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Ed. Stolzenberger, Editor
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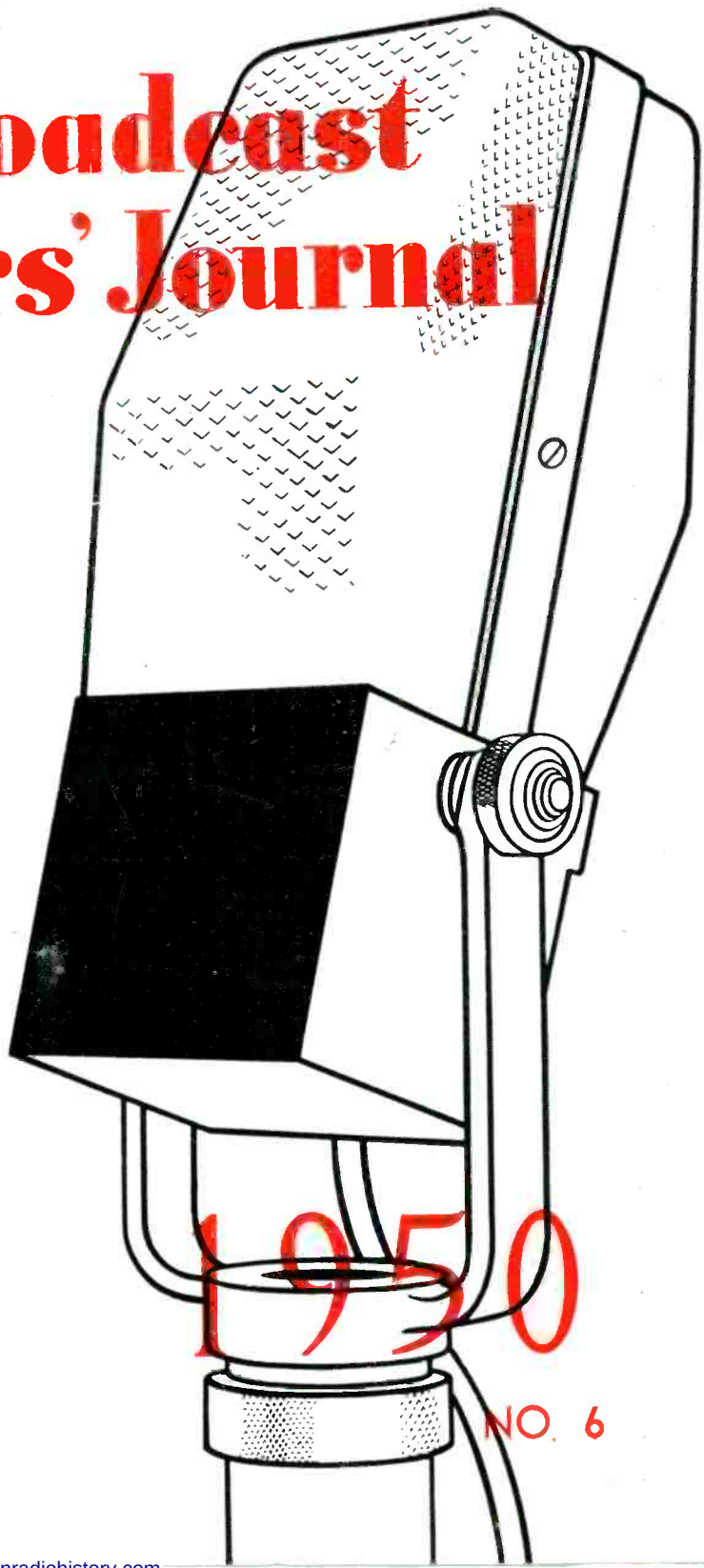
The Broadcast Engineers' Journal



Effectively

REPRESENTING

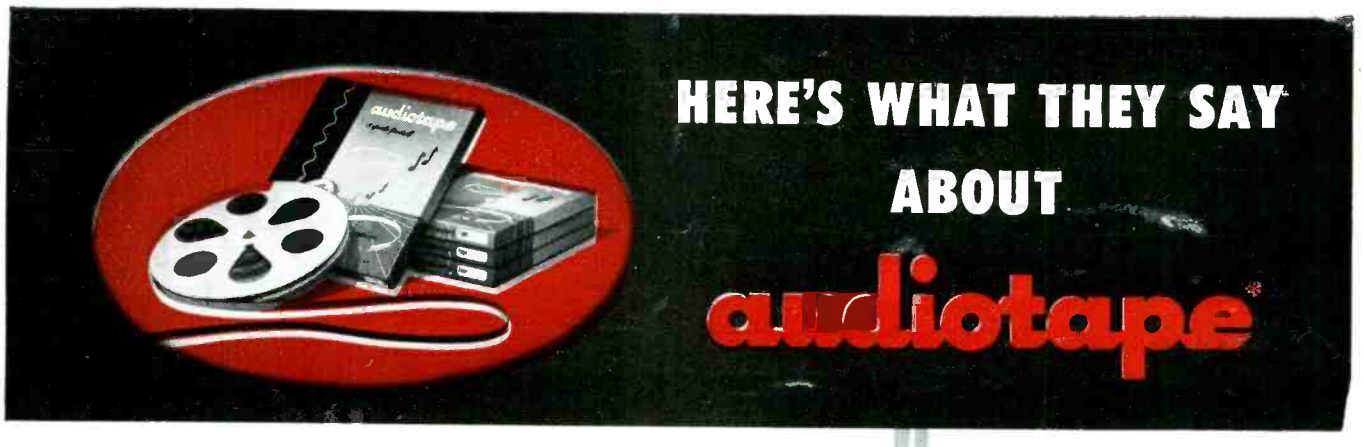
RADIO and

TELEVISION MEN

SINCE 1934

June 1950

VOL. 17 NO. 6



From all parts of the country—from users in every branch of the recording art—hundreds of reports have come in, commenting on the performance of Audiotape. The typical comments quoted below speak for themselves.

If you haven't tried Audiotape yet, why not see for yourself just what it can do to improve the quality of your tape recordings? Your local Audiotape and Audiodisc dealer will be glad to fill your requirements. Or, write to Audio Devices for a free 200-foot sample reel of either paper or plastic base Audiotape. It will speak for itself.

A Recording Service

"We find that your plastic Audiotape meets our requirements far better than the others we were using. We were bothered with flutter before, but now it seems that our discs we duplicate from tape are of much better tonal quality."

A Sound Consultant

"I have tested the samples on several recorders under various conditions. Both paper and plastic base proved to be as fine as any I have yet used--good frequency range and especially low noise level (inherent)."

A Radio Station

"We find Audiotape to be the best so far obtainable. There is less dust, dirt, and grit accumulation from this tape compared to others--as a result our machine runs at more constant speed."

A University

"We are using No. 1251 to record sound tracks for our educational films. We find the product very satisfactory and particularly appreciate the flat tape that does not hump away from the head in the middle."

A Research Laboratory

"Have found your tape the best for my recorder. Very low noise level and very uniform characteristics are its outstanding qualities. Price is also attractive."

A Home Recordist

"We've compared Audiotape with the tape we've been using and were impressed with the fidelity and low noise level. The output for a constant level 1000 cycle input is remarkably good, showing uniform coating."

A Broadcasting School

"I am happy to report that of several brands of tape tried, Audiotape has the lowest consistent noise level. Over-all response is remarkably consistent for all parts of each reel."

An Industrial Firm

"I find that this tape excels all other makes now on the market in quietness, range, and ease of handling. On the strength of the test sample, have disposed of all other makes and am now using only Audiotape."

A Grammar School

"We have used various tapes in our school work here and really know that yours is second to none. You can expect an order from us shortly."

A Radio Station

"We are very pleased with your Audiotape samples. Noise level very low and quality excellent. We use it whenever a good reproduction is desired. We find your tape and your discs best in the field."

A University

"We are delighted with the plastic base sample and in the future plan to order it exclusively. In speech work fidelity is very important, and we feel that the plastic Audiotape is the best we have tried."

A Radio Station

"Results from tapes tested--excellent. Low noise levels --low distortion. Seems to be less capstan slippage than other tapes. Attractive prices. All future purchases by us will include Audiotape."

A College

"Thanks for the Audiotape samples. We are using your plastic base tape exclusively for the original recording of our radio programs. We find that there is practically no loss dubbing from tape to discs."

A Radio Station

"Excellent tape--much less flutter due to its ability to fit head contours better. All of our new tapes will be Audiotapes."

* *Trade Mark*

AUDIO DEVICES, INC.

444 MADISON AVE., NEW YORK 22, N. Y.

Export Dept.: ROCKE INTERNATIONAL, 13 East 40th St., New York 16, N. Y.

THEY SPEAK FOR THEMSELVES

THE BROADCAST ENGINEERS' JOURNAL

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Volume 17, No. 6 — 135 — JUNE, 1950

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A Message to the Members of NABET

from

JOHN R. McDONNELL
President, NABET

George Maher

NABET

Executive

Secretary

Loyal NABET members can take justifiable pride in their Union as they review the past six months. Few, if any, Unions have had the moral fiber to expose themselves to the hazards, both real and imaginary, of conducting a membership referendum on the question of Affiliation under circumstances as complex (and actually dangerous) as NABET found itself in 1950, and, still find the stamina and resiliency to bounce back negotiate its major contracts successfully within two months after the Affiliation vote was taken. That a degree of confusion and doubt should exist in the minds of some of our members is understandable, but, we can justifiably take renewed hope and confidence in the manner in which the large majority of the membership expressed their preference for NABET as their Union, and, the determined and effective support the bulk of the Network Membership gave their Negotiating Committee. It remains for those of us who have confidence in the future of NABET to reassure those who may have wavered momentarily and to inspire them, by example and deeds, to a new high degree of Union spirit and solidarity. If we are successful in this we need have no fears for the future.

* * *

The Network Negotiating Committee merits the plaudits of the entire Union upon the consummation (and membership ratification) of the Network Engineering Contracts. Negotiations have been long, bitterly fought and exhausting. The Committee never wavered and are to be congratulated upon the consummation of contracts providing not only substantial wage increases (averaging $33 a month in all classifications) but substantial improvements in other phases of the contracts, such as—seniority and working conditions. The Committee, in turn, justifiably feels that their accomplishments would have been impossible without the overwhelming support of the Network Members who, in turn, can take credit for their demonstrations of almost complete solidarity under very trying circumstances.

* * *

As this is written the NABET members around the country are electing their officers for the next term. These Chapter Officers, in turn, become National Councilmen, and, it is to be hoped that the membership will survey their ranks and determine upon officers who will provide strong, effective, NABET-minded leadership in the years to come. It is every member's responsibility to cast his vote wisely. If the democratic processes are to continue to be successful each member must make the most of his opportunity to cast a Union Ballot.

Sincerely,

JOHN R. McDONNELL,
President—NABET.

The negotiations between NABET and the ABC and NBC networks were concluded Friday, May 19, 1950. The Engineering, Traffic & Communications, and New York Sound Effects contracts are signed and in effect. There is no doubt about the effectiveness of the unity of action by the membership in support of the Negotiation Committee.

The new NABET Engineering contracts at ABC and NBC provide for the *continuance* of:

a. A single national contract, with all wage scale and working condition provisions applying uniformly to all offices of the networks;
b. Premium scale for video control engineers;
c. Two-man transmitter watch.

In addition, the new NABET Engineering contracts at ABC and NBC provide for the following distinct gains over the prior contracts:

a. Vastly improved seniority clause, based upon the LIFO principle—last in, first out.
b. Jurisdiction and job function of Television Technical Director and Light Direction Engineer spelled out. Any deficiencies showing up in the TD and LDE jurisdiction is due solely to the fact that this jurisdiction has never before been spelled out, and had been in a nebulous state. The competitive handicap brought about by vastly lower standards at other TV stations was a distinct disadvantage to the NABET Committee which could not be completely overcome at this time.
c. Improved grievance procedure.
d. Severance pay; 1 week salary for each year of service, minimum two weeks salary.
e. Reduction of pay scale escalator from 6 to 5 years.
f. Improved bargaining position at expiration of new contract, which expires October 31, 1951.—the tradtiional "upswing" period of broadcasting business.
g. Greater uniformity between the ABC and NBC contracts, tending to standardize and stabilize the industry, leading toward eventual elimination of the competitive disadvantage claims on the part of management.
h. Wage increases averaging $7.50 per week.
i. Air Credits for Television Technical Directors.

The ABC and NBC Engineering contracts will be published in their entirety in the next issue of NABET's *Broadcast Engineers' Journal*. Plan to pass on your copy to your acquaintances at other stations and networks. Get to know your contract in all its details. These contracts are now being printed in booklet form, and each member will receive a copy through his Chairman in the near future.

In succeeding isssues of our Journal, the Traffic-Communi-

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NABET - ABC - NBC Network Negotiations Concluded in Spirit of Harmony at Hotel New Yorker Dinner, May 19, 1950

Messrs. Perl, NABET Attorney; Ed Stolzenberger, President of the Metropolitan New York Local; T. H. Phelan, NBC New York Division Engineer; NABET Executive Secretary George Maher; ABC New York Engineering Manager George Fisher; Jim Connor, NBC Traffic; Cliff Gorsuch, NABET Business Agent; Co-Chairman DeWitt C. Shultis.

Messrs. Knopfke, Manager NBC Sound Effects; Sam Monroe, Sound Effects Advisor; Ted Clements, AM Advisor; Harry Byers, WJZ Transmitter; Miss Helen Guy, ABC Program Dep't; ABC Engineering Vice President Frank Marx; George McElrath, NBC National Operations Engineer for AM; ABC Vice President Joe McDonald; ABC Engineering Manager Bill Trevarthen; NABET'S Perl and Stolzenberger; NBC P ersonnel Director Ernest de la Ossa.

Messrs. Souhami, NBC Personnel Dep't; ABC Vice President Joe McDonald; Omar Elder, ABC Legal Dep't; Reggie Willcocks, ABC Traffic Manager; Miss Helen Guy, ABC Program Dept; NBC Personnel Director Ernest de la Ossa; Miss Alida Perry, ABC Communications Advisor; James Rynack, ABC Traffic Advisor; Lou Zangaro, NBC Communications Advisor.

Tri-Color TV Picture Tube Development

Development of several types of single tri-color driect-view picture tubes for color television reception is progressing rapidly, and two of the more advanced types will be demonstrated within the next few weeks, Dr. E. W. Engstrom, Vice President in Charge of Research, RCA Laboratories, disclosed to the Federal Communications Commission.

Testifying in the FCC's hearings on color television, Dr. Engstrom outlined a number of specific major improvements and simplifications made recently in the RCA all-electronic, high-definition, completley compatible color system. Substantial progress has also been made in field testing the RCA system, he said, and reports of the results have been filed with the FCC and widely distributed to the radio industry and other interested parties.

Both of the more advanced single tri-color picture tubes developed by RCA research scientists are undergoing tests in experimental model receivers, Dr. Engstrom stated, and they "show an attractive picture with good resolution and good color. The other types of tubes on which we are doing research show considerable promise, although they are not as far advanced in development as the two types which we demonstrated. Within the next few weeks we expect to make this demonstration."

Further Advances Foreseen

Describing RCA's work on single tri-color kinescopes (picture tubes) as a "significant development," Dr. Engstrom said:

"As yet, we do not know which of the several methods of operation employed in these tubes is the best. However, the excellent progress to date makes us confident now of the outcome—a practical direct-view tri-color kinescope.

"Our investigations of receiver circuits for use in connection with a tri-color tube have, of course, been carried out in parallel with the tube development. We feel that this circuit development is straightforward and will provide for further color receiver simplification. For example, only one yoke and deflection system are used, just as in the ordinary black-and-white receiver. In turn, the elimination of two of the three deflection systems needed in the current three-kinescope assembly also reduces power supply requirements.

"With a suitable tri-color tube incorporated in the simplified receiver, we may produce in the not too distant future a fully-electronic color television receiver with but ten to fifteen tubes more than for a comparable black-and-white receiver."

RCA Develops Portable Color Camera

Among other advances reported to the FCC by Dr. Engstrom was RCA's development of experimental portable camera equipment for use in remote color television program pickups. The new field camera will first be used at Princeton, N. J. in color tests of co-channel and adjacent-channel interference. Later, it will be used in field measurements of interference between New York and Washington stations and then moved to Washington for use in RCA's color television field tests in that area.

After describing how RCA had achieved a high degree of color stability in its all-electronic system, Dr. Engstrom revealed that outstanding progress in simplification had been made with "high-level sampling" of colors in RCA receivers. In earlier receiver models, he explained, color sampling of the incoming video signal was done at a low energy level and the output of the sampling circuits was passed through three separate parallel video amplifier channels to the three picture tubes.

"In the new receivers using high-level sampling," Dr. Engstrom continued, "the incoming video signal is first amplified in a single video amplifier channel, and then the sampling is done directly at the kinescopes.

"The elimination of two of the three separate video amplifier channels and the material reduction in the complexity of the sampling circuits have resulted in significant reductions in tube complement."

Simplification Reduces Tube Requirements

As an example of the simplification thus achieved, Dr. Engstrom said that the tubes required for the video amplifier and sampler were reduced from 40 to 16. Even with this accomplishment, Dr. Engstrom said he did not believe that more than a good start in simplification had been made, and that RCA research scientists were looking forward to further significant reductions in tube requirements.

On the subjects of field tests, Dr. Engstrom told the FCC that the RCA color television system had had a total of 853 hours of test operation on the air in Washington between September 18, 1949 and February 20, 1950. While most of the tests he discussed concerned highly technical matters, Dr. Engstrom made the following comment on program acceptance:

"There do not appear to be any system limitations on programming, since such defects as color break-up, color fringing, and flicker are not present in the RCA color television system. In respect to these characteristics and to picture resolution, the capabilities of the RCA color television system are the same as for black-and-white television. However, we intend as a part of our extended field tests to continue to transmit programs of many types and to obtain observations on the results.

"The gamut of colors that it is possible to produce with the RCA receiver primaries compares very favorably with that possible with the best processes of color reproduction and is much superior to most commercial processes."

Wih regard to reception of color transmissions in black-and-white, Dr. Engstrom testified:

"We have had extensive tests of monochrome reception of color transmissions. This was broadened to the whole of the WNBW service area when regular afternoon color programs were started January 9. This color program of one hour a day, five days a week, was designed to test color transmissions, to develop color programs and to develop operator experience. At the same time, the programs have demonstrated that real viewer interest developed for monochrome reception of these color transmissions. Response of the people in the Washington area has been excellent."

The testimony given by Dr. Engstrom concluded with a summary of the information on the RCA color television system made available in recent months to the FCC and the radio industry. This information, he said, was supplied in the form of statements, letters, reports and technical bulletins.

THE BRUSH MULTI-CHANNEL AIRPORT RECORDER

By Dr. S. J. Begun, Vice President and Chief Engineer
The Brush Development Co., Cleveland, Ohio

[EDITOT'S NOTE: *Dr. S. J. Begun, internationally-famed accoustical scientist, is considered one of the outstanding authorities on magnetic recording. His book, "Magnetic Recording," was published last year by Murray Hill Books.*]

To memorize a multitude of simultaneous events for subsequent reference purposes has always been an important technical problem. If such events are in the nature of sound, any one of the various methods of sound recording has to be carefully analyzed for its practical usefulness for such an application. Of the three broad principles of sound recording, namely, the mechanical, optical, and magnetic methods, magnetic tape recording seems to have the most striking advantages. No process is required after recording, prior to reproduction. Many channels can be provided within a limited space. The recording can be made continuous without excessive bulk of the equipment. Any desired degree of fidelity can be achieved, and maybe most important of all, the recording medium can be used over again if the recorded data prove to be of no permanent value.

The multi-channel tape recorder, BK-430, which we have exhibited recently incorporates the most modern thinking in sound recording. On a 7/10" wide paper tape, 4500' long, as many as 14 independent messages can be simultaneously recorded for a continuous period of four hours. Since the paper tape is only two mil thick, a total of 56 hours of recording can be stored in a space of approximately 75 cubic inches. This space is equivalent to that occupied by a cube having sides 4.3" long. The tape is held on ¾" thick reels having a diameter of slightly less than 14". The reels facilitate easy storage and permit simple attachment to and removal from the equipment. The tape moves in a manner similar to that in a motion picture projector, from a supply reel to a takeup reel, passing over a series of recording heads with a speed of 3.75" per second. There are as many recording heads as there are messages to be recorded. The multi-channel recorder provides a fidelity of reproduction which is better than that obtained from the sources which supply the messages.

The primary purpose of this multi-channel tape recorder is to store for later reference all communications between ground and plane. Since the equipment is located on the ground, it cannot have any advance information whenever a pilot wants to communicate with the ground station. Since it has to be ready to accept the full content of the message, it must be in operation all the time. To facilitate such a service, a minimum of two tape transport mechanisms is required. Whenever one mechanism has been in use for approximately four hours and thus comes close to exhausing its own tape supply, the second tape transport mechanism must start operating. It does so in such a manner that for a short period the same message is recorded on the end of one tape and at the beginning of the other. A feeler associated with the supply reel inspects continuously the amount of tape available and automatically initiates the operation of the next unit when it senses the end of the tape supply.

Though each tape transport mechanism and all of its associated mechanical, as well as electrical components, are designed with an eye on reliability and sturdiness, there is no man-made device which for one or the other reason might not fail. To assure the utmost in reliability, a third standby tape transport mechanism is usually provided which will automatically take over if for any one reason failure should occur to either or the other units.

The messages from the communication receivers are fed to as many independent recording amplifiers as channels are in operation, and are supplied from these recording amplifiers with an appropriate level to the individual recording heads. Particular attention has been given to the design of the electronic equipment, since it has been fully recognized that the reliability of the instrument depends upon the strength of every element of the device. All amplifiers are fed from a common power supply with a standby power supply constantly ready to take over automatically if the operating power supply should break down. Two amplifier channels are always combined in one easily removable chassis, each channel having a magic-eye tube which continuously indicates its proper operation. If failure occurs, the chassis can be easily removed and can be replaced in a matter of seconds by a spare chassis which is part of the equipment.

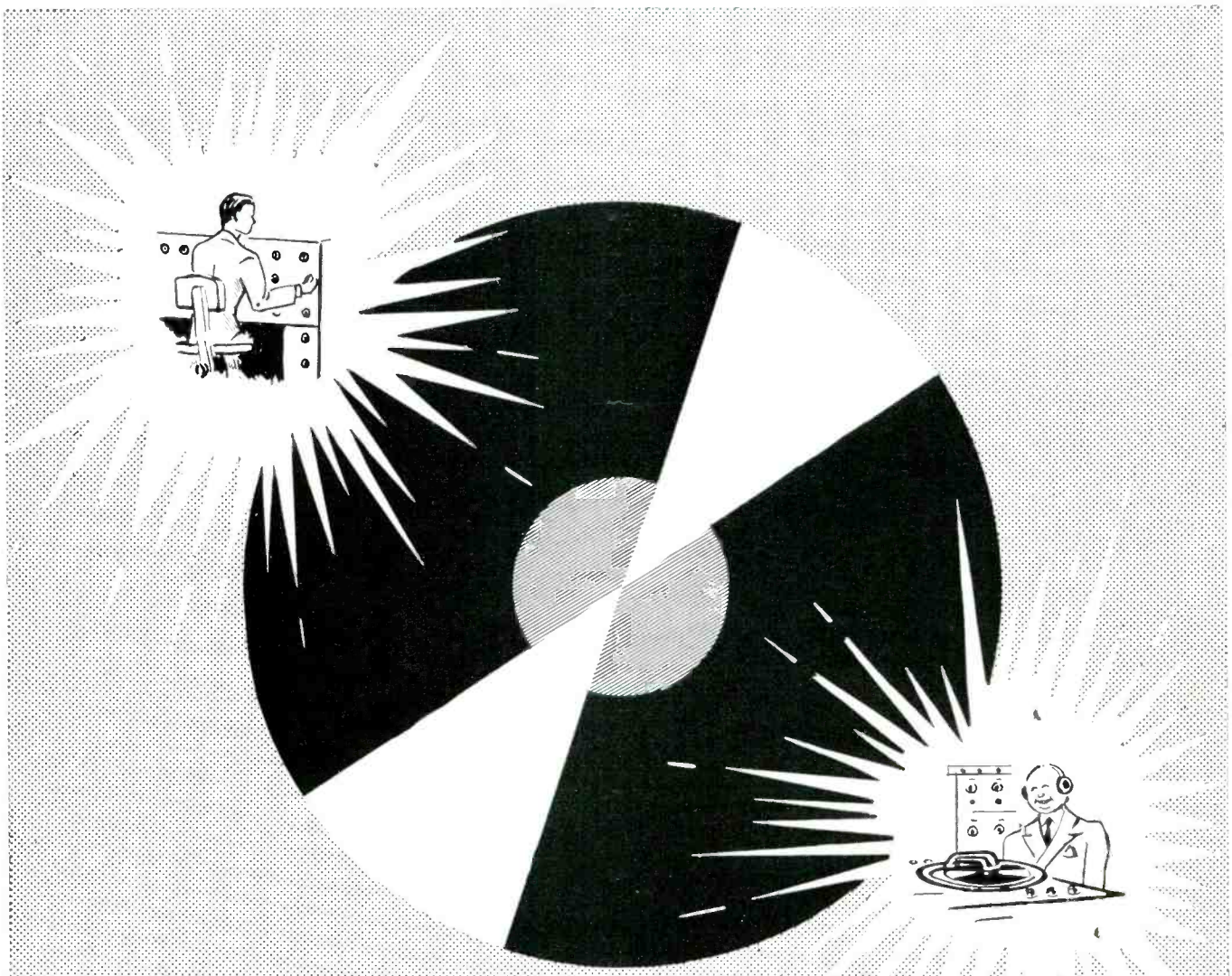
In the normal mode of operation an attendant has to serve the equipment for the purpose of changing the reels only once every eight hours. Otherwise, no particular attention has to be given to the device.

The recording of all of these messages is a safety measure, and the chances are that they will only be reproduced in case of a mishap. For reproduction, a fourth tape transport mechanism is provided which is associated with two playback amplifiers. Each of these can be connected to any one of the fourteen channels. Thus, it is possible to listen simultaneously to two recordings which have been made at any one instant and correlate the respective times to the events. Since the playback units will only be rarely consulted, the design is such that the drive mechanism of the reproducer can easily be used to replace any recording tape transport mechanism for maintaining program continuity.

A few words might be in order about the economy of such an installation. To maintain the equipment in operation requires approximately 500 watts. It is usually considered satisfactory to keep recordings for approximately 15 days, after which period the recording can be erased, and the tape can be used again. A total of 90 tape reels is required for each installation. Since tape will give satisfactory service for a period of at least five years, three-tenths of a cent per hour per channel will completely amortize the initial investment for the recording medium. Approximately .5 cents per hour per channel will amortize the total initial cost of the equipment.

While the multi-channel recorder has been built primarily for monitoring of ground to air communication, it should have many other applications. The instrument could effectively be used for monitoring of radio programs; it could be used for the recording of extensive conferences such as take place in the U. N. sessions where it is important to keep a record of the same speech in various languages; it might be used for recording of simultaneous telephone conversations, and in many other fields.

Before closing, it might be pointed out here that emphasis has been laid upon flexibility. Any combination of transport mechanisms might be employed, depending upon the application. If a total of four hours' continuous recording is all that is needed, one tape drive with amplifiers will do.



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Review of Current Technical Literature

By Lawrence W. Lockwood

Audio Engineering—Jan. 1950

The Bantam Velocity Microphone—L. Anderson, L. Wigington

Design details for a miniature velocity microphone are discussed by the engineers who developed the KB2C.

Sterophonic Reproduction—T. Lode

Simple method for simulating sterephonic effect with a single channel radio or phonograph system.

A Loudspeaker for the Range from 5 to 20 KC.—B. Smith, W. Selsted.

Full design information on high fidelity speaker.

Recording Characteristics (Pt. 2)—C. McProud.

Frequency content of a normal musical or speech program permits the use of pre-emphasis to increase signal to noise ratio.

Longitudinal Noise in Audio Circuits (Pt. 1)—H. Augustadt, W. Kannenburg.

A discussion of the general effect of the presence of longitudinal noise on a transmission circuit, with a description of the differences between metalic circuit noise and longitudinal noise.

Audio Engineering—Feb. 1950

An Improved Audio Frequency Phasemeter—O. Kruse, R. Watson.

Description of an instrument designed to measure accurately the phase difference between two audio signals of equal or differing magnitude.

The Cathode Follower Output Stage—R. Mitchell.

Summarizing the advantages and disadvantages of a much discussed circuit arrangement which has many zealous adherents.

The Measurement of H-P Filter Characteristics—W. Neuman.

Methods employed in making measurements on filters may introduce errors unless the signal source is a pure sine wave. The author shows how to make allowances for these errors.

Magnetic Recording of Meter Data—R. Zenner.

Recording equipment normally employed for sound may often be used to advantage as an aid to various types of instrumentation.

Longitudinal Noise in Audio Circuits (Pt. 2)—H. Augustadt, W. Kannenberg.

Pt. 2 of series shown above.

Communication News—Oct. 1949

(House mag. of Philips Industries, Holland.)

A Graphic Procedure for Calculations Involving Transmitting Line Systems—A. de Onis.

This paper describes a graphical procedure for various calculations on transmission line systems involving such usual devices as matching stubs and transmission line transformers. Also existence of symmetric branches is considered.

FM-TV—Jan. 1950

A New Sound Effects Console—E. Beal.

It can provide sound effects for video and audio programs which are beyond the capabilities of ordinary turntables.

FM-TV—Feb. 1950

Attenuation Due to Rainfall—H. Bus.

A method for predicting probable duration and magnitude of microwave attenuation, employing available statistics.

Use OF DC Level Controls—E. Noll.

Why it is necessary to vary the DC level of video signal information, and how this control is accomplished.

Studio Tape Recorder—W. Pauly.

How problems of mechanical design have been met in the Presto recorder.

Practical Wireless—Jan. 1950 (British Pub.)

London Birmingham Television Radio Relay Link

Full details of the new layout and circuits.

Proceedings of the IRE—Jan. 1950

Service Engineering for Television—E. Ecklund

A discussion the approach to proper service engineering.

Radio Propagation Variations at VHF and UHF—K. Bullington.

A discussion of the variations of received signal with locations (shadow losses) and with time (fadings) which greatly effect both the usable services area and the required geographical separation between co-channel stations.

The Dynamic Sensitivity and Calibration of Cathode Ray Oscilliscopes at Very High Frequencies—H. Hollmann.

The drop in sensitivity of a cathode ray oscilloscope at very high frequencies is investigated through the extension of the simple inversion formula by introducing the exit displacement as well as the addition deflection in the stray fields.

Two Simple Bridges For Very High Frequency Use—D. King.

Design features and sample performance characteristics are given for both units over the 100 to 500 mc range.

A Coupled "Coaxial" Transmission Line Band Pass Filter—J. Karakash, D. Mode.

This paper describes a band pass filter in which the coupled elements consist of a shielded pair of cylindrical conductors.

Wide Angle Metal Plate Optics—J. Ruze.

The design equations for constrained metal plate lenses are derived.

Speed of Electronic Switching Circuits—R. Williams, D. Aldrick, J. Woodford, Jr.

Methods of analysis of electronics switching circuits are described which lead to determination of triggering delay and switching wave forms.

Design Factors in Low Noise Figure Input Circuits—M. Lebenbaum.

The use of double tuned circuits in the inputs of high frequency amplifiers often results in achieving better noise figures than if the simpler single tuned network were used.

TV Engineering—Jan. 1950

Trends in TV Receiver Antenna Design—I. Kamen.

Critical analysis of eight types of antennas found to represent trends for 1950.

Germanium Diodes For UHF TV—F. Lingel.

Crystal type mixer liodes, featuring welded whiskers developed for 475-890 mc band converter unit applications.

Measurement of Transient Response of TV Receivers—J. Van Duyne.

Description of test methods found ideal for plant checking of electrical fidelity or picture quality of TV sets.

KBTV Dallas, Texas—B. Sadler, M. Zimmerman.

Detailed report on design, installation and operation of Channel 8 TV system in one of the largest cities in the southwest.

TV Camera Tube Design—A. Lytel.

Mechanical electronic and optical characteristics of nine types of pickup tubes which have been developed during the past twenty years.

Underwriters Laboratories Requirements for TV Receivers—K. Geiges.

Discussion of UL standards developed to eliminate hazards of fire and shock.

Tele Tech—Feb. 1950

Directional Antenna Systems For Microwave TV (Pt. 1)—C. Rosencrans.

Operating notes and formulae for determining power, gain, beam width, radiation patter and other important characteristics of TV microwave relays.

Audio Technics For Television—C. Cole.

Varying camera field dimensions and problems of acoustic interference present challenge to audio researchers in search for new electronic controls.

New One Tube Limiter Discriminator for FM—(Pt. 2)—A. Haase.

Description of multiple uses of 6BN6 grated beam tubes.

An Asymmetrical Horizontal Scanning System—R. Thalner.

Use of direct drive for horizontal scanning introduces difficulties in obtaining linear deflection. Properly designed correcting yoke coil makes linear scanning possible.

GEO. MAHER—From Page 2

cations, and Sound Effects, contracts with ABC and NBC will be discussed and published.

If there are questions as to the meaning of any clauses in the new contracts, we shall appreciate your contacting the National Office.

It is incumbent upon all Chapter Chairmen to strictly enforce and adhere to the contracts.

NABET has again proved its effectiveness in the broadcasting industry.

GEORGE MAHER,
Executive Secretary.

See next issue for compete network contract.

WASHINGTON

By W. D. DEEM

First of all I want to introduce James D. Martyn, a comparatively new man. During the war James served with the U. S. Coast Guard. After the war he took a position with the Mutual Phone Co. of Honolulu. After that followed a tour of duty as Chief Engineer for the Voice of America's 100 KW transmitter for the State Dept. in the islands. Early in '49 he was back in the States located in Philadelphia at Station WFIL. His home is in Reading, Pa. In April of '49 he designed and helped build Station WWPA in Philly. James is now a Group 2 engineer at the WNBW transmitter. He is married and is the father of two boys. When he settles the housing problem for his family he will again be active at his hobby, that of amateur radio. His call letters are W3KIB.

Art Redfield of the WNBW rainbow crew, done went and purchased himself a brand new yellow convertible. Naturally it would have to be something strikingly colorful, he being in Color Television. The car has beautiful white sidewall tires and the first day he had the car he scraped one of them at the curb in front of his house and anyone passing could see him out there, brush in hand, scrubbing them down at 11 P.M. Art paid cash for the car and the aristocrat is at present enjoying a three weeks vacation in Florida. Who said that NABET isn't a good Union? Rah! Rah! NABET!

Leon Chromak of the WNBW color crew has been given credit for an idea that has saved the camera crew time and effort. It is a method of "burning off" the camera after and alignment period. The color cameras of the RCA system take a little longer to line up than do the present black and white cameras and in the process some burns might occur. To get rid of these burns Leon has suggested a white pull-down shade that fits over the RMA pattern and going a step farther, when the shade is pulled down 20 inches more a registration chart comes into view. This is the chart used to register all three tubes so that they all see the same picture over the area of the raster. It is composed of inch squares, the overall size being that of the RMA pattern.

Wally Bush came up with a classic statement one day while he was on one of the cameras that had a view finder that wasn't up to par. He summed it up by saying "I'm not out of focus, I'm just going to the point of least de-focus."

Mel Ward, formerly of station WOL is now at WRC as a Group 2 engineer. Also new downtown at WRC is Harold Green, formerly of WFVA in Frederick, Md. From WEAM in Arlington, Va., comes Wm. Brewer. Nabet is happy to have these men with them.

WOIC reports that the District Commissioner has classified their location as commercial paving the way for expansion of their studios and other improvements.

Leo Pitts is a new engineer at WOIC. He is a former flying technician with TWA Airlines and is now learning shading, camera and other duties at the WOIC Studios.

The Washington WNBW field crew, namely Dodd Boyd, John Rogers, Jim Martinson, Vern Swiger, Vern Ingersoll and Mac McCollom, received a thank you letter from Mr. F. A. Wankel in New York for the nice job they did televising the Easter Parade from New York. Mr. Adolph J. Schneider also sent congratulations. He mentioned especially the work Vern Swiger did on the zoomar lens camera.—73's Warren D. Deem.

The NBC Color TV Crew in the studios at the Wardman Park Hotel. Smiling from left to right (standing) are: LEON CHROMAK, video engineer; DAN HUNTER, RCA Engineer and also an inactive member of NABET; BILL WELLS, video engineer; WM. VOSSLER, audio engineer; HOWARD DUHAMEL, lighting engineer; JIM MELINE, cameraman; ART REDFIELD ,audio boom "A"; WARREN DEEM, cameraman; "SMOKEY" STOVER, audio boom "B"; and seated from left to right are JOE DONAHOE, dollyman; and WALTER GIBSON, RCA Engineer.

On this page, to go with this picture, is a poem that should present a fitting title to these gentlemen.

"THE RAINBOW DIVISION"

At the start of the day,
The pictures are Maroon,
But they shape up nicey,
Along about noon.
A touch of gain on the Red,
More skew on the Blue,
A little shading on the Green,
To give a better hue.
With this spectrum of color,
It's best to envision,
That we must be a part,
Of the "Rainbow Division."

DETROIT

By WALT BAKER

Everywhere we look around the Detroit Chapter, negotiations seem to be in progress. Here at WWJ the first round has been completed, and at last week's general membership meeting the committee was instructed to return and beat it around some more.

We are pleased to report that negotiations have closed at WDET, the CIO-owned station, and the contract is ready for signature. Terms of the contract are similar to WJ's, with the added advantage of a three year escalator. The boys will profit immediately by a $15 raise which amounts to a 25% increase.

Other bargaining bouts include WLAV, Grand Rapids; WJBK, Detroit, and WKMH, Dearborn. The Flint, Mich. stations still are waiting their turn. Which by the way, is a type of situation that keeps the boys in the National Office so busy.

We here at WWJ have adopted an old service attitude—remember when you used to say, "I'll believe it when I see it?" Well, that's us! And it finally happened here. The other day management woke up to the awful truth that the only way they could make more money was to increase their on-air time. But since facilities were already working to the limit they found to their horror that they would have to buy more equipment and hire more men to handle the added programming. As a result, NABET Detroit is richer by seven new members. And WWJ-TV now has a new two-camera RCA studio chain, another master sync generator, and one of the newest RCA stabilizing amplifiers (our third 'sync stretcher!).

As for the new members, we shall introduce them briefly: In the AM dept. are, Bill Sabo from WCAE, Pittsburgh, and Bud Gould.

In the TV dept. we have, Dick LeClerc from ABC-TV in New York, Sid McMullon by way of KADA Ada, Okla., and RCA Institute, Don Balcom of WJR, Detroit, and Bill Potter from WIBM, Battle Creek.

The hiring of men for AM was due to the fact that two former members of the dept. who came over to TV had to be replaced. This gave rise to a rather amusing situation.t Management has always hired new men. Last year, however, an agreement was wrested from them during negotiations that in the future for every three men hired into TV, one AM man would be transferred.

When the hiring began, management, reluctant to the last, refused to reveal the chosen ones until the last minute. Which all leads up to the fact that two pools were formed and a very lucrative time was had by some.

Well, we've heard some mighty strange stories knockin' around the studios lately but this month's prize winner involves a non-technical publicity man who was getting too great a signal on his receiver. Having heard some of the engineers talking about putting in an attenuating pad to correct the situation, he diligently tracked down one of the supervisors and asked him if a little sponge would do the trick!

That's all 'til next time.—Walt Baker.

ST. LAWRENCE

By ALEEN A. CORBIN

Elections are the main topic this month around WWNY and WMSA. The stations pick their new chapter representatives about the middle of this month. Things aren't quite the same as they were last year. At this time then there were probably a half dozen who would have taken the job and two who ran neck and neck right down to a photo finish, with the chapter split right down the middle behind them—just like a good old-fashioned political election. However, if this year is noteworthy for anything, it is for the dearth of candidates. David Lane, who is now chapter chairman, has done a bang-up job in that position. However, he has occupied it for almost three years, and it is understandable that he should want, and need, a rest. I don't doubt, though, that when the election returns are in, the one receiving the majority will assume his duties with a deep sense of responsibility. For such a small chapter, it is pleasing to note that we do have several fellows of rather outstanding ability, who can always come through in the pinch.

William and Anne Walck welcomed their first baby, a boy, William J., in mid February. Already the kid has earned a couple of extra bucks for his dad. Bill is the census-taker in Black River, and every name he enters on his rolls means a larger pay check from Uncle Sam.

Vacations got off to an early start this year. I was in New York for two weeks the last of May. I had a great time making the rounds of the theatres and foreign movies that don't come to towns the size of Watertown. Bill Walck took Anne and the baby to Pennsylvania to see his folks the first week in May. Glenn and Anne Hall took Carolyn and went to New York for their fourth wedding anniversary to visit Anne's people. And Bob Bouchard took his lovely wife and two small, very active sons to Boston for his fourth anniversary. Frances Bouchard had a great time attending a class reunion while she was there, and Bob amused himself by going out to watch the Red Sox and the Braves. From somewhere Bob has got the ridiculous notion that the Red Sox are going to win the pennant this year. I don't know where he got it, and he persists in keeping it, no matter how many times I tell him the Yankees are going to do a repeat this year. They sure looked fit while I was there.

Last month the chapter was faced with a very interesting problem that arose from our having a tape recorder. As some of you may know, John Foster Dulles, the newly appointed advisor to Dean Acheson, is a native of this area. Before assuming his new duties and immediately after his appointment, word was received here that he was coming for a rest to his summer home. This was a good two

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LABOR - MANAGEMENT NEWS

The Secretary of Labor Says:

We shall not have social peace until we have approached more closely the objective of economic justice, and we cannot have economic justice until machinery and trade become subject to the rule of conscience. That means a new birth of freedom without violence or expropriation. That means making private enterprise the servant, and no longer the master, of human society.

That calls for a liberty which is economic as well as political. It calls for a genuine equality of the poor and the rich in terms of the fundamental satisfactions which our technical and material progress has made possible. It calls for the active participation by the State in making sure that the cards are not stacked against any group or class or individual in America.

I know that in the field of labor relations there is much more cooperation and understanding than most Americans realize after reading the newspaper headlines. The countless agreements which are quietly worked out are not brought home to us. A conspicuous dispute shocks and shakes us because we make the mistake of assuming that it is an expression of the rule and not the exception in labor-management relations.

The worker has won his own place in the modern world because he is sharing more and more widely in the benefits of economic justice. That makes private enterprise stronger by eliminating its maladjustments.

Employee Benefit Plan Review

Expanded Social Security retirement benefits are anticipated under new pension agreements recently concluded with unions by two subsidiaries of the Sinclair Oil Corp. and the Goodyear Tire & Rubber Co.

Sinclair Refining Co. and Sinclair Oil & Gas Co. have agreed with Oil Workers—CIO on a jointly financed pension plan providing a minimum of $125 a month, including social security. The agreement is conditioned by the following provision:

"That the Federal Social Security Act is amended by HR 6000, or its substitute amendment, to become law on or about July 1, 1950 so as to provide for increased primary benefits of not less than approximately 70% of the primary benefits provided for under the existing law."

Goodyear Tire & Rubber Co. has agreed to a $100 a month minimum, including social security, non-contributory pension plan for employees with 25 or more years' service under a contract with United Rubber Workers—CIO. Benefits start at 65. The plan is effective April 1. The basic monthly pension is 1% of total earnings divided by 12. If the 1% formula exceeds $100 a month, Goodyear pays the difference between that amount and social security. For example, if total earnings are $122,500, 1% divided by 12 is $102. Assuming social security is $45, Goodyear pays $57 to bring the total to $102.

If social security benefits are increased, 50% of social security will be added to the 1% formula as figured above. For example, if the 1% formula divided by 12 equals $102 a month and the new social security benefit is $76 a month, the retired employee gets $102 a month plus $38 (half of $76) or $140. Of this amount $76 comes from social security and Goodyear pays $64.

If an employee becomes disabled after 15 years' service, he gets a pension based on the 1% formula with a $50 a month minimum. There are also early retirement provisions for employees with 20 years' service after they reach 55.

Goodyear will also pay the entire cost of group life insurance, formerly on a contributory basis. Benefits are on an earnings schedule but will average about $3,200. At retirement, half the amount of group life will be continued with a $1,000 minimum.

SEVERANCE BENEFITS UNDER PHILCO PLAN

The introduction of severance benefits in the new $100 a month, including social security pension plan negotiated by the new Electrical, Radio & Machine Workers—CIO union and the Philco Corporation of Philadelphia brings up a new phase in union negotiated plans. In a bulletin to members, James B. Carey, chairman Electrical Workers, points out that the Philco plan "will most likely be the basis of our demands in the pension field."

Mr. Carey asserts that the Philco plan "is unique in the history of industrial pensions. For the first time, it commits a company to the idea that a worker is entitled to be paid for his years of work when he quits before retirement." He points out that approximately 45% of the Philco employees at Philadelphia are women, "who will obviously not remain with the company until retirement age."

Provisions Are Outlined

Although Philco's 8½c an hour contributions to the plan started Jan. 1, details have not been worked out. Mr. Carey outlined the severance provisions as follows:

"1. Our estimates indicate that 6c out of the 8½c an hour now being set aside by the company can go into an individual's account. We hope that the final plan will be similar to the CIO plan in effect at national office. This provides for investment in E Bonds of all contributions to an individual's credit. This would provide for automatic severance pay and death benefits.

Present Another Problem

"2. Those with close to 25 years service but still in their forties or fifties present another problem. We hope that within a few years arrangements can be made to provide these persons an actuarially adjusted pension at age 55 after 25 or more years service. This will be taken up with company actuaries as details of the plan are worked out.

"We hope to have approximately 70% of the company's contribution set aside to the credit of the individual worker, either in E Bonds or through some other method. This would mean that persons quitting 10 years after the plan went into effect would be entitled to bonds with a matiurity value of $1,670 or to the same amount under a different type of investment. Persons with 20 years service would be entitled to bonds with a maturity value of $3,880," according to Mr. Carey.

"Death benefits which are integral part of the plan" are given for the following ages with the maturity value of bonds if person dies at age 65:

Present Age

55	$1,670
45	$3,880
35	$6,800

"Company actuaries estimate that pension costs alone will amount to about 6c an hour," Mr. Carey points out. "Our figures for a pension and severance pay plan, tied in closely together as one plan, indicate that 8½c an hour should be sufficient to provide for an adequate pension, severance pay at the rate of 6 cents an hour for all permanent employees, and similar death benefits."

Retirement Provisions

Pension income for persons with 25 or more years seniority at age 65 will be $100 a month, including primary social security. Arrangements will be made for persons with less seniority to be retired at a proportionate income. "We hope to provide pensions for persons 65 and over who have as little as 5 years seniority. For persons under 60, we hope to permit retirement at 65 with a minimum of 10 years seniority," Mr. Carey states.

"For the first time in recent years, the CIO union in the electrical and radio industry is working closely together with CIO unions in steel and auto. The Philco workers got their pension and severance pay plan because the steel workers went out on strike for a pension plan and because the auto workers fought for the Ford pension plan. We took advantage of the best provisioins of the steel and auto plans and improved these provisions with the severance pay and death benefit angles. Already we have been told that the newest steel pension plans are incorporating aspects of the Philco pension plan. We are certain that with the new and vigorous alliance of the CIO unions in steel, auto, and the electrical and radio industries, CIO workers and workers throughout the nation will march forward to increased security and self respect," Mr. Carey, who is also vice-president of the CIO International, states.

U. S. STEEL ESTIMATES PENSION COSTS

U. S. Steel Corp. estimates that the cost of its new pension and insurance plan will be $78,000,000 a year compared to $10,500,000 it has been spending. Future service pension costs are estimated at 4.79% of payroll or $42,600,000 million a year. Past service pension liability is estimated at $560,000,000. As U. S. Steel has $64,000,000 in its old pension fund this will leave a net past service liability of $496,000,000. Interest of $12,400,000 will be paid annually on this liability. Added to the future pension costs the total cost will be $55,000,000 a year. As costs under its contributory plan will decline from $4,500,000 to $4,000,000 a year, this $500,000 savings will leave a net annual pension cost of $54,500,000.

U. S. Steel will continue its contributory pension plan, in effect since 1940, with future participation limited to those employees not entitled to overtime pay.

Although its contract with United Steelworkers—CIO extends pension benefits only to employees who have retired since March 1, 1948, U. S. Steel will extend benefits to employees retiring prior to that date.

Group insurance costs will be increased from $1,000,000 to $14,000,000 annually, it is estimated.

JOHNSON & JOHNSON REVISE PENSION PLAN

Minimum pensions of $100 a month at 65 after 30 years' service are provided under the revised pension plan of Johnson & Johnson, New Brunswick, N. J. Vesting provisions will enable employees after 15 years' service to retire as young as age 45 with reduced benefits. Employees will contribute 2½% on first $3,000 of earnings, 5% over $3,000 with a $20,000 top limit. Retirement income is based on 1% of pay up to $3,000, 2% of excess. Past service will be computed at 3/4% of future service allotment. New employees are eligible after three years but must be at least 30 years old.

The new plan will be administered by a six-man joint labor-management committee and will cost approximately $3,000,000 in retroactive benefits with current costs estimated at around $1,000,000 a year.

SINCLAIR PLAN DETAILS ARE ANNOUNCED

Expanded pension and insurance benefits are provided under a new agreement by Sinclair Refining Co. and Sinclair Oil & Gas Co. with Oil Workers—CIO, effective July 1. In addition to agreeing upon a $125 month minimum retirement income contingent upon the passage of a bill expanding social security benefits, the pension plan provides for the vesting of 50% of the past and future service annuities after 10 years' service. Vesting is increased at the rate of 5% a year until it reaches 100% with 20 years' service. If the participant becomes totally and permanently disabled after 15 years' service, his service credits becomes 100% vested and prorated benefits are payable immediately.

The $125 a month retirement income minimum, including social security starts at 65 after 20 years' service and those with 15 years' or more service are elegible for retirement income at 65 on a proportionate basis. There is an early retirement after 55 provision under mutual agreement. The "lay-off" provision in figuring continuity or service has been extended from 180 to 365 days.

Employees will continue pension contributions on the same schedule as provided under the old plan.

Eligible Age Lowered

Eligibility requirements are now age 25 after five years' service or age 35 and over after one year service. The later alternative was formerly the sole requirement. Employees now eligible for the first time and those who previously had not elected to participate will be eligible to join and will be allowed full past service credits.

Under the accident and sickness provisions of the new plan, 58% to 62% of full pay will be paid up to 52 weeks in case of disability. An accidental death and dismemberment benefiit of $1,000 covering both occupational and non-occupational accidents is provided. Employees receive $8 a day and dependents $6 a day hospitalization benefits up to 70 days. Miscellaneous hospital expenses are 10 times the daily room rate. There is a $225 maximum surgical schedule for employees and $180 for dependents. Physician attendance at $3 a day with a $93 limit is provided during hospital confinement. Maternity benefits for employees and dependent wives are $50 to $150 with $100 for normal delivery. The monthly cost of insurance to employees is:

Annual Wage	*Single*	*With Wife and children**
$1,000-$2,999	$1.55	$3.65
$3,000-$3,999	1.80	3.90
$4,000-$7,499	2.15	4.25
$7,500 plus	2.50	4.60

*Same rate for wife only, 50c a month less for children without wife.

Five Year Pension Contract

Pension benefits can't be changed prior to June 30, 1955 and a 90 day notice to bargain on changes is required after April 1, 1955. A similar provision is provided for insurance benefits, except that agreement runs only two years or to June 30, 1952. The agreement is subject to ratification by union membership and company stockholders. The union's Sinclair Nation-Wide Council has approved the plan.

WAGE AND HOUR QUESTIONS RAISED

Questions have been raised regarding the exclusion or inclusion of benefits under profit-sharing and pension plans in estimating overtime under regulations issued in connection with the amended Federal Fair Labor Standards Act. Several attorneys who specialize in wage and hour legislation raised the following questions. They were submitted to William R. McComb, Administrator, Wage and Hour and Public Contracts Division, U. S. Department of Labor, Washington 25, D. C. by the editor of the Employee Benefit Plan Review as follows:

Questions Asked Commissioner

"If a profit-sharing retirement plan qualifies under Section 165 (a) of the Internal Revenue Code, does it have to provide for immediate vesting so as to meet your profit-sharing requirements under Section 7 (d) (3) (d) Part 549.1 (e). If so, can it qualify instead under 7 (d) (4)?

"Does Sect. 7 (d) (4) and your interpretations apply to all retirement plans qualified under Sect. 165 (a) IRC? If so, does the requirement that payments be made to a single trustee or a majority of trustees not officers, affiliates or representatives of the employer apply to pension plans where the money is invested in life insurance? Many small pension plans qualified under Sect. 165 (a) IRC have provisions requiring trustees to invest contributions of the fund in life insurance or endowment policies on lives of employees and have one or several company representatives as trustees. Will it mean that such plans will have to arrange for outside trustees?"

Commissioner Replies

Mr. McComb replied as follows: "The administrator's position of when an employer's contributions to a welfare plan may be excluded from the regular rate of pay is similar to that of the Bureau of Internal Revenue in determining what constitutes wages for social security tax purposes. from the category of wages under Section 1426 (a) (2) of the Federal Insurance Contributions Act and Section 1607 (B) (2) of the Federal Unemployment Tax Act they would not be regarded by the administrator as part of the regular rate of pay under Section 7 (D) of the Fair Labor Standards Act as amended. Contributions to such welfare plans are not a part of the regular rate of pay regardless of whether they meet the tests of the regulations relating to profit-sharing plans under Section 7 (D) (3) (B) of the Fair Labor Standards Act.

"The profit-sharing regulations do not relate to or affect contributions irrevocably made by an employer to a trustee or third person pursuant to a bona fide welfare plan."

DU PONT PROPOSES HIGHER PENSION PAYMENTS

An increase in pension payments at all levels without additional cost to employees is proposed by E. I. du Pont de Nemours & Co. A $100 a month minimum, including social security, starting at 65 after 25 or more years service, is provided. It is estimated that employees averaging over $200 a month for the last 10 years will exceed the minimum. For example, a 25 year service employee averaging $250 a month will get $113.75 a month total retirement income while a $300 a month employee will receive $127.50 per month. The plan will be made retroactive to around 3,000 pensioners now receiving checks. The proposal is subject to ratification by stockholders at their annual meeting in April and will become effective May 1, if approved. Prorated pensions will be paid those retiring at 65 after 15 years' service. Employees can elect to retire at 60 if they have 30 years' service and they must retire at 65. The original plan was adopted in 1904 and approximately 400 employees retire on pensions each year.

DEADLINE is 2nd OF EVERY MONTH. EXAMPLE: COPY RECEIVED MARCH 2nd APPEARS IN THE APRIL ISSUE, IN THE MAIL APRIL 1st.

Heading Cuts for Chapter news columns. Chapters without regular heading cuts and desiring same, should send in photo, cartoon, or drawing of subject matter that they wish used to identify and distinguish their column.

GLASS COMPANIES AGREE ON $100 A MONTH PLANS

Pittsburgh Plate Glass Co. and Libbey-Owens-Ford Co. have signed a $100, including primary social security, minimum pension agreement with Glass, Ceramic & Silica Sand Workers—CIO, effective May 1. It is non-contributory plan. Payments start at 65 after 25 years' service. The minimum pension formula is based on $4 per month for each year of service from 15 to 25 years plus $1 per month per year over 25 years and up to 50. Participants who become disabled after 15 years' service will receive 75% of retirement income up to age 65 when benefits will be refigured. After May 1 service requirements will be met if the employee works at least 135 hours a month. Layoffs or leaves of less than five years will not constitute a break in service. The plan is retroactive to employees retiring since May 1, 1949. No changes can be made for two years. The companies can cancel with 60 days notice in 1953 and 1954 and both sides can cancel after 1955. Accident and sickness benefits are increased from $15 a week for 13 weeks to $26 for 26 weeks.

Corning Glass Works, Corning, N. Y. has agreed to a non-contributory $100 a month minimum pension, including social security, in a contract with American Flint Glass Workers. It covers those receiving pensions under the present plan.

ALLIS-CHALMERS OFFERS $100 A MONTH PENSION

A $100 a month pension plan, including social security, is offered employees by Allis-Chalmers Manufacturing Co., Milwaukee. It would start at 65 after 25 years' service and would be made retroactive to around 300 employees who have retired since Dec. 1, 1942. Proportionate benefits are provided for those with less than 25 years' service. Early retirement after 60 and $50 total disability retirement after 55 is provided. Automatic retirement at 68 is provided but no one is subject to this requirement until after the plan is in effect one year.

KROGER UPS RETIREMENT BENEFITS 50%

Kroger Co., Cincinnati, has increased benefits under its non-contributory retirement plan by 50%. The maximum number of years which can be counted for retirement purposes has been increased from 35 to 40. The eligibility age has been reduced from 30 to 35. Both minimum and maximum retirement income limits have been doubled. All benefits are in addition to social security. Retirement income is payable starting at 65 after at least 15 years' service at the rate of 3/4 of 1% of first $3,000 plus 1½% of excess on average earnings for last 10 years. All benefits are in addition to social security.

GROUP BENEFITS UNDER NEW STEEL PLANS

Group insurance benefits provided by Bethlehem Steel, U. S. Steel, Allegheny-Ludlum, Great Lakes Steel and Superior Steel under agreements with United Steel Workers have been announced. Life insurance prior to retirement ranges from $2,000

to $4,500 with a flat $26 a week for accident and sickness, except under the Bethlehem plan which provides $1,500 life and $24 a week accident and sickness for those earning less than $1.07 an hour. The other companies are providing for the $2,000 life, $26 a week accident and sickness for all employees earning less than $1.29 an hour.

The group life schedule follows:

Less than $1.29	$2,000
$1.29 but less than $1.57	$2,500
$1.57 but less than $1.86	$2,500
$1.57 but less than $1.86	$3,000
$1.86 but less than $2.15	$3,500
$2.15 but less than $2.43	$4,000
$2.43 or more	$4,500

At retirement each participant will receive $1,250 paid-up life insurance.

Hospitalization benefits are provided up to 70 days on a service basis under the U. S. Steel and Bethlehem plans.

Insurance and hospitalization benefits are financed by a 2½c an hour contribution by the employer plus contributions by the worker. Contributions under the Bethlehem plan will range from $2.90 a month for those without dependents to a maximum of $4.40 a month. For those with dependents the rate will be $4.15 to $5.65. The U. S. Steel scale will be slightly lower as the company has had a group plan and its rates can be based on actual experience. Additional life insurance, ranging from $1,000 to $2,250 can be purchased by U. S. Steel employees at 90c to $2.05 a month.

UNION CONTRACT REPORTS

Automobile-CIO—Chance-Vought Aircraft, Dallas: Contrib. ins. plan to replace employee pd. plan. Contrib. pens continued. Dart Truck Co., Kansas City: Co. pays 5c hr. ot welf. Marlin Rockwell Co., Plainfield, Conn: 7c hr. co. pd. pens. United Aircraft, Hartford, Conn: Add'l ins. Wright Aeronautical Corp., Woodbridge, N. J.: Co. pd. $1,000 life, surg. for employees, hosp. and med. includ. dependents.

Bakery and Confectionery-AFL—Rockwood & Co., New work: Add'l 2½s hr. welf.

Bridge, Structural and Ornamental Iron-AFL—Empire Structural Steel Co., Syracuse, N. Y.: Hosp. and ins.

Building Service-AFL—Calvary Cemetery Assn., St. Louis: Co. pd. pens. at 65 after 20 yrs. ser. up to 40% of av. earn. for prev. 5 yrs. Rockefeller Center, N. Y.: Hosp. for emp. and depfl, acci. and sick, at half pay for 26 wks. Co. to pay emp. share of state dis. ins.

Chemical-AFL—Ciba Pharmaceutical Products Co., Summit, N. J.: Co. pd. med. ins.

Communications-CIO—Teleregister Corp., N. Y.: Co. pd. hosp. and surg., add'l group ins.

Electrical—H. S. Getty Co., Philadelphia: 4c hr. welf. Motor Mower Co., Richmond, Ind.: Add'l co. contrib. to ins. and h osp.

Electrical Railway and Motor Coach-AFL—City Coach Lines, Evansville: Contrib. pens. $50 mo. start 65 after 25 yrs. Delaware Coach Co., Wilmington: Co. pays $2 mo. for ins.

Federal Labor-AFL—Gendron Wheel Co., Perrysburg, O.: Co. pd. ins.

Furniture-CIO—Gregg and Sons, Nashua, N. H.: Co. pd. ins. Kroll Bros. Co., Chicago: Add'l hosp. and acci. and sick ins. Stephenson Mfg. Co., South Bend, Ind.: 3c hr. ins.

Machinists-Ind.—American Hardware Co., New Britain, Conn.: Contrib. ins. Crescent Insulated Wire & Cable Co.: 4c Co. pd. hosp. and surg. Eckstrom-Carlson Co., Rockford, Ill.: Co. pd. acci. and sick ins. Jasper Blackburn Products Corp., St. Louis: Co. pays $4.35 mo. to welf. fd. Ranco, Inc., Columbus, O.: Co. pd. 5c hr. ins.

Meat Cutters-AFL—St. Louis National Stock Yards Co., East St. Louis, Ill.: Co. pd. ins. after 1 yr. ser. $500 life, $25 wk. acci. and sick.

Mine, Mill and Smelter-CIO—Niagara Falls smelting & Refining Co.: 5c co. pd. ins.

Mine Workers-Dist. 50—H. Baker & Co., Maplewood, N. J.: Co. pd. $1,000 life, A. D. & D., hosp. surg. and med. Cozier Container Corp., Caldwell, O.: Contrib. ins. Equitable Gas Co., Pittsburgh: $50 bonus on retirement. Pens. plan. Inc. ins. Syracuse Brick Corp., Syracuse, N. Y.: Co. pd. ins. Washington Brick Co., Muirkirk, Md.: Inc. ins. and hosp.

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POLITICAL ETHICS

By CHESTER M. WRIGHT

There are times when it is possible to wonder whether character assassination is a rather typical American occupation.

The broadcast, shotgun charges flung around by Wisconsin's Republican McCarthy provide a case in point.

It is possible that within the great army of government personnel in Washington there are some pinks and maybe some outright reds.

There are orderly procedures for getting at and ticketing those that break our security laws.

But McCarthy doesn't proceed in an orderly, disciplined fashion. He lets go with blast after blast at great numbers of men and women who are put under suspicion and who may never at all get a chance to clear their names.

Somehow there seems to be a lot of unfairness about that kind of procedure.

* * *

The excuse—for it isn't a reason—is politics. The Senator seems to have believed that it would lure votes if he could make it appear that there were a lot of reds in Washington and that he was the White Knight come to rescue the fair maiden of government from the clutches of a peril worse than death.

There are other character assassins in Washington, too. There are others who can put in a word here or a word there, just casting enough shadow of suspicion to blacken a reputation. It is so easy to do that and so difficult to ever remove the shadow so cast.

All in all, there is some pretty dirty business now and then. Those who hate the idea of a police state might do some looking to see how we can approach the qualities of a police state, even though we do not have the form or the legal sanction.

Charges such as McCarthy has made can, under certain circumstances, ride with a man to the end of his days. He is purged from government occupation—purged for keeps.

* * *

Of course a Senator can get by with almost anything under the cloak of senatorial immunity. He is just about immune to court reprisal. No matter how much he may lie, how grossly he may malign, there stands Old Man Immunity to throw a cloak of protection around his shoulders.

A senator, my hearties, is no ordinary man, in that respect, no matter how gutter-common he may be in some other way or ways.

Why does political life have to be so besmirched with tirades, invectives, innuendo and outright lies?

Why do men think it pays to behave in political disputes in ways they would not even consider in any other field?

To Page 15

ABC CHICAGO —By DICK DAVIS

I've been receiving quite a ribbing since the guys here read my last column. I stepped a little out of line and started to play weather prophet. I made the rash statement that spring had finally come to Chicago and the golfing and fishing weather was just around the corner. Since then we've had only two decent days. The rest have been full of snow, rain and sleet. Maybe by the time this is published we'll have had some decent weather.

In behalf of the membership I would like to take this opportunity to welcome the following Engineers to the Chicago Chapter of NABET:

Mr. John W. Medill	Mr. Richard H. Moss
Mr. Joseph J. Chovelok	Mr. Thomas Baron
Mr. Harold A. Downham	Mr. Samuel A. Gornick
Mr. John A. Toth	Mr. Newt M. Robinson
Mr. William R. Richmond	Mr. Roland F. Robinson
Mr. Frank E. Laughlin	Mr. Bruce S. Berquist
Mr. Alfred Talarice	Mr. James L. Grinnell
Mr. Joseph J. Aurello	Mr. Harold E. Whitteberry

Here's to lots of fime, high type knob twisting, fellows.

I mentioned last month that Jim Valentine was getting married. Well, George Hillas and a couple of the other fellows decided that a small celebration would be in order. They secured a hall, lots of beer, sandwiches, and some entertainment. As it turned out there were about one hundred people present. The beer was of the canned variety so of course no one thought to bring even one opener. The party was in full swing when the wiring in the joint started acting up and sparks started flying. Leo Mulatz was seen scarwling around on the top of a ten foot ladder cutting wires like mad with a pen knife. Everyone expected to see him go flying out through the roof any minute. There were numerous other very amusing incidents that night, but for reasons of health (mine) they had best remain unmentioned at this point.

We may have cause for another party around the first part of May. Mr. Frank A. Koerner, Technical Director of the Civic Studio, has announced that he will marry Miss Marge Bishop on May th. Marge is an independent television producer here in Chicago. Our congratulations and well wishes.

Ray Chappell has been seen strutting around the Pent House Studio lately. The reason is a new son. His first in fact. It surely beats me how all of these engineers can afford both babies and new cars. I can't seem to manage either.

Last Sunday we had a couple of chimpanzees on Super Circus. When they weren't performing the owner kept them tied to the iron stairway that leads up to the Civic Engineering Control Room. Believe me they did a wonderful job of guarding same. About six engineers spent two hours marooned at the top of the stairs. Cliff Vogel got real brave and ventured down finally but promptly went back up when one of them made a swipe at him and tried to deprive him of his coat. The last thing I saw was some of the talent tossing rations up to the guys.

Since Chicago has become our National Office, Dolores Martin, our secretary, has been busy as a little beaver. Come May 1st Mrs. Bertha Tree will take over the bookkeeping and lighten the load.

A good many of you probably remember the WKJG strike of Auglst 1948. Bob Downie was one of the NABET members involved at the time. The NLRB has just recently handed down its final decision in the matter and ordered that Bob and the other engineers involved be reinstated with back wages from August 1948 to April 14th 1950. Bob is also to be reimbursed for any moving expenses incurred as a result of the strike. I'm sure that this is good news to all of us.

That's about all that's new in Chicago for the time being. See you again next month.

POLITICAL ETHICS—From Page 14

They believe voters are caught by clap-trap and that is why they do it.

Once voters prove that they do their own thinking, that they weigh the facts and decide upon them, mud-slinging operations will begin to grow unpopular.

But up to now, strange as it is, mud and bunco seem too often to pay off in votes.

* * *

Senators baying like hounds make an unlovely spectacle. So do lawyers who browbeat witnesses just because they have the protection of the court while the witness has none at all.

Of course truly big men do not resort to such tactics.

But there are actually few truly big men in our public offices. We have too many mediocrities.

So it is good, now and then, to raise a protesting voice against the stupidity and the unfairness of wholesale mud-slinging, against vituperation, against meanness and smallness—and against the idea that it is good politics to shout "red" at men who are in no sense even pink and who have no proper way to prove it before the damage to their reputation is too far along to be successfully overcome.

The real red, just like the spy, should be branded and made known for what he is.

But labels should be pinned on with care, that no innocent may be unjustly accused. The voters finally have the remedy, if only they will learn to use it.

It isn't too early to start learning.—CMW.

Adoption of RCA Picture Definition Method by CBS Seen As Move Toward RCA Color Television System

Announcement by the Columbia Broadcasting System that it plans to adopt the "sampling" and "horizontal interlace" principles of achieving high picture resolution in its color television system is a significant move on the part of CBS to adopt important elements of the all-electronic, high-definition color system developed by the Radio Corporation of America, it was said by Dr. C. B. Jolliffe, Executive Vice President in charge of RCA Laboratories Division.

"At last CBS has admitted the weakness of its color television system, limited by their requirement that it operate with a mechanical scanning disk," said Dr. Jolliffe. "Dr. Peter Goldmark of CBS gave eloquent testimony on this point before the FCC. Because of lack of resolution in its system, CBS now states that it will adopt the principles of "sampling" and "horizontal interlace" developed by RCA for its all-electronic color television system.

"Despite this latest move, however, the CBS system will still lack compatibility with the present black-and-white television system," said Dr. Jolliffe. "The flaws of color break-up and flicker will still remain in the altered CBS system.

"CBS now makes a virtue of the RCA "sampling" and "horizontal interlace" principles (picture-dot interlace). We are glad to note from Dr. Goldmark's testimony that CBS has finally recognized the merits of the RCA color television system, by adopting several of its outstanding features."

Dr. Jolliffe recalled that in February, CBS testified before the FCC that it "welcomed" RCA's development of the single direct-view tri-color picture tube for color television reception as being advantageous to the CBS system. Furthermore, Dr. Jolliffe said, it was RCA's image orthicon television camera tube that first made it possible for the CBS color system to pick up live subjects in the studio and to telecast outdoor programs.

"For several years, CBS has been reproducing color television pictures with the aid of electric motors and twirling color disks," said Dr. Jolliffe. "CBS has urged the FCC to adopt standards that would permit the commercialization of its mechanical system. It is most gratifying to RCA to know that CBS is shifting more and more toward the electronic methods developed by RCA."

Dr. Jolliffe said that even this last minute adoption by CBS of the RCA method of "sampling" and "horizontal interlace" does not and cannot bring the CBS color system to the same high standard of performance as the RCA color system. Also, he pointed out, the CBS system continues to be incompatible with black-and-white television.

"Of course, if CBS continues to modify its system by adoption of other important elements of the RCA system, including the use of the RCA tri-color tube, there will be little technical difference left between the two systems. There would remain, however, the important element of compatibility which the RCA system provides to safeguard the public investment in television receivers.

"Indeed, CBS has taken leaves out of RCA's book of achievement," said Dr. Jolliffe. "We hope CBS will continue this trend, and that it will take the few remaining steps for adopting the RCA methods of achieving compatibility and high-definition pictures. They will thus be enabled to discard the mechanical scanning disk with its inherent limitations. Such a step forward by CBS would end a needless argument and benefit all concerned."

ST. LAWRENCE

From Page 10

weeks before his expected visit. On the day of his arrival, the station sent their political reporter and special events reporter down to the station to meet him and to ask him a few questions. By a strange coincidence he happened to have about ten minutes in which to chat with them, so the special events reporter led him up to the studio (which is right in front of the railroad station) and proceeded to record, all by himself, without the assistance of an engineer, a ten minute interview with Mr. Dulles. This interview was considered important enough to air twice or even three times with a special introduction and ending explaining that it was the first radio appearance of Mr. Dulles since his appointment. The station even sent a special wire to CBS with which we are affiliated to ask them if they would like us to feed it to them on Saturday or Sunday, days on which the station felt network had nothing in particular to offer to its audience. After having been cheated out of overtime pay, the engineers felt only a little better when it was discovered that, not only had net not bothered to answer the station's wire, but had taken the excerps that it had forwarded and datelined them Washington. And when Charles Collingwood used them as direct quotes on his 11:00 Saturday night newscast, he did not mention the station, the city, and definitely not the announcers involved.

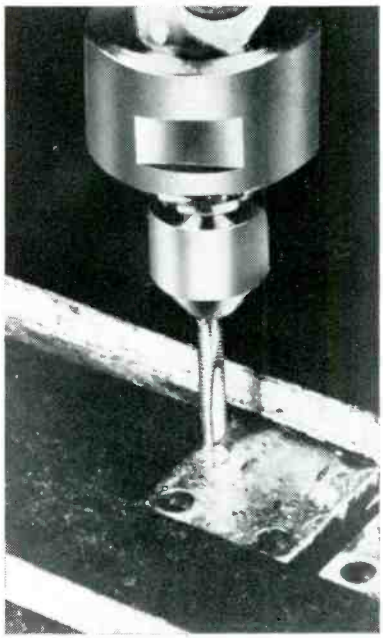
Dave Lane immediately approached the station to find out the details. Their story was that they had not realized that Dulles would be able to talk for any length of time, and for this reason it was unfeasible to assign an engineer to the job. Therefore, the special events reporter, who is a very bright lad, and who always carries his own tape recorder (which uses the same tape as does the station's machine) in the back seat of his car, had hastily thrown his set into action, so the station wouldn't miss a good story. After all, we wouldn't want them to miss a scoop like that, would we? They were reminded that they had known of Mr. Dulles impending arrival for several weeks, plenty long enough to assign an engineer. If the story had been important enough to air two or three times, it most certainly was important enough to rate a professional job. We also reminded management that this was very directly taking overtime pay from the engineering staff. They assured us that they did not wish to do anything of the sort, but they asked us to think it over some more to decide whether or not we wanted to demand an engineer for all such jobs. It didn't take us very long ot tell them what the entire membership felt about the whole deal. In addition Dave sent a long letter to the main office explaining the situation and asking if we couldn't legally refuse to play back such a recording. They promised to do some research on the matter, and in the meanwhile they advised us to write a strongly-worded letter to the management as a warning of further action to be taken on our part if there were any sort of a repeat performance.

The tape recorders seem to be a great improvement over the old disc type for economy and facility of use. However, these very traits may serve to cause trouble of this sort for engineers in times to come.

TRADE NEWS

CARBON STEEL TAPS

Increased tap life and more precise threads are obtained by a new line of small taps recently introduced by Woodruff & Stokes, Quincy 69, Mass. Available in standard or special sizes up to No. 2 (.086 inches) and having up to 260 threads per inch, these taps are low in cost, high in production. Between 2500



and 4000 threading operations per tap are reported from a number of users.

The improved performance of W-S Small Taps is due to advances in design and manufacturing processes. The cut thread and flutes are highly polished to reduce drag and fatigue. Cutting edges have great strength due to the radial chamfer and extra chip clearance is provided by the radial flute. In addition, special heat-treating methods have been developed which, applied to carbon steel, produce an extremely hard cutting edge and increased toughness throughout the length of the tap.

W-S Taps are replacing custom-made and imported taps. Accurate to within ±.002 in. on pitch diameter, they make possible savings both in lower initial cost and in increased runs up to 300%.

Taps having special pitch diameter or thread profile are available on special order. For full particulars, write to Woodruff & Stokes, Quincy 69, Mass.

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The first FM broadcasting station in Venezuela went on the air last month using a 250-watt transmitter manufactured by the General Electric Company at Electronics Park.

Sold by International General Electric S. A., Venezuela, the transmitter will be operated by Radio Cultura with studios in Caracas.

In addition to providing FM programs, the new transmitter will serve as a relay between Radio Cultura's studios, located at Esquina El Tejar, and the AM transmitter in the Urbanizacion Washington.

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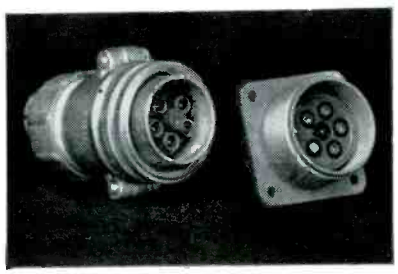

High Voltage Connectors

Special high voltage connectors designed for use with pre-amplifiers operating at moderately high voltages as utilized for nuclear research but equally suitable for other high voltage or high altitude applications are now available from the Atomic Instrument Company, Boston, Mass. Small and light in weight, these multicircuit connectors have an insert body molded from melamine for high dielectric strength and arc resistance while the six contacts are precsiion machined and silver plated for low contact resistance, freedom from corrosion and ease of soldering.

The connectors are keyed to provide positive polarization to ensure the pins are in the proper position to make contact. Additional safety is provided when the center contact is connected to a grounding wire as it is a "make first, break last" type. Standard "AN" type shells and fittings permit maximum versatility of application.

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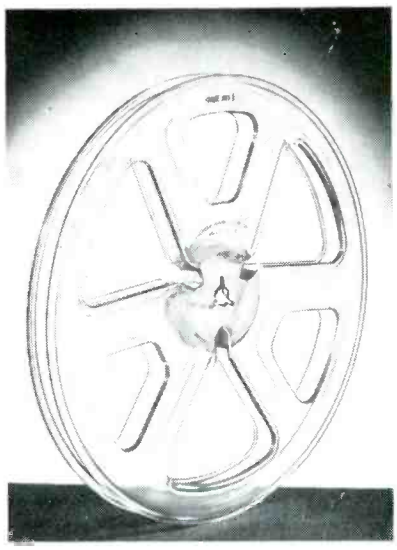
Light Weight, No-warp Amerline Plastic Reels Prove Success On Tape Recorders

Attractive, extra-strong Amerline Plastic Reels are proving their ability on tape recording machines. They function more reliably, and help avoid damage to tapes.

Because they're light in weight, inertia does not keep the reels revolving after the machine stops. These reels stop where they should and do not "throw" tape. Also, being plastic, they cannot become



magnetized and thus do not interfere with fidelity of reproduction.

Greatly strengthened and reinforced, these moisture-proof reels will not bend, break or chip—even when dropped on the floor. If flexed, they instantly snap back into position; thus assuring true running under hard handling and long use. Heat will not warp them.

They are very quiet in operation, and their smoothly-beveled edges prevent cutting or tearing tape while three convenient slots facilitate quick attachment of tape to reel. Another welcome feature is the numbered reel sides that help prevent confusion as to edge of tape being recorded or played back.

These new reels are obtainable in 5" and 7" diameters for ¼" tape, in 200' and 400', sizes for 8 mm movie film, and in 400' size for 16 mm movie film.

Further details and quantity discount quotations may be secured by writing the manufacturer: Amerline, Inc., 1753 N. Honore St., Chicago 22, Illinois.

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Trend Toward Larger Screens Shown In TV Picture Tube Sales

Sales of television picture tubes to TV equipment manufacturers in November indicate further increases in the proportion of larger-screen receivers, the Radio Manufacturers Association reported.

Of the 463,593 television type cathode ray tubes sold to equipment manufacturers in November, more than 58 per cent were between 12 and 13.9 inches in size, while tubes 14 inches and larger accounted for 19 per cent of sales. Tubes nine through 11.9 inches represented 17.9 per cent, and tubes six through 8.9 inches in size for 3.9 per cent.

AIEE Polls Membership

A recently completed poll of the American Institute of Electrical Engineers' membership has revealed that more than three-quarters of those voting, "favor carrying on present basic policies as a technical society," James F. Fairman, president of the Institute, has announced here.

The vote was 7,000 in favor of a proposal to adhere to the technical field with 2,000 members favoring a proposal to expand activities into the non-technical field with substantially increased dues, Mr. Fairman reported.

With the poll results as a background, the A.I.E.E. Board of Directors decided on policy procedure in the matter at its February meeting, according to Mr. Fairman. The action was taken, he said, after the Board had agreed that a majority of the A.I.E.E. membership seemingly considered the Institute primarily a scientific and educational association but that there appparently were thousands of members also who expressed a need for more non-technical action on the part of A.I.E.E.

Consequently, according to Mr. Fairman, the Board at the February meeting, adopted the following contemplated plans for procedure in the matter:

1. "To work continually for the unification of the profession."
2. "To recognize the fact that the Institute finds its chief reason for existence in the technical field."
3. "To handle questions on non-technical affairs as necessary and as they arise, on an emergency basis until through unification they can be handled on a general professional basis."

To reassure itself that the Board of Directors was interpreting the membership's attitude correctly, Mr. Fairman stated, a poll of the membership on its February plans cited above, now is being taken. In discussing the three points to be voted upon in this membership poll, Mr. Fairman pointed out:

"Under item 1 the Directors will continue and, if possible, strengthen their efforts to speed up Engineers' Joint Council exploration and consummation of unification. For the many members who are much concerned about the problem of what to do in the interim, it suggests and endorses individual participation in National Society of Professional Engineers, Section participation in local councils, and individual, local, and national preaching of the gospel of unification.

"Under item 2 the present concentration on technical activities will continue. Included in technical activities are matters of membership, prize awards, education, publication, and cooperation with other societies on technical questions. These in turn require the maintenance of an active program of public relations, both nationally and in the Section areas.

"Registration will be included as a sort of capstone of the educational process. While a good deal of educational activity might ultimately be handled best by the suggested overall organization, nevertheless Engineers' Council for Professional Development work must continue in its present fashion in the interim period.

"Under item 3 it should be recognized that the restricted emergency actions of the Board of Directors in the non-technical field will be much less effective than some would desire. This in itself, however, will tend to accelerate the final completion of some satisfactory form of over-all organization."

FAX Progress

The publication and delivery of a newspaper to the public by radio should become an accomplished fact with the reduced cost of facsimile receivers for home use resulting from quantity manufacture of such instruments. This is expected as regular programs become available on a broadcast basis.

This was the prediction of John V. L. Hogan of New York City in a paper on facsimile broadcasting presented to the Winter General Meeting of the American Institute of Electrical Engineers, Thursday, February 2, at the Hotel Statler, New York. Three thousand engineers and scientists from the United States, Canada and other Western Hemisphere nations gathered to hear 200 papers on various phases of magnetics, electronics, nucleonics, education and safety.

Facsimile transmission is the method of delivering a newspaper or other printed material by radio to a home or office receiver. The page is printed simultaneously line by line by the recording machine at the receiving end as an exact duplicate of the material being fed into the scanning machine at the sending end.

Mr. Hogan said, "Facsimile is just beginning to go into general use. More or less like television, the broadcasting of facsimile programs will first be directed to receiving sets and display recorders located in public places such as hotel lobbies, airport terminals, theatre lobbies, etc. As regular programs become available on a broadcast basis it is epected that home receiving sets with facsimile recorder, or facsimile recorders for attachment to standard FM sound receivers, will get into production. The inevitable consequence of quantity manufacture is to bring down cost, and thus facsimile receivers are expected to become availab'e at such reasonable prices that they can be purchased and used by the average home owner. In this way, the publication and radio delivery of a facsimile newspaper to the public should become an accomplished fact."

Mr. Hogan pointed out that by the use of multiplex it is possible for any FM station to operate two simultaneous services without mutual interference. Thus, he said, in addition to the normal FM sound channel carrying speech and music, the FM broadcaster has available, on the same carrier wave, an entirely different service which delivers printed matter from the broadcast receiving set.

The cost of adding a multiplex facsimile channel to an FM sound station is relatively small, he declared, as may be the cost of facsimile operation and programming. Since the Federal Communications Commission now permits the sale to advertisers of white space on the pages of the facsimile newspaper, the FM broadcaster is provided with a new source of income which should more than meet the expense of the facsimile opertaion, and thus contribute to the cost of the FM sound operation.

Galactic and Solar Radio Waves

Communication at frequencies up to about 15 mc is ordinarily limited by atmospheric radio noise or static. At higher frequencies, interference is caused by solar noise or cosmic noise, coming mainly from the constellation Sagittarius. This celestial noise can cause jumpiness in a television picture, blind a radar, or override a communication channel.

At the Bureau of Standards, two aspects are being investigated; the intensity versus frequency characteristic of celestial noise, and the direction of arrival. Mr. Grote Reber, who is Director of this work at the Bureau, and whose background includes extensive radar and communications experience, described the most recent development in this field with a brief background of the astronomy involved, at a Long Island Section IRE meeting.

INDUSTRIAL TELEVISION

Simple Compact System, Based on New Vidicon Tube, Extends Sight for Aid to Science, Industry and Education—System Can Be Adapted for Color Pictures—First Details Are Revealed at 1950 IRE Convention.

A new and highly effective television system that extends human sight far beyond normal limits for benefits to science, industry and education was disclosed and demonstrated in New York by Dr. Paul K. Weimer and other research scientists of RCA Laboratories.

The new system, which produces excellent black-and-white pictures at normal light levels, can be adapted to produce pictures in natural colors, according to Dr. V. K. Zworykin, Vice President and Technical Consultant of RCA Laboratories, who directed development of the system. He said that, whereas surveys have indicated that black-and-white pictures will meet the requirements in most industrial uses, RCA engineers are working on color equipment to fulfill needs that may arise.

Described as the smallest and simplest system ever devised for non-broadcast, industrial television operations, the new RCA system is based on a remarkably small and sensitive pickup tube known as the Vidicon. The system consists solely of two units—a television camera approximating the size of a personal 16 millimeter movie camera and a master monitor that can be carried as easily as a suitcase.

Details of this industrial television system were reported in technical papers presented by Dr. Weimer and Richard C. Webb, of RCA Laboratories, at the 1950 Convention of the Institute of Radio Engineers in the Hotel Commodore. An informal demonstration of the equipment showed its flexibility and effectiveness of performance. At that time, Dr. Zworykin declared:

Great Promise of RCA System

"RCA industrial television promises tremendous contributions to 20th Century industry, education and science. The achievement of smaller and less costly television chains (camera and monitor combinations) which provide excellent performance will hasten the coming of age of this new service.

"Closed-circuit television can be a powerful instrument of education, bringing great teachers into the presence of hundreds or thousands of students. It can bring virtually any number of doctors to the side of a surgeon for observation of rare operations. It is the expendable eye that can watch dangerous industrial and scientific processes. So versatile is industrial television that no man—no score of men—can foresee all of its future uses.

"This service eventually will be available in color, as well as in black-and-white. While surveys have indicated that black-and-white coverage will meet the requirements in most industrial uses, engineers at RCA Laboratories are at the present time working on color equipment to fulfill needs that may arise."

There were two separate phases in developing the system, according to Dr. Zworykin. First came the building of the Vidicon pickup tube, which operates on the principle of photoconductivity, rather than employing photoemissive cells as used by the image orthicon, the orthicon and other pickup tubes serving as the electronic "eyes" of conventional television cameras. The second phase consisted of engineering and designing the camera and monitoring-control unit.

Simplicity of Vidicon

In describing the Vidicon tube, Dr. Weimer said that, despite its reduction in size to less than a tenth of that of the image orthicon, the new tube is able to transmit pictures at normal lighting levels and to attain a resolution of more than 500 lines. The tube is only one inch in diameter and six inches long.

"The simplicity of the construction and operation of the Vidicon can hardly be overemphasized," he declared. "It contains only an electron gun and a target, as contrasted with gun, two-sided target, image section and electron multipliers of the image orthicon tube. The Vidicon's related equipment is proportionally less complex."

Dr. Weimer said that a number of materials have been found to be satisfactory for the photoconductive target and that, by proper selection and processing of the materials, it is possible to make a target sensitive to the entire visible range of the spectrum.

Whereas the Vidicon was designed specifically for industrial television, he added, intensive research is being carried on at RCA Laboratories in the development of tubes of this type for use in RCA's new all-electronic, high-definition color television system. Moreover, he said it is expected that further development of the Vidicon will improve its quality sufficiently to make it a valuable device in commercial black-and-white telecasting.

Light sensitivity obtainable with photoconductive cells such as those used in the Vidicon, Dr. Weimer said, is many times greater than the sensitivity which can be achieved with photoemissive cells such as employed in image orthicons. He said that theoretically it is possible to devise a photoconductive tube ten times as sensitive as the image orthicon. He disclosed, in addition, that it has been found that ordinary 16 mm motion picture lenses which are relatively inexpensive, work satisfactorily with the one-inch Vidicon.

Uses Less Watts Than A Toaster

The entire system operates on 110-volt, 60-cycle alternating current and consumes only 350 watts, about one-third that used for an electric toaster, Mr. Webb said. He pointed out that it is capable of transmitting a signal 500 feet over a coaxial cable closed circuit, giving it enormous flexibility for a wide range of industrial, scientific, and miscellaneous applications.

"RCA scientists developed the system so that it is almost compatible with standard television broadcasting technique," Mr. Webb continued. "Home television receivers can be adapted to use as monitors by the addition of a single tube, with accompanying resistors and capacitors, at a very modest cost.

"The system has inherited a good part of its simplicity and small size from the Vidicon tube, which is considerably less demanding in its requirements of power and associated equipment than the image orthicon."

"The Vidicon requires no electron multiplier equipment and, since it is smaller, less deflecting power, it was pointed out. The smaller deflecting circuits were engineered for simplicity and compactness. Miniature tubes, used for the first time in a television system, also helped to cut down on size.

"In broadcast television field equipment now in use, the synchronizing generator alone requires a separate case," Mr. Webb said. "We have shrunk our generator to

the size of two cartons of cigarettes. By assembling everything in a single case we have eliminated the need for a power supply which heretofore has been required to run the signal from case to case."

The master control unit of the system is 24 inches long, 15 inches high and 8¼ inches wide. It weighs 58 pounds. It contains a regulated power supply, small synchronizing signal generator, a video amplifier strip, and all the scanning deflection equipment for both the camera and its own 7-inch monitoring kinescope. It has 44 tubes, about 50 per cent more than the average home television receiver.

The camera is 10 inches long, 3¼ inches wide and five inches high and has a remote focusing mount, which permits the operator to adjust optical focus by remote control from the master unit.

Operation of Tube

Dr. Weimer described the operation of the tube as follows:

"In the Vidicon, light—representing elements in the picture being picked up—passes through the glass face of the tube, then through a transparent coating on the inside of the tube which forms the signal plate. The light then strikes the photo-conductive target which, on the side next to the signal plate, carries a positive charge of from 10 to 30 volts.

"The inside surface of the photoconductive target is maintained at ground potential, or zero voltage, by the scanning beam's depositing of electrons upon it. Because the target material is an insulator, very little current flows while it remains dark.

"When light strikes the target, it increases the conductivity of the material sufficiently to permit a charge to flow across the target and to charge the light-struck area a volt or two positive in the 1/30th of a second between successive scans.

"As the scanning beam deposits enough electrons to neutralize this accumulated charge, it generates the video signal, which is taken off the metal lead ring attached to the signal plate. Finally, this signal passes by cable to the monitor-control unit, where the image is viewed."

Power Amplifier Economy

Marked economies in original investment and in operating costs are indicated for the new DuMont power amplifier unit which steps up the output rating of the basic Acorn TV Transmitter from 500 watts or 1 KW, to 2½ KW or 5 KW, respectively.

Such equipment has recently been installed, comprising the DuMont Acorn Transmitter, which was previously supplied as a 500-watt transmitter but now delivers 1 KW, and the new power amplifier. The Acorn Transmitter acts as a driver for the single-stage power amplifier. This single-stage power amplifier unit consists of a pair of air-cooled tubes whose initial cost is below $200 each. The overall floor space required for the combined transmitter equipment is approximately one-half that required for other 5 KW transmitters in service today, because with less stages, less tubes, no water-cooling system, a self-contained blower system, and no vestigial side band filter, the entire transmitter is housed in a cabinet measuring 27" deep by 15' long. The same tube types are used in the visual and aural transmitters, thus reducing the spare requirements and having the added advantage that tubes which show signs of weakening after many hours' service can be shifted from the 5 KW visual to the 2.5 aural transmitter in order to gain maximum tube life. Initial tests have indicated tube life on Channel 7 through 13 many times that of other commercial transmitters.

Here are ten of the outstanding features of the new DuMont 5 KW TV Transmitter, comprising the basic Acorn Transmitter plus the Oak Power Amplifier:

1. Single-stage amplifier provides for 5 KW Visual 2.5 KW Aural operation using the DuMont Acorn Series Transmitter (1 KW Visual .5 KW Aural) as driver.

2. Air-Cooled Tubes: (a) No water plumbing in transmitter or transmitter building. (b) When tubes are changed, no water lines have to be disconnected, causing water to be spilled on the equipment. (c) A self-contained blower cooling system requires no special external blower system other than for removing hot-air exhaust from units.

3. Low tube cost in final stages and throughout transmitter.

4. Identical tube type used in visual and aural transmitters: (a) Reduces spare requirements. (b) Tubes can be transferred from 5 KW Visual to 2.5 KW Aural circuits for maximum life.

5. Quick Tube Replacement: (a) Reduces possible off-the-air time. (b) Any tube can be replaced in less than 1½ minutes.

6. Grounded grid amplifier circuit enables tube replacement without requiring neutralizing adjustment.

7. No vestigial side band filter required as lower side band is attenuated by overcoupled circuit and one simple notching filter that is built into the equipment.

8. Control unit incorporates the following features: (a) All fuses and circuit breakers are in a common location. (b) Indicator lamps indicate at what point within the system there is a trouble source.

9. No external test equipment is required for tuning the transmitter: (a) Built-in Wobbulator and (b) Built-in Band Pass Indicator.

10. Mechanical Design: (a) Complete accessibility for servicing. (b) Each unit within the system is mounted independently of other units. (c) No complicated drive mechanism for the tuning controls.

Whether as initial equipment for the TV station starting out as a 5 KW transmitter, or again as additional equipment whereby the basic 1 KW or lower power transmitter can be stepped up later to higher power, the so-called Oak Power Amplifier is an important adjunct to the Acorn Transmitter.

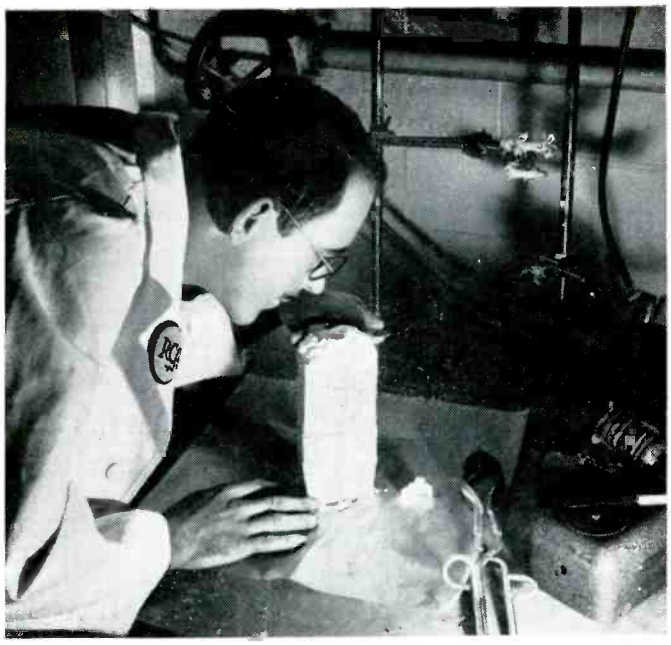
See next issue for complete network contract

Billions of speeding electrons set phosphors "on fire"

Gleaming luminescent materials, excited by an electron beam, help create television pictures

No. 5 in a series outlining high points in television history

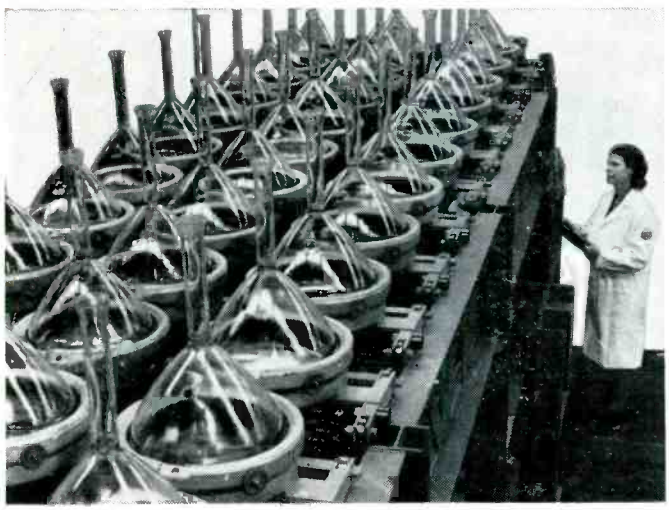
Photos from the historical collection of RCA



This block of luminescent material, *energized by ultraviolet light, provided illumination for this photograph. Luminescent materials of the highest purity are produced in bulk at RCA Tube Plant.*

• "*Specpure Laboratory*," said a sign at RCA Laboratories, "*Do Not Enter. Dust Is Our No. 1 Trouble-maker.*" On the floor were moistened rugs to trap shoe-borne dust. Scientists and technicians had to change to clean white clothing before entering the room.

Purpose of this meticulous housekeeping was to provide a place where no speck of dirt would handicap the work in progress. RCA scientists were studying *luminescent materials*—seeking ways to produce them in bulk, while maintaining utmost quality and purity. Not even a speck of foreign matter could be tolerated. One part of copper *in ten million* will show up as green spots on a television screen.



In a special vibration-free room, *air-conditioned—and with temperature and humidity evenly controlled—tubes move at a snail's pace along this settling belt, while the luminescent coating settles on the face of the bulb in a delicate, film-like covering—a flawless surface, smooth and uniform.*

Although phosphors have been known for centuries—since even sugar, salt, and diamonds have been found to have luminescent properties—little intensive research was done until scientists began seeking to perfect these glowing materials for use on the screens of television receivers. A scientist at RCA Laboratories, in the Specpure Room, was one of the first to develop the fundamentals for a way of making luminescent materials in bulk for television.

This development is one of the reasons why, at RCA Tube Plant in Lancaster, Pa., they can now be made by the tankful! Even in mass production, each "batch" has uniform characteristics. White light, of the type most suitable for creating television pictures, is produced by mixtures of luminescent materials combined in exactly the correct proportion.

Guarded at every step against any trace of contamination, these phosphors are deposited in a delicate film-like coating on the faceplates of television tubes . . . where they cling to the glass by a form of molecular attraction. Excited by an electron beam, they glow with a brilliant white light and thus produce the crisp black-and-white pictures we see on television.

To television, the phosphors developed by RCA scientists are as important as paint is to a painter. The face of the kinescope tube is the "canvas." A picture appears as a visible image when the electron gun acts as a "paint brush" to create patterns in the phosphors!

A "Brand New" SOLUTION TO YOUR AUDIO MEASUREMENT PROBLEMS

FEATURES

FREQUENCY RANGE:
20 cycles to 20 KC.

ACCURACY:
Accuracy is ± 0.1 db, from 20 cps to 20 KC.

OUTPUT LEVELS:
Ranges of output levels: +4 to —110 db and —10 to —124 db in steps of 0.1 db.

ACCESSIBILITY:
All components accessible from front of rack panel—for ease of servicing.

IMPEDANCE RANGES:
(a) *Source Section*— 600-150 ohms internally terminated. 600-250-150-30 ohms unterminated.

(b) *Load Section*— 600-250-150-16-8-4 ohms.

Daven's Moderate Priced Transmission Measuring Set

This is the instrument for which you have been waiting! For accuracy and efficiency, the Daven Type 11 A gain set, will fill your bill. Incorporating many of the features employed in more expensive models, this unit may be used to make all the precise measurements required by the FCC. This is a direct reading instrument, entirely eliminating time-consuming computations.

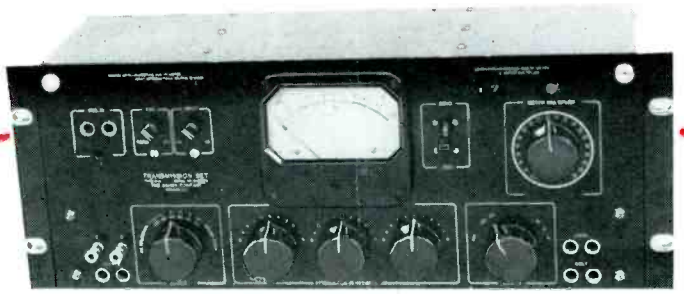
A new design feature, permits the servicing and inspection of all components from the front of the panel, with a maximum of ease and in a minmum of time.

It is no longer necessary to use makeshift equipment for determining the transmission characteristics of audio systems. The Type 11 A gain set has been priced low enough to place it within the reach of the most limited budget.

APPLICATIONS

- AUDIO GAIN MEASUREMENTS.
- AUDIO LOSS MEASUREMENTS.
- MEASUREMENTS OF MATCHING AND BRIDGING DEVICES.
- COMPLEX CIRCUIT MEASUREMENTS.
- MEASURING MISMATCH LOSS.
- FREQUENCY RESPONSE MEASUREMENTS.
- CHECKING CABLE LOSS.
- TELEPHONE REPEATER MEASUREMENTS.
- VOLUME LEVEL READINGS.

WRITE TO DEPT. BE-5 FOR ADDITIONAL INFORMATION.



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