THE QUIET FORUM

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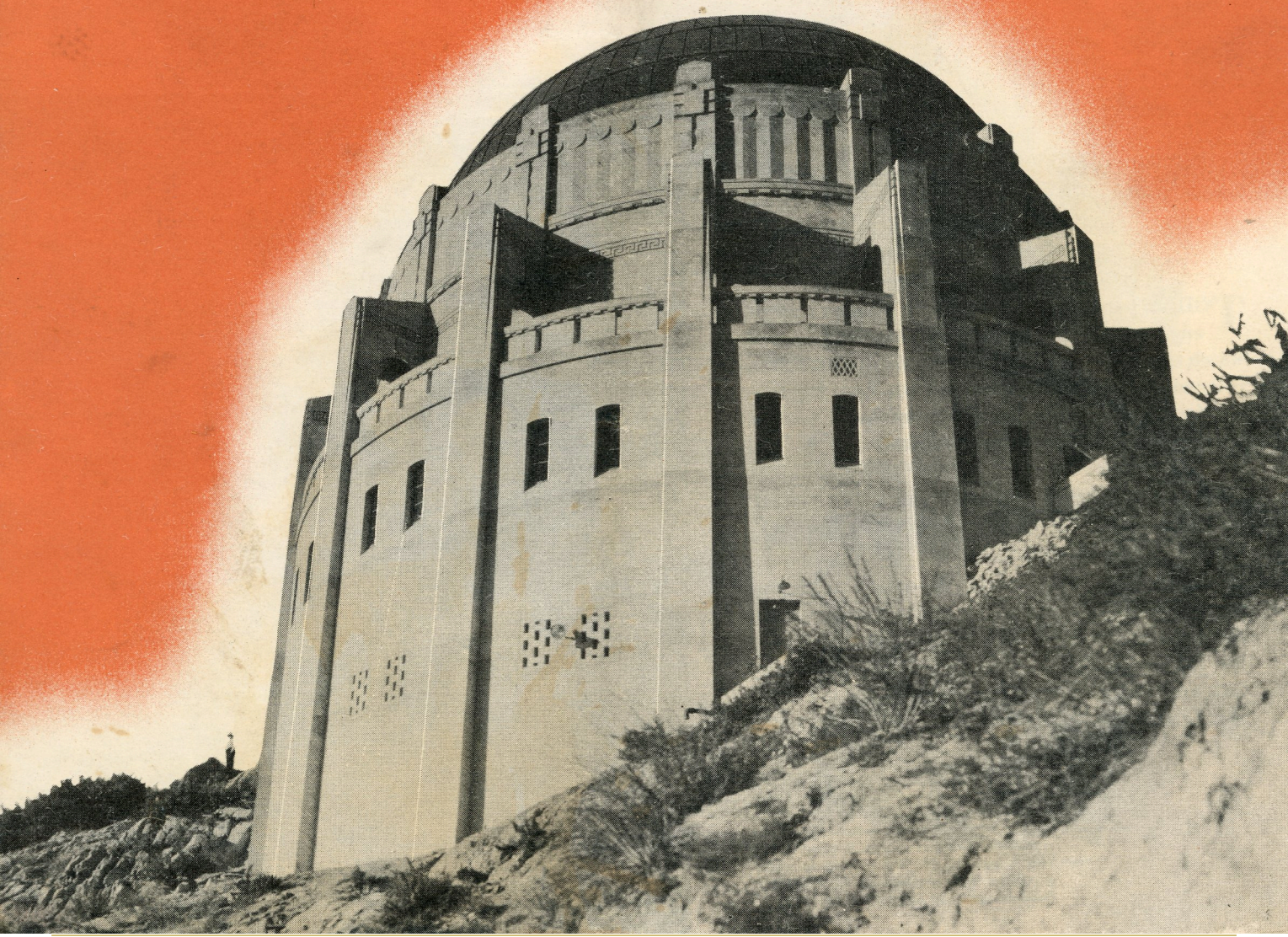
WESTERN ASBESTOS CO.

VOLUME 4

Acoustical Engineers and Contractors
OAKLAND — SAN FRANCISCO — SACRAMENTO

No. 2

COMBINING LESS NOISE— BETTER HEARING



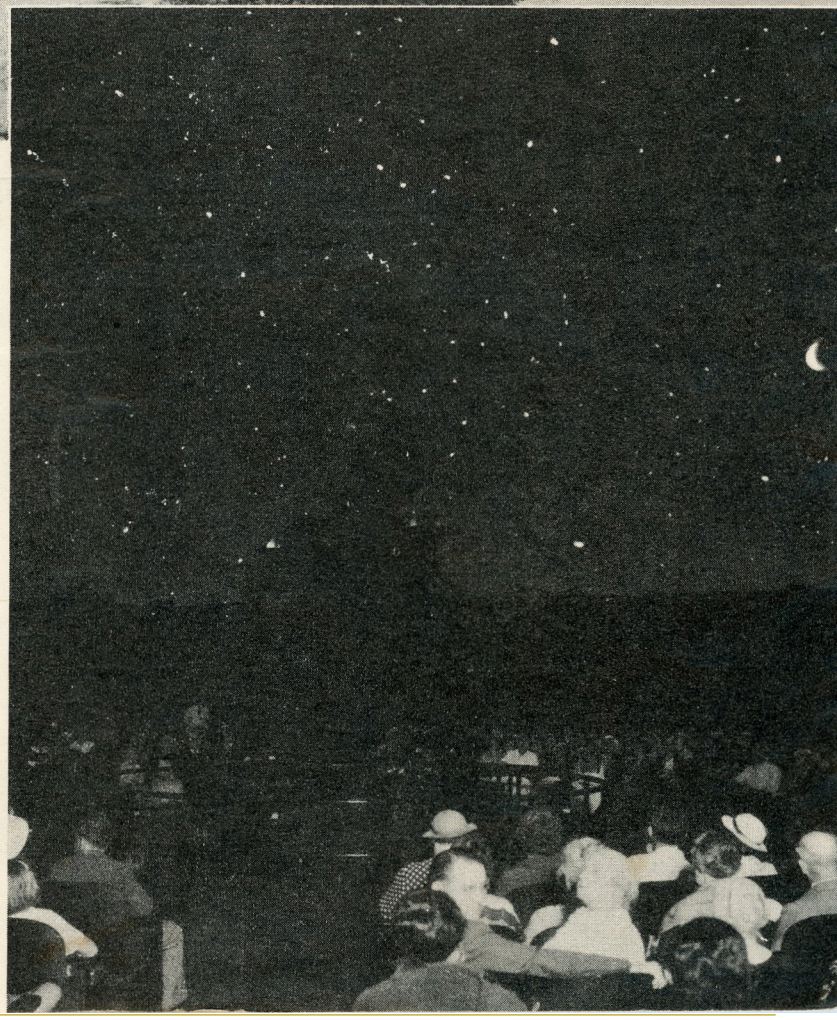
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QUIET AS THE STARS OF NIGHT



TODAY persons eager to acquire a better knowledge of the habits of heavenly bodies can watch their movements on a "man made sky." This is possible in Griffith Planetarium, Los Angeles, California, where the lecture room has a vaulted dome ceiling, having an inside diameter of 48 feet, forming an impressive "sky" of seemingly vast proportions. On this sky through delicate mechanisms play replicas of all the planets, stars and comets known to man.

To assure quiet and distinct hearing during lectures, this dome ceiling is fully treated with Acousti-Celotex Mineral Tile especially prepared for this purpose. The tile was applied to a metal lath and plaster ceiling and serves as an excellent sky. Lectures are easily heard in this crowded room.



WHEN 500 VISITORS AT THE GRIFFITH PLANETARIUM gaze at the stars, moon and sun passing across the domed ceiling, they are witnessing the ability of Acousti-Celotex to reflect light and absorb undesired sound. A special tile was prepared for this ceiling to make possible the projection of heavenly bodies upon an acoustical surface.

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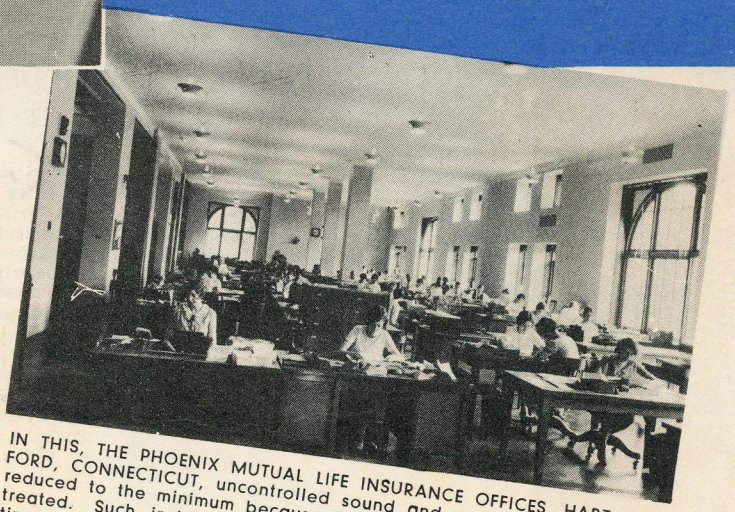
NOISE

REDUCES OFFICE EFFICIENCY

NOISE distracts you — steals valuable thoughts from your mind. Noise gives both you and your employees jumpy nerves, fatigue, headache, causes errors and efficiency. Noise costs you money.

Your own efficiency and that of your office employees can be increased by the installation of a Celotex Acoustical Product. There is one to suit your specific purpose. Noise control is not a gamble. It is sound dollars-and-cents business. Let us give you the facts.

IN THE NEW YORK OFFICES OF THE UNITED STATES TOBACCO COMPANY, this Calicel ceiling combines efficient sound correction and lasting beauty. Such treatment pays for itself in increased efficiency and reduced errors.



IN THIS, THE PHOENIX MUTUAL LIFE INSURANCE OFFICES, HARTFORD, CONNECTICUT, uncontrolled sound and costly errors are reduced to the minimum because the ceiling is Acousti-Celotex treated. Such installations are not expensive and pay continuous dividends.

RAYMOND ROSEN & COMPANY
WHOLESALE DISTRIBUTORS
32ND AND WALNUT STREETS
PHILADELPHIA, PA.

July 26, 1937.

Mr. Martin J. Brennan, Vice-President
Jacobson & Company, Inc.,
1609 Vine Street,
Philadelphia, Penna.

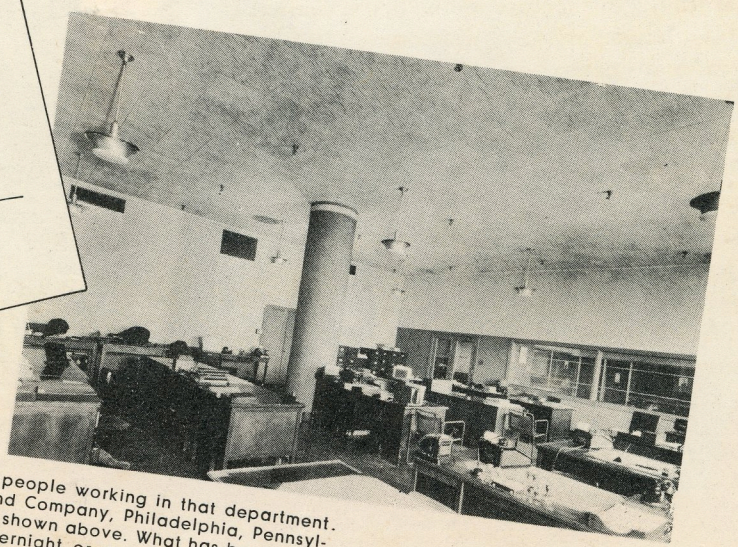
Dear Sir:

I am pleased to advise you that the installation of Absorbex, Type "A" Acoustical Tile which you have recently completed in the office of our accounting department, is entirely satisfactory. As a matter of fact, the results have exceeded our most optimistic expectations.

The increase in efficiency of the people working in that department is marked and we are delighted to heartily endorse this material as well as the workmanship and finished appearance.

Very truly yours,
RAYMOND ROSEN & COMPANY

RR*Cm.



"THE INCREASE IN EFFICIENCY of the people working in that department is marked" writes Raymond Rosen and Company, Philadelphia, Pennsylvania, of the installation of Absorbex shown above. What has been done here can be done in your offices overnight or over the weekend. No lost time—no interference—no muss.

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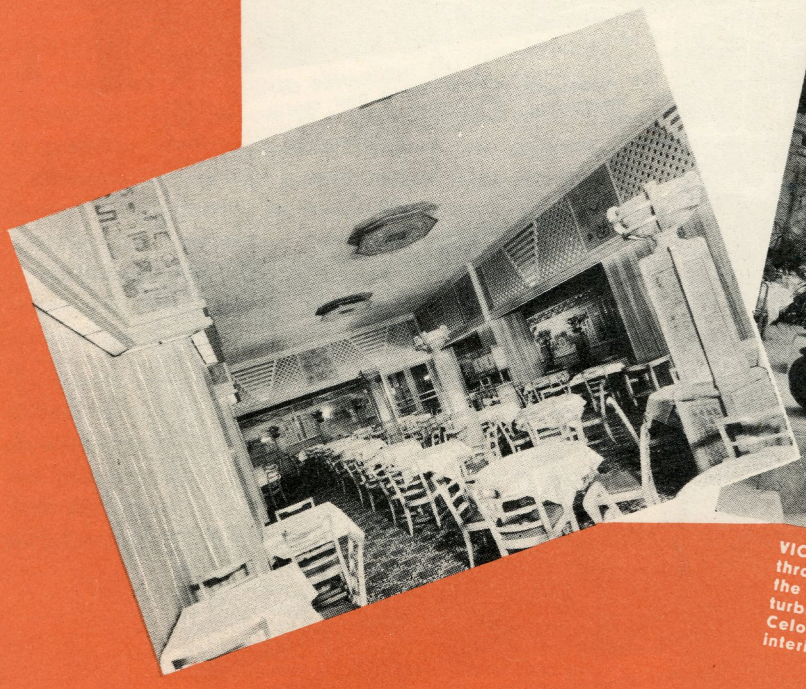
DINE WITH NO DIN IN THESE FAMOUS RESTAURANTS



IN THE CEILING OF THE MAYAN RESTAURANT, (ABOVE AND BELOW), Rockefeller Center, New York, Calicel, fitting in perfectly with the architecture, lends beauty in addition to quiet. Calicel is a mineral acoustical tile available in various natural stone shades.

TWO restaurants at opposite Coasts known for widely divergent atmosphere, serving different foods have two important things in common—good food and QUIET. They are both world famous—The Mayan Restaurant, Rockefeller Center, New York and the Victor Hugo Cafe, Beverly Hills, California.

Quiet, too, was achieved in different manners with different materials, but in both the annoying rattle of dishes, the clatter of silverware and the rumble of conversation has been eliminated, providing comfort for patrons and profit for the management.





VICTOR HUGO wanted to maintain his famous glass ceiling through which patrons could gaze at the heavens, and at the same time add QUIET to his menu of delicacies. Disturbing noise was eliminated by the application of Acoustical Celotex to the walls leaving the unusual beauty of the interior unimpaired.

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University of Minnesota

TESTS . . . APPROVES . . . USES

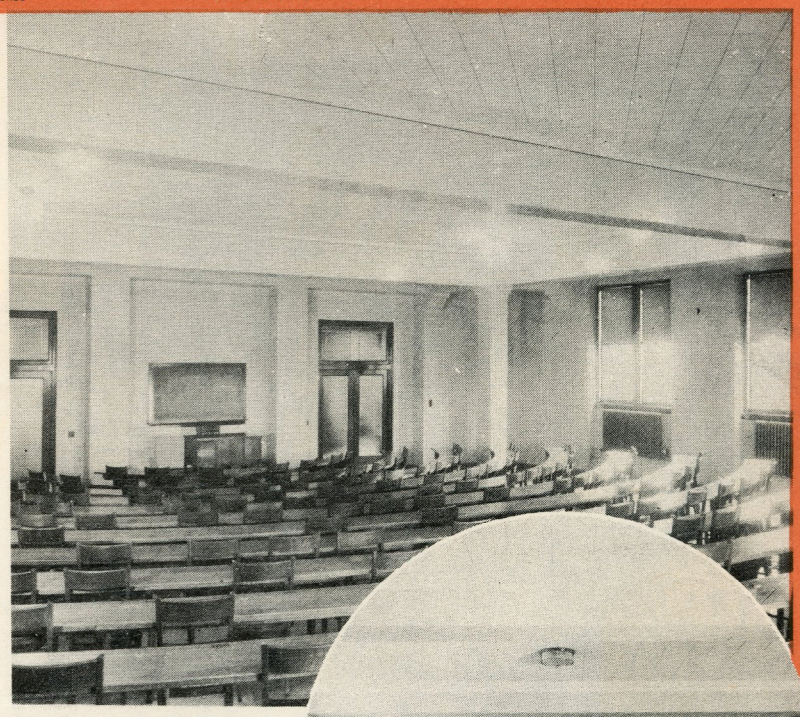
ACOUSTI-CELOTEX

TRADE MARK REGISTERED U. S. PATENT OFFICE

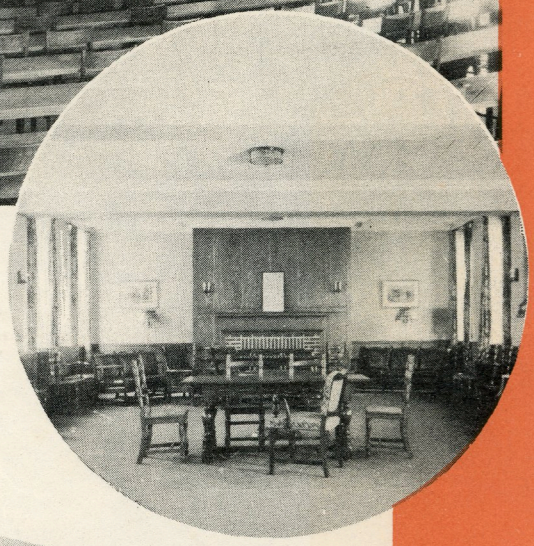
SOON sport fans throughout the country will be following the activities of Minnesota's national championship football team. Bernie Bierman's Golden Gophers have achieved an enviable reputation because they play scientific football. Perhaps their football lessons are well learned because quiet is achieved in the coaching offices through the use of Acousti-Celotex.

This, however, represents only a small portion of over 65,000 square feet of Acousti-Celotex installed in the many University buildings. Thoroughly convinced by comprehensive Physics Department study of the value of sound treatment, the University decided to install acoustical material wherever advisable. Tests were made in the Physics Department of all acoustical materials submitted and a decision was reached in favor of Acousti-Celotex.

As a result of these tests, strict specifications for acoustical material have been set up by the University. Continual repeat orders testify to the fact that Acousti-Celotex meets these requirements and in addition produces an attractive finish job.



STUDENTS in this lecture room at the University of Minnesota, owe some credit for their high grades to Acousti-Celotex.



CONTINUED EFFICIENCY is one of the factors that helped decide the University of Minnesota in favor of Acousti-Celotex. The Lounge in Men's Dormitory.



The neat, clean appearance and high light reflecting qualities are the factors that decided in favor of Acousti-Celotex. Dining Hall in Men's Dormitory.



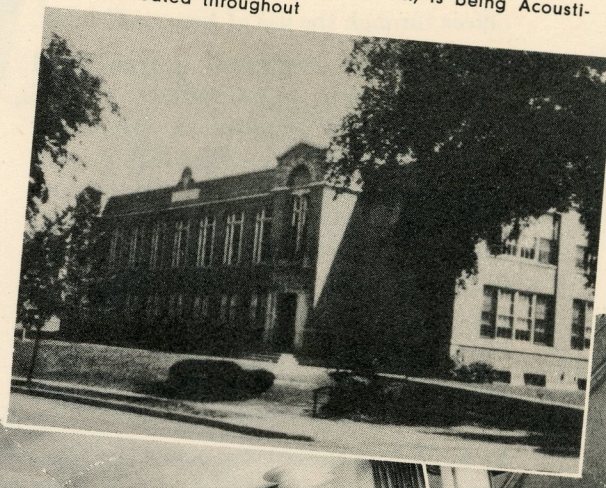
REPEATED PAINTING AND WASHING does not reduce the efficiency of Acousti-Celotex. Corridor in Health Service Hospital, University of Minnesota.

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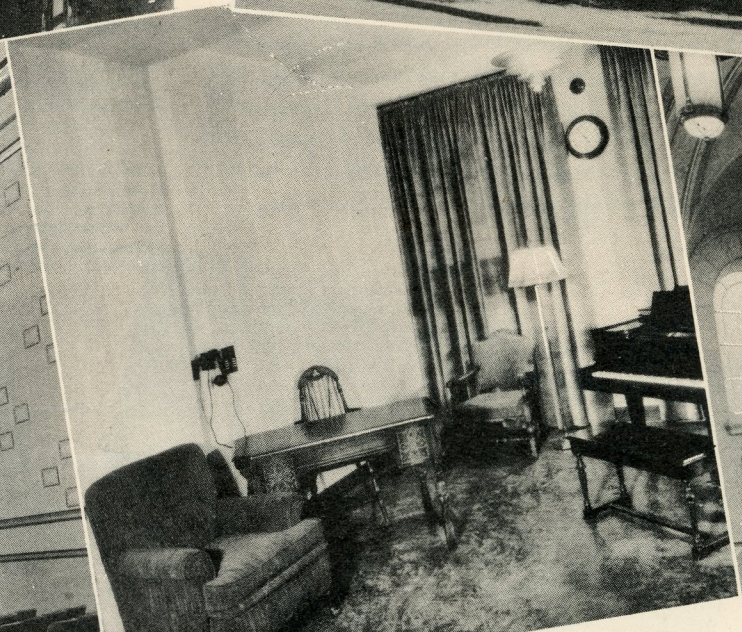
ERRORS ARE A SERIOUS BUSINESS IN BANKS, so the Bank of America, Ventura, California, protects against them with Acousti-Celotex. Noise is a retarding element in any business—NOISE bounces around the room distracting you and your employees. Noise disturbs—ruins concentration—causes fatigue, headache, inefficiency. NOISE causes errors and errors cost you money. You can't afford the extravagance of a noisy office.

ABOUT TWO YEARS AGO IN REDWOOD FALLS, MINNESOTA, Acousti-Celotex was installed in the combination gymnasium-auditorium. Impressed with the performance of this material, the School Board President invited several friends to examine the improvement—result—an installation in the bank. Later corridors of the old school were treated and now a new school, under construction, is being Acousti-Celotex treated throughout

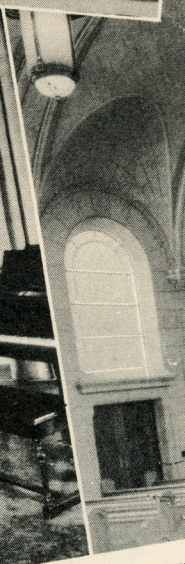




IN THE EMPIRE THEATRE, QUEBEC, CANADA, VIBRAFRAM, a Celotex acoustical product, improves sound projection. Because of acoustical control, patrons in the rear hear distinctly and those near the front of the house are not deafened by excessive sound.



RADIO STUDIO ENGINEERS know the value of acoustical correction and studio designers know the high efficiency of Celotex acoustical products. In Station KGW, The Oregonian, Portland, Oregon, Acousti-Celotex and Standard Celotex are combined for efficiency and beauty in architectural design.



ST. JOSE
New Yo
an attra
acoustic
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we will

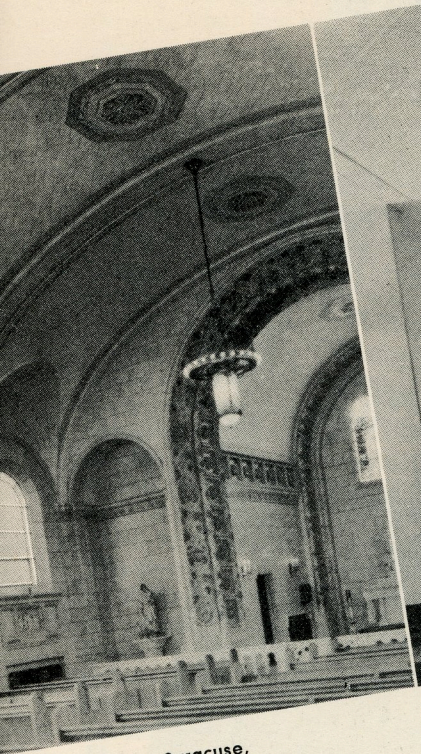
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CELOTEX acoustical products say "hush" to noise—hushing the noise in your offices means money in your pocket.

Whatever your noise problem—whatever your location, you can enjoy Celotex prescribed acoustical treatment. You may be safe in the assurance that one of the oldest, the largest, and most complete line of acoustical products is at your command.

We will gladly investigate your noise condition and suggest a remedy. Application may be made overnight, or over a week-end. Call us and let us put you in touch with others near you who have profited from noise correction.

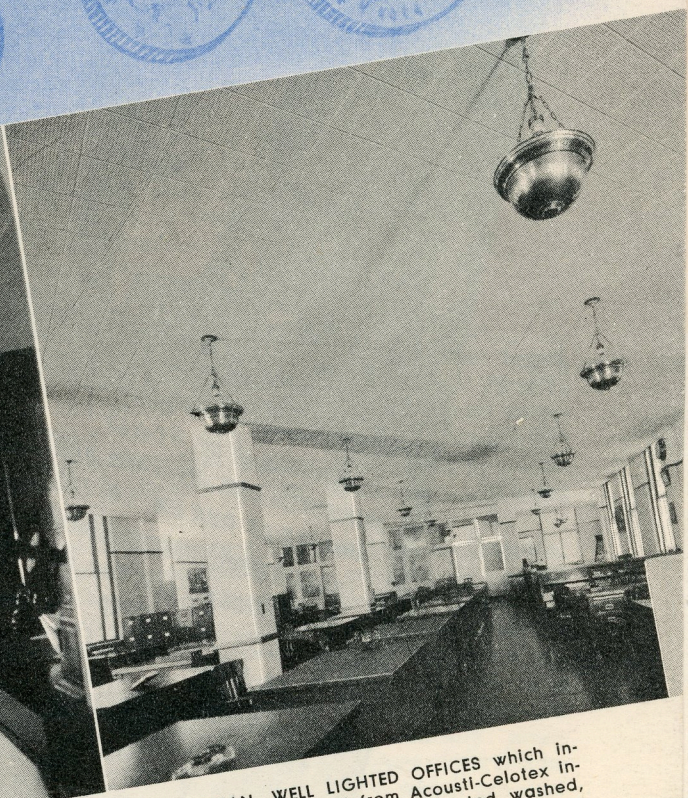
HUSH MONEY



OSPITAL CHAPEL, Syracuse, Acousti-Celotex treated in herringbone pattern. Good be assured and architectural ntained with Celotex acous- s. Tell us your problem and mmend a cure.



NOISE does not disturb the patients of the Santa Anna Valley Hospital, Santa Anna, California, because Acousti-Celotex says "hush" to noise. Once installed it maintains its efficiency indefinitely requiring no additional surfacing.



NEAT, CLEAN, WELL LIGHTED OFFICES which increase efficiency result from Acousti-Celotex installation. This material can be painted, washed, or cleaned regularly by your regular help. These are the attractive offices of the Argentine Portland Cement Company, Buenos Aires, Argentine.



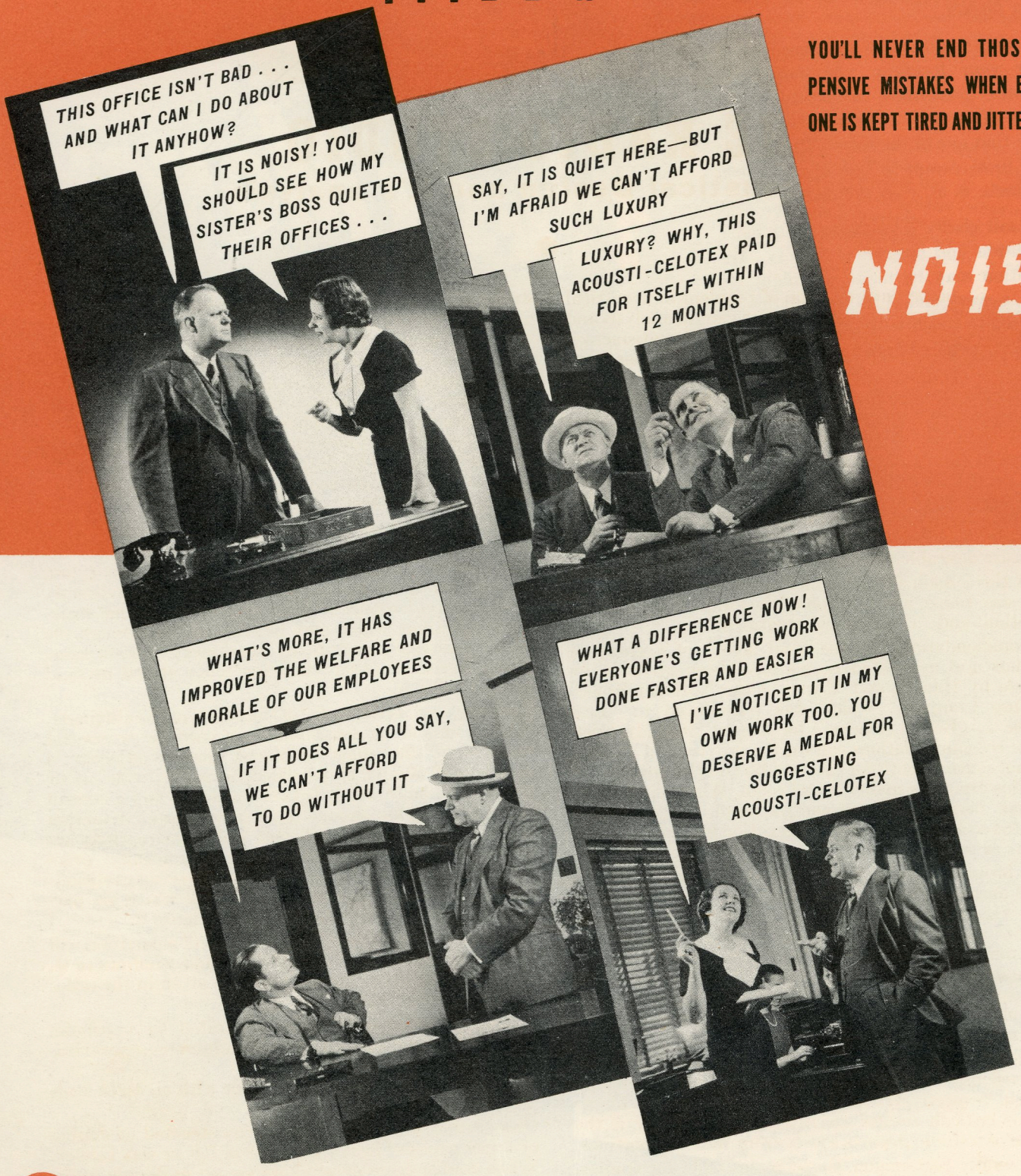
THE OFFICES OF GEORGE BLACK & COMPANY, Portland, Oregon; Absorbex has been used in the ceiling for noise correction, achieving an effective appearance as well. Efficiency can be increased 10 per cent, Typing mistakes reduced as much as 29 per cent, with proper NOISE CORRECTION.

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WHY BLAME HER? . . .
. . . IT'S YOUR FAULT!

YOU'LL NEVER END THOSE EXPENSIVE MISTAKES WHEN EVERYONE IS KEPT TIRED AND JITTERY BY

NOISE



IT'S the noise you take for granted that wastes money. Telephones, typewriters, voices, foot steps, ALL destroy concentration—slow up work, cause mistakes . . . Noise actually wastes an average of 10 per cent of time and work you pay for according to tests made by leading companies.

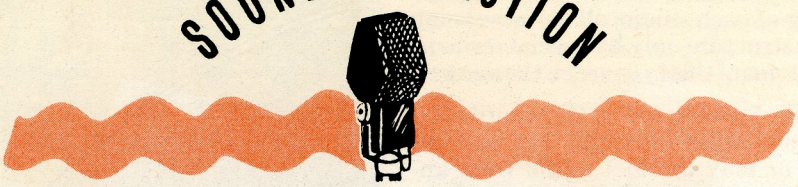
Thousands of progressive companies have subdued noise at a profit with Acousti-Celotex, increasing efficiency to 10 percent. Actual records show that Acousti-Celotex has:

Reduced typists mistakes 29%.
Reduced mistakes by machine operators 52%.
Increased production 8.8%.

The secret of Acousti-Celotex is the patented perforations that trap and smother noise. The effect is permanent, because Acousti-Celotex can be painted and washed.

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SOUND CORRECTION



THE RADIO STUDIO

The Acoustical Design and it's analysis

THERE is perhaps no type of problem in acoustical engineering which requires more careful analysis and a more exact solution than that of providing satisfactory acoustical conditions in radio studios. This has been brought about chiefly by the rapid improvement of equipment and program technique and the consequent heightened standards of broadcasting quality. Together with this progress, there has accumulated sufficient experience that it is now possible to state rather precisely the acoustical requirements necessary to good broadcasting. Expert opinions are still at considerable variance on some points, but the basic principles of correct acoustical design are sufficiently well established that it appears desirable to outline them in this article.

The three main factors which must be considered are (1), size, shape, and location of the studio, (2) sound insulation, and (3) acoustical treatment.

Recommendations for the ideal layout of a group of studios and associated rooms have been given in an article by Hanson and Morris of the National Broadcasting Company, which was reproduced in "Less Noise . . . Better Hearing" for August, 1931. In brief, these recommendations call for the provision of an individual control booth for each studio and the grouping of studios around a main control room. Where space limitations permit only one control room, this should be located so as to give direct observation into every studio as far as possible.

The proper size of a studio is governed chiefly by the total number of persons expected to occupy it in normal use. Figure 1, taken from an article by Morris and Nixon[1] entitled "N B C Studio Design", shows the optimum relation between the volume of a studio and the number of artists (dotted line). This curve is based on experience in the use of studios of different sizes. The upper curve, marked "maximum occupancy" refers to studios where audiences are admitted.

Figure 1 also shows the optimum proportions of studio dimensions, namely, 2-3-5 for the height, width and length, respectively. Although these ratios are by no means critical, results are often unsatisfactory if the shape of a studio departs widely from these proportions.

A generally rectangular shape is desirable for studios. Large curved surfaces should never be used, as they tend to cause focusing action and consequent uneven distribution of sound energy.

[1]Journal Ac. Soc. Am., Vol. VIII, No. 2, Oct. 1936.

In laying out walls, care should be taken to avoid placing large sound-reflecting surfaces, such as doors or windows opposite each other. If both the sound source and the microphone happen to be placed on the same perpendicular line joining such surfaces, a multiple echo or "flutter" will be set up between them, and will be picked up by the microphone. If such a location of reflecting surfaces is unavoidable, the possibility of flutter may be minimized by draping windows or by setting the glass at a slight angle so as to put it out of parallel with the opposite surface.

Adequate sound insulation of studios obviously is necessary to prevent extraneous sound from entering the microphone. Interfering noise may be of two types, namely, air-borne sound, which is transmitted directly from adjacent rooms or from the outdoors, and structural vibration, which may be transmitted through the entire building structure by machinery, water pipes, phone boxes, or other vibrating units placed in rigid contact with it.

Airborne noise is the easier of the two types to eliminate. Studios should be separated by a corridor or control room, or if they must be placed directly adjacent, a double wall should be provided having as wide an air space as possible. Walls between a studio and a control room or corridor should have a minimum reduction factor of 40 db. More efficient wall constructions are advisable when structurally and economically practical. The reduction factors of several types of partitions are given in Table 1, and three of these which are particularly effective are illustrated in Figure 2.

The overall sound insulating efficiency of a partition will be no better than that of the doors and windows in it. The following door constructions are given in the order of their effectiveness:

1. Double sound-proof doors separated by vestibule.
2. Double sound-proof doors with minimum separation.
3. Single sound-proof door.
4. Single ordinary heavy flush door with air-tight seals on all sides.

Observation windows should be constructed of double or triple panes of heavy glass set in felt or soft rubber. When double doors or windows are set in double walls, the structural separation should be carried through completely by setting separate frames in each part of the wall.

The elimination of interference due to structural vibration may be accomplished by locating the source of vibration and isolating it from the building structure by

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a resilient mounting. If this is impractical, it will usually be necessary to employ floating construction for the floor, walls, and ceiling of each studio, all surfaces being connected to the main structure only by special resilient mountings. Several systems of this type are on the market.

Another source of noise interference is the ventilating system. The ducts may either introduce fan and air noise into the studio, or may conduct sound from another studio. The path between studios, by way of the ducts, should be as long as possible, and if necessary, the ducts should be lined with sound absorbing material. The latter procedure will also reduce air noise in the ducts.

The third factor in acoustical design, namely, the acoustical treatment, involves the proper distribution of treatment on the studio surfaces and the securing of correct reverberation times over the audio frequency range.

For the general purpose studio, the treatment should be more or less evenly distributed on all walls and ceiling areas. If this is not done, and the entire treatment is placed on one surface, such as the ceiling, the other surfaces are necessarily left highly reflective and are liable to set up flutter echoes, as explained above. In general, it is desirable, both from an acoustical and decorative standpoint, to choose a material or combination of materials having coefficients such that as much as possible of the available wall and ceiling area is treated. Such surfaces as wainscots, narrow pilasters, coves, and small ceiling beams may, however, be left untreated, as may be required by the architectural scheme, since they are usually of small enough size or so located as to cause no acoustical difficulties.

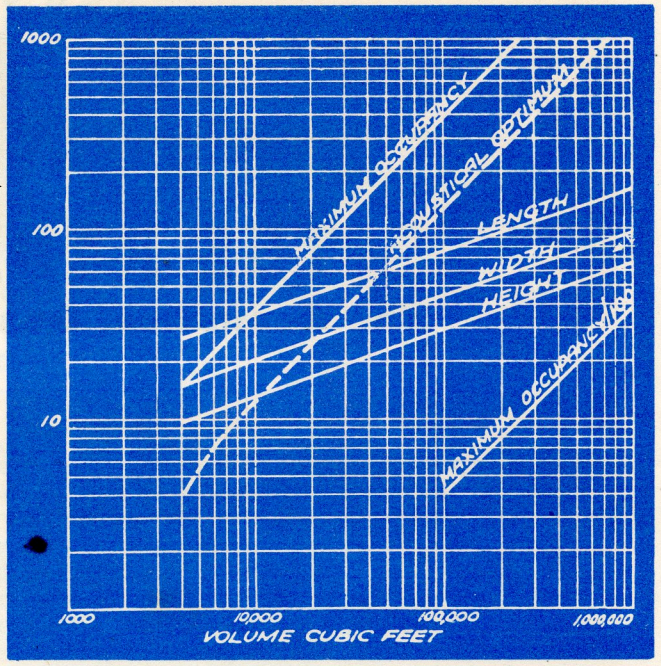
When the absorbing material is evenly distributed in this manner, the studio may be used for a variety of purposes, and permits considerable flexibility in microphone placement.

In recent years, several varieties of the "live end, dead end" principle have been used with success in large studios used exclusively for music. In this type of studio, the acoustical material is largely concentrated in one end of the room, and the other end is left with one or more surfaces highly sound reflecting. The artists are placed

Table I. Reduction factors of wall constructions.

Construction	Average Reduction Factor	Authority
3″ gypsum tile, plastered both sides	34 db.	Riverbank Labs.
4″ hollow clay tile, plastered both sides	35 db.	Riverbank Labs.
Double 3″ gypsum tile, plastered both sides, loose ½″ Celotex between (Fig. 2A)	42 db.	Riverbank Labs.
2x4″ studs, Celotex lath and plaster both sides	33 db.	Riverbank Labs.
2x4″ staggered studs, Celotex lath and plaster both sides	37 db.	Riverbank Labs.
2x2″ double studs, Celotex lath and plaster both sides, loose ½″ Celotex between (Fig. 2B)	46 db.	Riverbank Labs.
1″ Thermax nailed to 3″ Thermax, plastered both sides	42 db.	Bureau of Standards
1″ Thermax nailed to 3″ Thermax, Sisalkraft paper between, plastered both sides (Fig. 2C)	47 db.	Bureau of Standards

Fig. 1. Relation of studio capacity, dimensions and volume.



in the "live" or untreated end and the microphone in the "dead" end. With this arrangement the artists are given the benefit of reflecting surfaces around them, which facilitates their performance, and the localized reverberation in the live end tends to enhance the "brilliance" and quality of ensemble of the music. At the same time, reverberation effects around the microphone are reduced by the heavy treatment in the dead end. The result of this method of treatment is to give the illusion of a greater number of musicians performing in a larger room than is actually the case. It should be mentioned that successful use of this type of studio requires rather expert knowledge of pickup technique. Furthermore, it is not as adaptable to various types of program or to changes in arrangement of artists and microphone as the ordinary studio. This may be a disadvantage where the total number of studios is limited.

The Columbia Broadcasting System have recently used a variant of the "live end, dead end" principle by providing a single reflecting end wall, in front of which the artists are placed. In other studios, the reflecting surfaces have been broken up into large V-shaped corrugations for the purpose of diffusing the reflected sound in the live end, and thereby improving the blending of the various instruments.

The value of the correct reverberation time for a given studio is subject to a certain difference of opinion among equally qualified authorities. Any listing of "optimum" reverberation times, therefore, must be considered simply as a design objective representing, on the average, studios which have already been accepted generally as acoustically good. The same interpretation must be given to tables of the optimum relation between reverberation times over the frequency range, over which even wider divergence of opinion is encountered. In using such tables, it should be remembered that some tolerance is allowable, and that definitely unsatisfactory conditions will result only from wide departures from the listed values.

In the article "N B C Studio Design" referred to above the authors present a chart of optimum reverberation

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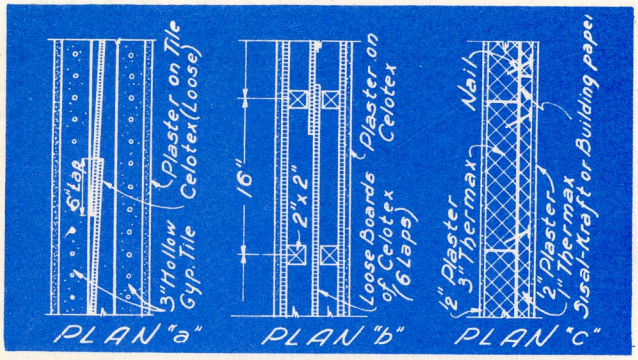


Fig. 2. Wall constructions suitable for studios.

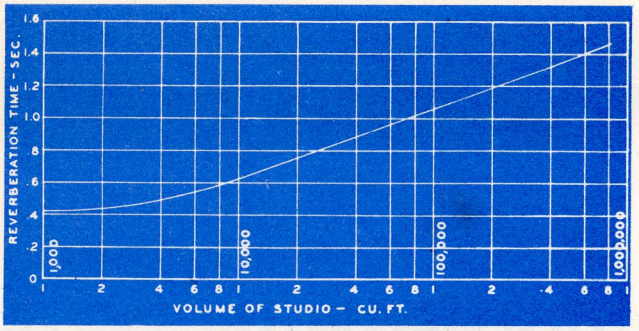


Fig. 3. Optimum reverberation time at 512 cycles of studios of different volumes, as recommended by the National Broadcasting Co.

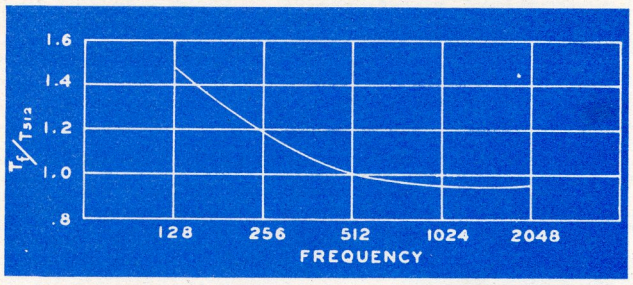


Fig. 4. Ratios of the optimum reverberation time (T_f) at any frequency to the optimum time at 512 cycles (T_{512}), as established by the National Broadcasting Company.

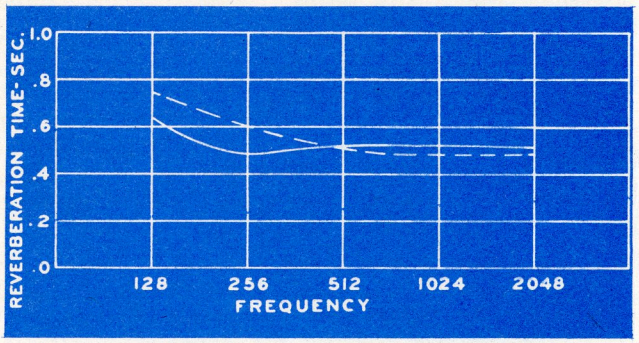


Fig. 5. Reverberation times of a typical studio treated with Acousti-Celotex and Celotex Tile Board (solid line), compared with optimum reverberation-frequency characteristic (dotted line).

times for studios of different volumes. These values are shown in Figure 3, which is drawn for a frequency of 512 cycles[2], and, except for large audience studios, refers to the empty room condition. It has been found that a single set of values, as shown, will cover most types of program, since those programs which require the longest reverberation times, such as an orchestra broadcast, also require the largest studios to accommodate the artists.

Figure 4 shows the ideal relation between reverberation time and frequency as recommended by N B C. This curve shows the ratio of the optimum reverberation time at each frequency to the optimum value at 512 cycles, as determined from Figure 3. This ideal relation represents the results of a study of the reverberation-frequency characteristic of studios considered satisfactory. Recent improvements in and additions to Celotex acoustical products have made them particularly suitable for use in studios. Types C-1 and C-2 Acousti-Celotex applied on furring strips and Type A Absorbex over mineral wool show remarkably high absorption at the lower frequencies in comparison to the higher frequencies. Since it is usually desirable to cover all wall and ceiling areas, and since the use of Acousti-Celotex or Absorbex alone generally provides more absorption than is necessary, part of the available areas may be treated with Celotex Standard Building Board or Tile Board, also applied on furring. These materials have rather low absorption coefficients, but a practically flat absorption-frequency curve. Table II gives the coefficients of Celotex acoustical products recommended for studio treatment.

Table II. Absorption coefficients of Celotex acoustical products especially suitable for studio treatment.

Material	Mounting	Frequency 128	256	512	1024	2048	Authority
Acousti-Celotex–							
Type C-1, ½"	1	.36	.58	.51	.52	.62	Ac. Mat. Assoc.
Type C-2, ⅝"	1	.40	.59	.68	.81	.66	Ac. Mat. Assoc.
Absorbex–							
Type A, 1"	2	.58	.77	.98	.92	.79	Ac. Mat. Assoc.
Type A, 1"	3	.91	.99	.87	.84	.88	Ac. Mat. Assoc.
Celotex Tile							
Board, ½"	4	.31	.33	.29	.26	.26	Riverbank Labs

Mountings—

1. Nailed to 1x2" furring, 12" o.c.
2. Nailed to 1x3" furring, 18" o.c., filled between furring with 1" mineral wool.
3. Nailed to 2x4" studs, 18" o.c., filled between studs with 3½" mineral wool.
4. Nailed to 1x2" furring, 16" o.c.

Excellent acoustical conditions may also be obtained by the use of Vibrafram, a recent addition to Celotex acoustical products. Vibrafram absorbs sound by diaphragmatic vibration instead of by porosity, and for this reason is particularly efficient in the low frequency range. It is, therefore, useful either alone or with other types of treatment for obtaining the desired reverberation times over the entire frequency range.

By using combinations of these materials it is possible to obtain reverberation times closely approximating the optimum values at all frequencies. The graph in Figure 5 shows the reverberation-frequency characteristic of a typical studio treated with a combination of Types C-1 and C-2 Acousti-Celotex and Celotex Tile Board, all applied on furring. The solid curve represents the calculated reverberation times obtained with this treatment, and the dotted curve is the optimum reverberation-frequency characteristic recommended by the National Broadcasting Company.

[2]The original chart is given on the basis of 1,000 cycles. The curve for 512 cycles was obtained by multiplying each value in the original chart by 1.05, which is the ratio recommended by N B C of the reverberation time at 500 cycles to the 1,000 cycle value. Figure 4 has also been corrected from the original data to a basis of 512 cycles.

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Mannings, Incorporated.....San Francisco
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Metropolitan Life Insurance Co..San Francisco
Otis McAllister Co.....San Francisco
Pacific Coast Steel Co.....San Francisco
Retailers Credit Association....San Francisco
San Francisco Chronicle Bldg....San Francisco
San Francisco Stock & Bond Ex..San Francisco

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KYOS Broadcasting Station.....Merced
KTAB Broadcasting Station.....Oakland
KFRC Broadcasting Studios....San Francisco
KWG Broadcasting Station.....Stockton
Mackay Radio & Telegraph Co.....Palo Alto
KPO Broadcasting Studios.....San Francisco
KROY Broadcasting Studios.....Sacramento
KLS Broadcasting Studios.....Oakland
KSRO Broadcasting Studios.....Santa Rosa
KHUB Broadcasting Studios.....Watsonville
KMJ Broadcasting Studios.....Fresno

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Federal Land Bank of Berkeley.....Berkeley
Anglo London & Paris Nat'l Bk..San Francisco
Bank of America.....San Francisco
Bank of America.....Colusa
Wells Fargo Bank & Trust Co...San Francisco
First National Bank.....Los Gatos
Pacific National Bank.....San Francisco
Bank of America.....Napa
Bank of Italy.....San Francisco
Bank of America.....Sonora
Farmers & Merchants Bank.....Lodi
Bank of America.....Oakland
Bank of Italy.....Sacramento
Crocker First National Bank....San Francisco

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Willows Union High School.....Willows
Armstrong College of Business.....Berkeley
University of California.....Berkeley
State Teachers College.....Chico
Petaluma High School.....Petaluma
Aptos Jr. High School.....San Francisco
Modesto Jr. College.....Modesto
Balboa High School.....San Francisco
Elmhurst Jr. High School.....Oakland
Girls High School.....San Francisco
Mills College.....Oakland
Glenn Park School.....San Francisco
Oakland High School.....Oakland
Stanford University.....Palo Alto
Jas. Lick Jr. High School.....San Francisco
Roseville Union High.....Roseville
Salinas Grammar School.....Salinas
Gustine Union High School.....Gustine

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San Mateo County Community Hosp..Beresford
St. Francis Hospital.....San Francisco
St. Mary's Hospital.....San Francisco
Napa State Asylum.....Napa
San Francisco Hospital.....San Francisco
Peralta Hospital.....Oakland
U. S. Hospital Bldg. No. 5.....San Francisco
City of Palo Alto Hospital.....Palo Alto
Univeristy of California Hospital.San Francisco
U. S. Veterans Hospital.....Palo Alto
Psycopathic Hospital .....San Francisco

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State Theatre.....Auburn
Lorin Theatre.....Berkeley
State Theatre.....Chico
California Theatre.....Dunsmuir
Rialto Theatre.....Eureka
State Theatre.....Eureka
State Theatre.....Fort Bragg
U. S. Veterans Hospital Theatre....Livermore
State Theatre.....Martinez
National Theatre.....Modesto
Uptown Theatre.....Oakland
State Theatre.....Oroville
Empire Theatre.....Placerville
Fox Senator Theatre.....Sacramento
Golden Gate Theatre.....San Francisco
Metropolitan Theatre.....San Francisco
Verdi Theatre.....San Francisco
T. & D. Jr. Theatre.....Santa Rosa
Rialto Theatre.....Stockton
State Theatre.....Ukiah

CLUBS

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W. O. W. Hall.....Fresno
Women's City Club.....Oakland
California Club.....San Francisco
Islam Temple.....San Francisco

MISCELLANEOUS

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Virgil G. Caporgno Funeral Chapel....Oakland
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Mendocino County Court House.....Ukiah
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