazards to sensitive electronic or mechanical equipment is not a problem without a solution; it has been a concern of many industries, businesses and professions.

There is a family of fire extinguishing chemicals that is becoming commonly available having a maximum effect on a fire and a minimum effect on sensitive equipment: the *Halons*.

Halon

Halogenated hydrocarbon chemicals have been around a long time, since after World War II. The name describes the characteristics of the chemical's molecular composition.

Carbon tetrachloride was one early ones; it was effective and was used for Class B-C fires for a number of years until it became obvious that the toxic and corrosive effects of it were worse than the fire.

The newer Halon chemicals are much safer. Halon 1211 and 1301 exhibit relatively low levels of toxicity and corrosivity, while still possessing the high level of fire effectiveness. They are used in fire extinguishing systems for auto racing cars, airplanes and electronic computer/data processing equipment.

Years of use in critical applications have proven these Halon chemicals to be effective on Class B-C fires and very ben- evolent to electronic/electrical equipment. And so, their use is recommended for a radio station's equipment too.

Halon for fire prevention and protection is available in two forms: the traditional portable fire extinguisher configurations and as a total room flooding system.

The flooding system is designed for critical equipment rooms such as computer installations (its cost may make it prohibitive for a typical radio station). It's the ultimate way to minimize a fire's property and equipment damage.

In a Halon flooding system, everything's automatic. When a fire is detected the room fills up with the Halon gas which extinguishes the fire. And, since Halon is an almost inert gas, it leaves the room without a trace of gas or the fire, and leaves the equipment intact.

"What-if" fire thinking

A plan of what to do in case of fire costs little. Just the instropective "what-if" thinking effort will do the station a lot of good; it might even make your insurance company happy too.

Though the chance of fire is slight, the

value of a plan and the thinking exercise to make it can be quite high from an engineering perspective: it is much, much easier to maintain, than it is to clean up and rebuild.

Transmitter site fire protection and prevention planning requires some extra, and extremely important, steps.

According to the new EPA rules governing PCB containing equipment, if there are PCBs at the site you must register their existence with the local fire department.

And, in the event that they are involved in a fire, you must report the incident immediately to the US Coast Guard National Spill Response Center by calling (800) 424-8802. That is another important reason to plan for fire protection.

There's a lot more to know about fires: How and why they start and how to put them out.

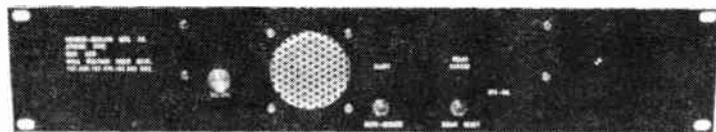
To get more information to quench your fire-fighting questions, check with your local fire department and library, or just read the fine print on your fire extinguishers, if you have any.

Coming up in my next column is a topic related to Class C electrical/electronic equipment fires. Applying the intent of the Standards of Good Engineering Practice will minimize the potential of electrical fires.

Although it is primarily thought of in the context of the FCC rules—Section 3.40 (1950s), 73.46 (1970s), and 73.49 (1980s)—as an area for the Radio Inspector's scrutiny, its actual practice should be as a matter of self-interest for all engineers.

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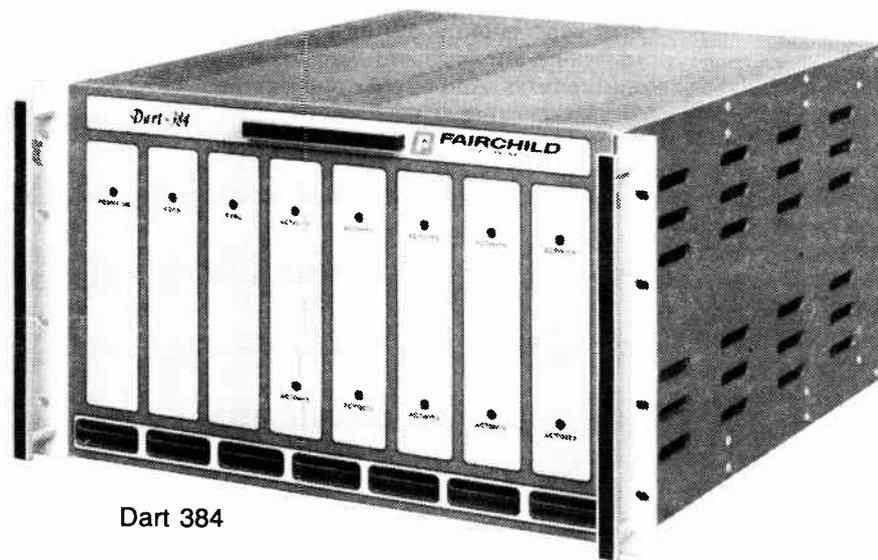
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Comparing Mics for Production

by Tyree S. Ford

Baltimore MD ... I just received an exciting call this morning from David Parnigoni's office at the NAB giving me the nod to conduct a three-hour production seminar at the upcoming convention in Dallas.

At the time of this writing, the session is scheduled for Saturday 28 March from 11 AM to 2 PM. This will be a great opportunity to meet and exchange ideas. I hope you can make it.

Ty Ford, a radio audio production consultant, helps stations optimize their use of production equipment and airstaff skills. He can be reached at 301-889-6201.

We will cover the basics as well as more advanced practices and theory. You'll also get the chance to hear the results of our most recent mic comparison, which you will read about in this column.

Please contact me with any great ideas or techniques you may have that pertain to production. Send me copies of your most dynamite production. Keep in mind that some of the best production is very simple.

Send your 7½ or 15 ips tapes to my Baltimore office, 3804 Ednor Rd., Baltimore MD 21218. Even if you don't plan to attend the convention this time, keep those ideas and tapes coming. If your tape is used, you will be credited in

absentia.

I would like to thank the following people and companies for their cooperation in our recently completed mic com-

Producer's File

parison. Tim Finnegan of Martin Audio Video for the Sanken CU 41, Dick Ravich of AKG, Tony Tudisco of Sennheiser, Michael Solomon of Beyer Dynamic, Jim Long of Electro Voice, John Phelan of Shure and Jerry Graham of Gotham. These folks helped make this event possible by shipping me the mics and by providing me with good information.

Thanks also to Bill Spicer of Spicer Productions, here in Baltimore, for the use of the new SSL equipped studio in which we recorded the comparison. Finally, thanks to Dwight Weller, DE at WLIF, for the loan of a new SM-7.

I decided early on to arrange for a panel of experts to compare these mics. The panel consisted of Steve Cook, CE at Spicer; Betsy Harmatz of Sheffield Aud-

io Video; and Jay Harrison of J. Harrison Recording.

Combined, these people probably do over half of the voice and voiceover recording work in the Baltimore area. All three are well known for the great job they do.

Betsy and Steve both use mainly AKG 414's and U-87 Neumanns. Jay is currently using Neumann TLM-170's.

Knowing that these were their mics of preference suggested two things. First, I expected them to rate well in the comparison. Secondly, they would rate well because they're very good mics.

Several days before the comparison my office began to look like an electronics supply room. With 19 mics to compare, I had about \$8,000 in mics in front

(continued on page 18)

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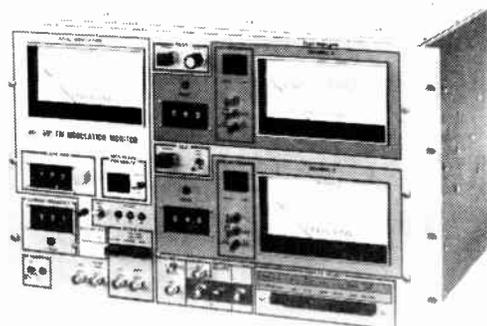
A color-coded system ties together the associated displays, switches, and jacks for a particular function or test. Select your test by pushing a color-coded button and simply read the results on all of the indicators. It's as easy as it sounds.

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The 691 can now be optionally ordered to measure two SCAs. There are many other features ... write or call for complete information.



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Table 1.

Electro-Voice RE-20	Neumann U 47
Shure SM-7	Neumann U 87
Sennheiser MD 421	Neumann TLM170
Sennheiser MD 409	AKG C414EB/p48
Beyer M 260	AKG C414B-ULS
Beyer M 88	AKG 535 EB
AKG D 12E	AKG 460 B
AKG D 330BT	AKG The Tube
AKG D 112	
Sanken CU 41	

Table 2.

A		B		C	
1. Beyer M500	\$260.00	Neumann U 87	} Tie	Neumann TLM 170	
2. Sennheiser MD 421	\$349.00	AKG The Tube		Neumann U87	
3. Neumann U87	\$1,600.00	Beyer M500		AKG The Tube	
4. Sanken CU-41	\$1,930.00	Sennheiser MD 421		Beyer M500	
5. AKG The Tube	\$1,800.00	Electro-Voice RE-20	\$544.00	AKG C414EB/P48	
6. AKG C414EB/P48	\$895.00	Neumann TLM 170		Neumann U47	\$1190.00
7. Neumann TLM170	\$1,500.00	Sanken CU-41		Sanken CU 41	

Shure SM7—better on hard sell than soft
Sennheiser MD409—somewhat bassy, better on hard sell.

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Bucking Audio Establishment

by Fred Baumgartner

Part I of IV

Englewood CO ... What started as series of questions about audio processing, turned into a rather long and radical analysis of where we are and where we are going.

I am going to start this under the premise that it is always in good taste among broadcast engineers to argue about the nature of audio and its processing.

First, audio processing does not exist in a vacuum, but rather as part of a hierarchy of needed functions.

Second, the building blocks we use to assemble the audio chain represent functions of the devices rather than functions to be accomplished.

Third, the standard industry processors have not been getting better year by year so much as they have improved in quantum leaps.

Fourth, it is no longer true that the least number of processing units is best.

Let's begin with the goal, which is to have the maximum number of listeners. For the commercial stations, listeners transform into revenue, for others, it becomes support.

To reach the goal we must satisfy a hierarchy of needs (Figure 1).

The first item is programming. Most of us find ourselves in one of two situations. Either our programming is unique and broad-based enough to gain the desired audience, or we are one of the gang fighting for our share with competition that is only fractionally different.

We are all aware of stations that program to such a limited psychographic (1): That a significant part of the audience can be classified DX, or (2): If the

Frederick Baumgartner, assistant CE at KWGN-TV and former CE of WIBA, Madison WI, is a frequent contributor to RW. He can be reached at 303-740-2883.

listener wants it bad enough he will do most anything to get it.

The other extreme is the seven rock stations going head to head in a 50 station market. If you are alone in your programming, you have satisfied your needs and need do little else. If you and others have satisfied the first need, then the battle is waged in the second level of the hierarchy.

Conditions of coverage

The second level is coverage. One of three conditions exist. All are indistinguishable, one has a noticeable advantage or there is no contest.

In the first condition, for the area of in-

terest, each station easily puts a working receiver into full quieting, full limiting, 100% copy or however you describe a good solid hole in the dial.

In the case of a notable advantage, one station requires more active searching and tuning to listen to than does another.

In the third condition, one station is a hole on the dial and the other a bump in the noise ... no contest. The conditions are based on relative power, pattern, location, dial position and hours of operation. If at this point no one has a decided advantage, we move to the third level.

The third level is loudness/fatigue. If

the first two needs are satisfied, the station that is the loudest will gain the most audience. Inversely, the station with the least fatiguing audio will get a larger audience and keep it longer.

The fourth level is audio color and fidelity. Again, if the above are satisfied, the battle is waged here.

There are a series of "local" factors which have various degrees of influence. Among these are loyalty (dial rusted on one station), contests, promotions, brushing the limits of bad taste, etc.

These are the exceptions that prove the rules and are generally rather short term influences on audience size.

(continued on page 15)



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Circle Reader Service 11 on Page 22

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The best audio processing system money can buy just got better! The TEXAR Replacement Card Five (RCF-1), when used in conjunction with your TEXAR AUDIO PRISM'S™ and Orban Optimod 8100*, delivers an additional 1.5 dB of perceived loudness. That's a lot in today's competitive markets! In fact, the RCF-1 has more clean power than anything else money can buy.

We designed the RCF-1 in response to many telephone calls from AUDIO PRISM users over the past 18 months. While each call was unique, two recurring questions emerged: 1) "Sometime ago, we bought AUDIO PRISM'S to stand out from the crowd, but the competition has caught on and caught up. Today, they have AUDIO PRISM'S too. What can we do to re-establish our lead?" And 2) "What can we do to get more low-end bass?"

Exploring ways to further increase the modulation power of the AUDIO PRISM/Optimod combination, TEXAR engineers determined that the limiting factor was in the attack and release times of the Optimod. This is not to criticize the Optimod, a well designed and respected unit, but it is to recognize that competitive market situations require many broadcasters to use it in ways other than for

which it was originally designed. Intended to operate on raw, unprocessed, console output, its operation included a generous safety margin to accommodate operator inattention. Face it: not everyone runs perfect levels.

The conservative design of the Optimod prevented these indiscretions from ever getting on the air. But today, many broadcasters precede their Optimod with the digitally controlled AUDIO PRISM. In these cases, the safety margin is no longer necessary. What if you could say to your Optimod, "I'll take care of the ups and downs in average level; you worry about making modulation?" That, in very simplified terms describes the operation of the RCF-1. (Not surprisingly, the RCF-1 should *not* be used in a barefoot Optimod, as there will be no safety margin for an overdriven board.)

Making more low-end bass available to users was a simple extension of the RCF-1. The original card 5 had a predetermined, fixed amount of bass which it would permit. Beyond that, it would reduce the gain of the low frequency stages. As you mixed in more lows on the AUDIO PRISM'S, the Optimod would simply take them right back out. Today, the RCF-1 has a "BASS BOOST" control which allows the user to dial in all the

low-end bass one could want.

Card 5 is a plug in board, so installation of the RCF-1 takes less than 3 minutes. Adjustment takes less than one. No readjustment of the AUDIO PRISM is required.

To install the RCF-1, simply open the front cover and access panels of the Optimod. Turn off the Optimod power switch and pull out the original card 5. Slide the RCF-1 in its place and turn the power back on. Replace the access panel with the new one provided and set the RCF-1 controls to the recommended settings. That's all there is to it. No complicated soldering. No complicated modifications to circuit boards. No readjustment of other controls in the system.

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At Odds With Myths of Audio

(continued from page 13)

To sum it up, as an engineer you are in one of three states.

1. Ahead of or even with and unable to pass the competition,
2. Behind and able to improve or,
3. Unable to compete.

The only case worth discussing here is the second. Although I intend to speak of audio processing, allow me to say that if the levels of the hierarchy above have not or cannot be satisfied you have nothing to gain by aggressive audio processing.

If the problem is programming, it makes no sense to expend large amounts of money and effort on audio. If the problem is coverage, it takes more sense to fix that (if it can be) first.

If the first two levels cannot be met, then the stations priorities must be survival . . . narrowcasting, cost control and the like.

Cases in point

It makes no sense for a station with poor coverage or unpopular programming to pour money into an audio system in the hopes of competing with a number of stations with decided advantages.

One example is the not-quite-suburban station attempting to be "loud" enough to get into the metro market. The station with hopeless transmitters, ground systems, short or failed FM antennas, cannot "fix" the problem by adding a magic audio box.

It makes no sense to have a decided coverage advantage and excellent programming and then push up the loudness and increase the fatigue only to reduce time spent listening (TSL).

Audio processing does not live in a vacuum. What is done here must reflect where you are in terms of what is needed to get to the goal.

Obviously a good engineer has to be aware of where he is on the hierarchy, and how what needs to be done fits with what resources are available.

The PD's role

Obviously we have stepped into the land of the PD and or those who function in that capacity.

This is one of the gray areas of broadcast engineering. The PD must be part of the audio decisions.

There is nothing wrong with giving the PD a tweaker, setting up the proper listening environment, making him read the processor books (especially the part to the PD) and—with guidance—having him have at it.

Again one of three things will happen. First, you and the PD could reach agreement and gain mutual respect for each other.

Second, you will help the PD arrive at his desired sound.

Third, the PD will be convinced of his ignorance and give the tweaker back. All of these are adequate mutual understandings.

But alas, there is a fourth possibility: you may go to war with each other.

After all this, I am sure that you think "of course processing does not exist in a vacuum." In reality the concept is rather universal.

Any number of folks speak of the ideal "straight wire" and many processor manufacturers speak of the one box that does it all or the box that will make you

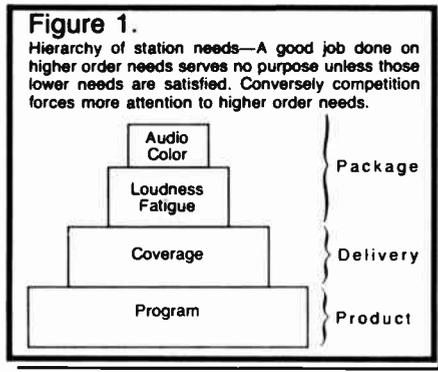
loudest, etc.

The group we call the "golden ears" talk of a transparent system. The point here is that these easy-to-swallow truths are not truths, or even ideals, because the goal is audience and we are constrained by our programming and coverage.

If a pair of back to back diodes and a white noise generator could get us the maximum audience, then *that* is truth.

The building blocks

The current and last generation of processors are almost universally configured as an automatic gain control



(AGC), compressor and limiter.

The mixing board goes in and a transmitter accepts the output. These are the functions of the processing *devices* and not the functions of *processing*. The functions of processing are input correction, colorization, transmitter correction and receiver/path correction.

If the building blocks do not represent the desired functions, we may be asking the wrong questions and making some of the wrong decisions.

Asking "how much compression, loudness, frequency response correction, etc.," are likely less appropriate than asking "have I corrected my input, transmitter, receivers and colored (or uncolored) the sound to meet my goal?"

The topic of inappropriateness of the tools to the task is rather broad and I will skip on before I return in detail.

I am not saying that everything we are doing or thinking is wrong, but that there may be a better method of thinking about audio.

Processing "leaps"

The third issue I outlined above has to do with the quantum leaps in audio processing. I see three distinct "leaps."

The first level covers the devices from about 1920 through the 1960s. These devices were built first as self defense . . . keeping a crooner from damaging the transmitter.

The limiter kept the transmitter from over modulation and the AGC covered for the operators' limited ability to ride gain.

The compressor comes later to fight off noise levels and improve coverage. This first generation gear is characterized by noise, distortion and slowness. I visit a lot of stations, and a very few still employ this generation of gear.

Some are in mint condition and used on well-cared-for older transmitters in auxiliary service (which is very appropriate as an aggressive state of the art processor will either damage an old transmitter or the transmitter must be run at very low modulation levels).

More often we find second generation processors. These are normally built around opamps and add little noise or

undesirable distortion.

They are faster and smarter with gates and intelligent gain controls. Many are virtually transparent until "asked" to process. In major market terms the costs are relatively small, in small markets they are often a major expense item.

New generation

The third level of processors is only beginning to appear. This is the entirely digital processor.

Many processors now use some digital circuitry mostly in control lines and to blink the front panel LEDs. To the best of my knowledge the only true digital processors are on work benches.

This is such a complex topic that again I must save this for later. But I will cheat and prematurely add two concepts here.

The first is that digital processors work in the time domain more than the amplitude domain.

Second, the hard cold economic facts are that the sum total of the world's audio processing needs is very small and thus the components and concepts used to design digital processors (as has been the case with analog processors) will be those adapted from other purposes.

To return to the original premises, and item four. A near universal truth is that the least number of processing elements is the best.

The proof is the station with \$20,000 and two racks of processors that sounds just awful. Clearly three things happen with the addition of more processing elements.

First the sum total of each boxes problems (mostly noise and distortion) adds.

Second, interactions between boxes (one unit correcting what the last has done or worse amplifying a fault upstream) increases.

Third, the margin of error increases faster than the number of units. Odds of nonharmonious operation and single unit failure get rather high. The tools to analyze what is going on get more complicated and difficult to use.

The adage "less is better" is certainly true in the manner in which it is intended.

Clearly the ground lost does not compare with that gained. The rule then should be rewritten to say "each part of the processing chain must be a part of the overall good."

This is a cost-benefits analysis. In first generation gear, the gear has such high noise and distortion that each added device has a serious negative effect on the overall sound.

Because the first generation processors were "defensive," any defense one could live without resulted in a less distorted and quiet product.

In this generation of gear, each device is so clean and distortion free (if operating properly, of quality heritage and not processing heavily) that even very long chains of equipment have good audio characteristics that far exceed the ability of the transmitter to carry.

It may be that the larger number of processing elements can result in achieving the goal.

In the next three parts I will deal with an overview of audio processing using objectives rather than function blocks ("what are we doing?" rather than "what do these do?").

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Loop-Fed Answers Early Woes

by Floyd Hall

Crestline CA ... Did you know that ... ?

What with all the recent agitation and promotion, and altruistic theorizing about developing an AM antenna which *only* radiated a ground wave, sans high angle skywave radiation; that we already went through all this between 1930 and 1940? True!

In the early days of broadcasting, the trend towards vertical radiators was for 1/2 to 5/8 wave antennas, (180-225°), since even in those bygone days it was known that the longer antennas radiated a stronger ground wave.

The important thing is that these early broadcasters soon discovered that these high vertical antennas produced not only higher ground wave fields, but also a nasty minor lobe pointed at about 50° or 60° elevation.

When this high angle radiation reached the ionosphere (the Heavyside layer as it was known then), it was reflected back down to earth about 50 or 60 miles from the station, and proceeded to cancel the ground wave!

I have known several of these situations, the most notable of which in California was KNX on 1070. Although throughout the day they had a nice 3-5

Old Timer

mV/m signal in the Riverside-San Bernardino area—some 60 miles from the station—by 1600 hours they began to fade so badly they were largely unreadable.

Now as the result of this phenomena, the German broadcasters in 1930 started to use a single vertical wire or metal rope, hung in the axis of a self supporting wooden tower, with a height on the order of a half wave or better.

These antennas were a decided improvement over a metal tower radiator of the same height, as to anti-fading characteristics described above. However, as I am sure you recognize, these wooden towers were impractical, with maintenance difficulties, and they sometimes were burned down!

Now, around 1940 a Mr. Helmut

Floyd Hall is a regular RW columnist and an engineering consultant at Consulting Radio Engineers, Crestline, CA. Call him at 714-338-3338.

Bruekman, consultant at the Signal Corps Engineering Laboratories in Fort Monmouth, NJ, came up with an entirely new approach to the vertical radiator.

He wrote a paper and described his new principle—he called it the "Loop-fed Antenna." The first important use of his antenna was one erected by the 100 kW station in Frankfurt am Main in 1946.

During 1947 Bruekman did some experimental work with his loop-fed antenna at WMAQ; and subsequently published a wealth of data on its radiation characteristics.

Space here doesn't permit any more detailed description, but he claimed much superior operation over the usual base-fed vertical radiator, with virtual elimination of fading at 50 to 100 miles (McKinney please note)!

While we are on the subject of antennas, and hence towers, I want to talk about a subject I have come up against recently, and also over many, many, years, and that is relamping and maintenance.

I have seen numerous instances where these functions have been performed by a station engineer, and in a couple of cases by announcers! This absolutely horrifies me! I have said to a station owner/manager, "Do you mean to tell me you allow that kid to climb your towers?"

Whereupon he replies, "Oh, it's OK, he's signed a waiver."

Oh me, oh my, and Holy Mackerel! Such a waiver is not worth the paper it is written on.

If this kid falls off the tower and is injured or killed; or he gets badly burned; his wife, or his parents, or his uncle, or whatever; can collect all the station is worth, or more in a suit for damages! No judge will admit in evidence a waiver signed by the injured party.

Under no circumstances will I recommend a rigger or tower man to a client, unless he can show me a certificate of insurance of at least a million dollars; P.L.

& P.D., and medical. If I sound a bit positive about this, believe me I have seen some disturbing examples.

In addition, I've seen several cases in which a station has paid out substantial damages to the parents of children who were hurt, or burned, on a tower which was judged to be inadequately protected from such activity: a poor fence which could be easily climbed; or a gate left unlocked; and no sign to warn of danger.

Another danger that exists, in a little different way, is the theft of ground systems.

"Do you mean to tell me you allow that kid to climb your towers?"

I know of one station in California who lost the entire ground system, about a three-tower array, three different times in a period of about two years. In spite of the fact the entire property was chain link fenced! They simply dug a hole under the fence!

The very best way to thwart these thieves is to light up the area with a couple of 150 W weatherproof floodlights about 20' up on each tower, connected to the tower light wiring. They just don't like to be seen in the light.

And by the way, when was the last time you gave your tower(s) a really good inspection? You should have a copy of Part 17 of the Commission's Rules.

Now:

1. When has your tower(s) been painted last? Is the color still good and bright, and are there any rust spots showing?

If your tower(s) had not been galvanized, and there is some rust showing here and there, don't paint over them, for they will continue to rust under the

paint. These spots must be wire brushed and primed with red lead oxide or other rust preventive coating.

2. Check the base insulator and the socket of the pivot. These are usually cast iron and often crack. If you find a cracked one, the tower will have to be jacked up, and the socket replaced.

3. Now, with your binoculars look carefully at the guy insulators. You may find two or three broken. They will have to be replaced and the guy retensioned.

As to guy tension, sight up the guy and see how much sag there is. On a 200' tower, there should be about three to four feet of sag in the top guy. This sag acts as a kind of spring, and lets the tower move a little in the wind. Any tighter, and the guy may snap in a good strong, gusty, wind.

4. Take a good look at the guy anchors. If the anchor rod is in dirt, dig down to the concrete, then coat the rod with tar, or roofing compound to arrest and prevent rust.

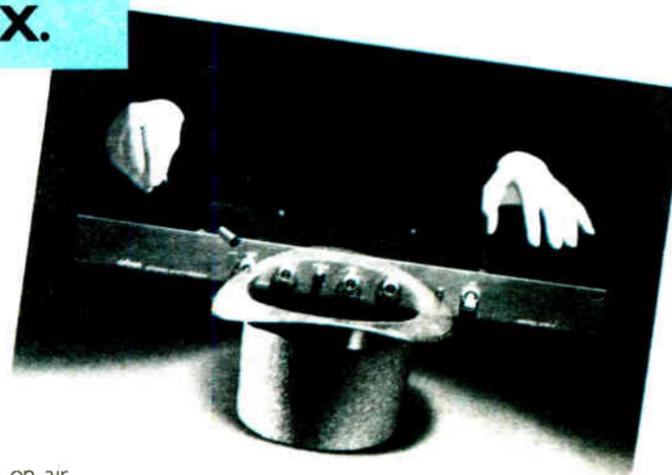
5. Sight up each leg of the tower to see if it is plumb. If it isn't, then the shear and moment is displaced, and this calls for a rigger with a transit and a dynamometer, to tension all the guys the proper amount.

6. Last, but not least, find out if there is any leakage between the tower light wiring and the tower. Do this with an AC voltmeter when you are shut down. You would be surprised how often you can measure 115 V between the tower and ground.

I have had a couple of stiff jolts when I grabbed hold of a brand new tower! This means, of course, that the hot lead is shorted to the tower, and this usually occurs in the beacon. Since the tower isn't grounded, you probably won't find it out until you get bit!

One final question. Is the tower light wiring in conduit, or armoured cable? Or is it just insulated pairs such as Romex or the like? If the latter, you're in trouble, and I will tell you why next time.

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Production Mics Are Compared

(continued from page 12)
of me.

The evening of the session I met Steve, Betsy, Jay, and Beth Schnably (our female voice talent) at Spicer. Two pieces of copy were used; one soft sell and one hard sell.

We experimented with each mic to find its "hot spot." External wind screens or pop filters were used on all but the RE-20. No EQ or processing was used. Mics with EQ positions were left in the flat position. The 421 Sennheiser was recorded in the M position. Table 1 shows the list of mics we compared.

The entire collection took over three hours to record. During the recording, both Betsy and Jay commented that hearing a playback of the tape through the monitoring systems at their own studios would be helpful.

They felt their lack of familiarity with the acoustics in Spicer's studio would alter their reactions. Within two weeks, I found holes in their incredibly busy schedules to conduct each playback session.

During the comparison, I asked each engineer to make notes and rate each mic on a scale of one to ten.

At the end of each listening session, we added up the points, compared the comments and chose the top seven mics. The results are in Table 2. At the bottom of Table 2 are mics which rated well but

didn't make the top seven.

While it surprised me that five mics of the seven appeared on all three lists, what surprised me most was the cost range—\$260 to \$1930!! You can buy seven Beyer M500's for the price of one Sanken CU-41, and still have change left for cable and connectors.

We were, of course, using the mics for one specific application: the recording of

“

If you're considering adding mic processing to your present audio chain, first think about the mics you are now using.

the human voice. Attempts to compare these mics for other applications would, no doubt, yield substantially different results.

The tube from AKG, it should be mentioned, comes with suspension mount, windscreen, power supply/remote control with bass rolloff, and 30' of connecting cable. This is included in its \$1,800 list price, along with an extremely sturdy flight case.

We closely compared the two AKG C414's, and found we preferred the EB/P48 to the B-ULS for very close mic work. Both mics exhibit a bass increase

when worked closely. Both sounded much better when worked from a distance of 4" to 6".

If you have mic eaters doing a screaming CHR format, you'll have to restrain and retrain your airstaff to get the best from these mics.

The Beyer M500, which drew positive comments like "crisp" and "bright" surprised us. It was substantially brighter

than the SM-7 or RE-20, similar to the MD-421, but with a bit more bottom.

Its almost 8 dB rise from 1 kHz to 10 kHz provides a lot of cutting power. If you have anyone on your staff with a sibilance problem, make sure you hear them on it before you put your money down.

Jerry Graham of Gotham, distributors for Neumann, had a few thoughts on the fragility of condenser mics. According to him, the biggest liability (if that's what you want to call it) of the U87 and U87A, is that they must be returned periodically so that the capsule can be cleaned.

In these mics there is a charge on the capsule which attracts the various flora, fauna and fluids that are projected from the mouth of the person speaking into the mic. Incidentally, the U87A has about a 10 dB higher output than the previous model, and a bit less self-noise.

The TLM 170, like its predecessor the U89, does not have a charge on its capsule, thus the collection of contaminating effluvia is greatly reduced.

In speaking of equipment with Phil Wells of KLZZ in San Diego, we kicked

around the old chestnut concept that condenser mics shouldn't be used because, when broken, they are too expensive to fix or replace.

If this is your concern, consider an "equipment abuse" form to be read and signed by new staff. Recognize that accidents happen. Recognize a responsibility to inform new staff about the proper handling of new equipment. Also make it understood that abuse will not be tolerated.

Those stations who are "running lean" will continue to hire these people. They will also continue to operate as cheaply as possible, and will put short term goals ahead of medium and long term goals.

Most of us got our start at stations like this. While it is important that we remember and use the positive parts of these early experiences, it is equally important that we recognize that quality and performance (while often intangible except for price tag) are what distinguish us from the rest of the pack.

If you're considering adding mic processing to your present audio chain, first think about the mics you are now using.

Plugging an OK mic into a new super processor may end up costing much more than buying a couple of super mics, and using very little processing. The chain is only as strong as its weakest link.

If you're interested in trying some new mics, call your broadcast supplier to see if you can get any "loaners" or if their return policy will allow you to get what you need. Incidentally, the next question you should ask them after they tell you the list price is, "What's my price?"

By the way, John Weber of KTVQ in Billings, MT has a great way to keep the EQ on a Sennheiser 421 from being changed. Give him a call if you're having problems. Gary Peterson at KGGG in Rapid City solved the problem by using a piece of 1" heat shrink tubing shrunk around the EQ ring.

Thanks for the tips. Keep those cards and letters coming. I hope you can make it to Dallas this March.

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Managers Need To Be Leaders

(continued from page 10)

warded for their accomplishments, but the team as a whole can develop and receive recognition for their collective performance.

This not only generates a pattern of individual aggressiveness, but it also creates a peer-pressure situation where the group itself motivates the individuals, because no one wants to be the guy who let the team down.

One of the marks of leadership, especially in middle management, is to both challenge and reward subordinates.

Challenges are very important components in the machinery of leadership. Great leaders seem to get more out of their troops than average managers, because they expect more out of them.

They give each employee as much responsibility and opportunity as they can handle. It hones and sharpens their skills, and it allows the exceptional performers to shine. This is being a leader.

The rewards, although tremendously important, are usually less in the control of the middle-management leader. It may take an Act of Congress to get one of your employees a merit raise, especially if you have a union contract to contend with.

My advice is to go to Congress. But only do it for the really exceptional performers.

Other rewards you can offer are job titles, assistant leadership positions, opportunities beyond and outside of the normal sphere of departmental activities, and any educational or informational opportunities that come along, such as seminars and conventions.

The key to effective leadership is really the key to success in any interpersonal activity. Quality communications. Communication must be free and open, and it must flow both up and down the chain of command.

That means that the leader must be as willing to take the positions of his subordinates to upper management as he is to push the mandates of upper management down on his people.

One of the toughest challenges to the leader trying to implement open and clear communication is that of cutting through the sludge to get at the real facts. Everyone tries to color what they report, in a work situation, in order to put themselves in a good light.

The leader must instill the concept that criticism will be accepted—without retribution. And that the only facts that are acceptable are *real* facts, because they are the only ones that can lead to real solutions.

Also, office politicking cannot be accepted. That is to say the getting together and working out our "story," so that we're all saying the "right" thing.

It should not be tolerated for managers to put pressure on subordinates to alter to the truth to protect the boss, the department or his own hide. If there is a problem, it must be accurately communicated, not frosted over.

The truest test of a leader, in the final analysis, is what he or she gets out of

subordinates; both in terms of performance and loyalty.

A real leader hires the right people, then salvages those people rather than firing them when things occasionally go sour. A leader fires people who cannot function as effective team members, without dragging his feet.

The subordinates of a real leader know what he expects of them, but they also know how much he appreciates their performance.

The backbone of the leader is self-confidence. Without it leadership is impossible. With too much of it leadership is also impossible. The test of self-confidence is admitting when you're wrong and setting out to correct the situation rather

than hiding it.

Another facet of the true leader is the ability to differentiate between leading and commanding. The commander gives orders with the threat that failure will result in decapitation for those responsible. This command by fear lacks several elements of true leadership.

The leader can get the same amount of emotional commitment from his people, but it comes more from their not wanting to let him or the other team members down, rather than from just trying frenetically to save their own skin.

Finally, integrity and character round out the description of a true leader. Without integrity no one will follow you. If you can't be trusted, you can't be

a leader.

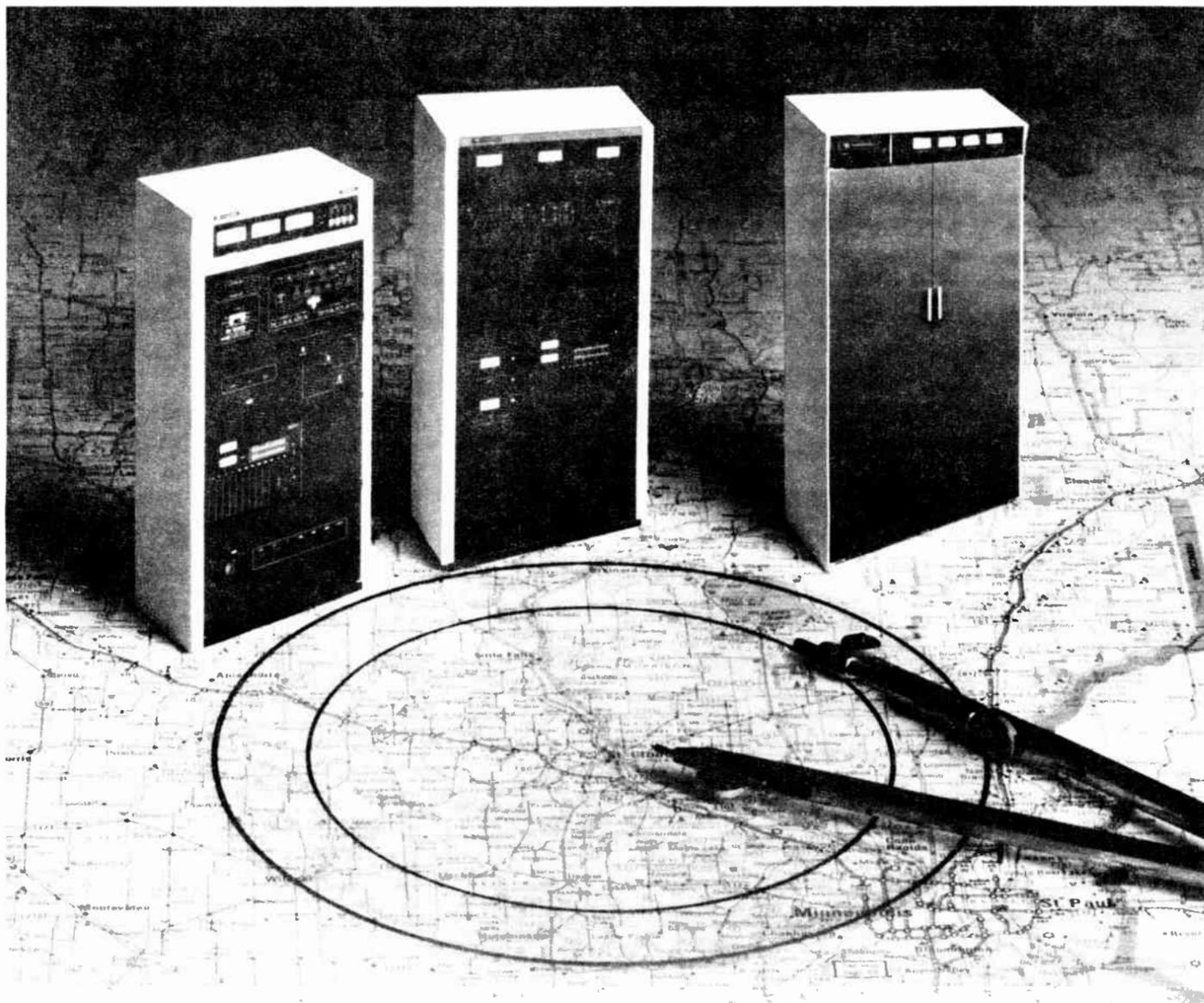
Character is the ability to follow through on a good commitment, long after the emotions which caused you to make it have dissolved.

Your character will be obvious to those over whom you have authority—and to those who have authority over you. It is controlled by the force of your will, and if you can develop any part of your person—develop a strong character.

So, you can see that what makes a good leader are not only things that come bundled in you when you're born, but there are many components that you pick up or develop along the way.

As Harold Ganeen would say, "Leadership, like life, can only be learned as you go along."

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Circle Reader Service 18 on Page 27

Contract Engineering

by Mark Durenberger

Minneapolis MN . . . Are you one of a growing number of engineers asking just how you fit into the long-term picture of the new broadcasting era?

Or are you content with your job, satisfied with your role in your station's performance and comfortable with the growth scenario? Take a moment to ponder some questions.

If growth in your job is important to you, are you satisfied with the opportunities ahead, or are you casting about

Mark Durenberger is a senior RW columnist and an independent consulting engineer. He can be reached at 612-822-0041.

New Era of Station Engineer

to see how you'll be able to improve your lot in this new era of cost-efficient broadcasting?

Small AM stations are dropping like flies. More and more are simply going "dark." AM stereo is not proving the everlovin' salvation its ardent proponents have long proclaimed.

Meanwhile, new class A FM assignments are spotted all over the country in towns as small as 1,000, hardly likely to support the cost of delivering still another radio signal to an over-crowded band. (Within reach of my radio three

AM's and an FM are dark right now in a marketplace with decent dollars.)

Today's major market is shaking down into what's likely to be the long-term positioning of its radio leaders: a dominant AM, the rest of the the major portion of the pie split equally among seven to ten FM or AM/FM combo leaders; the remaining few percent of the listeners spread among the other 25 stations.

Small and medium-market broadcasters are watching their station-owner friends go to the bank with hat in hand. It's a tough world out there. The only

real station growth is that demanded by consolidation of facilities for efficiency's sake and by the FM upgrading opportunities of 84-231 and 86-144.

The modern station manager is learning to survive in the new era.

He's computer-literate; understands the efficiencies of sharing a Contract Chief with others in the area; can interpret those remaining FCC rules and procedures which affect his daily operation, and hires a consultant for the rest (often asking for bids); exchanges survival ideas with his peers; and is no longer afraid of engineering.

As a citizen-consumer in the high-tech era, he knows the high-technology he can buy in blister-packs is supported not by a repair depot, but by direct replacement, since it's usually cheaper to replace than repair.

He thinks he can treat his radio station in the same manner, so in his zero-based budgeting approach to engineering he believes it's usually cheaper to simply "plug in a new card" than pay to troubleshoot the old.

He's supported by the equipment manufacturers who (wisely, for their own survival,) offer "remote maintenance" ports and instant telephone support at a "plug-in-replacement" test level that a secretary can often understand.

A bleak picture?

As a radio station Chief Engineer, where do you fit into this picture? Does your management understand that this approach makes it hard to attract dedicated engineering talent?

It'd be tough for you as a creative and dedicated engineer to really get involved if your boss's view of your job is that it's a "necessary evil."

If you're a cynic, you may see yourself as just a function-block between the program and the cash register.

The dedicated engineer retains pride in his or her station, but unless your job provides some growth potential, perhaps expansion to support of other station operations, the job of Chief Engineer as we know it today may not have much of a future.

Still, the short-term picture still looks pretty good, at least at operations which are making a decent buck. There's a lot of work at the stations still on the way up, or repositioning themselves with new formats and new facilities.

It's great to design and move studios . . . particularly when today those moves are fewer and farther between, and proper long-term planning is much more important . . . but even new studio wiring can now be done on a "plug-in" basis.

The thrill of selecting, ordering and installing a new transmitter is dissipated by the time it's on the air and working properly. The fun and challenge of building your first tall tower is absent the second time around. Then what?

"Rookie or Veteran?"

Where do you go from where you are? If you're fairly new at broadcast engineering, you're on a learning curve and you'll be spending the indefinite future in that mode.

(continued on next page)

Comtech's 3.8 Meter has the Extra Performance Margin Needed for Crystal-Clear Audio Reception. Why Settle for Less?

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Contract Engineering

... Essentials For Surviving

(continued from previous page)

One thing to concern yourself with ... something we didn't have to worry about just a few years back ... is long-term positioning.

Set those long-term goals as soon as you can, but don't count too much on long-term security as a Chief Engineer unless you see yourself in a role expanded way beyond what you're doing now.

Where do you fit in as a "rookie" at a station with a large engineering staff?

My advice: learn all you can from the good engineers on the staff, but never be afraid to display your ambition and interest.

When I scored my first "big-time position" it was at a Powerhouse AM with a union staff of 14. I'll never forget the first time I heard a "fellow engineer" respond to some extra effort I made, by saying "what are you trying to do, make the rest of us look bad?"

Where do you fit in if you're a Chief at age 35 with 15-20 years experience?

Have you been able to expand the base of your contribution to station operations?

Are you now also Facilities Manager, Telecommunications Manager, Computer Guru and perhaps even involved in sales? If so, the future at a progressive station can be bright indeed.

Do you work for a dynamic radio group? Perhaps your ambitions are to be Group Chief. Expect to spend more time in the field supporting your stations than you will in Corporate Management and long-term planning roles.

The trend today is toward decentralization of engineering management. The prospect most attractive to a manager hunting a Chief is a thoroughly experienced engineer conversant with *all* aspects of a station's operation, who can communicate effectively with manage-

ment, looks good in a suit, but knows when to take it off and get his hands dirty.

We've spent a lot of bull sessions at Madison and elsewhere trying to figure out why the allied electronics industries snap up all the new engineering talent.

Each year, fewer "new" bodies join the broadcast engineering fraternity, while fewer still make it past the first cut where they were hired as the part-time "third body" but somehow seem to get thrown out on the street the minute the major rebuild project is complete.

As an industry-watcher, that problem bothers me only slightly less than the concern about the future of a lot of really fine engineers who, because they never had to do much long-term career contemplation, either find themselves suddenly on the street or, worse, start compromising in order to hold on to their positions.

Don't let that happen to you.

Carl Sagan says "the first step is to ask the right questions." Ask the hard questions. Don't be afraid of the answers and of what inevitable change will bring.

The bottom line is that if you like your job and the station, you ought to seriously evaluate all the long-term possibilities of your position, including professional growth and salary structure to make sure you're going in the right direction.

It must be a terrible feeling for a guy who's spent 20 years working for a company to be told he's not needed any more, or to be offered an early retirement package at a time when he feels he has the most to contribute.

If my comments and questions have caused you to think a little about your own future, then we can consider this column worthwhile. If you disagree, or have more to add, please call or drop a note.

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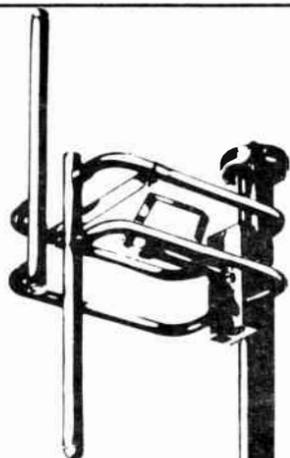
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RF coaxial load resistor
Altronic Research Inc.'s new Omegaline model 6725 RF coaxial load resistor is an air cooled termination for 50-ohm coaxial transmission line systems up to 25,000 W. When connected, protection of equipment and personnel is achieved by the use of a thermal sensor which detects the application of RF power and automatically activates the airflow system even if the blower switch is in the "Off" position. An over-temperature sensor is connected to an interlock switch to guard against excessive power or inadequate airflow. For more information, call **Tim Roper** at 501-449-4093, or circle **Reader Service 93**.



Digital processor
Audio Digital Inc.'s ADD-3 Digital Processor features one input and three outputs with 490 ms delay. An alphanumeric LED display on the front panel displays channel, delay time and menu prompting. Delay time is steppable in 15 μ sec increments to 10 ms, then 1 ms increments to the maximum. A security code must be entered to alter delay settings. Input and output trim pots are recessed in the front panel and can be internally bypassed to unity gain. There are XLR connectors for the input and outputs. The unit occupies only one standard rack space. For more information, call **Audio Digital** at 503-687-8412, or circle **Reader Service 53**.



Voice processor with mic preamp
Symetrix's new 528 Voice Processor includes the control functions needed for microphone signal processing: mic preamp, compressor/limiter, downward expander, parametric equalizer and de-esser. Phantom powering is provided for condenser mics. LED metering indicates interactive dynamics processor gain reduction, de-esser activity and output level. Levels are kept in check by the compressor/limiter, which responds quickly to transients and gently to normal speech level changes. The downward expander prevents pumping, reduces noise from cart machine solenoids and paper rattling, and maintains the best possible SNR, according to the company. For more information, call **Lavina Speer** at 206-282-2555, or circle **Reader Service 72**.



Remote control system
TFT Inc. has introduced a new generation of remote control systems, the 8610 series. The system is an outgrowth of its 7610 series. Several enhancements were made, including status indicators on the principal terminal units. The 8610 is expandable to a total of 112 channels. The 8610 series is easily operated by non-technical personnel, and is easy to install, according to the company. Existing 7610 installations can be updated and expanded using the new add-on chassis from the 8610 series. List price of the 8610 system with 10 channels each of raise, lower, telemetry and status is \$3800. For more information, call **Jesse Maxenchs** at 408-727-7272, or circle **Reader Service 61**.



Cart machine
Broadcast Electronic's new 5400C Tape Cartridge Machine features a new Phase Lok V head assembly, as well as a new cartridge guidance system. All its specifications meet or exceed the 1975 NAB standards. The stereo SNR exceeds 56 dB. For more information, call **Tim Bealor** at 217-224-9600, or circle **Reader Service 81**.



Sound enhancement process
Barcus-Berry Electronics, Inc.'s sound enhancement process can provide Class A and Class B radio stations with the clearer, more distinct sound of a bigger station, according to the company. The Barcus-Berry Electronics' process is a multi-band, program controlled audio signal processor which generally improves the overall sonic clarity of reproduced sound. It works by retiming the alignment of the sound envelope, and allows the high frequencies to be more audible. It was originally designed to overcome deficiencies such as masking and phase shift in speakers. The BBE signal processor is totally compatible with all existing broadcast equipment. The net price for the BBE signal processor is \$499. For more information, call **John McLaren** at 714-897-6766, or circle **Reader Service 67**.

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5 Network/group owner	10 Other

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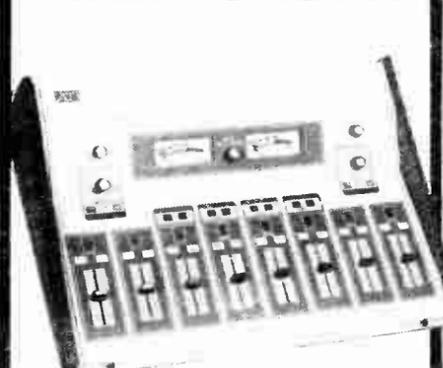
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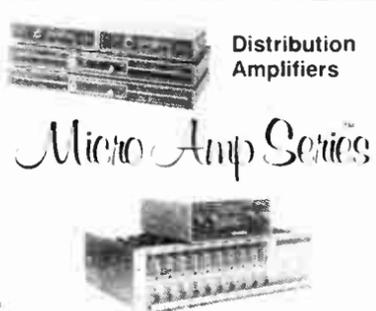
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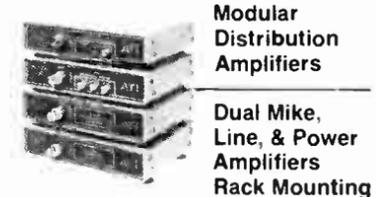


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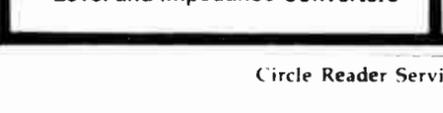
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Buyers Guide

Automation Equipment Stations Automating CDs

by Marlene Petska Lane

Falls Church VA ... Broadcast use of compact disks in automation systems is fast becoming reality as the cueing problem posed by commercial CDs is being resolved. But it appears there has been no "right" way to address the problem; manufacturers have taken several approaches.

No CD cues

Perhaps the most serious problem that prevented broadcasters from immediately automating CDs was the lack of standard trip tones or cue pulses. The amount of time between the beginning of a track and the actual start of the audio varies with each CD's producer. And, there is no end tone on cuts to signal to an automation system that the end of a song has been reached.

"I just didn't dream that when they came up with CDs that they wouldn't come up with a standard end tone," said Robert Dix, President of Shafer World Communications.

Dix said his company was the first to start interfacing CDs to automation systems "about three NABs ago." But the Shafer system, as well as other systems, was held up by the CD cueing problem.

Standard not likely

Although forcing the recording industry to adopt a cue standard remains appealing to both automation manufacturers and broadcasters, it appears unlikely that that will happen.

"Radio is such a small part of the

whole that you'd have a hard time convincing recording companies that they should do the extra encoding work," said Thomas Ransom, director of broadcast sales and marketing for IGM Communications.

Overview

In light of the gloomy outlook for standardization, the industry is finding other ways to cope with the problem.

Syndication

Customized CD libraries are a workable alternative. Companies such as Digital Programming Inc. have taken on the mammoth task of recording customized libraries and formats on CD with their own special cue tones.

Music syndicators have already completed production libraries on CD, and are moving into music formats as well. Many of them should be in evidence at this year's NAB convention.

"The biggest problem in the past (with

regard to CD libraries) has been one of supply. We as an industry can no longer use that as an excuse. Most formats are available in abundance," said Dave Burns, national sales manager for Allied Broadcast Equipment.

As stations start using more CDs and start taking advantage of what syndicators have to offer, it should help CD automation gain a foothold.

Dave Evers, sales manager of automation products for Broadcast Electronics, believes the syndicators "will be the key to CD automation."

But there are others in the industry who offer a different point of view.

A software approach

Ron Schiller and Associates has explored another avenue in search of a solution, namely, using software to cue and control CDs. Schiller's CD Filer system controls CD players via an IBM PC/XT or compatible, and cue information, including crossfades, and pre-set fades can be programmed into a separate database created by the user.

The database permits a machine to

select specific cuts on a CD. It can also be set up to give the on-air talent information about a cut.

The software can catalog, sort and manage 2000 CDs, and allows an entire show to be preprogrammed.

IGM Corporation's Ransom favors the use of external controllers, and predicts software such as Schiller's will be more successful than other cueing solutions because the cue "is not locked in there forever, regardless of format."

Cueing to audio

But Allied Broadcast Equipment and SMC have taken another approach to the problem. Their Audiometrics Multiplay CD system bypasses the need for cue tones with its ability to cue to audio.

The system actually "reads" the audio to cue to the start of a song. And, it can tell the programmer how many minutes and seconds into a cut he leads.

The Audiometrics may be controlled by Allied's model XTC, which allows a user to gang two multiplays together; by SMC's CDP programmer unit, which

(continued on page 28)

Reminiscing About Automation

by James C. Woodworth, Pres.
Control Technology, Inc.

Ft. Lauderdale FL ... When I was asked to write this article on the history of automation, I suddenly felt old. Me write history? Well, history it is and I'm

proud to have been a part of it along with a cadre of other dedicated people.

Ironically, automation was around before the first cart machine was introduced at NAB in 1959. You've got to remember that back then, FM stood for "Fatal Mistake" instead of "Fine Money" as it does today.

Those broadcasters that were brave enough to put an FM on the air needed a cheap source of programming to hold the license. You couldn't sell it and nobody listened to it!

I guess you would have to say that Paul Schafer was the father of automation. A dapper young guy from California with a crew cut and a bow tie, he came up with a marvelous device called the "CUE DOT."

The heart of this rig was an Ampex 350 hooked to two Seeburg Jukeboxes. Schafer recorded the spots sequentially on the Ampex. After every spot cluster, he would apply a dab of silver paint or foil on the tape.

In operation, every time the "CUE DOT" would pass over a sensor, it would cause the Seeburgs to clatter into action.

Pursuing other ideas

Meanwhile, two guys from the Midwest, like Henry Ford, thought they had a "better idea." Elmo Franklin and Jack Jenkins formed a company called Automatic Tape Control and built a tube-type sequencer, model SCG-9. A year later ATC and Spotmaster were to give the industry the first cart machines.

While all this was going on, the late Rogan Joneses, senior and junior, were hard at work up in Bellingham, WA,

building the IGM 300 "Simplimation" and amassing a formidable library of pre-recorded programming. Gates jumped in, too, with the Night Watch. Like Schafer, he used Seeburg Jukeboxes.

In the early 1960s, playing the music was no problem. The venerable Scully 270 with its 14" reels handled it very nicely.

Carousel invented

Still, nobody could come up with an economical way to play the spots. Well, Bill Moulic solved that problem. Under the trade name of MaCarta, the infamous Carousel was born, setting off what was to become the industry's 15-year love-hate relationship with that beast.

Paul Schafer, however, had been very busy out in Chatsworth, CA. He'd thrown away the cans of silver paint from the "CUE DOT" days and come up with the Schafer "Spotter."

This machine was truly a marvel to watch in operation. Again, it was centered around an Ampex. But this time it had a special spotter tape which had 3" of oxide cleaned off every 70 seconds, thus creating "windows" for a photocell.

The spot locations were programmed from an entire rack containing 200 rotary

(continued on page 29)



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NOTE: Part 3 of "Cart System Still Not Perfected" will appear in next month's Buyers Guide.
—Ed.

Buyers Guide

Audiometrics Player A Real Jewel Box

by Tom H. Jones, Pres. & Gen. Mgr.
KNXR

Rochester MN ... Back in the late 1950s, the RCA broadcast catalog displayed a rather revolutionary and unique piece of equipment. It was billed as an automatic turntable.

I was a student in those days and did my share of hanging around the local radio station. One day, the new RCA device showed up at the station.

The old RCA system

There it was, a large, control-less, floor-standing cabinet painted the usual RCA amber gray. A multi-conductor ca-

User Report

ble exited the cabinet and a control box was attached to the other end. The box had about a dozen numbered pushbuttons on its face.

Inside the large metal cabinet was a Seeburg jukebox mechanism containing one hundred 45 RPM records. You can well imagine everything this unit was supposed to do!

Suffice to say, it didn't cue up very well, it was rather undependable and it made for lots of unpredictable dead air

Now, it's more than 25 years later and we've come full circle! I'm a station owner-operator now and in our on-air control room is an Audiometrics AMCDs-1000A automatic CD player.

Technological leap

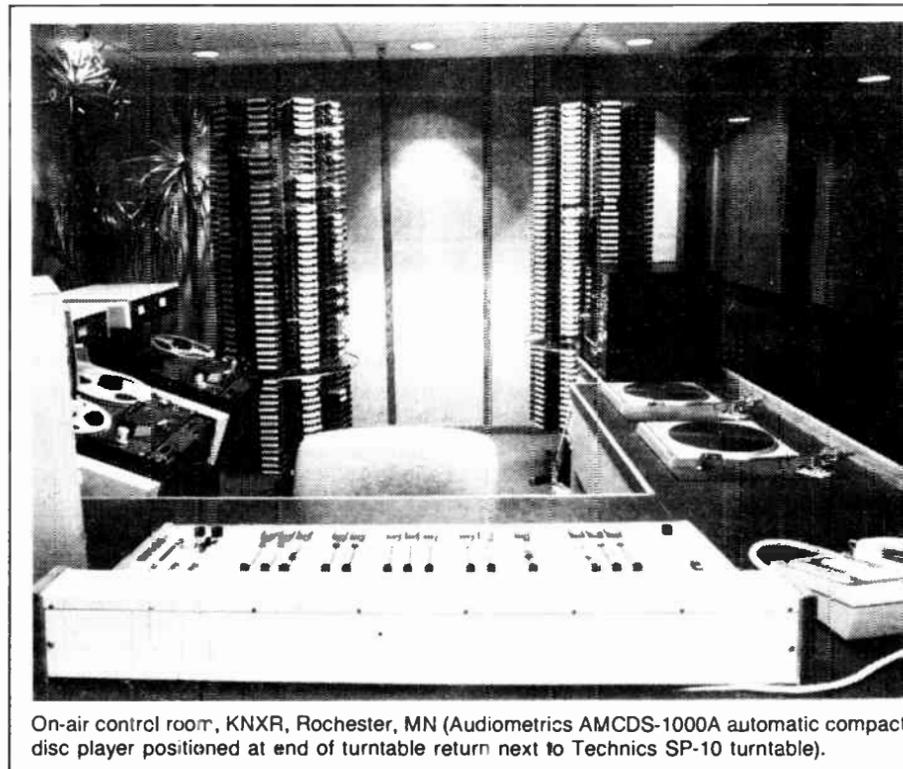
It stores a hundred compact discs and automatically cues up the disc and cut you select. The main difference between it and the old RCA unit is that the Audiometrics player works dependably well and sounds great, too.

The machine is manufactured in Japan by Denon and is marketed by Allied Broadcast Equipment. At first glance, the black cabinet looks like a microwave oven. It measures 22"x17"x16" and weighs about 80 lbs. A smoked plexiglas door on its front allows you to load CDs in a carousel and see the mechanism operate.

Two tiny spotlights illuminate the carousel-player compartment. Once the carousel is loaded, it looks like one of the wheels on NASA's moon rover!

A group of large push buttons and a 3/4" LED display on the unit's front face gives you complete control and knowledge of which disc and cut is being or will be played. A second LED display indicates time remaining for the cut which is on the air.

The player sounds very clean, smooth



On-air control room, KNXR, Rochester, MN (Audiometrics AMCDs-1000A automatic compact disc player positioned at end of turntable return next to Technics SP-10 turntable).

and musical. Using a Denon test CD, frequency response was ruler flat from 20 to 20,000 Hz. There is obviously only one D-to-A converter because I measured an approximate 12 μ sec delay between channels at 20 kHz.

Cueing up

The unit can be operated manually from the front panel controls. Ten cuts can be programmed into memory. Once a cut has been aired, the machine puts the disc back in the carousel, then selects and cues the next disc and cut, then waits for you to put it on the air.

I timed the shortest cue-up from one cut to another on the same CD at about seven seconds, while the longest time to end one song and cue up another from a CD on the opposite side of the carousel was 27 seconds.

Yes, the player does cue up to the music and the cues are tight! In fact, if your console input module has a few microseconds of built-in on-air delay, you'll have to remove the delay, the cues are that tight.

Rarely, a CD may not cue up properly. We've found two out of several hundred. The problem was misplacement of the cut number coding on the CD by the manufacturer. The player cues first to the cut number, then to the beginning audio. You can faintly hear the laser pickup servo searching and gathering data as it cues up—like a hard disk on a personal computer.

Computer connection

One of the most valuable features is the RS-232 port which opens up a world of possibilities. You can connect a personal computer and, with simple hex commands, do anything the manual controls can do.

The player also transmits complete information back to the computer on the status of its operation. Can you visualize an unattended overnight operation with two Audiometrics players and an announcer's voice track on a reel-to-reel machine, all controlled by a personal computer?

The player is ready to go on the air immediately after you unpack it. There is a multi-pin connector on the rear so you can remote start the player from the logic connector on your console.

The only fault I found is that the multi-pin connector does not provide a contact closure to turn off your console's input module when it finishes playing a selection. It does, however, provide this function when operating from the RS-232 port.

Longer CD life

We started building our CD library in May, 1983 and had been using a manual pro CD player. With time, I began to notice significant scuffing and scratches accumulating on our expensive CD collection.

Repeated handling—in and out of jewel boxes and players—in a busy control room was starting to take its toll. A few cuts wouldn't track anymore. It was at this point that the Audiometrics player entered the scene.

Economies, other than preserving the life of a compact disc, emerged as we began to use the Audiometrics. Human handling of CDs is reduced to once every couple of weeks when the CDs are rotated in and out of the machine. Storage racks are not required in the control room anymore. Jewel box breakage has been eliminated.

The CDs are under lock and key inside the player. Our board operators know only about the cuts which have been approved for air-play. With our format (adults 35+) we average about 10 usable cuts per CD or 1,000 usable cuts contained at any one time in the Audiometrics player.

Our operators pre-program 9 cuts in the machine's memory at the beginning of an hour; they simply press the "on" button on the console and cued-up music is on the air. The machine does all of the disc handling and cueing, thus freeing the operator for other tasks.

Screening and auditioning new music is not limited to the production room turntable as with conventional records. With the variety of portable CD players (we use the Sony D-55) you can audition new CDs for airplay anywhere—at home, in your car, while relaxing! I auditioned 75 new CD albums while on vacation!

The most important point, though, is that it is more cost effective to play a CD directly on the air than it is to dub the
(continued on page 29)

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Buyers Guide

FS-12A Eliminates Goliath Woes

by John Bisset, CE
WCPT-AM

Washington DC . . . A week after the installation of our "basic" automation system, the GM, Traffic Director, and I sat in a meeting searching for a solution as to why the automation wasn't working.

Someone said, "I've never heard of an automation system that worked. Why is it that when you talk to others about automation, all you hear are horror stories?"

One would almost believe that the words "automation" and "trouble" were synonymous.

A simple system

It seemed that Don Winget felt that way, too. And, as a broadcast engineer, he felt there had to be a simpler way. This was the major thrust behind the development of the FS-12A Format Sentry from Sentry Systems of Seattle, WA.

And simple it is. For starters, you don't have to have a degree in computer science to program it, or even understand the terminology. All commands are in user-friendly English.

This may not be a concern for the CE, but when you introduce this newest

member of your staff to the secretary or a jock, watch out! The prompt messages on the screen make a friend out of the most computer-illiterate individual.

The Format Sentry interfaces with a personal computer. We chose a Tandy 1000, but the choice is up to you. You may want to choose a duplicate of a system already in place at the station—like an IBM PC. That way you have a backup computer, should the one running the automation fail.

Easy installation

An audio interface box performs the actual audio switching and control functions. Here again, simplicity reigns. You don't need an expensive service tech to install the system. A well-planned and easily read instruction manual covers the particulars.

The system is shipped with the capacity for 12 sources (reel-to-reels, carts, networks, etc.). You don't need to buy expensive source cards to expand the system; however, random access sources like Carousels or Instacarts require their own interface boards. Each of the 12 sources are random access, and can be controlled by satellite.

The FS-12A memory contains over

4,000 events, permitting several days of programming. The main menu permits selection of one of nine screens through simple one letter entries. On-screen prompts for each screen tell you what to do.

User Report

The selections include Dump Log from Disk, Edit Log, Review Log to Screen, Save Log to Disk, Print Log to Printer, Clock Set, Load Starting Event, On-Air Screen and System Check.

Easy to change

Unlike other systems employing two screens or logs, the Sentry Log is what is on the air, and last minute changes can be edited at any time. Review Log to Screen permits you to page through the events listed in memory.

A typical change would find you reviewing the Log to Screen to locate the event number to be changed, editing the log, and then loading a new starting event to permit the change to be the next event executed by the system. All of this takes place while you are on the air.

Like most automation systems, the Format Sentry is equipped with a silence sense and a cue/program monitor bus. The Format Sentry is simple to operate, easy to maintain and reasonably priced.

Performance counts

We purchased our FS-12A system from Jim Woodworth at Control Technology. Since its installation nine months ago, the Format Sentry has performed 24 hours a day without a hitch (a surge arrester and UPS were worthwhile investments, and are highly recommended). It may be dwarfed by the size of the growling Goliaths found in other automation systems, but its performance is unequalled.

The Goliaths may be bigger, and perform some tricks that are beyond the abilities of the FS-12A, but you quickly learn that it's not the quantity of tricks the automation system can perform, but the reliability that counts.

The only problems we've had have been from the jocks at the satellite service hitting the wrong tones! That's a dramatic change from the hourly headaches generated by other systems.

Perhaps the most comforting thought, however, is that the system designer—Don Winget—is as close as your phone. He encourages customer input, too.

And when you call about a question, you won't get answers like, "We're phasing out that model, so we can't update the software," or, "You're out of warranty; talking to a technician will cost you."

This modern-day David has hurled a stone at all the Goliaths, and if sales of the FS-12A are any indication, the Giants are falling!

Editor's note: For more information, contact Jim Woodworth at Control Technology: 305-761-1106. The author may be reached at 703-683-3000.

ESP-2 System Satisfies WHEZ

by William A. Lemmon, Proj. Eng.
Federated Media

Fort Wayne IN . . . Recently Mike Peters (Peters Broadcast Engineering) asked me to help install a new automation system for WHEZ in Portage, MI.

We chose the SMC ESP-2 system for several reasons. The programming was to be the nostalgia program from the Satellite Music Network, the price was within budget and programming was easy. Also, a sister station was using an SMC, which meant we would have access to a lot of spare parts.

User Report

We also liked the fact that there is a fiber optic link between the programming control head and the main chassis. (The system was to be installed next to a 5 kW transmitter.)

Configuration

We ordered the ESP with three cart Carousels, one Revox PR-99 MKII reel-to-reel and a single play cart deck. We planned on adding a second reel-to-reel that was already on hand. The system included the normal programming control head, plus an extra monitor for use in an air studio.

The unit arrived fully assembled, ready for installation. Installing the extra reel-to-reel was a cinch, as we had ordered the necessary cabling. Satellite feeds were hooked up, the control heads were set in place and the fiber optics were run into place through the ceiling. We were almost ready to go.

The last remaining detail was making modifications to the PR-99. Since the sta-

tion was to carry the Michigan football schedule, we wanted to tape delay parts of programs, as well as the satellite net commercials.

Modifying for tape delay

The Revox PR-99 has a Return to Zero function with an alternate set point. We wanted to use this function as part of the tape delay, but it is not brought out as part of the remote control functions.

When we opened the PR-99, we found the switches for the RTZ to be contact closures to ground. We installed a DIN plug and paralleled the switch contacts.

By wiring into the external flag outputs of the ESP, we can now set the automation to record a news program, automatically return to zero and then play the program in a later time slot. (Note, however, that this modification will void the warranty.)

Satisfactory operation

The system has been operating for a little more than a year now without too many problems. But unfortunately, the problems that WHEZ has experienced have been the kind that will drive an automated station nuts.

Two of the Carousels developed mechanical alignment problems and required factory repair.

The clock failed, and in order to fix it and recalibrate it, we had to pull out the memory board. You can plan on spending several hours retyping the program formats back in, since all of them must be entered manually.

I suggest that there needs to be a computer tape—disk drive to record and save the memory contents. SMC should make this a priority.

If you purchase a system, don't forget to order the extender cards necessary for repairs.

Overall, the system has been satisfactory. The problems we've experienced are about normal for a piece of machinery this complicated.

Editor's note: For more information contact SMC at 309-452-5313. The author may be reached at 219-447-5511.

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Buyers Guide

IGM Accommodates KOLA Needs

by Fred Cote, GM
KOLA

San Bernardino CA ... In early 1987, we decided to change our FM station format from AOR (album-oriented rock) to CHR (contemporary hit radio)—programming we felt would reach a broader audience.

Since we were automated with an older IGM controller, we decided this was the time to consider updating.

Our engineer went to the NAB show in March with definite guidelines about

searching for a new automation programming controller. He found it in IGM Communications' newly introduced EC (Economical Controller) system, one which works on any IBM computer-compatible.

We purchased one for our FM station that spring and a second one for our AM station later in the summer.

I have been an automation user for almost thirty years, always selecting the best I could find for the money. Some years ago I worked for a major station, WCOP Boston, which used the old IGM

music service and some of its earliest automation systems.

Later when I bought KFMW (now KOLA), the station had some old 1950s relay-switch automation that worked just fine. We did some custom design to streamline the system and actuated reel-to-reels and SMC Carousels, later switching to IGM Instacarts when they came on the market.

We were impressed in the 1970s with the fancy IGM controllers installed in major CBS and NBC stations, but they were too sophisticated and expensive for

us to consider. Since the company seemed to be keeping on top of technological advances, we continued to monitor IGM's new automation offerings.

When the EC came along at the NAB, we were delighted to find a price tag of around \$5,000 for a controller that did almost as much as the old 1970s \$80,000 systems. Last spring the closest system to the EC that we saw was \$12,000—so the EC's price tag made quite a difference.

The EC gives us control of 12 audio sources, memory for 2500 events, a floppy disk memory backup and the ability to make changes through updated or re-programmed software without fooling around with the hardware.

Of our 12 available audio sources, four are IGM Instacarts on our FM and three on our AM. Since each Instacart has 48 cartridges, that makes 192 possible playbacks for the FM and 144 for the AM.

We run fully automated at our stations KOLA Riverside and KGUD Benning,

User Report

doing all the programming at KOLA and feeding KGUD by STL. Voice tracking is on cart, as well as station IDs, PSAs, commercials and the like. The only thing live is news.

An operator on duty monitors the upcoming commands and makes sure the cart loading is correct. The screen shows the last event played, the one on air, and the next ten or fifteen events upcoming—rolling over so that one could insert 2500 continuous events into the system.

One thing we like is that the system accommodates very short events, as brief as just "KOLA." Our prior automation system would sometimes lock up and die if items of less than ten or twelve seconds were called up.

The new EC provides the great flexibility of programming two- and three-second events, as well as long pieces, enabling us to program tightly. The Instacarts, just as the name implies, respond instantly with random access, so they cause no problem. The only misses we get are if the operator fails to check cart positions and insert the correct carts, a rare situation.

Now if we decide to change our format from CHR to something else, all we have to do is reprogram the system through software changes. We appreciate that freedom.

The very first ECs did not run Instacarts, only Go-Carts. But within a few months IGM developed new interfaces that enabled us to operate our old-style Instacarts (and any newer ones we might purchase in the future).

Another thing that helped us out was that the new EC takes up only 5½" rack space, whereas our old one consumed three or four feet. We are a small operation in new but tightly planned quarters, and the saving in rack space is another plus.

I know that the technology keeps changing for automation systems, but frankly I don't know what else any new system could do that the EC doesn't achieve already.

Editor's note: For more information, contact Tom Ransom at IGM: 206-733-4567. The author may be reached at 714-684-9992.

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Buyers Guide

WEEI Enters Touchscreen Age

by Larry S. Vidoli, Dir. Tech. Ops.
WEEI-AM

Boston MA . . . Combo all-news? Yes! A dual anchor morning drive team at a major market all news radio station can run combo. WEEI in Boston has done it with the help of touchscreen technology.

The program log is displayed in vivid color on a 19" Sony touch sensitive monitor. We simply "Touch" the log to air the event.

Adaptable to station needs

The Touchstone 2000 series automation assist system is the brainstem of a company called Media Touch of Salem, NH. The system is run by an IBM computer and, depending on your station's needs, can be as simple as one PC or as complex as a large networking system of many touchscreens and workstations.

Our system consists of:

- 1) Three IBM-XTs, one running OPLOG or the touchscreen, and two we use as editors.
- 2) One IBM-AT. This file server contains the 24-hour log and logs all events as they happen.
- 3) One Touch screen Monitor.
- 4) One Copy Monitor for live commercials, promos, etc.

User Report

- 5) One Ramko RS 1616 audio switcher.
- 6) Five IGM Instacarts.
- 7) One electronic switcher.
- 8) One Automation Decoder.
- 9) Two printers.

The touchscreen not only allows access to the scheduled log events, but gives the operator complete control over *all* sources that would enter any normal console and more. It allows switching ON, switching OFF, cue, and even fade as you wipe your fingers across the screen.

A Ramko digital switcher/mixer allows RS-232 switching of 32 inputs to any one of eight outputs. All 32 inputs can be switched from the touchscreen.

A bank of 50 electronic switches are used for such things as starting reel-to-reels, turning on and off telephone systems and delay circuitry. Again, all this is accessible from the screen.

Not only are all recorded events aired from the touchscreen but also live copy, when touched, will appear in a window on the screen. An optional, large letter, 13" copy monitor allows scrolling and paging of commercials, PSAs, tags, etc.

Printing out logs

Every evening after the traffic department has completed its scheduled program log, we download it to our file server. The system is compatible with any computerized traffic system. We have used both Marketron and Jefferson Pilot logs with only minor reconfiguration and debugging.

Each morning the previous day's log is printed out for the billing department. The log displays *every* event start time and duration—in other words, every time you have touched the screen.

The system is expandable in many di-

rections including compact disc, electronic newsroom access, transmitter control and even television switching. All of it can be done with the touch of a finger.

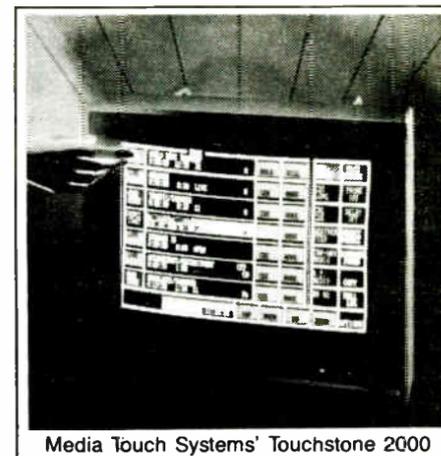
With any complex system a fair amount of support is required. Live copy must be typed into the system. Carted commercials, features and the like must be loaded and unloaded from the Instacarts, and the normal back-up systems must be readily available.

From a technical standpoint, regular

maintenance must be done on all the support systems and, more importantly, your engineer must be fully capable of computer operation. Some system software troubleshooting will be required.

Without a doubt, the on air talent has the least to worry about, and that's the way it should be.

Editor's note: For more information call Media Touch Systems at 603-893-5104. The author may be reached at 617-262-5900.



Media Touch Systems' Touchstone 2000

Don't just optimize . . . maximize



The Secret Is Out . . . THE FM 3 SYSTEM FROM CRL

In the past few months we have been receiving orders for the two units pictured above. Since it was not a complete system, we were curious about how they were being used. A few phone calls revealed that they were being placed in front of the 8100A. It seems that the multiband processing provided by CRL greatly improved the loudness and allowed precise adjustment of the sound to fit any format. The 8100A was then "backed off" so that it sounded better. The result was a louder, brighter sound that was very consistent. Well, it's hard to keep a good thing secret. Because so many customers have discovered this combination we decided to give it a name: **The FM 3.**

Customers using the CRL/O' mod combination include many of America's major broadcasters, including all three networks. Call us for more information. We can arrange a **FREE 10 day trial** of any CRL system: The FM 2, FM 3, or FM 4.

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Buyers Guide

BE Backs Up the Control 16X

by David J. Evers, Sales Mgr.
Automation Products
Broadcast Electronics, Inc.

Quincy IL . . . Ever since program automation systems left the electro-mechanical age and moved into the era of computerization, users recognized that some means of protecting the contents of the programmed memory was necessary.

Today, we take this backup requirement for granted on the computer systems we use. Back in the early days of the current microcomputer revolution the most common forms of program storage were paper tape and audio cassettes!

In our Broadcast Electronics Control 16x systems, we provided for backup by means of an RS-232 port which, upon external command, could dump the contents of the system's memory to be stored on an external RS-232 device.

Originally, we provided a Texas Instruments Digital Cassette/Terminal, which not only stored the data but could also give a hard copy listing of the system's memory for program verification.

When this approach became too expensive, we tried a more novel one with our Cart Load/Dump, which used the FSK encoding and decoding facilities of our Intelog Logging Encoder to transfer the systems memory to a standard NAB cartridge.

Still, these methods were not ideal since the speed was only 300 baud (30

characters per second) and they were sometimes prone to errors.

As personal computers began to proliferate and penetrate the broadcast industry, people began to ask us to use a floppy disk drive in the system to store the data.

Although very desirable, this solution was not simple. The expense of adding hardware to the system in the form of a disk drive, controller and interface circuitry was not trivial. Nor was the software effort required to integrate this hardware into the system.

Since program automation systems are a relatively low volume business, the cost of implementing such an option would result in a very expensive selling price. For far less than this cost, the station could go out and buy a PC, including disk drives, monitor, and printer; and they would get the extra benefit of having this computer to use for other projects.

With this in mind, we decided to write a software package for IBM PCs and compatibles to allow the loading and saving of system memory onto a floppy disk using the RS-232 connection to the Control 16x.

The PC load/dump program

For the past year, Broadcast Electronics has been perfecting the software project, now known as the PC Load/Dump Program, at a beta test station.

The CE of the beta site remarked that

the Load/Dump software enabled the station's office IBM PC-XT to talk to the Control 16x and allowed them to "effectively retire the mule train tape storage medium."

The PC Load/Dump Program is menu-driven, allowing even relatively untrained operators to successfully transfer data from the system to the PC.

Options are available for saving system memory to disk, loading data back to the system from the disk, special features such as clearing blocks of memory and printing hard copy listings of the systems memory, and a parameters section that lets the user customize the program to his automation system and computer configuration.

Saving data

The main functions of the program are the saving of system data to the floppy disk, and the subsequent loading of that data back to the system when necessary.

The data is stored on the disk in a file, which is identified by an eight character file name followed by a three letter extension. The file name is chosen by the user, and may be anything that will help in the identification of that file later on, such as MORNING or TUESDAY.

The three letter extension is provided by the PC Load/Dump program, and serves to categorize the data into three types: Events (signified by the EVT extension), which are program steps as stored in the system's memory; Compare Times (CPT), which are entries which perform a specific function when the specified time is reached; and Entire Memory (ALL), files which contain the entire contents of system's memory (both events and compare times).

The Entire Memory is useful in maintenance and repair situations where the full memory must be reloaded as quickly as possible, without having to load each individual event or time file.

The actual data transfer process between the Control 16x and the PC occurs at speeds significantly faster than previous methods of memory backup. Originally, the transfer rate was 300 baud or 30 characters per second; backing up the standard system memory of 3000 events could easily take 10 minutes or longer.

Now, speeds of up to 9600 baud are possible, and full memory transfers can take place in two or three minutes. And, since the Control 16x allows separate storage of specified sections of the systems memory, most transfers take even less time.

Some pleasant side benefits

One benefit of the PC Load/Dump program was not considered in the design, but has since turned out to be an attractive feature. We found that it can serve as a gateway to the system from other processing systems in use around a station, from a word processor to edit and create system programs, to a traffic/business computer system for entry of commercial schedules.

Any business automation system that can create ASCII text files with the proper codes for system functions and event numbers for break times can schedule spots directly into the system by way of the Load/Dump program. Outside vendors do not have to worry about RS-232 parameters or error checking.

The PC Load/Dump Program is Broadcast Electronics' first entry into the software-only marketplace. With the positive response we have received from this product introduction, and with the large number of suggestions made for additional products of this type, the future looks promising for more exciting developments to come.

Editor's note: For more information, contact the author at Broadcast Electronics: 217-224-9600.

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SUPERELAY is a multi-purpose controller that has many applications in a broadcast studio, control room, A/V system, or similar installation. For years, hundreds of engineers have built "black boxes"

full of relays to do all this.

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"GEEZ . . . I WISH SOMEBODY SOLD A GADGET TO DO ALL THIS!"

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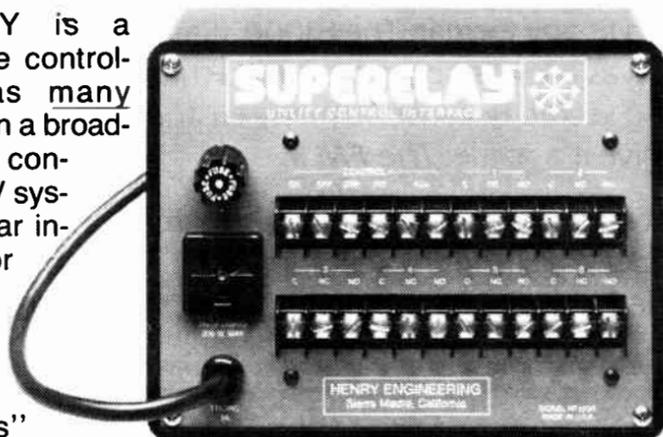
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CD Automation Comes to Broadcast Industry

(continued from page 23)

may control up to four machines with 2000 walk away events; or by Media Touch System's "small program" using touchscreen technology.

The Touchstone system is yet another approach to cueing and automating CDs. It too relies on software to program fades and cues for specific discs. But while the Schiller system is software, Media Touch's offering is an entire computerized way of controlling audio, and can completely automate a station.

Interest from all corners

In light of the vast interest in CDs among stations, manufacturers of automation systems have begun to recognize the role of CDs and are reconfiguring their automation systems accordingly.

Shafer already has the interface to play Century 21 CDs. "We've been making new interfaces and advancements while waiting for (the syndicators) to get their job done," said Dix.

Broadcast Electronics has been work-

ing about 8 months on the incorporation of CDs into their automation system, according to Evers. Evers said BE has been "struggling" with decisions regarding the basic architecture of the system.

"Do you go back and completely redesign the architecture to obtain more numbers in the memory (to accommodate the multi-CD players) or do you move to another level of abstraction—such as choosing cuts by the music title selection?" said Evers.

Other automation equipment manufacturers say they have little left to do to interface with the multi-CD players.

Ransom of IGM reports that the company is working on CD automation, but that "the economics are just not right yet for digital." He added that IGM's automation equipment will need very little modification to perform in the digital domain.

Whatever approach manufacturers and broadcasters choose to pursue, one thing is clear: CD automation has an exciting future.

Buyers Guide

Reminiscing About Automation

(continued from page 23)

switches, lights and two humongous cross-wired stepping relay counters, giving one the ability to pre-program, randomly, 100 spots.

In operation, let's say you would program a spot at location #7, and another one at location #56. The Ampex would play spot #7 and stop. Then, it waited a second, a relay went "tick" and all hell broke loose.

The Ampex would surge into Fast Forward with the stepper chattering like crazy and lights going on all over the place. The Ampex would shortly reach location #56 but by that time it was going 200 mph in Fast Forward.

Another "tick," and bang, the brakes came on, finally stopping the runaway express at, say, location #75. The whole process was repeated again in Rewind. After three or four shots at it, the thing finally came to rest, hopefully, at location #56.

It is rumored that brake band sales to Spotter users kept Ampex afloat for years.

One cannot close this chapter without the name Ron Crider appearing. He was Schafer's sales manager at the time. Given a Schafer 800 and a couple of Spotters he could automate any station in the country.

Multiple card player

The year is 1962 and the camera pans East and zooms in on the ATC guys, Elmo and Jack. After months of consulting with the Otis Elevator Company, they unveil the ATC 55 multiple cart player at NAB.

The machine stood over 6' tall and held 55 carts in a vertical row. The transport, driven by a 2/3 horsepower motor, moved up and down on a huge threaded lead screw.

The 55 proved quite reliable but had one interesting quirk. The Elevator Motor was so powerful that if trouble developed in the "Lower Limit Switch," the transport would screw itself right out the bottom and the whole rack would fall over on its face.

As chief engineer of Spotmaster at the

CD Jukebox

(continued from page 24)

selections on cart. Transferring 10 cuts from a \$15 compact disc would require 10 blank carts at \$5.50 each (\$55 total) plus the cost of labor to dub the carts.

With the Audiometrics, the cost and time required for cart dubbing are eliminated while maintaining the same control of music played on the air that carts provide. Additionally, you provide better audio quality to the listener and acquire indefinite play life.

I feel the Audiometrics CD player offers a powerful tool for improving control room efficiency, reducing music production costs and upgrading the quality of sound of any station. It has done all of this and more at KNXR.

Editor's note: See also the story on page 30. For more information, contact your regional Allied Broadcast Equipment office. The author may be reached at 507-288-7700.

time, I tried to get the company interested in this rapidly growing new industry. They didn't think too much of the idea, so in 1963 I resigned and started Broadcast Products, Inc. in Rockville, MD.

I wanted to build something simple and inexpensive so the little guy in Frog-level, Alabama could benefit from automation. BPI's first product was the Autocue, a simple 25 Hz Tone Generator and Detector that sold for \$300.

Prime time

The years 1965-1975 were probably the heyday of automation. 1965 saw the emergence of two immensely popular automation systems, the Schafer 800 and the IGM 500. They both accomplished the same thing but went about it in different ways.

The 800 was a sequential system with banks of thumbwheel switches called "Format Fields." The 500 was a "Time Insertion" system with commercials being armed by a cam timer. When nothing was showing on the clock it simply played music.

1965 was also the beginning of the "Era Of The Vans." Every company had a van—big Bluebird buses complete with a full blown automation system, generator and cocktail bar.

A salesman would pull into the parking lot and drag the hapless station owner into the van for a demonstration. Usually, after about an hour of sales pitching, he had the signed order, the downstroke, and was gone!

He who got there first got the order. It was not uncommon for a salesman to fly back to the factory with an order and, of course, a down payment.

Looking for the ultimate system

In 1966, I was churning out Autocues as fast as I could make them until Russ Morgan of WCTR in Chestertown, MD

came to see me. He said, "Jim, I want a system with all the good features of the 800 and 500. Will you build one for me?"

It seemed like a good idea at the time, so I designed and built the first Broadcast Products AR-1000 system in the basement of my house. It took seven men to get it up the stairs. The AR-1000 was a combination of sequential and time insertion operation with the first solid state digital clock.

“

I fired them all! I fired them all! Your machine is going to do it.

”

Competition among the manufacturers was fierce, but friendly. Automation was on such a roll. Station owners demanded bigger and bigger systems that hopefully would automate every facet of a station's operation. Machines could do everything!

At BPI in 1971, we received a super rush order for a very large system from a major market station. The system arrived on schedule and I went in with the installation crew.

Great expectations

When I arrived, there was an LP tracking on a turntable and no one else was at the station except the owner and a secretary. When I inquired as to the lack of personnel, the owner replied, "I fired them all! I fired them all! Your machine is going to do it."

Well, I went on the air for eight hours straight, spinning records, doing farm

reports, hog belly futures and local news (from the afternoon paper) from towns whose names I couldn't pronounce.

Around 7 that evening, we got the system cranked up and programmed, leaving "Automated Radio" to churn on into the night. Unbelievable as it sounds, that's the way it was.

Pushing onward

Pre-NAB was always fun. Every year there was something brand new. Everybody had a hot soldering iron, making last minute modifications on the NAB floor, hoping the systems would hold together for all four days.

I remember Carl Peterson and Nick Solberg from IGM with IBM punch cards all over the IGM booth trying to get the 630 to run. IGM had introduced the Instacart and BPI the AR-2000, which was as far as technology could be pushed at the time.

Paul Schafer had again sold the company, this time to Applied Magnetics. Under the leadership of Jim Cunningham, the Schafer 8000 mainframe computer was developed. The 8000 was expensive and far ahead of its time. Only seven were sold.

IGM, too, experimented with the DEC PDP-8 in its 740-770 series automation. These systems were also quite expensive. Sales were confined mostly to major markets.

Automation throughout the latter 1970s was largely a refinement of existing techniques and incorporation of microprocessor technology into existing concepts.

Today, what used to comprise racks and racks of hardware is now reduced to one 5 1/4" rackmount switcher and a personal computer, costing about 20% of the former systems.

Editor's note: For more history, contact the author at Control Technology: 305-761-1106.

This new QuantAural™ QA-100 Audio Program Analyzer gives you the advantage in competitive broadcasting

Simply put, the QA-100 quantifies what you hear. Your station sound can now be electronically monitored the way you hear it. Exactly. And, you can monitor the competition too!

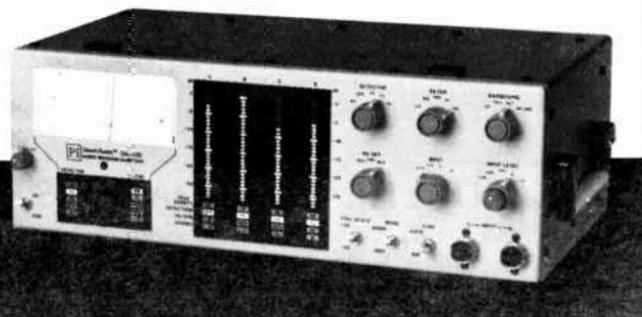
Real time analysis of any audio signal. From a receiver, tape recorder, or processing equipment. You see the measurements as you hear the sound. Changes in processing or variations in system performance are immediately shown on the QA-100 panel meter or bargraph display—using program material as the signal source.

The QA-100 hears like a program director and talks like an engineer. With it you can monitor maximum peak level (relative peak modulation), overall

processing effectiveness (average level), tightness of sound and processing control (peak density), tonal balance, consistency and preemphasis (four band real time analyzer), stereo image width (L + R to L - R ratio) and "punch" (special "aural intensity" measurement).

Interested? To learn more about how the QA-100 will help your station compete, call Potomac Instruments today.

QuantAural is a registered trademark.



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932 PHILADELPHIA AVE. SILVER SPRING, MD 20910
(301) 589-2662

Buyers Guide

BAI Warrants Used Equipment

by Earl R. Bullock, Pres.
Broadcast Automation Inc.

Dallas TX ... Have you considered automating your radio station from 6 PM till signoff? Have you wanted to control your programming by using a syndicated music service but don't have the necessary equipment?

Broadcast Automation Inc. is in the business of helping find answers to these questions by providing remanufactured automation equipment.

Many stations have purchased used equipment directly from another station with the primary intent of saving money. Their intentions are admirable.

They plan to have their contract engineer, in his spare time, check out the equipment and make it ready for use. Or better yet, they arrange to have their full time engineer check it out and repair it if necessary.

The equipment always works when taken out of service! Then why doesn't it work when it's put back in service? Note that the full time engineer always seems to have more important tasks to do, like keeping the transmitter running so the station can stay on the air.

BAI has recognized these problems and has taken on the task of purchasing equipment no longer being used, storing this equipment for prospective buyers, and rebuilding it once it is ordered.

An automation system for a radio station generally consists of several pieces of equipment:

- 1) A controller with some means of programming.
- 2) Random access sources for commercials or spot announcements.
- 3) Sequential sources for music.
- 4) Single play sources for jingles, relate lines, IDs, etc.
- 5) A network or news channel.

- 6) Logging.
- 7) Equipment racks.

BAI combines new equipment with remanufactured equipment to provide a system with the capability to automate a station.

The Schafer 900 Series Controllers provide a wide range of capabilities. The Schafer 903E, with 3 days of Time File memory and over 3800 format events, can give you weekend programming as well as the necessary time events for live network joining, starting and stopping and remote functions.

The Schafer 903 has a one day memory with all the other capabilities that the 903E has. The Schafer 902.5 uses the basic programming capability made popular with the Schafer 800 in that thumbwheel switches are used to select the sources to be played. The .5 part adds an MOS solid state memory to program the random access cart sources.

A new entry into the automation picture is the IGM-EC, the Economical Controller. The EC is used in conjunction with an IBM-compatible PC.

There are several random access sources available. However, the SMC Carousel continues to be the least expen-

sive per cart random access source.

BAI's program of rebuilding the SMC Carousel includes complete disassembly. The inner and outer trays are cleaned and replated, and the frame is repainted. Open frame rotate and tray motors are replaced with totally enclosed motors and gear boxes.

The head stack assembly is replaced with a new SMC HB-10 unit or, if you plan to use the 3M Scotchcarts, with the ITC Delta head stack assembly. New cards are provided for most of the electronics.

The availability and lower prices of new, playback only, reel-to-reel decks for automation use has reduced the market value of used decks. Also, the high cost and lack of parts availability of some decks makes them too cost prohibitive to rebuild.

BAI offers systems with new decks as a first choice, then ITC 750s, Revox A77s, Scully 270s, and others if you need a lower priced system.

We normally do not receive many used cart decks with the systems we purchase, since stations generally need them to operate in a manual mode. Thus, we furnish new cart decks with

the systems.

The network capability normally is determined by the automation controller. It may take only a source card to provide this channel. This is one reason why satellite music services require less equipment.

VEL, or verified encoded logging is not as popular as it once was. Maintenance is now the primary reason for having a logger. Schafer has one logging card with a microprocessor that can provide information such as silence sense and closed loop indication.

We find that the totally enclosed racks made for Schafer Electronics are most popular. They are easy to haul and provide a good environment for the electronic equipment.

Buying remanufactured systems can save a station manager or CE the task of advertising for equipment, discussing it with prospects and worrying about the follow up with the previous owner.

BAI can configure a system to the buyer and eliminate the need for selling off unwanted source equipment. And BAI warrants the remanufactured equipment so that the buyer is assured it works when he receives it.

Editor's note: For more information, contact the author at Broadcast Automation Inc.: 214-380-6800.

Audiometrics Came From Japan

by Dave Burns, Nat'l Sales Mgr.
Allied Broadcast Equipment

Richmond IN ... Almost two years ago a decision was made to research an electromechanism which would be capable of automating the compact disc format.

Broadcast stations had barely begun to use CDs. However, evidence was available that this latest technological leap was not a fad. Subsequently, radio and CDs have become fast friends.

No wear, no pops, no clicks. The library doesn't have to be replaced and mid- and innergroove distortion is gone forever. A 25 year oldie will sound just as it did a quarter of a century ago.

Finding the right vehicle

But, let's get back to the logistics of how to facilitate the programming of these round, flat jewels. We considered design from the ground up and discovered that the quantities needed to cover R&D alone were staggering (our total market potential is slightly over 10,000, but is significantly less in reality).

Then we looked at existing technology. One manufacturer proposed his 60-capacity unit which had self-limited programming capability and presented great difficulty in loading and unloading discs. Its audio specs were pedestrian at best.

Another 60-disc capacity unit was play mechanism only. No way to program without custom interfaces and software. No real RS-232 capability, either.

Then we were fortunate in locating a manufacturer which had designed a 100-disc unit specifically for karaoke (sing-along) bars in Japan. The first unit we saw had a coin slot on the front. It was industrial strength!

Several telexes (up to 15 feet in length) followed. Software redesign and broadcast applicable features were agreed upon. Pricing was arrived at. Actual production was begun just prior to NAB 1986. We are now into generation three.

Random access multiplay

The Allied Audiometrics® AMCD5-1000A CD Multiplay is specifically designed for operator-assisted and fully-automated operation. With a maximum access time of 28 seconds and its unique cue-to-music ability, it's the ultimate CD

programming tool. There's random access for any disc, any cut and order. Up to 100 discs per machine are secured under lock and key.

With over 2000 in daily commercial use in Japan alone, mechanical and electronic specifications had a proven track record. Modifications and new software were specified by Allied and SMC® to be sure its function would meet the most stringent and most sophisticated needs.

Access to the AMCD51000A's capabilities is via an RS-232 port. We've designed three ways to tap its resources and pin-out information has been used by our clients to roll their own PC control.

The simplest available control is the model XTC which permits the user to gang two multiplays and program CDs back to back or in any ratio to other media (including records, carts, etc.) desired. The XTC allows total remote control and exhibits present, recall and future status information.

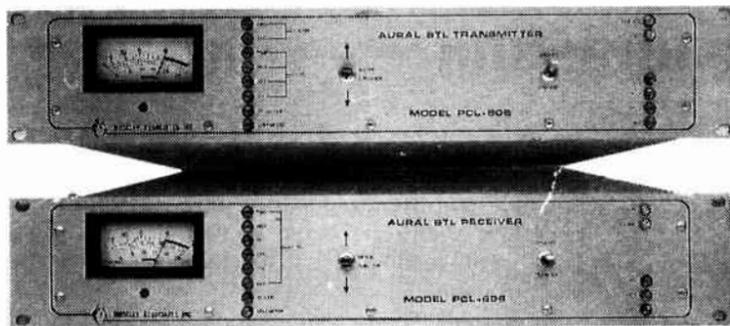
Up to four machines (up to 2000 walk-away events) may be preprogrammed and managed by the CDP programmer unit. The SMC CDP may be used as a stand alone programmer in full auto, semi-auto, or live assist modes.

The third method available is the Media Touch® System by Touchstone, which brings computerized touchscreen control of the AMCD5-1000A.

We believe the CD Multiplay can help a station's programming team maintain their position and image with little or no introduction of operator resistance. All this with complete playlist integrity. And the sound ... Oh, the sound!

Editor's note: For more information, contact the Allied Broadcast Equipment office serving your area. See also the User Reports on pages 24 and 27.

The Moseley PCL-606/C Totally Transparent



- Ends telco line charges
- Unequalled selectivity
- Outstanding linearity and frequency stability
- Built-in diagnostic metering—received signal read in true microvolts
- Digitally synthesized transmitter—no crystals
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Buyers Guide

QA-100 Knows What You Hear

by John P. Bisset, CE
WCXR/WCPT

Part 2

Washington DC ... During the initial development of the QA-100 QuantAural Audio Program Analyzer, I was permitted to join the engineers at Potomac Instruments while they tested it. The purpose of these tests was to assess the usefulness of the device in analyzing commercial broadcast stations.

Although many tests were conducted, perhaps one of the most interesting—and most appropriate for the instrument—was that of comparing the processing of various stations in the Washington, DC market.

Some of the results of these observations follow, as a followup to the last article which described the basic operation of the QA-100. I hope to share my experience that the QA-100 is a useful tool to keep one's own audio in shape and at the same time give the engineer a glimpse of what the competition is doing.

With the LED bargraphs in the wide-band detector mode, a visual representation of peak to average programming can be obtained. A comparison of the three major Top-40 stations is displayed in Table A.

These readings were taken from the average of several measurements at different times (although, due to the large amounts of compression employed by each station, the results were nearly constant).

From the Table, station C has the tightest peak to average ratio. However, it is interesting to note that station A, with a little more dynamic range, was clearly the loudest (INT), and its peaks were "brick walled" at 0. Stations B and C displayed a little more range of peaks.

The compression levels (comparing the peak to average) are nearly the same, leading some in our group to speculate that all three were using the same type of processor, set up nearly identically.

When switching to the filters mode, an even more interesting picture developed. The real-time spectrum analyzer showed both low and presence boosting for station A. Station B displayed only high boost, and station C boosted only the presence band.

In the stereo mode, the L, R, L-R, and L+R signals were viewed. Station A demonstrated abnormally boosted highs in its L-R. Station C reflected a more even, "normal" frequency distribution, and station B displayed some presence boost in the L-R signal.

Although the QPK (quasi-peak) values for the three stations were the same, the INT (Intensity) or way the ear perceives loudness clearly identified station A as the winner of the "loudness war."

Further analysis showed another station with commercials of a higher peak density than the music. The QPK (quasi-peak) level of the spots was consistently 3 dB higher than the music. Two other stations, obviously employing separate processing chains for the commercials and the music, demonstrated the opposite.

In another instance, a station was observed processing its L-R to the point that it exceeded the L+R most of the time. One of the easier listening stations also insured there was plenty of L-R, perhaps in an attempt to give the listener the broadest of stereo images.

Throughout the tests, peak to average ratios of -9 dB were found to be the point beyond which the audio was ripped to shreds. Two stations—both country—approached this level. Hot on their heels was another easy listening format which averaged -11 peak to average. This was interesting, given all the talk about listener fatigue.

Still another station chose to L-R process the mike only, with an interesting effect both on the air—and displayed by the QA-100.

Classical station A's stereo performance seemed to lag behind that of B. But one had to wonder, was the apparent lack of processing their attempt to attract the audiophile?

Two of Washington's urban stations were compared, and their differences were like night and day. Station L was a good 5 dB below station M in peak to average ratios. In addition, its peak density was such that at times, you could tune right past it.

In addition to "spying on the other guy" the QA-100 can be used to set up the stereo in the PD's office. Since multipath problems are heard first in the higher frequencies such as the SCA and the L-R information, orienting the FM

STATION	TABLE		A			
	PEAK	AVERAGE	PEAK	RANGE	QPK	INT
A	0	-15	0		-5	-8
B	0	-14	-1	to 0	-5	-9
C	0	-13	-1	to 0	-5	-10

antenna for the best L-R as displayed on the bargraphs will ensure a clean signal.

When adjusting your own station's processing, the QA-100 can permit you to listen to clipping artifacts by switching to the high-pass filter mode. This ability to "slice up" the audio band is an engineer's dream.

Another unusual application of the QA-100 is that of grading your jocks' voices. Measuring the raw voice at the console output and observing the peak to average ratio will demonstrate the "gutsiness" of the talent. If a voice is very asymmetrical, and its peak to average ratio is in excess of 25 dB, it will be more difficult to process.

It has long been known that by getting the average up through fast compression, density will be increased. A problem, however, has been the LF distortion.

Multiband processors have countered this by varying time constants in different frequency bands. The QA-100 can display the peak to average ratio of each of these bands, allowing the engineer to study the effects of different time constants on the peak to average ratio of that particular band.

In viewing the stations here in Washington, it was very apparent that there are as many different approaches to controlling modulation level and "sound" as there are stations in the market.

Just as apparent was the excellent "edge" the instrument gives—not only to supplant paranoia, but to evaluate the overall processing effectiveness of your station.

Editor's note: For more information, contact Dave Harry at Potomac Instruments: 301-589-2662. The author may be reached at 703-683-3000.

Automation Extras

Brainerd, MN ... The M.W. Persons Programmer 3A Live Assist Controller is an interface between man and machine in a radio studio where music comes from reel-to-reel. It has a memory which stands ready to start the next music source when the live announcer pushes a button. Cassette and cartridge machines can also be connected.

Built to handle four inputs, the Programmer 3A controls both logic and audio functions, mixing audio to a common output. The output can go directly to the mix bus of the studio console. A built-in timer resets to zero each time a source is started.

An auto sequence option makes the

Programmer 3A cycle through all four sources in a fixed sequence, giving the operator walk away time.

Also available is the 25 Hz Tone Processor, a dual 25 Hz tone detector and dual program amplifier with 25 Hz notch filters. One processor provides the interface needed to convert a remote controllable reel-to-reel into a source for automation or live assist.

The built-in 25 Hz filter is extremely narrow, removing an absolute minimum of programming while preventing the 25 Hz switching tones from getting on the air.

For more information, contact Mark Persons: 218-829-1326.

Play Only Is Hard Work

Radio automation can be tough on a tape transport. That's why you should equip your system with the hard-working Revox PR99 Playback Only.

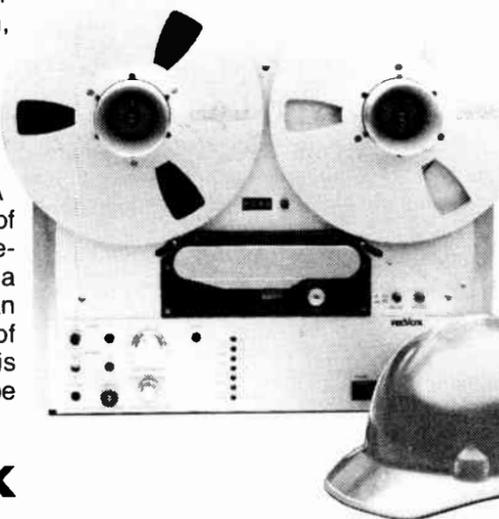
The PR99 is Swiss-engineered and German-built to perform smoothly and reliably. Hour after hour. Day after day. Year in and year out.

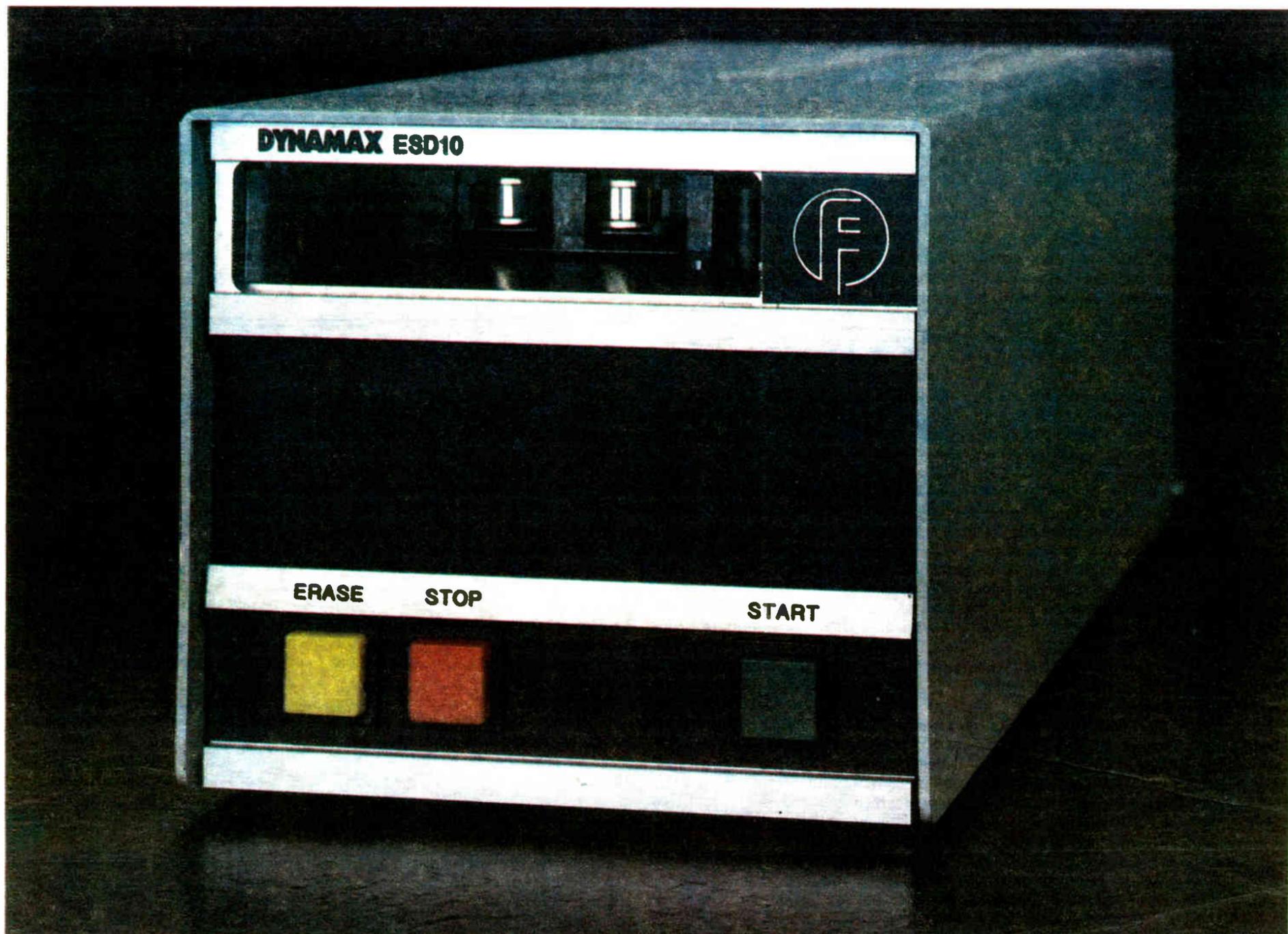
Revox reliability is no accident. It is based on a solid die-cast chassis, heavy-duty reel motors, a servo capstan motor, and contactless switching. In the Studer Revox tradition, every part is assembled and checked with meticulous precision.

The PR99 Playback Only also offers front panel controls for repro level, EOM stop delay time, and treble EQ for low and high speeds. A front panel light indicates presence of EOM signal. Audio, status, and remote signals are carried through a single multipin connector, so you can replace playback units in a matter of minutes. The PR99 Playback Only is available in 3.75/7.5 or 7.5/15 ips tape speed combinations.

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