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## Audio Devices' President In Europe; To Confer With Top Phono-Radio Heads

"1946 Record Sales Only Beginning; Foreign Disc Demands Up Too"—Speed

William C. Speed, President of Audio Devices, Inc., sailed recently on the QUEEN ELIZABETH for Europe, where he is scheduled to meet with leading recording and broadcasting officials in England and France on market conditions and technical advancements in sound recording.



William C. Speed

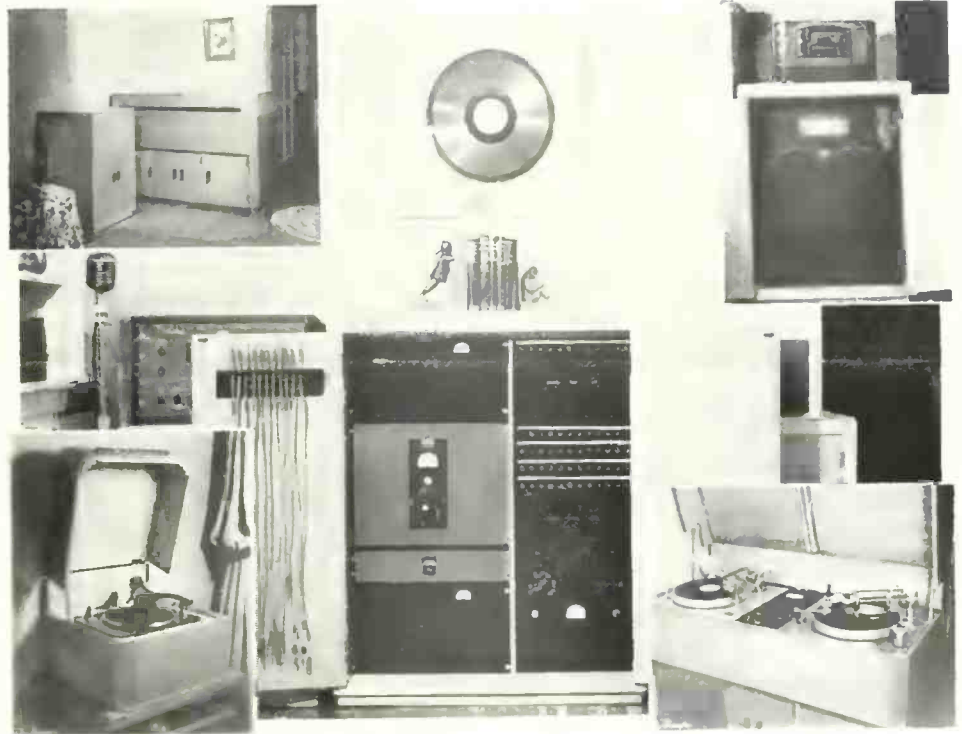
Prior to his departure, Mr. Speed related that, although 1946 witnessed the manufacture of more than 300,000,000 phonograph records, plus countless thousands of other types of

transcribed recordings, the year 1947 promises even greater record production.

"We in the recording industry," Mr. Speed emphasized, "definitely believe that the popularity phonograph records and recorded radio programs enjoyed during the past year is only the beginning of a trend that will soon see more and more people enjoying recorded entertainment in their homes.

"Phonograph record production and sales alone last year," Mr. Speed pointed out, "were three times as great as before the war. This has occurred," he said, "in spite of the fact that comparatively few new phonograph machines have yet been produced. And, this large increase," Mr. Speed continued, "is not only seen in this country, but abroad as well. Exports of recording discs have increased rapidly and now amount to more than 10% of domestic sales. The production of electrical transcriptions, the more expensive and better quality record, primarily used for transcribed radio programs, was also far greater than in previous years," Mr. Speed explained. Prior to 1941, this type of record was used almost entirely for musical programs.

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Occupying an attractive corner in Larry Ruddell's living room (Larry is ABC's disc chief) is this amplifier rack, which contains 6 channels of recording equipment and the master control board. Other units in the room, pictured clockwise: New Garrard RC-60 record changer atop a 16" record file cabinet; Match ply-wood cabinets housing test equipment and recording lathes; Incompleted power supply and tuner rack; Inside view of recording tables, which includes equalizers, transfer keys, VI meters, etc.

## "Recording Is My Avocation and Vocation Too" Says American Broadcasting's Recording Chief

By Larry A. Ruddell  
Recording Supervisor

AMERICAN BROADCASTING COMPANY

Ever since the day my father brought home our first "gramophone" many years ago and said you can make music if you turn the crank and push the switch, I have been interested in making music played by other people sound good.

Since those days many changes have taken place not only in the art of recording but also in reproducing, and during this interim I have tried many ways and have had many disappointments in my quest for perfect recording and playback. Actually the nearer I have thought I was to this goal the further away I have been from it. Recently, in my attempts to learn why, I have become surrounded in my every day life by what is actually a laboratory, consisting of the latest equipment developed in the industry.

The accompanying pictures will show in part the equipment I have, and I will

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### Oh, Yes He Was!

A contestant on Mutual's "Double or Nothing" a few Sunday nights ago was asked: "Was Enrico Caruso one of the greatest voices ever to be heard over the radio?" Promptly came the answer: "Yes." Todd Russell, program arbiter, just as promptly said: "No." Unabashed the guest retorted: "But I heard him over the air only two weeks ago!" The contestant explained it was a recording. Russell paid off!

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### Audio President In Europe

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Since that time, however, the use of completely transcribed shows has increased each year until today recorded programs are being presented approximately half of the total time radio stations are on the air.

In addition to foreseeing an unprecedented output in phonograph records and electrical transcriptions, the Audio official also explained that the demand for the instantaneous disc is now more than four-fold pre-war and with the construction of many new radio stations, coupled with the stepped-up manufacture of recording machines, the 1947 demand will reach even greater proportions.

When questioned on the practicability of other types of recording devices, such as wire and tape, and the '47 production outlook for them, Mr. Speed answered by saying: "It is our feeling in the recording industry that in the not too distant future delayed broadcasts, original motion picture recording, and conference recording will surely take advantage of some of the features offered by these other devices, particularly iron oxide coated vinyl tape. This method of recording, which was brought to a high degree of perfection by the Germans during the war, is now well along the road to mass production here. In fact, our own company has done considerable research on vinyl tape during the past year and production is now under way. However, he concluded, "any effort to indicate that discs and oxide tape, for instance, are competitive seems rather futile at this time. Discs are still high on the wave of popularity with every indication of staying there if simplicity, quality and price are to remain as governing factors."

Mr. Speed will remain in Europe for approximately one month.

#### "SCHOOL SOUND SYSTEMS"

A splendid guide for those selecting and utilizing sound equipment, *School Sound Systems*, a comprehensive 31-page summary of basic standards for school sound systems, is being offered (single copies free) to educators and others working in the field of Audio education by the Radio Manufacturers Association, Washington, D. C.

### ABC Disc Chief Home Recordist

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try and describe to the reader what my "home recording unit" consists of.

The first thing I had to do was to sell my wife on the necessity of having it and to reconcile the investment that was necessary for the installation. Since this was to be a "proving ground" for my ideas it was essential that I have the tools with which to work, so I proceeded by "trial and error" to obtain the finest speakers, amplifiers, cutters and other components necessary for the construction of a recording and sound system.

I utilize practically every controversial component that is discussed in the trade today; triode and pentode amplifiers, commercial, custom built and equipment of my own design. Communication receivers, TRF and Superhet tuners, Jensen and Altec speakers, special recording equalizers, etc.

We all know that before we can hope to cut a good "platter" we have to be sure we have a good recording table, cutter and blank on which to record. If we haven't these basic requisites, regardless of what else we have, we cannot hope to obtain the desired result.

For recording I use Allied tables. I have mounted these on twenty-four inch base panels and together with a few other "tricks" the records are free from any visible pattern and there is no discernible "rumble" on playback. For appearance sake, the overheads have been chrome-plated and the base plates are stainless steel. The control panels are mounted on bakelite and chrome trimmed. The tables are lighted with overhead lumaline fixtures.

I have tried all cutters that are interchangeable with my overheads including RCA, Fairchild, Presto and others but of all these I prefer the new Presto 1D.

Due to lack of space, the rack consists of 60 R-T-S jacks and the main cable from the recording table to the rack contains 50 pair of shielded leads and 10 additional pair run up from the auxiliary block in the power supply cabinet. It also contains 6 channels of equipment. Two of the amplifiers use 6B4's, one 807's, one 6L6's and two 6V6's in the output. I use the new Super-Pro 400X for communication work, the Hallicrafter S36 for UHF work from 27.5 to 143 megacycle and for comparative FM tests, a Miller TRF tuner, the new AM-FM Browning and last but not least the new deluxe Fisher.

Also in the rack there are two four-channel Pre-amps that are interchangeable with any of the above equipment

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

### W O W

In the midst of the current widespread interest in improved recording fidelity, one factor has received little notice, the question of stability of speed, or wow. This is the more curious because the public is quite conscious of such a fault.



C. J. LeBel

Everyone, of course, appreciates the need for watching the condition of the drive mechanism of a recording machine and playback table. On the other hand, few seem to remember the role of excessive clearance between center pin and disc hole. The result can be serious, regardless of the quality of the machine. In fact, a very fine pre-war machine can be the most erratic offender, due to pin wear from the many discs recorded or played.

#### The Problem

To simplify this discussion, we disregard the spiral nature of the groove and consider the needle running at a fixed distance from the center of the disc. We ignore also whether we are recording or reproducing—a disc miscentered in recording and played back centered will exhibit the same wow as a transcription disc perfectly centered in recording, and miscentered in playback. We likewise neglect the distortion products resulting from the frequency modulation process (which wow is), and take only the maximum range of pitch change. This figure has been the one generally discussed, being most easily measured.

#### Calculation

If a disc with a hole larger than the center pin is placed with one edge of the hole against the pin (as usually happens in a busy recording room), the disc center is offset from the center of rotation by half the difference of hole and pin diameters, which we may call  $\frac{d}{2}$ .

This means that the distance from the groove to the center will change, during



one revolution of the disc, from

$$R - \frac{d}{2}$$

to

$$R + \frac{d}{2}$$

where R is the distance from the center of rotation to the groove spot which is being played.

Obviously, the proportional change in groove velocity as a result of the change in radius will be

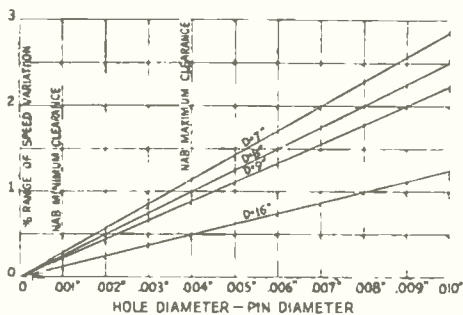
$$\frac{R + \frac{d}{2}}{R - \frac{d}{2}} - 1$$

In terms of diameter (D = 2R) this becomes

$$\frac{D + d}{D - d} - 1$$

In the range of variation we are considering, where d is very small compared to D, this expression may be very accurately simplified to change in groove velocity =  $\frac{2d}{D}$

This may easily be read in the following figure:



Of course, if this wow occurs in recording, and if the reproducing pin is the same size, the wow by fortuitous placement on the pin may be doubled, unchanged, or reduced to zero in reproduction.

**Some Practical Observations**

Obviously, some variation in disc hole size must be allowed, to allow for a reasonable amount of wear of punch and die. Also, some variation of pin size is necessary. On the other hand, the number of professional machines is limited, whereas the discs are made by the million. Hence, it is most economical to allow a larger share of the permissible variation for the disc hole.

In March 1942, the National Association of Broadcasters set the following dimensions as standard:

- Disc hole .285 to .287" diameter
- Pin hole .283 to .284" diameter

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U. S. Savings Bond radio promotion for 1947 gets underway as Kenny Delmar (radio's Senator Claghorn) and Gladys Swarthout, lovely singing star, present one of the first discs of the new "Guest Star" series to Wm. A. Kielmann, Vice President of the New York State Bankers Ass'n.

**Over Eleven Hundred Stations Sign-Up To Air Treasury Department's "Guest Star" Records**

With America's radio stations leading the way in promotion, the U. S. Treasury Department chalked up a grand total of well over eight billion dollars' worth of Savings Bonds sales during 1946. And, transcriptions were the most important and widely-used medium of Savings Bonds radio promotion. When the "Treasury Salute" (fifteen minutes, twice each week) transcribed series completed its run the latter part of December, it was being broadcast by one thousand and four stations—probably the greatest number of stations in radio history ever to carry a program for an extended period.

In addition to "Treasury Salute," the Radio Section of the Savings Bonds Division produced during 1946 thirty-six five-minute transcriptions featuring famous athletes and prominent women. These discs were done with an interview format, but only the interviewee's voice was cut on the record. Carefully timed pauses were spaced between answers, so that local station sportscasters and women commentators could ask the questions from scripts which were provided with the transcriptions. This production twist added a novel, local flavor to the programs and garnered for them wide and enthusiastic acceptance. Approximately seven hundred stations presented these five-minute interview transcriptions.

for 1947 is well under way with this year's fifteen-minute feature being "Guest Star," a variety program starring many of today's outstanding radio artists.

In addition to one or two top-name guests, each "Guest Star" program features as "host," Kenny Delmar, plus music by the Savings Bonds Orchestra and Singers under the direction of Denes Agay. All of the shows feature original material prepared especially for the Treasury by writers Carroll Moore, Jr., Mort Freedman and Milt Surrey.

Eleven hundred and twelve stations have placed written requests with the Savings Bonds Division for the "Guest Star" transcriptions. Program number one was released for broadcast March 30th. The entire series will be accompanied by high-level promotion to build the largest possible listening audience.

Not only during the war, but even more so during the first peacetime year of Savings Bonds activity, has transcribed radio proved its value, so it's only logical that the Treasury will continue to base its Savings Bonds radio operation on transcriptions and the individual radio stations during 1947.

Savings Bonds transcription production



"The transcribed announcement scheduled for this period will not be heard."

### ABC Disc Chief Home Recordist (Continued from Page 2)

and which permit me to do all kinds of mixing; each one consists of two low-level and two high-level inputs.

I use the Western Electric 9A and 9B pickups for playback of hill-and-dale and lateral reproduction respectively. Each pickup has its own booster and pre-amp in its circuit.

There is a cutter-transfer key that makes it possible to cross-over from one cutter to the other through the same recording channel but by the use of cutter keys it is possible to record two different fifteen minute programs simultaneously.

As level indicators I use the Weston VU Meter on the control panel of the recording table and on the amplifier control rack I have a DB Meter calibrated with the one on the recording table for the presetting of recording levels. All of the recording amplifiers are flat from approximately 20 to 20,000 within plus or minus 2DB with about one-half of one percent distortion.

For the playback of commercial shellac records I use the new Garrard RC60 record changer with the new GE, MPLI crystal and the Garrard magnetic pickups that are all interchangeable. For recording I use discs from all of the "Big Four" manufacturers but for overall dependability and consistency it is the Audio Red-Label two to one.

My test equipment consists of a Hewlett-Packard Oscillator, RCA Oscilloscope, Daven Gainset, Hewlett-Packard distortion meters, RCA Volt-Ohmyst tube tester, continuity meters and miscellaneous check records. It is possible by "throwing" a patch-cord in the rack to feed tone to any channel, to "meter" the output as well as put it on the scope

by the same simple procedure. I have striven for simplicity of operation and design and interchangeability of all components of the system. All input and output impedances are 5000hms which greatly increases flexibility.

Always remember you cannot take out of a system more than you put in and if it is not Clean going in it will not be Clean coming out. The human ear is final criterion by which all reproduction is judged and if it is not pleasant listening your efforts for perfect reproduction have been in vain.

### Disc-Data

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From the chart, these dimensions will permit a fluctuation range, at 7" diameter, of

Average	.07%
Maximum	.11%
Minimum	.03%

These are not normally noticeable. On the other hand, we have often encountered badly worn pins on otherwise good machines, a typical case being .280"

With a .287" hole, this would produce a range of .2%, which may be noticeable when added to the natural wow of the machine.

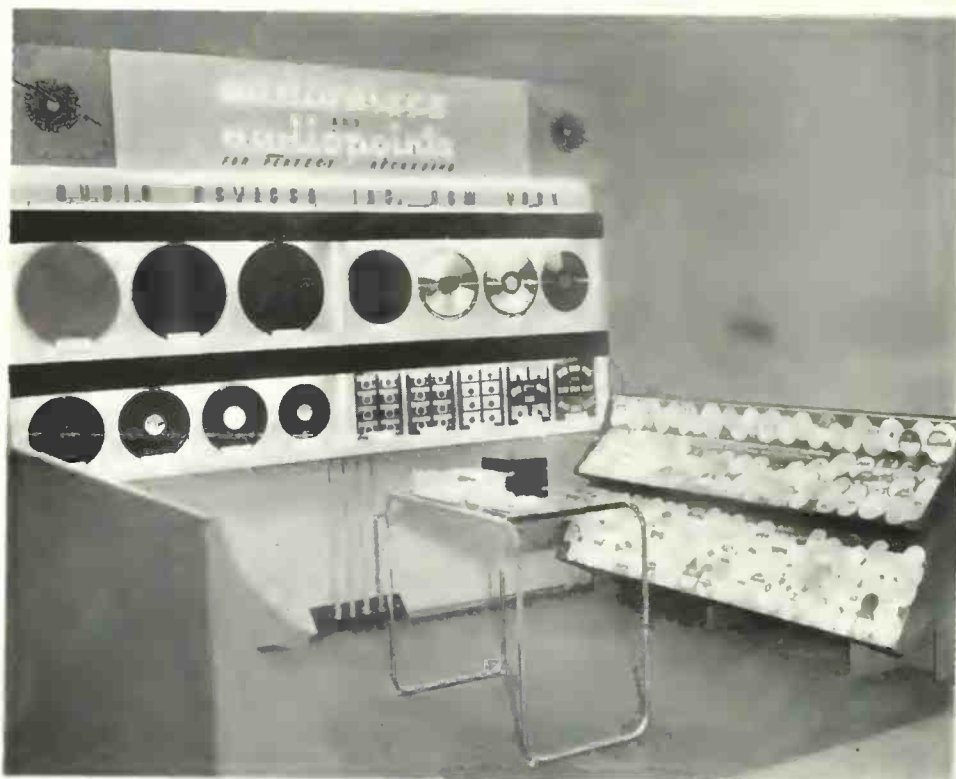
Actually, the NAB limit of range of variation of recording machine speed is .2% (+.1%), so it is reasonable to keep other variations small by comparison.

### Conclusion

Wow being such a variable, and so hard to track down, it is the better part of wisdom to minimize misfit as a cause. Many machines now in use have pins as small as .278". It would be wise to measure your own machines at intervals, and if the size is beyond official limits, consult the manufacturer. Do not use an oversize pin—a hole of lower limit size may fail to fit on. With many tables in use for nine or ten years, this matter deserves real attention.

### Attention Readers

If YOUR name is not on the Audio Record mailing list, drop a penny post card to—The Editor, Audio Record, 444 Madison Avenue, New York 22, N. Y.



The 1947 National Convention and Show of the Institute of Radio Engineers, held March 3-6 in New York's Grand Central Palace and Hotel Commodore, saw the registration of 12,500 persons and was unquestionably the most successful event in the Institute's history, IRE officials advise. During the four day meeting, 120 technical papers were presented, several of which concerned latest developments in the recording field, and 170 exhibitors from every state in the union and from every province of Canada displayed their products. The Audio Devices display (above) showed the various types of discs, their applications, and each step necessary in their production, from raw material to finished blank. Also, the process involved in making phonograph records from Master discs. On the booth's sidewalls, transcription labels, representing hundreds of radio stations and recording studios throughout the United States, Canada, Alaska, Porto Rico and Hawaii using Audiodiscs, were displayed.