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Many Recorded Programs Being Aired By Europe's Few Commercial Stations

Discs Cut Here For Foreign Playback European commercial radio com-pletely inoperative during the War with the exception of some forty low-powered stations in Spain and a high-powered (60,000 watt) privately owned station in the tiny republic of Andorra, perched high atop the Pyrenecs, has now returned to normal peacetime operations. "Radio Andorra" operated commercially throughout the entire War.



The "Speakerina." Europe's famous disc jockey of Radio Andorra, who broadcasts continuous music from twelve noon until 1 A. M. each day.

After the cessation of hostilities, stations which operated commercially before the war in France were not reissued their permits to operate commercially. These stations were confiscated by the Germans at the time of the Occupation and after the Liberation were taken over by the French Provisional Government. The Government still controls them and has shown no indication that they will return them to their former owners to be operated commercially.

Today, the only radio stations operating commercially in Europe are the twenty-six stations of the Italian Network; the forty outlets in Spain; the aforementioned Radio Andorra; Radio Monte Carlo in Monaco and Radio Luxembourg. And, as is true with most stations in America today, all are making considerable use of transcribed programs in their daily schedules. Italian network, for instance, has recently acquired an NBC Thesaurus library to supplement other recorded programs being aired to affiliates. And then too, CETRA, a subsidiary of the Broadcast-(Continued on Page 2)



Paul J. Miller, assistant managing director of WWVA-Wheeling, W. Va. interviews two members of the crew of the LST 753 on the transcribed broadcast of the "Incentive Inspection" of the ship by employees of the Blaw-Knox Company of Martins Ferry, Ohio. Edwin L. Keim, WWVA's chief engineer, is shown at the controls of the recording equipment.

Cutting Discs Aboard Navy LST While Underway Unusual Experience of WWVA Recording Staff

(Recently, the editors of Audio Record usked the studio engineers of several 50,000 watt stations to write a brief account of the studio engineers of several solution interesting recording" they had ever made. Many replies were received, but it is believed that the experiences (related below) of Edwin L. Keim, Chief Engineer, WWVA-Wheeling, W. Va. and his staff were among the most interesting and most unusual.)

It was during the summer of 1945 that the recording staff of WWVA was given possibly its most interesting and unusual assignment. After months of planning, obtaining authorizations from the Secretary

In The Flesh-No Less

A few Sunday nights ago on the Jack Benny stanza, four of radio's topflight warblers occupied the guest slot

-Dick Haymes, Andy Russell, Dennis Day and the incomparable Crosby. While the others were building up a dramatic entrance, Bing sidled in, and, sceing that Benny's expression registered surprise, and being a fellow who can grasp such a situation, der Bingle said a la Fred Allen's Mrs. Nussbaum: "You are expecting a transcription, maybe?"

of the Navy on down, plus countless miles of other red tape, the Blaw-Knox Company of Martins Ferry, Ohio (wartime manufacturers of 40mm anti-aircraft gun mounts) succeeded in arranging a stop-over of a few hours for one of the Navy's LST's (landing ship-tanks), enroute down the Ohio River to New Orleans, for an "Incentive Inspection." The plan was to permit Blaw-Knox employees to board the vessel and inspect the gun mounts of the famous "fightin' forties" that they themselves were building. Object, of course, was to increase their interest in production. In connec-(Continued on Page 2)

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Transcribed Shows Or Participation? By Charles J. Basch, Jr., President BASCH RADIO PRODUCTIONS New York, N. Y.

"I'm using a woman's participating program," an account executive said to me a few years back, "and I'm getting fair results. For the same amount of money, what else is there that will do a better selling job?" "Something that



will give your client 'sponsor identification', which he isn't getting on the participating program," was my reply.

The reasoning behind purchasing a spot on a participating program is that a woman commentator or other artist enjoys a certain fol-

Chas. J. Basch, Jr.

lowing and a 'rating'. The hope is to try to hook in on this 'rating'. We believe this reasoning to be erroneous, and it has been proven dozens of times. You don't necessarily 'hook in' on a rating. You merely get a spot announcement on a program. There is no 'sponsor identification' attached to that. A case in point:

Better Proof Than Hoped For

An agency man told me that he had just bought a spot on a well-known New York participation show for one of his clients because it had a good rating, was musical, and as the women in his home did not like soap operas, they listened to this program continually.

The women turned out to be his wife, a nurse, and a maid. I told him that I thought they listened to the program and recognized it as the show featuring 'Joe Doakes', but that I did not believe they knew too much about the spot announcements or participations the program contained. He disagreed. So, we called the station and found that there were ten participating sponsors on the show. Inquiry disclosed that the women were able

(Continued on Page 6)

European Stations Air Disc Shows (Continued from Page 1)

ing Company SIPRA, has made some excellent recordings of the best Italian opera singers. An album of Ferruccio Tagliavini made by this company is now on sale in New York City.

Radio Andorra. because of its geographic location. has practically no live talent and therefore makes constant use of recordings of every kind. As a matter of fact, this station carries on a continuous disc jockey show from twelve noon to 1 a. m., the disc jockey being a very pretty girl called "The Speakerina". Her trade mark, "Aqui Radio Andorra", is known from Gibraltar to the English Channel. This is the only station in Europe providing a continuous program of light popular music.

With a desire to sell their products in the European market, American sponsors are making recordings of their commercial programs here in America for use on the Italian network. A recent example of this was the series of singing commercials made by Elsa Miranda, the "Chicquita Banana" girl, for Royal Baking Powder, a product of Standard Brands, Inc.

The Government radio of all European countries carried on extensive experiments with recording during the war and today commercial radio is now picking up where Government radio left off. Thus, continuous and increasing use of recordings over the commercial radio stations of Europe is a certainty.

ABC Net Places Daylight Saving Plan In Operation

On April 27, the American Broadcasting Company placed in effect its Daylight Saving Time plan of operations initiated last year and which, through use of special lines and recordings, maintains all its programs in all time zones at the same time the year around.

Operating only during the 22 weeks of Daylight Saving Time, the plan this year will encompass ABC's entire program schedule.

Basic mechanics of this operation developed by ABC involves special broadcast lines and recordings. Through the use of these special lines, programs will be broadcast live to ABC stations operating on Daylight Saving Time and recorded in Chicago and Hollywood for rebroadcast one hour later for stations operating on Standard Time.

A similar system used on most of ABC's program schedulc and on most of the stations last year during Daylight Saving Time was found to be mechanically perfect when 1,848 hours of continuous recording in Chicago alone resulted in the loss of only five minutes and that through a power failure.

Parts Show To Be Held

In Chicago This Month The 1947 Radio Parts and Electronic Equipment Conference and Show is scheduled for May 12th through May 16th at the Stevens Hotel in Chicago. Audio Devices will display its products in Booth 148.

WWVA Crew Records Aboard LST (Continued from Page 1)

tion with the occasion, arrangements were made for a few officials of Blaw-Knox and press and radio representatives to board the ship at Steubenville, Ohio and travel with it to the point where the special dock for the Incentive Inspection had been built, near Martins Ferry.

WWVA attempted to arrange a broadcast of description and interviews to completely cover the proceedings. Naval authoritics in charge turned "thumbs down" on a plan to use the station's Mobile Relay Unit aboard the ship. Permission to use the vessel's radio transmitters was also refused. However, it was finally suggested that a portable recorder be used so that naval personnel could check material before released. This plan was followed and the recording equipment was taken aboard at Steubenville where the LST had to be locked through one of the numerous control locks on the Ohio River.

Almost immediately after boarding the ship, it was discovered that the only "AC" available was an auxiliary supply unit used on the gun turrets. The ship's electrician advised that the frequency might be unstable. So then, the recorder was set-up on an ammunition box just ahead of the pilot house. Some trouble was experienced with vibration from the diesels when the ship was underway but this was controlled by putting a couple of Navy blankets under the recorder, which later proved a good idea because the discs cut were acceptable for broadcast purposes.

Prior to the ship's arrival at the Blaw-Knox dock where the WWVA "shore" crew took over with their Mobile Relay Unit, several interviews with various officials and ship's personnel were recorded. The MRU piped the balance of the broadcast to the master control room in Wheeling where it was routed to recording. A couple of hours later, after considerable editing, the show was on the air. The officers and crew of the LST, by this time several miles south of Wheeling on their journey to the coast, heard the program aboard ship.

This incident is of particular interest since it is believed that it was the first broadcast ever attempted from a naval vessel in war time, while underway, hundreds of miles from any ocean.



By C. J. LeBel, Vice President AUDIO DEVICES, Inc.

RECORDING LACQUER

Lacquer forms the coating for all modern instantaneous recording discs, and since the groove is cut directly in it, the character of the coating is the character of the blank. This article answers many questions which have come to us from



time to time, and so may give the professional recordist a better understanding of the material which he handles. Needless to say, a recording lacquer does not consist of a highly filtered mixture of ordinary commercial black automo-

C. J. LeBel

bile lacquer with two drops of decibel juice added to each gallon.

Virtually any lacquer made includes most, if not all, of the following classes of constituents:

Film Former

The film forming material around which the entire formula revolves may be any one of the following: nitro-cellulose, ethyl-cellulose, acetyl-cellulose, or vinyl chloride. All of these are available in many types and "viscosities." Complete tests leave no doubt that nitrocellulose is by far the best as regards all professional recording qualities. Of the others, ethyl-cellulose has been utilized in some amateur home recording discs, but the results are certainly not professionally usable.

Solvents

The film forming material as received from its manufacturer is quite unfitted for direct coating; in fact, cannot even be applied as a film without being dissolved in a solvent, of which we have our choice of three different groups (classified by boiling point).

Low boiling solvents will evaporate very rapidly even at room temperature Representative materials in this class are: acctone, ethyl-acetate, methylacetate, alcohol, methyl-ethyl-ketone, and scores of others.

Medium boilers evaporate rather slow-

ly at room temperature, but evaporate rapidly at a slightly elevated temperature.

Finally, we have high boilers which evaporate very slowly indeed at an elevated temperature. In fact, it may be rather desirable to heat for twenty to one hundred hours to drive them out completely.

It is very difficult to make a satisfactory lacquer using only one of these solvents, so the chemist prefers to use two and often all three groups. Correct selection of solvents will greatly help production reliability.

Resin

Occasionally, a chemist will wish to add a resin or other similar material to give the coating some body. This will give the coating more strength, but the desirability of its use is perhaps questionable. For the chemist who insists on using such a material, there are a very large number of resins, such as the copal, dammar, mastic, shellac, and the phenolic and alkyd groups.

Diluent

To dissolve the resin or to change the evaporating properties of the solvent mixture, a diluent is very often added. Diluents do not absorb moisture and, therefore, are very well behaved in summertime, whereas some solvents previously mentioned may absorb some moisture, and this has to be driven out in the processing. On the other hand, a diluent by itself will not dissolve the film forming material, and only a limited amount of it may be used, for the limited compatibility of diluents with solvents sets a definite maximum. Representative diluents are: benzol, toluol, and naphtha.

Plasticizers

We come now to the most important materials of all, the plasticizers. Lacking them, we would find a coating which was extremely hard, extremely brittle, extremely noisy, and violently inflammable when it had dried. To prevent this, materials are added which should remain in the coating throughout life. Properly chosen, they soften the coating, make it easy to cut and quiet in playback*. Two types of plasticizers are available: the solvent type and the nonsolvent type. Solvent plasticizers actually are solvents of extraordinarily high boiling point, so high that they very often will decompose before they will boil at atmospheric pressure. Representative materials of this sort are: dibutyl phthalate, dioctyl phthalate, triacatin, dibutyl sebacate.

Non-solvent plasticizers will not dissolve the base material, but are compatible with it. They have many excellent properties, and the only thing that limits their use is the fact that an excess will tend to sweat out under adverse conditions. It is, therefore, necessary to use a mixture of solvent and non-solvent plasticizers. Castor oil is one of the most common non-solvent plasticizers.

Dye

A black dye is usually added to a lacquer in order to improve its appearance and make it easier for the recordist to judge depth and smoothness of grooves. There are only two very simple requirements for the dye. It must be extremely dark in color, and it must be readily soluble in the solvent. There are a very large number of dyes available, all answering this description, and dye selection is perhaps the easiest problem of the entire formulation.

The Formulating Problem

Because Audio Devices has its own lacquer plant, the composition of the material is entirely under our own control.

An ordinary industrial finishing lacquer may contain six or seven constituents; adequate formulae may be found in many reference books and the chief limit is the cost of materials. Half of the job of an industrial lacquer chemist is the developing of the use of extenders to cheapen the material without injuring its properties, and most of the other half of this job is that of improving the quality without significantly increasing the material cost.

Recording lacquer is quite another affair. It will contain approximately thirty constituents, some of which are present to the extent only of .05% and the formulae are entirely secret. We have never seen a single recording lacquer formula published, and the most important plasticizer constituents could not be detected with accuracy by the best analyst. The magnitude of the formulating problem may be best appreciated when we realize that it is an art as much as a science and that it is basically exeprimental in nature. The chemist must try a large number of proportions of each material with a large number of alternate proportions of each other material. We may appreciate this problem the better when we realize that fifteen materials each tested in ten different proportions will mean 1510 tests to be made. This chviously completely impossible regardless of how many men are brought to bear on the problem. We rely very heavily then on the genius of our formulators and, as they feel their way along in the developments, they are able to eliminate a large number of the tests as obviously unnecessary.

Plasticizer Choice

As was mentioned previously, plasticizers are extraordinarily non-volatile materials which are used to stabilize the coating and give easy cutting, long playback life, and low flammability. There have been two schools for formulation thought. American formulation in the American beginning period 1934-1938 used very little plasticizer; the coating was made soft by leaving a considerable amount of residual solvent. The discs were stored in a solvent tight can to retain this residual solvent. When the disc was removed from its can and left in the air, the solvent would evaporate and the coating would slowly harden. Typical playback life for such a coating was ten to twenty playings; the norse level was high and the stability of the coating was extremely poor. Nitro-cellulose with inadequate plasticizer is not a remarkably stable material, so the groove would warp appreciably with time, and the distortion increase would be very great. We have observed a harmonic distortion increase as great as 10% to 20% within a period as short as two weeks in testing discs of this sort.

The second school of thought began with La Societe des Vernis Pyrolac of Paris in the period from 1929 to 1935. In 1938 Audio Devices entered into a contract with Pyrolac whereby AUDIO-DISCS are manufactured in the U.S.A. under an exclusive license agreement. This contract also gave all the lacquer formulation "know-how" developed by Pyrolac since 1929. Our company is thus the only American company whose experience goes back so far.

Audio Devices' success with this type of recording lacquer from 1938 on forced a change in American practice, virtually completed by 1941. Pyrolac had found that a very quiet and durable coating could be made by using adequate plasticizers of the correct proportions, and the object of their formulator was to create a coating which would have no change in character throughout life. Properly done, such a coating will have a playback life ranging from several hundred to several thousand times, 20 db lower noise level, and negligible distortion throughout life.

Plasticizers may evaporate, oxidize, or polymerize, but because recording lacquer coatings are so sensitive, good record platsicizers will not exhibit any such changes. Ordinary industrial-lacquer data are wholly inadequate to the record-lacquer formulator's needs, for industrial lacquers can lose 50% of their plasticizing with little visible effect. 2% in recording disc plasticizing would be extremely bad. Audio Devices, Inc., is

thus very fortunate in that its license agreement with La Societe des Vernis Pyrolac gives it access to recording lacquer tests begun as far back as 1929 and to their experience in manufacturing discs going back as far as 1932. Thanks to this extensive library of test data, our chemists have found the long life stipulation imposes no restriction whatever on the formulator's results. They were able to get quite as good performance in the long life disc as they could get if they were willing to take short cuts and use impermanent materials. It should also be pointed out that proper plasticizers exert a very profound stabilizing effect on nitro-cellulose and that such a coating is, therefore, of longer life than we can now estimate. Pieces of plasticized nitro-cellulose made in 1866 are still in existence. Research goes on continually with noticeable results and high promise for improvements in the near future.

Personality

Every experienced recordist will testify that a given lacquer formula has a very definite personality. Some of them are treacherous, ill-mannered and prone to cause trouble, while others are always reliable. Personality is perhaps the sum total of twelve factors. These may be listed as follows:

a. Easy cutting.

b. Static and thread throw.

c. Noise (as measured immediately after cutting).

d. High frequency response.

e. Playback life.

f. Aging of the uncut disc, loss of cutting qualities.

g. Aging of the cut disc, development of noise and inter-modulation distortion.

h. Adherence to aluminum under all climatic conditions.

i. Processing characteristics, good behavior in both the silvering and gold sputtering methods.

j. Stability of recording properties under a wide range of temperature and humidity.

- k. Advance ball behavior.
- 1. Grease resistance.

Coating Process

Audio Devices introduced machine coating into this country and demonstrated that no other method equalled the single layer, homogeneous, automatic application of lacquer to an aluminum disc. When the film has dried, the disc is put through a controlled temperature cycle. This improves the coating considerably; the noise level decreases and the high frequency response improves

The Coating Machine

Eight years of experience have indicated that this automatic coating machine does not impose any restriction on the formulation; in short, any coating which makes a good record can be handled by this machine. Coatings made by other methods will be several db noiser than the same material applied by machine.

Quality Control

Of course, it is one thing to devise a good formulation, and it is another thing to manufacture it successfully. This problem has become more complex year by year and, with the present deterioration of raw material, it has even become necessary to re-purify a large number of chemicals. The impurities removed would have no significant effect on an ordinary industrial lacquer, and it is perhaps no reflection on the chemical manufacturers to say that re-purification is necessary. It has merely been found that microscopic percentages of certain impurities tend to effect considerable changes in the lacquer performance. Quality control is not a new phrase with us, as we were using advanced quality control procedures years before the war. Production control in the disc plant is a large subject in itself; it is chemical engineering par excelsis.

*. High Frequency and Noise Level Characteristics of an Instantaneous Recording Disc — C. J. LeBel. ATE Journal, Vol. 8, No. 1, p. 6, January 1941.

Reprints of This Article Available on Request

The Audio Record has been enlarged from four to six pages this month in order that we might bring our readers Mr. LcBel's complete article. Reprints are available to all who request them. Write—The Editor, Audio Record, 444 Madison Avenue, New York City.

Secretary-Treasurer Television Broadcasters Association, Inc.

Although network facilities for television broadcasting are now being expanded across the nation, the television broadcaster will have to rely on "recorded" programs to a marked degree if he is to fulfill the requirements of the Fed-



eral Communications Commission, which initially called for a minimum 28 - hours - per - week of telecasting be-ginning April 1.

Networks can provide the television broadcaster in outlying regions with a certain amount of high quality programs, but for "local"

Will Baltin

shows, where sufficient talent is unavailable, he will have to fall back on tran-scribed or "recorded" material, much as the radio broadcaster does today.

The Disc Does The Work

Of course, in television there is a marked difference as to what constitutes a recorded show. In radio the disc jockey merely chortles his introductionsand the commercial-and then permits the disc to provide the entertainment.

Film is to television what the acetate disc is to radio. Quantitavely speaking, good film for television is scarce today. One can understand the reticence of the major film producer to supply television broadcasters with the product he makes available to theatres. A great hope for the telecaster lies in the independent film producer who is presently "packaging" film shorts, ranging from one to 30minutes in duration.

New Film For Recording Tele

Intriguing projects are also understood to be under way in the laboratories of du Pont and Eastman Kodak where special film is being developed for recording television programs directly off the face of a cathode ray tube. With the picture quality on the fluorescence of the kinescope constantly improving, and with the brilliance of the image easily controlled, it is quite possible to film an entire studio-produced television program off the face of the video receiving tube and thereby provide a method of not only retaining a permanent record of the production, but making possible distribution of the film for use on other stations.



Grouped around a recorder as they listen to the playback of a disc are students in Elissa Landi's "Speech for Radio and Television" class at New York's City College. From left to right-Henry Dasaro, Miss Landi, Rose Kaufman, Mildred Cuscione and Sgt. W. P. Berkeley.

New York's City College Offers Speech Course To Radio-Tele Aspirants; Many Discs Employed

Because the use of recordings has proved to be one of the most valuable assets in attaining the goal of perfection in speech for radio and screen and radio, in her classes in "Speech for Radio and Television," offered by the Evening and Extension Division, City College School of Business, New York City.

Records Aid In Speech Correction

Recordings used in the class are made from scripts read by all the students individually and in dramatic form. Later these records are played back to the student in individual conferences and in class. The defects in speech, inflection and diction arc then discussed, in an effort to help the student overcome his speech faults and attain perfection. Miss Landi thus provides assistance for those who have imperfections in their speech which mar their speaking personality. Special attention is given to individual problems, both in class and in interviews between student and instructor.

Miss Landi's classes are held on Tucsday evenings in the studios of radio station WOR-New York. They are but a part of the many classes which comprise the radio and television offerings of the Evening and Extension Division of the City College School of Business. All the classes make tours of broadcasting stations and television centers as a part of the class work and recordings are a part of the scheduled instruction in many of

television, they are used extensively by Miss Elissa Landi, star of stage,

the courses, according to Earl Ryan, Supervisor of Radio and Television.

Courses and instructors include "Survey of Radio and Station Practice," taught by Jo Ranson, Public Relations Director, Station WHN—New York; "Practical Radio Announcing," by Carl Mark, Radio Director of the Al Paul Lefton Advertising Agency, New York City; "Radio Scriptwriting for Produc-tion," by Ted Cott, Program Director of WNEW-New York and Jeff Selden, head of the continuity writing staff for Station WNEW; "Television Studio Operation and Program Production," by Raymond E. Nelson, President of the Raymond E. Nelson Advertising Agency, New York City; "Documentary Ra-dio," by Seymour N. Siegel, Director of Programs at the Municipal Broadcasting System, Station WNYC; "Radio Broad cast Advertising," by Hershel Deutsch, Radio Director of the Gray Advertising Agency, New York City; and "Radio Audience Research," by Oscar Katz, As-sociate Director of Research in the Columbia Broadcasting System.

Workshops offered include: "Television Laboratory Workshop," "Radio Dramatics Workshop," "Advanced Radio Dramatics Workshop," and "Workshop in Television Commercials."

AUDIO RECORD

Record Shows or Participation?

(Continued from Page 2) to remember five of the ten sponsors between them, or an average of 1 2/3 each. This was better proof than I had hoped for, but it brought out the point that the show was definitely identified by the artist on it, and that various clients got little sponsor identification.

Greater Product Identification

Now, we don't say that participating programs do not do a successful job. Some have done it and are still doing it. We do say that your own transcribed program, properly tied in to your own commercial message, will supply greater 'identification' and, therefore, stimulate sales. That, after all, is what a client desircs. It has been computed that a five minute show (time and talent) in most markets costs about the same as a participation. Tests comparing participations and transcriptions in cities of comparable size on stations of comparable wattage at approximately the same cost have been made. These tests invariably proved the five minute shows a better sales medium.

You may ask, "Will a listener tune in for a five minute show, or do they get it quite 'by accident' as the carry-over from a previous broadcast?" Our answer is that a good five minute show will create its own listening audience, and that listeners will tune in for it. This is Fact -not Fantasy! To prove the point when Vick Chemical Company used "IT TAKES A WOMAN" (one of our recorded programs, incidently) in Canada, the ratings in various cities varied from 5.1 to 13.1, due to local conditions. CFRB-Toronto reported a record rating of 9.8 the highest daytime rating of any program of any length on that station. The show was on from 12:55 to 1:00 P. M. enjoying more listeners than the fifteen minute show which followed, and the ten minute show which preceded it. This proves conclusively that listeners tuned in specifically to hear "IT TAKES A WOMAN," a five minute show, which gave the client both rating and 'sponsor identification'.

Who Pays The Bills?

This sponsor identification business is just simple arithmetic. If you have a 20 rating and 50% sponsor identification, 10% of the people know who is paying the bills for your show. If you've got a 15 rating and 90% sponsor identification, then $13^{1}/_{2}$ % know who is paying the bills.

It's a proven fact, if an advertiser wants to get the most out of his advertising dollar he will select a good transcribed 5 minute show in preference to the participation every time.

N. Y. Outlet Features Special Recorded Program From London

Mobile Recorder Used For Interviews

"Pleasure Parade," a new series of fifteen minute recorded programs heard over WNEW-New York on Sunday cvenings is designed to acquaint Mr. and Mrs. America with England's theatrical headliners. The transmission via BBC covers the entire entertainment world in London and is also carrying items and interviews with well-known Americans visiting England. Producers of the 13week transcribed series use a mobile recorder for on-the-spot broadcasts from sporting events and other places of entertainment.

The Television Transcription (Continued from Page 5)

Paramount Pictures, Inc., is employing a similar method in its experiments for theatre television, and it has already been revealed that Paramount is able to receive a television program off the air, film the sight and sound, develop and print the subject in from one to three minutes. This so-called "delayed" television makes it possible to provide many theatres with a television service for immediate use when the subject is received or for exhibition whenever desired.

One thing is quite clear: There is a definite place for the "transcribed" program in television and this will be borne out to an ever-increasing extent as more video stations reach the air this year.

SILENT SENTINELS OF

4,632 Little Bottles

These bottles are but a small portion of the 4,632 i which have passed through our laboratory. Each represents a part of a continuous series of chemical research-responsible for attaining and maintaining the quality of Audiodiscs.

★ ★ ★ For the leadership of Audiodiscs is the result of exhaustive experimental work, plus the most exacting quality controls known to the recording industry. ★ ★ ★

Recently, to add still further to our research facilities, we greatly expanded our laboratory. Today, our research engineers are constantly exploring new materials and methods, in order to further improve recording fidelity and broaden the field of sound reproduction.

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