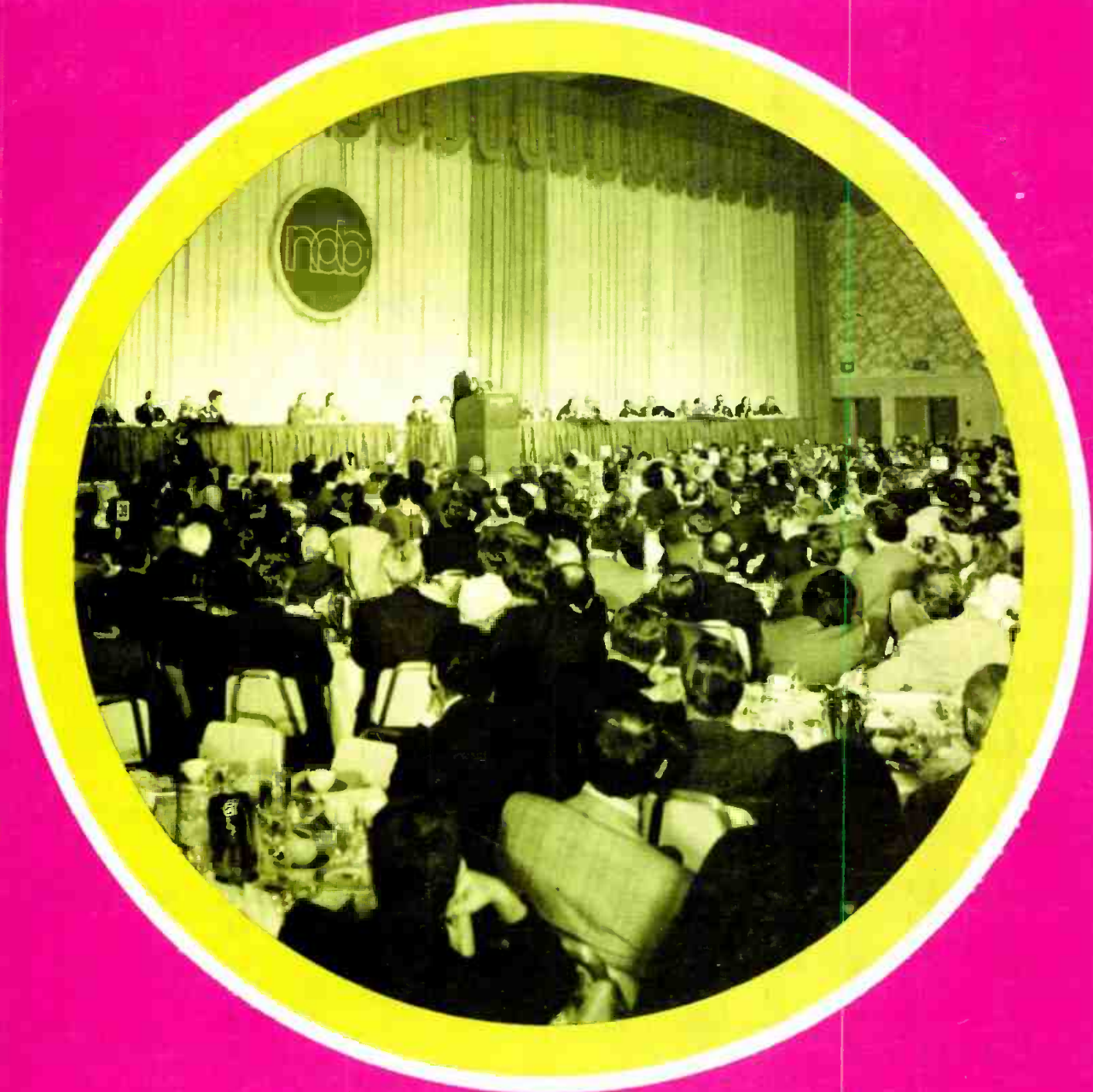


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# BROADCAST **engineering**

*the technical journal of the broadcast-communications industry*



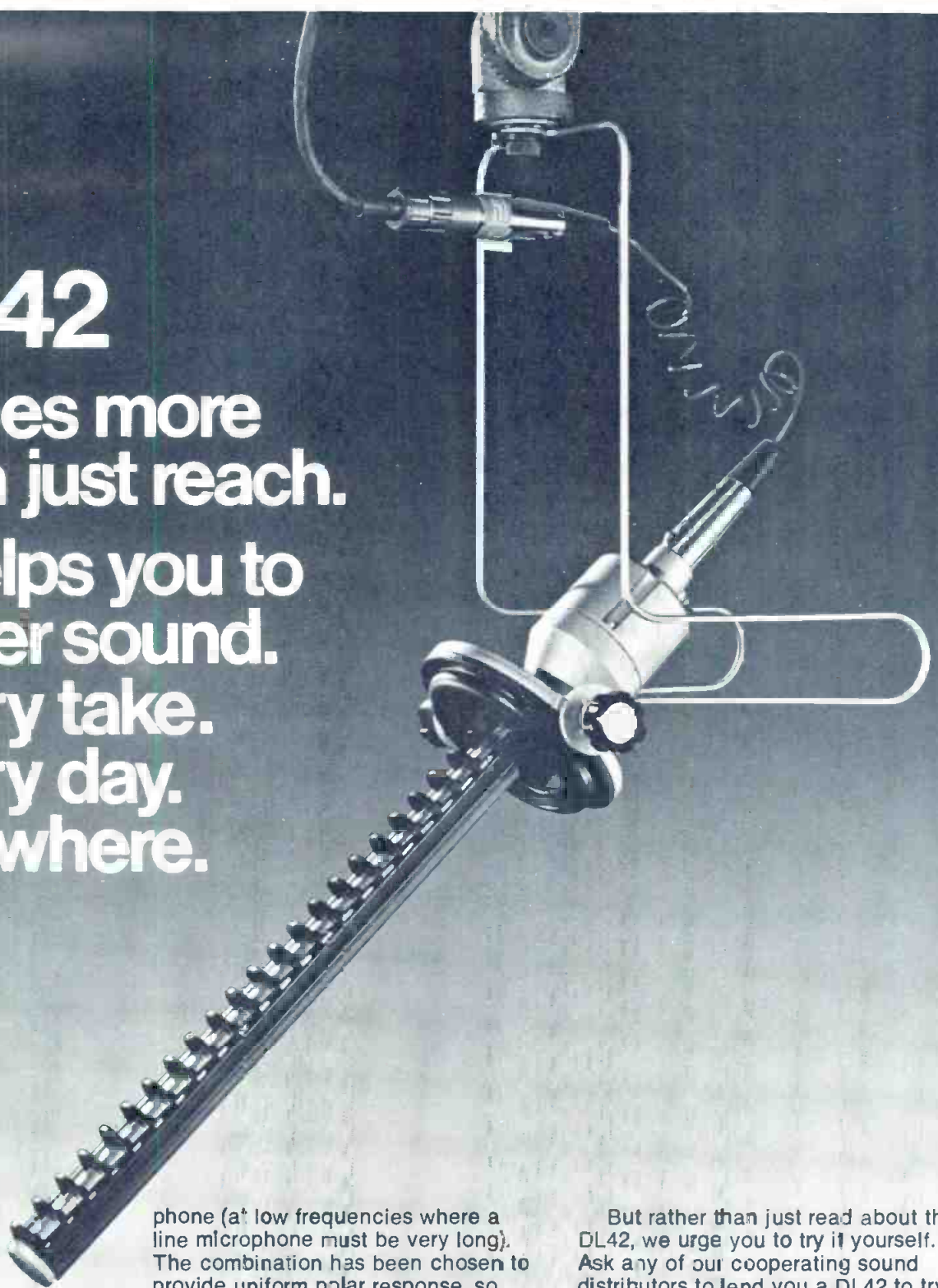
## **NAB convention wrap-up issue**

Lighting For Newscasts  
Ending the Freeze Again  
Phase Monitor Update

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# BROADCAST engineering

The technical journal of the broadcast-communications industry <sup>®</sup>

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---

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---

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### ABOUT THE COVER

The 1973 NAB national convention was a huge success. Our first two articles and the Products section reflect the size and direction of the convention that set a record for attendance.

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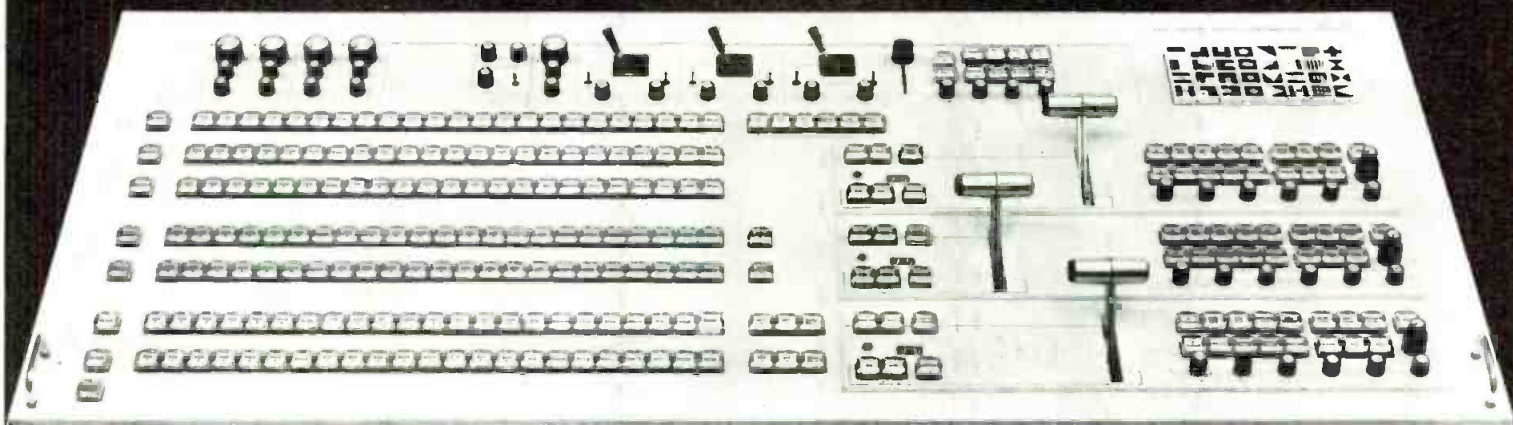
# THE 1600 SERIES


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# DIRECT CURRENT FROM D. C.

May, 1973

by Howard T. Head

## NCTA Features Technical Sessions at Convention

The National Cable Television Association (NCTA) is holding its 22nd Annual Convention at Anaheim, California from June 17-20. Technical sessions and equipment exhibits will be a major feature of the convention.

Two of the technical sessions are being sponsored jointly by NCTA and IEEE Groups on Broadcasting and Broadcast and Television Receivers. The work of the IEEE Coordinating Committee on Cable Communications Systems (CCCCS) will also be featured. Technical papers at these joint sessions will include reports on precise carrier offset, special cable television receivers. VTR time-base stability, and a report on the use of test signals in the picture vertical interval (see below).

Among special demonstrations which will be featured are the PLATO interactive teaching system and an actual demonstration of a satellite-receiving station feeding a CATV head-end. Registration information may be obtained from NCTA, 918 Sixteenth St., N.W., Washington, D.C. 20006.

## Translator Expansion Encouraged

The Commission is supporting pending legislation which would broaden the operational scope of both FM and TV translators. If the changes become law, the Commission would be permitted to exercise wider discretion as to local originations on both FM and TV translators, and would be authorized to permit unattended operation of FM translators.

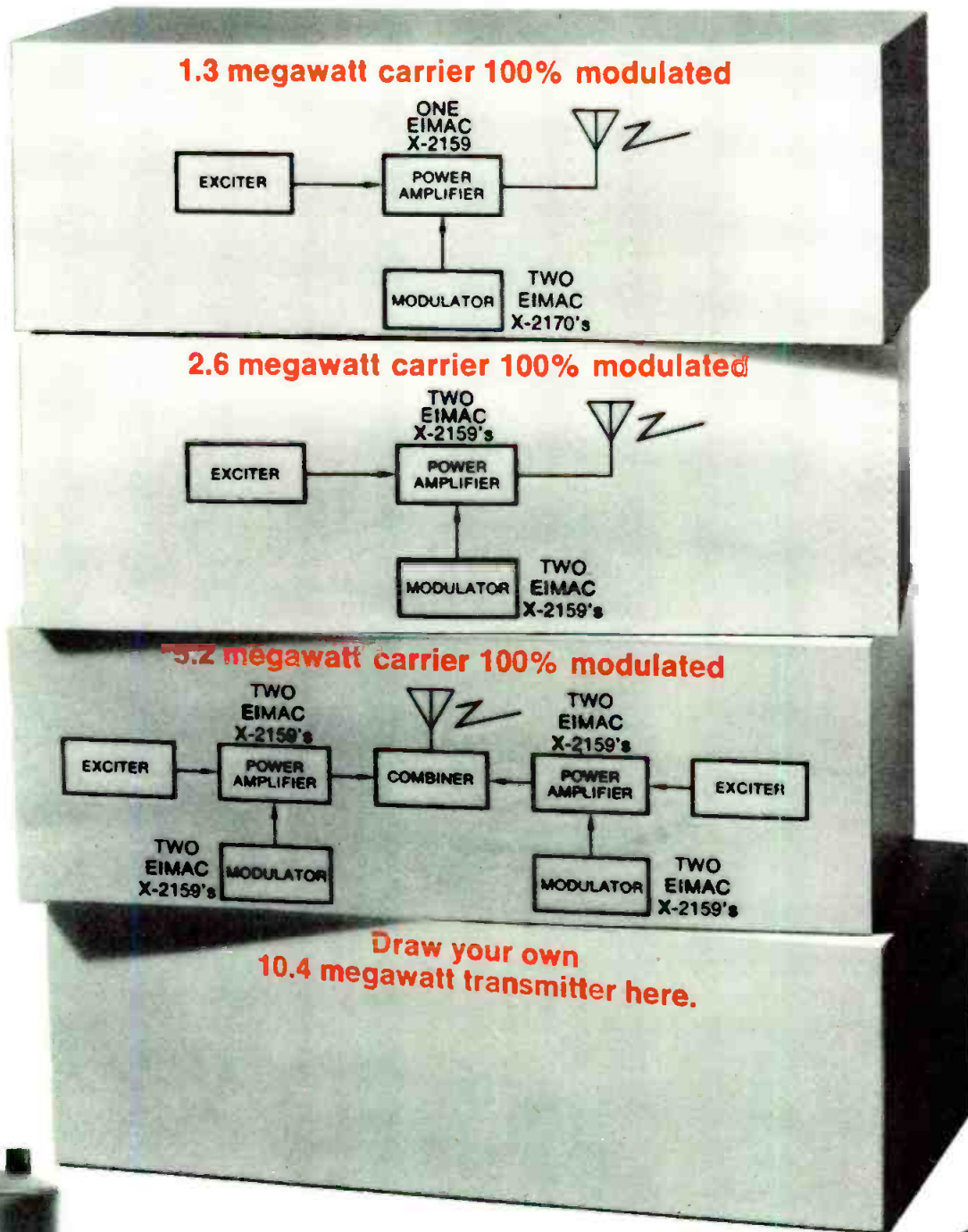
The present law permits the unattended operation of TV translators. The Commission has construed the present law to permit local commercial originations for periods not exceeding 20 seconds. The pending bill would leave specific time limitations to Commission discretion and would broaden the definition of translators to include FM as well as TV.

## TV Networks Rebuffed Plans to Use Line 20

The Commission has informed the four major television networks (ABC, CBS, NBC, and PBS -- yes, PBS, the Public Broadcasting System) that they may not implement a plan to use line 20 (in the vertical interval) for program identification and cueing purposes. In rejecting the networks' proposal, the Commission concluded that such operation "represented a non-broadcast use of the TV signal".

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The Commission went on to point out that the principal function of the proposal was related to the operation of TV stations receiving program material from the networks. In most instances, the actual radiation of the signal appeared to be incidental and unnecessary.

The networks' proposal comes at a time when a special Ad Hoc Committee of the Joint Committee for Intersociety Coordination (JCIC) and the Electronics Industries Association (EIA) are studying a wide range of proposals for the use of the vertical interval. A special report of this Ad Hoc Committee will be featured at a technical session of the NCTA Convention in June (see above).

#### Frequency Monitoring Relaxations Proposed

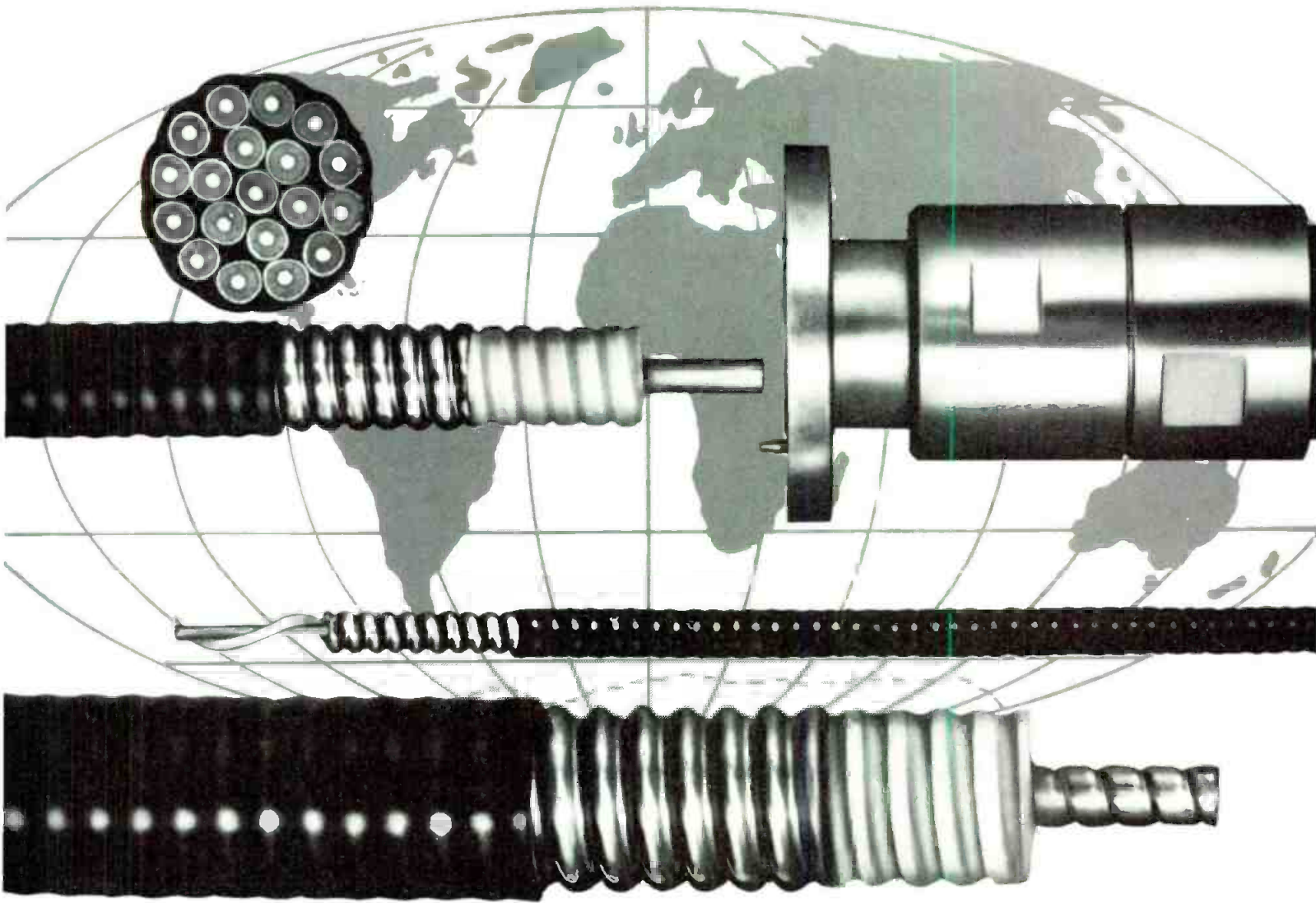
The Commission has proposed to eliminate the present requirement that all AM and FM broadcast stations be equipped with a type-accepted frequency monitor. Relaxations are also proposed for FM stereo pilot subcarrier frequency checks.

Existing frequency tolerance requirements would be maintained, and AM and FM stations would be expected to have their carrier frequencies measured monthly or more often if any difficulties were encountered in maintaining tolerance values. Stereo pilot, FM SCA and TV carrier frequencies would be required to be measured monthly.

#### Short Circuits

The Commission has authorized an exchange of high VHF and low VHF channels between a commercial and an educational TV station...The FCC Cable Bureau has moved its offices to 2025 M Street, N.W., Washington, D.C....Commissioner Robert E. Lee has suggested that additional FM channel assignments might be made by reducing FM bandwidth and lowering the present requirement for 800 kHz frequency separation in the same city....The Emergency Broadcast System (EBS) conducted a successful closed-circuit test on April 11, the first such test since the fiasco of September 14, 1971....The Commission has authorized a directional AM station to read its base ammeters by means of closed-circuit television.



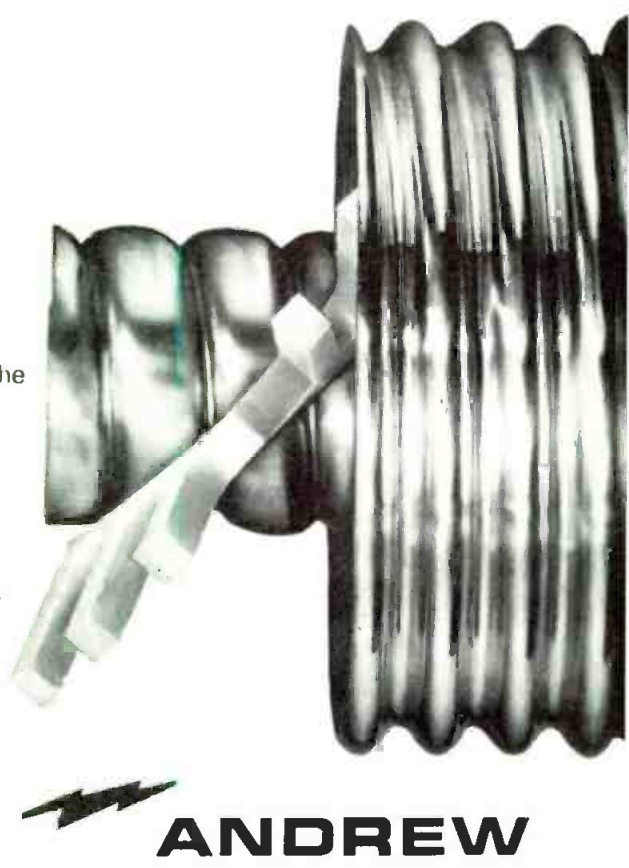


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[www.americanradiohistory.com](http://www.americanradiohistory.com)

## Let's Get Together

**Dear Editor:**

How did you get "hooked" on BROADCASTING? Maybe your Dad owned a 5,000 Watt daytimer ...or...just maybe you got started at a college or a high school station—similar to WLTL-FM (January BE).

For the past six years I have worked closely with young broadcasters and have learned quite a bit from these so-called "non-professionals". I now serve as a consultant to two college and one high school station—WMPH-FM in Wilmington, Delaware (which I founded back in 1969).

My sympathies are with WLTL in their search for a chance. Many broadcasters are just too busy to help these youth. However, after involving many veterans with such

stations, mutual respect seems to flow between the experienced and the not so experienced. What I see as the greatest need of these non-commercial stations, is the involvement of many more broadcasters in every capacity (management... engineering...music) with these young people. Where else can new and experienced broadcasters share their problems, their joys, and their excitement in such a rapidly changing industry.

To broadcasters...I say, "Get Involved", maybe as a consultant. This only entails stopping by their station say once a week (or even monthly will be a help) and even inviting their station members to visit you. That will give you a chance to show-off all your tricks in

operation and even "brag" a little. It'll do your ego good and they'll respect you more in addition.

Just one note. Don't imply that because you do one thing one way, that they have to do it the same...but there's never any harm in merely suggesting a course of action. But let them decide. Who knows? They might just teach you a few tricks! And to young broadcasters...ask questions of your consultants, and show them the respect they deserve.

A lot can be learned from each other whether you've been in this field fifty years or fifty minutes—I guess that's why broadcasting is so unique!

**Robert C. Huber**  
Broadcast Consultant  
Warren R.I.

## The Winners' Circle

**Dear Editor:**

I would like to know the winners' names of the Harold E. Fellows Memorial Scholarship presented annually by the National Association of Broadcasters.

I honestly believe your readers would be interested in knowing how those who dedicate themselves to the field of broadcasting could apply and become eligible for the NAB financial educational assistance.

**Mario A. Herrera, Eng.**  
KSAT TV  
San Antonio, Tex.

Award of Harold E. Fellows Memorial Scholarships to four outstanding students in radio and television were announced at the 51st annual convention of the National Association of Broadcasters.

The scholarships, honoring a former NAB president, carry a grant of \$1,250 each for the coming academic year. They reward outstanding students in schools of broadcasting who wish to continue their studies and enter the field of commercial broadcasting.

This year's winners:

•Kellen Thornton, Lubbock,



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Texas, a senior at Texas Tech who will do her graduate work at Minnesota University.

●Alex Washington of Mattapan, Mass., a junior at Emerson College in Boston.

●Michael Cantrall of Redding, Calif., a junior at Stanford University in Palo Alto.

●Kristine Kelly of Port Huron, Mich., a junior at Central Michigan University at Mt. Pleasant.

The awards are funded by NAB and administered by the Association of Professional Broadcasting Education.

The winners were announced by APBE's Scholarship Committee which is composed equally of representatives of broadcasting and the academic community.

Bruce Linton, Chairman of the Radio/TV Department, University of Kansas, is the Committee Chairman. Members are Richard C. Block, vice-president and general manager of Kaiser Broadcasting Stations, Oakland, Calif., Joseph Ripley, chairman of the Radio/TV Department of the University of Kentucky; Donald E. McClintock, vice-president and general manager, KFBB-TV, Great Falls, Montana; Robert Snyder, chairman of the Radio/TV Department of the University of Wisconsin-Oshkosh; and Jack Lee of Huntington, W. Va., formerly with Lin Broadcasting Co.

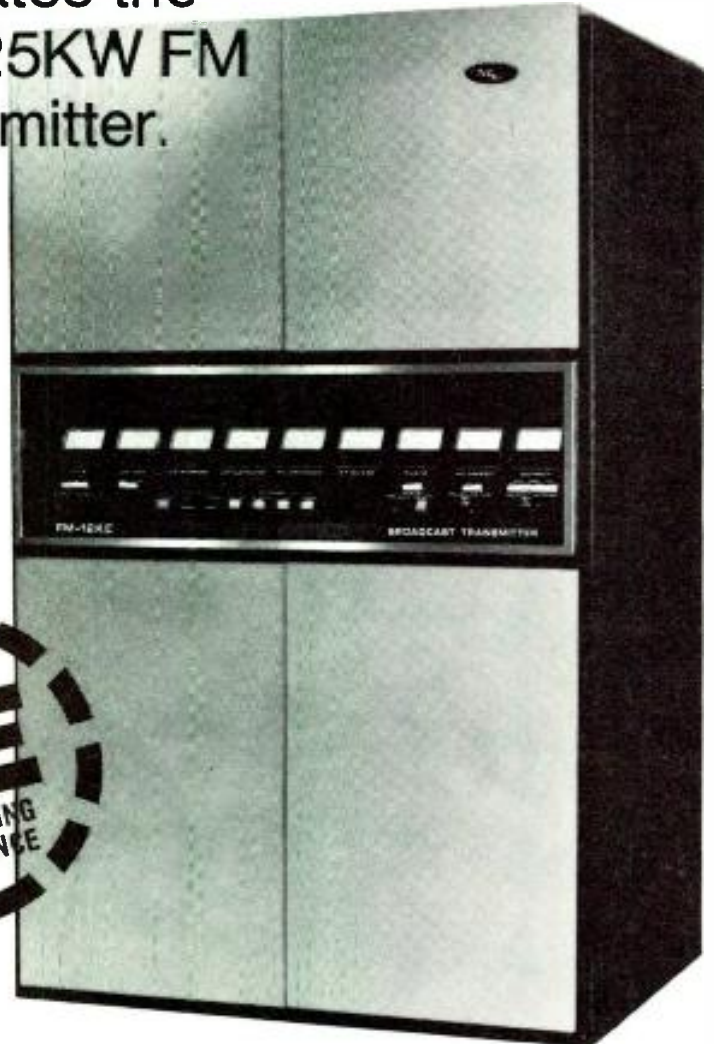
**The Editor**

### **Credit Where It's Due**

In the March issue of **Broadcast Engineering** there appeared on page 82 an article written by Marvin Blumberg of A. D. Ring & Associates, a Washington D.C. based consulting firm.

It was an excellent article, but the byline is incorrect. We're blushing about the byline, but we're proud to have run the article. The credit for the article should go to Marvin, while the laugh is on me.

**The Editor**



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## INDUSTRY NEWS

# FCC Convention Panel on the line

Broadcasters and officials of the Federal Communications Commission had a lively and informative discussion on the regulation of radio at the NAB convention in Washington.

The management radio conference of the National Association of Broadcasters 51st annual convention featured FCC Commissioner Richard Wiley and members of his Re-Regulation Task Force.

Introducing Commissioner Wiley was NAB Joint Board Chairman Richard W. Chapin, Stuart Enterprises, Lincoln, Neb., who is head of NAB's Work Group on Re-Regulation.

Task Force members appearing were: Wallace Johnson, chief, Broadcast Bureau, Harold L. Kassens, assistant Broadcast Bureau chief; Steve Crane, consultant; Philip Cross, legal assistant, and John M. Taff, engineering assistant.

Wiley said that as a result of the NAB and FCC groups working on re-regulation a channel of communications has been established and each side can learn from each other.

He told the broadcasters to keep the cards and letters coming and said the best in re-regulation is yet to come. He also urged them to respond to the Commission's recently-issued notice of inquiry on the ascertainment of community problems.

### Answers For Executives

In response to questions from the radio executives, the Task Force members supplied these answers:

Wiley said the Commission is moving to bring FCC Field inspectors into the re-regulation scheme

and is considering holding regional workshops for broadcasters and FCC personnel.

He said the aim of the re-regulation movement is to make the rules "simple, direct and pragmatic" and enforce them.

Johnson said the Field Engineering Bureau gave the Task Force many suggestions that have been incorporated into re-regulation rulings, and that there will be a lot of improvement regarding inspection of stations.

Regarding an automatic transmission system, Kassens said the FCC has been thinking in terms of how to design the transmitters to meet Commission specifications.

However, he said the recent report NAB provided the FCC asks the Commission to tell the industry what it wants a transmitter to do and leave the rest to the broadcasters. He noted that this is a new, and interesting thought.

### Quad Thoughts

Kassens, discussing FCC standards on quadrasonic broadcasting said there are no regulations, but some suggestions on the matrix system, and that a report will be prepared by the Electronic Industries Association on the discrete system.

The study, he said, will cover all types of systems and after a Commission review, it will issue a rule. That, he said, probably will come in about two years.

### Community Needs, Station Needs

Cross said stations should determine their community needs on a continuing basis in addition to the

survey required six months in advance of filing an application for renewal. Regarding public service spot announcements, he said this is one of the questions in the ascertainment inquiry and said the Commission wants answers from the broadcasters.

Tass said the requirement that engineers be able to see the transmitter meters at all times has presented "a great deal of trouble."

He said the rules have been relaxed, but real relief may come when the FCC examines extension meters.

Crane also asked the broadcasters to spend some time with the ascertainment inquiry "and let the Task Force hear from you."

Assertainment, he said, is designed to meet community problems and what is done to determine the problems and what is broadcast is the personal responsibility of the broadcaster. If there is a different way of ascertaining problems than is now required by the FCC, he said, then let the Commission know about it.

## AM-FM Monitors Considered Again By Commission

Elimination of the requirement that AM and FM stations must be equipped with a continuously operating type-accepted frequency monitor has been proposed by the FCC in a rulemaking notice.

The Commission also proposed to change requirements concerning frequency checks for FM Subsidiary Communications Authorization (SCA) subcarrier frequencies, stereo pilot subcarrier frequencies and television station carrier frequencies. Monthly measurement of these frequencies will be required.

The proposals are part of the Commission's continuing study of the re-regulation of broadcasting.

The FCC said that the present state-of-the-art of automatic frequency control provides an "inherent stability" substantially exceeding that required by Commission rules, so that AM and FM stations may no longer need to use frequency monitors.

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[Continued from page 11]

While licensees using transmitters with automatic frequency control systems that maintain frequency within prescribed tolerances would only have to measure the actual transmitter frequency once a month, licensees who have difficulty maintaining frequency within tolerance would be expected to make frequency measurements more often, the Commission said.

In relaxing the requirement for daily frequency checks for SCA and stereo pilot subcarrier frequencies, the Commission noted that existing rules specify tolerances allowed, and require frequency checks as often as necessary to insure operations within tolerance. Licensees will continue to be responsible for proper operation of subcarrier frequencies, the FCC said.

The Commission deleted AM, FM, and television rules requiring type approval for frequency monitors. Although the sections of FCC application forms that refer to frequency monitors will no longer

be applicable, the Commission decided that it is not necessary to change the forms now. It will make an overall examination of application forms during the re-regulation study, it said, and expects to make all the necessary changes at one time.

the National Association of Broadcasters, was re-elected executive secretary.

Newly-elected to the Board were Mr. McDougald, Rod Rightmire of Ohio University, Athens, and James Welke of the University of Wyoming at Laramie.

### APBE Elects New President

Clark Pollock of Nationwide Communications, Inc., Columbus, Ohio, is the newly-elected President of the Association for Professional Broadcasting Education.

Pollock has served as vice president for the past two years.

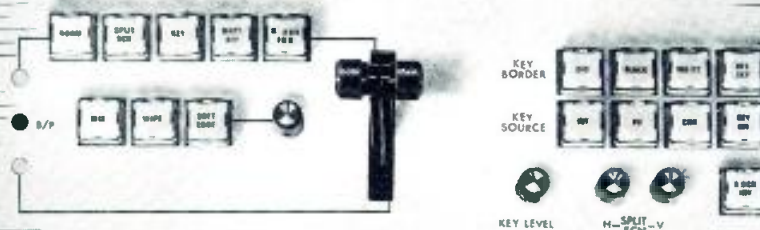
Worth McDougald of the University of Georgia in Athens was elected vice president and Richard Block, president of Kaiser Broadcasting Co., Oakland, Calif., was elected secretary-treasurer.

Dr. Harold Niven, vice president for planning and development for

### Color TV Manual

Carl Babcoke, Technical Editor of Broadcast Engineering and Managing Editor of Electronic Servicing, has had his sixth book released. It is titled "Color-TV Servicing Made Easy, Volume 3" by Wayne Lemons and Carl Babcoke, and is published as number 20875 by Howard W. Sams & Co., Inc. of 4300 West 62nd Street, Indianapolis, Indiana, 46268. The book has four chapters relating to color servicing in general, plus information complementary to the Photofact coverage of 21 brands of color receivers.

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# Society Will Grow With Professional Approach



## *Dear SBE Members:*

On behalf of the new officers and directors I would like to thank all of you for your support. It is a great honor to be asked to serve the Society and we pledge our sincere efforts to continue the growth of the Society through its local chapters and individual members.

I would like to especially thank Bob Flanders for the outstanding accomplishments during his term of office including the computerization of the membership records and the agreement with Broadcast Engineering.

The Board of Directors at its meeting of March 25th, 1973 unanimously elected immediate Past President Bob Flanders and Past President Lew Wetzel, Fellows of the Society. This Fellowship was conferred upon Mr. Flanders at the annual membership meeting held during the NAB convention.

It is the intention of your new officers to continue the present growth of the Society and to establish new chapters. We believe that the strength of the Society must come from strong, active local chapters and we are working with several engineers who have asked for assistance and information on the formation of local chapters.

The Board has appointed committees headed by Ben Wolfe and Ed Karl to establish a professional certification or endorsement program as well as a code of ethics for Broadcast Engineers. We believe that the Society must direct a major effort to raise the professional status of all engineers in the field of broadcasting.

We need your help to make the SBE function so it can best serve you and your chapter. Won't you please make suggestions and recommendations on how you feel the SBE should be run.

**James C. Wulliman**  
**President**  
**Society of Broadcast Engineers**

## SBE Elects National Officers

James C. Wulliman, Manager of Broadcast Engineering of WTMJ-AM-FM-TV and CATV, Milwaukee, Wisconsin, has been elected President of the Society of Broadcast Engineers, succeeding Robert Flanders, Director of Engineering, WRTV, McGraw Hill Broadcasting Division, Indianapolis, who completed his second term (the limit per the SBE constitution) on March 25th.

Elected to the position of Vice President is Glenn Lahman, Engineering Manager, KDKA-KDKA-TV, Pittsburgh. Lahman succeeds Richard T. Monroe, Vice President, Engineering, Group W, Westinghouse, New York, who also completed two terms as the SBE vice president.

Elected as Secretary-Treasurer was Robert Truscott, chief engineer WITI, Storer Broadcasting, Milwaukee, Wisconsin. Truscott succeeds Gordon Trout of WIRE Radio, Indianapolis, who also completed his second term.

The new officers took over the reins of the SBE at the Annual Meeting held March 25th in Washington, D.C. The SBE National Office of the SBE will remain in Indianapolis, Indiana, and will be managed by Ms. Virginia Doss, Assistant Secretary-Treasurer. (The SBE headquarters address will continue as P.O. Box 88123, Indianapolis, Indiana 46208. All mail pertaining to membership, routine chapter business, etc., should be sent to Ms. Doss at that

address.)

Mr. Wulliman had previously served as an SBE board member and is past chairman of SBE Chapter 28, Milwaukee. His past associations have been as chief engineer and assistant station manager in charge of operations for WMVS-TV; chief engineer for WTVT-TV, Decatur, Ill.; and chief engineer and assistant station manager for WCNB AM-FM, Connersville, Indiana. Wulliman is the author of several articles on radio and television station operation and automation for industry magazines and NAB convention papers. Professional affiliations include IEEE, SMPTE, and board of directors, Milwaukee Area Medical Television Network.

Mr. Lahman is a charter member of the SBE; he previously served the Society in the capacity of board member. He is engineering manager for KDKA and KDKA-TV, a Group W station, and is a former chairman of SBE's Chapter 20, Pittsburgh.

Mr. Truscott is currently serving as vice chairman of Milwaukee SBE Chapter 28, and has been chief engineer of WITI TV since 1956. Prior to assuming his present position, Truscott was assistant chief engineer for WTVW, Milwaukee, and in 1954 was also assistant chief engineer for WREX TV, Rockford, Illinois. Other positions include staff engineer assignments at WOC AM & TV, Davenport, Iowa; WGN, Chicago; and WOW-TV in Omaha, Nebraska.

#### **SBE Elects New Directors**

Elected to SBE Board are: Steve DeSatnick, Leo W. Reetz, Robert F. Cox, Henry L. Van Ambergh, Eugene R. Hill, Charles T. Morgan,

and John T. Wilner.

Steve deSatnick is Director of Engineering, WCVB, Boston, Massachusetts.

Mr. deSatnick's broadcasting career spans 23 years of professional experience, including:

Vice President, Operations & Engineering, for WNET-TV (New York City); General Manager, NYU Television Production Center; and Chief Engineer and Operations Manager, Mobile Video Tape, Inc.

Mr. deSatnick, a former S.B.E. board member, has been an instructor in communications at Columbia University and New York University. He holds a B.S.E.E. degree from Columbia University.

Leo W. Reetz is with the American Broadcasting Company, Inc. New York, New York.

Leo W. Reetz works for ABC, Inc., with the Allocations and R. F. Systems section of the Broadcast Operations and Engineering Department. He was formerly Chief

Engineer at KCRG-TV in Cedar Rapids, Iowa, and of KEZI-TV in Eugene, Oregon.

He is a graduate of Oregon State University and has previously served as a director and Chairman of the Admissions Committee of the S.B.E.

Robert F. Cox is Director of Development & Public Relations, Indiana Institute of Technology, Fort Wayne, Indiana.

Mr. Cox's present responsibilities include planning and directing long-range programs for I. I. T., a non-sectarian college of engineering and science. He has held this position since 1969.

Mr. Cox's previous experience includes:

1966-1968 - Executive Program Manager for the U.S. Information Agency in the development of a Government of Vietnam Television system.

1965-1966 - Secretary of Defense Project Manager for establishment



## **The Old And The New**

Officers, Directors, and Staff of SBE. Seated, left to right: Robert Z Ingalls, Director; James C. Wulliman, President; Virginia Doss, assistant Secretary-Treasurer; Robert W. Flanders, outgoing President; Robert F. Cox, Director; John T. Wilner, Director. Standing, left to right: Steve deSatnick, Director; Henry L. Van Ambergh, Director; Robert Truscott, Secretary-Treasurer; Charles T. Morgan, Director; Eugene R. Hill, Director; Leo W. Reetz, Director; Edwin T. Karl, Director; Glenn Lahman, Vice President; Lewis Wetzel, former president and outgoing director; and Joseph Risse, SBE Editor.



of television in Vietnam.

1961-1965 - Office of the Secretary of Defense: Established policy, formulated plans, prepared organizational structures and conducted field management standardization surveys of Armed Forces Radio Television stations world-wide.

**Henry L. Van Amburgh** is Chief Engineer, WGAN AM-FM-TV Portland, Maine.

Mr. Van Amburgh has been a professional broadcaster since 1951. A graduate of Hudson Valley Community College, he has previously worked as a staff engineer at WCHN, Norwich, New York (appointed chief engineer in 1953); WTRI-TV, Troy, New York; and WPRO-TV, Providence, R.I. From 1961-62 he was chief engineer for WPRO-AM and in 1962 went with WGAN Stations as chief engineer. He has been a member of the Society of Broadcast Engineers since 1967.

**Eugene R. Hill** is Vice President-Engineering, Kaiser Broadcasting, Oakland, California.

Mr. Hill joined Kaiser Broadcasting in 1964 as chief engineer of WKBD-TV, Detroit, Michigan. Hill was appointed Director of Engineering of Kaiser Broadcasting Corporation in 1965 during which time he directed the construction of WKBD-TV (Detroit), WKBS-TV (Philadelphia), KBSC-TV (Los Angeles), WKBG-TV (Boston), WBHK-TV (San Francisco), and WKBF-TV (Cleveland). In 1969 Mr. Hill was appointed Vice President of Engineering for Kaiser.

He has been a member of the NAB Engineering Advisory Committee since 1967 and is a Past Chairman of the Electronic Industry Council.

**Charles T. Morgan** is Assistant Director of Engineering, Susquehanna Broadcasting Company, Avoca, Pennsylvania.

Morgan is Ass't. D. E. for the Susquehanna Broadcasting Co. and chief engineer of its Scranton/Wilkes-Barre outlet, WARM-AM. For the past 12 years Morgan has served in an engineering management capacity with his company and has been involved in the expansion of its 12 broadcast facilities.

Morgan, the author of a number

of textbooks, is a charter member of S.B.E. and a member of the AES. He is presently serving as chairman of S.B.E. Chapter #2, Scranton/Wilkes-Barre.

**John T. Wilner** is Director of Engineering, State of New Jersey Public Broadcasting Authority, Trenton, New Jersey.

Mr. Wilner, a current S.B.E. board member, has been director of engineering for New Jersey's Public Broadcasting Authority since mid-1970.

Wilner was a member of the original CBS Laboratories' team and helped install CBS's first television station in New York through 1949.

He has also been associated with the Hearst Corporation (Vice President of Broadcast Engineering) and



Kear and Kennedy, engineering consultants.

At the 1973 SBE Annual Meeting, held March 25th, in Washington, D.C., the Board of Directors of the Society of Broadcast Engineers, Inc., elected to the grade of Fellow two former Presidents of the Society, Robert W. Flanders, and Lewis D. Wetzel.

Flanders just completed his second term in the presidency. Wetzel served as president in 1969 and 1970. Others who previously have been elevated to Fellow are Charles Hallinan, Binghamton, N.Y., also a former SBE president; and Glenn G. Boundy, Miami, Florida.

### **Chapters in the Making**

The following areas represent locations for possible future chapters. Information on any planned organizational or technical meetings may be obtained from the individual listed as the contact in each case. Anyone interested in formation of a chapter in other locations may contact Virginia Doss, Asst. Sec. Treas., SBE, P.O. Box 88123, Indianapolis, Indiana, 46208, or at WRTV, 1330 North Meridian, Indianapolis, Indiana. It is also urged that you keep the SBE Journal editor advised at P.O. Box 131, Dunmore, Pa. so that your efforts to form a chapter might be enhanced by publication in our Journal.

<b>Location</b>	<b>Contact</b>
Tucson, Ariz.	H. J. Bart Paine, Telephone 882-6644, or Chuck Deen, KOOL TV, 511 W. Adams. Phoenix, Ariz., telephone 271-2345
Miami, Fla.	John Blattner, 11001 N. Kendall Dr. Apt. A107, Miami 33156
St. Louis, Mo.	Arthur H. Rounds, 1321 Aspen Drive, Florissant, Mo. 63031
Puerto Rico:	Bob Beurket, Asst. Chief Engineer, WRIK TV, Ponce/San Juan, Puerto Rico. Telephone 809-724-7575
San Francisco, California:	Robert Daines, CBS Laboratories, One Embarcadero Center, San Francisco, Calif. 94111

# Chapter News

**Chapter 1 - Binghamton, N. Y.**  
**Chairman: Larry Taylor, WENY TV,**  
**Mark Twain Hotel, Elmira, N. Y. 14901**

Jerry Preston of RCA provided the technical session consisting of slides and a discussion on the new RCA FM solid-state transmitter. Preston, as usual, provided a very interesting meeting. Chairman Taylor reviewed plans for the May Joint Meeting with Chapters 2 and 22, the location to be either Owego or Binghamton, N.Y.

**Chapter 2 - Northeastern Pa.**  
**Chairman: Paul Evanosky, WVIA TV FM,**  
**Old Boston Road., Jenkins Township, Avoca, Pa. 18641**

The March 5th session, as reported previously, consisted of a tour of the new WVIA TV FM studio facilities. The April 2nd meeting, also held at the WVIA TV studios, (as will most future meetings), included reports by those who attended the SBE Annual Meeting and NAB Convention, March 25-28, in Washington, D.C. Guest speaker was Ray Desmarais of Burwen Laboratories, Lexington, Mass., who demonstrated his Company's Dynamic Noise Filter. This unit, unlike the Dolby System, uses no encoding and, therefore, can be used at any point in the broadcast system with no ill-effects. Desmarais showed how the equipment can be inserted in the transmitter feed to reduce noise originating from discs, rumble, tape, and so on.

Joint meeting with Chapters 1 and 22 for May was announced and members urged to attend this annual event on May 8th.

**Chapter 9 - Phoenix, Ariz.**  
**Chairman: Charles Deen, KOOL TV**  
**511 W. Adams, Phoenix, Ariz. 85003**

The following brings us up to date on recent meetings of Chapter 9. On January 15th members and guests met at KTAR TV studios to hear Jack Williams, President, Pacific Recording and Engineering Corp, San Diego, talk on "What

You've Always Wanted to Know About the AG-440...but Didn't Know Who To Ask". Williams covered "...why the 440? the 350 was good enough...now that you've got one, what does it do?...how to align and adjust it...idiosyncrasies and problems...modifications... questions and answers..."

At the February 13th meeting, held at KTVK-TV studios, Clyde Gamboe of Shefler-Kahn Co., local manufacturers Rep for International Rectifier Corp., presented a program on "Solid State Relays".

The March 9th meeting, at KPHO studios, included a talk by Philip Kane and Ben Nakamiyo of the Federal Communications Commission on the "FCC FM-Television Monitoring Unit." Members were later provided with a tour of the monitoring unit by the FCC officials. Methods used in monitoring and measuring TV and FM signals were described and demonstrated. Representatives of 2-way radio, land-mobile, and amateur groups helped to make up the above-average number in attendance. Election results were announced at the March meeting as follows: Chairman: Charles Deen; Vice-Chairman: Deleau Rester; Secretary-Treasurer: Thayne Higgins; Program Chairman: Robert Johnson; Member at large: Earl Mehafley.

**Chapter 15 - New York, N. Y.**  
**Chairman: John Lyons, WWRL 41-30 58th St., Woodside, N.Y. 11377**

For the March meeting, program committee chairman, Art Silver, arranged for a seminar, "Theoretical and Practical Applications of Coaxial Cable for TV, FM, and AM Broadcasting", by Andrew Corporation representatives John Pryjma, Eric Brooks, and Harry McKee. Bob Woerner, WNEW TV, chapter secretary has announced the April meeting to be a talk by Tom Schoonover, Gates Div., Harris Intertype Corporation on "Paralleling TV Transmitters". A report on this meeting will appear

in the next issue. The chapter's meetings are held in the New York Times Bldg., WQXF Presentation Studios, 9th floor, which is only 2 blocks from the Port Authority Bus Terminal. Those attending are welcome to use the Times' cafeteria which opens at 6 PM; address is 229 West 43rd St.; usual meeting time is 2nd Thursday of each month, September through June, 7:30 PM.

**Chapter 16 - Seattle, Wash.**  
**Chairman: Clay Freinwald, KMO Radio**  
**Box 1277, Tacoma, Washington 98401**

Regular meetings are now held every 2nd Wednesday at the Norslander restaurant, 300-3rd Avenue, West, Seattle. On March 14th, members and guests heard Don B. Clark of the Naval Civil Engineering Laboratories, Port Hueneme, California, discuss the effects of Electromagnetic Pulse on "unhardened" stations and on electrical and telephone services. His talk was illustrated by color slides. Clark detailed the magnitude of currents to be expected from nuclear explosions and protective measures that should be provided. Bill Cruse of Region 8 Civil Defense Office was on hand. Bob Dietsch presented his monthly FCC report. Officers and directors were nominated for the coming year. Election and results will be covered in next issue.

**Chapter 18 - Philadelphia, Pa.**  
**Chairman: Jack Jones, WCAU TV**  
**City Line and Monument Avenues, Philadelphia, Pa. 19131**

On Monday, April 2nd, members and guests met at Williamson's restaurant. Following a refreshment hour and dinner, Kodak presented a VIDEOFILM STORY, a 2-part presentation on the subject of Photographing for Television. Part 1 was Videofilm Production. Part 2 covered Videofilm Reproduction. Usual meeting date for the chapter is 3rd or 4th Monday, dinner 6 PM, at Williamsons restaurant.

[Continued on page 49]

# Spotmaster

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# NAB convention management highlights

Attendance up, sales up, prospects up...but "topless radio" was down. It was an active, optimistic convention.



Vince Wasilewski (at left) presents the Distinguished Service Award to Ward Quaal.

Business was good at the NAB annual convention this year. At press time the final attendance figures were not available, but the NAB was estimating 9,000. No one at the convention doubted the figure.

What it really meant was that, despite outside pressures that have been building in the past few years, broadcasters are adjusting and prospering. One very definite indication of the state of the industry is the amount of business taking place on the floor of the exhibit halls. Contracts were being written. And in many cases—due to delivery dates of new equipment just unveiled—a great number of pieces of equipment in the exhibits were sold on the spot.

### ***Accentuating The Positive***

As we reported earlier, Ward Quaal was selected for this year's annual distinguished service award. At the convention, Mr. Quaal was reluctant to take credit for his

accomplishments. Rather, he graciously accepted the honor and poured out his thinking on the honor and accomplishments of the industry itself.

It could have simply been one of those occasions where a distinguished, deserving industry leader is honored. Instead, Mr. Quaal pitched the industry from the inside. Obviously, it was an attempt to remind the industry that it has good reason to be proud. It was a testimonial to show and encourage faith in broadcasting.

What follows are excerpts from his address that we must agree bear repeating:

"If I were to select one man in the history of communications law who did the most to safeguard those inherent first amendment freedoms, he would be the late Louis G. Caldwell, attorney of Washington and Chicago, and the first General Counsel (in 1927) of the Federal Radio Commission, forerunner of the FCC. A colorful, white-maned, brilliant man whose

honesty and integrity were legend, he wrote most of those provisions of the early radio law that were so sound in principle that they remain the keystone of the Communications Act, which otherwise has been so twisted and distorted by Congressional patchwork, and ridiculous FCC interpretations, and outlandish court actions as to make it punitive, as well as contradictory!!!

"We owe an enormous debt to others of that first generation who are still here—stalwart defenders of our system and who are as young in zeal and dedication as they were when it was "fun" to be a broadcaster with the rewards "slim". Among these are such innovators and fine gentlemen as Niles Trammell, Rosel H. Hyde, Frank Stanton, J. Leonard Reinsch, Clair McCollough, John Fetzer—to name only a few.

"I will not resort to flaming rhetoric to exhort all of you to defend the freedom and sanctity of American broadcasting! That is

why you are here! It is the reason for being of the National Association of Broadcasters!!! It is your obligation to defend that which you and your predecessors fashioned by popular demand—the expressed wishes of a nation of 220 million Americans—including the three percent of self-announced intellectuals who preach what they seldom practice!

"In the words of that fine man of note, Johnny Mercer, let us strive to eliminate the "negative" and accentuate the "positive"—let us all acclaim what is right about broadcasting!"

**NAB President  
Pinpoints Problems**

Once more the NAB's hard line boss addressed the joint radio-

television assembly. Once more he used his time to take a hard-nosed position on the state of the industry. If you like a fighter in your corner, you have to like what Vince Wasilewski had to say as much as the way he said it.

Looking down the pike at broadcast roadblocks, Wasilewski struck first at a most recent problem: consumerism.

"Our problem with consumerism," said Wasilewski, "is that many in this movement are extremists. Some of these people who do not believe that advertising should be permitted at all. They do not believe that Americans should be exposed to it because it leads them to make expenditures these people regard unwise. These are the people who feel that advertising is evil

despite the fact that almost everything they know about the current world is brought to them on the wings of advertising.

"There are other critics who are not as sweepingly antagonistic, but whose approach can also be terribly damaging. These are the people who advocated the cigarette advertising law - a law that has been about as complete a failure as any law which ever went on the books and certainly as ineffective a law as ever has been passed by the Congress.

"Despite that, there are people who advocate a similar law for other products. With Alice-in-Wonderland logic, they twist the word drug as in "drugstore" to mean the same as the drug "heroin." They equate the advertis-



The exhibit areas were crowded this year. NAB estimated that over 6,000 registered and another 3 to 4,000 attended.

ing of nasal sprays and toothpaste with the pushing of heroin and hashish. Handicapped by the lack of any scientific research and the absence of a single piece of valid evidence, the "ban-the-ad" crusaders now demand that we disprove what no one has proved in the first place.

"They are the people who push for counter-advertising despite the evidence and expert testimony that such a policy would destroy the system of broadcasting and, for that matter, newspapers and magazines, were it ever extended to those media. These are the people who want to cut advertising out of children's programming entirely. They would require that programs for children be carried while destroying the economic base that makes them possible.

"Challenges to broadcaster's freedoms—both economic and programming—do not come only from government, although the challengers frequently try to use the government as a device for imposing their restrictions. If the FCC did what all the community groups wanted them to do—in the name of freedom and access and open discussion and all the other terms that are frequently used—they would weave a web of restrictive regulation that would strangle to death television and radio stations by the hundreds within a month.

"Because the objectives of these groups are not really open access but only access for their ideas, not really open discussion but only discussion of their convictions, and not really for freedom, except for themselves.

### **The Free Press**

"Attempts to restrict broadcasting's news freedoms and to separate us from the rest of the press continue unabated. That is not surprising. The battle between broadcasters and those who want to restrict our freedoms will go on forever. Government pressures are now, and always have been, a principal concern. As many have observed, the historical relationship between the government and the press has been an adversary one. The government will often be

offended by free reporting. No President, from George Washington to John Kennedy and Lyndon Johnson, has ever been satisfied with news coverage of his administration. Certainly there is something to be said for their points of view because free reporting will occasionally venal.

"Nevertheless, a free press, with all its weaknesses, is not only the best alternative available for thoughtful men who believe in democracy, it is the only alternative.

"There is a free press issue involved in our effort to secure fair and equitable license renewal legislation. Some journalists and commentators have been saying that the administration has offered broadcasters a deal: license renewal in return for a curtailment of criticism and for insuring the flow of friendly propaganda. It is claimed that the Administration bill would require broadcasters to toe the line in return for administration support."

### **License Renewal**

"Now let me correct the record, if I may. More than 18 months ago this Association, at the urgent request of the entire broadcasting industry, established license renewal legislation as its number one priority. Month after month your NAB staff has worked long hours in preparing for license renewal legislation. There have been no 40-hour work weeks for a long time. More broadcasters have supported this cause than any other in my experience. As a result, well before the Administration bill was introduced, there were 80 license renewal bills in the hopper, with more than 200 members of the Congress having introduced one or more bills. Hearings on the bill had already been announced. In other words, neither broadcasters, nor this Association, were sitting on the sidelines in breathless anticipation of an Administration bill.

"While we welcome the Administration's support, the truth is that its bill has confused the issue of license renewal, albeit unintentionally. Mr. Whitehead's Indianapolis speech was controversial, and the

timing of the bill's introduction was unfortunate, even though the bill itself is a good one.

"But there was no deal. No such deal has been offered, no such deal has been accepted and no such deal would ever be accepted. I don't think any member of this Association seriously believes that I or any of our Board of Directors would sell our free press birthright for a mess of protection pottage. That is sheer poppycock. If Dr. Parker and others who have claimed that really believe it, then I think their cynicism has impaired their judgment. Freedom to program your station's news and public affairs as you see fit, free of government interference, is a principle that I shall fight for so long as I am President of this Association. No other cause is as precious or as important to me.

"Now let us put this subject in perspective. We welcome the Administration's support of five-year licenses and renewal stability. We welcome Chairman Dean Burch's support of the same and his thoughtful suggestion for remedial legislation. We welcome Congressman Rooney and Congressman Broyhill's collaboration on a bill, H. R. 3854, co-sponsored by some 70 of their colleagues, a bill we supported in our testimony two weeks ago. We are grateful to Congressman Jim Collins and his colleagues, both Republicans and Democrats, who have lent their names to still another approach to license renewal.

"Each of these approaches has merit, and I have great faith in the ability of Chairman Macdonald and his Subcommittee on Communications and Power to blend these bills into a piece of legislation that is fair both to the public and to the broadcasters.

"We regret that Mr. Whitehead's Indianapolis remarks left the impression that a license renewal bill might restrict the freedom of the broadcast press when, in fact, it will increase it. Such legislation will establish clearer standards for renewal hearings. It will provide that licenses cannot be lifted unless law or FCC rules have been disregarded.

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"We have rolled this heavy stone halfway up the hill. Let's not let it roll to the bottom now. Let us meet the wild charges with reason, rhetoric with facts, and emotion with calm. Let's also realize that while we have made a promising beginning we have a long way to go before this legislation becomes the law of the land. Let's not flag or fall for lack of persistence and enthusiasm. You have done a great job so far. You have done the most effective job I have ever seen in all of my years watching broadcasting activities in Washington. Let's stay with it. Let's win it."

### **Radio Code Board Acts On Sex Programs**

The Radio Code Board of the National Association of Broadcasters, responding to an apparent increase in sex-oriented talk shows, has directed the Code Authority to monitor such programs as well as questionable lyrics.

It said the monitoring should be extensive and comprehensive and should cover all member stations who may possibly be broadcasting such shows.

The Board also adopted unanimously comprehensive rules to govern the radio advertising of non-prescription home remedies. The rules are similar to those adopted by the Television Code Review Board last month.

Both actions were taken at a meeting Sunday, the day before the formal opening of NAB's 51st annual convention at the Shoreham and Sheraton Park Hotels.

The first resolution on talk shows directed NAB's Code Authority to "increase its monitoring to cover sex-oriented talk programs and questionable lyrics to help determine the extent to which member stations are carrying such material and to help determine the status of such material under Radio Code standards." The action was a further implementation of the resolution passed last November which stated that:

"The Radio Code Board is aware of the concern about increased candor on some radio talk shows that feature discussion of sex matters, and calls on Code sub-

scribing stations to be alert to their individual responsibilities on this issue. The Radio Code Board further recommends that broadcasters take into account the sensitivities of the communities they serve in determining when and how to air such programs. Further, the Board cautions that such programs be responsibly handled so as to avoid sensationalism or advice which goes counter to generally accepted medical opinion."

### **Sen. Baker's Challenge**

Meanwhile, Sen. Howard Baker told NAB attendees that while he supports the industry, he intends to challenge it. We really need that, because we don't have enough challenges. However, let's look at how he summed up.

"To me, your recent voluntary efforts regarding commercial practices on children's television programming, and over-the-counter drugs illustrates your dedication and determination to take charge of your own destinies.

"Significantly, I have refrained from endorsing your efforts categorically and absolutely because in these areas, as well as many others, there will always be room for improvement. This is inherent in the dynamic nature of the medium and our imperfect knowledge as to the role it has in shaping our values and life style.

"If you continue to be imaginative and responsive in seeking these improvements, you will do more to advance the public interest, and your own interests, than anything your defenders in Congress or elsewhere could hope to do. If you accomplish this, the remaining task for those of us in government will be infinitely easier. We will be able to give you the stability necessary to go about your business which, of course, is giving the American people the finest system of broadcasting in the world."

### **Protection For Newsmen**

Senator Sam J. Ervin, Jr. (D.-N.C.) told the National Association of Broadcasters that he hopes legislation protecting news-

men will be passed by Congress.

Sen. Ervin is the author of a bill which would shield newsmen from revealing confidential sources or being required to hand over unpublished notes to the Government.

"We call them the newsmen's privileges but they're really the privilege of the public, in order that the public might know what is going on in this country," the Senator said.

Addressing broadcasters during a luncheon speech at the NAB's 51st annual convention, Senator Ervin said that many bills protecting newsmen have been offered in



Vince Wasilewski... "While we welcome the Administration's support, the truth is that its bill has confused the issue of license renewal, albeit unintentionally.

Congress.

"I hope we will be able to agree on a bill which will protect the newsmen against the abuses now being so often inflicted upon him," he added.

The Senator was introduced at the luncheon by NAB President Vincent T. Wasilewski as a legislator "renowned in the halls of Congress and across the nation as a leading Constitutional authority."

Senator Ervin said the First Amendment was passed by the Founding Fathers "because they knew the institutions of Government which the Constitution created would not function effectively without a free flow of information which would enable the



American people to know what's going on in their country."

"The only thing that keeps the American Government honest and efficient is the freedom of the press," he continued.

### **Armed Forces Radio**

Armed Forces Radio was cited by the National Association of Broadcasters for "thirty years of outstanding service to members of the United States Armed Forces throughout the world."

The citation was presented at the management radio conference of NAB's 51st annual convention by NAB Radio Board Chairman Andrew M. Ockershausen, the Evening Star Broadcasting Co., Washington, D.C.

Accepting for Armed Forces Radio was Col. Robert Cranston, Commander, American Forces Radio, Los Angeles, Calif.

### **Lower ASCAP Fees**

Radio broadcasters were told that court action by the All-Industry Music Licensing Committee was successful in reducing license fees paid to ASCAP by radio stations.

But they also were told that BMI is making a "seemingly unwarranted demand" for further fee increases when its contracts are renewed in the coming year.

The report was made by Harold Krelstein of the Plough Broadcasting Co., Memphis, Tenn., a committee member, during a management radio assembly at the 51st annual convention of the National Association of Broadcasters.

Pointing out that BMI fees have increased from \$5,000,000 in 1963 to \$15,500,000 in 1972, Krelstein stated that there has been no increase in the use of BMI music in that time. In fact, he said, one of the largest publishers, Jobette, formerly was BMI's most successful publisher but transferred to ASCAP in 1972. He said ASCAP rates have been reducing consistently over the years. However, BMI has taken a hard line, stating that it would not forego any increase in fees while current licenses are in effect.

Negotiations with BMI will continue during the coming months.

The All-Industry Music License Committee includes, in addition to Krelstein: Chairman Elliott M. Sanger, WQXR, New York, N.Y.; Vice Chairman George W. Armstrong, Storz Broadcasting, Omaha, Neb.; Vice Chairman Bob A. Church, Storer Broadcasting, Miami Beach, Fla.; Treasurer Roger B. Read, Taft Broadcasting, Cincinnati, O.; Secretary J. Allen Jensen, KID, Idaho Falls, Ida.; Richard C. Percival, Cowles Communications, New York, N.Y.; Robert L. Pratt, KGCF, Coffeyville, Kansas.; Joseph B. Somerset, Capital Cities Broadcasting, New York, N.Y.; James A. Stabile, Metromedia, New York, N.Y.; and Donald A. Thurston, WMNB, North Adams, Mass.

Sex talk programs, advertising of non-prescription medications, pay television, copyright legislation, counter-advertising and freedom of speech were top agenda issues.

Members of the executive committee of the National Association of Broadcasters outlined what action is being taken to alleviate some of the industry's most pressing issues.

Moderating the discussion at NAB's 51st annual convention was NAB Joint Board Chairman Richard W. Chapin, Stuart Enterprises, Lincoln, Neb.

Other committee members participating were Wendell Mayes, Jr., KNOW, Austin, Tex.; Robert F. Wright, WTOK-TV, Meridian, Miss.; Peter Storer, Storer Broadcasting, Miami Beach, Fla.; Andrew M. Ockershausen, Evening Star Broadcasting, Washington; Willard E. Walbridge, Capital Cities, Houston, Tex., and Richard Jencks, CBS, Washington.

Chapin urged the broadcasters to attend license renewal hearings being held by the House Subcommittee on Communications and Power. He also asked them to meet with their Congressmen and stress that there must be stability in the renewal process and a five-year term.

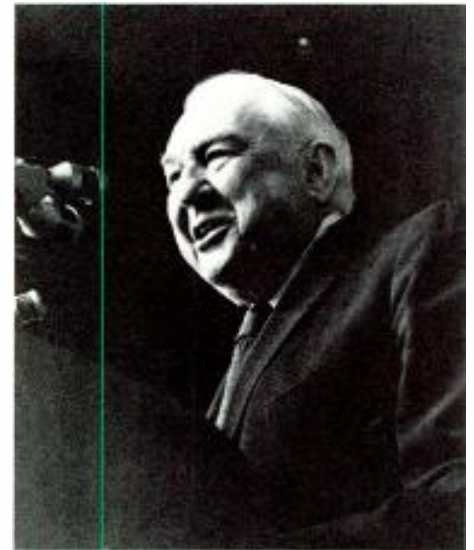
Mayes noted there recently has been a noticeable upsurge of Congressional interest in the advertising of non-prescription medications, particularly broadcast advertising.

Once again, he said, broadcasters will have to prove a negative—that drug abuse is not caused by broadcast advertising.

"There will be strong pressures exerted to reduce or ban proprietary remedy advertising. Radio and television are both under attack."

He advised broadcasters to adhere to the NAB Code rules on advertising of non-prescription medications.

He also advised them to watch their state legislatures, pointing out that some are proposing "resolutions" or "memorials" to Congress



Senator Sam Ervin... "...giving the American people the finest system of broadcasting in the world."

advocating restriction on proprietary medicine advertising.

Wright said that direct public payments to the producers of television programming and the owners of sports rights, through cable television and cable pay television, "will inevitably produce more money for those entrepreneurs than can be generated by the free, advertiser-supported system of broadcasting."

He said this is not in the public interest, and that "a privileged minority in this country have the clear economic capacity, through cable pay television, to divert the best in entertainment and sports programming from free television leaving the majority of U.S. homes with degraded and deteriorated

television service.”

He said there is no issue before the FCC which more urgently requires its attention and effective regulation than that of program siphoning which becomes more and more realistic with each passing day as additional homes are wired into the cable system.

Jencks said copyright lawyers for cable systems had won some court decisions and felt they had the upper hand.

However, he said, when the CBS-Teleprompter suit was appealed by CBS, the court ruled that cable systems must pay full copyright liability for the importation of distant signals.

He also said the copyright lawyers agreed to pay royalty fees or submit to arbitration but their cooperation in these areas was less than impressive.

The result of the CBS-Teleprompter decision may cause them to change their position on cooperating.

However, he cautioned the broadcasters not to rest on the success of this decision and urged them to make themselves heard in the upcoming copyright hearings in Congress.

Storer attacked the FTC proposal to require counter-advertising on radio and television and said it would “destroy the economic

foundation of an industry which is completely dependent on advertising revenue.”

The alternative to a free broadcasting system, he said, is government support or subsidy.

These threats to broadcasting will never end, Mr. Storer said, because radio and television “are so persuasive and pervasive they will always be under attack.”

Storer said NAB will continue to oppose counter-advertising and other threats to free broadcasting and said the Association has urged the FCC to reject the counter-advertising scheme as soon as possible.

Ockershausen said there is no doubt that many people are alarmed about on-air obscenity and that it has become a highly visible issue.

He said the FCC apparently is seeking a test case to determine how far its authority extends in this area. The Commission, he said, apparently intends to hold a formal inquiry to determine whether broadcasters are violating the laws on obscenity, profanity and indecency.

“Ultimately,” he said, “it is a matter of the individual broadcaster living up to his responsibility to his community and that a few broadcasters may not be exercising proper judgment.”

Ockershausen said the whole subject of sex and violence is very much in the forefront in Washington and that if broadcasters do not do something about it, government will.

Walbridge said it is an ironic sign of our times that Congress is being asked to make a law that would re-establish freedom of the press.

Press freedoms, he said, have been eroded over a decade or more and the problem “goes far deeper than any administration, any courts, any Congress, past or present.”

He said there are two ways to re-establish press freedoms: the legislative route and taking the problem to the people.

Walbridge said nine bills are being considered in the Senate and 51 in the House. NAB has testified and there are sympathetic friends in Congress. He said this is a complex process and asked broadcasters for their help.

He also said broadcasters should take their case to the people and remind them that “each generation is the guardian of the liberties of the next, that eternal vigilance is the price of liberty, and that as we defend our own freedoms, we are in truth defending their own individual liberties in our democracy.”

Even the FCC had a booth. Located in the main convention hotel, the FCC fielded questions from broadcasters who were either forging their way to another session or returning for another shot at the troublesome elevator system.



# Minithings from Editel.



The Mark III makes light work of weekly NHL hockey broadcasts.

## The Editel MARK III Camera

"When you want something improved, improve it yourself." Editel, seeing in their own daily experience the need for a reliable hand-held color television camera, did just that.

"We looked at it from a film camera standpoint. We simplified, condensed, miniaturized — shrinking everything but quality." Result: the Editel MARK III. And never-before mobility for cameramen.

MARK III goes unobtrusively into crowds (e.g. the Munich Olympics, major Golf Tournaments and Football Games), and provides unlimited commercial use through flexibility in lens selection. Its rugged, dependable, proven performance (tested in the field for over one year) ranks with that of any conventional heavy studio camera.

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22' long, complete for travelling shots, sound recording & playback.

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Innovation breeds innovation. Editel went on to develop a complete mobile production unit in mini size. The 8' x 22' x 8' MINI-MOBILE operates at high speed, carrying a production crew wherever the action is, with the camera being powered en route.

**EQUIPMENT:** 1 Editel MARK III color camera (operating on batteries, generator or 110V power); camera control unit; VR3000 Ampex tape machine; color playback; 8 in. 1 out. audio console (6 mike, 2 lines in, 1 line out); 1/4" Nagra audio tape machine; color monitors, vector-scope; audio and video jack fields, audio monitor and amplifier; 10 x 1 switcher for picture matching, 10 x 2 switcher (effects generator) at production desk. lighting and gripp equipment; 1000' camera cable; camera platforms on front, side, rear and roof; storage; dressing room, 2 air conditioners.

Equipped for a 2nd camera, a 2nd VR3000, phone lines; video lines in and out, 3 intercom outputs with program interrupt; facility for attachment to any larger multi-camera mobile.



editel  
minithings ahead

cast reception initially was poor.

"More recently, wire distribution has spread as an economical way of giving good color television reception in tall blocks of apartments, and their immediate neighborhoods. In addition, some local authorities have banned aerials from the roof-tops of the houses they build, and as an alternative they provide wire distribution, and charge for it in the rent of the home.

### **Introducing Ceefax**

"We have also developed, and will be bringing into experimental use later this year, a method of broadcasting information within the television waveform, which can be stored in an add-on unit in the home, and reproduced on the television screen whenever the viewer wants it. We call it Ceefax. It will provide up to 32 "pages" of information, in alpha-numeric form, on the television screen. I haven't any doubt at all that - if only as a friendly gesture to North American visitors - one of these pages will be devoted to telling us the time, temperature, air-pressure and so on; but the other 31 will provide news and information of any kind that can be presented on the television screen, in the form of words and numbers.

"The system could be interconnected with the telephone or cable service - so that the viewer might dial up any additional information that these companies were willing to provide. Ceefax will enable us to provide the kind of information - and much more of it - that can at present only be provided by cable television, because of the scarcity of broadcast channels. And because it can go out on existing transmitters, at the same time as, and without interfering with, the normal programs, it can be made available over-night to over 90 percent of the population of the United Kingdom.

"Ceefax is only the latest runner from a stable which has produced all-electronic standards converters, sound-in-syncs and PCM stereo sound. It takes us another stage along the road of digital techniques in television, made possible by the

great invention of the transistor and its derivations. But there is much that still has to be done and can be done. It will very soon be possible for most television pictures to be recorded, edited and processed in digital form with all the high quality and ruggedness that goes with digits.

"Possibly we shall have to wait for further developments in American space technology before we can exploit digits to the full. This might lead to television broadcasting by satellite directly into people's homes. With that sort of development in mind (and others nearer the ground), we are working on digital transmission systems. They use up more bandwidth than is required by analog systems, but they have many advantages; and "bit-saving" techniques may reduce the required bandwidth to manageable proportions. The result might even be a combining of the three color systems: NTSC; SECAM and PAL into one world standard using a luminance and a color-difference signal - but that is probably well into the next 50 years.

"Whatever happens, and whether he lives in town or country, he is going to have many options open to him. Broadcasting in the next 50 years is going to move as fast and as far again as it has done in the last 50."

### **Cartridge Problems In Stereo Systems**

James E. Lundquist, senior project engineer of Broadcast Electronics, Inc., Silver Spring, Md., told a session of broadcast engineers that "everything you ever had trouble with in monaural goes double for stereo cartridges."

Lundquist praised the rapid improvement in cartridges, pointing out that they now are in use worldwide, but emphasizing the many and intricate problems involved in their use.

"Even the smallest broadcast facility is not considered complete without at least three cartridge tape players and three or four hundred cartridges," he said. "The cartridges are simple to use and permit a versatility of programming that would be difficult to duplicate by



A. James Ebel... "and now 44 years later, I am even more proud to be a member of this great industry."

any other means."

However, he pointed out that as the cartridge comes into use in more and more diversified applications it is inevitable that some shortcomings of the system become increasingly more important. Primary among these shortcomings, he said, is what is termed the "stereo phase problem."

Stereo broadcasting, he said, essentially involves the use of two identical amplifiers that drive two identical speakers - and the time relationship between the two channels must be maintained at all times for all frequencies.

There's always a possibility of error, he said, because of the twisting of the tape when it crosses the headgap. An azimuth error of only one percent in phase reversal can result in a complete loss of signal at 1600 Hz. This would reoccur at all multiples of 1600.

He said that current tape guides on cartridges, while perfectly acceptable for monaural broadcast, do not have the precision required to eliminate the "phase problem" in stereo operation.

"There is considerable uncertainty about the effectiveness of the guides to steer the tape," Lundquist said. "The subjective position of various parts of the signal will be found to move about unpredictably. The more serious listeners in your

audience will definitely not care for this effect. When listening with stereo headphones it can be particularly disturbing."

He said reel-to-reel tape recorders apparently are not susceptible to the same type of inconsistency as cartridges. Because of inherent design factors, he said, tape guidance is simpler since tape guides are 6 inches apart, compared to 1.85 inches in a cartridge, thus reducing skew error by more than a third. In some of the larger professional recorders, he said, guides are as much as 8 and 10 inches apart, further reducing skew error.

Many possible modifications of the stereo cartridge have been attempted in recent years in an effort to improve performance. Two systems have adjustable corner posts in the cartridges so the user may adjust the tape entry height. Another has provided a precision corner post and a fourth has arranged the cartridge tape path to assume its operating height as far from the heads as possible.

Lundquist said a Broadcast Engineering testing program of a new head bracket design has shown "interesting results, while verifying the extreme difficulty of controlling the phase repeat ability."

He said broadcasters should "forget stereo" unless they are prepared "to have your people make some extra effort to maintain a high level of performance, and purchase the cartridges and equipment to do the job."

"For use with stereo (and possibly for future four track), the present cartridge system has proved to have shortcomings which impair program quality," he said. "The basic system needs some improvements before it can attain the level of reliability that has been enjoyed in the monaural systems.

"If changes are to be effected in an expeditious manner, the broadcaster, through the NAB Standards Committee, should insist upon active reconsideration of the standards with particular emphasis on stereo performance."

### **Engineering Award**

The annual Engineering award (as reported earlier in **Broadcast Engineering**) was given to A. James Ebel of KOLN in Lincoln, Nebraska.

But you didn't have to be an engineer to understand that Ebel loves his industry and is humble in his acceptance of the NAB's highest engineering award. Matter of fact, it will, however, cause some raised eyebrows when it becomes more generally known that Ebel is currently as much involved in management as in engineering. Not from the point of this qualifications, but from the point that some people are saying these days that engineering is strictly soldering iron oriented.

So it is then, that you will find his comments — taken from his acceptance address at the NAB convention — balanced between engineering and management.

"Sometimes we really don't appreciate how far we have come in this business. It is hard for me to realize that the first station I worked for as a radio operator was not crystal controlled. The transmitter had a Heising modulated Hartley Oscillator feeding a "T" antenna — and the size of the 250-Watt transmitter was almost the same size as the 50 kilowatt transmitters on display at this convention.

"The fantastic development over the years in broadcasting — including the refinement of AM, the development and introduction of FM, and the development and introduction of television with the later addition of color — were all the result of the ingenuity of engineers such as you, financed by a free, locally-owned, advertiser-supported, system of broadcasting.....The American System.

"Having an opportunity to rub elbows with broadcasters from other countries makes one realize how important the American system of broadcasting really is. It is hard to realize that we are practically the only country in the world with a truly free system of broadcasting. True, attacks have been made from time to time on the freedom of our system, but I am

confident that with engineers such as you, and responsible broadcasters such as those attending this convention, our system will remain free in the face of the attacks on it.

"With freedom comes responsibility, and each of us, engineers and management alike, must dedicate ourselves to providing the very best of service to our audiences — the very best of entertainment, suitable for reception by family groups — the very best of news with all the important facts and with balanced interpretations — and the very best of assistance to service organizations whether they be private, community, religious or governmental.

"The greatest opportunity one has in the world is an opportunity to serve. And audience research proves that we in broadcasting have the greatest opportunity of all communications media to serve. I was proud to be a broadcaster when I received my first broadcast limited license...and now 44 years later, I am even more proud to be a member of this great industry."

### **Correcting Color Distortion**

Recent advances in signal "timing" that can eliminate distortions and produce more true-to-life color television pictures were discussed by Leon J. Stanger, design engineer with the Gates Division of the Harris Intertype Corp., Quincy, Ill.

You'll recall that Gates has recently moved further into the television market by purchasing the GE TV camera line. Earlier it had established itself in the TV transmitter market.

He dealt primarily with the phenomenon known as "group delay" — a type of distortion in TV transmissions that occurs when one signal passes through the system in more or less "time" than another.

The "delay" can be either linear or non-linear, distorting the transmitted signal and the TV picture in different ways. Low-frequency, non-linear group delay has a significant effect on the luminance or brightness of the TV picture. High-frequency, linear errors primarily

affect the picture's chrominance or color content.

Stanger described methods of using IF, or intermediate frequency, to equalize these video discrepancies.

"It is very important," he said, "to equalize the low video frequencies accurately. Ghosting and loss of detail are evident if not equalized properly.

"IF (intermediate frequency) group delay compensation is the best method known to minimize low frequency delay errors. It may distinguish between the upper and lower sideband and apply the necessary correction to each."

### **Quadraphonic Standardization**

Arthur K. Peters, a consulting engineer from Mt. Vernon, Ill., urged broadcast engineers to "push to get standardization" in quadraphonic FM broadcasting techniques.

"Most of us have read in the industry journals that quadraphonic is here," Peters said. However, he maintained that from a broadcaster's viewpoint "the whole scene is ridiculous."

"Two basic quadraphonic schemes are being proposed," he said. "One is termed discrete and the other is termed matrix. There is a third which is a combination of discrete and matrix."

The matrix system synthesizes

two channels from four channels through a matrixing technique. The sum of the two synthesized channels, he said, yields a fairly good monophonic system. In addition, he said, individually the two synthesized channels display characteristics similar to the left and right channels in the stereo system.

"In other words," Peters said, "the matrix system of quadraphonic transmission is compatible with existing mono and stereo standards. Baseband requirements are also compatible."

He also pointed out that adaptation to such a system would require minimal expenditure to adapt a current stereo system in good condition to quadraphonic broadcast.

Peters said there is some "bad news." "At present," he said, "there are nearly as many systems of matrix quadraphonic as there are recording manufacturers. Each claims his own to be superior. In the meantime, the broadcaster and consumer are sitting back watching with interest and awaiting settlement of the fight.

"Unfortunately, of the half-dozen or so predominant matrix systems, none are compatible with each other. A broadcaster would be taking an unnecessary risk to invest in any quadraphonic equipment utilizing any one or two of the matrix schemes being touted today."

### **Positive Peak Modulation**

Ronald A. Graiff, ABC's allocations and RF systems engineer, reported that a radio broadcaster who tries to get too much out of his equipment is much like a motorist who always drives at the maximum speed limit on a super highway.

He told the Broadcast Engineering Conference that limits set by the government on AM modulation last year have had the effect of encouraging broadcasters to hit the permissible peak whether they or their equipment are capable of such a performance.

"A motorist on a super highway with a posted speed limit of 70 miles per hour will tend to push to that limit," he said. "...If no limit was posted, he would probably drive at a comfortable speed."

The same, he said, is true of the broadcaster who "wants to push to the 125 percent positive peak limit" set by the Federal Communications Commission.

He said early radio engineers were concerned only that the transmitter modulated its signal and sounded good. There was little if any concern with high peak modulation or consistently high average to peak ratios.

"But as competition increased for radio audiences," he said, "it was realized that the higher the modulation averages, the more likely the audience was to hear the station in weak signal areas, in cars, or on transistor radios. As a result, averages and peaks of modulation went up."

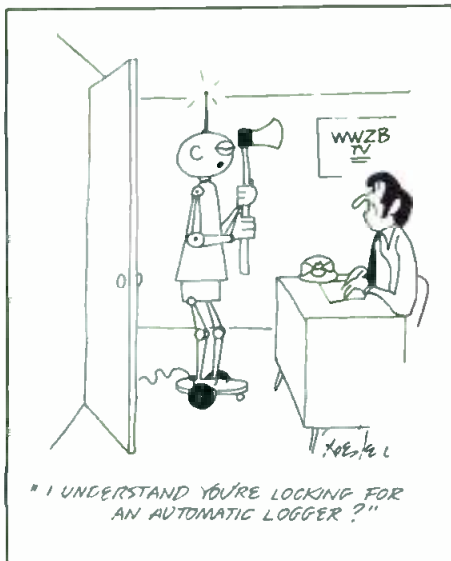
With audio peaks exceeding normal, he said, the ability of the transmitter to pass the signal was curtailed, distorting the audio signal. Additionally, as asymmetric waveform was produced and, since a zero average value could not always be achieved, a carrier shift was produced.

He said ABC uses two devices—an average level controller or AGC, and a limiter—to eliminate these anomalies.

The AGC controls the gain of the amplifier charge almost at an audio rate so the program tends to become leveled in an average range of 7dB. Since the AGC won't catch peaks of program or level changes



You might have saved your arches and your legs, but even in the exhibit areas the engineer's exchange was worth the effort.



that are beyond its dynamic range, the limiter is used to minimize such changes.

One important feature of the limiter is its ability to see a highly negative asymmetric peak and flip it over, with the effect that high negative peak (i.e., male voices) are inverted so that they go positive, thus increasing the average value of the transmitted audio.

### TV Program Control, Log

A computer tape which not only controls all broadcasts but also produces a complete station log was described by Robert J. Torpey, chief systems engineer of the Richmond Hill Laboratories of Toronto, Canada.

Torpey said the automated units, installed in the CBC stations in Edmonton and Toronto, use a digital cassette tape machine able to employ common cassette tapes.

The computer's memory bank, he said, permits entries of a complete day's events in one loading session, giving the operator access to 500 items scheduled to go on the air. Once entered, he said, the future events remain flexible, permitting the operator to edit, add to or change them.

"The cassette tape also allows the easy addition of a logging function to the automation system," Torpey said.

"The machine is a dual unit which consists of two tape transport systems sharing electronics. The sequence is such that the prepared tape is read from the transport on the left into the computer memory

...At the end of the day's programming, the tape on the right is used as a log of events as they occurred in the day with exact program times, alterations, changes as they occurred."

He said the tapes are interchangeable with a similar dual unit in the traffic department, thus permitting "a hard copy printout of the log and the program schedule by a small inexpensive line printer."

### Control System

A digital one-line machine control system that permits a technical director at a remote control panel to operate a number of film islands and video tape recorders on one communication channel was described at the Broadcast Engineering Conference.

Al Busch, director of engineering for Sarkes Tarzian, Inc., Bloomington, Ill., said the system, called DIGIPLEX, is capable of extremely rapid installation and almost eliminates the need for control room to

machine room intercommunication.

Busch said it is entirely possible that "a single man could load and assign machines, walk to a control point, operate for a while, stroll to another control point for another stint of operating, wander back to the machine room to change tapes or film, and then go back to the control room."

Also possible, he said, is the looping of a common control line through a computer so that machines would be automatically operated in accordance with a pre-established program.

Busch gave his audience an illustrated tour of WETA in Washington to demonstrate the system's simplicity. WETA has facilities for eight VTR's and five film islands to be controlled from any of four control positions via four communication lines.

### Five Radio Sites For Norfolk

Two radio stations in north-  
(Continued on page 50)

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B-910 exciter \$1995.00

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# transmitter

# Lighting your local news program

By William Schelling\*

There are a few basic concepts that must be discussed before actual lighting begins. These are facts that should be known ahead of any actual light plot and final hang and focus.

A meeting must be held with the director producer about the set and how many people the set must accommodate. You must consider where your newscaster is to be seated and his basic camera angles, and if he is to move and be seen on camera, and what he is going to do at this new position. Also, whether

\*CBS Television Network, New York.

it's to point to a map painted on the set or to go to an easel.

At these new locations you must make the director adhere to a basic camera shot so that you can light your man, and the art work on the easel or map cleanly, but we will discuss this later. You must also find out if there are other permanent people in the set, such as a sportscaster, or woman's editor or theatre critic. These people must be given permanent spots so that they can be lighted cleanly and given the artistic lighting they deserve and/or the needed help from lighting to clear up a facial problem, such as a scar or too round a face or too

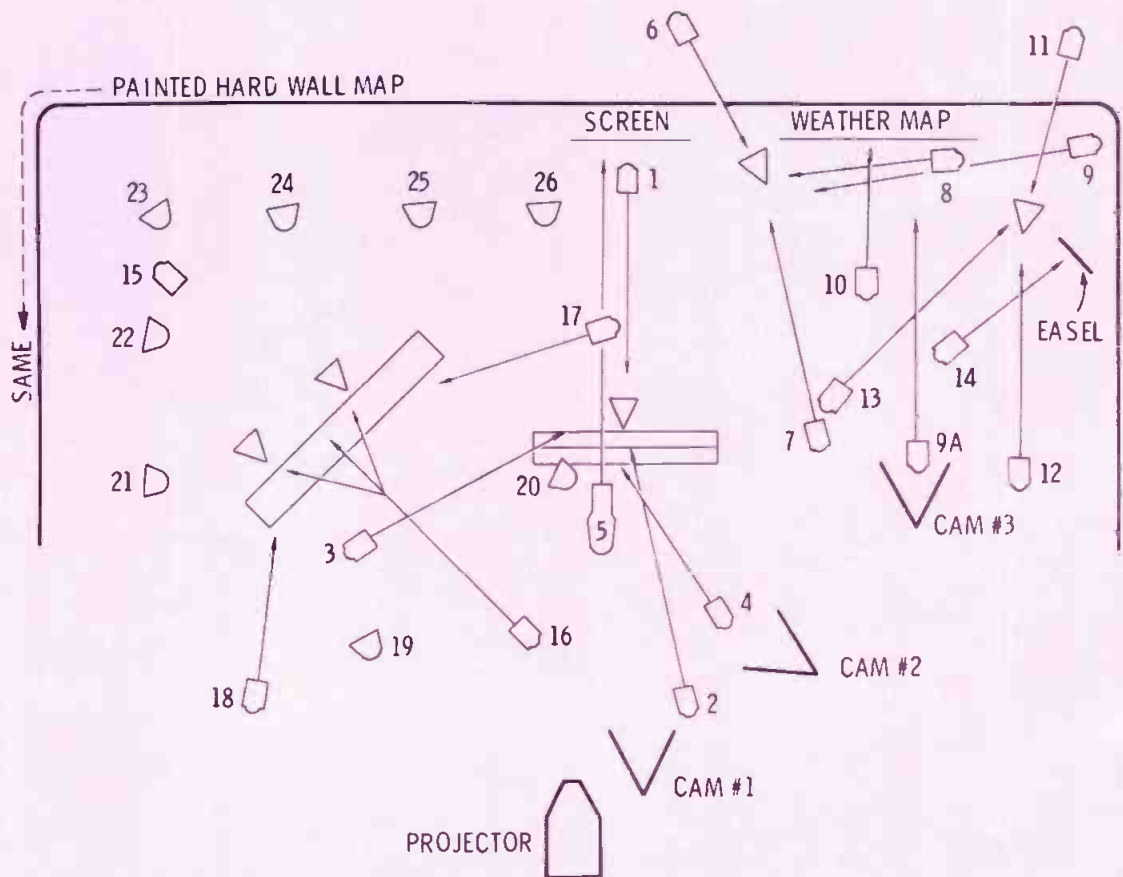
gaunt a face. These are the basic problems of a lighting director, and he must be able to remedy these situations.

## The Set Color

The next element that must be discussed is the color of the set. Be careful of beiges or light tans in color as they may become too close to skin tones. This causes the face, the most important aspect of your news set to blend into the background and that creates a problem of separation.

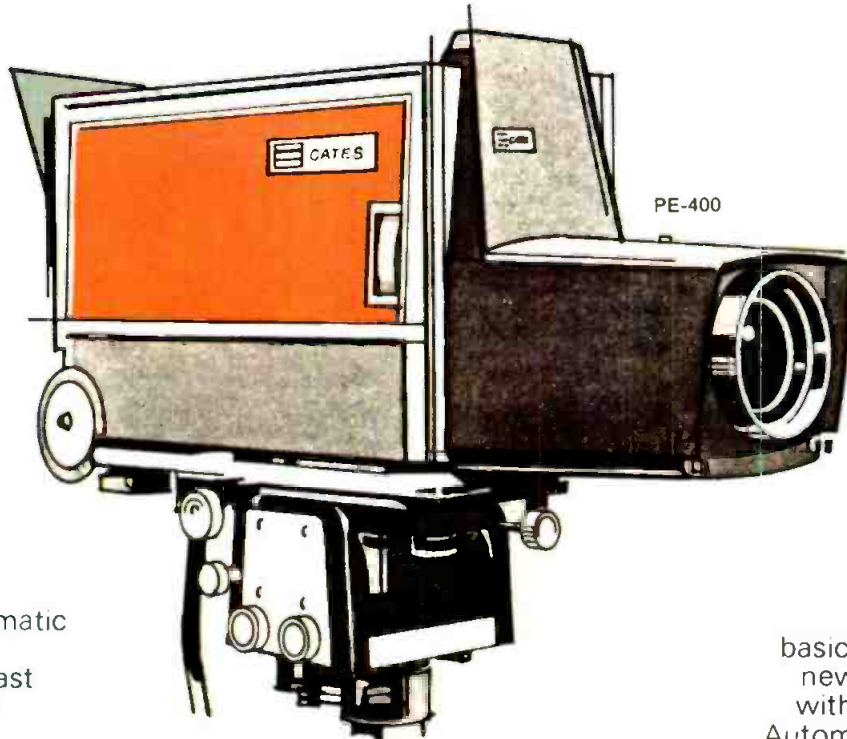
All colors have grey scale values, so all that has to be done is to take your grey scale chip chart and hold

Fig. 1 Hard-wall layout of news area. Note that all fresnels should have barn doors.



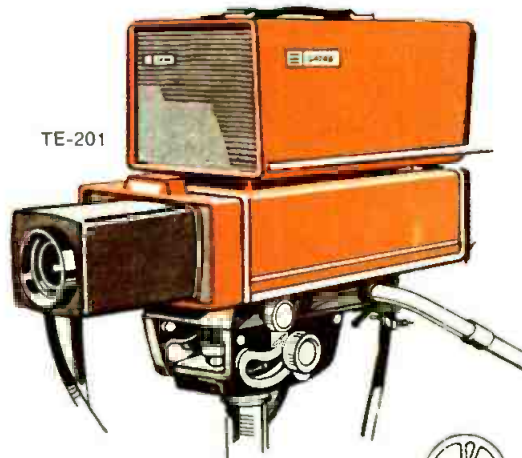


# Color TV cameras from Gates



*PE-400 live color TV camera.*  
 Outstanding color fidelity. Excellent pick-up tube life. Automatic contrast gain control reproduces high contrast areas. Simplified setup and registration.

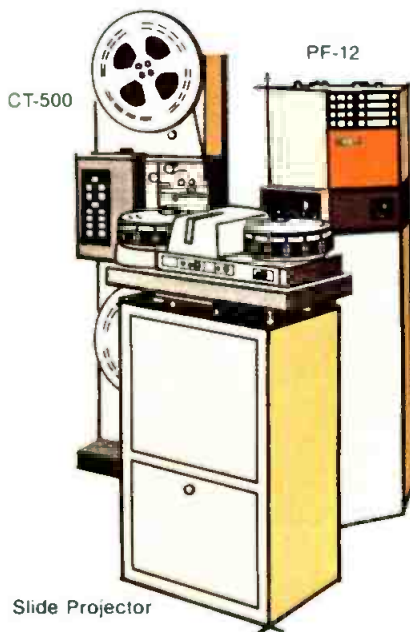
*TE-201 live color TV camera.*  
 Economical long-term operating stability and excellent color fidelity in an extremely versatile, lightweight (40 lb.) camera. Superior low-light-level lag performance. Operating controls located at camera control unit. Simple setup.



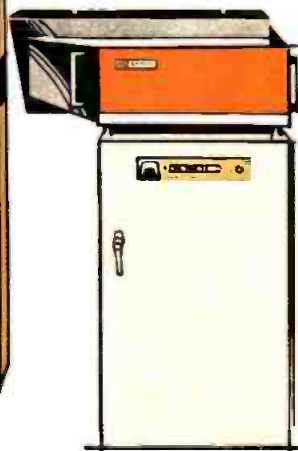
*PE-245 color TV film camera.*  
 Praised for excellent performance and reliability. Proven basic design enhanced by new solid-state preamps with S/N ratio of 50 db. Automatic contrast control compensates for film variations.

*TE-202 color TV film island.*  
 Integrated film island offering highly stable, reliable performance at low cost. Easy setup, hands-off operation.

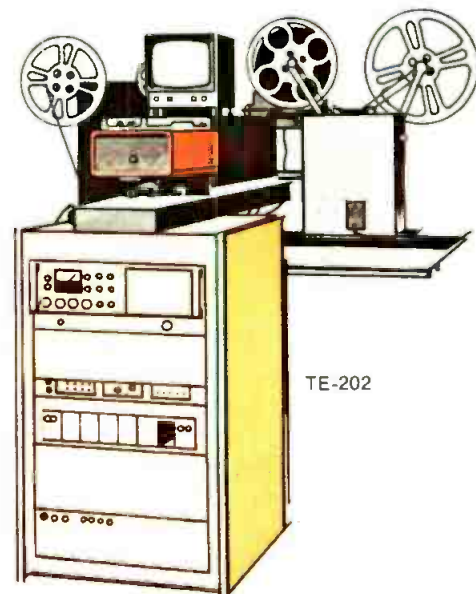
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 Quincy, Illinois 62301, U.S.A.



Slide Projector



PE-245



TE-202

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Ever notice how your paycheck sort of slips through your fingers before you get around to stashing a little away for the future?

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Everybody has trouble saving a buck these days. And, that's why there's a Payroll Savings Plan. Sign up where you work and an amount you specify will be set aside from each paycheck and used to buy U.S. Savings Bonds. Before you can get your hands on it. Before you can spend it.

It won't be too long before you have a nice nest egg built up, a bankroll that's really worth something.

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Now E Bonds pay 5½% interest when held to maturity of 5 years, 10 months (4% the first year). Bonds are replaced if lost, stolen, or destroyed. When needed they can be cashed at your bank. Interest is not subject to state or local income taxes, and federal tax may be deferred until redemption.



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Berkey Colortran's Ring-Focus Fresnels are a major improvement in Fresnel spotlights.

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**Relamping** Colortran's Ring-Focus Fresnels offer unique *rear lamping* so that gel frames and barndoors don't have to be reset. Focus adjustments remain unchanged.

**Socket** The new *floating diamond* four-point contact socket

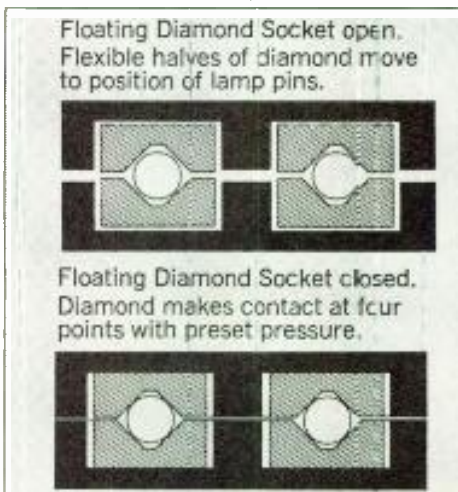
Ring-Focus Fresnel with rear lamping



(patented) doubles contact area and eliminates arcing and overheating. Pressure is constant and preset. Floating contacts are self aligning preventing lamp base, and seal failures.

**Cooling and lamp life** Improved cooling provides increased lamp life. New double wall construction, vented bottom housing, and a floating lens design permit cool air flow even in the critical 90° down position. Data from studios now using the Ring-Focus Fresnel indicate a lamp improvement in excess of 50%. Here's why:  
Focusing. Ring-Focus eliminates mechanical shock to the filament. Focusing the spotlight while hot is often the cause of premature lamp failure. With the Ring-Focus Fresnel, you move the lens — not the lamp.

Floating diamond four point contact socket



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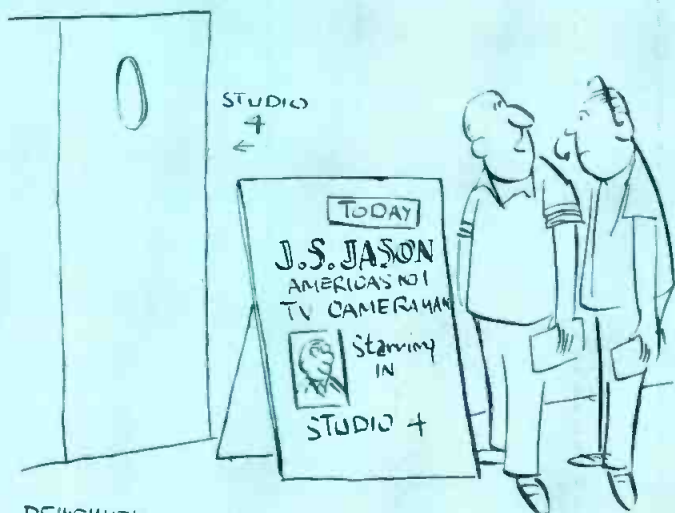
## LEGEND

DIM #	SET	USE	TYPE
1	News Desk	BL	Fresnel & B.D.
2	News Desk	K	Fresnel & B.D.
3	News Desk	CK	Fresnel & B.D.
4	News Desk	SL	Fresnel & B.D.
5	News Desk	SL	6" 2KW Elipsoidal
6	Weather Set	BL	Same Fresnel
7	Weather Set	K	Same Fresnel
8	Weather Set	CK	Same Fresnel
9-9A	"Walk"	CK	Same Fresnel
10	"Walk"	SL	Same Fresnel
11	Easel	BL	Same Fresnel
12	Easel	K	Same Fresnel
13	Easel	CK	Same Fresnel
14	Easel	SL	Same Fresnel
15	Theatre Critic & Guest	BL	Same Fresnel
16	Theatre Critic & Guest	K	Same Fresnel
17	Theatre Critic & Guest	R-CK	Same Fresnel
18	Theatre Critic & Guest	L-CK	Same Fresnel
19 & 20	Theatre Critic & Guest	B	18" scoop- scrimed
21-26	Set Map	S	18" scoop- scrimed
21-26	Are used in this situation as set lites, these are usually unscrimed		

Fresnel - usually 8" or 10" lens using 1' 5KW Quartz bulbs.

Elipsoidal "leko" 6" lens - shutters and color frame.

Scoop - 18" with scrim holder using PS 52 - 1500 IF bulb.



"HE'S A GOOD TV CAMERAMAN BUT AN AWFUL SHOW OFF."

it against a color and give it a grey value. There should be at least a 3-step separation between set and face.

The next problem to look for in your news set is that it isn't too highly polished or the materials used such as formica or a wood panel aren't too specular. If this happens, you will have hot spots and saturation in your picture, as well as color bounce.

Ever notice when people hold yellow paper it reflects in their face, or when a gal has colored jewelry it reflects into her face? This is a real no-no and can not be allowed to happen as it can ruin facial color that you try so hard to maintain. It also distracts the viewer terribly. This is why at some of the major networks, carpet is used in a dark color on desk tops that normally has a high absorbent factor, so light does not bounce back. This also prevents noise from pencils and markers being dropped or the commentator hitting his hand or ring against a hard surface. Indoor outdoor rubber backed carpet is excellent for this purpose.

### Talent-Set Separation

The next consideration is separation, that is the news people must be put at least 6 to 8 feet from the set. Lighting will help, but there is nothing like physical separation. This allows you to set light without spilling on to your commentator, and key light without putting shadows that can be seen on the set and are again very distracting. Also, it will allow you to hang your back lights at the proper angle (45 degrees). This also aids in the prevention of color bounce back on to your news commentators clothing from the set itself.

Camera line up and light temperatures are of the utmost concern to the lighting director. There have been many misconceptions about light temperatures (called Kelvin temperatures). All of us have heard that 3200 degrees Kelvin is a must and that you cannot vary from this. This is not true and has never been true. Normally, in television studios the chief engineer or the lighting director order 3200 degree K bulbs

for all luminaires, so, therefore everyone thought you had to line up at 3200 degrees K.

In most studios I have been in, there are dimmers and as you know when you begin to bring the dimmer down it lowers the Kelvin temperature, because the voltage is also being lowered which in turn lowers the temperature of the filament and more red is introduced. So after years of experience we have come to line up at 3000 degrees K to 3100 degrees K. This we've found is a good mean light temperature.

If you will an average light Kelvin temperature, if you are not sure about the accuracy of the camera line up box, line up in the set with all the lights on at their respective dimmer readings. This will insure the correct camera line up of Kelvin temperatures.

The summation of the above paragraphs comes down to one important factor and that is: **the tolerance of acceptable color temperatures that can be used on a face in a given scene using dimmer changes is 100 degrees K, either side of the 3000 degree K to 3100 degrees K camera lineup.** Any other Kelvin changes are a matter of taste, when it comes to set lights.

### **Lighting the Set**

We can now concentrate on lighting the set. You know all the pertinent facts about the set design and structure, color and materials used. Also camera placement, angles and moves. You should hold your light levels to approximately 225 F.C., 25 F.C. either side of this is acceptable, also comfortable for the commentator and his fellow newscasters.

Figure 1 is a typical news set and camera locations. I usually start with the back light (BL). These should be set at an angle of 45 degrees and at a reading of 175 F.C. If you have a dimmer board with enough dimmers, put this by itself at a setting of 8 points (using 0 off - 10 full) on the dimmer scale. This will allow you the latitude of bringing it up for a person with dark or dull hair, or, of course, down with light or thin hair.

I am sure you are saying at this

time well we only have one commentator and his hair is such a color. True, but we all know people use different hair and scalp soaps and hair dressings on their hair. This changes the color from day to day and you must be able to change your dimmer settings slightly

### **Key and Cross Keys**

The next group of lighting fixtures to be hung and focused are the Key (K) and cross keys (CK). Again fresnel type luminaires should be used. These are your modeling lights. These luminaires can, and do change the face drastically and must be hung with care.

You want your key light to model the good points of your commentator's face and not the bad ones, so you must take into consideration the bone structure and skin texture of his or her face. The key light is hung in a frontal position to the left or right of the newscaster. This is determined by you on his more complimentary side and then hung just low enough so as to enable the light beam to fill below the eye brow and throw a slight shadow to the left or right of his or her nose.

The height can only be determined after looking at your commentator's face. If it is flat and you do not have to worry about deep eye shadows, you can hang it at 45 degrees. This makes it more comfortable to work under. But now your angle left or right of the newscaster, no doubt, has to be wider because you must add contrast by going further to the left or right of camera. This will add shadow to the opposite side of the face in which light is hitting, changing the look of the face.

If the face is heavy and has jowls, the higher you hang and the further left or right you get and the closer to 45 degrees, the thinner the face becomes. When focusing, use the widest beam spread available to that fresnel and barn door the unwanted light.

### **Base Light**

Base light is the next group of fixtures to be hung. These are usually 18-inch scoops lamped with

low noise (I.F.) inside frost bulbs (this I.F. bulb is used instead of a clear to soften light, it will not lessen output). Then the fixture is scrimmed with spun glass to soften the light once again.

It is extremely important to use scrims and change the scrim every six months.

Base light is also called "fill light" and this is exactly what it does. It fills the dark shadowed areas of the set and puts a soft amount of light on the newscaster. It helps your overall contrast range in the black portions of the picture by reducing the blackness of the shadowed areas.

There may be instances in certain news sets where base light is not desirable. This is when an R.P. or front projection screen is used in conjunction with the commentator and the set. The base light here would wash out the slides or film, and you would lose contrast. Here is where your lighting level is really determined. If the projection on the screen is too low, the only thing left to do is bring down the overall light level. Your screen here determines light levels.

The last group of lights normally hung are the set lights (S.L.). Again, these are fresnels with barn doors. The door here is a very helpful instrument, it allows you to not only cut off light but to create lines and shadow or light where you see fit. The set light is nothing more or less than a fixture to illuminate scenery. It models the effects desired in a particular set and subdues the things less desired on the set. It highlights points of interest while subduing scenic elements that should be kept in the background. □

### **Management Highlights**

Ever wondered why your newscast compares poorly with your network news? As the writer shows, there are many little things that add up to a good color presentation. It's true, you can match that network color quality.

# Has the freeze really ended?

By Neil Smith\*

The "AM freeze" has ended! As of April 10, the FCC will once again accept applications, under a revised set of Rules, for new AM stations or for major changes in existing AM stations. For many prospective applicants, the years of helpless waiting are over...or are they?

The lifting of the freeze could affect every station, to one extent or another. In order to properly appreciate the intent of the new Rules and the impact they will have upon each individual station, it is necessary to review some recent and some not-so-recent history.

## Looking Back

The Federal Radio Commission was established back in 1927 for the express purpose of straightening out the mess in AM broadcasting, which, in those days, was the only kind of broadcasting in use. It was further understood that, once it had accomplished this mission, the FRC would cease to exist.

As we know, the FRC was transmuted into the FCC, and it wouldn't be far from the truth to infer that the continued existence of that body results, in part, from the continued existence of the mess in AM broadcasting. However, it would be incorrect to suggest that the FCC has not seriously attempted to solve this problem. The overall situation is much more complex than most of us realize,

\*Consultant with Smith and Powstenko, Embassy Square, Washington, D.C.

and these complexities cover far more than just the engineering facts.

"What to do with the AM band" has, in many ways, been the most perplexing and prolonged problem the FCC has had to face, and we in the industry have contributed mightily to both its complexity and its prolongation.

Established broadcasters fight against the idea of new competitors, while they seek relaxation of protection requirements so that they can improve their own facilities. Daytime broadcasters press for nighttime facilities and are opposed, as intruders, by unlimited-time broadcasters; yet both resent the stiff Rules that preclude improvement of their own coverages. "Outsiders" seek new channels on which to operate, but once they obtain them, they become "insiders" and fight against the next applicant. It's little wonder that many of the industry organizations have had little to say on the subject of the AM freeze.

## AM Allocations

From the beginning, the allocation of AM frequencies has been on a "demand" basis. If a frequency could be found on which no significant interference would be caused or received, the application would normally be granted. No consideration was given to other possible uses for that frequency in that area. Naturally, the demand for stations was heaviest in areas of high population density, and frequencies in such areas were rapidly used up.

By the early 1960's, the Commission was becoming more and

more concerned over the direction in which AM broadcasting was heading, and its concern was two-fold. In the first place, there remained vast areas of the country which were without primary nighttime service or adequate daytime service, while the applications being received continued to stress service to areas already well covered. Secondly, the AM allocation Rules required a tedious case-by-case weighing of gains and losses in service, and this procedure was becoming an increasing burden on the Commission's administrative processes.

During that same period, the Commission was converting the younger television and FM radio Rules from the old "demand" system to a "table of allocations" system, whereby channels would be distributed among communities through Rulemaking proceedings prior to the acceptance of applications for specific facilities. The Commission favored this approach, because it allowed them to hold channels for future use and to distribute the available channels more equitably among all communities, large and small. Furthermore, this method enabled them to greatly simplify their application processing procedures. In contrast, then, AM allocations seemed all the more archaic and difficult to handle.

## Early Freeze

In May of 1962, the Commission abruptly imposed a freeze on AM applications, and when the freeze was lifted in July of 1964, the industry found itself with a new set of AM Rules. Although standards of service and interference remained unchanged, "normally protected" service contours became absolutely protected, and service to unserved or underserved areas became an important factor in applications for new stations.

While these Rules severely limited the possibilities for new applications, they did not achieve

## Management Highlights

Neil Smith presents in this article the big picture of the freeze. If you don't happen to have a consultant to interpret the "lifting of the freeze", you'll be in good hands here with Smith's translation.

the hoped-for results. The flood of applications following that thaw involved improvements in existing stations, or new daytime stations, but did very little to provide the new nighttime services which the Commission sought. Quite logically, commercial broadcasters could find little to recommend their investing significant amounts of money to serve areas populated largely by jack rabbits and rattlesnakes.

Frustrated in its attempt to redirect the thrust of AM broadcasting and still swamped with applications, the Commission, in July, 1968, again imposed a freeze on AM applications. This was followed by a proposed set of Rules which were met with anguish by members of the industry. In general, these Rules would have permitted virtually no growth or improvement in AM broadcasting where service to unserved areas would not result.

Almost a hundred parties filed comments or reply comments in that proceeding, and the new Rules now adopted have, to some extent, reflected the more cogent of those opinions. These Rules are clearly a compromise between the ideals of the Commission, the wishes of most broadcasters, and the facts of life.

### **What the FCC Did Not Do**

What the Commission did is quite important, but what they **didn't do** is equally so and perhaps ought to be noted first. They did not change the values of "normally protected" contours. They did not change interference ratios. They did not change the "Go, no-go" principal. In fact, they left the entire AM allocations scheme essentially intact. One still calculates coverage and interference the same way as he did before the freeze, and the new Rules continue to prohibit interference being caused to any other authorized station.

What the new Rules do is to prescribe the situations in which an application will be accepted for



filing. Even where no interference would result from a proposal, the application will automatically bounce back if the applicant cannot meet certain other requirements.

As one might have guessed, the Number One requirement is service to unserved areas. If at least 25 percent of the new service area, or 25 percent of the population in that area, presently receives no other aural service (0.5 mv/m for AM or 1.0 mv/m for FM), the applicant in **in**. As long as he avoids causing or receiving interference, his application is good as gold.

Unfortunately, few applicants will be in such a position. Totally unserved area is hard to come by, particularly in the daytime. The Commission has, however, provided some alternatives, and it appears that it will be these other "loop-holes" which will prove to be the basis for the bulk of applications filed. (After all, applications proposing service to "white" areas could have been filed even during the freeze, and not many appeared.)

### **New Facilities**

For new facilities (or for full-time operation by a daytimer), the alternative criterion is to show that the existing service to the "community" (potential city-of-license) is "inadequate". Service is

considered inadequate, for this purpose, if at least 20 percent of the community receives less than two aural services, and, here, the minimum aural signal strength must be at least 5 mv/m for AM and 3.16 mv/m (70 dBu) for FM. Furthermore, AM or FM stations located farther than 50 miles from the community are not considered, nor are non-commercial services, and commonly owned AM/FM stations count as a single service. The only additional restriction attached to this approach is that no FM channel be available for use. If one is available, the applicant will be required to use it.

For improvement in facilities, the alternative to the "25 percent Rule" is to show that the applicant serves less than 80 percent of its community with a 5 mv/m signal. Provided that no objectionable interference would be created, such applications would be accepted automatically.

### **How To Encourage Growth**

The Commission's intent in all this is to encourage growth in FM while confining most AM expansion to smaller towns where the number of available services is small. At the same time, they recognize the need for existing stations to improve

facilities in order to keep up with the growth of their communities.

The significant new concepts are the official wedding of AM and FM into a single aural service, the concept of underserved communities and the reliance on 5 mv/m AM signals to define them, and the use of the 20-80 percent figure in establishing whether a station serves its community or whether a community is underserved. These new concepts are interesting in themselves, and they should produce some interesting results.

For example, if a town has no local station and is too far from other communities to receive 5 mv/m AM or 3.16 mv/m FM service, but if it has an unused FM assignment, an applicant would have to specify FM. However, once that applicant obtained a grant of his FM Construction Permit (and therefore "used up" the FM assignment), a second applicant could then file an AM application on the grounds that the community remained underserved but no FM channel was available.

If the FM permittee then chose to file a competing application for AM, he would probably lose because of the diversity-of-ownership issue. Once the second applicant's AM station has been authorized, the community would no longer be underserved, and the FM permittee couldn't apply for AM, even if he could find a channel. Furthermore, if the FM owner decided to get rid of his competition by purchasing the AM station, once he did so, the local AM and FM would be commonly owned, and the community would thus be once again underserved. The time would be ripe for a third applicant to file for and obtain an AM grant.

Wouldn't potential applicants find it wise, in such cases, to try to talk their bothersome neighbors into applying for the available FM channel in order to render AM the permissible aural service for which they themselves could then apply?

### **High Nighttime Power**

Another peculiarity likely to occur is the situation in which an AM station operates with higher power at night than in the daytime. Also, since the "80 Percent Rule" applies to the city of license rather than its suburbs, annexations by the center city could significantly affect the future of local stations.

Of course, these peculiarities are only a side issue. Many existing stations have seen their communities outgrow their service areas, and the new Rules are expressly designed to permit such stations to improve their facilities—as long as they cause no interference to others. Further, where smaller communities have a single local station (or none at all) and where a first or second station could easily be supported, in many cases, new stations may now be added.

### **Important Change**

In both of these regards, the Commission's new emphasis on 5 mv/m service is an interesting change. For years the Rules have specified indirectly that a station should provide 25 mv/m to the main business district and 5 mv/m to the most distant residential portion of the community. This Rule has now been stated more clearly, and the Commission is taking itself seriously by considering the 5 mv/m contour the limiting factor in many of these special provisions. Interestingly, many engineers have used the 5 mv/m value as a yardstick of this sort of service for years.

For those who surmise that the 5mv/m standard will offer substantial opportunities for new or improved facilities, Harold Kassens can cool their fervor a bit. Kassens is the assistant chief of the Broadcast Bureau, and he's been involved in AM allocations for a long time.

"We made some studies," he says, "and we were surprised to find that very few places in the more populated parts of the

country have no 5 mv/m service. In Ohio, for instance, only about twenty percent of the area is without service of that level, and Ohio is not unique."

Kassens admits quite frankly that the Commission's internal problems are high in his order of priorities. "It's a very simple and practical matter. With the staff available, we have to limit applications to those most likely to provide truly needed services. It's true that we are reassigning some personnel to handle the new load, but anyone who thinks we've intended to fling open the gates is mistaken."

The future of AM broadcasting is not the only future which is going to be affected by the lifting of the AM freeze. Harold Russell is the engineer at the FCC who will be responsible, in the days ahead, for the processing of the expected flood of applications. While he is currently wearing a look of impending doom, he's not yet ready to run for cover.

"We have only about half as many engineers on the staff right now as we did when the last freeze was lifted," Russell confides. "What's more, many of them are quite inexperienced." This is doubtless one reason why the Commission has stated that they may impose further temporary freezes for periods of up to ninety days, in order to catch up on their backlog.

### **FM Next**

Russell also admits that he and his staff will have to do some studying of FM, now that they will be evaluating FM coverage in connection with AM applications. His warning is that applicants should be particularly careful to provide complete and accurate data regarding both services.

"After all," he says, "when you're knee-deep in applications, you're certainly not going to waste a lot of time trying to correct a single defective one."

Bruce Longfellow, of the Commission's Rules and Standards



Division, may be accused of "pride of authorship", for it was he who was directly responsible for the new AM Rules. He's been handed some of the toughest jobs of this nature throughout his years at the Commission, and he has developed a philosophical attitude.

"We didn't try to please everyone," says Longfellow. "That would have been impossible. Instead, we tried to reach a compromise between opposing viewpoints—one that will hold up as far as possible into the foreseeable future."

Longfellow realizes there will be inequities in certain individual cases, because "there always are. Our job," he explains, "was to write general Rules. How they are administered isn't our domain, but the Commission has always considered the special cases, as they come up, and I see no reason for that not to continue."

The effects of the new Rules will be different for each station. Some will be able to make needed improvements; some will be saddled with new competitors. Some will watch their competitors improve, while they themselves will be forced to remain with their old facilities. Some will apply for new stations in other towns; others will find that the Rules now prohibit the application they had waited all these years to file.

Consider, though, the plight of the owner of a sole AM station in a small market, who has been hoping to apply for a station in a nearby town. The same Rule that allows him to file the new application also allows others to file applications for the community he now serves. It's hard for him to know whether to laugh or cry.

### **The Effect Of Rules Relaxations**

One factor apparently not considered by the Commission is the effect of their recent relaxation of operator requirements for stations with directional antennas, and their current efforts toward "de-

regulation". Often in the past, small market stations have shied away from nighttime operation when a directional antenna would have been required. Often, the initial application and installation costs were the determining factor, but in many other cases the problem of finding and keeping first-class engineers was paramount. Now that certain of these operating requirements have been relaxed, small market stations may look with more interest at the idea of directional nighttime facilities.

The chief of Broadcast Rules and Standards for the FCC is Neal McNaughten, and he tries rather unsuccessfully to hide his satisfaction with the release of the new AM Rules. McNaughten fell heir to the freeze and has had the ultimate responsibility in bringing about its solution. Now that the Rules have been adopted, his active participation is ended, and he can get on to a few thousand other matters. McNaughten's question is: "Have we ended the freeze?"

### **Some Encouragement**

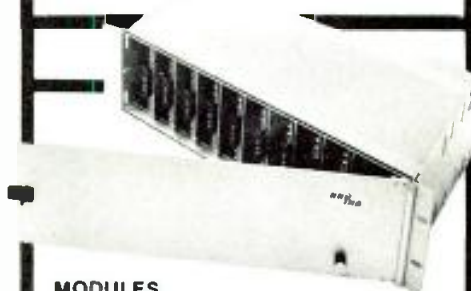
It's a good question. The Rules which were originally proposed would not have ended the freeze; they would have made it permanent. Only time can tell whether the new Rules will accomplish the Commission's stated purpose and whether the freeze was indeed lifted or only modified. It is accepted practice in the broadcasting industry to assume that **anything** the Commission adopts is bad, and certainly the consensus among consulting engineers is that no more than a slight thaw has resulted. In this case, however, it just may be that the Commission has given broadcasters the best compromise that could possibly have been worked out.

One fact that lends encouragement to this feeling is that Commissioner Nicholas Johnson dissented in this proceeding. From the broadcaster's standpoint, anything he disagrees with can't be all bad. □

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# An update on phase monitors

By Bob Jones\*

*BE's Facilities Editor brings you up to date on the directions the FCC is taking on antenna Phase monitors.*

The FCC has finally concluded its rather lengthy proceedings into phase monitors, or according to the FCC new language, antenna monitors. Yes, the term "phase monitor", like the DoDo bird is a thing of the past.

## History

Since January 10, 1973 the FCC has released three separate documents concerning antenna monitors. The first and most lengthy was the final Report and Order in Docket #18471. This dealt with what I call phase one of the three step proceedings. The Commission calls it "Rules and Regulations" with respect to maintenance and monitoring of the relative phases and currents in the elements of directional antennas and to provide for type approval of phase monitors used by standard broadcast stations. Whew! That's a mouthful.

The FCC actually contemplated three major areas in this particular docket. These include (1) the requirement that every standard broadcast station install and use a type approved phase monitor. That for the first time, (2) the maximum permissible deviations in the relative phases of the currents in a directional antenna not exceed  $\pm 2$  degrees from the licensed values. And (3) to set forth the essential specifications for phase monitors to qualify for type approval. The Commission also considered rules for the proper procedure to follow when a phase monitor becomes defective.

This proceeding began with the

original Notice of Proposed Rule Making on February 21, 1969. The dates for filing comments were extended twice with final comments being submitted on August 8, 1969, almost four years ago. Comments were filed by 38 separate individuals or groups representing station licensees, networks, individuals, engineering and trade associations, consulting engineers and the designers of manufacturers of phase monitors.

## Comments By Parties

It was surprising that there was a virtual consensus among those filing comments concerning two of the three main points. First that the proposed maximum permissible phase deviation of  $\pm 2$  degrees, as an absolute limit, is too restrictive in the majority of cases. And second, that type approved monitors should be required in instances where licensees propose to log phases at their remote control locations. In other cases, stations should be permitted to retain their present monitors, that is, they should be "grandfathered".

Some parties had suggested that the FCC should not put any restrictions on monitors, but put complete reliance on monitor points. In some ways the only true definitive indicia of proper array adjustment is when the monitor points are within limits.

Interesting comments were also received pointing out that, whereas a Rule stating a maximum permissible deviation in phase might be acceptable, any Rule should provide for temporary deviation beyond these limits during severe weather conditions. Obviously any tolerance that is reasonable under normal conditions, will not be acceptable when there is heavy rain, snow, icing, or abrupt changes in temperature. Of course all prudent stations' chiefs have for years recorded on their logs any such

weather effects.

In discussing the effects of too tight a phase deviation limit, Ralph Bitzer pointed out that if these phase deviations are too small, many operators will be impelled to making tuning adjustments to bring their pattern phasors back within tolerance. He points out, as many of us recognize, that most operators do not possess the technical competence to make these type adjustments. And that the results of such a practice can result in many misadjusted directional antennas.

Other comments emphasized that even under normal weather conditions, changes in phase monitor indications may reflect not so much changes in the antenna parameters, as changes in the sampling system itself. The importance of properly designed and installed sampling systems, including maintenance of same, was stressed. In fact Part III of this series goes into detail on the last step by the FCC into this whole general field of monitors in Docket #19692.

## Remote Base Current Meters

One of the other interesting points brought out in this proceeding was with reference to Section 73.67 (a) (5). This refers to the use of "remote base current meters".

Despite the language of the Rules, the Commission has permitted the adoption of practices by broadcasters at odds with this interest, thus sanctioning on an informal basis, the use of loops to obtain the output of a sampling line, to read and log in satisfaction of the requirement that indications of base current be read and logged. As will be shown later on, the Commission has revised their thinking to use monitor sample currents in lieu of indications of base currents. This will correct the existing situation.

One other point was raised by several parties commenting on this Docket. For example, if the FCC proposed that all stations be required to eventually change phase monitors, and they have; then Section 73.67(B) (5) of the Rules comes into play. This Section states

\*Broadcast Consultant, LaGrange, Ill., and Facilities Editor of Broadcast Engineering magazine.

that if a phase monitor is replaced by another monitor, "a skeleton proof of performance, consisting of measurements of three or four consecutive points on each radial used in the original application, shall be submitted to the Commission within 60 days of the date the replacement monitor is placed in service."

In effect, this says all stations employing directional antennas would have to run a skeleton proof when they installed their new "type accepted" monitor. As a practical matter, stations should not be put to this extra bother or expense when the cause for changing monitors is not voluntary.

### What's Reasonable

The FCC recognized that, in light of all the comments, they will not adopt a rule specifying a fixed permissible phase angle deviation for stations with directional arrays.

Even if the FCC tried to make a case-by-case approach to a fixed tolerance, with suitable provisions for excessive deviations because of weather and other adverse conditions, not all directional antennas behave the same.

The FCC notes that if a rule was adopted, a tolerance of  $\pm 3$  degrees might be appropriate. The effect of a deviation of this amount is approximately equivalent to a variation in current ratio of 5 percent, and that under normal weather conditions reasonable stable directional antennas can operate within such a tolerance without frequent readjustments.

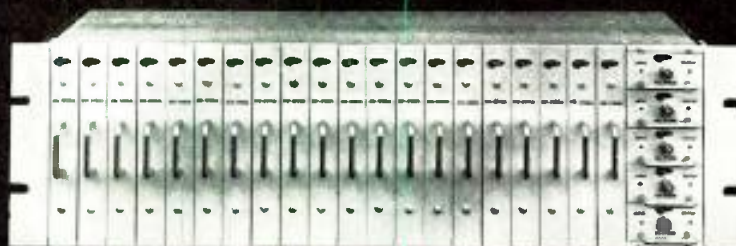
However, the successful application of any tolerance finally accepted for phase deviations requires that such deviations be accurately detected. Many stations are incapable of providing consistently accurate indications of phase or phase deviations. Most operators lay the blame for this

situation on sampling systems which are inadequately designed and/or improperly installed. Such systems often indicate phase variations in changes of temperature, moisture, wind velocity, etc., or deterioration of components of the system; rather than any real change in antenna phase relationships. The Commission proposes to establish at least minimum standards for the installation of sampling systems in Docket #19692.

The FCC thus recognizes that the incidence of faulty and inadequate sampling systems is so general that any attempt by the Commission to fix and require compliance with a specific phase tolerance will result, not in better maintenance of radiation patterns, but, in some cases, unnecessary and perhaps deleterious readjustments of array parameters.

Therefore, the Commission adopted the Rules outlined in Docket #18471, for the type

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approval of phase monitors, and for the eventual installation of such monitors by all stations using directional antennas as an important step toward the improvement of the technical operation of these stations. However, it is apparent that the problem of achieving better surveillance of antenna operations is not completely solved—that little is gained by requiring the use of a monitor giving accurate and stable indications of signals delivered to its terminals, if these signals are subject to errors introduced by faulty sampling systems.

Since the inception of this proceeding, the FCC concluded Docket #18930, and amended Section 73.93 of the Rules to permit third class operators to be employed at directional antennas, if the station is equipped with a type approved antenna (phase) monitor. The effective date of this requirement was suspended until these new type acceptance rules were finalized. For this reason the FCC has set June 1, 1974 as the effective date of this requirement of Section 73.93.

#### **What's Ahead**

Thus, the FCC has set a schedule for various stations to follow in changing monitors. First, new directional stations and those making major changes must install type accepted monitors as soon as acceptable monitors are available. Second, stations employing lesser grade operators must fulfill this requirement by June 1, 1974. Third, remote controlled stations, undertaking to read and log phasors at the remote control point must install such devices by June 1, 1975. And lastly, all stations employing directional antennas will be required to have type approved monitors installed by June 1, 1977.

In order to help station operators in complying with Section 73.69 of the Rules, when they change monitors, the FCC has deleted the former subparagraph (B)(5) and added a new paragraph (c).

In essence, they now require a proof of performance only when a station is unable to establish, by the specified base current observations and monitoring point measurements, that the directional array is operating within the limits and tolerances required by its license and the Rules. Under such circum-

stances, a partial rather than a skeleton proof is required. By this procedure the Commission hopes to avoid unnecessary hardship for station operators, yet insure that the indications of the replacement monitor represent the correct adjustment of the array.

#### **Section 73.69**

This new Section of the Rules states in summary the following points:

(A) Each station utilizing a directional antenna shall have in operation at the transmitter an antenna monitor, type approved by the FCC.

(B) In the event a monitor becomes defective, the station may operate without the monitor, pending repairs or replacement for up to 60 days, without further authority from the FCC. This provided, appropriate entries are made in the maintenance log, that base currents be read and logged at least once each day and that the monitor points be read at least once every seven days.

(C) If an authorized antenna monitor is replaced by another, the following procedure shall be followed. Temporary authority need be requested from the FCC in Washington to operate at variance pending the issuance of a modified license, that all operating parameters as well as monitor points be read prior to replacement of the old monitor, that immediately after installation of the new monitor all parameters and monitor points be reread. If these before and after readings do not agree then a partial proof of performance of at least 10 field strength measurements, on each radial, shall be taken and analyzed as per Section 73.186 of the Rules.

#### **Section 73.53**

The new Section setting forth the standards for meeting type acceptance are as follows, and must meet the following specifications. The monitor must operate between 540 and 1600 kHz, be capable of indicating any phase difference between two RF voltages of the same frequency over a range of zero to 360 degrees, be capable of indicating relative amplitudes of two RF voltages, be able to indicate increments of 0.5 degrees or less, be able to read increments of 0.1

percent or less, and shall be equipped to resolve ambiguities in indication. In addition if more than one RF input terminal is used, in addition to the reference input, that appropriate switching shall be provided so that each input can be selected separately. Each input shall be terminated with an impedance so that the voltage reflection co-efficient shall be 3 percent or less.

The accuracy in order to meet type acceptance must be  $\pm 1$  degree for applied signals if from 2/1 to 1/1, and  $\pm 2$  degrees or better, for signal amplitudes in excess of 2/1 up to 5/1. The repeatability of indication of any difference in phase readings shall be  $\pm 1$  degree or better. As to the accuracy of the relative amplitudes, over a range of 2/1 to 1/1, shall be  $\pm 2$  percent of the amplitude ratio, or better, and for amplitude ratios in excess of 2/1 and up to 5/1,  $\pm 5$  percent of the ratio or better. The repeatability of indication of the relative amplitudes over a range of 5 to 1 and 1 to 1 shall be  $\pm 2$  percent or better.

When modulation is applied on any frequency between 100 Hz and 10,000 Hz and up to 90 percent, shall cause no deviation in phase angle indications greater than 0.5 degrees of the values read in the absence of modulation.

All these specifications must be maintained when the monitors are operated over ambient temperatures between 10 and 40 degrees centigrade; power line variations over a range of  $\pm 10$  percent of the rated supply voltage; and over amplitude changes in any case over a range of maximum to minimum values of 3 to 1.

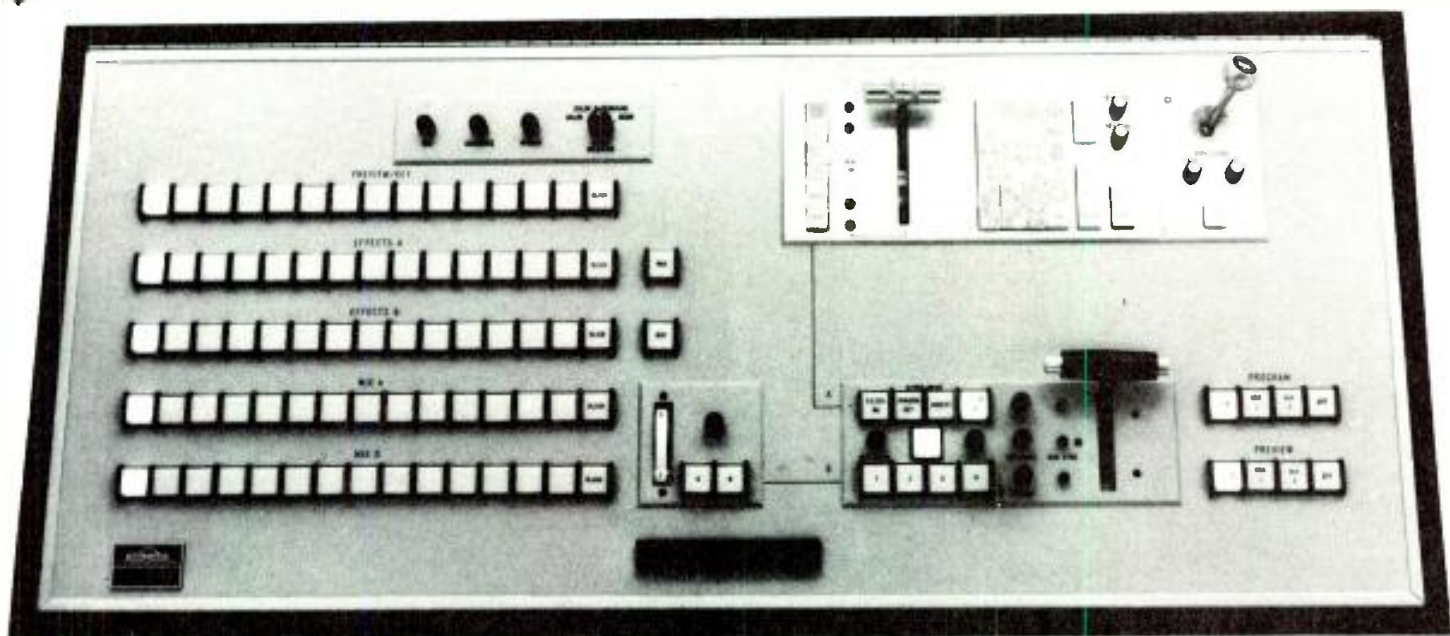
This summarizes the FCC's decision in Docket #18471. I trust this explains to each and every operator as to how soon his particular station has to install a new antenna (phase) monitor. And for those interested in making their own, what standards it must meet. Obviously all the old Andrew, RCA and Clarke Monitors must be replaced. The newer types may be able to comply. It is for the future to tell. Next month I'll go into detail on the FCC's release of Docket #18455 pertaining to the use of type accepted monitors by those employing remote control. □

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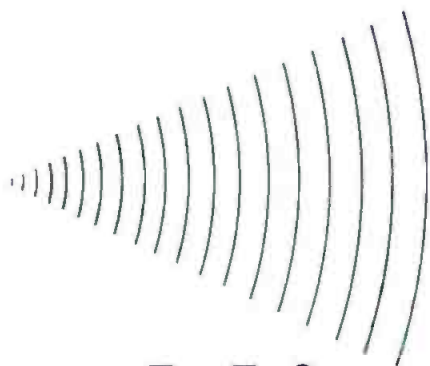
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PEOPLE IN THE NEWS

Broadcast

Tektronix, Inc., Beaverton, Oregon has appointed Stephen D. Kerman to the newly formed position of Marketing Product Manager—Television Products; and Joseph A. Gayer has been appointed Western Sales Manager—Television Products responsible for the field sales activity of the Tektronix Television Product Field Engineers...Edwin T. Karl has been elected vice president-engineering of Suburban Broadcasting Corporation...Morris Courtwright head of Courtwright Engineering and Automation Editor of Broadcast Engineering is now Mountain States District Manager for Collins Radio...Gerard Terdiman has been appointed Northeast Regional Sales Manager for the Scully/Metrotech Division of Dictaphone Corporation...Communications Technology Corporation of Los Angeles has announced the appointment of Bernard Decter as a Regional Representative...

Tom Brubaker, veteran television production manager for WSBT-TV, South Bend, Indiana, has been appointed general manager of WNIT-TV, the planned public television channel in the South Bend-Elkhart area...In a series of organizational changes at Superior Continental Corp., Thomas W. Dana, Director of Industrial Relations has moved to the position of Consultant in preparation for his upcoming retirement; Lawrence D. Oxford, Director of Systems and Data Processing, assumed the position of Director of Industrial Relations; and W. B. (Bill) Boggs joined the company as Director of Systems and Data Processing...Ronald D. Payne has been appointed Accounting Manager for Comm/Scope Company...

Harry Fine, Assistant Chief Engineer in charge of the Research Division, Office of the Chief Engineer, has been honored by the Washington Section of the Institute of Electrical and Electronics Engineers (IEEE) with the 1973 IEEE Patron Award. Fine is a Fellow of the IEEE and was chairman of the Washington Section last year... Charles W. Crum has been appointed Chief Engineer for CAMCAN (Chicago Archdiocesan Multimedia Communications Center and Network)...Robert Schraff Jr. has been appointed Advertising/Sales Promotion Manager for Javelin Electronics division of Apollo Lasers of Los Angeles... Edward J. Parker has been appointed to the position of Manager, OEM Sales, for RCA Solid State Division... Dr. Lawrence T. Frymire, Executive Director of the New Jersey Public Broadcasting Authority, has been elected Vice President for Instructional Television by the Eastern Educational Television Network (EEN)...

CATV

Fred H. Yeaton has been appointed Sales Administrator for C-COR Electronics, Inc. Yeaton will be

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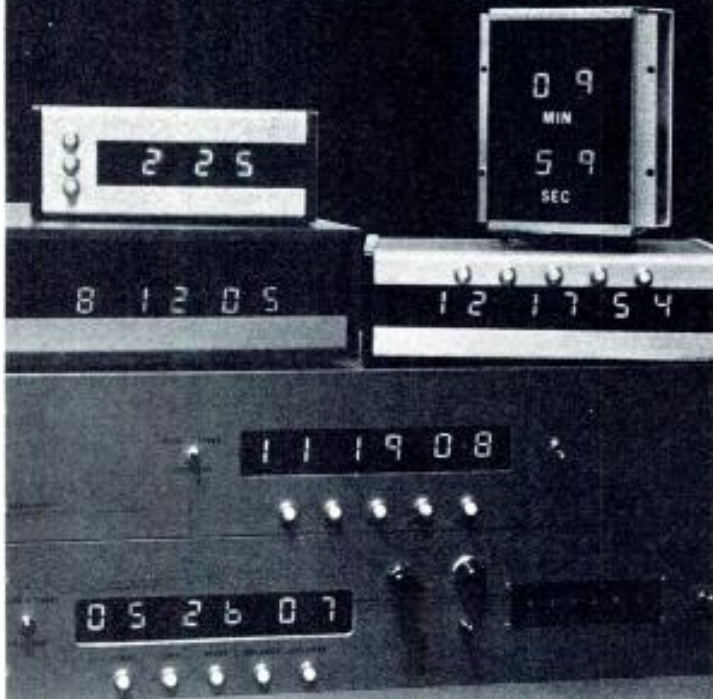
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## People in the News

(Continued from page 44)

responsible for order processing, invoicing, collection on past-due accounts, and developing business and manufacturing plant systems for C-COR's cable television business...**Joel A. Stroback** has been appointed to the position of Systems Engineering Administrator, C-COR Electronics, Inc. **Larry Gay** has been appointed Anixter-Pruzan's CATV sales representative for Oklahoma and Texas.

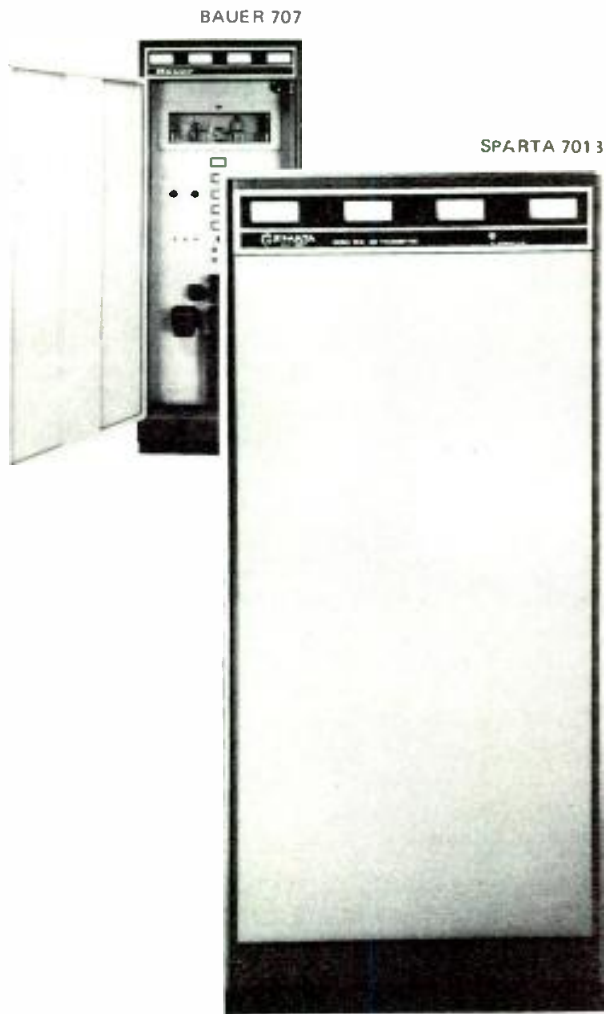
**Jim Teubner** has been named Manager, Superior Cable Division Accounting of the Cable Division of Superior Continental Corp...**Robert J. Greiner** has been named General Manager of Passive Operations of the Magnavox Company, CATV Division...In the recent reorganization of the Magnavox Company, CATV Division Vice President, **Caywood C. Cooley** has assumed additional duties as General Manager of the Terminal Access products group...The appointment of **Ed Pessara** as Midwest Regional Sales Manager for the closed circuit television (CCTV) equipment line has been announced by Concord Communications Systems...

**Kenneth H. Sechrist** has been appointed Personnel Supervisor for the CATV Equipment & Installation Operation of GTE Sylvania Incorporated...**William F. Edwards** has been appointed Project Coordinator for the CATV Equipment & Installation Operation of GTE Sylvania Incorporated...**Lew Forrest**, formerly Manager, Marketing Communications for the CCTV/Video Systems division of Javelin Electronics, has been promoted to National Sales Manager of Night Viewing Devices/Electronic Visual Aid division...**Suburban Cablevision Inc.**, the wholly owned cable television subsidiary of Suburban Propane, has named **Jack D. Cox** to the position of manager of the cable system in Morganton, N.C. ...**John B. Chaney, Jr.** has joined Jerrold Electronics Corp. as an MSO Account Executive; **Charles G. Perry III** has joined as Manager, Applications Engineering; and **David Brody** has been assigned advertising and public relations responsibilities. Brody will maintain his current duties assisting Jerrold customers with the promotion of their cable systems...

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## **book**review

### **Electronic Measurements**

**Basic Electronic Test Procedures**, written by Irving M. Gottlieb, is a step-by-step guide to all types of basic electronics measurements—using simple, inexpensive test instruments. The ability to make meaningful measurements and to put the resulting information to work is essential in any area of electronics.

In this new book, the mysteries usually associated with many electronics tests are unveiled...many for the first time. The author shows how to get accurate, meaningful measurements with ordinary VOMs, electronic meters, oscilloscopes, etc., by taking into consideration the errors inherent in most test instruments. The important thing is knowing—and understanding—the true nature of what is to be measured.

For example, it is surprising what can be done with the ohmmeter, allowing, of course for inaccuracies and deceptions. The reader will learn the advantages, and more importantly, the disadvantages of resistance measurements in solid-state circuits. It's all a matter of understanding the circuit or component under test.

This volume is a necessity for anyone in electronics—whether a student or “pro”. It contains 416 pages and 178 illustrations.

This book is available through Tab Books, Blue Ridge Summit, Pa.

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### **Digital Electronics**

**Digital Electronics: Principles & Practice**, has been written by Brice Ward. The first part of this book is devoted to a theoretical discussion of various types of digital circuitry, from the very simple to the relatively complex. This text is keyed to experiments in the latter part of the book. The majority of the experiments are developed around 7400 series TTL integrated circuit logic to allow you to perform the experiments with a minimum outlay of cash for equipment. A few ICs, some lamps, slide switches, and transistors, plus a 4.5 Volt battery will put you in a position to duplicate most of the simple experiments. A small additional outlay will allow the inclusion of a simple breadboard-ing system.

At the end of the book is the Appendix which provides complete construction plans for a very versatile logic trainer which can, at current prices, be put together for about \$50.00.

This book is available through Tab Books, Blue Ridge Summit, Pa.

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## SBE Journal

(Continued from page 16)

**Chapter 20 - Pittsburgh, Pa.**  
**Chairman: Henry R. Kaiser,**  
**WWSW,**  
**1 Allegheny Square,**  
**Pittsburgh, Pa. 15212**

The February 15th meeting, held at Buddies Restaurant, was a slide-illustrated presentation by Bill Bowser, Engineering Associate for Radio and TV, General Engineering Office, Bell Telephone, on the "Bellboy" paging service, which was recently inaugurated in the Pittsburgh area.

On March 15th, also held at Buddies, 12 noon, 3rd Thursday, as usual, Bob Mahoney, field engineer for Tektronix, described the application of the vertical interval test signal in a program VIR - FRIEND OR FOE?

**Chapter 21 - Spokane,**  
**Washington**  
**Chairman: T. O. Jorgenson,**  
**KXLY TV**  
**West 500 Boone Avenue,**  
**Spokane, Wash. 99201**

Luncheon meetings are held regularly every Monday at the Castle Restaurant in Southeast Spokane. Meetings held during February covered discussions on Powerline interference to TV transmitters; Audio dB VU meters, sine wave and peak levels; silicon rectifiers in transmitters. Anyone interested is welcome. Further information is available from chairman Jorgenson at (509) 328-9084.

**Chapter 22 - Central New York**  
**Chairman: Hugh Cleland,**

**WCNY TV/FM,**  
**506 Old Liverpool Rd.,**  
**Liverpool, N. Y. 13088**

Usual meeting date is 3rd Thursday, September through June. The January 18th meeting was held at the Northway Motor Inn. Bob Griffiths of Telemet presented the president of Spantronics, Bob Rulifson, who explained their new digital transmitter remote control system, demonstrating features with working models and a transmitter simulator.

The February 15th meeting was at Hotel Syracuse Country House. Bob Witkowski of WCNY was appointed chapter photographer to provide photos for SBE Journal. Technical session was on "To Microwave or Not to Microwave, is that the Question". Guest Speaker was Roger Peterson, chief engineer of Eastern Microwave Corporation. Eastern Microwave is the largest independent microwave network in the east; it provides special network

(Continued on page 51)

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## Five Operating Sites For Wide Audience

eastern Virginia have built five separate operating sites to provide better service to a widely-dispersed audience of more than one million people.

The benefits—and problems involved—were described to broadcast engineers by J. W. Looper, chief engineer of the Hampton Roads Broadcasting Corporation of Newport News, Va. He said the facilities were constructed to serve listeners in Norfolk, Newport News, Hampton Roads, Yorktown, Williamsburg, Virginia Beach, Chesapeake and Portsmouth.

The five sites are the main studio in Hampton Roads, a second studio in Norfolk, a night AM transmitter in Hampton Roads, a daytime AM and fulltime FM transmitter in Newport News, and microwave site in Norfolk.

The daytime AM transmitter in Newport News is non-directional, and operates on 5000 Watts. The FM transmitter, operating from the same site, is on a 24-hours daily basis and operates on 74,000 Watts vertical and horizontal. Night-time AM operations from Hampton Roads are directional.

With so large an area to cover—approximately 60 by 30 miles—extensive use is made of a mobile studio, which covers both Norfolk and the Peninsula. The mobile studio, when operating on the Newport News side of the James River, can direct its signal back to the Newport News studios. When operating across the river, the signal is sent to the Norfolk microwave site for relay to the Newport News studio via the one in Norfolk.

Problems in such multi-site operation are many, primarily in communication. WGH has reduced this to a minor problem by utilizing three separate microwave systems.

Possible power loss at any of the sites is a major concern, but standby diesel generators and five-week supply of fuel have been placed at the three main sites, ready to supply power on the instant. Since WGH has been on the air continuously since 1928, and also serves as the primary EBS station in the Hampton Roads area, such precautions are essential.


"The built-in redundancy of the multi-site operation has been a blessing as far as maintaining maximum air time," Looper said. "The problems of maintenance have expanded three-fold, however, and good preventive maintenance is a must." □

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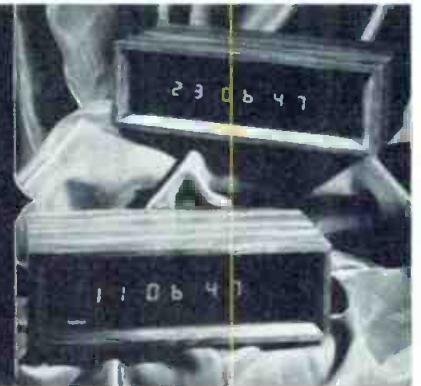


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BROADCAST ENGINEERING

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service and has constructed and operates the links of the Pennsylvania Public Television Network and its facilities. Also, its facilities furnishes imported television service for CATV systems throughout the east.

On March 15th, the meeting was again held at the County House; Jerry Preston, RCA, demonstrated RCA's new line of five, ten, and fifty kilowatt Ampliphase transmitters, and explained their method of converting phase to amplitude modulation. The exciter was described in detail.

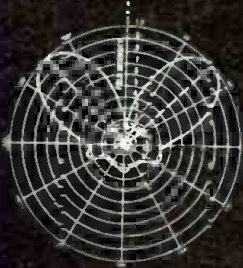
**Chapter 23 - Portland, Me.**  
**Chairman: Roland A. Desjardins, WCBB TV,**  
**P.O. Box 958, Lewiston, Maine 04240**

This chapter normally meets on the 2nd Tuesday, September through May, at the Holiday Inn, Portland, Maine. The February 13th meeting was preceded by dinner at 7:15 PM. The guest speaker was Donald C. Laubenstein, Information Coordinator, Maine Yankee Power Company who talked and gave a slide presentation on his company's power plant at Wiscasset.

**Chapter 25 - Central Indiana, Indianapolis**  
**Chairman: Joe Missick, WISH TV**  
**1950 N. Meridian St., Indianapolis, Ind. 46202**

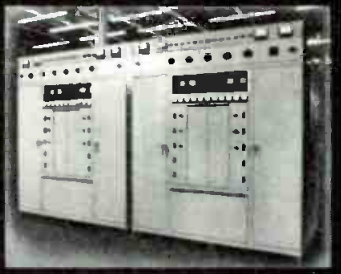
The regular monthly meeting is held the 2nd week of each month. The March meeting was held at the WISH TV studios. Results of the election were presented by John Guion, chief engineer of WRTV as follows: Chairman, Joe Missick; Vice Chairman, George Hoffman; Secretary-Treasurer, Odes Robinson, Jr. Guest speaker Bob Faulkner, district salesmanager for Central Dynamics described the operation and technical features of the PEC-102 Computer controlled, Automatic Video Tape Editor Control System.

(Continued on page 52)



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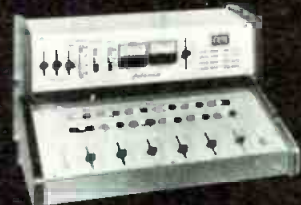
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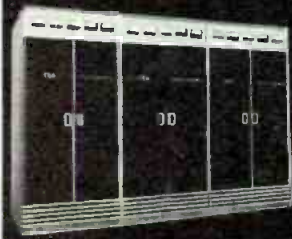
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## TELEVISION BROADCASTING:

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By Harold E. Ennes  
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## TELEVISION BROADCASTING:

### Camera Chains

By Harold E. Ennes  
Authoritatively provides the fundamentals necessary for more efficient assimilation of modern instructional books. The overall "system" concept is used to discuss studio lighting, camera mounting, interconnection facilities, power supplies, video amplifiers, video processing, camera control, setup circuitry, and more. 464 pages, hard cover. No. 20833—\$12.95.

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are covered and illustrated. Question and answer reviews for each chapter. 608 pages, hard cover. No. 20898—\$14.95.

## FIRST-CLASS RADIOTELEPHONE LICENSE HANDBOOK, 3rd Edition

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More than a question and answer book, it is also an excellent reference text on broadcast communications with a thorough coverage of theory and basic principles. It supplies all information needed to progress from a 2nd to a 1st class radiotelephone license. 416 pages, softbound. No. 20804—\$6.50.

## SECOND-CLASS RADIOTELEPHONE LICENSE HANDBOOK, 4th Edition

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By Dr. Howard W. Tremaine  
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Chapter 26 - Chicago, Ill.  
Chairman: Bradley Anderson  
University of Illinois, Box 6998,  
Chicago, Ill. 60680

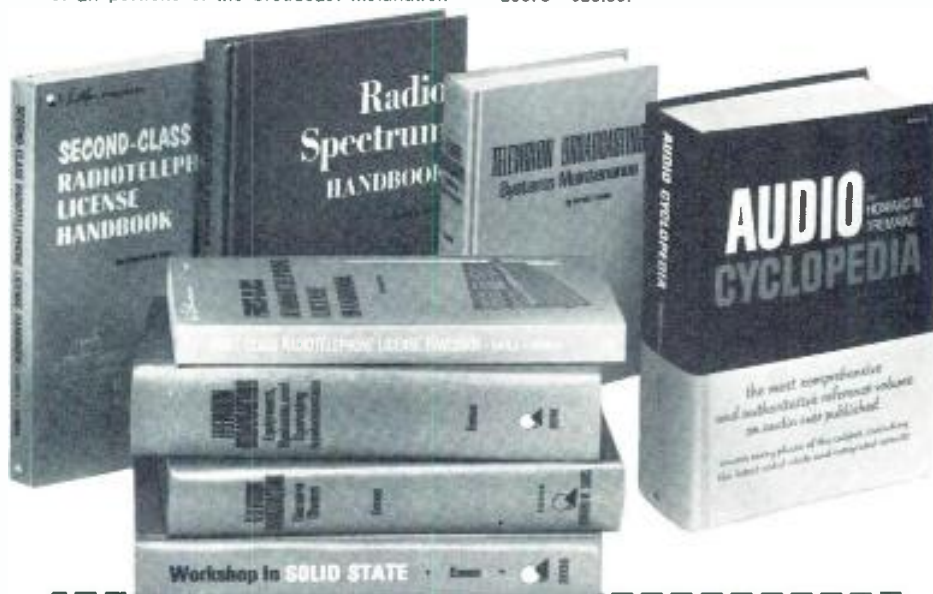
The Chicago chapter normally meets the 3rd week of each month, on Tuesday, Wednesday, or Thursday at various broadcast stations. NABET Chapter 41 is a sustaining member of the chapter and encourages attendance by members; the chapter also has a cooperative agreement with the A B E Credit Union serving broadcast employees in the Chicago area and which provides office and equipment assistance needed for meetings.

Chapter 28 - Milwaukee, Wisc.  
Chairman: Ed Wille, KENCOM  
7835 W. Caldwell Ct.,  
Milwaukee, Wisc. 53218

The March 13th meeting, held at Radio City Auditorium of WTMJ, as is usual, featured guest speaker Guy M. Lewis, RCA Sales Engineer who spoke on the "TCR-100 Video Cartridge System". This was a seminar type meeting which included a video tape and slide presentation on how the TCR-100 works and how it can be used in the typical broadcast TV operation. In the opinion of Bob Truscott, program chairman, this meeting was like a look into the future as "it's only a matter of time until we all have carts in use in our television operations."

Chapter 30 - Elkhart, Ind.  
Chairman: Chris Frederick,  
WJVA,  
South Bend, Indiana 46624

Chapter 30 was organized on October 19, 1972 at the WSJV-TV Studios in Elkhart, Indiana. The first regular meeting of the chapter was held on January 10, 1973 at the WSBT-TV Studios in South Bend, and was hosted by Bob Bell, chief engineer of WSBT TV. Howard M. Durbin of Electro-Voice presented a program on Quadraphonic Broadcasting; this was followed by a tour of the facilities of WSBT TV. On March 15th, a meeting was held at AT&T Technical Operations Center, South Bend, and was hosted by Robert Webb of AT&T and included an interesting tour of their operations center.



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# NEW PRODUCTS

(Use circle number on reader service card for further information)

## Zoom Lens

**Tele-Cine Inc.**, introduced a new Schneider 30 to 1 zoom lens for 1¼ and 1-inch color Plumbicon cameras. The lens has a continuous zoom range. The small size and weight - as well as its competitive with 10 to 1 and 15 to 1 price tag - should bring the lens consideration for both studio and remote work.

In addition, Tele-Cine introduced their 10-1 zoom lens which fits the RCA TK630, Fernseh KCP-40, Philips LDH-1, CEI-280, Ampex BC-230, Philips PCP-90, and the Gates 201. This is called the TV-30 series.

The company also showed their line of camera support equipment and complete camera remote control systems.

For More Details Circle (62) on Reply Card

## Solid State Audio Console

The new Stereo 80 eight-channel transistorized audio console, designed to provide the FM stereo broadcaster with optimum audio quality and operating flexibility, was introduced by the **Gates Division** of Harris-Intertype Corporation at the 1973 NAB Convention.

The Stereo 80 provides 18 inputs, which may be switched into eight stereo mixing channels to meet virtually any stereo requirement. The inputs include five microphones, four turntables, five tapes (cartridge or reel-to-reel), three remotes and network.

Performance specifications are outstanding, including frequency response of 20 to 20,000 Hz with less than 1 dB variation, and distortion less than 0.5 percent at

(Continued on page 54)

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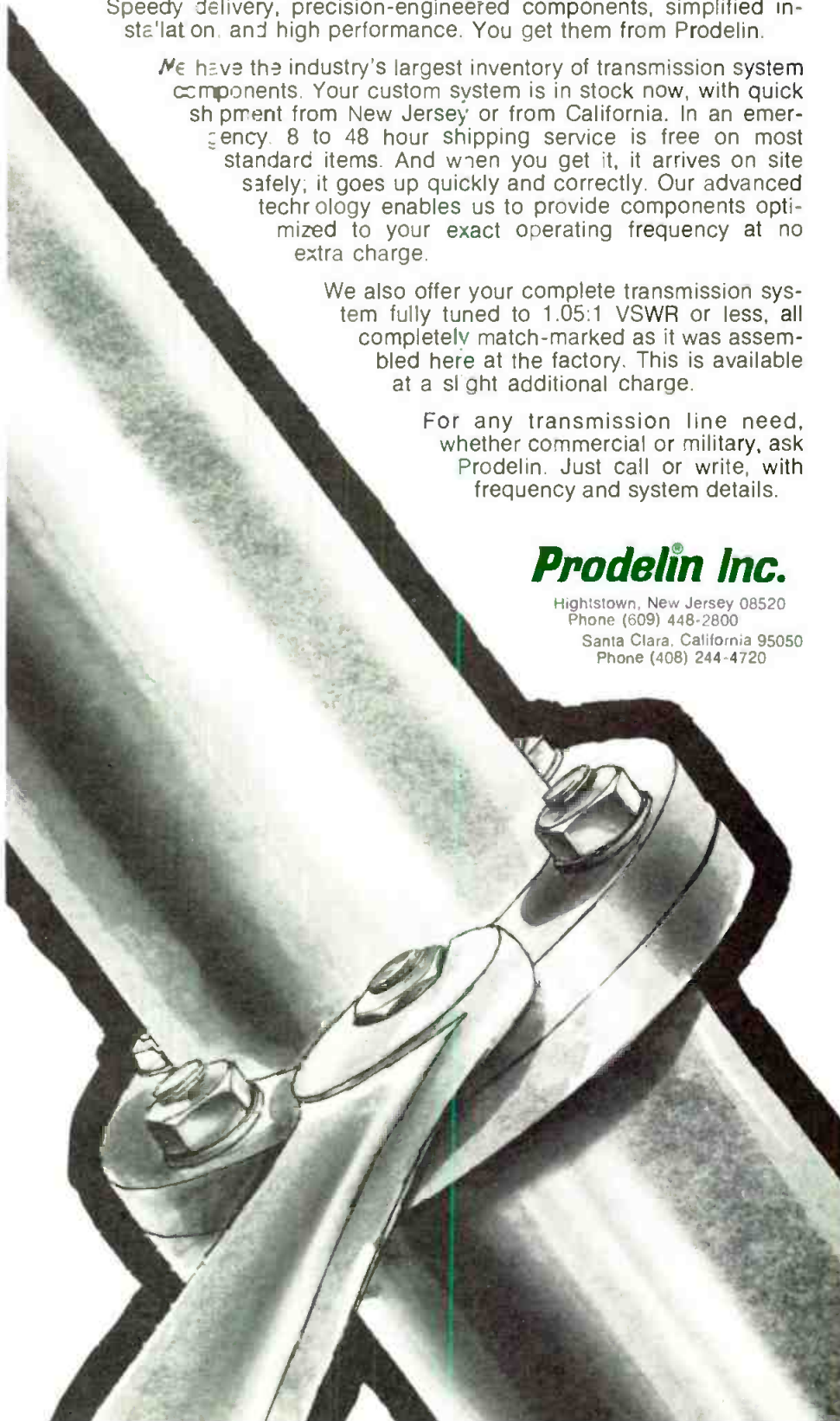
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## NEW PRODUCTS

(Continued from page 53)

all frequencies.

Program, cueing and monitor amplifiers all have the same electrical design and construction, and are completely interchangeable. As a result, two backup program amplifiers are provided as part of the console. Silicon transistors are used to assure the meeting of performance specifications over a wide ambient temperature range. All amplifiers are completely accessible when the top of the console is opened.

The dynamic range of the pre-amplifiers will accommodate microphone levels to -17 dBm without overload or distortion. The program amplifiers deliver +32 dBm output and the monitor amplifiers +40 dBm, all with wide frequency response, low distortion and low noise.

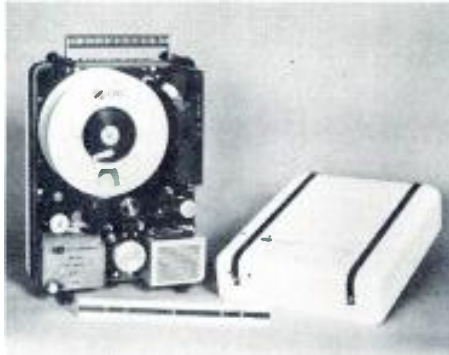
The Stereo 80 is styled with satin anodized aluminum front panels, and rich beige-gray pebble-text cabinet. The modern design will complement any control room decor.

For More Details Circle (63) on Reply Card

### Portable Color VTR

Echo Science Corporation demonstrated two new color, high-band video recorders at the 1973

National Association of Broadcasters convention. Both the Model 201C record/only portable and the Model 411C recorder/reproducer meet all performance levels of existing quadruplex recorders.



The 201C, including internal rechargeable battery, weighs only 38 pounds. It may be hand carried or back-packed. Its 15" x 11.42" x 6.42" dimensions are made possible by a unique Echo Science developed transport. This transport was first introduced into military airborne use three years ago and has seen extensive service in extremely severe and hostile environments. The color electronics are newly developed and represent the very highest state-of-the-art performance levels.

The Model 411C recorder/reproducer provides broadcast level performance. The transportable tabletop model weighs less than 140 pounds; its dimensions are 28" x 19" x 17¼". The unit may be ordered in a studio console configuration with a full monitor

bridge.

The basic machine will have the functional equivalents of Amtec\*, Colortec\*, velocity compensator, and processing amplifier. A composite signal (NTSC or PAL) is recorded on 1" magnetic tape with a record time up to one and a half hours on a 12½" reel. The 411C will have the additional capability of insert and assemble editing.

For More Details Circle (64) on Reply Card

### Differential Phase and Gain Corrector

CBS Laboratories, a division of Columbia Broadcasting System, Inc., has received a patent for an Automatic Differential Phase and Gain Corrector for broadcasting and closed circuit television applications.

The differential gain is measured by the DPG corrector first by removing the 3.58 MHz subcarrier from the ten stairsteps of the VITS signal. Unequal group peak amplitudes result in dA error signals. Correction signals are created in time to reach the first picture video signal at the start of field one in the succeeding frame. All then remains constant for the various luminous level regions which they represent until another VITS staircase arrives and the next sampling is made.

The differential phase is similarly measured and corrected with the



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sinewave phasing in the other steps. A synchronous phase detector is used with a locally generated 3.58 MHz signal serving as master reference. The latter signal is supplied by a crystal controlled oscillator. Correction signals are applied through a voltage-variable phase shifter. When corrections are being made, the only changes in the through-signal are the corrections themselves.

The Automatic Differential Phase and Gain Corrector is designed to be packaged integrally with the CBS Laboratories Vertical Interval Reference Correction System (VIR). It will also be offered to the broadcaster as a separate unit. The VIR System inserts a reference signal and automatically corrects certain distortions caused by deficiencies in the video transmission between the source and the final destination.

For More Details Circle (65) on Reply Card

### Automatic Centering Color Camera

Ampex Corporation placed on the market the first domestically manufactured broadcast color television camera with automatic centering. The new camera also features an extended red Plumbicon\* tube and a return viewfinder feed.

Charles A. Steinberg, Ampex vice president and general manager, audio/video systems division, said the new BC-230B color camera is an advanced version of the Model BC-230, which it replaces in the Ampex line.

The automatic centering device uses green as a reference to center blue and red both vertically and horizontally on a simple test pattern. Thereafter, the unit detects and automatically corrects any drift errors in actual performance. Previously, this feature was available only on more expensive, imported cameras.

The extended red Plumbicon tube is standard on the BC-230B and insures true red under all lighting conditions, inside and out. It is sensitive to low studio light and maintains color accuracy in bright sunlight.

A return viewfinder feed eliminates operator guesswork as to

what's happening at the control unit. With the touch of a button, the operator can view the same picture on his viewfinder that the director sees on the control monitor.

A bias-lighted prism permits fewer problems with image lag when panning or televising moving objects, even in the dimmest studio light. Since lag is a problem typically associated with aging tubes, the bias light also prolongs effective tube life in the BC-230B.


For More Details Circle (66) on Reply Card

### Multiple Cart Playback System

CARTRETTE multiple playback systems for playing back material recorded on CARTRETTES, the new 1/8" continuous loop tape cartridge, were introduced by Garron Electronics, Inc., a subsidiary of Visual Electronics Corporation.

The CARTRETTE systems all provide for two cue-tones and automatic fast-forward, and are based on the "BASIC-8" System

(Continued on page 56)



## Fidelipac's Hot Convertible


The new Cart-A-round Storage Racks. Each WR-25 Modular Rack holds 25 Type A Cartridges . . . eight can be mounted on our Mobile Carousel Base to make up the MR-200. Convert to wall mount by using the brackets supplied.

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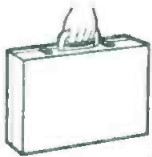
CBS Laboratories Mark III Image Enhancer is preferred by most TV stations. Because it sharpens both vertical and horizontal detail automatically. And improves picture resolution as well as color fidelity. The Mark III, with unique "crispended-comb" filter, separates chrominance from luminance, providing sharper contrasts with more defined picture detail. Available for all monochrome and color cameras. From CBS Laboratories, of course.

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56

## NEW PRODUCTS

(Continued from page 55)

which consists of eight independent CARTRETTE playback modules in a 5/4" rackframe that provides for the power supply and audio switching.

Also displayed was a "FULL 40+8" System providing for 48 CARTRETTE playback decks; ideal for automation systems and for having 48 sources loaded and ready for instant access by means of an attractive and easy to operate 10 key desktop controller.

All CARTRETTE Systems utilize CARTRETTEs, the 1/8th inch tape continuous loop cartridge. For More Details Circle (67) on Reply Card

### Camera line-up Equipment

Throughout the National Association of Broadcasters convention in Washington March 25-28, 1973, television engineers were invited to perform the "CLUE"—camera line-up equipment function on the new Norelco PC-72 studio and field color camera. Several hundred engineers from stations all over the U.S. took advantage of the chance to prove out the system which provides a 3-minute means of precise color-balancing as well as camera-matching without a waveform monitor. The CLUE demonstration was part of the Philips Broadcast Equipment Corp. exhibit of Norelco color cameras, audio equipment and the Norelco VCR (video cassette record/play) unit.

For More Details Circle (68) on Reply Card

### Automatic Film Cartridge Projector

The TV industry's first automatic film projector for broadcasting an uninterrupted sequence of commercials, news clips and other short subjects from 16mm film cartridges was announced by RCA Broadcast Systems.

The new projector, known as the TCP-1624, was designed and developed with assistance from Eastman Kodak Company. It will project

If Your VTR's  
Playback  
Looks  
Like  
This



When It Should  
Look Like  
This



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into a television camera a maximum of 24 cartridges in a continuous sequence. Each cartridge contains up to two minutes of film.

Neil Vander Dussen, Division Vice President, Broadcast Systems, said the TCP-1624 is the second member of a family of compatible, computer-oriented automatic systems that RCA is developing for broadcasters.

Vander Dussen said the new TCP-1624 film projector and the video tape cartridge recorder are expected to be equipment partners in automated TV station operations of the future.

"The new projector will enable broadcasters to automate the presentation of filmed segments in a station break, with smooth and instantaneous transitions between the segments," he added.

An engineering prototype of the projector was demonstrated at the National Association of Broadcasters convention.

In operation, the TCP-1624 projects film cartridges that have been loaded into a 24-section circular magazine. It contains two film transports — in effect two individual projectors — so that while one projector is running a film, the other is rewinding the previously shown film and cueing up the next one.

The new projector reproduces pictures and sound from a single cartridge or will operate continuously, depending upon the mode of operation selected by the operator. Startup is instantaneous, with no pre-roll of the film, and transitions from one cartridge to another occur in 200 milliseconds, making them virtually imperceptible to the TV viewer.

For More Details Circle (69) on Reply Card

### 1 kW AM Transmitter

**Sparta Electronic Corporation** introduced a new solid state 1kW AM transmitter, the MODEL 701B. The 701B provides 125 percent positive modulation, using the new 4-500 tubes; it is the only broadcast transmitter using this superb high power tube as a 1kW final.

Besides being all solid state right  
(Continued on page 58)

## The V11/21 Automatic Digital Logging System



from the industry's Creative Product Innovators.

The V11/21 Automatic Digital Logger records and prints out all necessary meter readings, saves valuable engineering time and assures total accuracy.

Here's a complete, self-contained system, including a printer which can display and print date identification, time, channel number and meter readings in volts, amps, watts, etc. The system is capable of sampling, measuring, displaying and

recording analog inputs from single or multiple sources, and is equipped with a real-time, solid state, 24-hour digital clock. Precise time can be displayed visually and also printed out.

This compact unit is only 7" high. Virtually maintenance free, it utilizes plug-in printed circuit cards for quick and easy replacement. Optional elements and equipment can be added for even greater versatility.

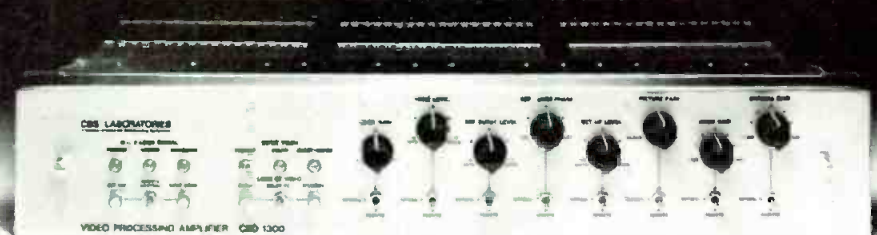
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CBS Laboratories' new Video Processing Amplifier is an outstanding performer! For monochrome or composite color restructuring, CBS Laboratories' CLD 1300 is the universal amplifier. High quality restoration is accomplished through individual controls of video, chroma, reference burst, sync and blanking.

In helical or quad tape use, the CLD 1300 actually improves quality dramatically. And the CLD 1300 can even be used simultaneously as a standby sync generator. From CBS Laboratories, of course.

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- The value-packed Six/70 (coming soon)
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### Multiple Cartridge Equipment

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- Mini-Series models (3 to 15 decks)
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- 610BX Automatic Audio System

### Other Audio & Video Equipment

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## NEW PRODUCTS

(Continued from page 57)

up to the finals and achieving 125 percent modulation, the new model has oil filled modulation transformer, builtin dummy load, vacuum capacitor final tank tuning, and the Sparta Tally Light overload indicator system.

For More Details Circle (70) on Reply Card

### Program Logging

**Metrotech Recording**, a division of Dictaphone Corporation, announced two new systems for the communications logging field described as providing significant cost savings over previous models. The product introductions were made at the National Association of Broadcasters convention.

The first unit, called **Metrotech 400**, is a logging recorder capable of storing more than 600 hours of audio information on a single 7200 foot reel of .5 mil triple-play tape. The second is a new **Time Code Generator/Reader**, called **Metrotech 4400**, which is an accessory to the new logger; it enables users as information is recorded to encode the time without requiring an extra recording track or additional electronics.

The 400 logger can operate unattended 24 hours a day for 12 days or for more than 24 days with one reel reversal. According to **Earl J. Peterman**, Vice President and General Manager of Dictaphone's Scully/Metrotech divisions, this slow speed capability ushers in a new era of economic efficiency for logging applications.

For More Details Circle (71) on Reply Card

### Broadcast Console

A new family of six "off-the-shelf" broadcast consoles is being marketed by **Fairchild/Robins**, designated Series 30000, the units range in price from \$750 for an economy 5 mixer monaural unit to \$2990 for an 8 mixer stereo unit. Two five mixer, stereo and two eight mixer, monaural units com-

## CONTROL AUDIO AT THE MIKE RIGHT HERE



### WITH THE NEW SWITCHCRAFT "Q-G" STRAIGHT CORD PLUG

Now, you can give entertainers and broadcasters instant, finger-tip control of sound right at the microphone. The new Switchcraft T\*F series "Q-G" cord plug has a built-in switch for "on-off" control of audio. The mike mounts on the plug so the switch knob is easy to operate by thumb—but its low profile alleviates inadvertent operation of the switch.

This new cord plug carries all the other great features of Switchcraft "Q-G" plugs: available in 3, 4 or 5 pin configurations; exclusive "ground contactors" for grounding/shielding through the connector; unique "captive design" insert screw to give a rigid assembly and positive electrical continuity; cable clamp to hold the cable securely; and a flexible strain relief to reduce cable wear.

Add this new Switchcraft "Q-G" cord plug with "on-off" switch to your line of audio connectors. Backed with Switchcraft's merchandising programs and promotions, it's bound to become a top seller for applications requiring control of audio at the mike.

For more details, contact your Switchcraft Representative or District Sales Manager at Switchcraft, 5581 N. Elston Ave., Chicago, Ill. 60630.

**SWITCHCRAFT**

For More Details Circle (53) on Reply Card

plete the line. All have "big board" styling and are finished in "Mod" colors.

Most of the units feature stepless slide faders, mic preamps with built-in limiters, padded armrests and wood grain end panels. All of the units are built with plug-in I.C. op-amp circuitry which is accessible for service even while the units are in operation by means of hinged meter and control panels.

For More Details Circle (72) on Reply Card

### Broadcast Quality Helical Scan VTR

International Video Corporation introduced their IVC-9000, a helical scan video tape recorder that has been designed for full broadcast applications.

There was considerable talk around the NAB convention of how helical had gained a place in the industry. And certainly IVC was sitting there at ground zero with the 9000, a machine that finally has been designed to give the best of helical to the industry. And, as you'd expect — if the job could be done, it was developed in the 2-inch format.

By staying with the 2-inch tape, helical can provide video plus five extra tracks. These will include two audio tracks, one cue track, one control track, and one address track. As you know, under the quad format, only three tracks are available. While one-inch has been popular for helical, IVC figures show that 2-inch tape has three times the transverse rigidity and two times the tensile strength of 1-inch tape.

Scan length on the 9000 is only 5½ inches around the scanning assembly. Because the image is segmented by two heads and continuous video information is available from the tape, there is no need to write a full field with each head as on a single head machine.

The relatively short scan length of the video tracks is designed to give good RF envelope recovery and smooth transition between successive heads. The heads operate in swamped modes, thus eliminating resonance matching requirements

(Continued on page 60)



# ANOTHER TALL ONE

## FROM THE TOWER PEOPLE

In 1972 alone, Stainless completed or had under construction eighteen tall towers! Nobody... but nobody... can match that. There's one name that stands out—Stainless. We're proud of that fact. And this list demonstrates the TV broadcasters' confidence in our product... "Stainless Tall Towers".

WPE-TV	Saginaw, Michigan	1359'	WJWB-TV	Athens, Ohio	874'
CKL-TV	Brandon, Manitoba, Canada	1328'	WSTC-TV	Blondie, Michigan	864'
WHA-TV	Madison, Wisconsin	1200'	WEAO-TV	Alliance, Ohio	774'
WOUC-TV	Cambridge, Ohio	1189'	WHP-TV	Harrisburg, Pennsylvania	507'
WOSL-TV	Columbus, Ohio	1124'	WJMN-TV	Montclair, New Jersey	658'
WNPB-TV	Marquette, Michigan	1101'	WJED-TV	New Brunswick, New Jersey	438'
WBGL-TV	Bowling Green, Ohio	1100'	WCB-TV	Leviston, Maine	648'
WILL-TV	Terre Haute, Indiana	1000'	WRF-TV	Roanoke, Virginia	285'
WPBC-TV	Portsmouth, Ohio	969'	WJML-TV	Winston-Salem, North Carolina	340'

Construction and fabrication are now in progress and field work will start in May on a new 2000 ft. tower for KOLR-TV Channel 10, Springfield, Missouri. Another tall one from the "TOWER PEOPLE"!


Let's sit down and talk towers—your tower.

**Stainless, inc.** 

North Wales, Pennsylvania 19454  
Telephone 699-4871  
In Canada: Welcan Ltd.  
Toronto 12, Ontario

Tall Towers for TV, CATV  
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# 6 to 36 IPS

## MULTISYNC MDA-1B

THE MDA-1B IS A SELF-CONTAINED RACK MOUNT, OR TABLE TOP UNIT, INTENDED TO SUPPLY DRIVE MOTOR POWER TO PROFESSIONAL TAPE DECKS FOR THE PURPOSE OF VARYING TAPE SPEED UNDER PRECISE CONTROL.

**\$625**

**FEATURES:**


- \* WIDE FREQUENCY RANGE 48 - 144 Hz.
- \* VERNIER CONTROL FOR FINE PITCH ADJUSTMENT
- \* NO MODIFICATIONS OF RECORDER REQUIRED
- \* FIXED 120 HZ. FOR 30 IPS OPERATION
- \* FAIL-SAFE AMPLIFIER PROTECTION CIRCUITRY
- \* EASILY PATCHED FROM RECORDER TO RECORDER
- \* QUADRATURE DRIVE FROM DUAL AMPLIFIERS AND 90 DEGREE OSCILLATORS

**APPLICATIONS:**

- \* PHASING-DELAY EFFECTS
- \* FINE TRACKS FOR RECORDING NON-TUNEABLE INSTRUMENTS
- \* 30 IPS DRIVE FOR 7.5/15 IPS RECORDERS
- \* COMPENSATE FOR OFF-SPEED TAPES
- \* VARIABLE-DELAY FOR DOUBLE-TRACKING
- \* LENGTHEN/SHORTEN RUNNING TIME OF BROADCAST TAPES

THE MDA-1B CONTAINS ITS OWN POWER SUPPLIES, OSCILLATORS, AND POWER AMPLIFIERS. THE CONNECTIONS TO AND FROM A DECK ARE MADE BY TWO CONTROL CABLES. THESE CAN BE INSERTED INTO EXISTING CONNECTORS WITHOUT ANY MODIFICATION TO THE TAPE DECK.

**PACIFIC RECORDERS AND ENGINEERING CORPORATION**  
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Place your order today. Then prepare yourself for a very satisfying experience!



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PREAMPLIFIERS

MP-8 (Mono) \$60  
SP-8 (Stereo) \$90

Outstanding sensitivity and near perfect reproduction. RIAA/NAB equalized 0.5 mv sensitivity @ 1 KHz for -4 dbm out — Balanced 600 ohm out — minus 65 db S/N ratio — +20 dbm out max — =1 db freq. response — Internal power supply — Table top/bracket mount. Shipping weight, 3½ lbs.



MIC/LINE AMPS

MLA-1 (Mono) \$68  
MLA-2 (Dual) \$96

Dual function utility amp. Inputs for mic and/or line — 600 ohm balanced outputs — mic input, -65 db for -4 dbm out — -20 dbm out max. — =0.5 db response, 10 Hz-20 KHz — 0.1% or less dist. — Internal power supply — Tabletop/bracket mount. MLA-2, Stereo/Dual Mono. MLA-1, Mono. Shipping weight, 4 lbs.



DISTRIBUTION AMP  
6 BALANCED OUT

DA-6 \$95

One third the cost of comparable units. Six 600 ohm balanced outputs — Balanced bridging input — 26 db gain — -20 dbm out max. — Input level control — 0.1% or less dist. — =0.5 db response, 10 Hz-20 KHz — Internal power supply — Tabletop/bracket mount — Shipping weight, 4 lbs.



TAPE CARTRIDGE  
LOADER (AUTOMATIC)

ACL-25 \$159

Precision winding without guesswork. Dial in the minute and/or seconds desired, throw switch to run. That's it! The exact amount of tape is fed onto the cartridge hub to the second, and shuts off automatically. No waiting around, no guesswork and 1 sec. accuracy. Also has exclusive torsion control for proper tape pack and winding of various cart hub sizes. TTL digital control circuitry. Shipping weight, 30 lbs.



RAMKO RESEARCH

2552 "E" Albatross P.O. Box 6031  
Sacramento, Calif. 95860 (916) 489-6695

## NEW PRODUCTS

(Continued from page 59)

and giving uniformity of signal characteristics between heads.

Using two heads permits shortening the track length to a manageable dimension which will give good interchangeability over a wide range of operational variations. Some additional fallout benefits include elimination of regenerative circuitry for the dropout period and the much simpler threading path for a 180 degree wrap. It is the 2-inch width and 180 degree scan that permits the luxury of additional tracks.

The 9000 uses a "super high band" set of carrier and deviation frequencies in the modulation and demodulation process.

The use of such elevated frequencies makes possible the same moire characteristic on 625 line color standards using a 4.43 MHz color subcarrier as can be obtained with high band in the NTSC mode.

A non-saturating multivibrator acts as the modulated oscillator whose output is applied to a record amplifier that drives the video heads from a low impedance source. In playback, the heads again see a low impedance. To further reduce the effects of banding, a compensation system is used.

From an economy standpoint, tape costs and tape storage is a consideration IVC has considered. Program material occupying a tape worth about \$195 per hour can be transferred to tape stock worth about \$90 per hour. Storage space is reduced because the new recordings would be on tape that occupies a smaller reel and container than that of quad tape combination.

For More Details Circle (73) on Reply Card

### Sound Duplexer System

The Coastcom Division of Scott-Buttner Corporation recently announced development of a new sound duplexer system for broadcasters and common carriers.

Designated as the SBC 415, the compact, all solid-state modular system is a unique engineering design approach to program audio

# beautifully engineered!



Fortunately RUSSCO engineering is more than skin-deep. RUSSCO's STUDIO-PRO and CUE-MASTER turntables offer the ultimate in long-wearing dependability and ease of operation . . . only 3 moving parts! No-slip starting and reliable Bodine synchronous motors (optional). 3 beautiful models starting at only \$152!

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RUSSCO's MONITOR MASTER amplifier gives you clean sound in a trim standard 19" rack size . . . Quick installation & easy service with plug-in P.C. boards. A trouble-free Powerhouse only \$210.00

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**RUSSCO**  
ELECTRONICS INCORPORATED  
1070 BROOKHAVEN, CLOVIS, CALIF.  
PHONE (209) 299-2167

sound duplexing which results in a virtually transparent transmission system.

Featured is an exclusive demodulator design that minimizes video interference over multi-hop microwave intercity routes and substantially upgrades the performance of multiple subcarrier systems on TV STL's.

SBC 415 performance features include less than 0.5% total harmonic distortion, greater than 70 dB signal-to-noise and  $\pm 0.5$  dB audio response from 50 Hz to 15 KHz. The SBC 455 equalized video low pass filter provides 50 dB or more attenuation of undesired components 1.5 MHz above the 5.5 MHz passband.

For More Details Circle (77) on Reply Card

### 50 kW AM Transmitter

The development of the Model AM-50KD AM Broadcast Transmitter is an-

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Area Code 412 281-3768

For More Details Circle (44) on Reply Card

nounced by American Electronic Laboratories, Inc. (AEL).

Designed for high reliability, low maintenance commercial broadcast service in the 530 kHz to 1640 kHz band, AEL's Model AM-50KD Broadcast Transmitter can provide up to 55kW output and is intended for operation under Part 73 of the FCC rules.

The transmitter is housed in a three-section modern cabinet featuring AEL's center control panel concept which places all metering, control and indicator functions at a level for easy observation while making tuning and operating adjustments. Positive pressure cabinet ventilation reduces the accumulation of dust and dirt.

All low level RF and audio circuits, as well as control logic and rectifiers of this four-tube transmitter, utilize solid state devices.

The RF section consists of dual selectable solid state oscillator circuits utilizing nontemperature sensitive crystals. Modern solid state logic circuits are used to establish the required operating frequency. A solid state power amplifier provides grid drive to a 4-400C IPA stage. The PA is a 4CX35000C tetrode operated in a high efficiency circuit which, with its large cooling system reserve, provides for long, reliable life.

Other features include high level plate modulation, oil filled modulation transformer and reactor, vacuum tuning capacitors, and fast restart after momentary power failures.

For More Details Circle (74) on Reply Card

### Professional Recorders

Professional audio recorders in one- and two-track quarter-inch



## PROTECT your broadcast equipment against lightning surges with WILKINSON AC LINE SURGE PROTECTORS

Excessive voltage surges caused by lightning, transformer arcing and induced transients are everyday occurrences that cause heavy damage to valuable broadcast equipment.

Now through the use of WILKINSON voltage sensitive Line Surge Protectors you can protect your equipment from line surges that may exceed even twenty times the normal line voltage.

A WILKINSON pulse compensated Line Surge Varistor, is placed across a line of its rated voltage. Should a surge or increase of voltage occur, the resistance of the varistor decreases at log scale as the voltage increases, thus acting as a momentary load or short circuit to the surge. WILKINSON Line Surge Protectors draw little or no current and are capacitor compensated for microsecond surges, thus damping all line disturbances as well as excessive voltage increase.

A small investment in WILKINSON Line Surge Protectors is your assurance that your valuable broadcast equipment will not be damaged due to line surges.

Model SIA-1 110 V. Single phase \$175.00

Model SIA-2 220 V. Single phase \$275.00

Model SIA-3 220 V. Three phase \$375.00

Model SIA-4 440 V. Three phase \$475.00

For complete details write to:

**WILKINSON ELECTRONICS, INC.**

1937 MacDADE BLVD. • WOODLYN, PA. 19094

• TELEPHONE (215) 874-5236 874-5237

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# console



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OMAHA, NEBRASKA. 68102 TELEPHONE (402) 342-2753

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complete information

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the Director of Sales

Dept. B-80

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## Tape Cartridge Racks

- Free standing
- Table top
- Wall mounting

Enjoy real fingertip convenience with these Spotmaster tape cartridge racks. Three styles, holding up to 200 cartridges, meet every need. RM-100 wood rack stores 100 cartridges in minimum space, for wall or table top mounting, \$47.50. LS-100 lazy susan rack holds 100 cartridges on table top rotating stand, \$79.50. RS-200 revolving rack is on casters for floor storage and mobility, accepts 200 cartridges, \$145.50. RS-25 rack sections, used in rotating racks, hold 25 cartridges, may be wall mounted individually; rugged steel construction, \$13.00.

Order direct or write for details.

**BROADCAST ELECTRONICS, INC.**

A Filmmage Company

8810 Brookville Rd., Silver Spring, Md. 20910

## NEW PRODUCTS

(Continued from page 61)

and four-track half-inch configurations, which incorporate the features of the M79 multi-track series, have been announced by 3M Company's Mincom division.

The new recorders, which were designed for broadcast, education and recording studio use, operate at three speeds (7½, 15 and 30 ips), but are capable of variable speeds from 5 to 45 ips by virtue of a new DC servo capstan assembly.

The recorders embody the 3M-patented "Isoloop" drive, and single card electronics. The introductory machines are console mounted. Rack-mounted configurations will be available later.

As with the multi-track M79 recorders, the quarter- and half-inch machines are convertible to any of the one-, two- or four-track configurations.

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capstan, Audio and control stack and erase head with complete safety.

STATIC & LINT-FREE CLOTH for cleaning larger exterior surfaces to prevent dust and dirt from infiltrating into interior portions of the VTR. Impregnated with a special formulation that virtually 'grabs' dust and dirt and removes acids from fingers which have come into contact with external machine surfaces.

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FOR MAG TAPE

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Vikron magnetic tape heads are designed to meet specific customer requirements. Our engineering department is happy to assist development engineers in determining the model and type of head best suited for their application. Send for your FREE catalog today.



**VIKRON**

4918 W. 35th Street  
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(612) 927-7716

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### Video Recorder Care Kit

Nortronics Company, Inc., has introduced a new video recorder care kit which is being marketed by the company's Recorder Care Division.

Designated QM-5, the new kit contains all the safe, effective products required to keep expensive video tape recorders operating at peak performance for the longest possible time.

Accessories contained in the kit include: FOAM SWABS manufactured with a specially formulated material with a cellular structure that literally captures dust, dirt and oxide from sensitive video heads when impregnated with tape/head cleaner.

TAPE/HEAD CLEANER in 16 ounce spray can. Very effective and completely safe for removing tough oxide deposits and dissolving a wide range of other contaminants. Supplied with an extension tube to direct spray into hard-to-reach areas.

MICRO-WIPES non-abrasive cellular cleaning tissues which are readily impregnated with tape/head cleaner and used to effectively clean

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**WANTED:** All surplus broadcast equipment especially clean A.M. & F.M. transmitters, contractors, capacitors. Surpluss Equipment Sales, 2 Thorncliffe Pk. Dr. Unit 28 Toronto 17, Ont; Canada. 1-73-ft

## WANTED CONT.

**TEN WATT TRANSMITTER.** used, to start high school station. Send details to James Selway, Sparrows Point High School, Edgemere, Md., 21219 5-73-1t

**WANTED - McCARTA MS-450** record amplifier, MS-1005 playback and used carousel, with or without random select. KSJT, Box 1296, San Angelo, Texas 76901 5-73-1t

**WE NEED YOUR HELP** in equipping Nevada's first independent Public FM station, we need everything but especially a transmitter, antenna, and monitors. Donations are tax deductible, but if necessary, we can't pass up a good buy. Contact Nevada State Public Radio Assoc., c/o Bill Moitley, Box 1425, Alhambra, Calif. 91802. 5-73-1t

**GATES BC-1J TRANSMITTER** or comparable type. Operable or Non-operable. WMOV, Ravenswood, W. Va. 26164 5-73-1t

## EQUIPMENT FOR SALE

**NEW MOSELEY ADP-220** transmitter automatic logging system. \$5900. Contact T. A. Bone, WPRI TV, Providence, R.I. Phone 401-521-4000. 3-73-3t

**SURPLUS AUDIO PATCH PANELS.** All Standard Configurations. Gulf Telephone & Electronics, Inc., P.O. Box 42130, Houston, Texas 77042. 7-72-ft

**TRANSMITTER-RCA CT-17A-3KW.** F.M. 3 Phase Power Supply, 230 volts. All parts and cabinet intact. New set of 5762's. Write: Range Corp. P.O. Box 501, Negaunee, Michigan 49853. 5-73-1t

**R F BRIDGES** for AM stations. Custom built. Instrument complete with drive generator and sensitive null receiver. Transistorized. Ideal for rapid network and antenna tuneup and system maintenance. Inquire Scott Radio Co. Warsaw, North Carolina. 5-73-1t

**CROWN STEREO RECORDER 800 series.** Mag-necorder PT63. Harmon Kardon Mixer Pre-Amp. RCA cutting lathe type 73B RCA Ribbon microphones, test equipment. Audio tape 3600 ft. 10 inch reels, 2000 albums, 4000 45's past hits. Must sell, best offer. PROS Recording Studio, 346 Old County Rd., Westport, Mass. Tele-636-2555. 5-73-1t

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**FOR SALE OR TRADE:** RCA TM-6C video master monitor, \$75; four Sarkes Tarzian VMP-2D video picture monitors, \$50 each. Good condition. Want used FM modulation and frequency monitor, and Gates RDC-10 remote control. Starting educational FM. Any donations tax deductible. WITB, Indiana Institute of Technology, 1600 E. Washington Blvd., Fort Wayne, Indiana 46803 5-73-1t

**RCA HEADWHEEL PANEL ASSEMBLY** video recording head, M140799 5 mil air bearing low band. Hy Ness Company, 2105 Cruger Ave., Bronx, N.Y. 10462 5-73-1t

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1-72-1F

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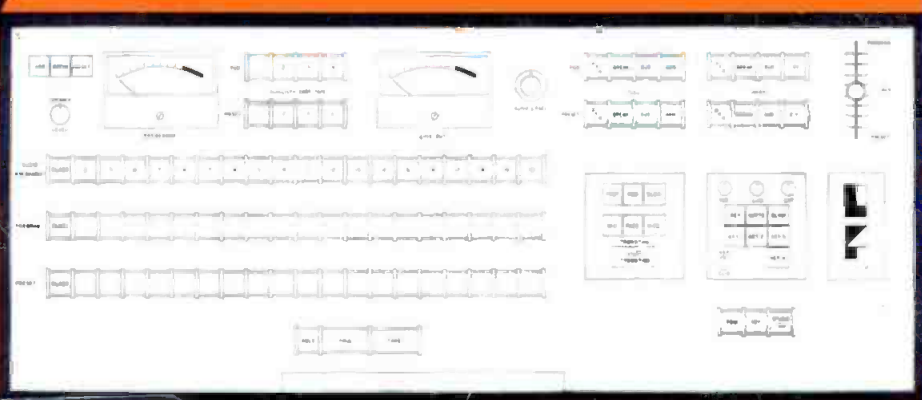
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