AN EXPERIMENTAL EXAMINATION OF THE EFFECTS OF SILLS ON SOUND TRANSMISSION

© Peter Sauer

A Thesis

in

The Faculty

of

Engineering

Presented in Partial Fulfillment of the Requirements
for the degree of Master of Engineering at
Concordia University
Montréal, Québec, Canada

August 1981

ABSTRACT

AN EXPERIMENTAL EXAMINATION OF THE EFFECTS OF SILLS ON SOUND TRANSMISSION

Peter Sauer

A series of tests has been undertaken to study the effects of sills on laboratory sound transmission losses. Parameters such as room size, room diffusion characteristics, panel material and panel size were varied in the test series.

Lower sound transmission losses were noted when the sill structure was rigid and backed by a small room ($37m^3$), and in the cases of a larger room ($95m^3$) without additional diffusion.

These tests cast doubt on the usefulness of the Area Power Method for sound transmission determinations.

ACKNOWLEDGEMENTS

I wish to express my thanks to the following people without whom I could not have completed this work: Dr. R.W. Guy and Dr. M. Lang who provided an environment to study and discover the wonders of acoustics, the technical staff of Concordia University who helped make things work, my family for prodding me on, Giselle for deciphering my writing and Xenia, a friend and colleague.

TABLE OF CONTENTS

TABLE OF CONTENTS (cont'd)

LIST OF FIGURES AND TABLES

GLOSSARY OF SYMBOLS

Symbol	Meaning	Units
A	Area	m^2
a	Absorption	sabin
B	Bulk Modulus	Newton/m^2
C	Wave Velocity	m/sec
D	Mechanical Resistance Decay Rate	kg/sec dB/sec
d	Depth of airspace between a two leaf panel	m
E	Youngs Modulus	Newton/m^2
	Energy Density	joule/m^2
f	Frequency	cycle/sec
g	Gravitational Acceleration	m/sec^2
I	Acoustic Intensity	watt/m^2
I_L	Intensity level	db
K	Wavelength Constant	1/m
L	Length	m
M	Mass	kg
	Modal Overlap Index	
S	Area	m^2
T_{60}	Reverberation Time	sec
TL	Transmission Coefficient	db
V	Volume	m^3
us	Angular Frequency	Rad/sec
xyz	Rectangular Coordinates	m
ẍ	Acceleration	m/sec
	Volume Density	kg/m^3

GLOSSARY OF SYMBOLS (cont'd)

λ	Wavelength	m
α	Absorbtion Coefficient	sabin/m^2

INTRODUCTION

Maslow (1), a social scientist suggests that adequate shelter is mankind's most pressing need after food. The shelter must protect the occupant from extreme external conditions and provide an environment in which he feels comfortable. Human comfort in the built environment requires, amongst other things, the satisfactory control of thermal, illumination, and acoustical needs. Acoustical needs are, perhaps, the least quantified, studied or understood.

One of the most important objectives of building acoustics is to provide acoustical privacy. This requires that sound, particularly undesired external sound (noise), be reduced such that it is unperceived, or deemed of no annoyance by the occupants of the room.

Tracing a path from a sound source to the receiver (usually human), one encounters the efforts of the builder who attempts to meet comfort conditions. Beyond site zoning, the builder has little control over sound sources, be they aircraft flying overhead or a neighbour's stereo. He also has little control over the receiver (the occupant). The occupant may be an urbanite who has adjusted to urban background noise levels or a newly arrived rural person who may find the same acoustic environment intolerable.

The builders' only control is in the design and construction quality of party walls. The National Building Code provides some guidelines and typical construction sections, but unfortunately, the performance of these sections in the field does not always meet expectations.

Reviewing the situation from the point of view of an engineer, complete knowledge of the sound transmission loss requires an understanding of:

1. The sound field on the source side of the wall
2. The vibrational behavior of the wall
3. The sound field on the receiving side of the wall
4. The vibrational behavior of any boundary to the system

and

5. The interaction between these sub-systems.

Such a vibrational system is analytically intractable. We must, therefore, look to experimental analysis to study the system. These experiments must be carefully undertaken to isolate, as far as possible, one parameter from another so that each effect may be quantified.

This problem is even encountered in the laboratory. The identical wall, between dissimilar rooms, has given different sound transmission loss results when the roles of the source and receiving rooms are reversed.

This is, in part, a result of incomplete understanding of the process of sound transmission. To ensure adequate sound insulation, the builder is forced to crudely overdesign walls. This is financially and structurally costly. The alternative is an inferior design which does not meet the needs of the situation.

As an attempt to identify certain parameters which affect sound transmission in the laboratory, this thesis examined:

1. The effects of sill widths on the sound transmission loss of panels.
2. The effect of sills on the sound transmission loss as the size of the panels changes.
3. The existing design procedure, namely the Area Power Method of sound transmission determination.

It is expected that the thesis will provide experimental data for other researchers, confirm or qualify certain trends suggested by others and provide further knowledge of the sound transmission phenomena within the laboratory setting.

BACKGROUND TO ROOM ACOUSTICS AND TRANSMISSION LOSS

Architectural acoustics is the field of physics which deals with sound waves in the built environment. It is concerned with the behavior and modification of sound fields in rooms (such as concert hall acoustics) and transmission phenomena (through walls and windows). Other areas of interest, such as structure borne noise, traffic noise and the human response to sonic stimuli are also involved in this study. Lord Rayleigh's "Theory of Sound" (1894-1896) (2) provided the 19th century foundation on which 20th century mathematical analysis is based. Sabine (3) provided the background in qualitative and experimental architectural acoustics.

This section will review current works in room acoustics, panel behavior, transmission loss theory and the difficulty encountered in correlating theory with experimental results.

ROOM ACOUSTICS

Consider an enclosed space in which a sound power source has just been turned on. The source will emit energy in the form of sound waves which reflect off the surfaces. Multiple reflections will occur until the energy contained in a given sound wave is dissipated at the walls or in the propagating medium (air). If the source operates continuously, many sound waves coexist producing the sound energy distribution which will tend to become uniform (diffuse field) with time. The diffuse conditions presume that the source emits a broad band spectrum rather than pure tones and that the diffused conditions exist at a distance away from the source.

As outlined in Kinsler & Frey (4), it can be shown that the intensity of a diffuse field on a wall may be given as

$$I = \frac{\mathcal{E} C}{4} \tag{1}$$

where

$\mathcal{E}$ = average acoustical energy density

C = velocity of sound

Assuming energy dissipation happens only at the walls, the energy absorbed will be

$$\frac{\mathcal{E} C}{4} = \sum \alpha i \, Si \tag{2}$$

where

αi = absorbtion coefficient of ith surface

Si = area of ith surface

The summation of room absorbtion (a) is often written as

$$a = \sum \alpha i \, Si \tag{3}$$

The equation governing the establishment of the sound field is

$$\frac{V d\mathcal{E}}{dt} + \frac{\mathcal{E} c a}{4} = W \tag{4}$$

where

V = volume of enclosure

W = sound power of source

Solving this equation for the initial condition at time t = 0

$$\mathcal{E} = \frac{4 W}{ac} \left(1 - \exp \frac{ac}{4vt}\right) \tag{5}$$

This equation may be written alternately as

$$I = \frac{W}{a} \left(1 - \exp\left(\frac{-aCt}{4V}\right)\right) \tag{6}$$

or

$$p^2 = W \rho o C \left(1 - \exp\left(\frac{-aCt}{4V}\right)\right) \tag{6a}$$

where

p^2 = mean square acoustic pressure

ρoC = impedance of air

The decay of a sound field once the source is turned off may also be derived.

If the average energy density is '$\mathcal{E}o$' when the source is turned off then

$$\mathcal{E}t = \mathcal{E}o \exp\left(-\frac{act}{4V}\right) \tag{7}$$

or

$$\frac{I}{Io} = \exp\left(-\frac{act}{4V}\right) \tag{8}$$

Relating these intensities to the decibels scale using the formula

$N_L = 10 \text{ Log } \frac{I}{Io}$ yields a decay rate D of

$$D = \frac{1.087\ ac}{V} \tag{9}$$

Sabine defined reverberation time T as the time required by a sound field to decay 60 dB, thus

$$T_{60} \quad \frac{60}{D} \quad \frac{55.2\ V}{ac} \tag{10}$$

or in metric units

$$T_{60} \quad \frac{.161\ V}{a} \tag{11}$$

Where

V = room volume (m^3)

a = metric sabines

Unfortunately, rectangular rooms rarely have a completely diffuse sound field, and variations are largely attributable to standing waves.

The standing wave is formed by a travelling wave which has been reflected back to its source and is in phase with the current radiating sound. In this situation, time constant wave modes result and an energy build up occurs. The resonant condition so generated is called a normal mode of vibration. It exists whenever the wave length λ is an integer multiple N of the path length L.

$$N = 1, 2, 3, \text{ etc.} \tag{12}$$

Remembering that the frequency "f" is related to the speed of sound "C" and wave length, if follows that

$$fn = \frac{nC}{L} \tag{13}$$

In the one dimensional case, the path length is twice the distance between the boundaries, or in terms of the distance Lx on the X axis

$$fn = \frac{nC}{2Lx} \tag{14}$$

The same result is available from considering the general plane wave equation (5)

$$p = A \exp (wt-kx-ky-kz) \tag{15}$$

Which satisfies the wave equation

$$\frac{d^2p}{d^2x} = \frac{1}{C^2}\frac{d^2p}{d^2t} \tag{16}$$

where

$$K = 2 \cdot \frac{f}{c} = (kx^2 - ky^2 - kz^2)^{\frac{1}{2}} \tag{17}$$

K, kx, ky, kz are wave length constants

The three dimensional solutions for the normal modes of an enclosure are given as

$$f = \frac{C}{2}\left(\left(\frac{Nx}{Lx}\right)^2 + \left(\frac{Ny}{Ly}\right)^2 + \left(\frac{Nz}{Lz}\right)^2\right)^{\frac{1}{2}} \tag{18}$$

Where Lx, Ly and Lz are the dimensions of the enclosure and

$Nx = 0, 1, 2, 3 \ldots\ldots\ldots$

$Ny = 0, 1, 2, 3 \ldots\ldots\ldots$

$Nz = 0, 1, 2, 3 \ldots\ldots\ldots$

A normal mode whose path encounters only two walls i.e. follows an axis, is called an axial mode. Targential modes encounter four walls in their course and oblique modes hit each side of the enclosure.

Normal modes may strongly influence reverberation measurements. The placement of the speaker and of the microphone will determine which modes are excited and which are picked up by the microphone. The reverberation measurements may sometimes be erroneous if the response which has been recorded is that of a single normal mode rather than the decay of a diffuse field. To mitigate this problem speakers are often placed in corners to excite many modes and additional diffusers are added so that no one mode predominates.

The number of modes in a given band of frequencies "f" may be found as

$$\Delta n = \left(\frac{4\pi V}{c^3} f^2 + \frac{\pi A}{2c^2} f + \frac{L}{8c}\right)\Delta f \qquad (19)$$

V = Room volume

A = 2 (LxLy + LxLz + LyLz), total surface area

L = 4 (Lx Ly Lz), sum of edges

Modal density is an important consideration in reverberation room design. As one generates low frequencies, one is confronted with discrete and widely spaced normal mode frequencies.

Schroeder (6), has suggested a formulation to determine a minimum acceptable frequency for a well designed reverberation room, that is

$$M = 7000 \left(T_{60}/V \right)^{\frac{1}{2}} \qquad (20)$$

where

M = Modal Overlap Index

T_{60} = Reverberation time

V = Room volume

Schroeder suggests a value of 3 for M.

PANEL BEHAVIOR

As outlined in the introduction, the common wall (panel) between two rooms has its own vibrational characteristics. Elementary analysis of the panel tends to separate the panel's response into three frequency dependent regions: stiffness controlled, mass controlled and the coincidence dip region. Fig. I

The stiffness and mass controlled regions of the panel response may be developed from an infinite thin panel mode Guy (7). In this model the panel has a uniform surface mass M, stiffness K and damping D. The panel is exposed to a normally incident soundwave Pi, a transmitted wave Pt, a reflected wave Pr and a reradiated wave Prr Fig. 2. Recalling the equation of motion for a single degree of freedom system

$$M\ddot{x} + D\dot{x} + Kx = Pi - Pt + Pr + Prr \qquad (21)$$

Assuming.

1) $Pi = Pr$

2) $Pt = -Prr = \rho oC\dot{x}$

3) $\dot{x} = \exp(jwt)$

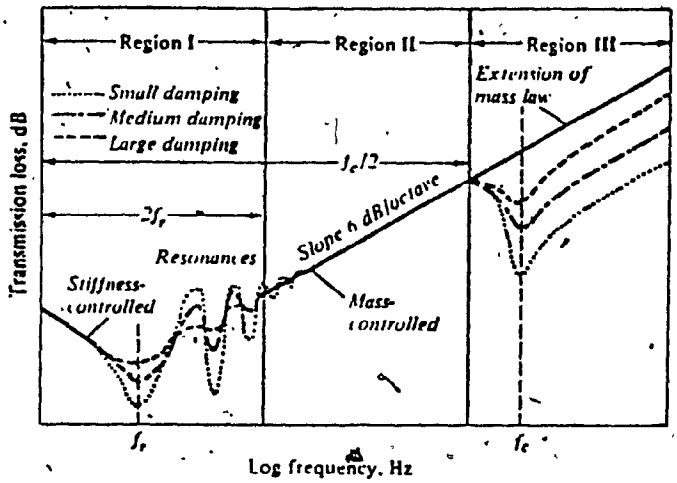
then $$2Pi \left(\left[2\rho C + D\right] + j\left[wM - K/w\right]\right)\dot{x} \qquad (22)$$

assuming

$$Pt = \rho C\dot{x} \qquad (23)$$

$$Pt = 2\rho C - Pi/\left[C + 2\rho C + D + j(wM - K/w)\right] \qquad (24)$$

Generally the panel damping "C" is quite small and can be neglected.



Theoretical transmission loss. Mass-controlled region is bounded by $f_c/2$ and $2f_r$, approximately.

Figure I Transmission loss of homogeneous infinite panel. *L. L. Beranek* (5)

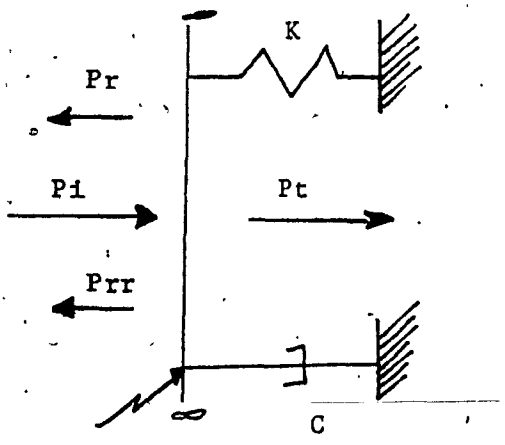


Figure 2

Model employed in stiffness and mass controlled Discussion

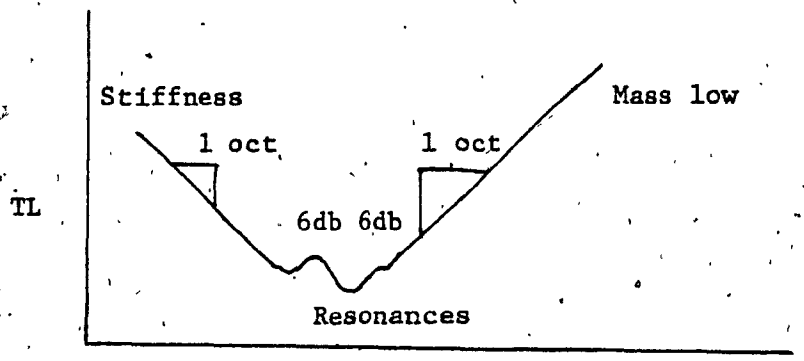


Figure 3

Response of model as a function of frequency

With this in mind and remembering that the transmission loss, TL, is the sound insulation characteristic of panel or wall

$$TL = 10 \text{ Log } \frac{(Pi)^2}{Pt} \tag{25}$$

$$TL = 10 \text{ Log } \left(1 + \frac{(wM - K/w)^2}{2\rho oC} \right) \tag{26}$$

When the angular frequency w is very small, the "K/w" term predominates. In such cases, a doubling of panel stiffness or halving of frequencies will increase the transmission loss by 6db/octave when "wM = K/w" resonances appear and transmission loss is controlled by damping. In general the poorest transmission loss results are found in this region.

When the mass or incident frequency is increased the "wM" term becomes dominant. When this occurs, the system is considered to be mass controlled. Eliminating the insignificant "K/w" term we develop the equation for the mass law as

$$TL = 10 \text{ Log } \left(1 + \left[\frac{(wM)}{2\rho oC}\right]^2\right) \tag{27}$$

Doubling the mass or the incident frequency will tend to increase the transmission loss by 6db/octave. This behavior is summerized in Figure 3. This slope is not always observed in practice. Two reasons are: the angle of incidence of the sound field to the panel and the room influence on Pt which is not considered in the model.

A coincidence region with lowered transmission loss at higher frequencies is often found which is not predicted by this model.

The low frequency resonance and the coincidence dip may also be described in terms of membrane vibrations (6). The effect of stiffness is reduced as frequency increases until one reaches the fundamental frequency fr of the panel. If the panel is assumed to be a thin simply supported membrane then

$$fr = \frac{x}{2}\left[\frac{(EI)}{P_s L}\right]^{\frac{1}{2}}\left[\frac{(1)}{(Lz)}^2 - \frac{(1)}{(Ly)}^2\right]^{\frac{1}{2}} \qquad (28)$$

where

E = Young's modulus

I = moment of inertia

P_s = surface density

L = unit width

L_x = height of panel

Ly = width of panel

Above the fundamental frequency, the transmission loss of the panel increases, subject to other panel resonances until the mass controlled region is reached.

Beyond the fundamental frequency additional bending resonances occur. When the incident sound wave matches in frequency and phase with panel bending waves, coincidence occurs. The effect of coincidence is to decrease the transmission loss as the two waves reinforce each other. The coincidence frequency is given by

$$fc = \frac{c^2}{2\lambda_T}\left[\frac{(Ly\ Ws)}{EIg}\right]^{\frac{1}{2}} \qquad (29)$$

Where

Ws = surface weight of panel

g = gravitational constant

Double panels act much like single panels. The variations are accounted for, in part, by the realization that the double panel consists of two single panels and an airspace i.e. two vibrational systems which may act independently or in unison. At low frequencies the individual leaves will resonate at their individual resonances fr. The double panel system will thus be largely stiffness controlled until both leaves have encountered their fundamental frequency. At higher frequencies the coincidence dip tends to be small if the leaves are dissimilar in mass. Identical leaves will tend to give a large dip as both leaves will reinforce each other at their identical critical frequency.

Formula E for the mass controlled region have been developed.

One such is given in Lewis (8) as: -

$$1/t = 1 - (\text{Cos}^2\emptyset \quad (\frac{wM}{\rho oCo})^2 \ (\text{Cos } B - \tfrac{1}{2} \frac{wM}{\rho oCo} \ \text{Cos}\emptyset \ \text{sin}B)^2) \quad (30)$$

where

$\emptyset$ = angle of incident sound wave

w = angular frequency of incident sound wave

C = air impedance

M = surface mass of panel

B = $Wd\cos\emptyset/C$

d = depth of airspace

C = speed of sound in air

This formula assumes both leaves to be identical and completely isolated. if

$$\text{CosB} = \tfrac{1}{2} \frac{wM}{PC} \cos\phi \quad \text{sinB} \tag{31}$$

then the transmission loss would be zero; this would come about when there was a mass spring mass resonance.

Solving for the resonant frequency 'fo' will yield

$$fo = \frac{C}{2 \cos\phi} \left[\left(\frac{2}{d}\right)\right]^{\frac{1}{2}} \tag{32}$$

Aside from the mass-spring mass resonance, the air cavity will act as a little enclosure whose resonances will be given by equation 19.

The formulations employed so far have inferred that the flow of energy is from the source room through the panel to the receiving room. The process may be looked upon as a coupling of physical systems.

MODAL SOUND TRANSMISSION MODELS

Pretlove (9), modeled the receiving room as a six sided box which had one flexible side and acoustically hard walls on the other five walls.

The sound field was described by the acoustical wave equation

(33)

Appropriate boundary conditions were applied to the model which included matching the displacement and velocity of the flexible wall with that for the soundfield in the box. The flexible wall was modeled as an invacuo simply supported panel. The natural modes of vibration of the model were then calculated.

Bhattacharya and Crocker (10) developed a more sophisticated solution to Pretlove's model. Their solution allowed for transient responses, did not require an invacuo panel response, attempted to explain coincidence in a finite panel and allowed for the flexible side to be smaller than the full sixth side. They also demonstrated that sound transmission is due to a series of panel/room mode couplings.

Guy and Bhattacharya (11) demonstrated both in theory and experiment that a panel room coupling could be achieved which would yield a negative TL.

Guy (12) has published the solution for a model that includes niches (sills) on either or both sides of a panel which need not occupy the totality of the sixth side..

Unfortunately the arithmetic solution to the sound transmission problem based on modal responses at the built environment scale is impractical. This arises from the great number of modes which must be taken into consideration at the present time.

It is felt that there are only a few critical modes which account for the sound transmission. A method for determining these modes has yet to be found.

AREA POWER METHOD

The laboratory experimenter is often faced with the sound transmission calculation. He is charged with the task of observing the sound insulative abilities of a panel under test and to take the effects of the receiving room into account in his transmission loss tests.

Assume the test panel covers the complete wall between the source and receiving room and flanking transmission is minimal. (Figure 4)

The speaker in Room 1 produces power at a rate W. The steady state intensity in Room 1 may be written as (4, 13)

$$I = \frac{W1}{a_1} \tag{34}$$

whilst the steady state mean square pressure is

$$P1^2 = 4 \frac{W\rho oC}{a_1} \tag{35}$$

where

ρoC = air impedance

a_1 = absorbtion in Room 1

or

$$1_1 = \frac{P1^2}{4\rho oC}$$

At the same time Room 2 is receiving its acoustical input W2 from the sound transmitted across the wall. Thus

$$I_2 S = W_2 \tag{36}$$

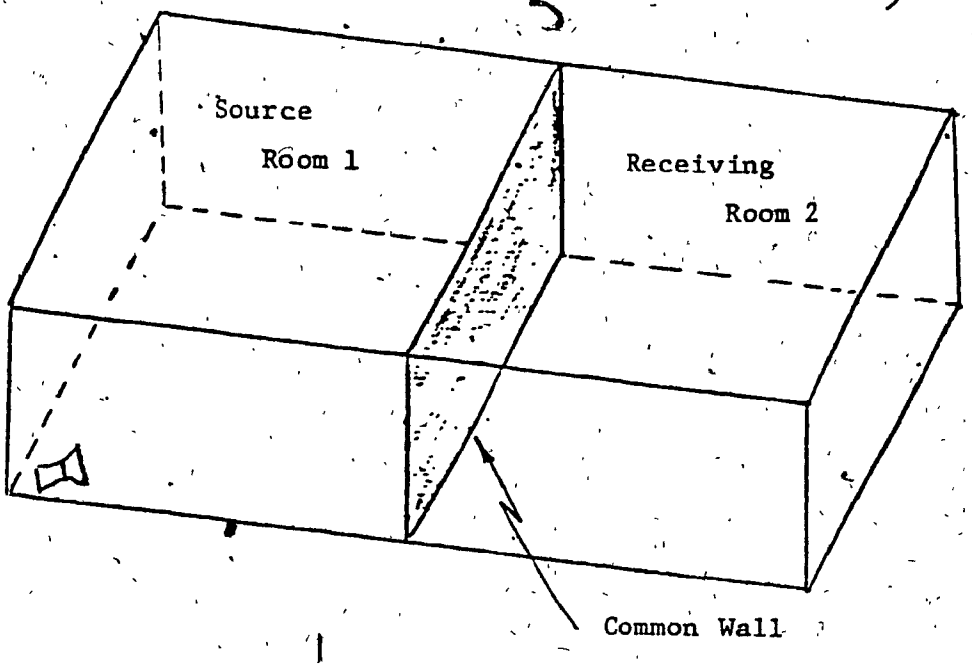


Figure 4

Schematic of a Transmission Suite

Homogeneous common wall

Composite Common Wall

Figure 5

Elevation of Common Wall

Where

I_2 = average sound intensity across the wall

S = common wall surface area

or

$$I_2 = \frac{P2^2 \quad a_2}{4S \quad \rho oC} \tag{37}$$

where

a_2 = absorbtion in Room 2

The transmission loss is defined as

$$TL = 10 \text{ Log } \frac{(I_1)}{I_2} \tag{38}$$

Substituting for I_1 & I_2 yields

$$TL = 10 \text{ Log } \frac{P1^2 \quad S}{P2^2 \quad a_2} \tag{39}$$

or

$$TL = L_1 - L_2 \quad 10 \text{ Log } \left[S/a_2\right] \tag{40}$$

where

L_1 = sound pressure level in Room 1

L_2 = sound pressure level in Room 2

It is suggested (14) that this method of calculating the transmission loss of a single material wall can be extended to walls of composite construction yielding a TL composite. (Figure 5). Assuming the TL for the individual components of the wall has been determined, then

$$\text{TL composite} = 10 \text{ Log} \sum \left(\frac{Ai}{At} \right) 10^{-TLi/10} \tag{41}$$

Where

Ai = Area of ith component

At = Total area

TLi = Transmission loss of ith component

SOUND TRANSMISSION - EXPERIMENTAL WORK

Some qualitative work on Laboratory design and its effects on sound transmission has been published.

Göselle (15) reviewed some of the problems inherent in sound transmission testing; much of the work is devoted to flanking losses. He did however, identify the problem of panel placement in the test room frame. He notes that the panel was mounted flush with one side of the frame and tested. He then added a .5 m wide baffle, made of plasterboard in front of his test panel. The effect of this addition was to decrease the transmission loss of the panel by as much as 4 db in the low frequency region. He also cites an earlier work suggesting that similarly sized source and receiving rooms can produce errors on the order of 2 to 3 db.

Kilhman (16) published a theoretical examination of errors in sound transmission measurements. He suggested sound transmission is a function of good coupling between a few source room, panel and receiving room modes; geometrically similar source and receiving rooms would lead to very similar room modes which would couple through the common panel. Based on a modal interpretation of sound transmission, he further suggests, the speaker (source) position becomes important as this would affect the number and the specific frequencies of the modes which would be excited in the source room as well as those excited in the common panel and the receiving room.

Kilhman published experimental data to support his hypothesis. This work was done using scale models. In the first of three tests reported, two test chambers, each 0.9 x 1.15 x 1.45 m were separated by an elastically

mounted 3.5 cm concrete wall. In the second test, the system was altered by reducing the volume of one chamber by 10 db. The third test retained the original dimensions of the system but added diffusers to both chambers. The results of tests 2 & 3 were quite similar and distinctly superior, 7 db at 400 Hz to the test 1 results. This distinction gradually reduced so that at 6.3 kHz, the differences were minimal.

He provided an equation to give a rough estimate of the difference in sound pressure between rooms of unequal and equal dimensions as

$$R_{unequal} - R_{equal} = 8 - 10 \text{ Log } (\frac{T}{a} \cos\theta) \qquad (42)$$

where

T = reverberation time

a = room dimension perpendicular to panel

θ = angle of incidence perpendicular to panel

This indicates that the transmission loss is strongly affected by the room depth.

Kihlman and Nilsson (17) coordinated a round-robin comparison of reduction indexes in 5 Scandinavian Laboratories. They reviewed the literature available at that time and proceeded to test concrete, lightweight concrete and chipboard with various mounting conditions in the various labs. The comparison demonstrated quite clearly the problems associated with attempting to obtain constant transmission loss results for a given panel type.

The results provided showed differences of as much as 10 db at frequencies below coincidence. As with Kilhman (16), these differences were much less dramatic beyond the coincidence frequency. Thier conclusions include

(i) Above coincidence the reduction index is a function of the total loss factor.

(ii) Below coincidence the reduction index is higher for elastically mounted panels compared to those firmly mounted.

(iii) The reduction index is larger for a partition in a frame rather than one mounted wall to wall.

(iv) The reduction index is a function of the placement of the panel in the test frame and the depth of the aperture and different Laboratories may produce differing reduction indexes for the same panel.

Lewis (8) investigated a number of variables associated with single and double window sound transmission performance. Among the pertinent results are:

Whilst employing the same gross area of glazing but varying the size of each panel from 525 x 30 mm to 1640 x 1100 mm, Lewis reports very little difference in the mass low region ± 1 db but a substantial coincidence dip for the larger panels. The difference at the coincidence frequency is reported as 7 db. He attributes this to the edge length to area ratio. In this way there is less edge to damp out the flexural waves of the large lites compared to the smaller ones.

In a separate test with 6.5 mm glass Lewis found no difference in transmission loss as a function of panel edge clamping.

For a third set of tests, a series of panels was placed in the middle of the test opening and flush with the source side. The results show the mid test frame position to be inferior, on the order of 6 or 7 db, to the flush mount in the mid frequency range 250 Hz to coincidence. Below 250 Hz results varied whilst above coincidence the TL was quite similar for each mounting condition.

Bhattacharya and Guy (11) provide further experimental data to indicate different measuring facilities can give different transmission loss results. They also show that the same facility may give differing results when the role of source and receiving rooms are changed.

This hypothesis was tested with $\frac{1}{4}$" aluminum, 2 in. composite gyproc wall board and 1" composite glass. The data presented indicate better transmission loss on the order of 5 db when the larger 120 m^3 room was receiving rather than the smaller 75 m^3 room.

Guy and Mulholland (18) investigated the effects of applying absorption to sills and/or reveals* as a method of improving transmission loss. Their results indicated an improvement with the addition of absorptive material on the sill. Optimum results were obtained when both the sill and the reveal were covered. In this case the improvement was as high as 10.5 db and at least 6 db for 1/3 octave bands above 250 Hz. Irregular results were obtained up to 250 Hz. It was assumed by the authors that the absorptive treatment was not effective at low frequencies and thus did not damp out the standing wave coupling. This was interpreted as indicating a modal coupling in the sill/area which could be damped out.

* The reveal is the sill on the receiving side of panel.

The test work for this paper was done in the same laboratory as that of Bhattacharya and Guy (11). Improved transmission loss when the large room receives was noted here too.

Michelsen (19) investigated some parameters of laboratories which may affect transmission loss measurements. He provides model data which indicated improved transmission loss as a test panel was moved from a symmetrical position in the test frame to a position on the edge of the frame. This improvement, up to 5 db was found exclusively at frequencies below coincidence.

It can be seen that diverse work has been published on the mechanisms and problems associated with sound transmission testing. Göselle (15) discussed flanking loss and identified the problem of the proper displacement of the panel in a niche. Kilhman (16) demonstrated problems associated with similarly sized and proportioned rooms. Kilhman and Nilsson (17) documented differences between laboratory while Bhattacharya and Guy (10) documented differences obtained in the same laboratory. Lewis (8) provides much data on glass panel configurations while Michelsen (19) investigated the room configurations using models. Lastly Guy and Mulholland (18) identified the sill as a distinct link in the sound transmission chain whose effect could be minimized.

From the material reviewed, it can be stated that there is a need to examine the various parameters which have been identified preferably in one series of tests using a full scale facility. The present work contributes to this end.

EXPERIMENTAL FACILITIES & METHODOLOGY

Transmission Loss Test Chambers

The primary test facility to study sound transmission loss at Concordia's Centre for Building Studies consists of two adjoining reverberation chambers (20), figure 6. The larger room has a nominal volume of 95 m^3 and dimensions of 5.18 m x 6.13 m x 3.00 m high. This room was designated Room A. The smaller room has a nominal volume of 37 m^3 and dimensions of 3.00 m x 4.51 m x 2.74 m high. This room was designated Room B.

The walls of each room consist of staggered stud/gyproc fastened on spring clips. The interior wall is made of laminations of 12.7 mm and 15.87 mm gyproc. The ceiling is of similar construction save that it is suspended on vibration hangers to isolate it from the rest of the building. The floors of the two rooms consist of concrete slabs cast-in-place, on a vibration absorbant mat.

Entrance to each room is through a system of three solid wood doors which have proper gaskets and seals. The two rooms are connected by a 2.5 m x 3 m opening. This opening is framed by 30 mm wide steel frames, one built into each room. A 36 mm gap separates the two frames.

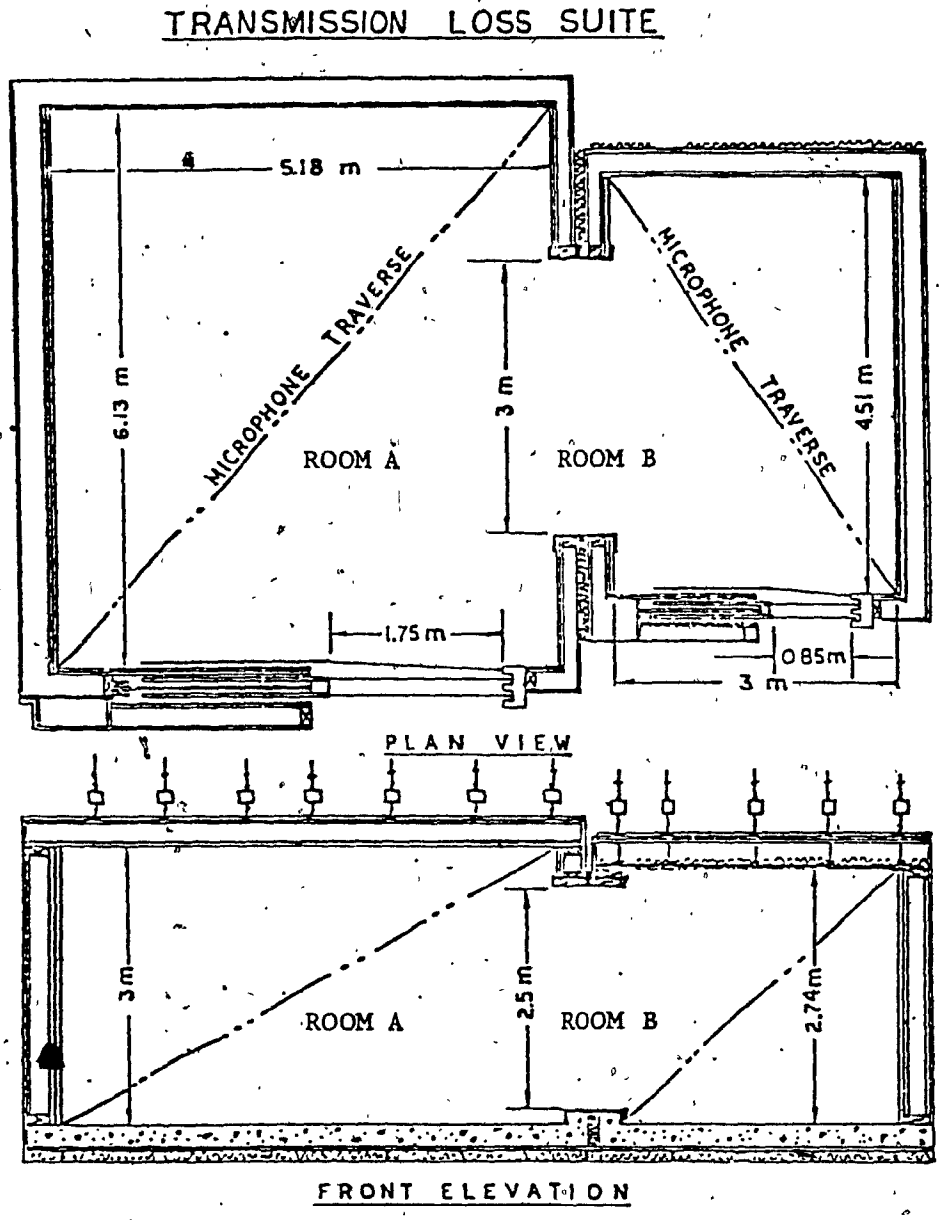


Figure 6

General Layout of Transmission Loss Suite

Lang (20)

Each room was fitted with a body diagonal traverse. The traverses were powered by small electrical motors and operated by an inhouse designed/ constructed circuit. Controls could be accessed through a panel at the operators station or under computer command. The controls included a manually operated rheostat to control the speed of the traverse. It was adjusted so that one trip, in one direction, would take approximately 35 seconds.

In order to improve the room response for sound power testing (21) extra low frequency absorbtion was added to Room A. Two methods were employed. The first consisted of two panel absorbers, each measuring 0.93m x 1.22m and having a resonant peak of about 200 Hz. The second measure employed 143 canadian 341 ml beer bottles (empty save for some small pieces of fiberglass) which have a resonance at 215 Hz.

The tests were conducted with two diffusion conditions. With bare walls, and with additional diffusers. The additional diffusion was added in Room B by leaning two 0.61m x 1.22m sandwich panels at about 60° above the horizon against the wall opposite the test wall and doing the same with two other panels against a side wall. Extra diffusion in Room A was added in two ways: Two sets of three 0.61m x 1.22m panels were joined to make two 1.83m x 1.22m panels. One such panel was leaned against the wall opposite the test wall. The other panel was placed in a corner adjacent the test wall and a side wall. A biconal rotating diffuser was also used. When not in use, the panels were layed flat on the floor and the rotary diffuser was turned off.

INSTRUMENTATION

Random noise for reverberation tests in the source room and in the receiving room, was generated as illustrated in figure 7.

A Bruel and Kjaer (B & K) 1405 noise generator set on pink 20K provided the basic input. The generated noise was then shaped by an inhouse/ constructed filter which provided the input to two B & K 2706 power amplifiers. Each amplifier drove high or low frequency speaker (s).

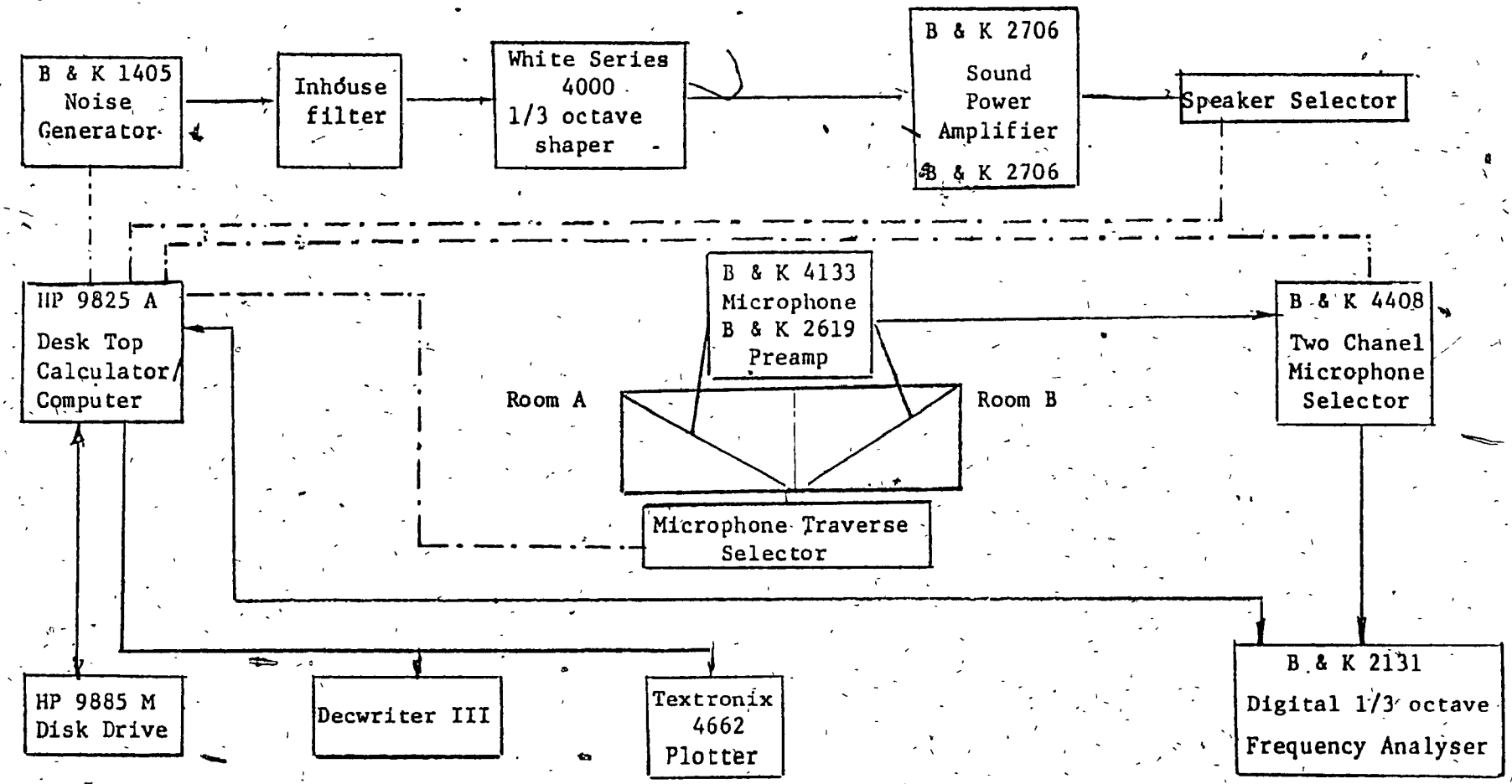
A white series 4000 1/3 octave filter set was then used to adjust the in room sound spectrum so that it would be flat from 100 Hz to 5 kHz inclusive. The noise generator and selection of Room A or Room B speakers was under computer control.

A 12.7 mm B & K 4133 microphone and a B & K 2619 preamplifier rode on each traverse. They were cabled to a B & K 4408 two channel microphone selector which was also under computer control. The selected microphone response was then fed to a B & K 2131 digital 1/3 octave frequency analyser.

The analyser was controlled by a Hewlett-Packard (HP) 9825A desktop calculator (computer). Data storage as well as software support was stored on 8" floppy discs by means of an HP 9885 M flexible disk drive. Hard copy output was available through the HP 9825A internal thermal printer, a Decwriter III and, a Textronix 4665 digital ploter on the IEC interface.

To observe panel vibrations, a B & K 4000 accelerometer was cabled to a B & K 2000 accelerometer preamplifier and in turn to a B & K 5000 integrator set for acceleration. This system was connected to the B & K 2031 1/3 octave analyser.

These observations were made for qualitative analysis of the panel response.



-.-.-. Function controlled by HP 9825

→ Direction of Information Flow

FIGURE 7

Schematic of Instrumentation for Transmission Loss Tests

TEST WALL

Three different sizes of panel were tested during the experiments carried out for this thesis. For this reason heavy filler walls had to be constructed to fit within the 30 mm wide steel frames in both Rooms A & B, to block that area of the 2.5 m x 3 m opening not covered by the size of panel under test. Figure 8

Each filler wall consisted of two 50.8 mm x 101.6 mm staggered wood frames, on separate wood bases. A 15.87 gyproc cover was applied to the wood frame which faced into a test room whilst a 12.7 mm and 15.87 mm gyproc laminate was applied to the frame facing the separation between the two rooms. A 37.5 fiberglass insulation layer was placed in the cavity of each wall, and in the space between the walls.

The STC for the completed wall ranged from 57 to 59, depending on which room received and what diffusion conditions were employed.

As three different panel sizes were to be placed into the wall, the filler walls were designed with concentric square openings. The length along the edges of these squares were .75 m, 1.6 m and 2 m for the two frames closest to the separation between the rooms and approximately .90 m, 1.75 m and 2.15 m in the frames adjacent to the rooms. Figure 9 & 10.

When the transmission loss tests for the filler wall were completed, the gyproc covering the .9 m x .9 m square hole in the outer frames was taken away. This exposed the fiberglass insulation which was in turn, removed, exposing the .75 m x .75 m square framing. The gyproc laminate was cut away from the .75 m x .75 m frame on each side.

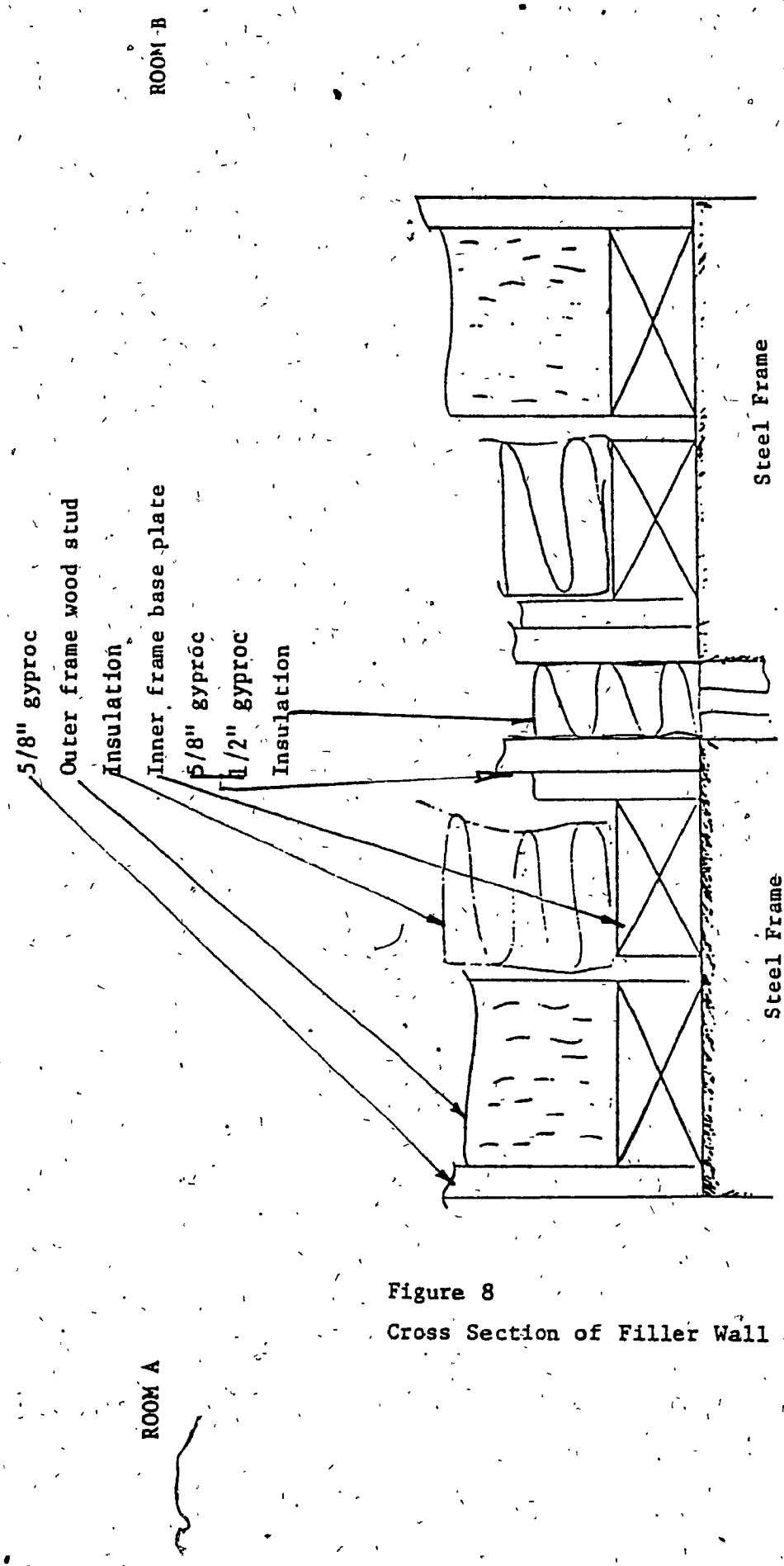


Figure 8

Cross Section of Filler Wall at base plate.

Figure 9

Dimensioning of Inner Wall Frame

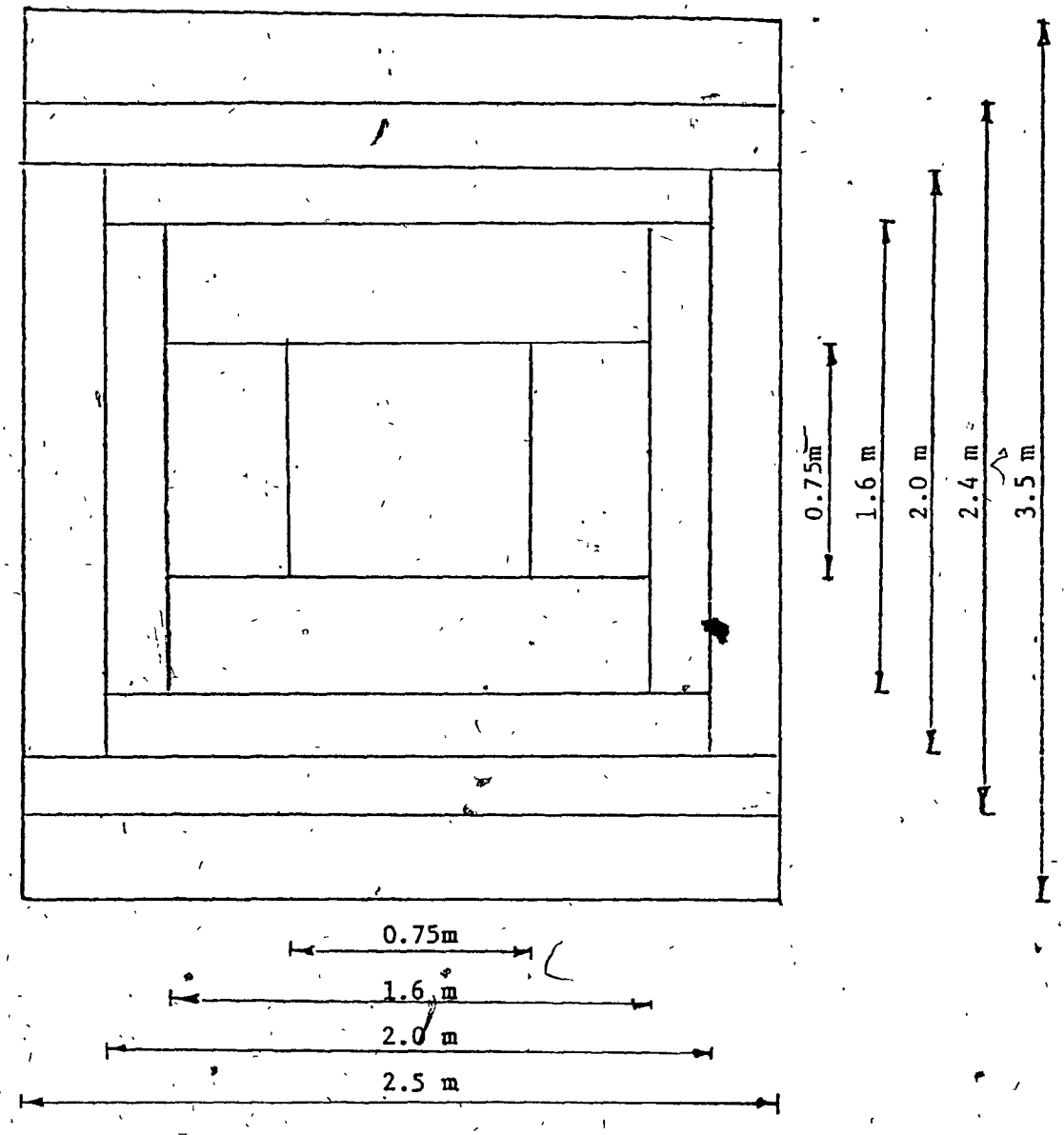
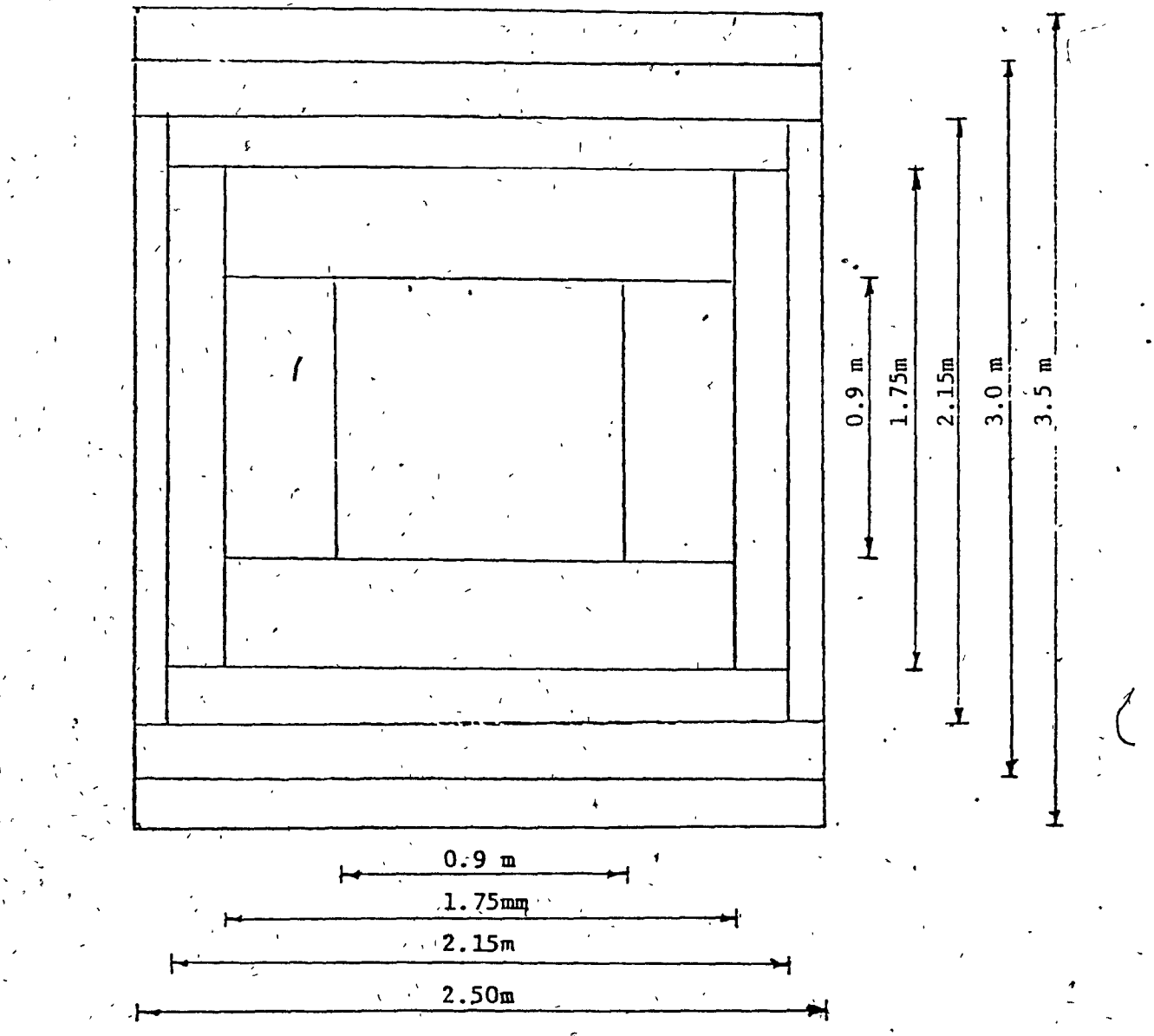


Figure 10

Dimensioning of Other Wall Frame



Once the insulation from the separation between the walls had been removed, a .75 m x .75 m aperture connecting the two rooms was established. The test panels were mounted in this aperture on one side or the other of the separation.

Pressboard used to span the distance between the .9 m square and the .75 m square openings created a flaired baffle. This baffle was constructed to minimize the effects of standing waves, as these waves, when pressured, would establish themselves on each side of the test panel. Fig. 11.

When the series of tests with the small panel size was finished, the gyproc covering the 1.75 m square hole was removed. This in turn exposed the wood which supported the .9 m hole, more insulation, the wood which supported the .75 m hole and the two ply gyproc behind the 1.6 m square hole, all of which was removed to establish the 1.6 m square aperture between the two rooms. Pressboard was again used to form the flaired baffle between the two sizes of holes. This partial demolition was repeated a third time to establish the 2.0 m on edge aperture for the third test panel.

The panels were mounted in the .75 m, 1.6 m and 2.0 m apertures in the following manner. A line of 1½" angle irons (1" on the smallest .75 m square) were screwed into the wood frame of the filterwall, 5/8" rubberized stripping was then used to cover the edges of the test panel. The system was clamped by the use of a second line of 1½" angle irons that were screwed into the wood frame at an angle in a manner to squeeze the weather stripping securely. This clamping resulted in somewhere between elastic and rigid mounting conditions.

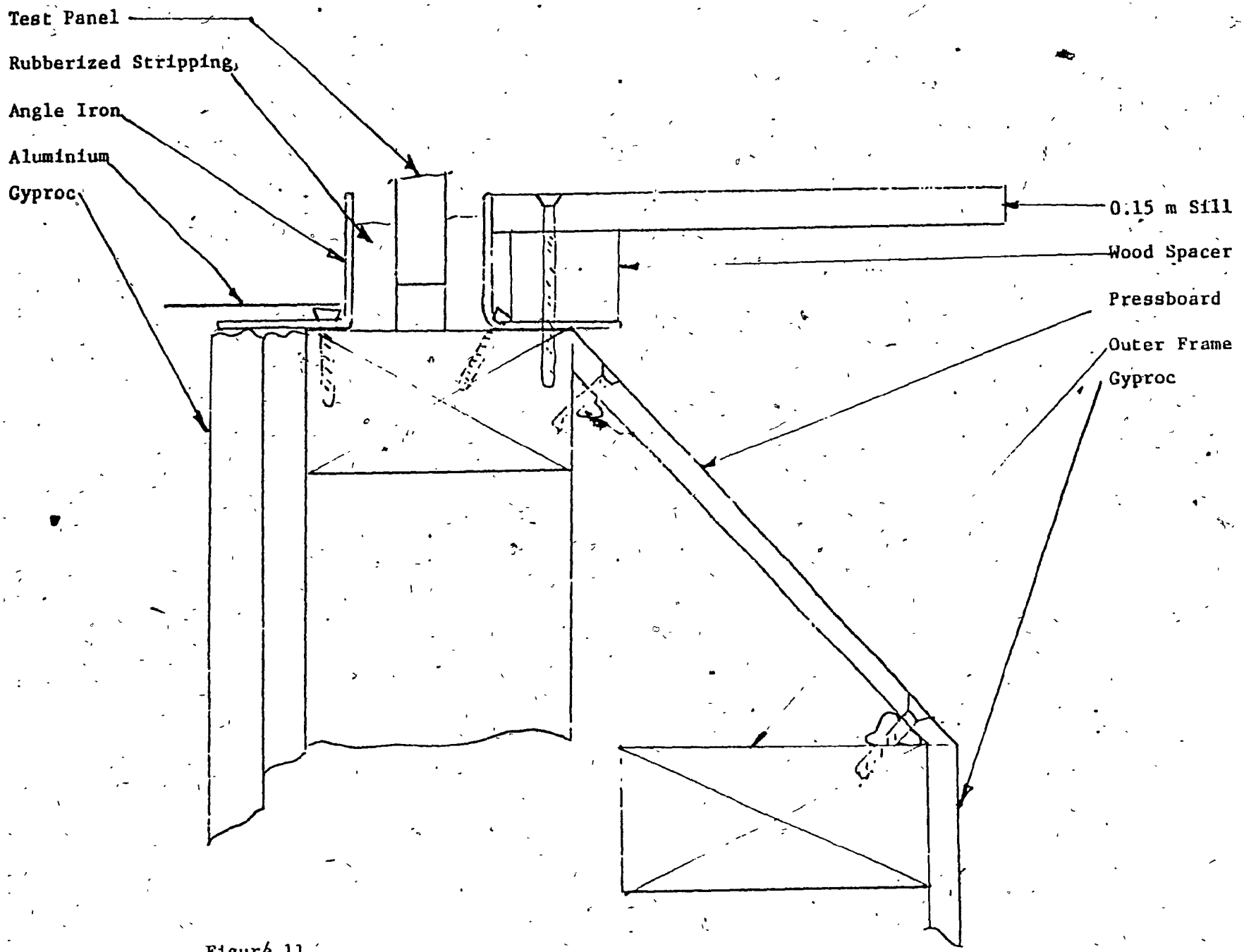


Figure 11

Cross Section of Filler Wall with Test Panel Mounting with 0.15 m Sill installed

The panels were mounted in the aperture of the filler wall of Room A, i.e. mounted in A and then moved to the aperture of the filler wall of Room B, i.e. mounted in B.

The area over the separation between the two walls and the width of the filler frame member in the alternate room was covered with 0.81 mm aluminum.

As vital part of the experiments, the effect of niche depth was investigated. The variation of the depth was accomplished by the addition of sills. These sills were always mounted so they would project into the room in whose wall the panel was mounted. During tests with sills, the room with sills always acted as receiver.

The sills were made of pressboard and surrounded the test panel like a square collar. Two widths were employed, .15 m and .30 m.

TEST CONFIGURATIONS

One hundred forty four tests were included in the test program.

These tests were a result of the permutation of the following variables:

1)	3 panel sizes	i) .54m^2 ii) 2.54m^2 iii) 3.60m^2
2)	3 panel types	i) 6.25mm glass ii) 15.88mm gyproc iii) double panel gyproc 15.88-15.88-15.88
3)	2 mounting orientation	i) mounted in Room A wall ii) mounted in Room B wall

For a given panel size and type, mounted in either Room A or Room B, the following tests were conducted:

1) Panel with .30 m sill and no extra diffusion
2) Panel with .30 m sill and extra diffusion
3) Panel with .15 m sill and no extra diffusion
4) Panel with .15 m sill and extra diffusion
5) Panel with no sill and no extra diffusion, Room A receiving
6) Panel with no sill and no extra diffusion, Room B receiving
7) Panel with no sill and extra diffusion, Room A receiving
8) Panel with no sill and extra diffusion, Room B receiving

TEST PROCEDURE

The test procedure was largely based on two American Society for Testing and Materials (ASTM) standards.

These two standards are:

C423 Test for Sound Absorption and Sound Absorption Coefficients by The Reverberation Room Method.

E90 Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.

Standard E90 assumes the transmission loss TL in a specified frequency band can be calculated as

$$TL = NR - 10 \text{ Log } (S/A_2) \tag{42}$$

where

NR = Difference between source room and receiving room sound levels.

S = Area of transmitting surface.

A = Sound absorption of receiving room.

This assumes that flanking transmission is minimal and S is the surface of the test sample. If the sample area is smaller than the area under test than proposition is made in Article 7.31 to use the Area Power Method to find the TL of the sample:

$$Ts = (TcSc - TfSf)/S_s \tag{43}$$

where

S_s, S_f S_c are surface areas of the specimen wall filler wall and composite wall respectively.

T_s, T_f, T_c are transmission coefficients of specimen, filler wall and composite wall.

It should be noted that

$$TL = 10 \text{ Log } (1/T) \tag{44}$$

The absorption is based on Sabine's reverberation formula. Solving for absorption in a given bandwidth, in terms of room volume V, decay rate of the sound field d, db/sec and speed of sound c,

$$A = \frac{.9210\ Vd}{C} \tag{45}$$

The decay rate was determined by the use of software developed at the Center for Building Studies. A sampling of 50 decays were taken. For each decay, the response at 1/16 sec intervals from source on -5 db to background + 10 db was collected for the frequency bands under consideration. The average level in each 1/16 sec interval for each 1/3 octave was then calculated. The slope of the linear best fit line through the average valves of the 1/16 sec intervals for each 1/3 octave was then used as the decay rate. All samples were taken with the microphone stopped at the high point on its traverse path.

It was observed that the size of Room B makes reverberation times acquired at low frequencies unreliable below 160 Hz. This is based on the expression

$$V = 4\lambda^3 \tag{46}$$

where

V = room volume

λ = wave length

From paragraph 5.3 of ASTM standard C423.

The reverberation software also allowed the operator to enter data such as air temperature (used to calculate the velocity of sound), test title, test name, date of test, calibration correction and area of test panel. Test date other than air temperature along with room absorption values were then stored on disk temporarily.

A second program was used to obtain the TL. This program initially obtained the reverberation data from the disk and then collected 40 separate samples of source room sound level and 40 separate samples of the receiving room sound levels. The number of samples was later decreased to 30 in each room without a significant increase in error. The program would initialize the traverse in the room in which the sampling was being done on every odd sample. A 32 sec linear average sample was taken within the 35 seconds it took the traverse to move along the diagonal, a second 32 sec linear average sample was taken as the traverse returned to its initial position. Once all 60 or 80 samples had been obtained, the program calculated the mean sound levels in the source and the receiving rooms, the standard deviation and error for this date in each 1/3 octave band, the noise reduction and transmission loss for the composite wall.

The test title, surface area of test specimen, the mean noise reduction, the room absorption valves and all values from the source and receiving room sound levels by 1/3 octave were then stored for future reference.

All experiments carried out on any given day started by calibrating the microphones with a B & C/4220 pistonphone. The difference in levels (usually 0.3 db) was included as a calibration correction in the software.

At the end of each sound transmission test, the accelerometer was attached to the centre of the test panel. A 32 second linear average of the acceleration response was collected with the base line on the B & K 2031 set at 60 db. These data were transferred to the HP 9825 A and then dumped out in the form of a bar chart on the Decwriter.

RESULTS AND DISCUSSIONS

One hundred and eight sound transmission configurations were examined in preparation for this thesis. Analysis was conducted in the following manner:

1. The Area Power Method was used to obtain the 1/3 octave results for the sound transmission of the various test configurations in accordance with ASTM E-90 (10).

2. The Sound Transmission Class (STC) ASTM - E413 (22) for each configuration was obtained and broad trends observed.

3. The 1/3 octave results of each test were examined to identify trends in selected frequency bands, namely, the mass controlled region and the coincidence region.

These trends were looked for in the matters of:

1. The effects of sills on the sound transmission in relation to panel.
   - i) Diffusion condition
   - ii) Panel size
   - iii) Panel material
   - iv) Receiving room
2. Other observable correlations.
3. Possible errors in experimental design.
4. Potential problems in the use of the Area Power Method.

1. The Effects of Sills on Sound Transmission

The non sill test configuration tended to be superior when:

a) The smaller panels were used without additional diffusion in the receiving room, table 2 typically (figure A4 & A6).

b) The smaller reverberation chamber without additional diffusion was used, table 3.

c) The smaller panels were used in conjunction with the smaller reverberation chamber, table 4 typically (figure B19 & B20).

Table 1 tabulates the STC's for each test configuration under consideration. Tables 2, 3, 4, 5 and 6 were prepared to isolate possible trends amongst the variable parameters. In each case the assurances of the non sill configuration superiority was taken as the base line. The designation "Best" refers to instances where the non sill condition has a higher STC than the 0.15 m or 0.30 m configurations such as the 0.54 m glass panel with Room A receiving with diffusers. "Same" refers to cases where the STC of the non sill condition equal to one and equal or better than the other sill condition. The 0.54 m glass panel with Room B receiving with diffusers is a case in point. "Worst" denotes a conditions where the non sill STC is lower than one or both of the other sill conditions. The 2.32 m glass panel with Room A receiving is such a case.

Table 2 demonstrates a relationship between sill condition, panel size and the diffusion condition of the receiving room. In general the non sill condition performs best with the smaller panels in a

non diffuse environment. This is indicated by the shift of occurances to the non sill being "Best", especially in the middle sized panel. The large panel exhibits no cases where the non sill condition yield the "Best" results.

Table 3 indicates the non sill condition had superior performance when the small room, Room B acts as the receiving room. The non sill condition performs better in both rooms when the diffusers are not used.

Table 4 suggests that the panel size and receiving room may interact to improve the non sill condition performance. Again as there are no occurrences of the non sill configuration being superior to the other conditions in the 3.92 m^2 format. It can be suggested, at least for these tests that the effects of the sills were minimized as the panel size increased. Reasons for this apparent decline in sill importance are reviewed in section 3.

Table 5 shows a minor relationship between non sill superiority, panel material and diffusion. As a general trend, the non diffuse field yields more cases where the non sill configuration is superior.

Table 6 indicates a strong relationship between panel material and receiving room. The effects are most noticeable for the single gyproc case where the four cases of non sill inferiority are moved up to the level of equal or better than the silled condition.

Once the aforementioned trends had been identified an examination of the 1/3 octave results was undertaken to identify underlying phenomena which explain the results.

As indicated by other authors (8, 15, 16, 17) the non silled condition i.e. where the panel is positioned asymmetrically in the test frame, tended to give superior responses compared to those silled or symmetrically positioned. The non sill responses are most prevalent in the non diffuse condition in Room A and in Room B. Typical of these phenomena is the 0.54 m^2 glass panel mounted in B without diffusers, Figure A8. This may be interpreted as confirming Guy and Mulholland's (15) observations pertaining to standing wave coupling as a sound transmission methodology.

This coupling is to be expected in Room A & B without additional diffusion. In these situations distinctive room modes will couple with sill modes to increase sound transmission. This can also be expected in the smaller, Room B, with diffusion. In this case the room size will tend to limit the number of modes, present. This will also limit the utility of the diffusers. If distinct room modes still exist, they may again couple with the panel in the lower frequency bands to produce a distinctively lower transmission loss for the silled configuration than the non silled case.

Much of the published data (11, 15, 16, 17, 19) indicates little difference at the critical frequency for differing configurations. Lewis (8) has provided at least one instance where an asymmetrically placed panel had a lower sound transmission loss than a symmetrically mounted panel, beyond the coincidence frequency.

The data obtained in this study often indicate inferior transmission loss at coincidence for the 0.54 m non silled case i.e. (figure A7). At this size of panel and at the higher frequencies, it appears the coupling factor between the non silled panel and the receiving room is higher than that of the panel to sill to receiving room system. This situation is to be found for the other two sizes of panels tested but not as profoundly (figure A16 & A26).

The tendendy for larger panels to have lower STC's than smaller panels of the same material may be explained as a function of the coincidence dip. Small panels have a large edge to panel area ratio whilst large panels have smaller ratios. This implies that a great proportion of the small panel kenetic energy can be absorbed by its edges when compared to that which can be absorbed by the large panel's edge. This excess energy is dissipated by the movement of the large panel causing its deep coincidence dip, figure B12. This result was also observed by Lewis (8).

The STC rating for large panels tends to be controlled by the provision that no point may be more than 8 db below the STC curve. The non sill case, which had nominal better performance in the mass controlled region, suffers most with the provision.

It may also be noted that the STC for each panel type tends to decrease as the panel size increases. This is again largely due to the coincidence dip which is more pronounced in the larger panels.

2. Other Observable Correlations

a) Room B (the smaller room) receiving tended to give the higher STC for the same panel size, type, sill and diffusion condition compared to Room A receiving.

b) Two dips in sound transmission were observed for most small panel configurations in the 160 Hz and 315 HZ - 1/3 octave bands.

c) Critical frequency of panels were unaffected by the sill condition.

Based on the STC values for the tests, table 1, the following table may be generated where the STC of Room A is subtracted from the STC of Room B.

Occurrences	Difference
31	> 2
4	1
8	0
7	-1
4	< -2

From this table, Room B receiving, tends to obtain the best STC. It is worthy to note that all four occurrences of the STC difference being less than one or equal to -2 occur with the large double gyproc panels, an anomaly discussed below. Bhattacharya and Guy (11) and Guy and Mulholland (18), employing the same transmission suite in different studies, obtained data indicating a superior noise reduction when their larger room received sound across a common wall. These differing results may tend to show the inadequacy of the 10 Log (S/A) room correction now employed. In addition, a room correction based largely on room depth, as suggested by Kihlman (16) may be in error.

Two dips the sound transmission curves for the small panel size were noted. The 0.3 m sill plot on figure A6 is typical of this. It was first assured that a resonance and a harmonic were present. Upon solving for the fundamental frequency of the sill it was noted that the f (1,0) or f (0,1) for the sill was approximately 225 Hz and the f (1,1) was approximatley 315 HZ. A review of the acceleration profiles of the walls indicate a strong acceleration in the 125 Hz and 160 Hz is attributable to the panel vibration whilst the resonances at 315 Hz may be due to a standing wave coupling between the sills and the rooms, figure 12. A complete set of data is in Appendix C.

Table 7 complies the critical frequency of each configuration. Though there are variations between 2.5 kHz and 3.15 kHz, these are probably due to mounting conditions rather than sill configuration.

3. Possible Errors in Experimental Design

a) Panel construction

b) Flanking losses

c) Improperly secured sills.

Every experiment is subject to experimental error. Three possible sources have been identified.

With the exception of the glass, the gyproc and the double gyproc were constructed in the test aperture. That is the various pieces of the panel were placed in the aperture and then taped and puddled together. This may have produced some irregular results. An example of this may be observed in the double gyproc panels mounted in Room A when compared to this configuration when mounted in Room B as a function of panel size figure B25 and B31. The Room B responses tend to be quite similar in the mass controlled region and deviate in the below the Shrodinger cut of frequency and in the coincidence region. The Room A responses tend to deviate much more and at lower frequencies as given panel seems to be affected by coincidence effects to different degrees.

Flanking loss is a nemesis in all sound transmission testing. With the range of panel types, sizes and mounting orientations, some flanking transmission is observable. The double gyproc when mounted on the A side of the test wall may well also indicate flanking loss. This may most noticeably be observed in the 5 kHz band on the two ply gyproc panel configuration in Room A. In this case, the 0.3 m sill configuration carries on an upward slope after coincidence. The

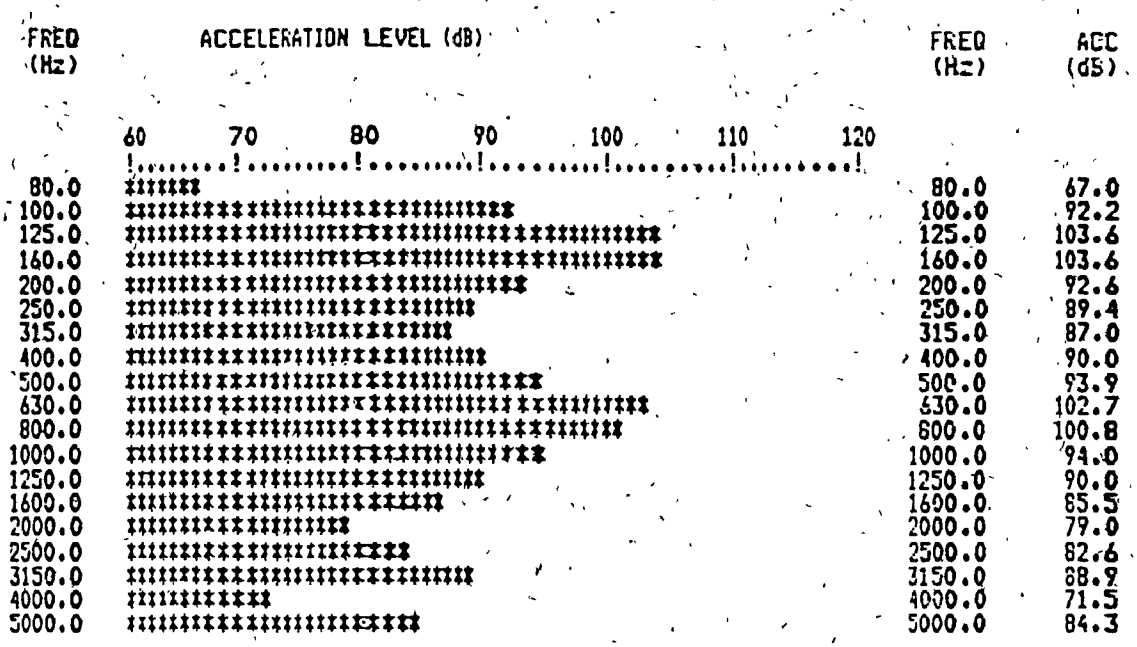


Figure 12 RMS ACCELERATION LEVEL 32 sec LIN avg
29in sep 12in baffle inA without diffuuser

non sill and 0.15 sill configurations drop at this band, figure A 30. This may indicate a high frequency shoot through which was affected by some contact with the experimental set up between the 0.3 m sill test without and with diffusers.

The sill construction must also be criticized. In Michelsen work (19) for instance the test panel was bounded by a rigid frame. In the work presented herein the sills were of a temporary nature and modified as the test series progressed. In this way the test sills may not have been as rigid as others have had.

This would tend to allow the sill to move and dampen out potential standing wave couplings which other researchers have indicated.

Guy and Mulholland (18) utilized absorbant material to line their sill assembly in one test. Based on their results they demonstrated a suppression in standing wave coupling and thus increased noise reduction in the frequency range where the absorbant material was effective.

The effects of the sills in this work are to be found most prominently in the small panel size which had the most rigid sill due to its small size.

This may indicate a practical method to minimize the effects of the sill on sound transmission. It is suggested that this sill may be made in such way as to allow some limited movement. This movement would tend to damp potential standing wave coupling and thus create a silled condition which had similar performance as a non silled configuration.

4. Potential Problems in the Use of the Area Power Method

From a review of the data it appears that the Area Power Method may be inadequate. Based on table 1, variations in sill depth, diffusion, condition, receiving room and panel size, with all other variables being the same in each case have generated differences in reported STC as high as 5 points for the same panel type. The results obtained in this study indicate the following situations may occur, causing errors from one panel test to another.

i) Unexpected low frequency resonances between the panel and/or receiving room.

ii) Lower sound transmission loss in mass controlled region for configurations with sills.

iii) Variable depth of coincidence dip based on panel size or mounting condition.

iv) Variable overal sound transmission loss subject to source/receiving room roles, table 1.

Four functional parameters have been identified. Unless the data used in the calculation of the Area Power Method are derived under similar circumstances to those which are being tested; errors may arise.

If similar test conditions are used, the effect would be to reduce the number of variables. This would sill leave the room parameter, which has yet to be described adequately.

Size & Sill Type / Panel Type	.54 m²			2.32 m²			3.92 m²		
	Nil	.15	.30	Nil	.15	.30	Nil	.15	.30
WITH DIFFUSERS									
Glass A, receiving	32	27	27	28	27	29	26	26	27
Glass B, receiving	33	33	33	28	29	29	29	29	29
Gyproc A, receiving	28	29	33	29	29	29	28	29	29
Gyproc B, receiving	32	32	32	31	31	28	30	30	29
2 ply gyp. A, receiving	34	33	32	33	32	32	35	35	35
2 ply gyp. B, receiving	36	35	35	36	35	35	34	34	33
WITHOUT DIFFUSERS									
Glass A, receiving	32	30	30	29	28	28	26	27	27
Glass B, receiving	34	33	33	28	28	28	28	29	30
Gyproc A, receiving	33	32	30	29	30	29	28	29	29
Gyproc B, receiving	32	32	32	31	30	30	30	30	28
2 ply gyp. A, receiving	34	34	32	33	32	32	36	36	36
2 ply gyp. B. receiving	36	34	34	35	34	34	33	32	33

TABLE I

Table of Test Configuration STC Values

With Diffusers	0.54 m^2	2.32 m^2	3.92 m^2
Best	3	2	0
Same	2	2	4
Worst	1	2	2

Without Diffusers	0.54 m^2	2.32 m^2	3.92 m^2
Best	4	4	0
Same	2	1	3
Worst	0	1	3

TABLE 2

Non sill superiority as a function of panel size and diffusion condition.

With Diffusers	A	B
Best	3	2
Same	2	6
Worst	4	1

Without Diffusers	A	B
Best	4	4
Same	2	4
Worst	3	1

TABLE 3

Non sill superiority as a function of receiving room and diffusion condition.

Room A - Receiving	0.54 m^2	2.32 m^2	3.92 m^2
Best	4	3	0
Same	1	1	2
Worst	1	2	4

Room B - Receiving	0.54 m^2	2.32 m^2	3.92 m^2
Best	3	3	0
Same	3	2	5
Worst	0	1	1

TABLE 4

Non sill superiority as a function of panel size and receiving room.

With Diffusers	Glass	Gyproc	2 ply Gyproc
Best	1	0	4
Same	2	4	2
Worst	3	2	0

Without Diffusers	Glass	Gyproc	2 ply Gyproc
Best	3	1	3
Same	1	3	3
Worst	2	2	0

TABLE 5

Non sill superiority as a function of panel material and diffusion.

Room A - Receiving	Glass	Gyproc	2 ply Gyproc
Best	3	1	3
Same	0	1	3
Worst	3	4	0

Room B - Receiving	Glass	Gyproc	2 ply Gyproc
Best	1	1	4
Same	3	5	2
Worst	2	0	0

TABLE 6

Non sill superiority as a function of panel material and receiving room.

Size & Sill Type / Panel Type	.54 m^2			2.32 m^2			3.92 m^2		
	Nil	.15	.30	Nil	.15	.30	Nil	.15	.30
WITH DIFFUSERS									
A - Receiving									
Glass	3.15	3.15	3.15	2.5	3.15	3.15	2.5	2.5	2.5
Gyproc	3.15	3.15	2.5	2.5	2.5	2.5	2.5	2.5	2.5
2 ply Gyproc	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
B - Receiving									
Glass	3.15	3.15	3.15	2.5	2.5	2.5	2.5	2.5	2.5
Gyproc	3.15	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
2 ply Gyproc	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
WITHOUT DIFFUSERS									
A - Receiving									
Glass	3.15	3.15	3.15	2.5	3.15	2.5	2.5	2.5	2.5
Gyproc	2.5	3.15	2.5	2.5	2.5	2.5	2.5	2.5	2.5
2 ply Gyproc	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
B - Receiving									
Glass	3.15	3.15	3.15	2.5	2.5	2.5	2.5	2.5	2.5
Gyproc	2.5	2.5	2.5	3.15	3.15	3.15	2.5	2.5	2.5
2 ply Gyproc	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

TABLE 7

Table of Critical Frequencies (x 1000)

CONCLUDING REMARKS

The results from the test series tend to support a number of trends identified by other workers. Namely, the sills were found to be a link in the sound transmission mechanism. Unfortunately the performance of the non sill configurations are not as dramatically superior to those published elsewhere (15, 19). This may be the result of not matching the depth or exact dimensions of the built on sills to the niche on the source side of the panel. This mismatch of sills would produce distinct resonant modes which would not couple through the panel in the same way as identical sills. It can be noted that the non sill configuration performed best, in comparison to the silled cases, when the small receiving room and small panel size were employed.

Variation in panel size generated results which were in general agreement with Lewis (8). They demonstrate that, for larger panel sizes, the coincidence dip may have a more prominent role in the determination of STC values and thus, the qualification of certain wall constructions for current building codes.

A significant variation to published material is to be found in the effect of room orientation. Bhattacharya & Guy (11) and Guy and Mulholland (18) have published data indicating better transmission loss when their large room received sound. The results from this series of tests indicates the opposite.

In addition the test series encountered low frequency resonances which were not expected. Such resonances were mentioned by Göselle (15). This is quite interesting since the sills used by Göselle appear to have been built similarly to those used in this work. Unfortunately he does not provide adequate dimensioning of his panel to indicate whether the resonance is due to excessive panel vibration or a standing wave coupling associated with the sill.

The Area Power Method of Sound Transmission calculation has been found to be an imperfect tool. In the absence of a better understanding of the sound transmission mechanism, its use is advised with extreme caution. A caveat to this effect should be included in the ASTM E-90 (14) protocal as well as an explicit statement of its use in the report which results from the test. This recommendation would allow the user of test data so obtained to weigh its significance in relation to other tests and his own experience.

SUGGESTED FURTHER RESEARCH

From the results obtained from this work three further projects are suggested:

i) Undertake this test series at one or more test facilities. This would take some time, however there is a desperate need to duplicate such work at different Laboratories to observe if the room parameter may have an overriding effect over other parameters.

ii) Initiate a study in model and full scale to observe variations in sound transmission loss as a function of room volume and/or room parameter.

iii) Initiate a discrete frequency analysis of a sill configuration in an effort to obtain a relationship between panel and sill coupling.

BIBLIOGRAPHY

1 Porteous, J. Doublas, "Environment and Behavior", Addison-Wesley Publishing Company, Reading, Mass. 1977.

2 Rayleigh, J.W.S. "The Theory of Sound" vol. 1 & 2, Dover Publications, New York, 1945.

3 Sabine, W. "Collected Works on Acoustics" Dover Publications, New York 1964.

4 Kinsler L.E. and Frey A.R. "Fundamentals of Acoustics", zed, John Wiley & Sons, New York 1962.

5 Beranek L.L., Ed. "Noise and Vibration Control". McGraw-Hill Book Company, New York 1971.

6 Lord, H.W., Gatley W.S. and Evensen H.A. "Noise Control for Engineers" McGraw-Hill Book Company, New York 1980.

7 Guy R.W. "Noise Isolation and Control by Barriers and Walls", Controlling Noise in Industry. Short course notes, session E. Centre for Building Studies. December 6-7, 1979.

8 Lewis P.T. "The Noise Generation by Road Traffic and its Penetration into Buildings", Ph. D. Thesis University of Newcastle.

9 Pretlove, A.J., "Free Vibrations of a Rectangular Panel backed by a Closed Rectangular Cavity", J. Sound Vib (1965) 2 (3), 197-209.

10 Bhattacharya M.C. and Crocker M.J., "Forced Vibration of a Panel and Radiation of Sound into a Room", Acustica 22:5 (1969/70).

11 Bhattacharya, M.C. and Guy R.W. "The Influence of the Measuring Facility on the Measured Sound Insulating Property of a Panel", Acustica, 26:6 (1972).

12 Guy, R.W. "The Transmission of Sound Through a Cavity Backed Window, Sill and Reveal Configuration", Centre for Building Studies, Report #47, August 1978.

13 "The Cost Effectiveness of Double Glazing Against Traffic Noise with Particular Reference to Schools, Hospitals and Offices", Heriot Watt University, Department of Building, December 1973.

14 Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions. ASTM E-90-75.

15 Göselle, K., "Uber Prüfstände zur Messung der Luftschalldämmung von Wänden und Decken" Acustica, vol 15 (1965) 317-324.

16 Kihlman T., "Sound Radiation into a Rectangular Room. Applications to Airborne Sound Transmission in Buildings", Acustica, vol 18 (1967).

17 Kihlman T., and Nilsson A.C., "A Comparison Between Reduction Index Measurements in Five Laboratories", Chambers Technical University, Goteborg, March 1972.

18 Guy R.W. and Mulholland K.A. "Some Observations on Employing a Panel's Sill and Reveal to Enhance Noise Reduction". Centre for Building Studies Report #46, August 1978.

19 Michelsen M. "The Effects of Laboratory Design on the Measured Sound Reduction Index", Lydteknisk Laboratorium Report #18, April 1979.

20 Lang M. "Acoustic Test Facilities at the Centre for Building Studies, Concordia University", Centre for Building Studies Report #45.

21 Rennie J. "Qualifications of a Light Weight Ninety Four Cubic Meter Reverberation Chamber for Determination of Sound Power levels of small Noise Sources", Master's Thesis, 1979, Concordia University.

22 Standard Classification of Sound Transmission Class ASTM E-413-73.

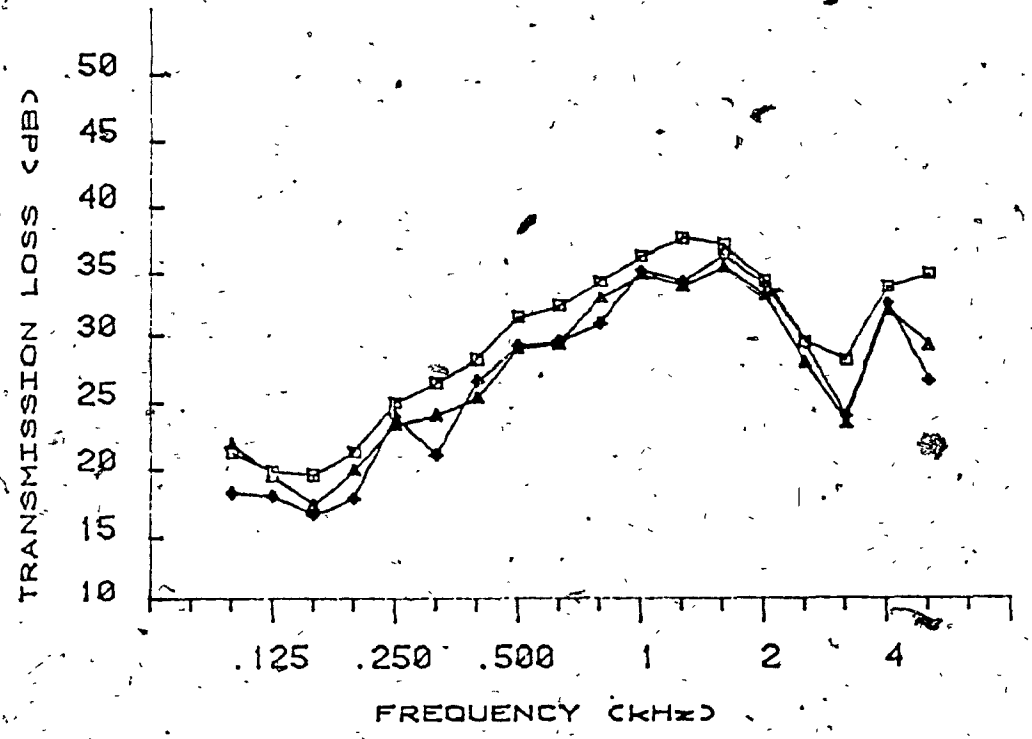
APPENDIX A

Graphs of Test Results as a Function of Sill Size

List of Figures

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	20.3	21.0	17.2
125	18.8	18.4	16.9
160	18.5	16.3	15.6
200	20.3	18.9	16.8
250	24.0	22.4	23.0
315	25.5	23.1	20.1
400	27.2	24.3	25.6
500	30.3	28.0	28.1
630	31.2	28.3	28.4
800	33.1	31.8	29.8
1000	35.2	33.7	34.1
1250	30.5	32.8	33.1
1600	36.8	34.3	35.3
2000	33.3	32.0	32.8
2500	28.4	26.9	28.3
3150	27.1	22.5	22.9
4000	32.7	30.8	31.3
5000	33.8	28.1	25.6



LEGEND

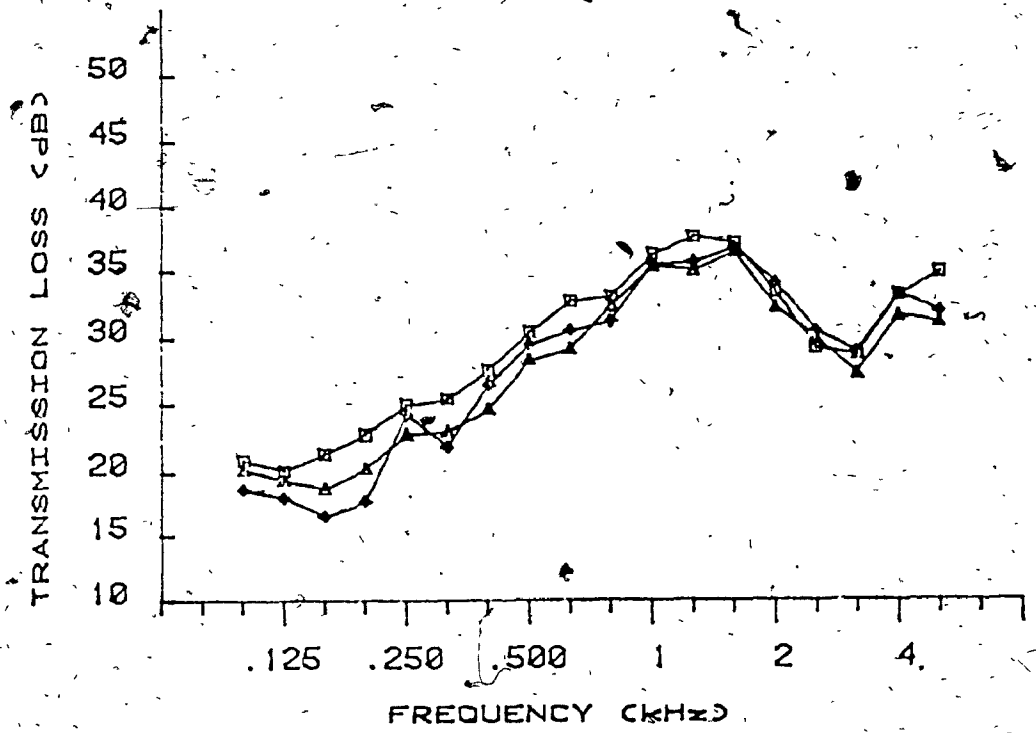
- non - all condition
- 0.15m all condition
- 0.30m all condition

FIGURE A1: TL FOR 0.54m^2 GLASS PANELS, WITH DIFFUSERS, MOUNTED IN ROOM A

A1

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	19.9	19.2	17.6
125	19.1	18.3	16.9
160	20.4	17.7	15.5
200	21.8	19.3	16.7
250	23.9	21.8	23.2
315	24.3	22.0	20.9
400	26.5	23.6	25.5
500	29.4	27.3	28.4
630	31.7	28.1	29.5
800	32.0	31.3	30.2
1000	35.1	34.2	34.4
1250	36.4	33.9	34.5
1600	35.9	35.2	35.5
2000	32.3	31.2	33.0
2500	28.1	28.9	29.4
3150	27.6	26.2	27.8
4000	32.1	30.6	32.1
5000	33.8	30.1	30.9



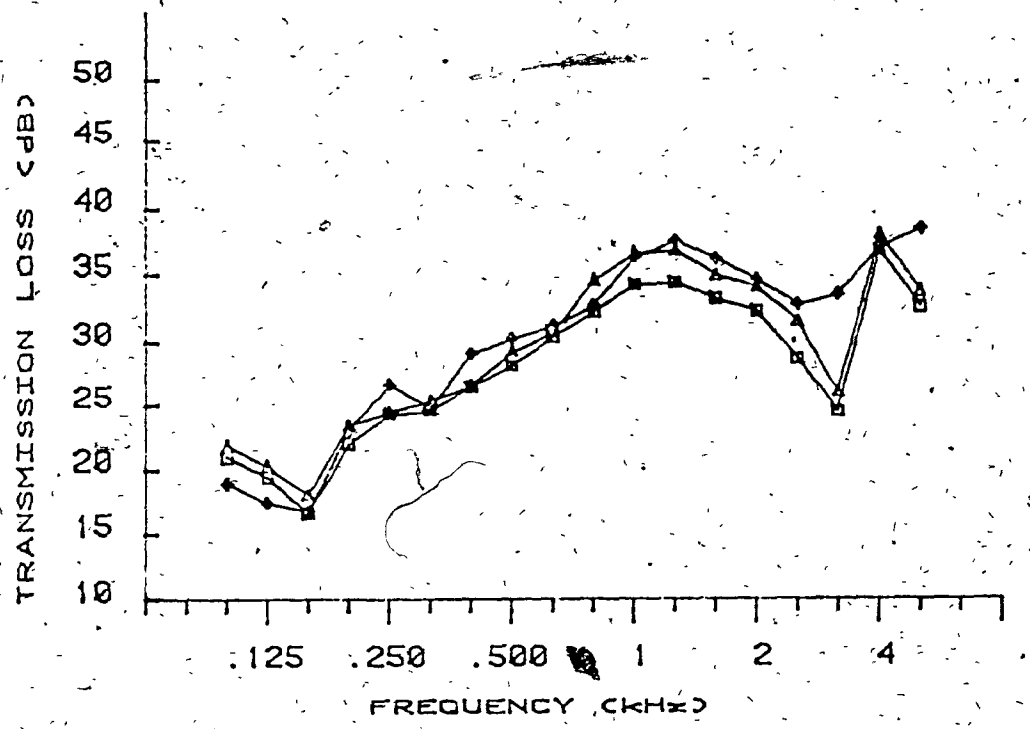
LEGEND

- non sill condition
- 0.15m sill condition
- 0.30m sill condition

FIGURE A2: TL FOR 0.54m^2 GLASS PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	Δ	◇
100	19.9	20.7	17.9
125	18.4	19.2	16.3
160	15.5	17.0	15.6
200	20.8	22.2	21.8
250	23.2	23.4	25.6
315	23.5	24.2	23.6
400	25.4	25.5	28.0
500	27.1	28.2	29.2
630	29.3	29.7	30.2
800	31.2	33.5	31.6
1000	33.1	35.5	35.1
1250	33.3	35.7	36.3
1600	32.1	33.8	35.0
2000	31.2	33.0	33.5
2500	27.6	30.5	31.7
3150	23.3	24.8	32.4
4000	35.6	36.8	35.8
5000	31.5	32.6	37.2



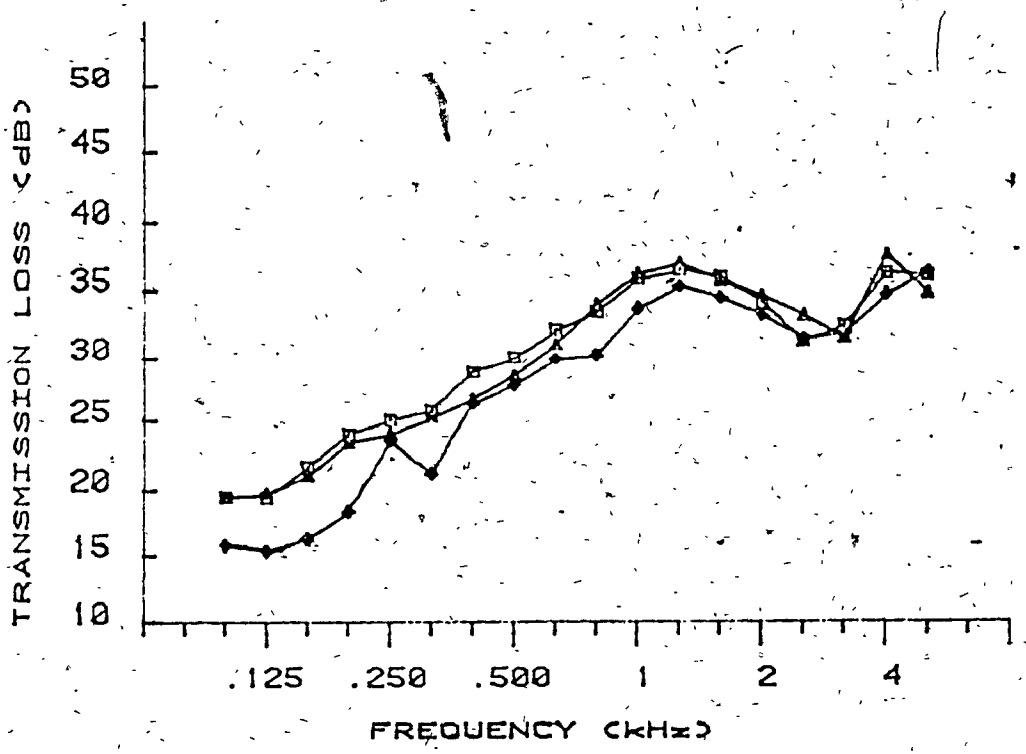
LEGEND

- non ₰ill condition
- 0.15m ₰ill condition
- 0.30m ₰ill condition

FIGURE A3: TL FOR 0.54m^2 GYPROCK PANELS, WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	Δ	◇
100	18.4	18.3	14.7
125	18.3	18.7	14.2
160	20.6	20.0	15.2
200	22.9	22.3	17.3
250	23.9	22.9	22.4
315	24.7	24.2	20.1
400	27.8	25.6	25.2
500	28.9	27.5	20.7
630	31.1	29.9	28.8
800	32.3	32.8	29.1
1000	34.7	35.8	32.6
1250	35.3	35.8	34.1
1600	34.8	34.5	33.3
2000	33.0	33.4	32.1
2500	30.2	32.1	30.4
3150	31.4	30.5	30.8
4000	35.1	36.4	33.6
5000	34.9	33.6	35.2



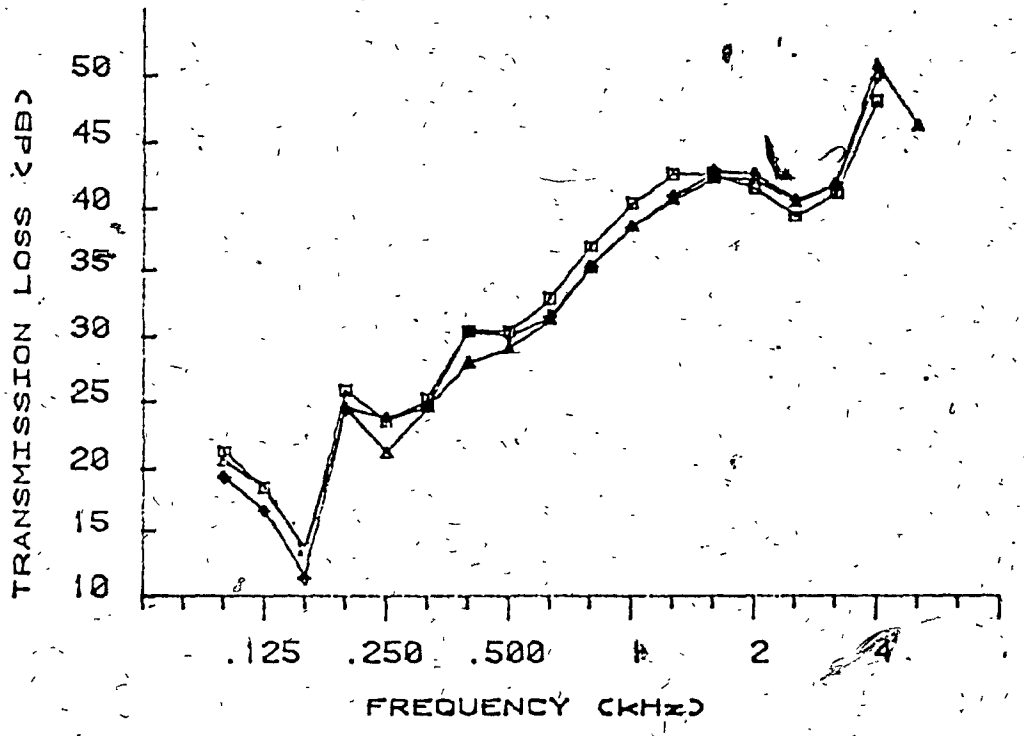
LEGEND

- □ non ≡ill condition
- Δ 0.15m ≡ill condition
- ◇ 0.30m ≡ill condition

FIGURE A4: TL FOR 0.54m^2 GYPROCK PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	20.3	19.6	18.3
125	17.5	17.4	15.5
160	12.4	12.2	10.3
200	24.7	23.5	23.3
250	22.5	20.2	22.7
315	24.2	23.5	23.6
400	29.3	26.9	29.3
500	29.3	28.0	29.0
630	31.8	30.2	30.5
800	35.7	34.1	34.1
1000	39.2	37.4	37.3
1250	41.6	39.6	39.8
1600	41.5	41.2	41.8
2000	40.5	41.1	41.6
2500	38.2	39.3	39.5
3150	40.1	40.7	40.8
4000	47.0	49.6	48.7
5000	56.0	45.1	56.0



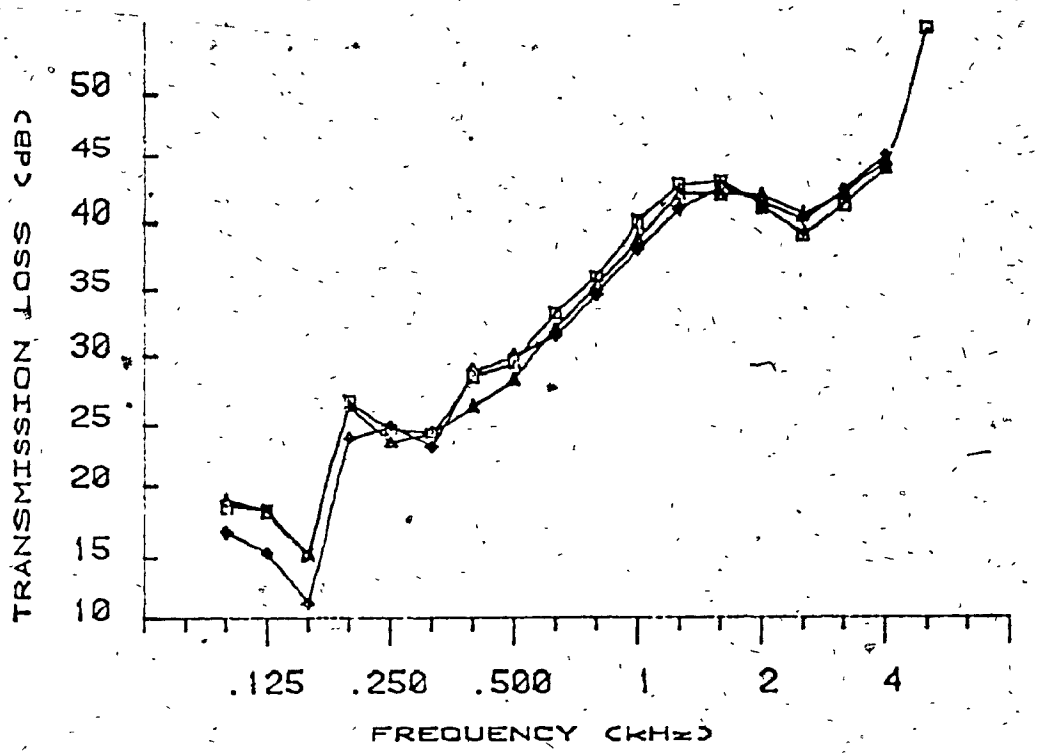
LEGEND

- □——□ non ∗ill condition
- △——△ 0.15m ∗ill condition
- ◇——◇ 0.30m ∗ill condition

FIGURE A5: TL FOR 0.54m^2 DOUBLE GYPROCK PANELS, WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	17.5	17.9	15.8
125	17.2	17.1	14.3
160	14.2	13.9	10.1
200	25.7	25.4	22.8
250	23.6	22.4	23.8
315	23.2	23.3	22.1
400	27.5	25.3	27.9
500	28.4	27.3	28.9
630	32.0	30.8	30.2
800	34.9	34.2	33.4
1000	38.9	37.8	37.1
1250	41.4	40.7	39.7
1600	41.7	40.7	41.2
2000	39.8	40.6	40.1
2500	38.0	39.3	38.9
3150	40.0	40.8	41.0
4000	42.6	43.3	43.8
5000	53.3	54.8	54.8



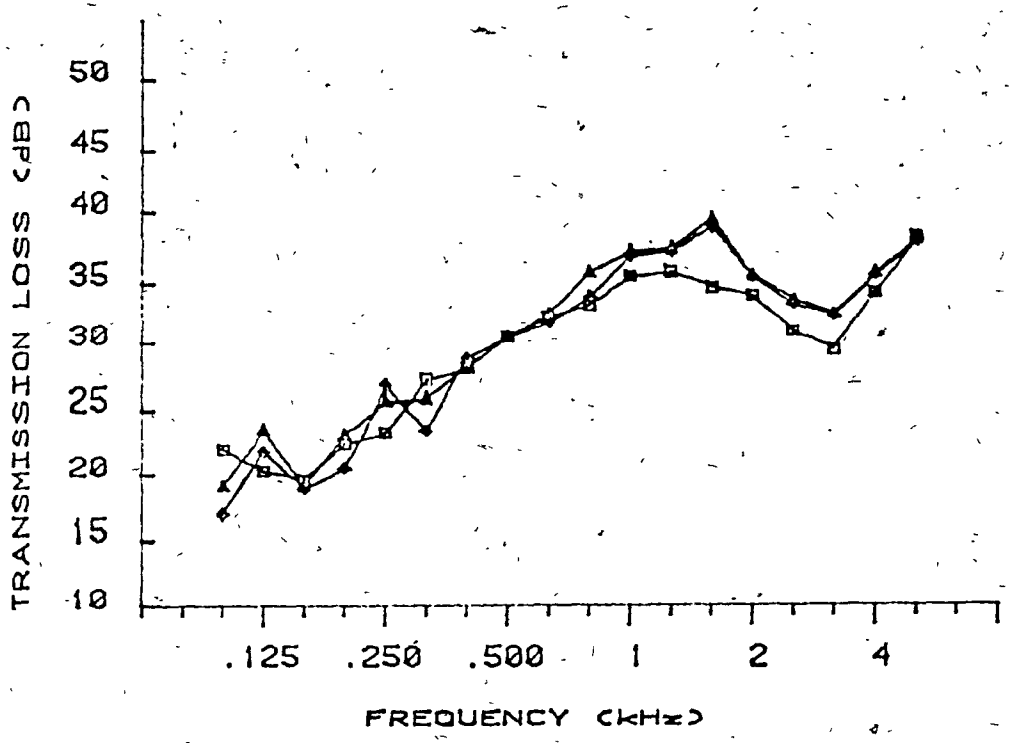
LEGEND

- non sill condition
- 0.15m sill condition
- 0.30m sill condition

FIGURE A6: TL FOR 0.54m^2 DOUBLE GYPROCK PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	21.1	17.9	15.8
125	19.2	22.6	20.9
160	18.5	17.9	17.8
200	21.5	22.3	19.5
250	22.5	24.6	25.6
315	26.1	24.8	22.6
400	26.9	27.0	27.6
500	29.4	29.5	29.4
630	31.1	31.5	30.6
800	32.2	34.8	32.9
1000	34.5	36.2	36.0
1250	34.8	36.5	36.3
1600	33.6	38.4	37.9
2000	32.9	34.6	34.5
2500	29.8	32.6	32.2
3150	28.3	31.4	31.2
4000	33.2	34.8	34.6
5000	37.2	37.2	37.0



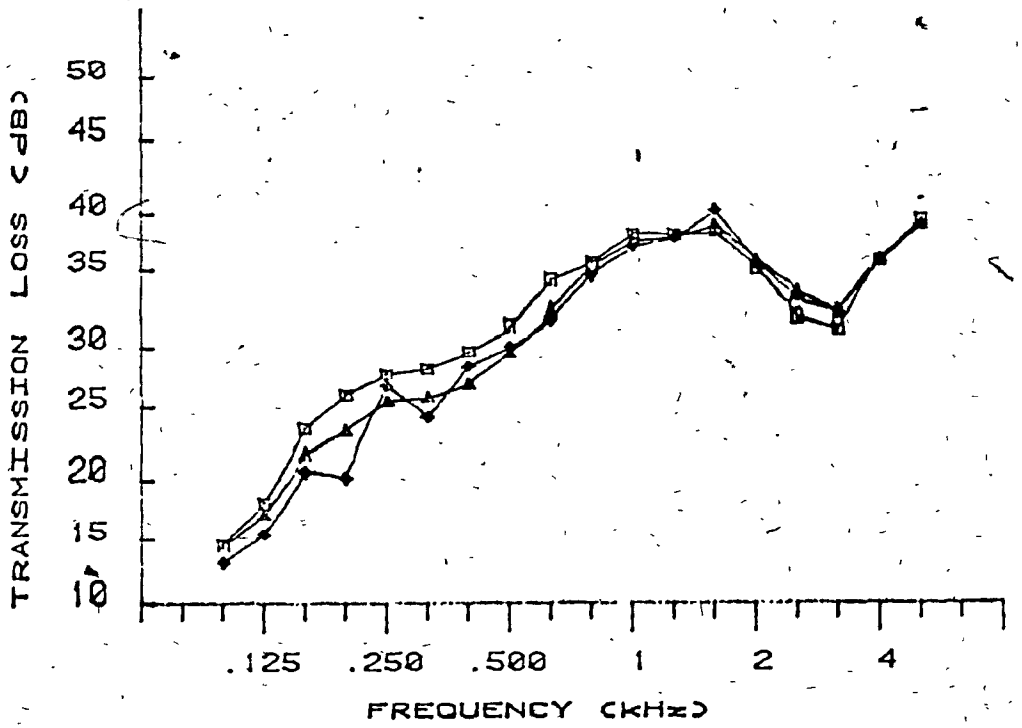
LEGEND

- □ non all condition
- △ 0.15m all condition
- ◇ 0.30m all condition

FIGURE A7: TL FOR 0.54m^2 GLASS PANELS, WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	13.5	13.2	11.8
125	17.0	16.1	14.3
160	22.2	20.6	19.5
200	24.9	22.1	19.8
250	26.6	24.3	25.6
315	27.0	24.6	23.1
400	28.5	25.7	27.2
500	30.4	28.3	28.9
630	33.1	31.3	30.8
800	34.4	34.1	33.4
1000	36.9	36.2	35.7
1250	36.9	36.7	36.5
1600	37.0	37.7	39.0
2000	33.9	34.6	34.3
2500	30.9	32.3	31.8
3150	30.1	31.1	31.2
4000	34.5	34.7	34.4
5000	36.3	37.7	37.7



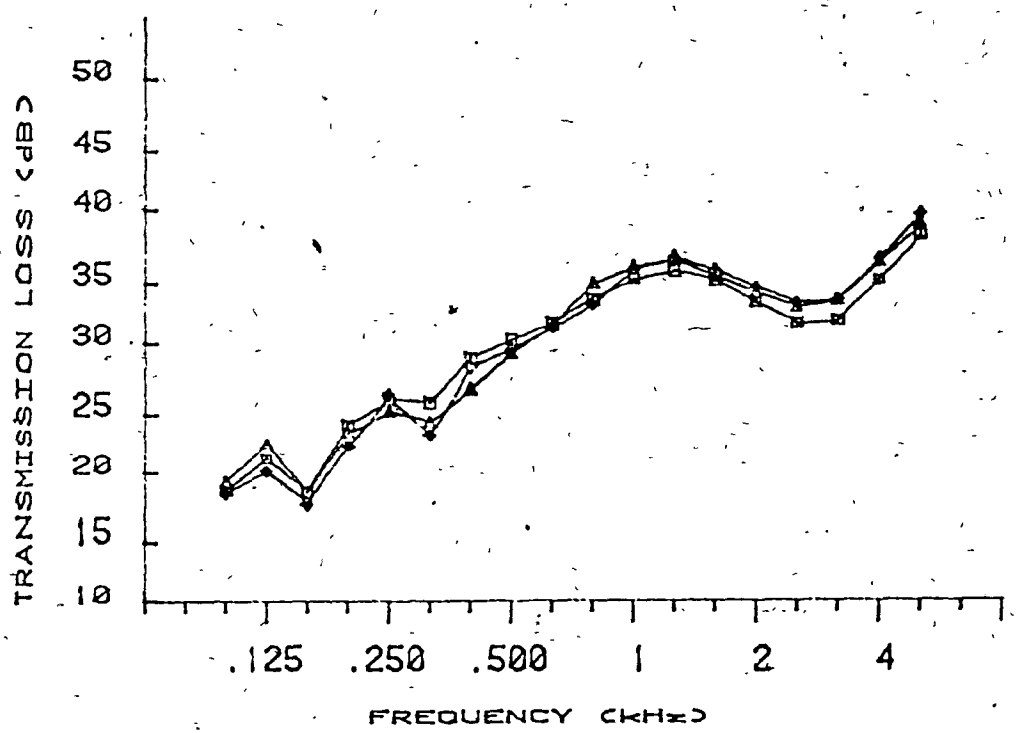
LEGEND

- non wall condition
- 0.15m wall condition
- 0.30m wall condition

FIGURE A8: TL FOR 0.54m^2 GLASS PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	17.4	18.1	17.2
125	20.2	21.5	19.0
160	17.3	17.3	16.4
200	23.1	22.4	21.3
250	25.[illegible]	24.2	25.3
315	24.[illegible]	23.3	22.3
400	27.8	25.8	27.2
500	29.2	28.1	28.5
630	30.6	30.4	30.2
800	32.6	33.9	32.0
1000	34.2	35.2	35.1
1250	34.9	35.7	35.9
1600	34.1	34.4	34.9
2000	32.2	33.1	33.5
2500	30.5	31.9	32.2
3150	30.7	32.4	32.5
4000	34.1	35.6	35.8
5000	37.4	38.8	38.6



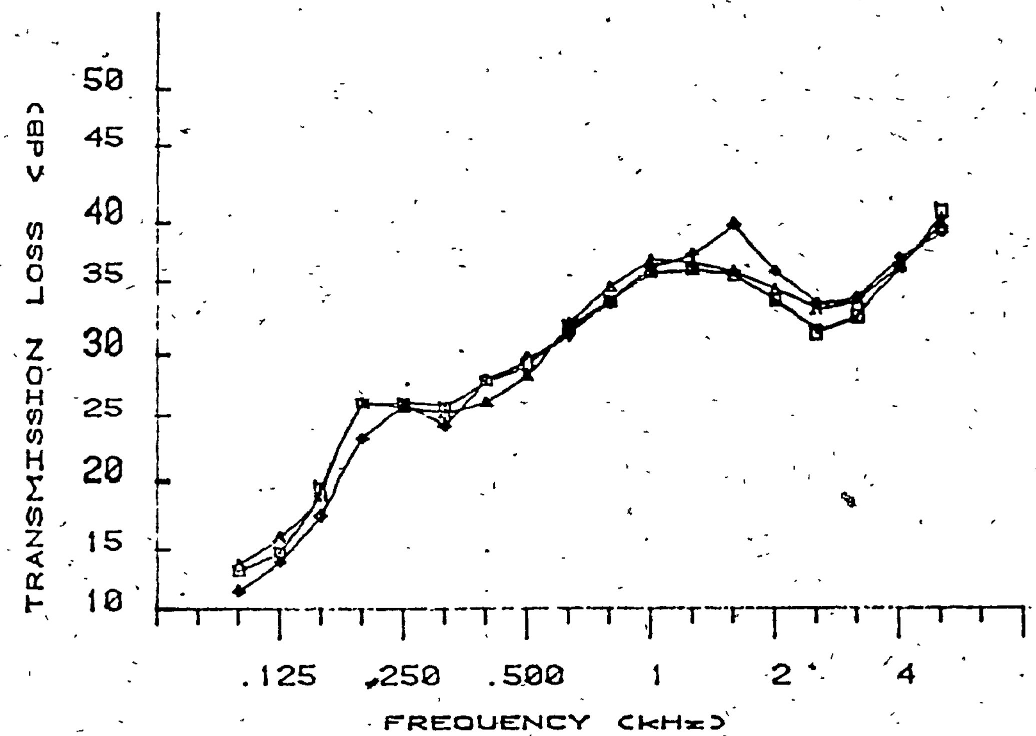
LEGEND

□——□ non ●ill condition
△——△ 0.15m ●ill condition
◇——◇ 0.30m ●ill condition

FIGURE A9: TL FOR 0.54m^2 GYPROCK PANELS, WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	12.1	12.6	10.3
125	13.7	15.0	12.8
160	18.4	18.1	16.8
200	25.1	25.1	21.8
250	25.2	24.6	25.0
315	24.8	24.1	23.0
400	27.0	25.2	27.2
500	28.2	27.5	28.6
630	30.5	30.6	30.1
800	32.2	33.4	32.1
1000	34.6	35.7	35.1
1250	34.8	35.4	36.2
1600	34.3	34.7	38.7
2000	32.3	33.1	34.7
2500	30.2	31.6	32.0
3150	31.1	32.3	32.5
4000	35.0	35.2	35.9
5000	39.6	38.8	38.1



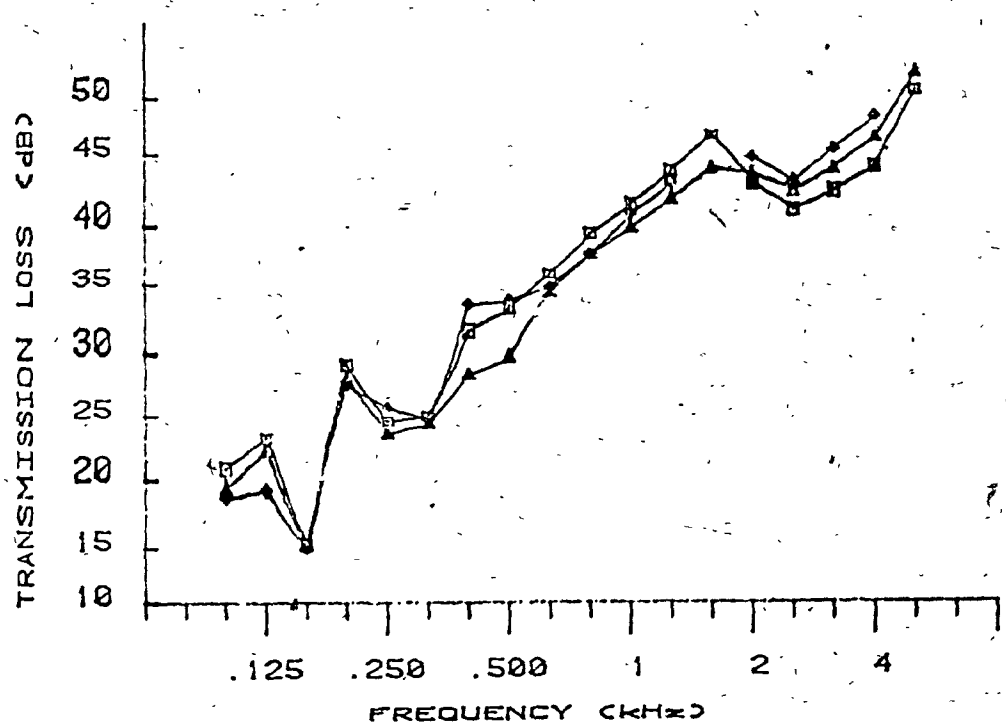
LEGEND

□ non sill condition
△ 0.15m sill condition
◆ 0.30m sill condition

FIGURE A10: TL FOR 0.54m^2 GYPROCK PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	19.6	18.4	17.8
125	21.8	20.6	18.3
160	14.3	13.9	13.7
200	28.2	27.2	26.5
250	23.3	22.1	24.5
315	23.8	23.8	23.4
400	30.3	27.4	32.0
500	31.7	28.7	32.3
630	34.7	33.0	33.4
800	33.2	36.4	36.5
1000	40.2	38.7	39.6
1250	42.3	40.8	41.6
1600	45.3	42.5	54.8
2000	41.6	42.1	43.3
2500	39.9	41.1	41.6
3150	41.1	42.5	43.9
4000	42.6	44.9	46.8
5000	49.1	50.6	57.5



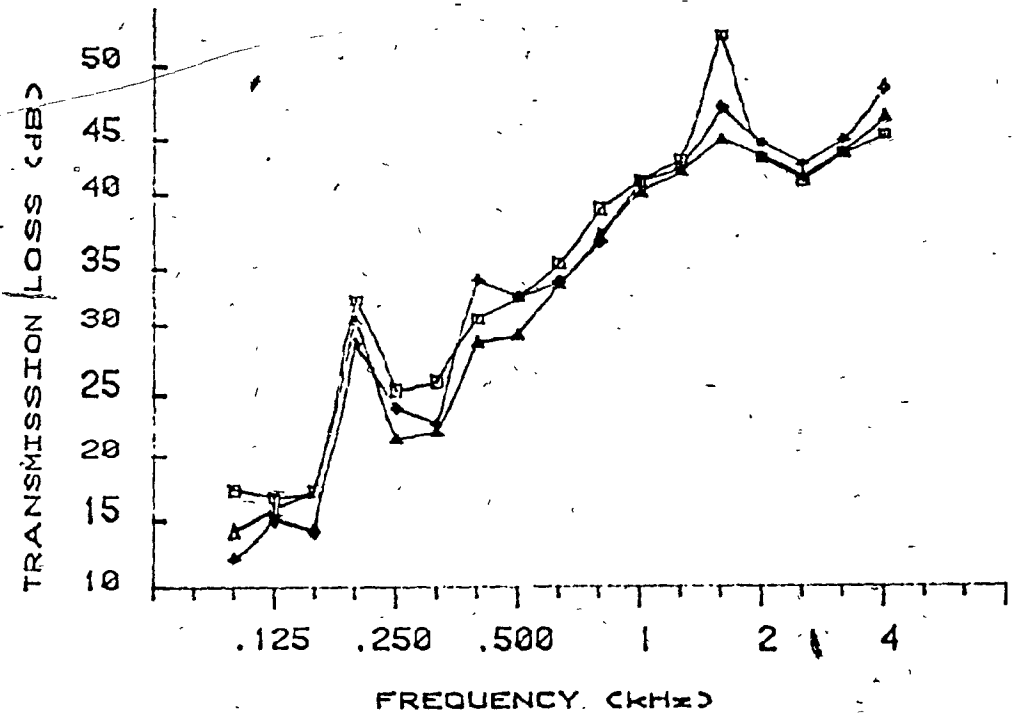
LEGEND

- non mill condition
- 0.15m mill condition
- 0.30m mill condition

FIGURE A11: TL FOR 0.54m^2 DOUBLE GYPROCK PANELS, WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	16.0	13.4	11.5
125	15.4	14.7	14.0
160	15.9	15.8	13.4
200	31.2	29.3	27.3
250	24.3	20.5	23.1
315	24.9	21.2	21.8
400	29.4	27.5	32.9
500	31.3	28.0	31.4
630	34.3	32.5	32.8
800	37.9	36.2	35.9
1000	40.0	39.1	39.8
1250	41.8	40.7	41.1
1600	51.3	43.8	46.3
2000	41.9	42.0	43.4
2500	39.9	40.3	41.3
3150	42.3	42.4	43.7
4000	44.2	46.6	47.6
5000	54.5	54.5	54.5



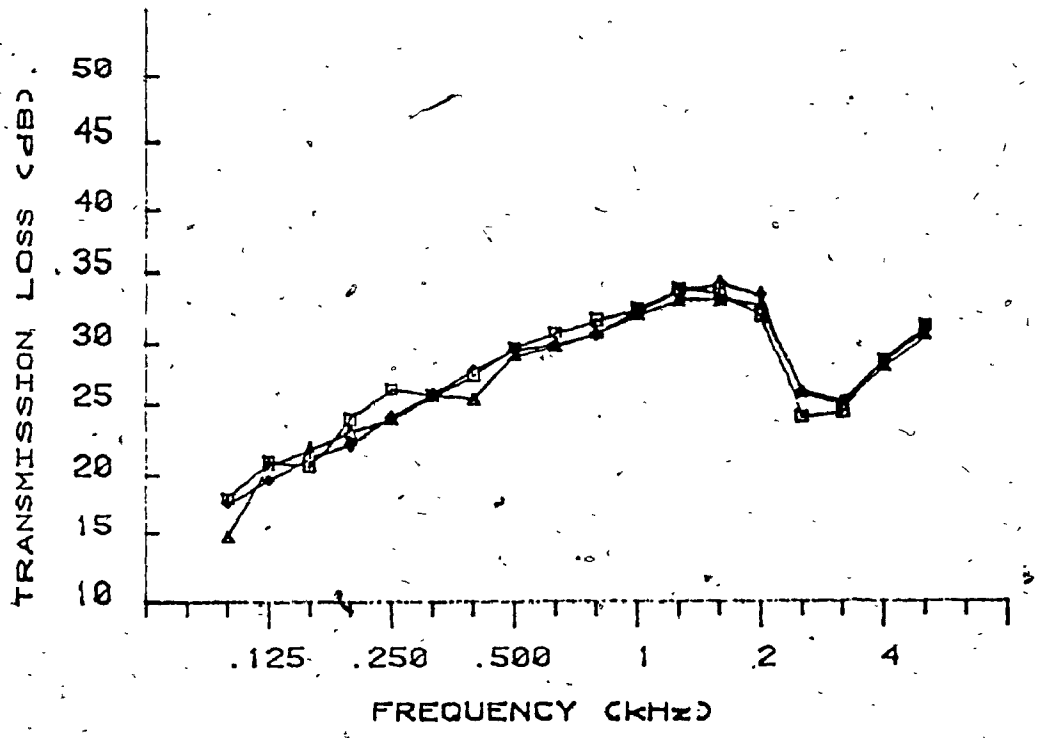
LEGEND

□——□ non swirl condition
△——△ 0.15m swirl condition
◇——◇ 0.30m swirl condition

FIGURE A12: TL FOR 0.54m^2 DOUBLE GYPROCK PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	17.1	13.6	16.5
125	20.0	19.7	18.5
160	19.6	20.9	20.2
200	22.9	22.1	21.2
250	25.1	22.9	23.0
315	24.6	24.6	24.7
400	26.1	24.3	26.5
500	28.0	27.8	28.3
630	29.7	28.6	28.8
800	30.7	29.7	29.6
1000	31.4	31.0	31.3
1250	32.7	32.0	32.7
1600	32.4	32.0	33.1
2000	31.0	31.6	32.3
2500	23.0	24.7	24.8
3150	23.3	23.7	24.0
4000	27.5	26.8	27.3
5000	30.3	29.5	29.9



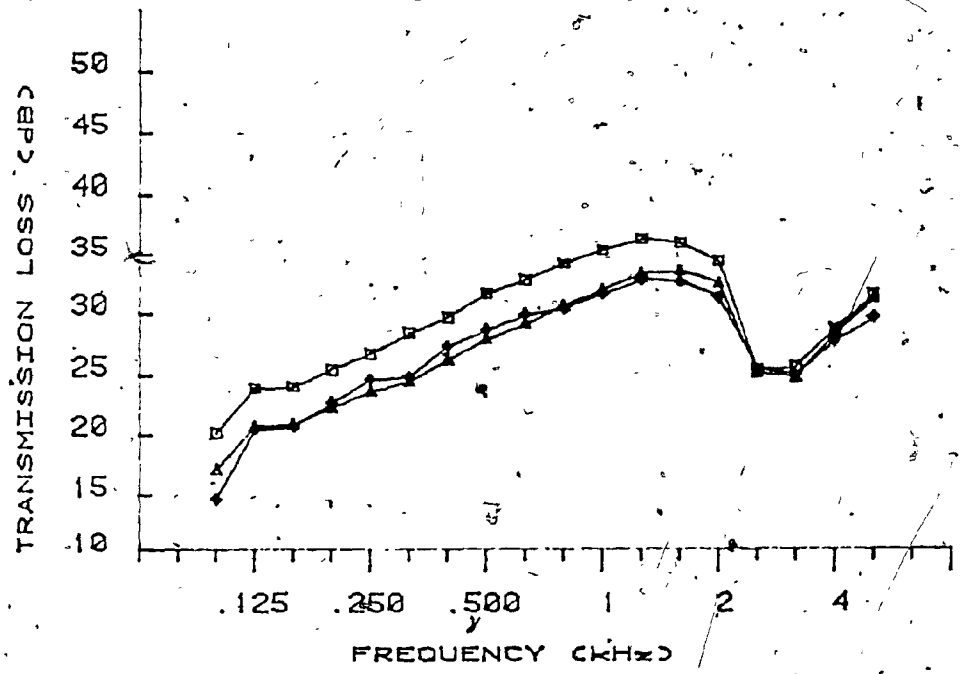
LEGEND

- non sill condition
- 0.15m sill condition
- 0.30m sill condition

FIGURE A13: TL FOR 2.32m^2 GLASS PANELS, WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	19.1	16.1	13.6
125	22.8	19.7	19.4
160	23.0	19.8	19.6
200	24.4	21.2	21.8
250	25.7	22.6	23.6
315	27.4	23.4	23.8
400	28.7	25.2	26.3
500	30.5	26.9	27.6
630	31.6	28.1	28.9
800	33.0	29.5	29.3
1000	34.2	30.8	30.4
1250	35.2	32.2	31.6
1600	34.8	32.3	31.4
2000	33.2	31.3	30.2
2500	24.4	24.0	24.3
3150	24.5	23.6	23.9
4000	27.7	27.3	26.6
5000	30.4	30.1	28.6



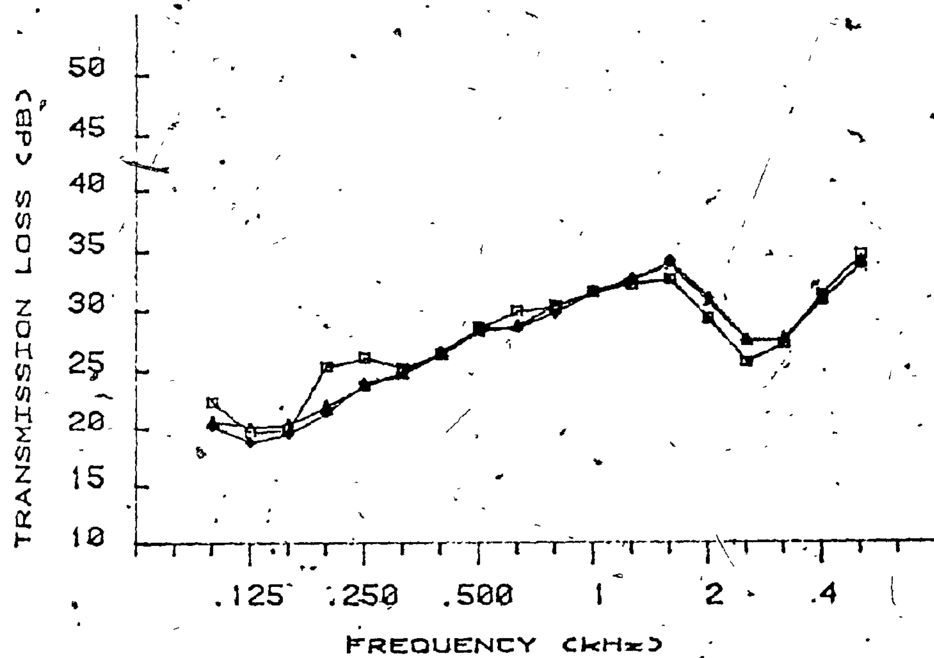
LEGEND

- □ non ≡ill condition
- △ 0.15m ≡ill condition
- ◇ 0.30m ≡ill condition

FIGURE A1.4: TL FOR 2.32m^2 GLASS PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	Δ	◊
100	21.3	19.5	19.1
125	18.5	19.0	17.5
160	18.7	19.2	18.3
200	24.3	20.9	20.3
250	25.0	22.7	22.8
315	24.1	23.7	23.8
400	25.3	25.3	25.5
500	27.4	27.2	27.4
630	28.8	27.6	27.5
800	29.2	29.3	28.7
1000	30.4	30.4	30.4
1250	31.1	31.5	31.4
1600	31.5	32.6	33.0
2000	28.2	29.5	29.9
2500	24.6	26.3	26.4
3150	26.1	26.5	26.4
4000	30.2	29.6	29.6
5000	33.5	32.9	32.8



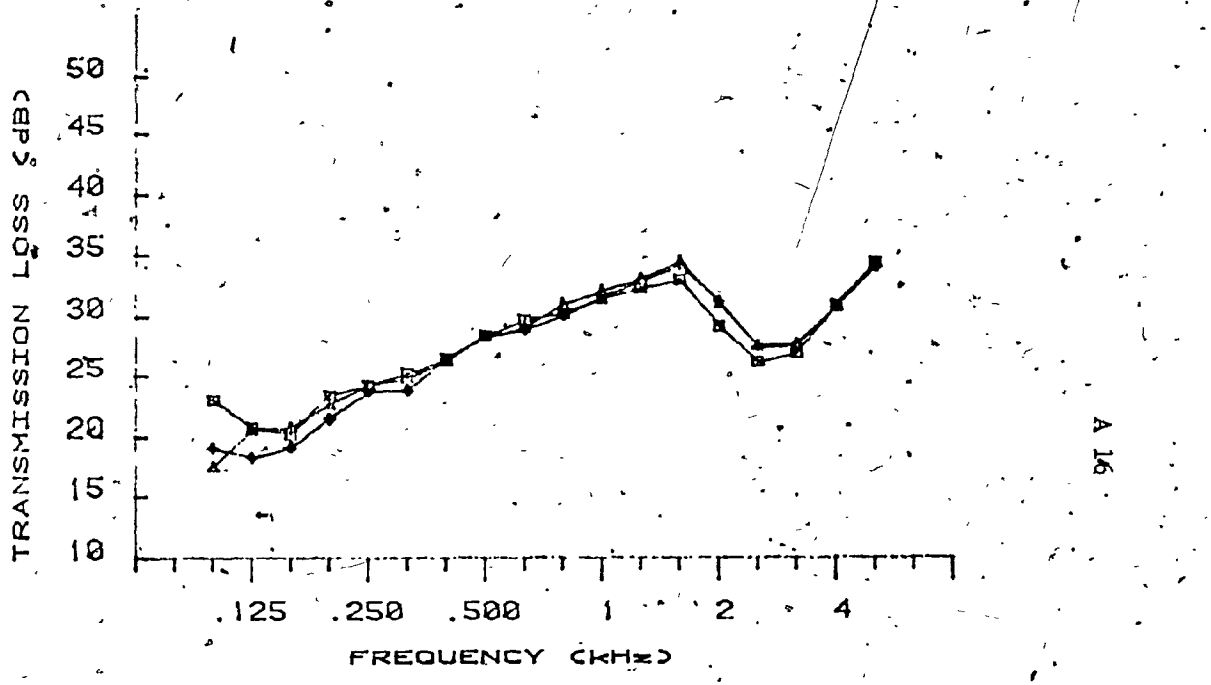
LEGEND

- □ non sill condition
- Δ 0.15m sill condition
- ◊ 0.30m sill condition

FIGURE A15: TL FOR 2.32m^2 GYPROCK PANELS,
WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	21.9	16.5	18.0
125	19.6	19.5	17.2
160	19.1	19.6	18.1
200	22.2	21.5	20.3
250	23.1	23.1	22.5
315	24.1	23.8	22.6
400	25.5	25.2	25.4
500	27.4	27.3	27.3
630	28.6	28.0	27.9
800	29.2	29.9	29.0
1000	30.4	31.0	30.5
1250	31.2	31.9	31.7
1600	31.9	33.3	33.0
2000	28.1	30.0	30.1
2500	25.1	26.5	26.3
3150	25.8	26.0	26.5
4000	29.8	29.7	29.7
5000	33.2	33.2	32.8



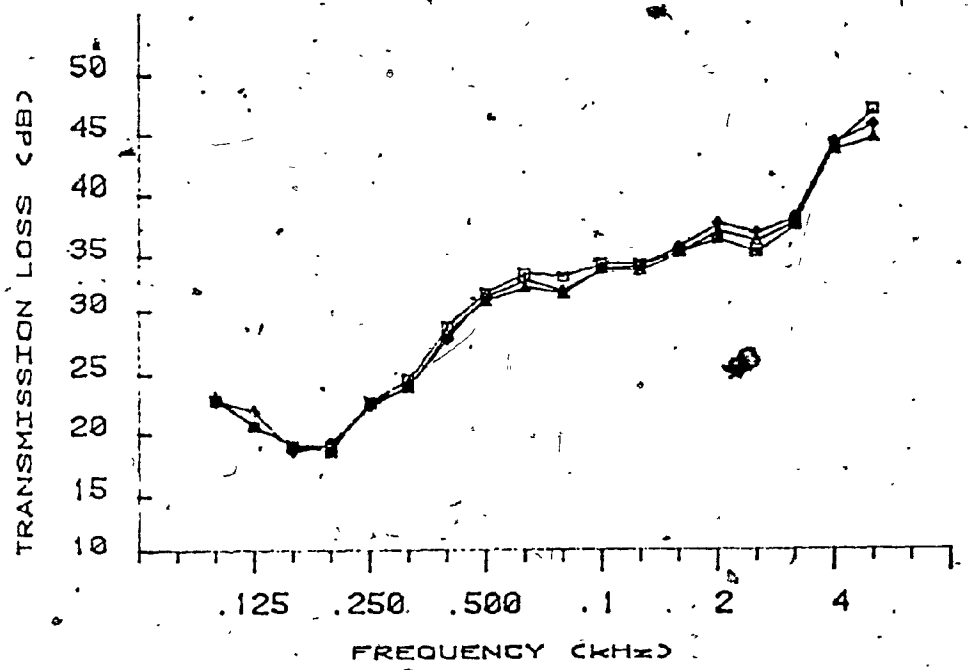
LEGEND

- □——□ non ∗ill condition
- △——△ 0.15m ∗ill condition
- ◇——◇ 0.30m² ∗ill condition

FIGURE A16: TL FOR 2.32m^2 GYPROCK PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	21.8	21.9	21.6
125	19.5	19.5	20.8
160	17.9	17.8	17.5
200	17.8	17.4	18.1
250	21.6	21.5	21.3
315	23.5	22.8	23.0
400	27.6	27.2	26.7
500	30.4	29.7	30.0
630	32.2	30.9	31.5
800	31.8	30.2	30.5
1000	33.1	32.5	32.6
1250	33.0	32.4	32.9
1600	34.1	34.1	34.6
2000	35.3	36.0	36.6
2500	34.1	35.1	35.8
3150	36.4	36.7	37.1
4000	42.8	42.4	43.1
5000	45.8	43.5	44.6



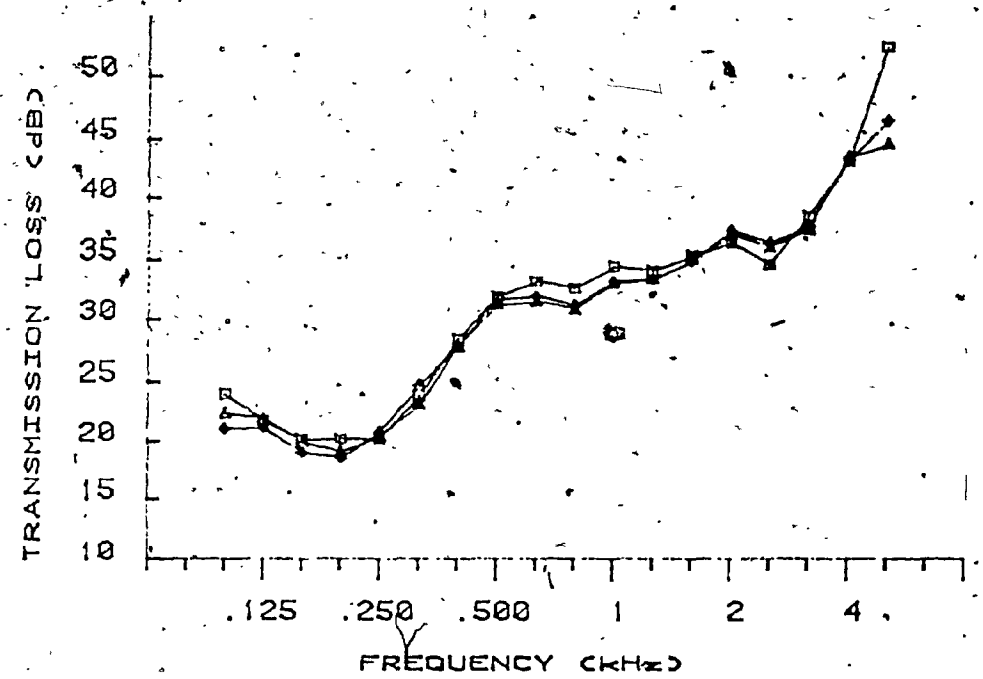
LEGEND

□——□ non ₰ill condition
△——△ 0.15m ₰ill condition
◇——◇ 0.30m ₰ill condition

FIGURE A17: TL FOR 2.32m^2 DOUBLE GYPROCK PANELS, WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	22.9	21.3	20.0
125	20.7	20.8	20.0
160	19.1	18.6	17.9
200	19.1	18.0	17.4
250	19.2	19.3	19.8
315	22.9	22.1	23.7
400	27.3	26.7	26.8
500	30.8	30.1	30.7
630	32.2	30.4	30.8
800	31.6	29.7	30.1
1000	33.4	32.0	32.1
1250	33.0	32.3	32.4
1600	34.3	33.9	33.8
2000	35.3	35.8	36.2
2500	33.6	34.9	35.3
3150	37.4	36.3	36.6
4000	42.0	42.4	42.1
5000	51.3	43.5	45.4



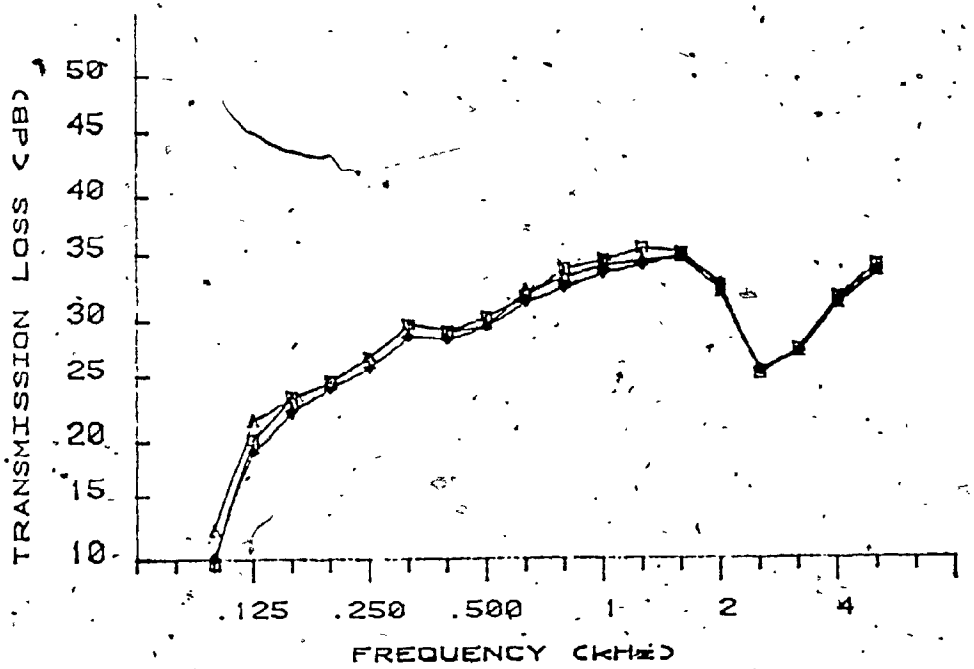
LEGEND

- non ill condition
- 0.15m ill condition
- 0.30m ill condition

FIGURE A18: TL FOR 2.32m^2 DOUBLE GYPROCK PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	8.7	11.2	9.1
125	19.1	20.5	18.0
160	22.2	22.1	21.2
200	23.5	23.4	22.9
250	25.7	25.6	24.6
315	28.6	28.6	27.6
400	28.1	28.0	27.3
500	29.2	28.5	28.4
630	30.8	31.2	30.5
800	32.7	32.1	31.5
1000	33.5	33.1	32.5
1250	34.3	33.4	33.1
1600	33.9	33.6	33.8
2000	31.5	31.1	31.6
2500	23.9	24.3	24.4
3150	26.4	25.9	26.0
4000	30.7	30.2	30.3
5000	33.0	32.5	32.6



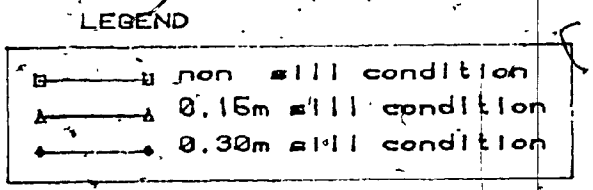
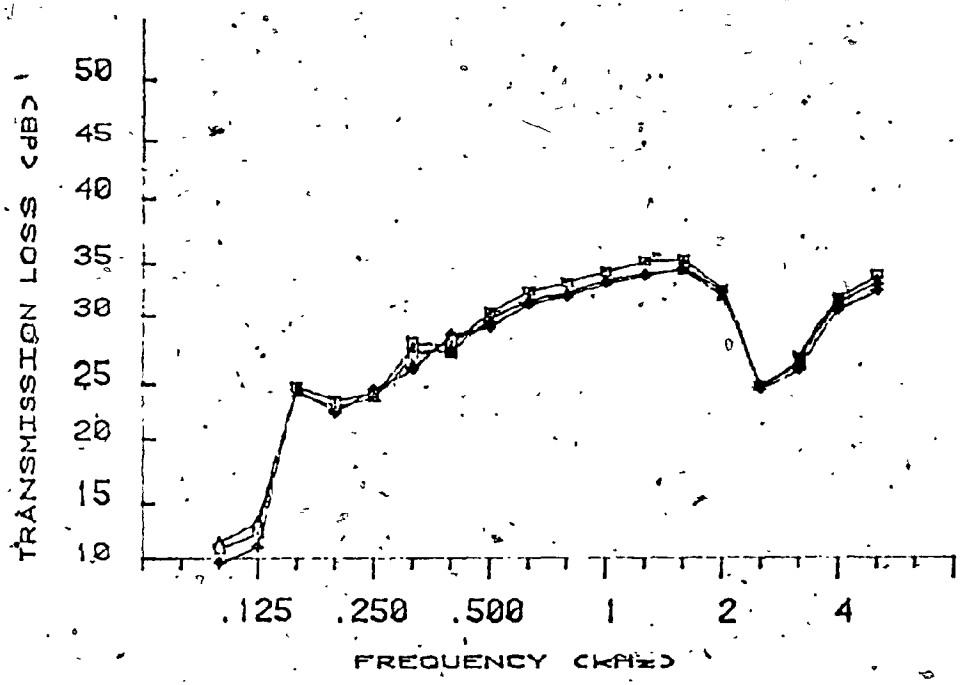


FIGURE A19: TL FOR 2.32m^2 GLASS PANELS, WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ (Hz)	□	Δ	◇
100	10.0	10.6	8.7
125	11.4	12.5	10.2
160	23.7	23.1	23.3
200	22.4	21.7	21.1
250	23.1	22.7	23.5
315	26.8	26.3	25.2
400	26.6	26.3	27.4
500	29.2	28.7	28.0
630	31.1	30.3	29.9
800	32.0	30.9	30.6
1000	33.0	32.2	31.9
1250	34.0	32.9	32.6
1600	34.2	33.1	33.4
2000	31.2	30.6	31.0
2500	23.6	23.7	23.4
3150	25.9	25.7	25.1
4000	30.4	30.0	29.4
5000	32.6	32.0	31.1



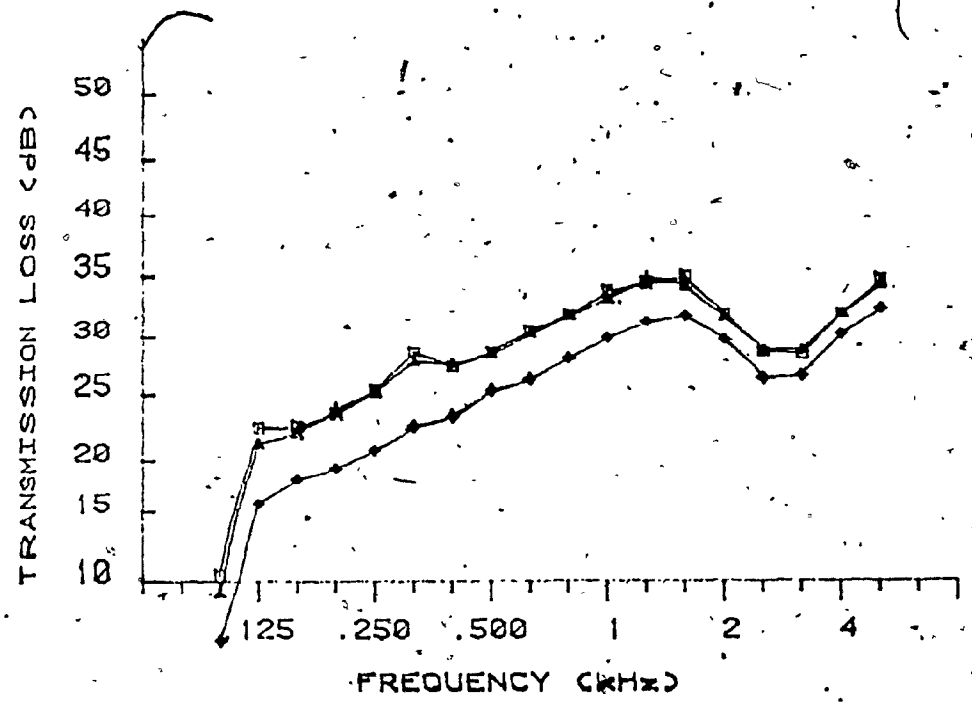
LEGEND

□——□ non wall condition
Δ——Δ 0.15m wall condition
◇——◇ 0.30m wall condition

FIGURE A20: TL FOR 2.32m^2 GLASS PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ (Hz)	□	Δ	◇
100	9.5	8.0	3.7
125	21.7	20.5	14.6
160	21.8	21.4	17.0
200	22.7	23.0	18.1
250	24.2	24.2	19.8
315	27.4	26.6	21.8
400	26.1	26.4	22.6
500	27.5	27.2	24.2
630	29.5	29.2	25.1
800	31.0	30.9	26.8
1000	32.9	32.4	28.7
1250	33.4	33.7	30.3
1600	33.9	33.3	30.8
2000	31.1	30.7	28.5
2500	27.4	27.5	25.1
3150	27.1	27.5	25.3
4000	31.1	31.1	28.0
5000	33.7	33.5	31.5



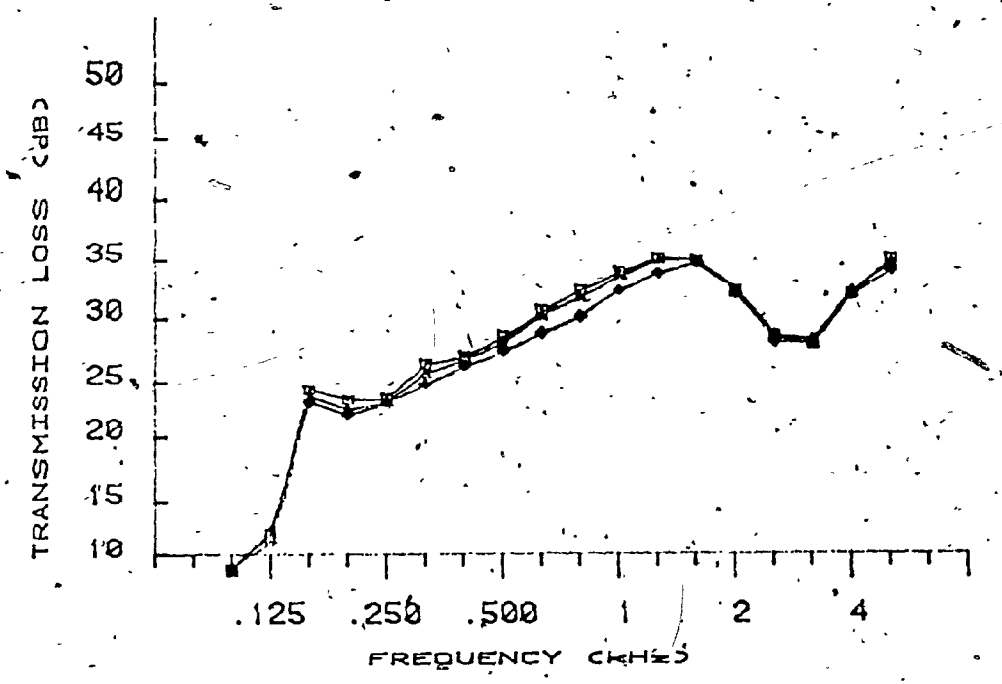
LEGEND:

- □——□ non sill condition
- Δ——Δ 0.15m sill condition
- ◇——◇ 0.30m sill condition

FIGURE A21: TL FOR 2.32m^2 GYPROCK PANELS, WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	7.8	7.8	7.9
125	11.0	11.1	10.1
160	23.2	22.6	22.0
200	22.2	21.3	20.8
250	22.4	22.1	22.0
315	25.5	24.7	23.7
400	26.1	25.9	25.3
500	27.6	27.2	26.6
630	29.5	29.2	27.9
800	31.1	30.5	29.0
1000	32.7	32.4	31.1
1250	34.0	33.8	32.6
1600	33.7	33.7	33.5
2000	31.2	30.9	30.8
2500	27.7	27.6	27.2
3150	27.1	27.4	27.0
4000	30.8	31.0	30.7
5000	33.9	33.5	32.9



LEGEND

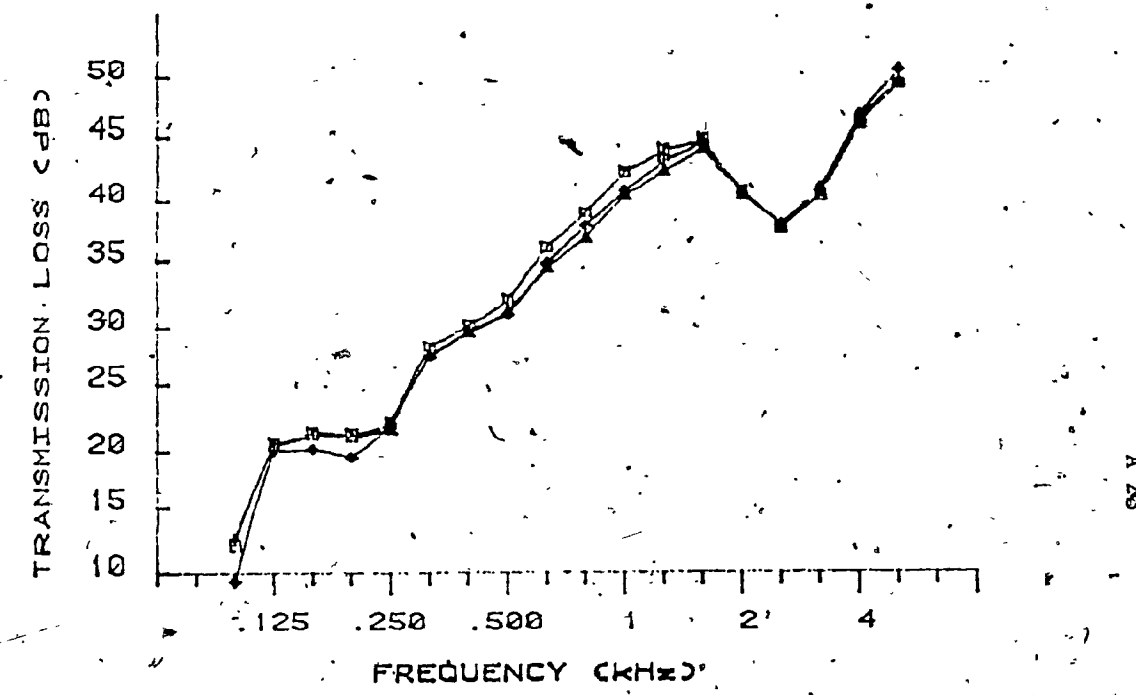
- □ non sill condition
- △ 0.15m sill condition
- ◇ 0.30m sill condition

A 22

FIGURE A22: TL FOR 2.32m^2 GYPROCK PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	11.1	11.4	8.3
125	19.7	19.5	19.0
160	20.5	20.3	19.1
200	20.4	20.2	18.4
250	21.2	20.8	21.1
315	27.2	26.5	26.3
400	29.2	28.5	28.7
500	31.2	30.3	30.0
630	34.9	33.4	33.7
800	37.8	35.6	36.6
1000	41.3	39.4	39.7
1250	42.9	41.4	42.2
1600	43.6	43.1	43.5
2000	39.8	39.5	39.6
2500	36.5	36.7	36.8
3150	39.3	39.6	40.0
4000	44.8	45.2	45.4
5000	48.1	48.3	49.4



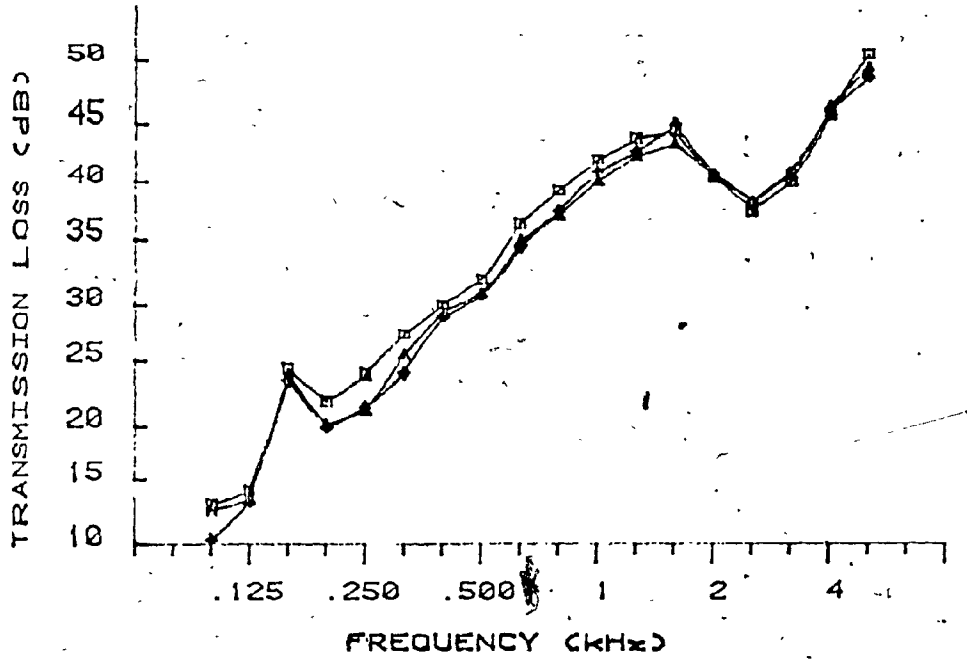
LEGEND

- □ non wall condition
- △ 0.15m wall condition
- ◇ 0.30m wall condition

FIGURE A23: TL FOR 2.32m^2 DOUBLE GYPROCK PANELS, WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	12.0	11.6	9.4
125	13.0	12.4	12.2
160	23.3	22.9	22.5
200	21.1	19.1	18.8
250	23.0	20.3	20.6
315	26.2	24.5	23.1
400	28.9	28.3	27.8
500	31.2	29.9	29.8
630	35.1	34.0	33.6
800	37.9	35.7	36.1
1000	40.9	38.8	39.8
1250	42.8	41.2	41.7
1600	43.4	42.4	43.9
2000	39.2	39.3	39.6
2500	36.1	36.8	36.9
3150	38.7	39.4	39.7
4000	44.6	45.1	45.0
5000	49.2	48.1	47.3



LEGEND

non ⌀111 condition

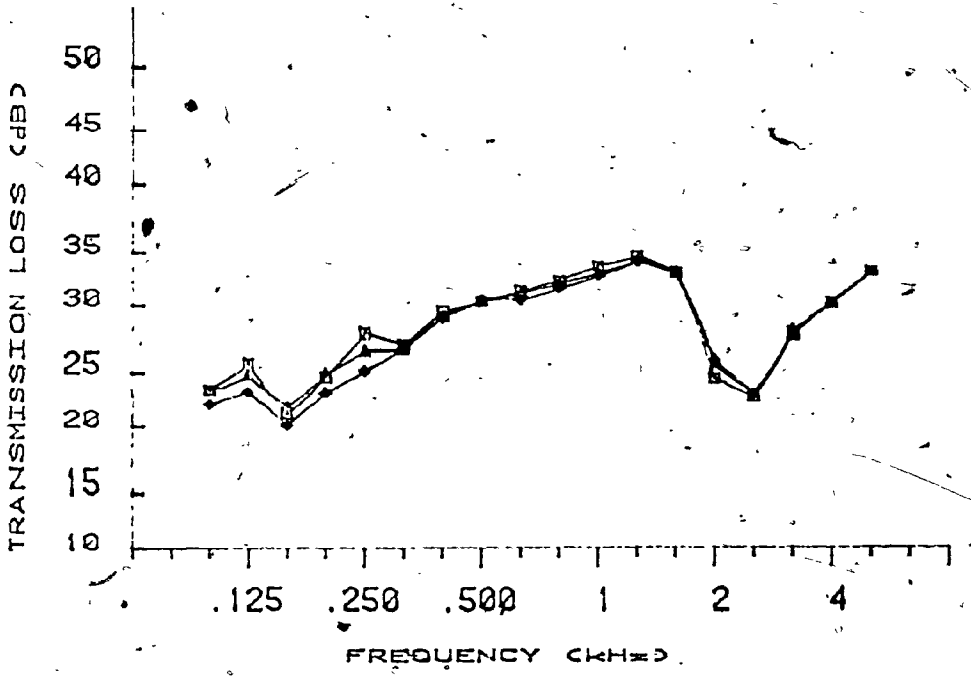
0.15m ⌀111 condition

0.30m ⌀111 condition

FIGURE A24: TL FOR 2.32m^2 DOUBLE GYPROCK PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	Δ	◇
100	22.5	22.4	21.1
125	24.7	23.7	22.3
160	20.1	20.8	19.0
200	23.6	23.8	22.3
250	26.8	25.5	24.0
315	26.0	25.8	25.8
400	28.4	28.0	27.9
500	29.2	29.2	29.4
630	30.3	30.0	29.4
800	31.2	31.0	30.4
1000	32.6	31.9	31.7
1250	33.5	33.1	33.0
1600	32.1	31.8	32.0
2000	23.4	24.5	24.8
2500	21.6	22.0	22.1
3150	26.6	26.8	26.6
4000	29.1	29.0	29.0
5000	32.1	32.0	32.0



LEGEND

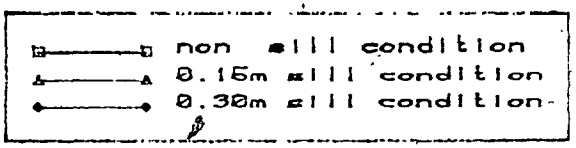
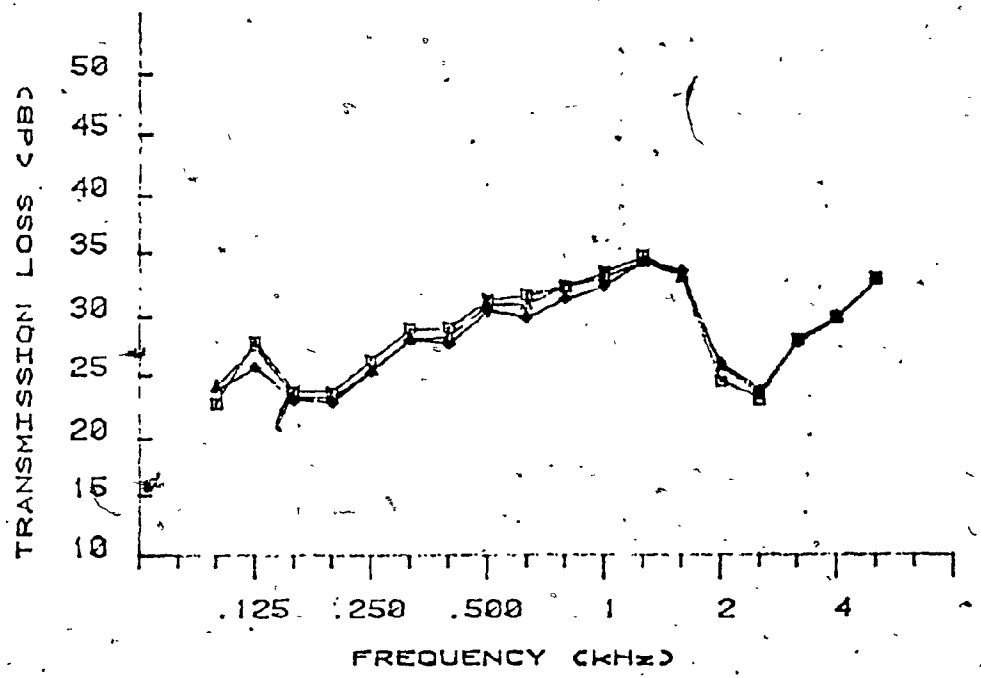


FIGURE A25: TL FOR 3.93m^2 GLASS PANELS, WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	21.6	23.0	22.7
125	26.9	26.4	24.6
160	22.6	22.1	22.0
200	22.5	22.1	21.7
250	25.2	24.3	24.2
315	27.9	27.1	27.0
400	28.0	27.3	26.6
500	30.3	29.9	29.4
630	30.6	29.9	28.9
800	31.3	31.3	30.4
1000	32.4	32.0	31.3
1250	33.0	33.2	33.3
1600	32.2	31.9	32.5
2000	23.4	24.6	25.0
2500	21.9	22.3	22.6
3150	27.0	27.0	26.7
4000	28.6	28.6	28.7
5000	31.9	31.7	31.8



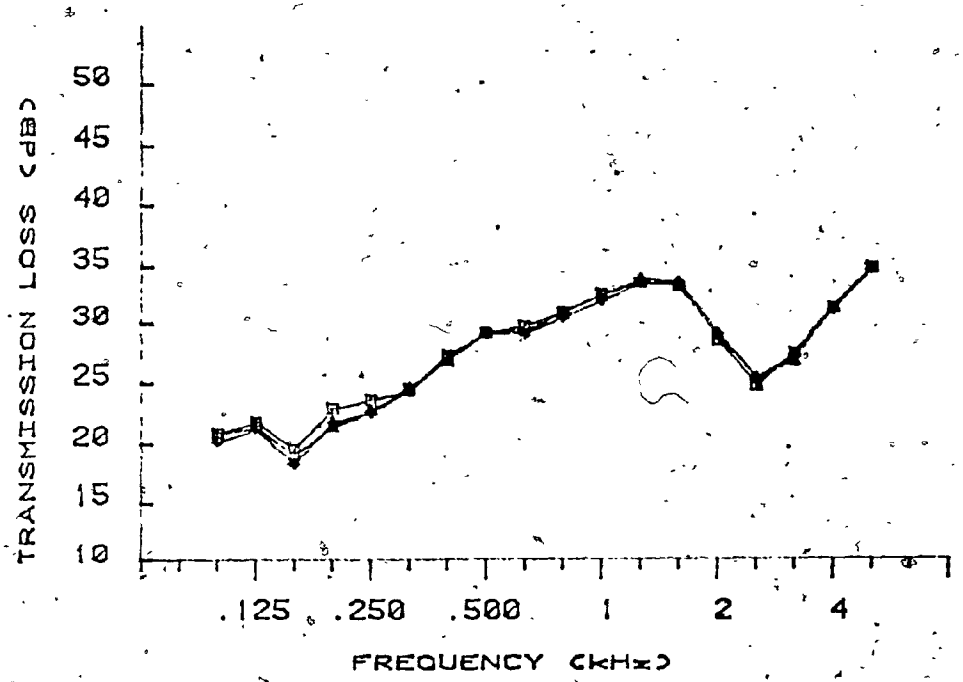
LEGEND

- non ≈ill condition
- 0.15m ≈ill condition
- 0.30m ≈ill condition

FIGURE A26: TL FOR 3.93m^2 GLASS PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM A.

TRANSMISSION LOSS (dB)

FREQ (Hz)	□	△	◇
100	19.9	19.8	19.1
125	20.9	20.4	20.2
160	18.5	17.9	17.2
200	21.9	20.4	20.8
250	22.7	21.8	21.7
315	23.5	23.6	23.4
400	26.2	25.8	26.0
500	28.1	28.1	28.0
630	28.6	28.2	28.0
800	29.8	29.9	29.4
1000	31.5	31.4	30.9
1250	32.5	32.8	32.5
1600	32.2	32.4	32.5
2000	27.4	27.9	28.0
2500	23.6	24.4	24.4
3150	26.4	25.7	26.1
4000	30.2	30.2	30.0
5000	33.9	33.8	33.7



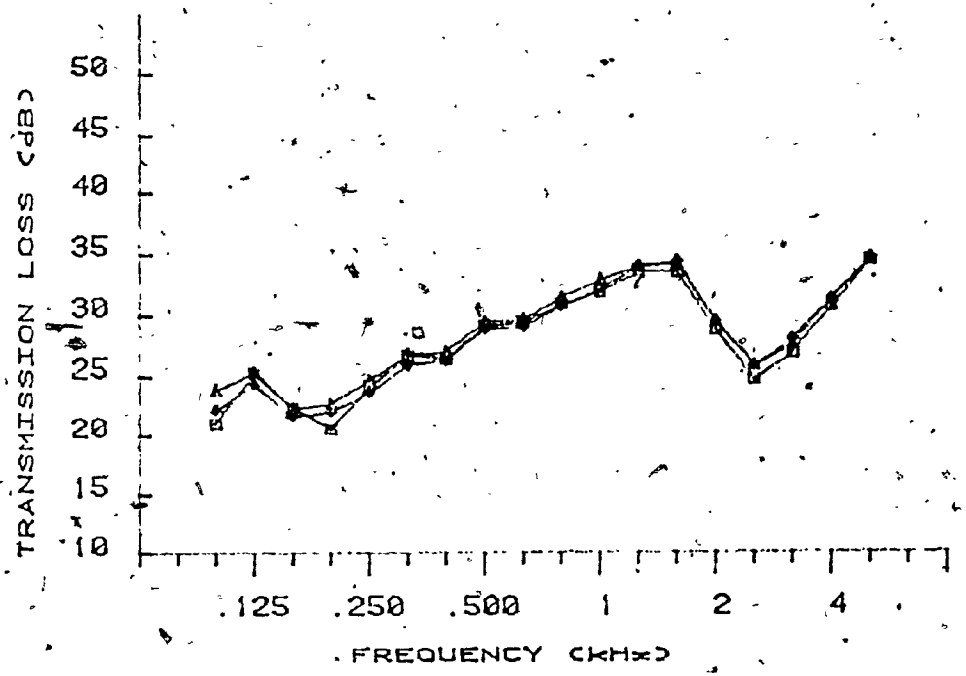
LEGEND

□——□ non still condition
△——△ 0.15m still condition
◇——◇ 0.30m still condition

FIGURE A27: TL FOR 3.93m^2 GYPROCK PANELS, WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ (Hz)	□	△	◇
100	19.9	22.8	21.8
125	24.2	24.3	23.3
160	21.3	21.3	20.6
200	19.4	21.7	20.9
250	23.2	23.7	22.6
315	25.6	25.7	25.8
400	25.4	25.9	25.3
500	28.0	28.4	27.8
630	28.3	28.6	27.9
800	29.8	30.3	29.6
1000	30.8	31.8	31.0
1250	32.5	32.9	32.9
1600	32.4	33.1	33.3
2000	27.6	28.3	28.3
2500	23.6	24.7	24.8
3150	25.6	26.5	26.6
4000	29.5	30.2	30.2
5000	33.3	33.6	33.6



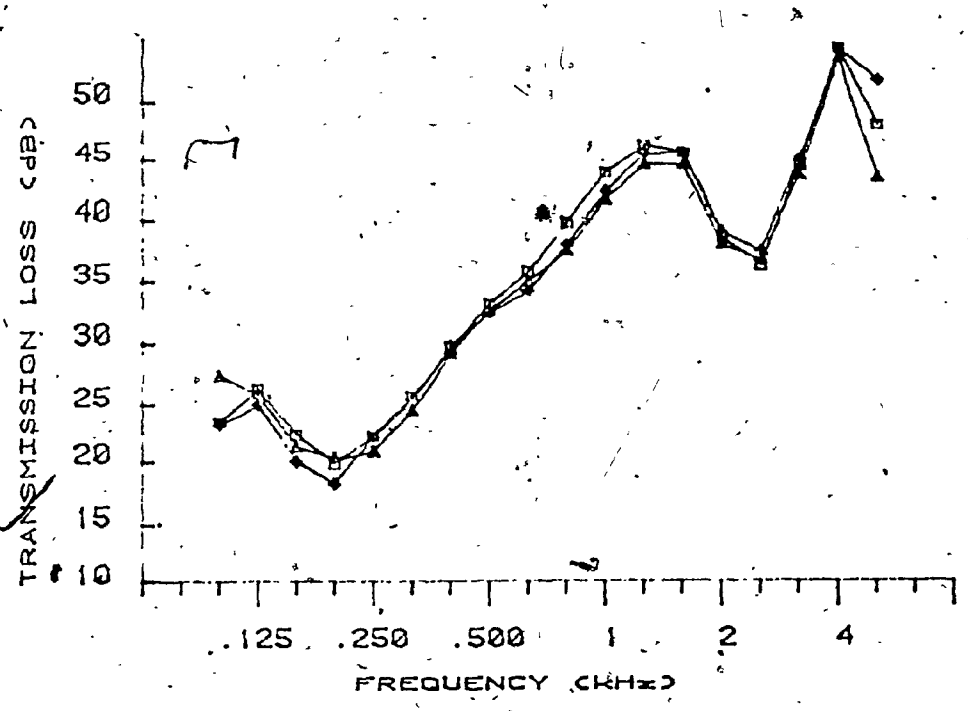
LEGEND

□——□ non still condition
△——△ 0.15m still condition
◇——◇ 0.30m still condition

FIGURE A28: TL FOR 3.93m^2 GYPROCK PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ (Hz)	□	△	◇
100	22.3	26.4	22.0
125	25.3	24.9	23.9
160	21.1	20.1	18.9
200	18.8	19.2	17.2
250	21.0	19.7	20.9
315	24.7	23.3	24.3
400	28.5	28.2	28.7
500	31.9	31.4	31.2
630	34.7	33.9	33.1
800	38.7	36.5	36.9
1000	42.6	40.4	41.0
1250	45.1	43.3	44.3
1600	44.4	43.3	44.4
2000	37.5	37.0	38.0
2500	35.2	35.7	36.4
3150	43.2	42.4	43.7
4000	52.9	52.3	52.8
5000	46.8	42.2	50.4



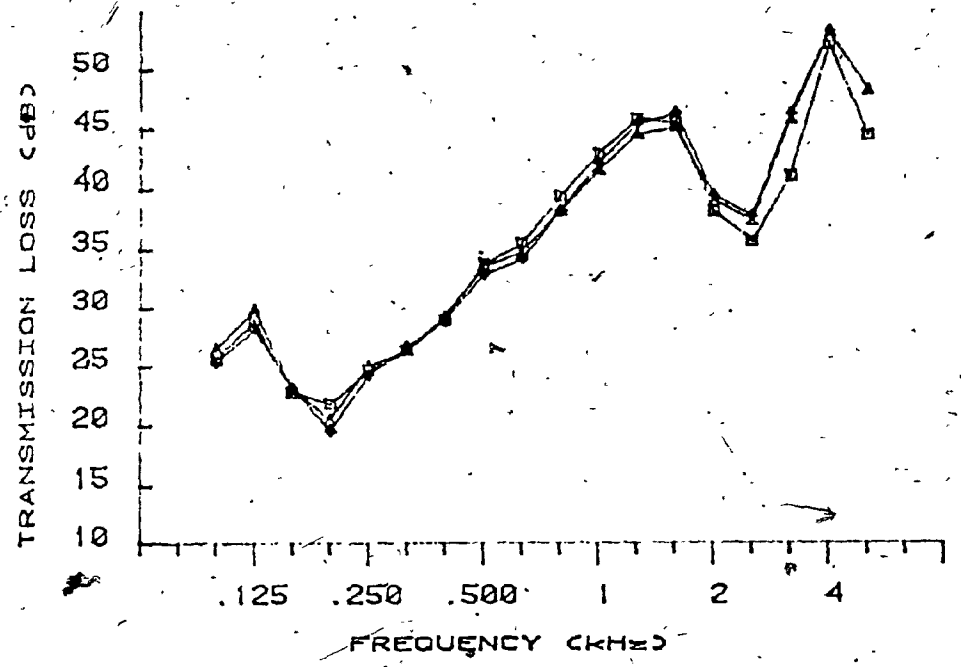
LEGEND

- non ∗ill condition
- 0.15m ∗ill condition
- 0.30m ∗ill condition

FIGURE A29: TL FOR 3.93m^2 DOUBLE GYPROCK PANELS, WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	Δ	◇
100	24.5	25.4	24.3
125	27.8	28.8	27.1
160	21.7	22.0	22.1
200	20.7	19.4	18.4
250	23.6	24.0	23.2
315	25.3	25.4	25.6
400	27.9	28.2	27.8
500	32.7	32.5	31.8
630	34.5	33.8	33.2
800	38.3	37.2	37.1
1000	41.8	40.4	41.0
1250	44.7	43.4	44.4
1600	44.4	44.0	45.2
2000	37.1	38.0	38.4
2500	34.6	36.3	36.7
3150	40.0	44.7	45.1
4000	50.9	52.0	52.1
5000	43.3	47.1	54.8



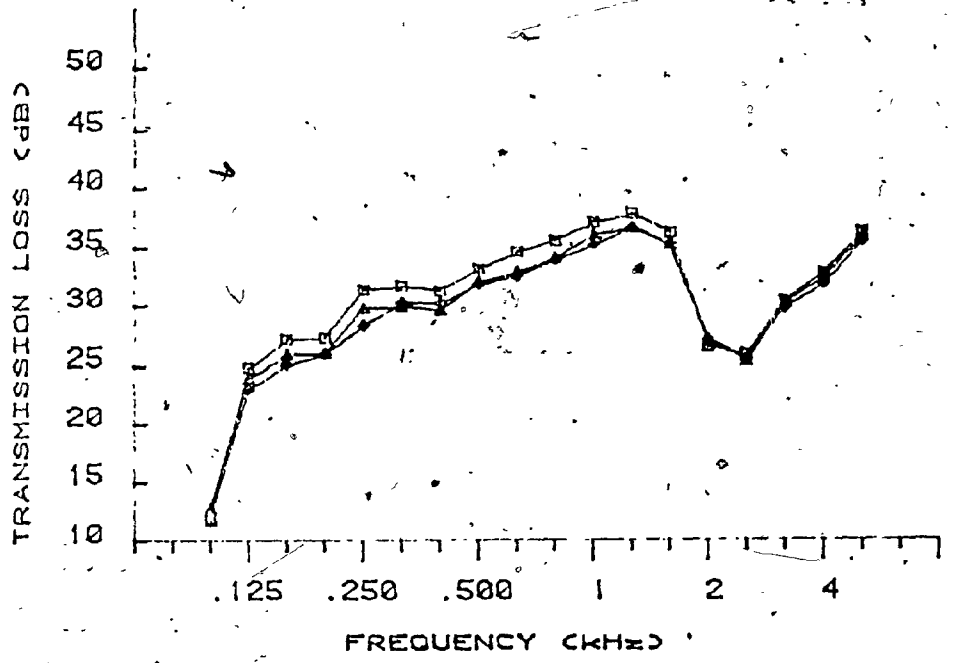
LEGEND

- non-still condition
- 0.15m still condition
- 0.30m still condition

FIGURE A30: TL FOR 3.93m^2 DOUBLE GYPROCK PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	10.8	11.7	10.8
125	23.8	22.9	22.8
160	26.1	24.9	24.1
200	26.2	24.9	24.8
250	30.3	28.7	27.3
315	30.6	28.8	29.2
400	30.2	28.5	29.1
500	32.1	31.0	30.7
630	33.5	31.8	31.5
800	34.5	33.0	32.9
1000	36.0	35.0	34.2
1250	30.7	35.5	35.0
1600	35.2	34.1	34.2
2000	25.5	26.0	26.0
2500	24.8	24.3	24.4
3150	29.3	29.1	28.6
4000	31.7	31.3	30.7
5000	35.2	34.9	34.4



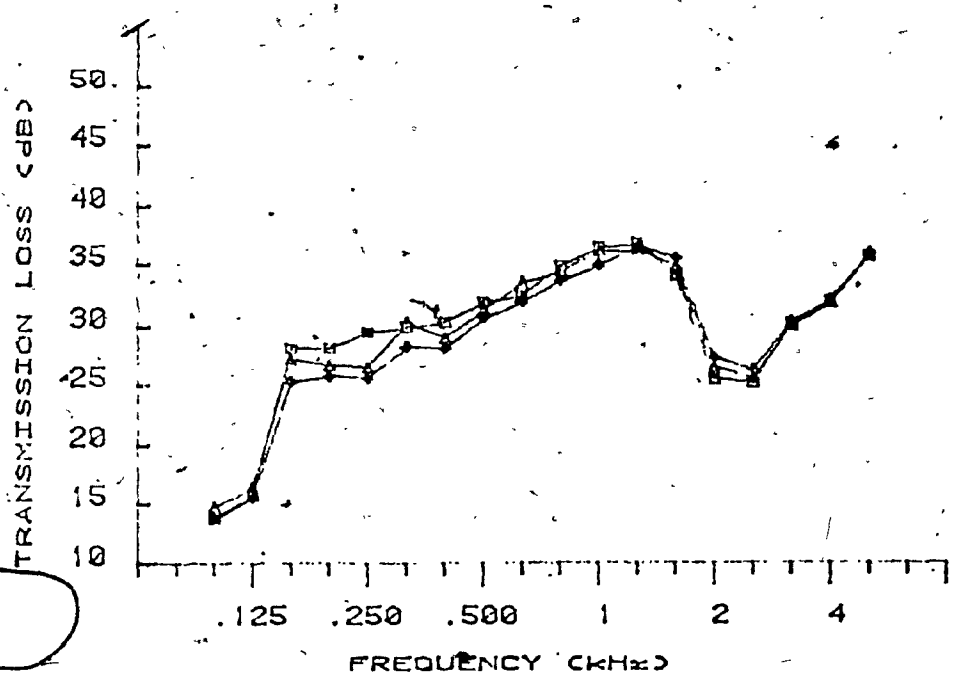
LEGEND

- non ≈ill condition
- 0.15m ≈ill condition
- 0.30m ≈ill condition

FIGURE A31: TL FOR 3.93m^2 GLASS PANELS, WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	12.7	13.6	12.6
125	14.6	15.3	14.4
160	27.1	26.1	24.2
200	27.1	25.5	24.7
250	28.4	25.4	24.5
315	28.8	29.2	27.2
400	29.3	27.9	27.0
500	30.8	30.3	29.6
630	31.4	32.4	30.9
800	33.7	33.3	32.6
1000	35.2	34.9	33.8
1250	35.5	34.9	35.3
1600	33.0	33.7	34.3
2000	24.3	25.3	26.1
2500	24.8	24.4	25.1
3150	29.1	28.8	29.3
4000	30.8	30.7	31.0
6000	34.4	34.6	34.7



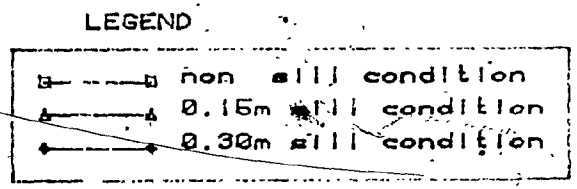
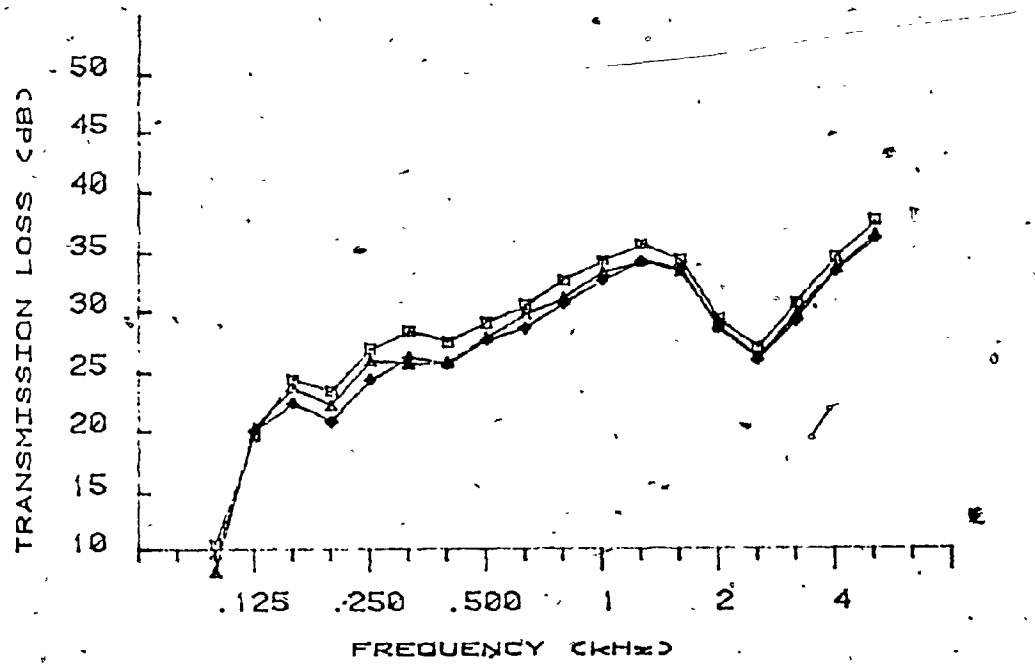


FIGURE A32: TL FOR 3.93m^2 GLASS PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	Δ	◇
100	9.5	7.1	8.4
125	16.6	19.2	19.0
160	23.3	22.6	21.3
200	22.3	21.1	19.7
250	26.0	24.9	23.3
315	27.4	24.7	25.3
400	26.5	24.8	24.7
500	28.0	26.8	26.7
630	29.4	28.7	27.6
800	31.5	30.0	29.5
1000	33.1	32.2	31.4
1250	34.6	33.0	33.1
1600	33.2	32.2	32.4
2000	28.2	27.6	27.6
2500	26.0	25.2	24.9
3150	29.5	28.6	28.1
4000	33.4	32.3	32.1
5000	36.6	35.4	35.1



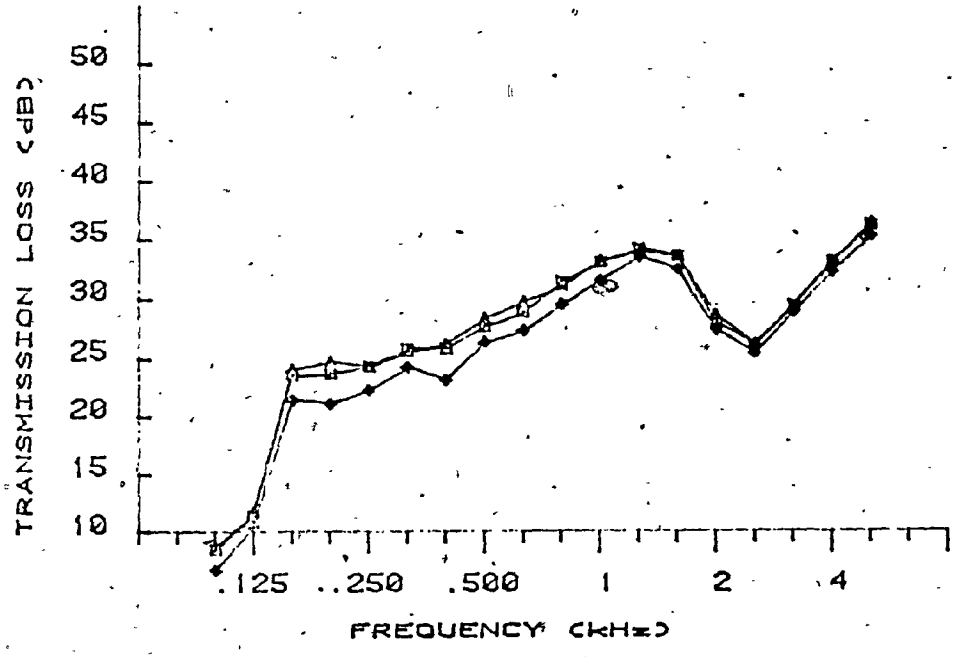
LEGEND

□——□ non still condition
Δ——Δ 0.15m still condition
◇——◇ 0.30m still condition

FIGURE A33: TL FOR 3.93m^2 GYPROCK PANELS, WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	7.5	7.7	5.7
125	10.4	10.7	9.4
160	22.5	23.0	20.3
200	22.6	23.0	20.0
250	23.3	23.2	21.2
315	24.8	24.5	23.2
400	24.8	25.2	22.1
500	20.0	27.3	25.3
630	27.8	28.7	26.3
800	30.2	29.9	28.4
1000	31.9	32.1	30.4
1250	33.0	32.9	32.4
1600	32.5	32.4	31.3
2000	26.9	27.5	26.3
2500	25.1	25.1	24.3
3150	28.4	28.3	27.8
4000	32.0	31.9	31.1
5000	35.1	35.2	34.2



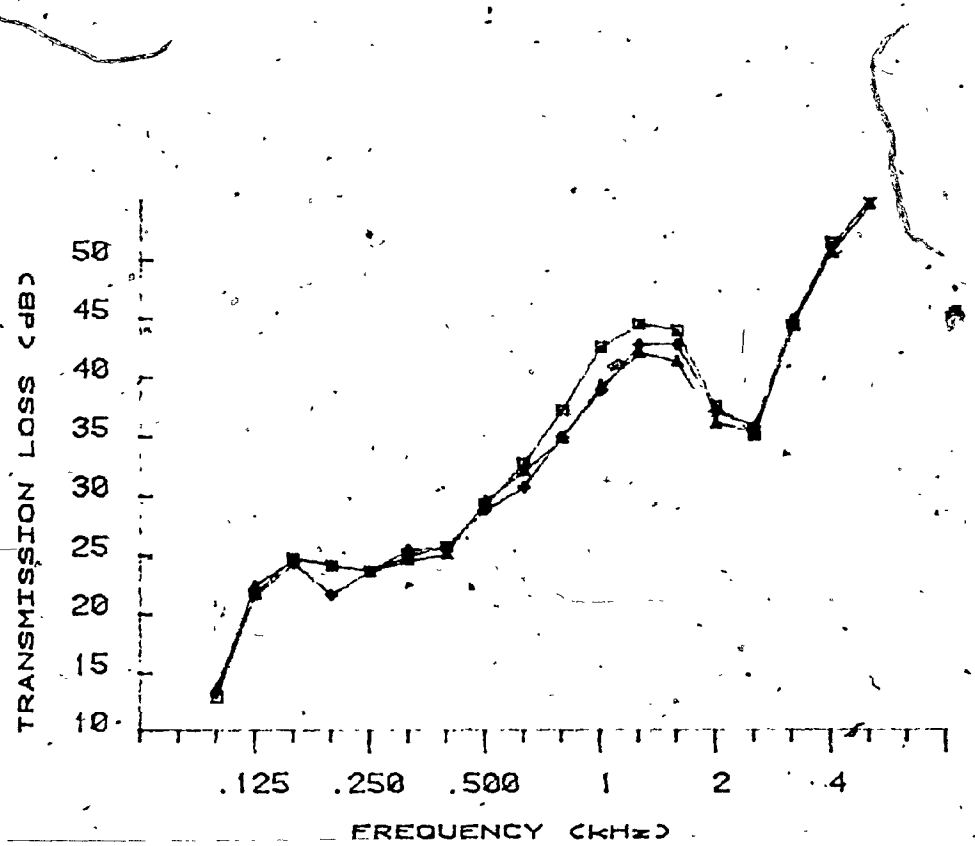
LEGEND

- non ≈ill condition
- 0.15m ≈ill condition
- 0.30m ≈ill condition

FIGURE A34: TL FOR 3.93m^2 GYPROCK PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	11.8	12.6	12.4
125	20.6	21.3	20.5
160	23.7	23.6	23.2
200	23.1	23.8	20.5
250	22.6	22.5	22.6
315	24.0	23.6	24.4
400	24.7	24.1	24.7
500	28.2	28.5	27.8
630	31.6	31.0	29.6
800	36.0	33.7	33.8
1000	41.4	38.2	37.7
1250	43.4	40.9	41.6
1600	42.8	40.1	41.6
2000	36.4	35.0	35.9
2500	34.0	34.1	34.6
3150	43.2	43.3	43.6
4000	50.3	49.4	49.9
5000	55.9	53.4	53.9



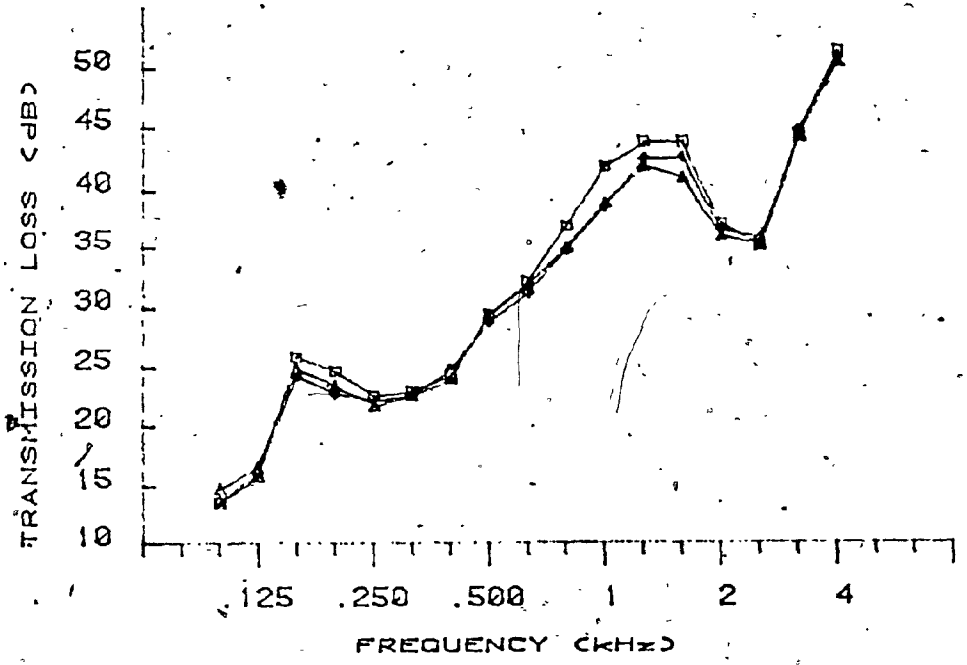
LEGEND

- □ non still condition
- △ 0.15m still condition
- ◇ 0.30m still condition

FIGURE A35: TL FOR 3.93m^2 DOUBLE GYPROCK PANELS, WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	Δ	◇
100	12.5	13.7	12.6
125	14.7	15.6	15.1
160	24.8	23.7	23.1
200	23.5	22.3	21.6
250	21.4	20.5	21.0
315	21.8	21.4	21.5
400	23.1	22.8	23.7
500	28.3	28.4	27.8
630	31.8	30.7	30.1
800	35.7	33.8	33.6
1000	40.8	37.8	37.4
1250	42.7	40.8	41.4
1600	42.7	39.9	41.6
2000	35.9	34.8	35.4
2500	33.9	34.0	34.6
3150	43.2	43.1	43.5
4000	50.2	49.2	49.6
5000	54.5	54.5	54.5



LEGEND

□——□ non ≈ill condition
Δ——Δ 0.15m ≈ill condition
◇——◇ 0.30m ≈ill condition

FIGURE A36: TL FOR 3.93m^2 DOUBLE GYPROCK PANELS, WITHOUT DIFFUSERS, MOUNTED IN ROOM B

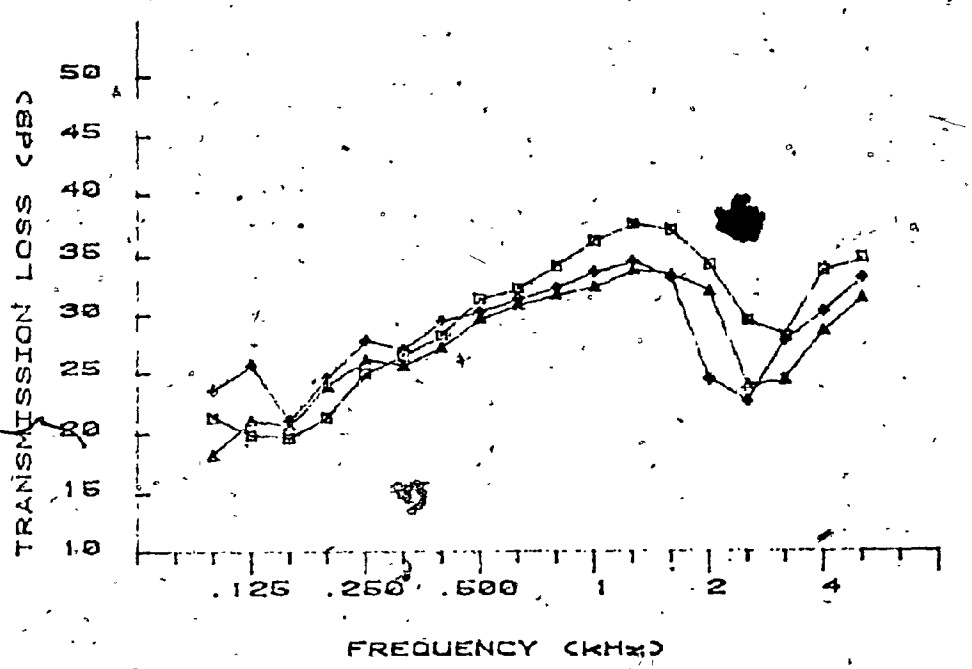
APPENDIX B

Graphs of Test Results as a Function of Panel Size

List of Figures

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	Δ	◇
100	20.3	17.1	22.5
125	16.8	20.0	24.7
160	16.5	19.6	20.1
200	20.3	22.9	23.6
250	24.8	25.1	26.8
315	25.5	24.6	26.0
400	27.2	26.1	28.4
500	30.3	28.6	29.2
630	31.2	29.7	30.3
800	33.1	30.7	31.2
1000	35.2	31.4	32.6
1250	36.5	32.7	33.5
1600	36.8	32.4	32.1
2000	33.3	31.0	23.4
2500	28.4	23.0	21.6
3150	27.1	23.3	26.6
4000	32.7	27.5	29.1
5000	33.6	30.3	32.1



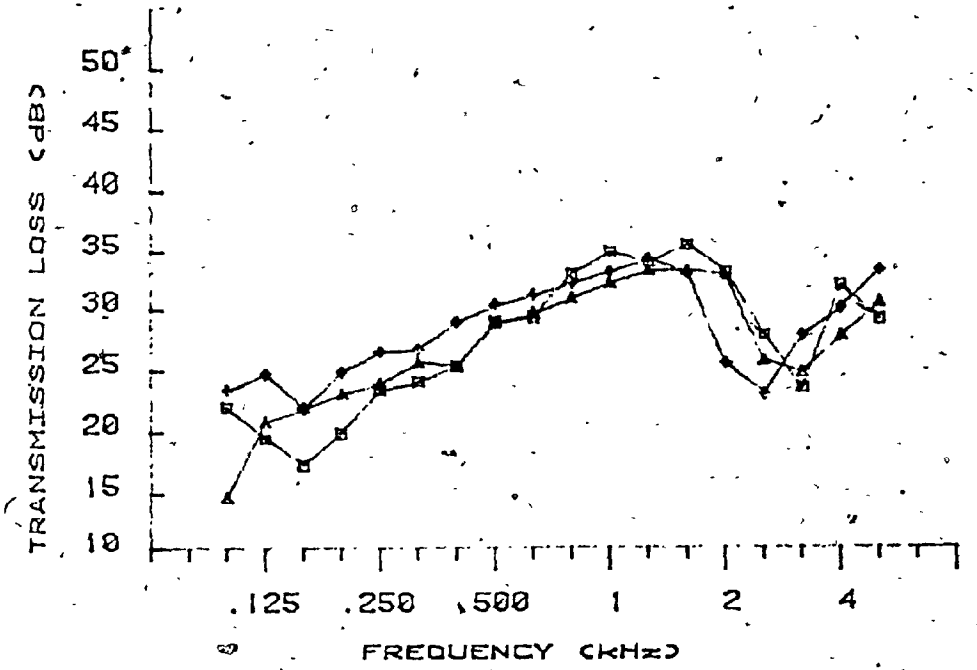
LEGEND

□——□ 0.54m^2 panel
Δ——Δ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B1: TL FOR GLASS PANELS WITHOUT SILL AND WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	21.0	13.6	22.4
125	18.4	19.7	23.7
160	10.3	20.9	20.8
200	18.9	22.1	23.8
250	22.4	22.9	25.5
315	23.1	24.6	25.8
400	24.3	24.3	28.0
500	28.0	27.8	29.2
630	28.3	28.6	30.0
800	31.8	29.7	31.0
1000	33.7	31.0	31.9
1250	32.8	32.8	33.1
1600	34.3	32.8	31.8
2000	32.0	31.6	24.5
2500	26.9	24.7	22.0
3150	22.5	23.7	26.8
4000	30.8	26.8	29.0
5000	28.1	29.5	32.0



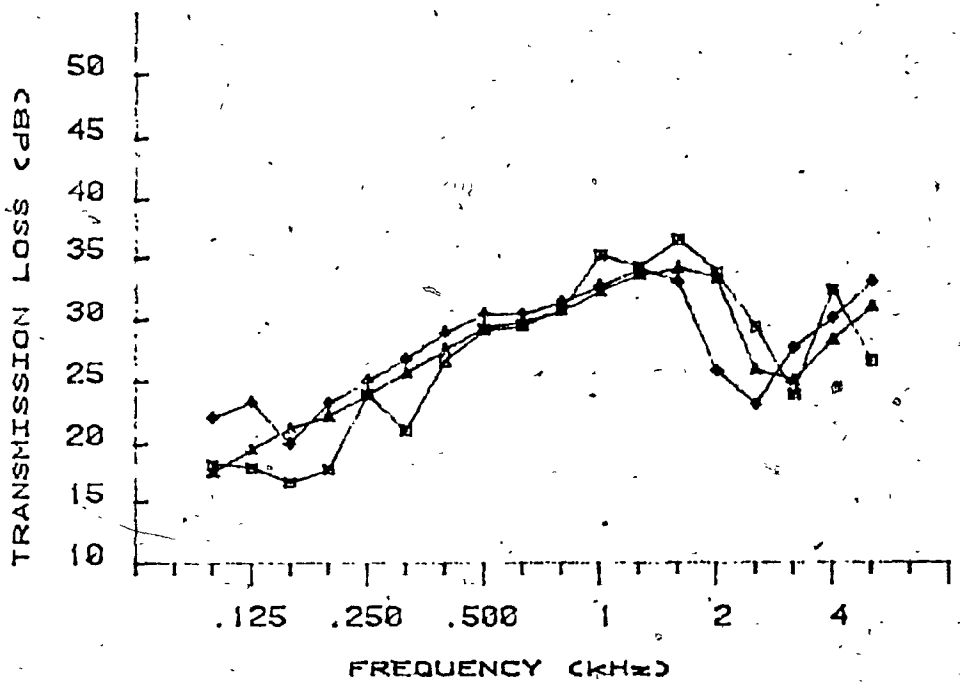
LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B2: TL FOR GLASS PANELS WITH A 0.15m SILL AND WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	17.2	16.5	21.1
125	16.9	18.5	22.3
160	15.6	20.2	18.0
200	16.8	21.2	22.3
250	23.8	23.0	24.0
315	20.1	24.7	25.8
400	25.6	26.5	27.9
500	28.1	28.3	29.4
630	28.4	28.8	29.4
800	29.8	29.6	30.4
1000	34.1	31.3	31.7
1250	33.1	32.7	33.0
1600	35.3	33.1	32.0
2000	32.8	32.3	24.8
2500	28.3	24.8	22.1
3150	22.9	24.0	26.6
4000	31.3	27.3	29.0
5000	25.6	28.9	32.0



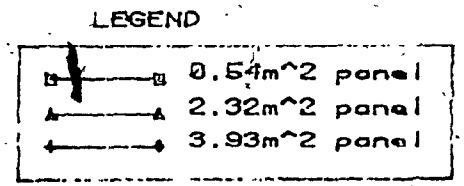
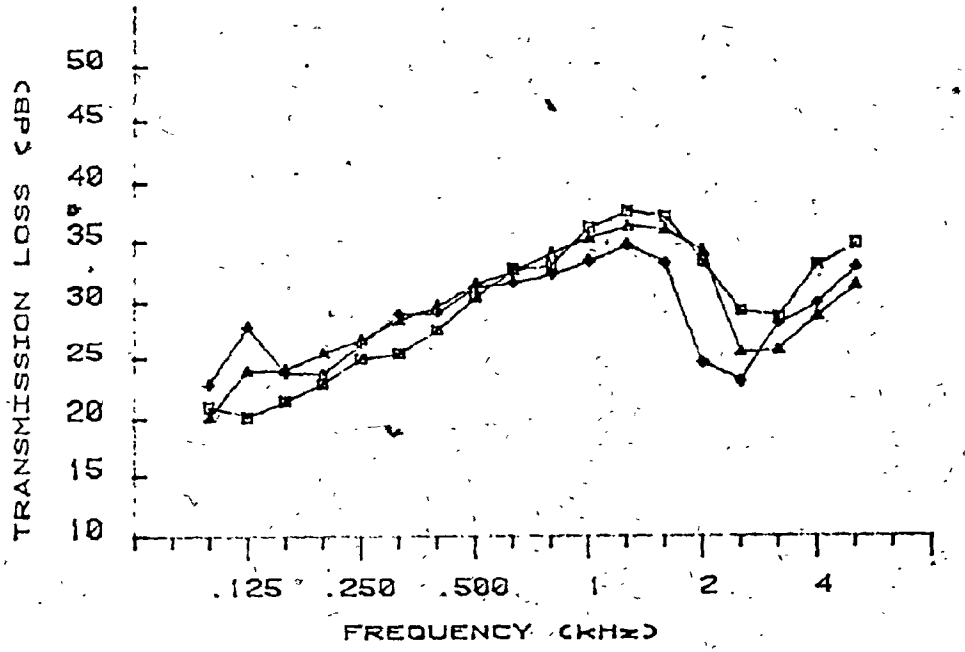


FIGURE B3: TL FOR GLASS PANELS WITH A 0.30m SILL AND WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	19.9	19.1	21.6
125	19.1	22.8	26.9
160	20.4	22.9	22.6
200	21.8	24.4	22.5
250	23.9	25.7	25.2
315	24.3	27.4	27.9
400	26.5	28.6	28.8
500	29.4	30.5	30.3
630	31.7	31.6	30.6
800	32.8	33.8	31.3
1000	35.1	34.2	32.4
1250	36.4	35.2	33.6
1600	35.9	34.9	32.2
2000	32.3	33.2	23.4
2500	28.1	24.4	21.9
3150	27.8	24.5	27.0
4000	32.1	27.6	28.8
5000	33.8	30.4	31.8



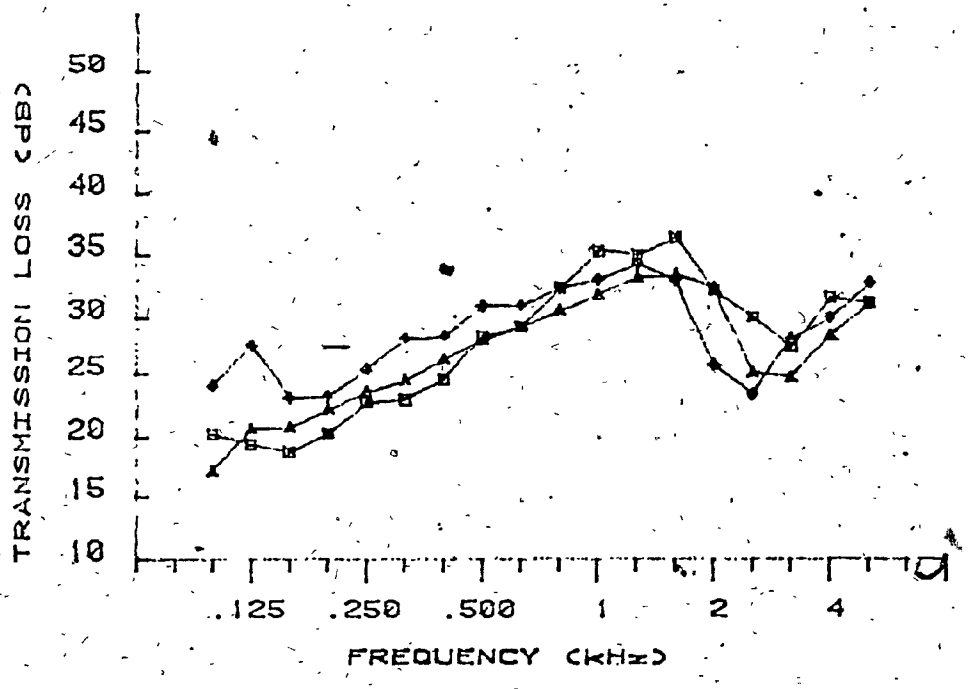
LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B4: TL FOR GLASS PANELS WITHOUT SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	19.2	16.1	23.0
125	18.3	18.6	26.4
160	17.7	19.8	22.1
200	19.3	21.2	22.1
250	21.8	22.6	24.3
315	22.0	23.4	27.1
400	23.8	25.2	27.3
500	27.3	26.9	29.9
630	28.1	28.1	29.9
800	31.3	29.5	31.3
1000	34.2	30.8	32.0
1250	33.9	32.1	33.2
1600	35.2	32.4	31.9
2000	31.2	31.3	24.6
2500	28.9	24.0	22.3
3150	26.2	23.6	27.0
4000	30.6	27.3	28.8
6000	30.1	30.1	31.7



LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B5: TL FOR GLASS PANELS WITH A 0.15m SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	17.6	13.6	22.7
125	16.9	19.3	24.6
160	15.5	19.6	22.0
200	16.7	21.6	21.7
250	23.2	23.5	24.2
315	20.9	23.8	27.0
400	25.5	26.3	26.6
500	28.4	27.6	29.4
630	29.5	28.9	28.9
800	30.2	29.3	30.4
1000	34.4	30.4	31.3
1250	34.5	31.6	33.3
1600	35.5	31.4	32.5
2000	33.0	30.2	25.0
2500	29.4	24.3	22.6
3150	27.8	23.9	26.7
4000	32.1	26.6	28.7
5000	30.9	28.6	31.6

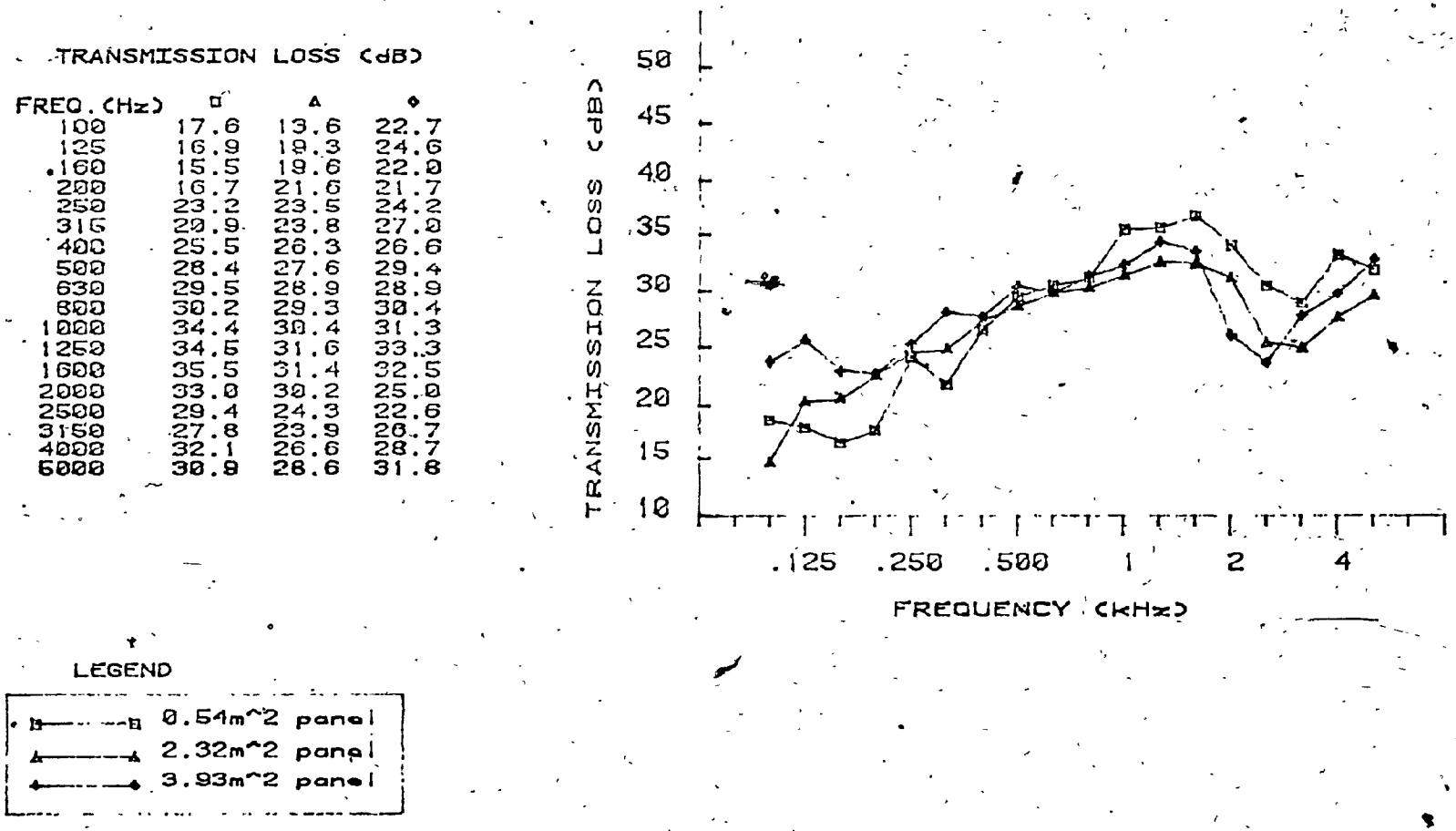
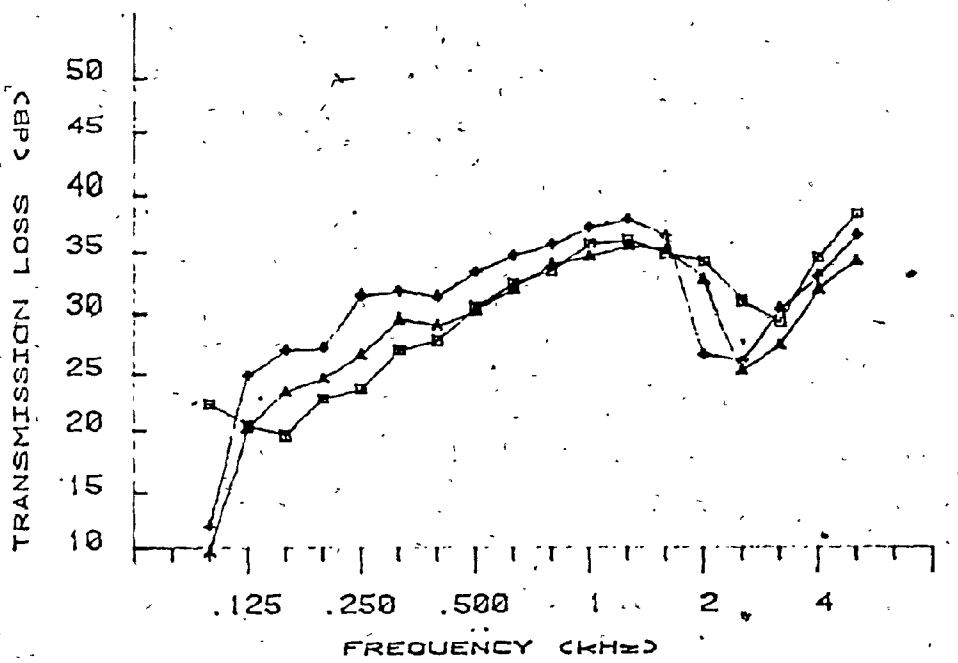


FIGURE B6: TL FOR GLASS PANELS WITH A 0.30m SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	21.1	8.7	10.8
125	19.2	19.1	23.8
160	18.5	22.2	26.1
200	21.5	23.5	26.2
250	22.5	25.7	30.3
315	26.1	28.6	30.6
400	26.9	28.1	30.2
500	29.4	29.2	32.1
630	31.1	30.8	33.5
800	32.2	32.7	34.5
1000	34.5	33.5	36.0
1250	34.8	34.3	36.7
1600	33.6	33.9	35.2
2000	32.9	31.5	25.5
2500	29.8	23.9	24.8
3150	28.3	20.4	29.3
4000	33.2	30.7	31.7
6000	37.2	33.0	35.2



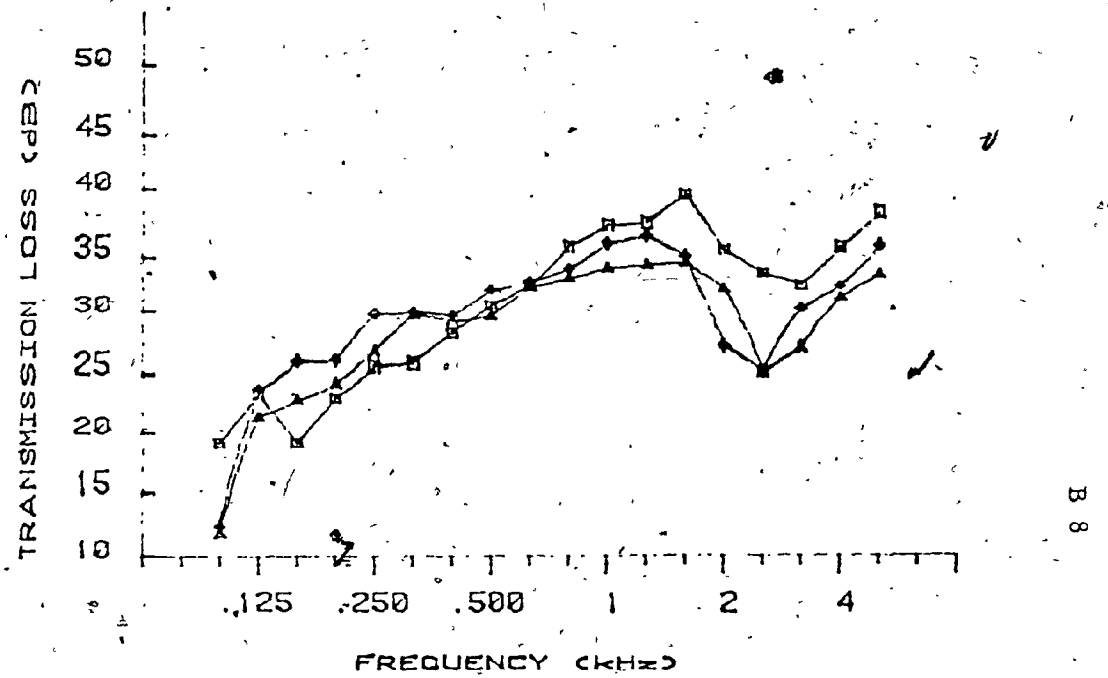
LEGEND

0.54m^2 panel
2.32m^2 panel
3.93m^2 panel

FIGURE B7: TL FOR GLASS PANELS WITHOUT SILL AND WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	17.9	11.2	11.7
125	22.6	20.5	22.9
160	17.9	22.1	24.9
200	22.3	23.4	24.9
250	24.6	25.6	28.7
315	24.8	28.6	28.8
400	27.0	28.0	28.5
500	29.5	28.5	31.0
630	31.5	31.2	31.8
800	34.8	32.1	33.0
1000	36.2	33.1	35.0
1250	36.5	33.4	35.6
1600	38.4	33.6	34.1
2000	34.6	31.1	26.0
2500	32.6	24.3	24.3
3150	31.4	25.9	29.1
4000	34.8	30.2	31.3
5000	37.2	32.5	34.9



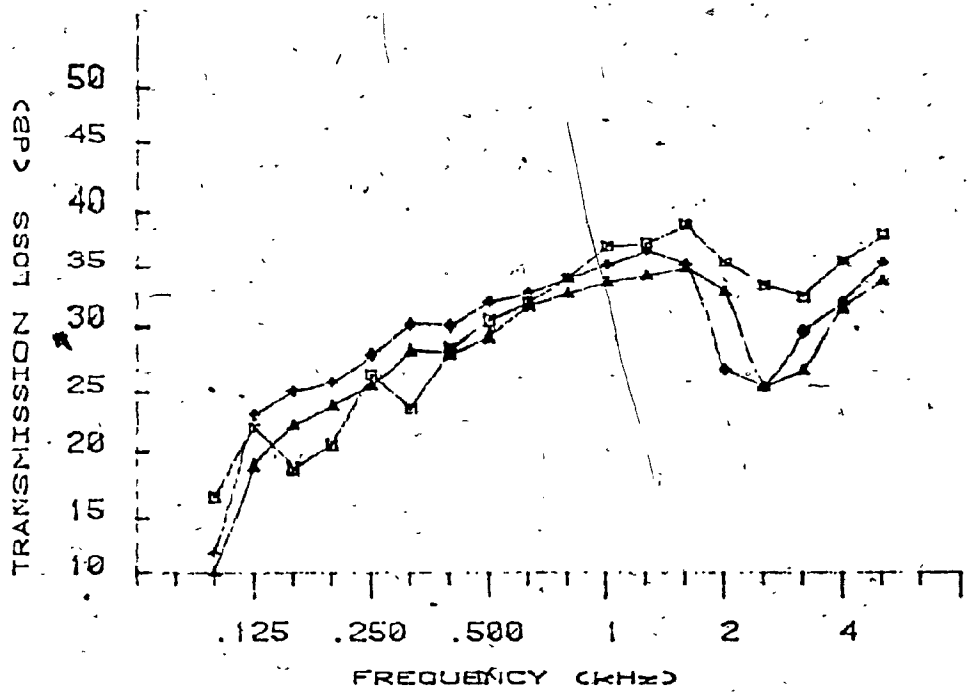
LEGEND

□ 0.54m^2 panel
△ 2.32m^2 panel
◇ 3.93m^2 panel

FIGURE B8: TL FOR GLASS PANELS WITH A 0.15m SILL AND WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	15.8	9.1	10.8
125	20.9	18.0	22.0
160	17.8	21.2	24.1
200	19.5	22.9	24.9
250	25.6	24.6	27.3
315	22.6	27.6	29.2
400	27.6	27.3	29.1
500	29.4	28.4	30.7
630	30.8	30.5	31.5
800	32.9	31.5	32.9
1000	36.0	32.5	34.2
1250	36.3	33.1	35.6
1600	37.9	33.8	34.2
2000	34.5	31.6	26.0
2500	32.2	24.4	24.4
3150	31.2	26.0	28.6
4000	34.6	30.3	30.7
5000	37.0	32.6	34.4



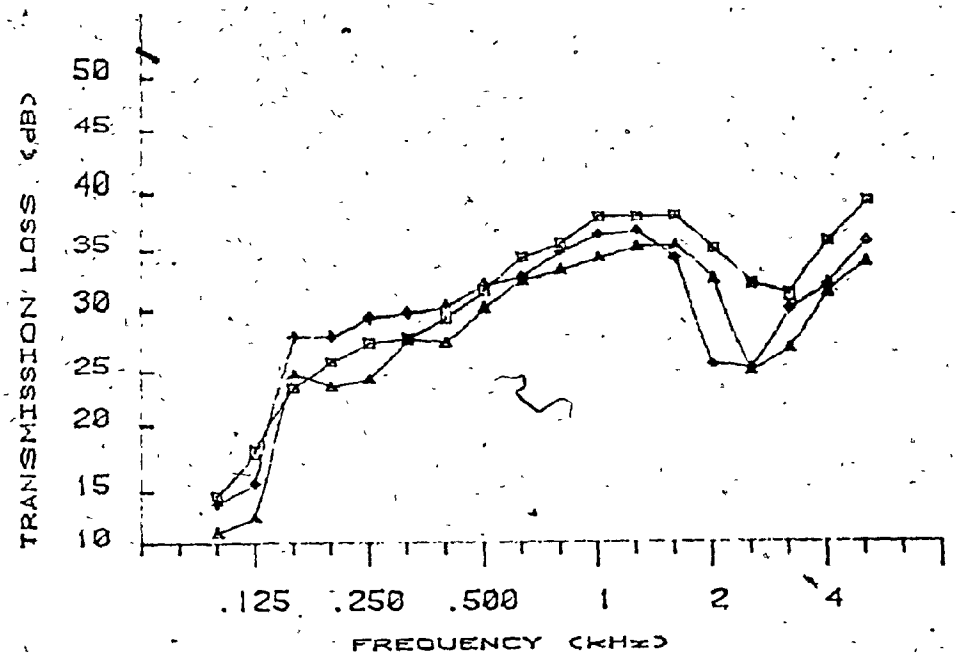
LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B9: TL FOR GLASS PANELS WITH A 0.30m SILL AND WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	13.5	10.0	12.7
125	17.0	11.4	14.6
160	22.2	23.7	27.0
200	24.9	22.4	27.1
250	26.6	23.1	28.4
315	27.0	26.8	28.6
400	28.5	26.6	29.3
500	30.4	29.2	30.8
630	33.1	31.1	31.4
800	34.4	32.0	33.7
1000	36.9	33.0	35.2
1250	36.9	34.0	35.5
1600	37.0	34.2	33.0
2000	33.9	31.2	24.3
2500	30.9	23.6	24.0
3150	30.1	25.9	29.1
4000	34.5	30.4	30.8
5000	38.3	32.6	34.5



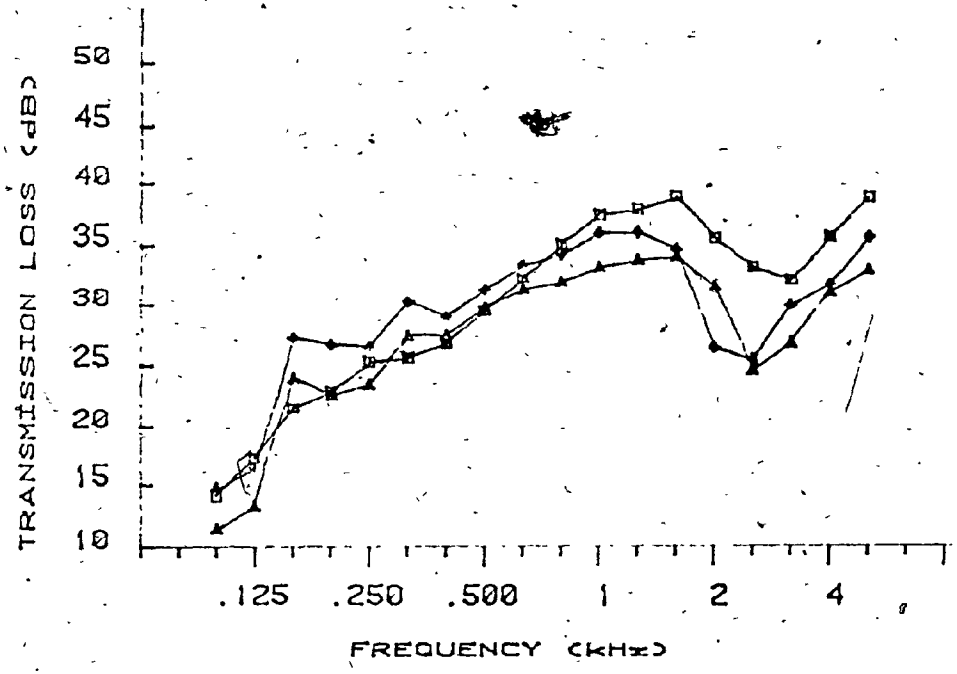
LEGEND

- □ 0.54m^2 panel
- △ 2.32m^2 panel
- ◇ 3.93m^2 panel

FIGURE B10: TL FOR GLASS PANELS WITHOUT SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	13.2	10.6	13.6
125	16.1	12.5	15.3
160	20.6	23.1	26.1
200	22.1	21.7	25.5
250	24.3	22.7	25.4
315	24.6	26.3	29.2
400	25.7	26.3	27.9
500	28.3	28.7	30.3
630	31.3	30.3	32.4
800	34.1	30.9	33.3
1000	36.2	32.2	34.9
1250	36.7	32.9	34.9
1600	37.7	33.1	33.7
2000	34.6	30.6	25.3
2500	32.3	23.7	24.4
3150	31.1	25.7	28.8
4000	34.7	30.0	30.7
5000	37.7	32.0	34.7



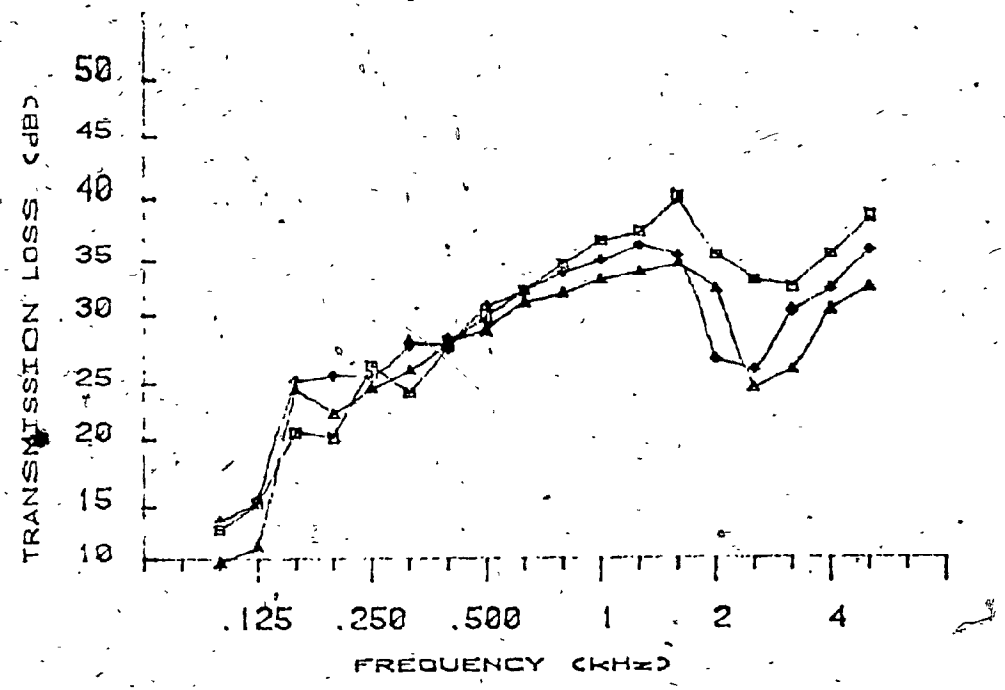
LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B11: TL FOR GLASS PANELS WITH A 0.15m SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ (Hz)	□	△	◇
100	11.8	8.7	12.6
125	14.3	10.2	14.4
160	19.5	23.3	24.2
200	19.0	21.1	24.7
250	25.6	23.5	24.5
315	23.1	25.2	27.2
400	27.2	27.4	27.0
500	28.9	28.0	29.6
630	30.8	29.9	30.9
800	33.4	30.0	32.5
1000	35.7	31.9	33.8
1250	36.5	32.6	35.3
1600	39.0	33.4	34.3
2000	34.3	31.0	26.1
2500	31.8	23.4	25.1
3150	31.2	25.1	29.3
4000	34.4	29.4	31.0
5000	37.7	31.1	34.7



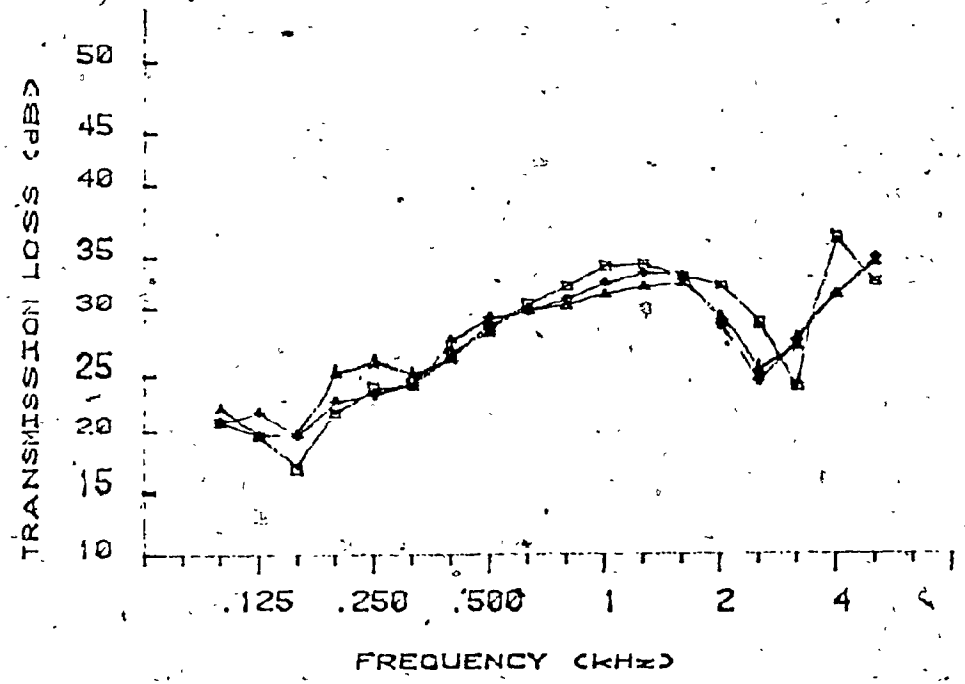
LEGEND

- 0.54m^2 panel
- 2.32m^2 panel
- 3.93m^2 panel

FIGURE B12: TL FOR GLASS PANELS WITH A 0.30 SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	19.9	21.3	19.9
125	18.4	18.5	20.9
160	15.5	16.7	18.5
200	20.8	24.3	21.9
250	23.2	25.0	22.7
315	23.5	24.1	23.5
400	25.4	25.3	26.2
500	27.1	27.4	28.1
630	29.3	28.8	28.6
800	31.2	29.2	29.8
1000	33.1	30.4	31.5
1250	33.3	31.1	32.5
1600	32.1	31.5	32.2
2000	31.2	28.2	27.4
2500	27.6	24.6	23.8
3150	23.3	20.1	20.4
4000	35.6	30.2	30.2
5000	31.5	33.5	33.0



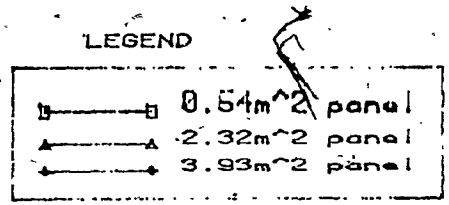
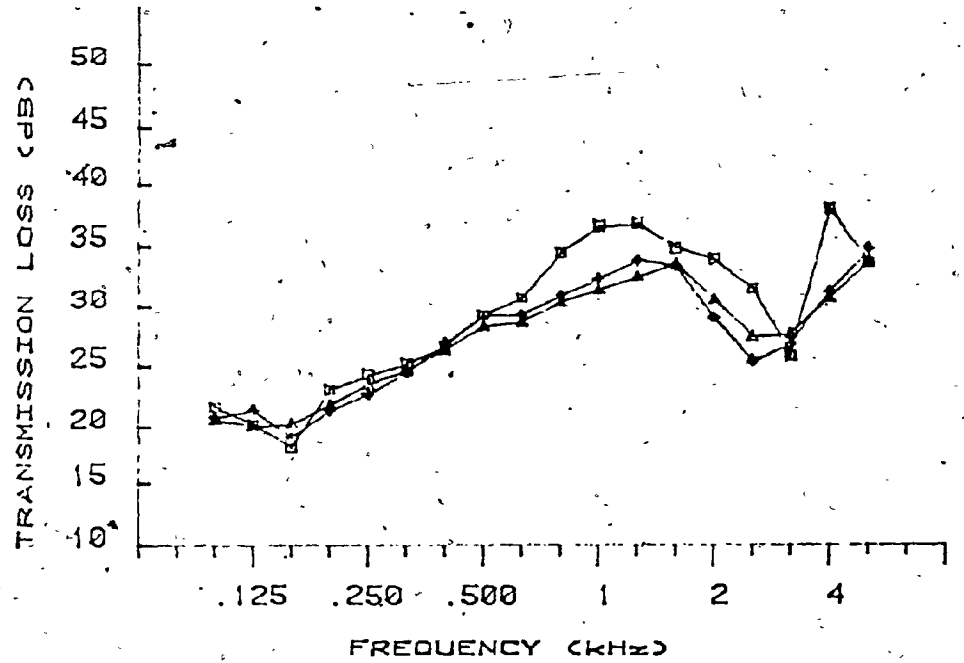


FIGURE B13: TL FOR GYPROCK PANELS WITHOUT SILL AND WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	20.7	19.5	19.8
125	19.2	18.0	20.4
160	17.0	19.2	17.9
200	22.2	20.9	20.4
250	23.4	22.7	21.8
315	24.2	23.7	23.6
400	25.5	25.3	25.8
500	28.2	27.2	28.1
630	29.7	27.6	28.2
800	33.5	28.3	29.9
1000	35.5	30.4	31.4
1250	35.7	31.5	32.8
1600	33.8	32.6	32.4
2000	33.0	29.5	27.9
2500	30.5	26.3	24.4
3150	24.8	26.5	25.7
4000	36.8	29.6	30.2
6000	32.6	32.9	33.8



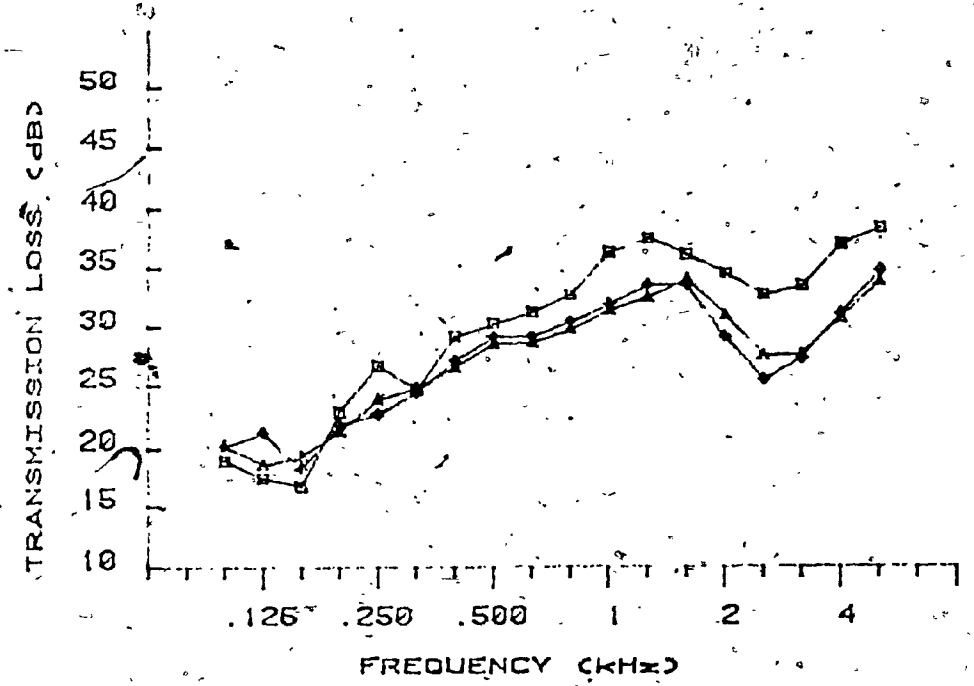
LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B14: TL FOR GYPROCK PANELS WITH A 0.15m SILL AND WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	17.9	19.1	19.1
125	16.3	17.5	20.2
160	15.6	16.3	17.2
200	21.8	20.3	20.8
250	25.6	22.8	21.7
315	23.6	23.8	23.4
400	28.0	25.5	26.0
500	29.2	27.4	28.0
630	30.2	27.5	28.0
800	31.6	28.7	29.4
1000	35.1	30.4	30.9
1250	36.3	31.4	32.5
1600	35.0	33.0	32.5
2000	33.5	29.9	28.0
2500	31.7	26.4	24.4
3150	32.4	28.4	26.1
4000	35.8	29.6	30.0
6000	37.2	32.8	33.7



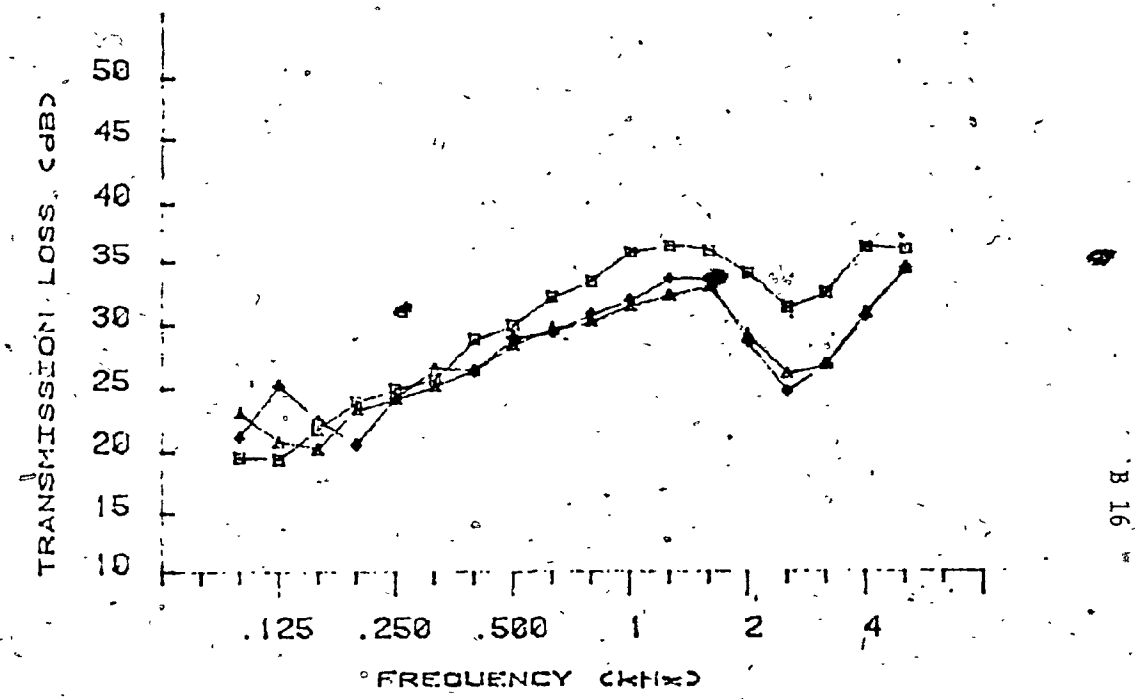
LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B15: TL FOR GYPROCK PANELS WITH A 0.30m SILL AND WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	18.4	21.9	18.9
125	18.3	19.6	24.2
160	20.6	19.1	21.3
200	22.9	22.2	19.4
250	23.9	23.1	23.2
315	24.7	24.1	25.6
400	27.8	25.5	25.4
500	28.9	27.4	28.0
630	31.1	28.6	28.3
800	32.3	29.2	29.8
1000	34.7	30.4	30.8
1250	35.3	31.2	32.5
1600	34.8	31.9	32.4
2000	33.0	28.1	27.6
2500	30.2	25.1	23.6
3150	31.4	25.8	25.8
4000	35.1	29.8	29.5
5000	34.9	33.2	33.3



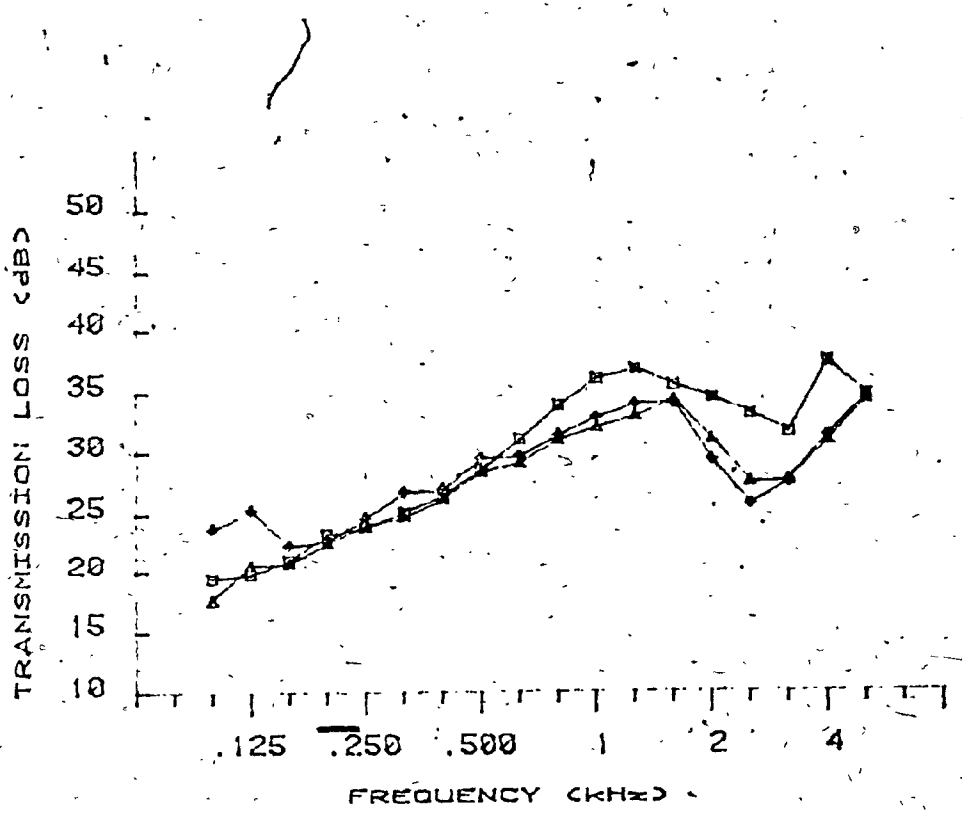
LEGEND

□ 0.54m^2 panel
△ 2.32m^2 panel
◇ 3.93m^2 panel

FIGURE B16: TL FOR GYPROCK PANELS WITHOUT SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	18.3	16.5	22.8
125	18.7	19.5	24.3
160	20.0	19.6	21.3
200	22.3	21.5	21.7
250	22.9	23.1	23.7
315	24.2	23.8	25.7
400	25.6	25.2	25.9
500	27.5	27.3	28.4
630	29.9	28.0	28.6
800	32.8	29.9	30.3
1000	35.0	31.0	31.8
1250	35.8	31.9	32.9
1600	34.5	33.3	33.1
2000	33.4	30.0	28.3
2500	32.1	26.5	24.7
3150	30.5	26.0	26.5
4000	36.4	29.7	30.2
5000	33.6	33.2	33.6



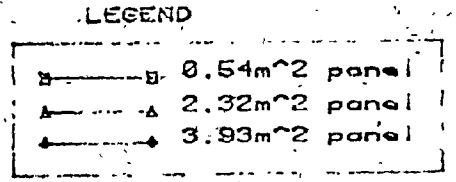
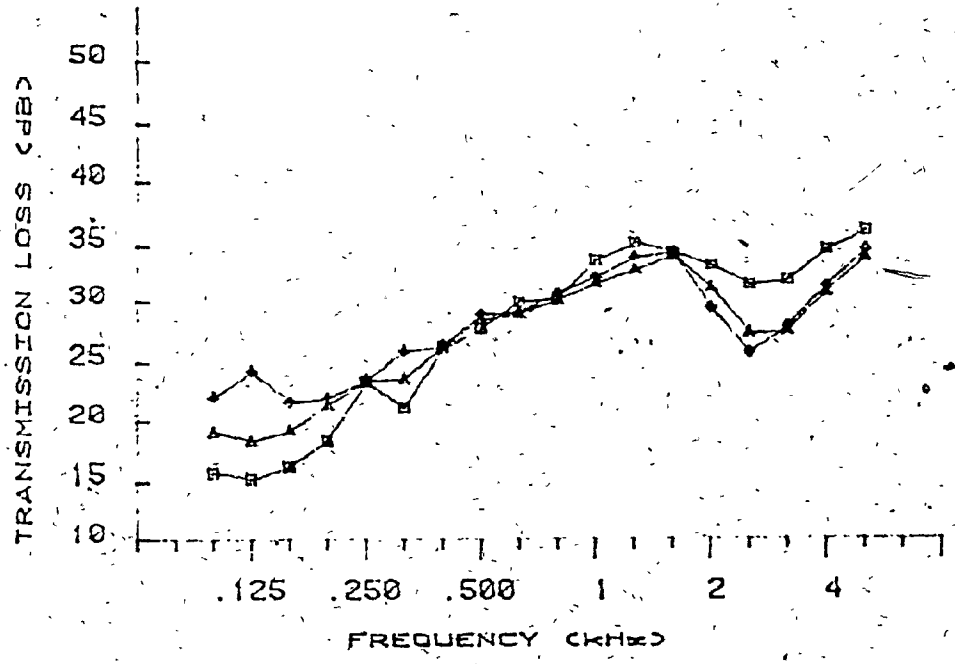


FIGURE B17: TL FOR GYPROCK PANELS WITH A 0.15m SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	14.7	18.0	21.0
125	14.2	17.2	23.3
160	15.2	18.1	20.6
200	17.3	20.3	20.9
250	22.4	22.5	22.6
315	20.1	22.6	25.0
400	25.2	25.4	25.3
500	26.7	27.3	27.6
630	28.8	27.9	27.9
800	29.1	29.0	29.6
1000	32.6	30.5	31.0
1250	34.1	31.7	32.9
1600	33.3	33.0	33.3
2000	32.1	30.1	28.3
2500	30.4	26.3	24.6
3150	30.8	26.5	26.8
4000	33.6	29.7	30.2
5000	36.2	32.8	33.6



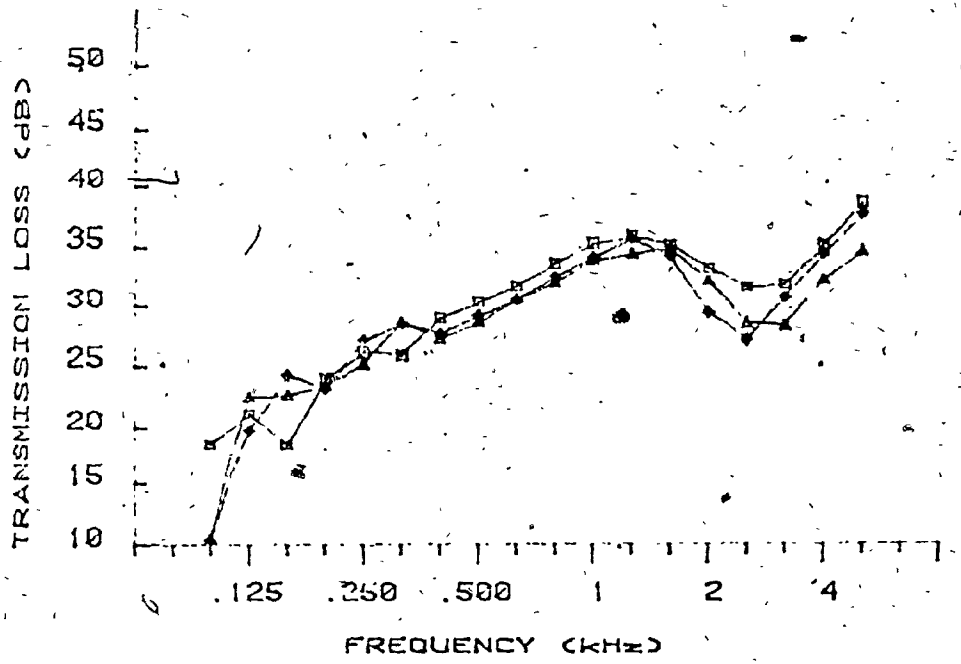
LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B18: TL FOR GYPROCK PANELS WITH A 0.30m SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	17.4	9.5	9.5
125	20.2	21.7	18.6
160	17.3	21.8	23.3
200	23.1	22.7	22.3
250	25.1	24.2	26.0
315	24.8	27.4	27.4
400	27.8	26.1	26.5
500	29.2	27.5	28.0
630	30.6	29.5	29.4
800	32.6	31.0	31.5
1000	34.2	32.9	33.1
1250	34.9	33.4	34.6
1600	34.1	33.9	33.2
2000	32.2	31.1	28.2
2500	30.5	27.4	26.0
3150	30.7	27.1	29.5
4000	34.1	31.1	33.4
5000	37.4	33.7	36.6



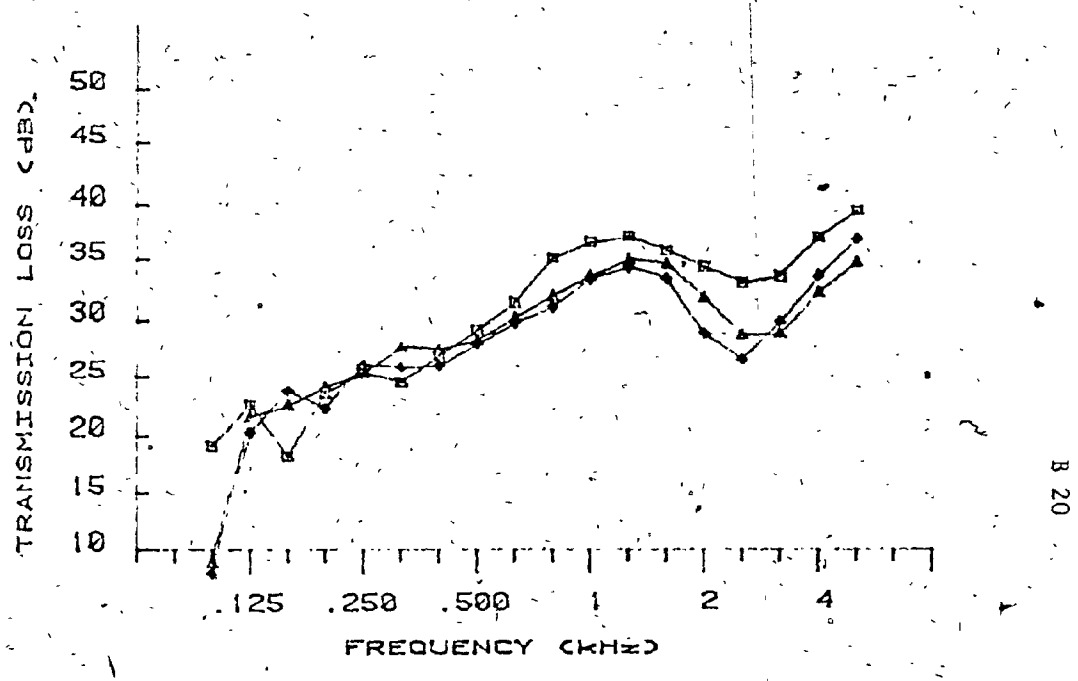
LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B19: TL FOR GYPROCK PANELS WITHOUT SILL AND WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	18.1	8.8	7.1
125	21.5	20.5	18.2
160	17.3	21.4	22.6
200	22.4	23.2	21.1
250	24.2	24.2	24.9
315	23.3	26.6	24.7
400	25.8	26.4	24.8
500	28.1	27.2	26.8
630	30.4	29.2	28.7
800	33.9	30.9	30.0
1000	35.2	32.4	32.2
1250	36.7	33.7	33.0
1600	34.4	33.3	32.2
2000	33.1	30.7	27.6
2500	31.9	27.5	25.2
3150	32.4	27.5	28.6
4000	35.6	31.1	32.3
5000	38.0	33.5	36.4



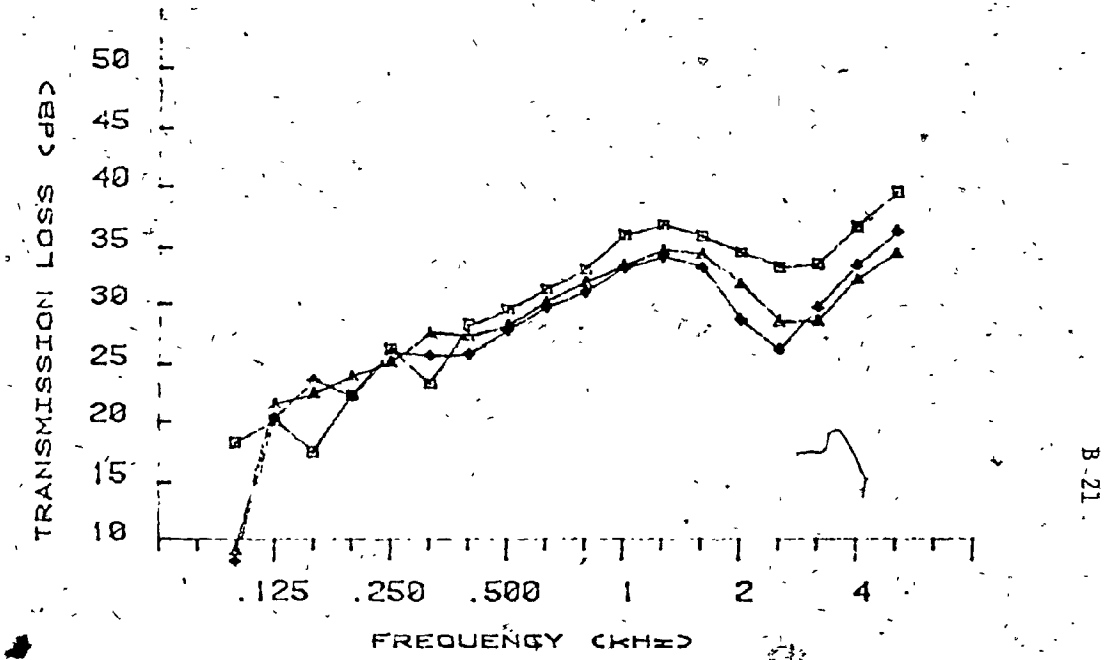
LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B20: TL FOR GYPROCK PANELS WITH A 0.15m SILL AND WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ (Hz)	□	△	◇
100	17.2	8.0	7.1
125	19.8	20.5	18.2
160	16.4	21.4	22.6
200	21.3	23.8	21.1
250	25.3	24.2	24.8
315	22.3	26.6	24.7
400	27.2	26.4	24.8
500	28.5	27.2	26.8
630	30.2	29.2	28.7
800	32.8	30.9	30.0
1000	35.1	32.4	32.2
1250	35.9	33.7	33.0
1600	34.9	33.3	32.2
2000	33.5	30.7	27.6
2500	32.2	27.5	25.2
3150	32.5	27.5	28.6
4000	35.8	31.1	32.3
5000	38.6	33.5	35.4



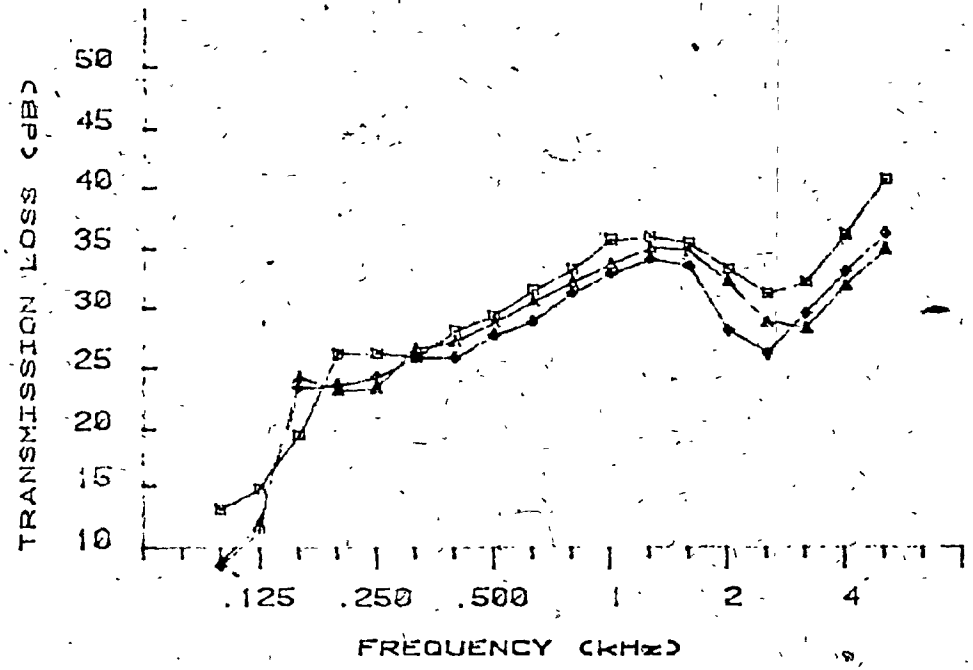
LEGEND

0.54m^2 panel
2.32m^2 panel
3.93m^2 panel

FIGURE B21: TL FOR GYPROCK PANELS WITH A 0.30m SILL AND WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	12.1	7.8	7.5
125	13.7	11.8	10.4
160	18.4	23.2	22.5
200	25.1	22.2	22.6
250	25.2	22.4	23.3
315	24.8	26.5	24.8
400	27.0	26.1	24.8
500	28.2	27.6	26.6
630	30.5	29.5	27.8
800	32.2	31.1	30.2
1000	34.6	32.7	31.9
1250	34.8	34.0	33.0
1600	34.3	33.7	32.5
2000	32.3	31.2	26.9
2500	30.2	27.7	25.1
3150	31.1	27.1	28.4
4000	35.0	30.8	32.0
5000	39.6	33.9	35.1



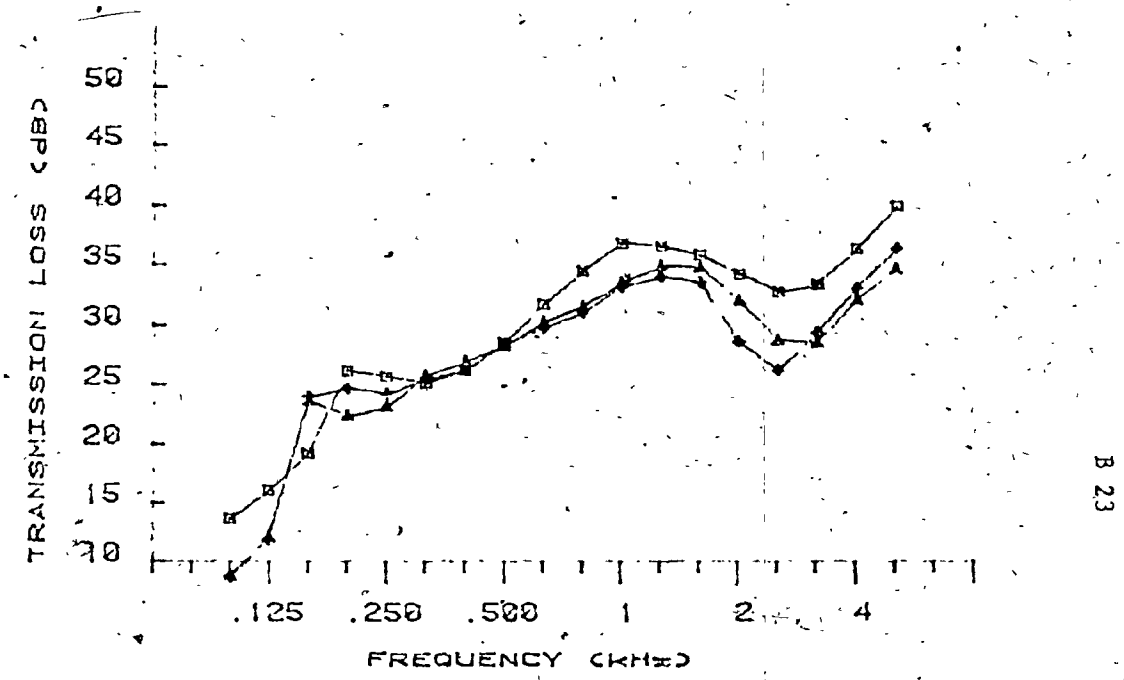
LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B22: TL FOR GYPROCK PANELS WITHOUT SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	12.6	7.8	7.7
125	15.0	11.1	10.7
160	16.1	22.6	23.0
200	25.1	21.3	23.6
250	24.6	22.1	23.2
315	24.1	24.7	24.5
400	25.2	25.9	25.2
500	27.5	27.2	27.3
630	30.6	29.2	28.7
800	33.4	30.5	29.9
1000	35.7	32.4	32.1
1250	35.4	33.8	32.9
1600	34.7	33.7	32.4
2000	33.1	30.9	27.5
2500	31.6	27.6	25.1
3150	32.3	27.4	28.3
4000	35.2	31.0	31.9
5000	38.8	33.5	35.2



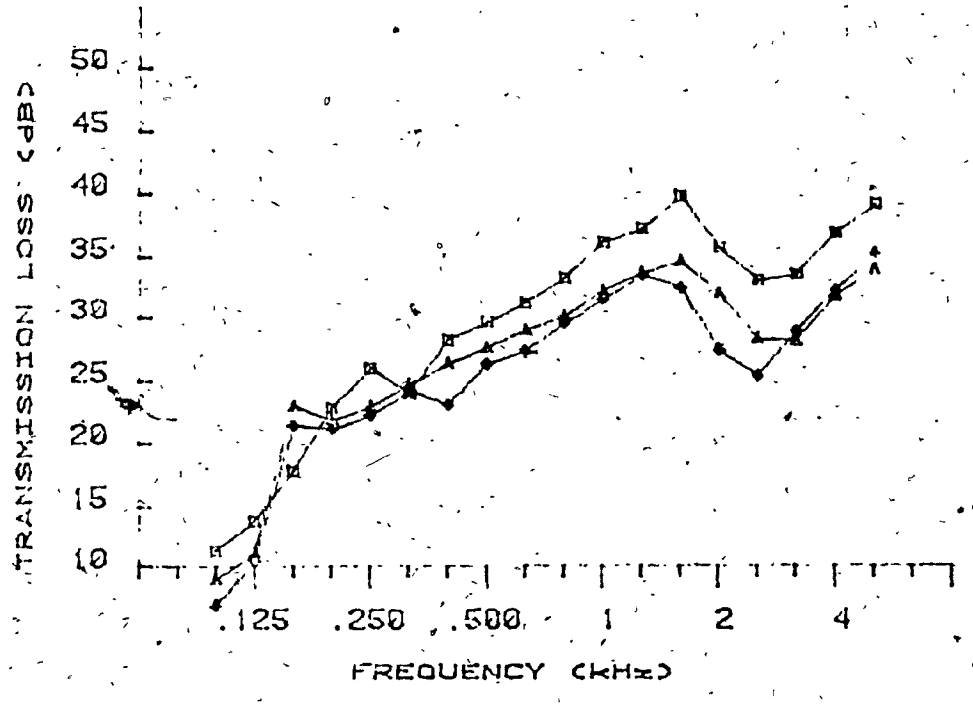
LEGEND

□ 0.54m^2 panel
△ 2.32m^2 panel
◇ 3.93m^2 panel

FIGURE B23: TL FOR GYPROCK PANELS WITH A 0.15m SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	10.3	7.9	5.7
125	12.8	10.1	8.4
160	16.8	22.0	20.3
200	21.8	20.8	20.0
250	25.9	22.0	21.2
315	23.9	23.7	23.2
400	27.2	25.3	22.1
500	28.6	26.6	25.3
630	30.1	27.9	26.3
800	32.1	29.0	28.4
1000	35.1	31.1	30.4
1250	36.2	32.6	32.4
1600	38.7	33.5	31.3
2000	34.7	30.8	26.3
2500	32.8	27.2	24.3
3150	32.5	27.8	27.8
4000	35.9	30.7	31.1
5000	38.1	32.9	34.2



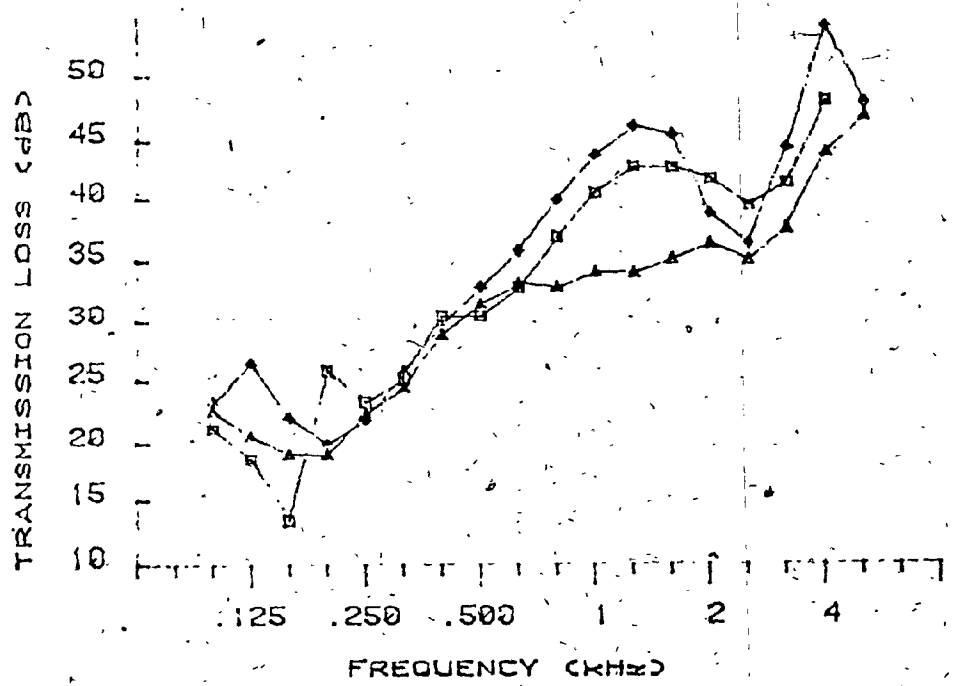
LEGEND

0.54m^2 panel
2.32m^2 panel
3.93m^2 panel

FIGURE B24: TL FOR GYPROCK PANELS WITH A 0.30m SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	20.3	21.8	22.3
125	17.5	19.5	25.3
160	12.4	17.9	31.1
200	24.7	17.6	18.8
250	22.5	21.6	21.0
315	24.2	23.5	24.1
400	29.3	27.6	28.5
500	29.3	30.4	31.9
630	31.8	32.2	34.7
800	35.7	31.8	38.7
1000	39.2	33.1	42.6
1250	41.6	33.0	45.1
1600	41.5	34.1	44.4
2000	40.5	35.3	37.5
2500	38.2	34.1	35.2
3150	40.1	36.4	43.2
4000	47.0	42.8	52.9
5000	56.0	46.8	46.8



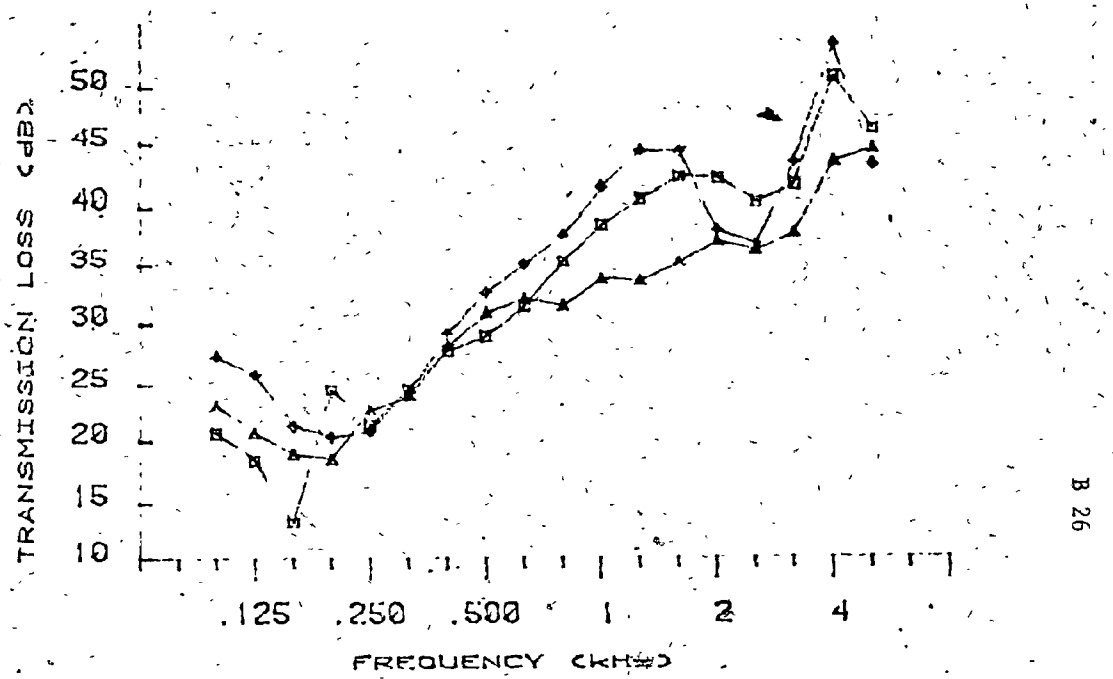
LEGEND

□——□ 0.64m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B25: TL FOR DOUBLE GYPROCK PANELS WITHOUT SILL AND WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	19.6	21.9	26.4
125	17.4	19.5	24.9
160	12.2	17.6	20.1
200	23.5	17.4	19.2
250	20.2	21.5	19.7
315	23.5	22.8	23.3
400	26.9	27.2	28.2
500	28.0	29.7	31.4
630	30.2	30.9	33.9
800	34.1	30.2	36.5
1000	37.4	32.5	40.4
1250	39.6	32.4	43.3
1600	41.2	34.1	43.3
2000	41.1	36.0	37.8
2500	39.3	35.1	35.7
3150	40.7	36.7	42.4
4000	49.6	42.6	52.3
5000	45.1	43.5	42.2



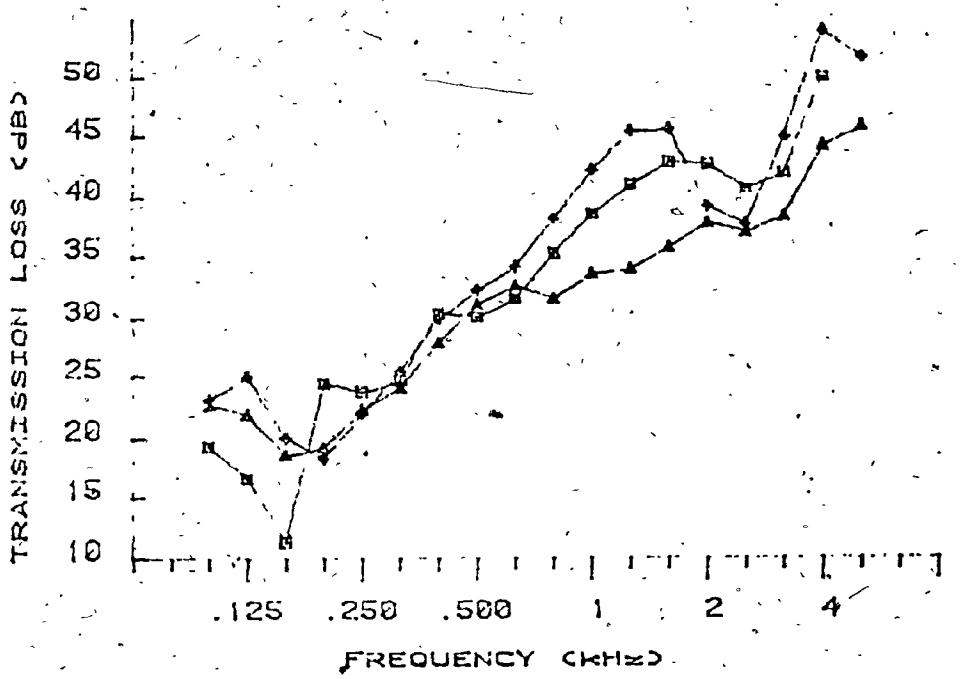
LEGEND

□ 0.54m^2 panel
△ 2.32m^2 panel
◇ 3.93m^2 panel

FIGURE B26: TL FOR DOUBLE GYPROCK PANELS WITH A 0.15m SILL AND WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	18.3	21.6	22.0
125	15.5	20.8	23.9
160	19.3	17.5	18.9
200	23.3	18.1	17.2
250	22.7	21.3	20.9
315	23.6	23.8	24.3
400	29.3	26.7	28.7
500	29.9	30.0	31.2
630	30.5	31.5	33.1
800	34.1	30.5	36.9
1000	37.3	32.6	41.0
1250	39.8	32.9	44.3
1600	41.8	34.6	44.4
2000	41.6	36.6	38.0
2500	39.5	35.8	36.4
3150	40.8	37.1	43.7
4000	48.7	43.1	52.8
5000	56.0	44.6	60.4



LEGEND

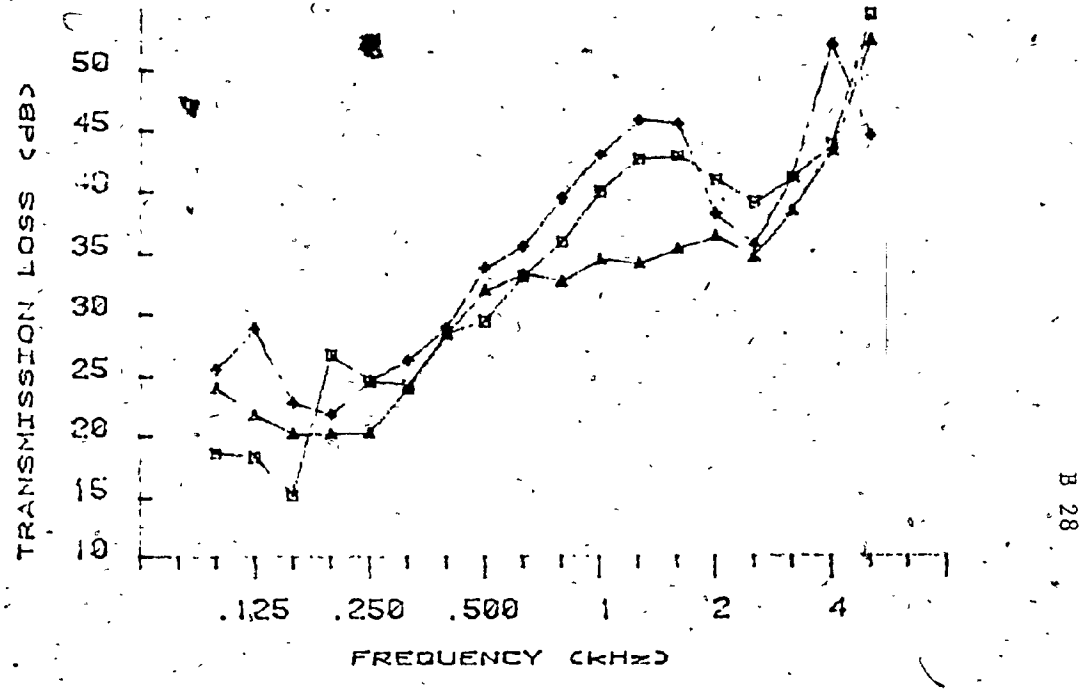
8.54m^2 panel
2.32m^2 panel
3.93m^2 panel

B 27

FIGURE B27: TL FOR DOUBLE GYPROCK PANELS WITH A 8.30m SILL AND WITH DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	17.5	22.9	24.5
125	17.2	20.7	27.8
160	14.2	19.1	21.7
200	25.7	19.1	28.7
250	23.6	19.2	23.6
315	23.2	22.9	25.3
400	25.6	27.3	27.9
500	28.4	30.8	32.7
630	32.0	32.2	34.5
800	34.9	31.6	38.3
1000	38.9	33.4	41.8
1250	41.4	33.0	44.7
1600	41.7	34.3	44.4
2000	39.8	35.3	37.1
2500	38.8	33.6	34.6
3150	40.8	37.4	40.0
4200	42.6	42.0	50.9
6000	63.3	51.3	43.3



LEGEND

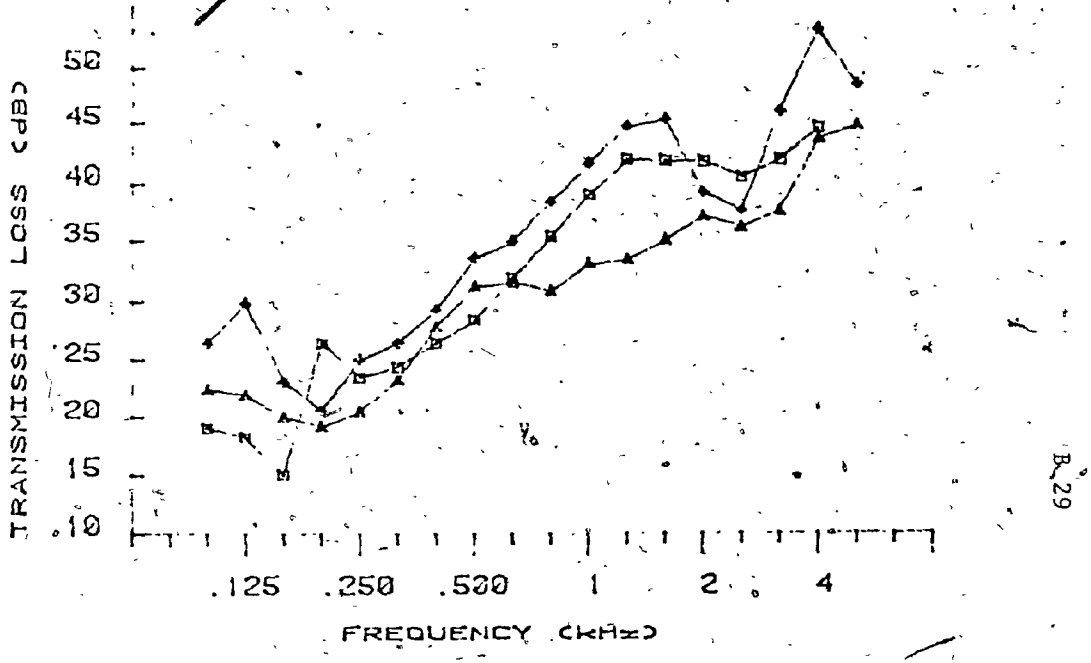
□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

B 28

FIGURE B28: TL FOR DOUBLE GYPROCK PANELS WITHOUT SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ.(Hz)	□	△	◇
100	17.9	21.3	25.4
125	17.1	20.8	28.8
160	13.9	16.6	22.0
200	25.4	18.0	18.4
250	22.4	19.3	24.0
315	23.3	22.1	25.4
400	25.3	26.7	28.2
500	27.3	30.1	32.5
630	30.8	30.4	33.8
800	34.2	29.7	37.2
1000	37.8	32.0	40.4
1250	40.7	32.3	43.4
1600	43.7	33.9	44.0
2000	40.6	35.8	38.0
2500	39.3	34.9	36.3
3150	40.8	36.3	44.7
4000	43.3	42.4	52.0
5000	54.8	43.6	47.1



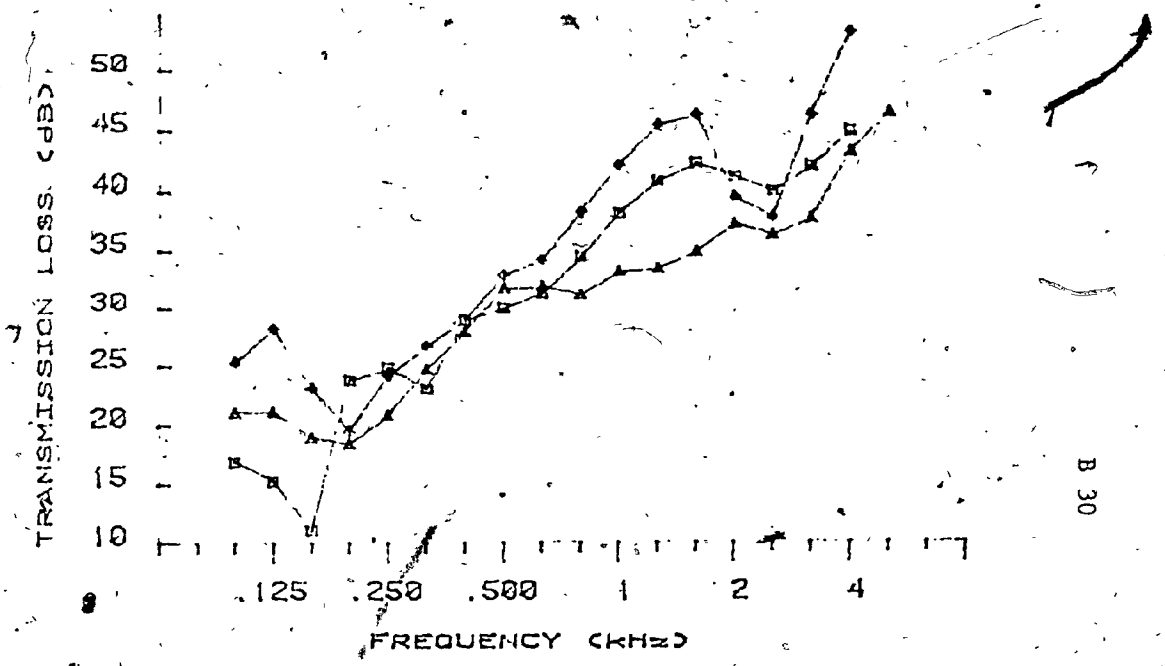
LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B29: TL FOR DOUBLE GYPROCK PANELS WITH A 0.15m SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	15.8	20.0	24.3
125	14.3	20.0	27.1
160	12.1	17.9	22.1
200	22.8	17.4	18.4
250	23.8	19.8	23.2
315	22.1	23.7	25.6
400	27.9	26.6	27.8
500	28.9	30.7	31.8
630	32.2	30.8	33.2
800	33.4	33.1	37.1
1000	37.1	32.1	41.0
1250	39.7	32.4	44.4
1600	41.2	33.8	45.2
2000	40.1	36.2	38.4
2500	38.9	35.3	36.7
3150	41.0	36.6	45.1
4000	43.8	42.1	52.1
5000	54.8	45.4	54.8



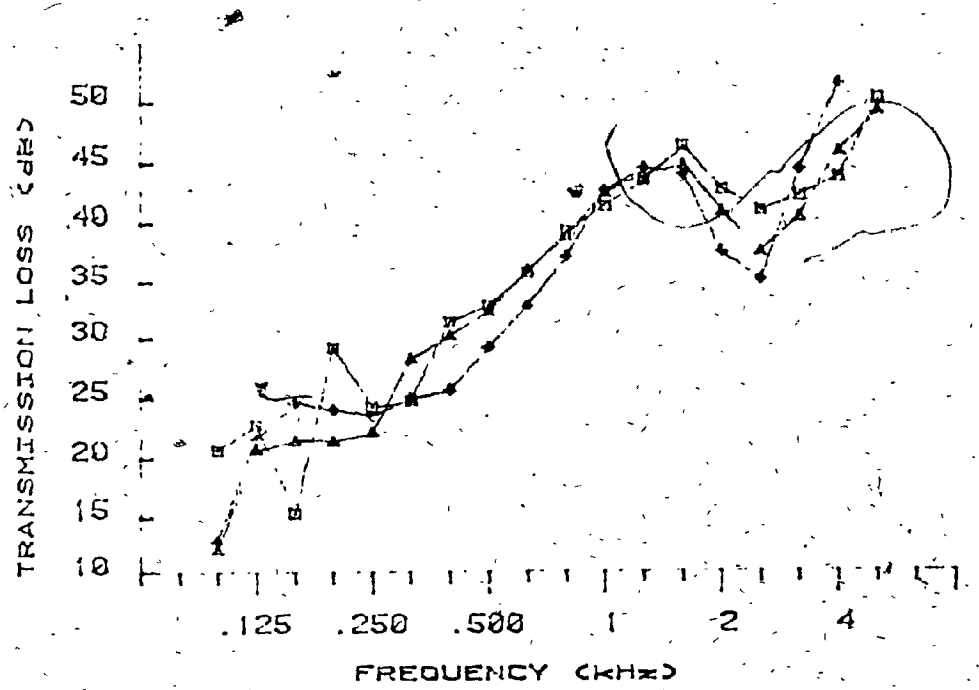
LEGEND

□ 0.54m^2 panel
△ 2.32m^2 panel
◇ 3.93m^2 panel

FIGURE B30: TL FOR DOUBLE GYPROCK PANELS WITH A 0.30m SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM A

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	19.6	11.1	11.8
125	21.8	19.7	20.6
160	14.3	20.5	23.7
200	28.2	20.4	23.1
250	23.3	21.2	22.6
315	23.8	27.2	24.0
400	30.3	29.2	24.7
500	31.7	31.2	28.2
630	34.7	34.9	31.6
800	38.2	37.8	36.0
1000	40.2	41.3	41.4
1250	42.3	42.9	43.4
1600	45.3	43.6	42.8
2000	41.6	39.8	36.4
2500	39.9	36.5	34.0
3150	41.1	39.3	43.2
4000	42.8	44.8	50.3
5000	49.1	48.1	65.9



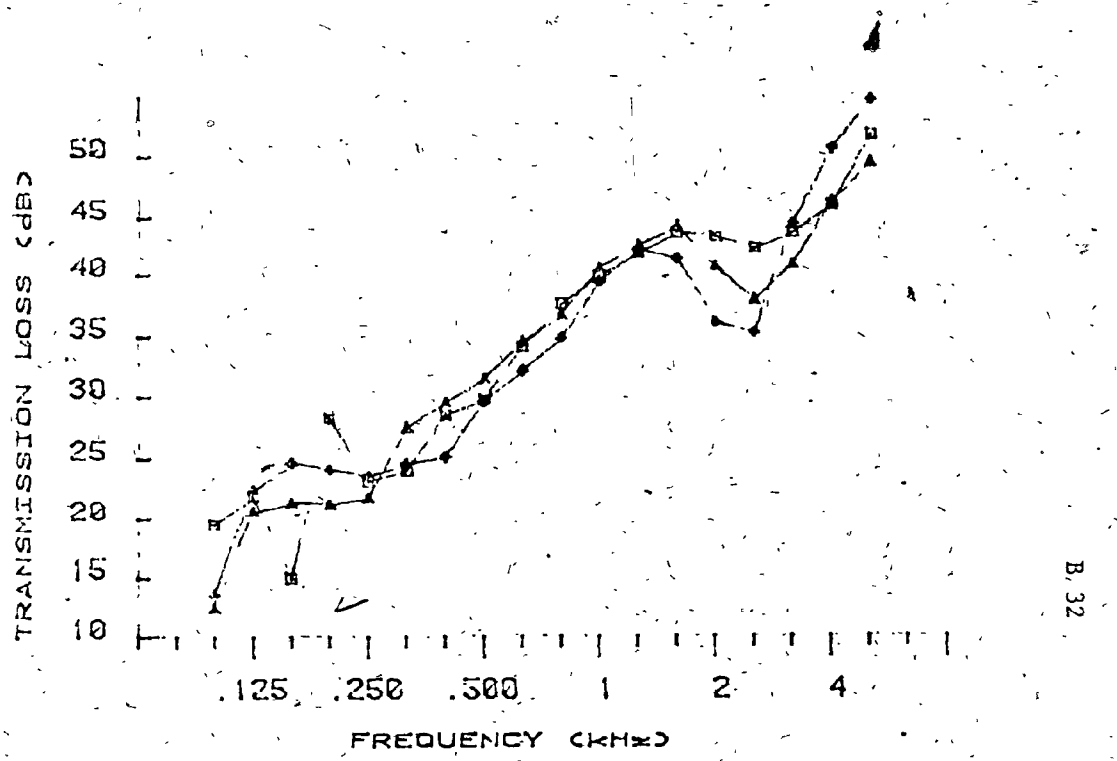
LEGEND

□ 0.54m^2 panel
△ 2.32m^2 panel
◇ 3.93m^2 panel

FIGURE B31: TL FOR DOUBLE GYPROCK PANELS WITHOUT SILL AND WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	18.4	11.4	12.6
125	20.6	18.5	21.3
160	13.9	20.3	23.6
200	27.2	20.2	23.0
250	22.1	28.8	22.5
315	23.0	26.5	23.6
400	27.4	28.5	24.1
500	28.7	30.3	28.5
630	33.0	33.4	31.0
800	36.4	35.6	33.7
1000	38.7	39.4	38.2
1250	40.6	41.4	40.9
1600	42.5	43.1	40.1
2000	42.1	39.5	35.0
2500	41.1	36.7	34.1
3150	42.5	39.0	43.3
4000	44.9	45.2	49.4
5000	50.6	48.3	53.4



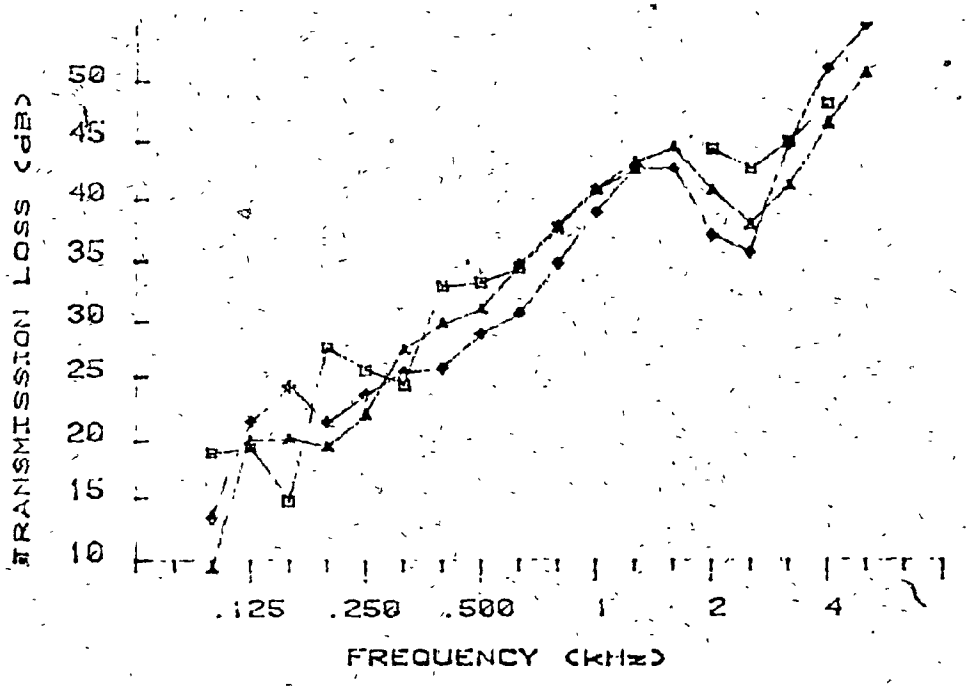
LEGEND

□ 0.54m^2 panel
△ 2.32m^2 panel
◇ 3.93m^2 panel

FIGURE B32: TL FOR DOUBLE GYPROCK PANELS WITH A 0.15m SILL AND WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	17.8	8.3	12.4
125	18.3	19.0	20.5
160	13.7	19.1	23.2
200	26.5	18.4	20.5
250	24.5	21.1	22.6
315	23.4	26.3	24.4
400	33.0	28.7	24.7
500	32.5	30.0	27.8
630	33.4	33.7	29.6
800	36.5	36.6	33.8
1000	39.6	39.7	37.7
1250	41.6	42.2	41.6
1600	54.8	43.5	41.6
2000	43.3	39.6	35.9
2500	41.6	36.8	34.6
3150	43.9	40.0	43.6
4000	46.8	45.4	49.9
5000	67.5	49.4	53.9



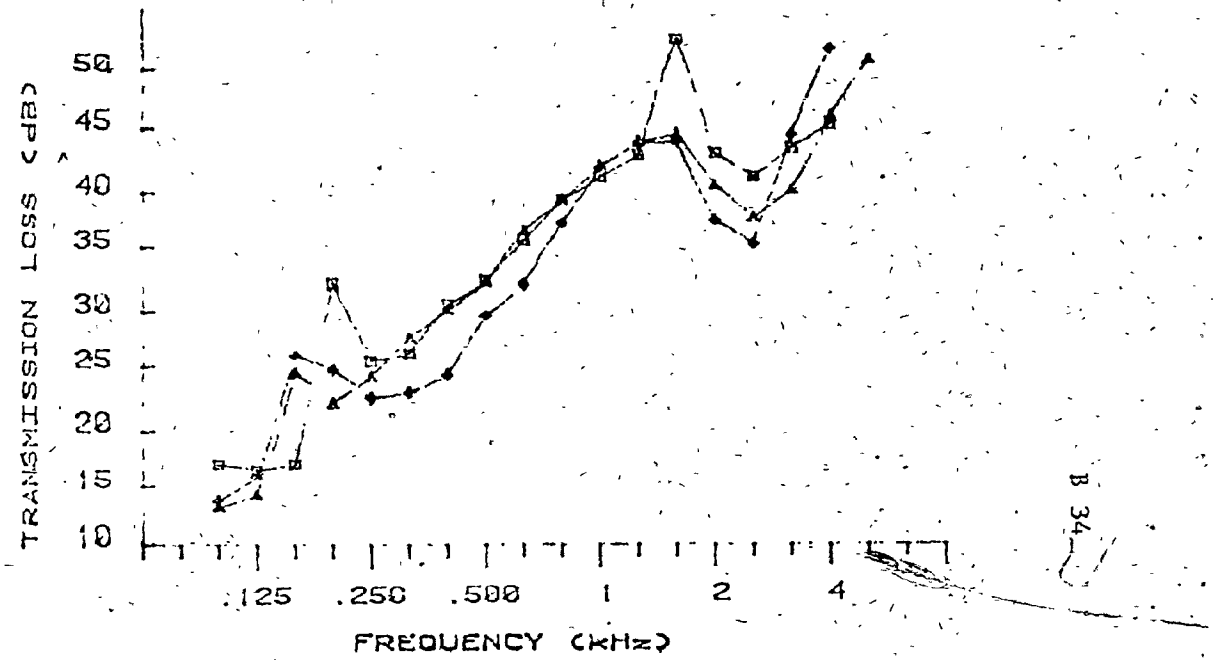
LEGEND

□——□ 0.54m^2 panel
△——△ 2.32m^2 panel
◇——◇ 3.93m^2 panel

FIGURE B33: TL FOR DOUBLE GYPROCK PANELS WITH A 0.30m SILL AND WITH DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	u	A	*
100	16.0	12.0	12.5
125	15.4	13.8	14.7
160	15.9	23.3	24.6
200	31.2	21.1	23.5
250	24.3	23.8	21.4
315	24.9	26.2	21.8
400	29.4	28.9	23.1
500	31.3	31.2	28.3
630	34.3	35.1	31.0
800	37.9	37.9	35.7
1000	40.0	40.9	40.8
1250	41.8	42.8	42.7
1600	51.3	43.4	42.7
2000	41.9	39.2	38.9
2500	39.9	36.1	33.9
3150	42.3	38.7	43.2
4000	44.2	44.6	50.2
5000	64.6	48.2	54.6



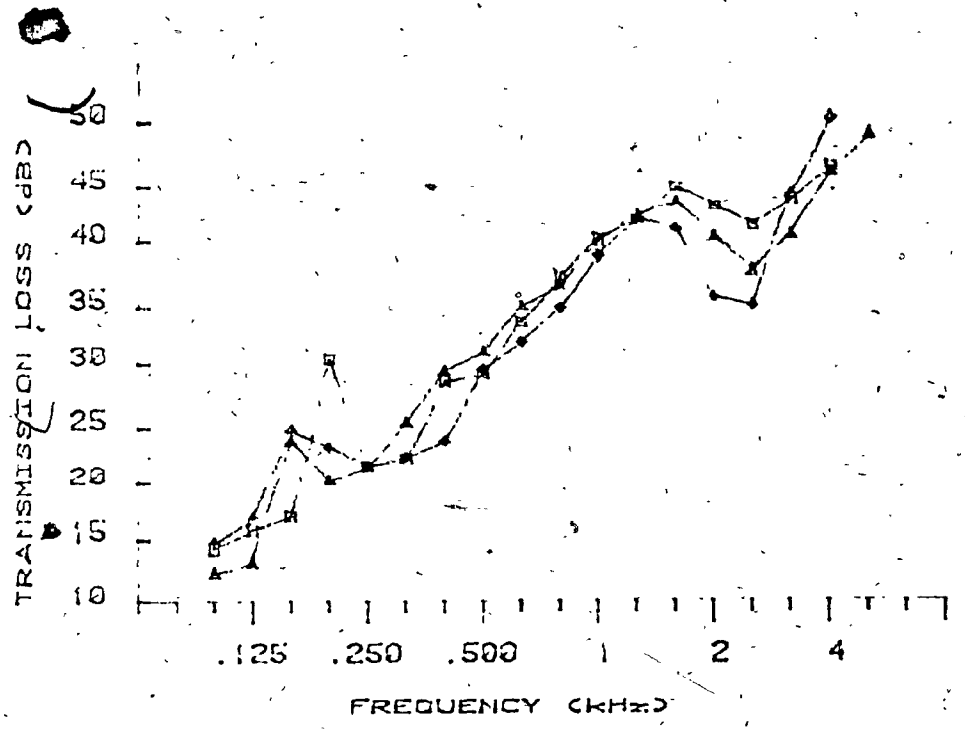
LEGEND

u 0.54m^2 panel
A 2.32m^2 panel
* 3.93m^2 panel

FIGURE B34: TL FOR DOUBLE GYPROCK PANELS WITHOUT SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	Δ	◇
100	13.4	11.6	13.7
125	14.7	12.4	15.6
160	16.8	22.9	23.1
200	29.3	19.1	22.3
250	20.5	20.3	20.5
315	21.2	24.5	21.4
400	27.5	28.3	22.8
500	28.0	29.9	28.4
630	32.5	34.9	30.7
800	36.2	35.7	33.8
1000	39.1	38.8	37.8
1250	40.7	41.2	40.8
1600	43.8	42.4	39.9
2000	42.8	39.3	34.8
2500	40.3	36.8	34.0
3150	42.4	39.4	43.1
4000	45.6	45.1	49.2
5000	54.5	48.1	54.5



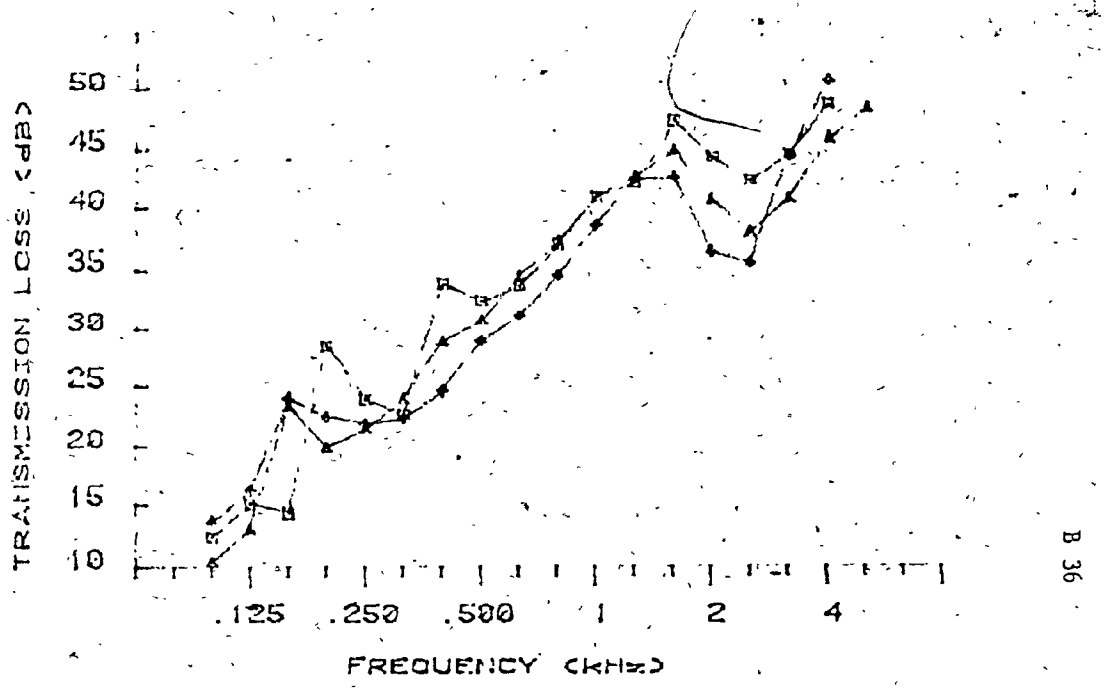
LEGEND

□ 0.54m^2 panel
Δ 2.32m^2 panel
◇ 3.93m^2 panel

FIGURE B35: TL FOR DOUBLE GYPROCK PANELS WITH A 0.15m SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM B

TRANSMISSION LOSS (dB)

FREQ. (Hz)	□	△	◇
100	11.5	9.4	12.6
125	14.0	12.2	15.1
160	13.4	22.5	23.1
200	37.3	18.8	21.6
250	23.1	20.6	21.0
315	21.8	23.1	21.5
400	32.9	27.8	23.7
500	31.4	29.6	27.8
630	32.8	33.9	30.1
800	36.8	36.1	33.6
1000	38.8	39.8	37.4
1250	41.1	41.7	41.4
1600	46.3	43.9	41.6
2000	43.4	39.6	35.4
2500	41.3	36.9	34.6
3150	43.2	39.7	43.5
4000	47.6	45.0	49.6
5000	54.6	47.3	54.5



LEGEND

□ 8.54m^2 panel

△ 2.32m^2 panel

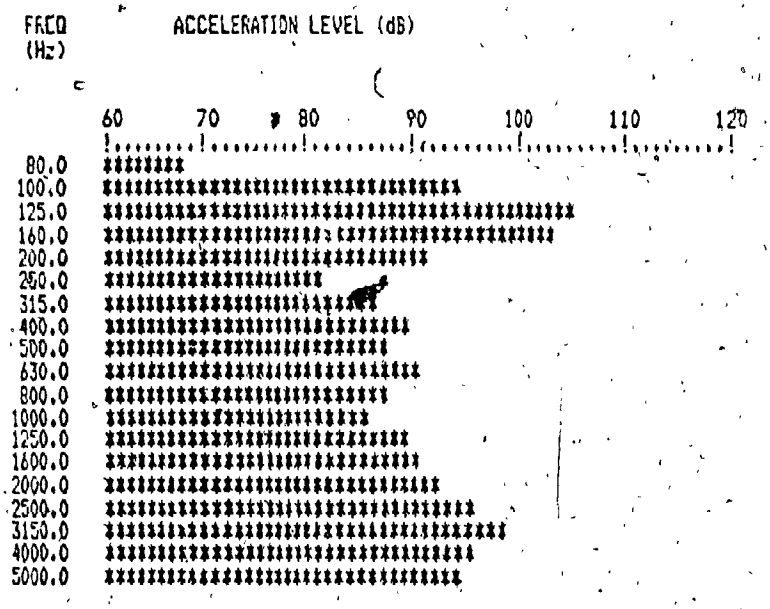
◇ 3.83m^2 panel

FIGURE B36: TL FOR DOUBLE GYPROCK PANELS WITH A 0.30m SILL AND WITHOUT DIFFUSERS, MOUNTED IN ROOM B

APPENDIX C

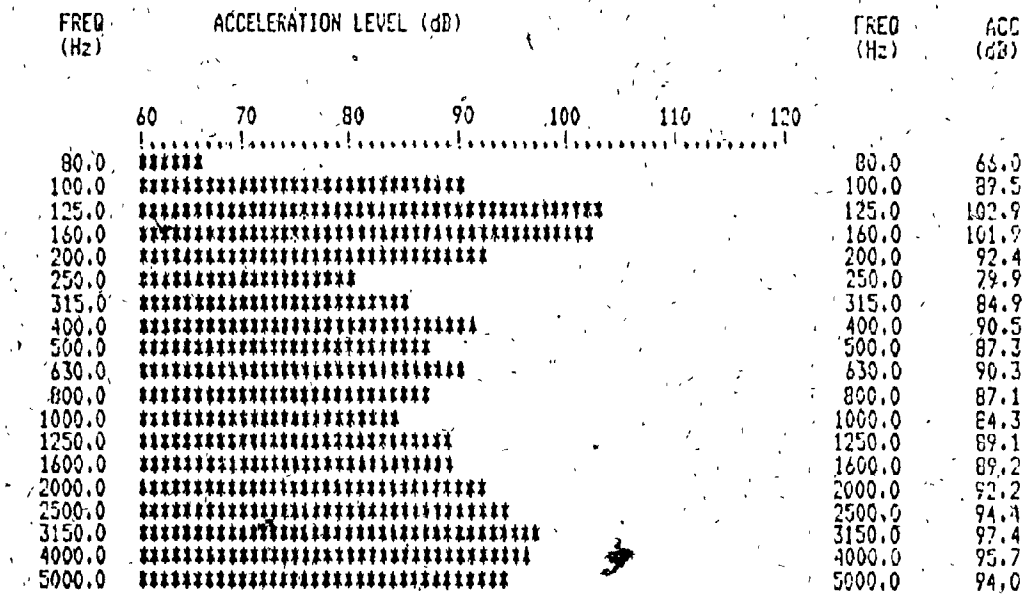
Graphs of Accelerometer Measurements for Each Test

List of Figures



FREQ (Hz)	ACC (dB)
80.0	68.4
100.0	93.7
125.0	104.9
160.0	102.7
200.0	91.2
250.0	81.4
315.0	85.6
400.0	89.4
500.0	87.1
630.0	89.9
800.0	87.1
1000.0	85.1
1250.0	88.9
1600.0	90.1
2000.0	91.6
2500.0	95.2
3150.0	98.0
4000.0	94.9
5000.0	94.1

RMS ACCELERATION LEVEL 32 sec LIN avg
tst009 29in glass in A room A receiving with diffuser



FREQ (Hz)	ACC (dB)
80.0	66.0
100.0	89.5
125.0	102.9
160.0	101.9
200.0	92.4
250.0	79.9
315.0	84.9
400.0	90.5
500.0	87.3
630.0	90.3
800.0	87.1
1000.0	84.3
1250.0	89.1
1600.0	89.2
2000.0	92.2
2500.0	94.1
3150.0	97.4
4000.0	95.7
5000.0	94.0

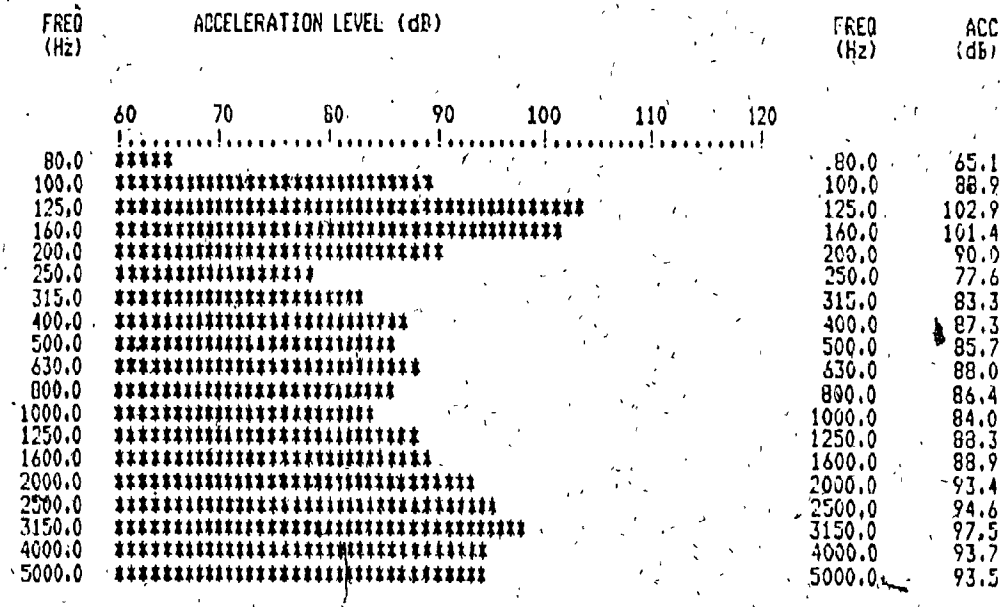
RMS ACCELERATION LEVEL 32 sec LIN avg
tst011 29in glass inA roomA receiving without diffusers

FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0	#######	80.0	66.7
100.0	################################	100.0	92.4
125.0	##	125.0	103.8
160.0	###	160.0	102.0
200.0	################################	200.0	90.6
250.0	######################	250.0	80.9
315.0	##########################	315.0	85.6
400.0	###############################	400.0	89.4
500.0	############################	500.0	86.7
630.0	################################	630.0	89.9
800.0	###########################	800.0	87.1
1000.0	##########################	1000.0	85.2
1250.0	############################	1250.0	89.1
1600.0	##############################	1600.0	89.9
2000.0	##################################	2000.0	91.4
2500.0	#####################################	2500.0	95.4
3150.0	##	3150.0	98.1
4000.0	###################################	4000.0	93.3
5000.0	##################################	5000.0	94.4

RMS ACCELERATION LEVEL 32 sec LIN avg
tst030 29in glass 6in baffle inA with diffusers

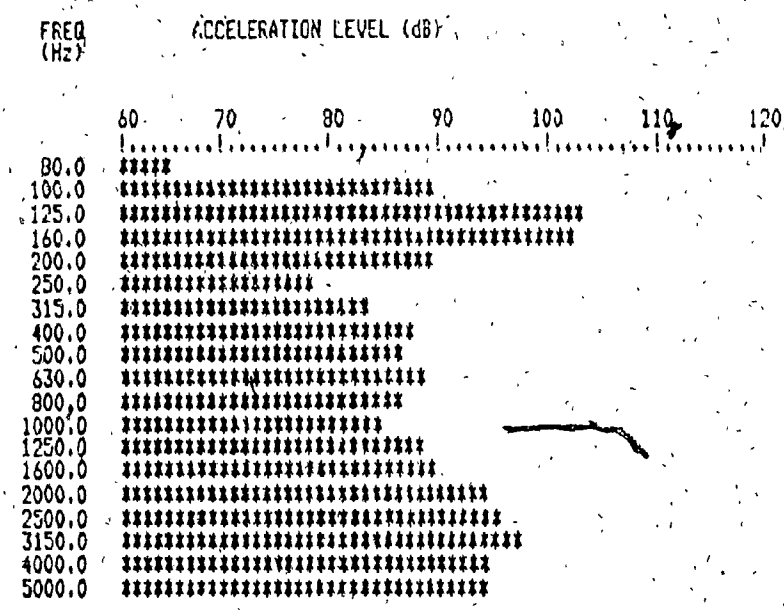
FREQ (Hz)	ACCELERATION LEVEL (dB)	FREQ (Hz)	ACC (dB)
	60 70 80 90 100 110 120		
80.0	######	80.0	66.3
100.0	############################	100.0	89.4
125.0	##	125.0	102.4
160.0	##	160.0	101.9
200.0	################################	200.0	92.1
250.0	#####################	250.0	80.9
315.0	##########################	315.0	84.9
400.0	##############################	400.0	90.0
500.0	###########################	500.0	86.7
630.0	##############################	630.0	89.5
800.0	###########################	800.0	87.6
1000.0	#########################	1000.0	84.7
1250.0	##############################	1250.0	89.7
1600.0	###########################	1600.0	88.9
2000.0	################################	2000.0	91.8
2500.0	##############################	2500.0	94.1
3150.0	##################################	3150.0	97.3
4000.0	################################	4000.0	95.0
5000.0	###############################	5000.0	93.9

RMS ACCELERATION LEVEL 32 sec LIN avg
tst029 29in glass 6in baffle in A-without diffusers



FREQ (Hz)	ACC (dB)
80.0	65.1
100.0	88.9
125.0	102.9
160.0	101.4
200.0	90.0
250.0	77.6
315.0	83.3
400.0	87.3
500.0	85.7
630.0	88.0
800.0	86.4
1000.0	84.0
1250.0	88.3
1600.0	88.9
2000.0	93.4
2500.0	94.6
3150.0	97.5
4000.0	93.7
5000.0	93.5

RMS ACCELERATION LEVEL 32 sec LIN avg
tst027 29in glass 12in baffle inA with diffusers



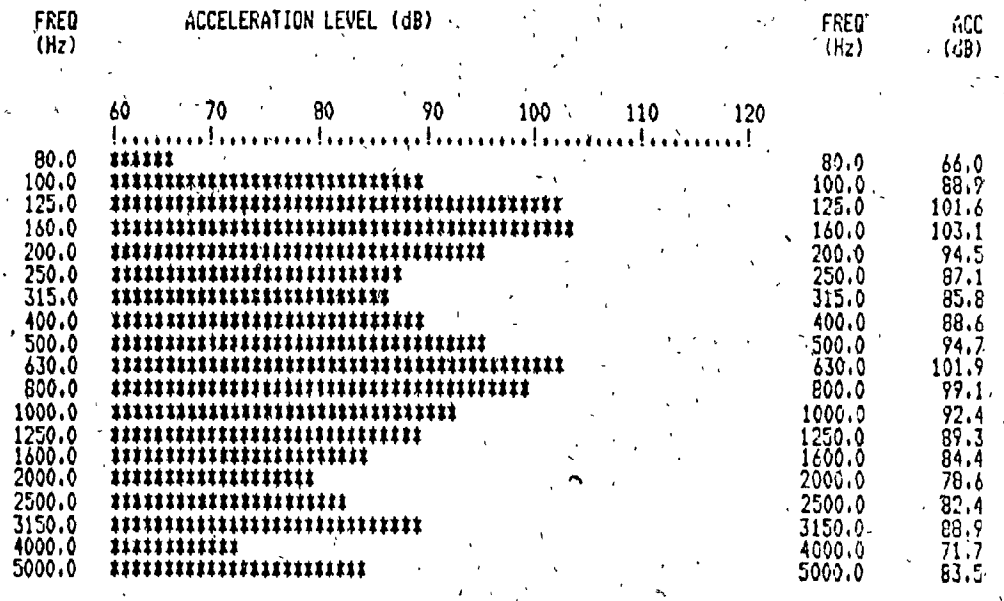
FREQ (Hz)	ACC (dB)
80.0	64.8
100.0	88.9
125.0	103.1
160.0	101.5
200.0	89.4
250.0	78.0
315.0	83.0
400.0	86.9
500.0	85.6
630.0	87.7
800.0	86.4
1000.0	84.0
1250.0	88.4
1600.0	88.8
2000.0	93.5
2500.0	94.6
3150.0	77.3
4000.0	93.6
5000.0	93.5

@ RMS ACCELERATION LEVEL 32 sec LIN avg
tstC28 29in glass 12in baffle inA without diffusers

FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0	#######	80.0	67.2
100.0	################################	100.0	92.4
125.0	##	125.0	103.6
160.0	##	160.0	103.2
200.0	################################	200.0	93.0
250.0	##########################	250.0	86.3
315.0	##########################	315.0	86.0
400.0	##############################	400.0	90.0
500.0	##################################	500.0	94.2
630.0	##	630.0	102.3
800.0	#####################################	800.0	95.9
1000.0	##################################	1000.0	93.0
1250.0	##############################	1250.0	88.5
1600.0	##########################	1600.0	84.5
2000.0	##################	2000.0	79.1
2500.0	######################	2500.0	82.1
3150.0	##############################	3150.0	83.9
4000.0	###########	4000.0	71.7
5000.0	########################	5000.0	83.4

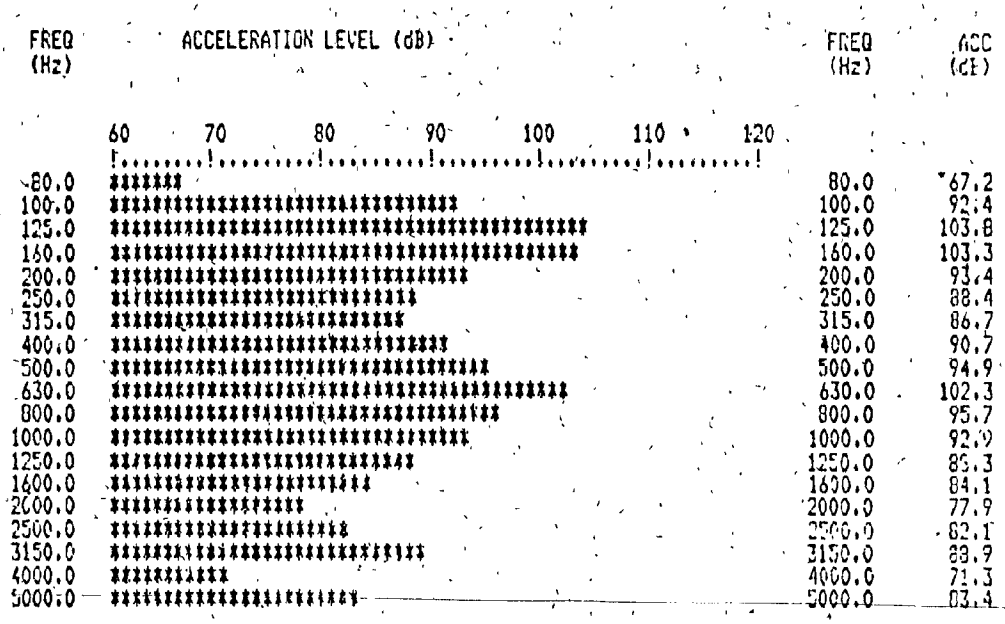
1st 026

RMS ACCELERATION LEVEL 32 sec LIN avg
29in gyp room A receiving with diffusers



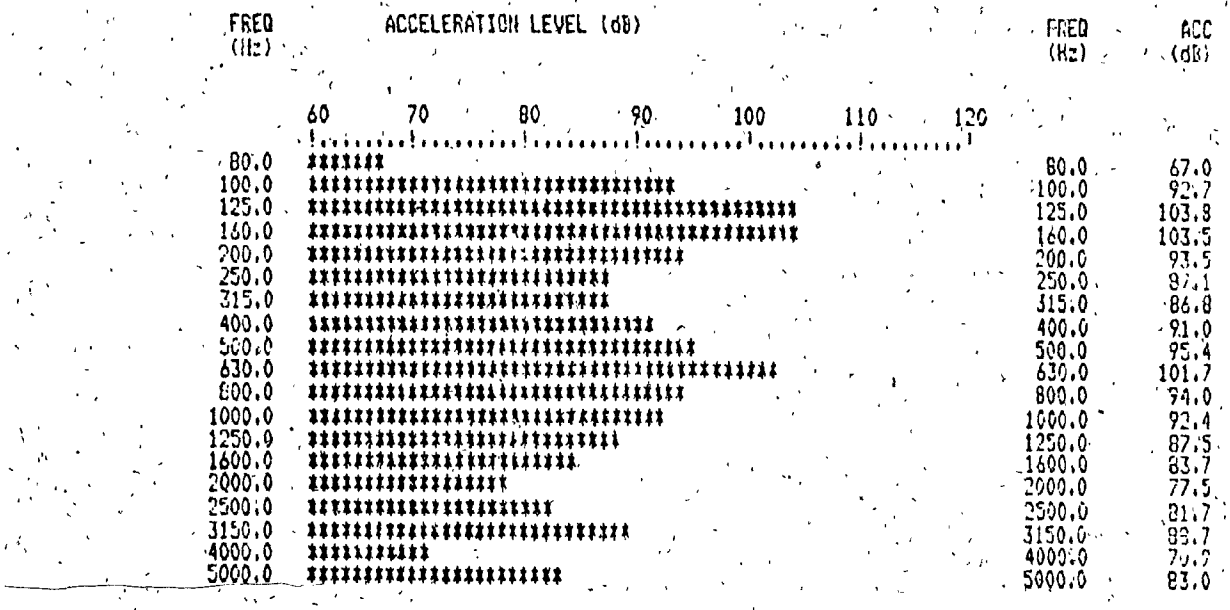
FREQ (Hz)	ACC (dB)
80.0	66.0
100.0	88.9
125.0	101.6
160.0	103.1
200.0	94.5
250.0	87.1
315.0	85.8
400.0	88.6
500.0	94.7
630.0	101.9
800.0	99.1
1000.0	92.4
1250.0	89.3
1600.0	84.4
2000.0	78.6
2500.0	82.4
3150.0	88.9
4000.0	71.7
5000.0	83.5

tst 017 RMS ACCELERATION LEVEL 32 sec LIN avg
29in gap mA receiving without diffusers



tst 024

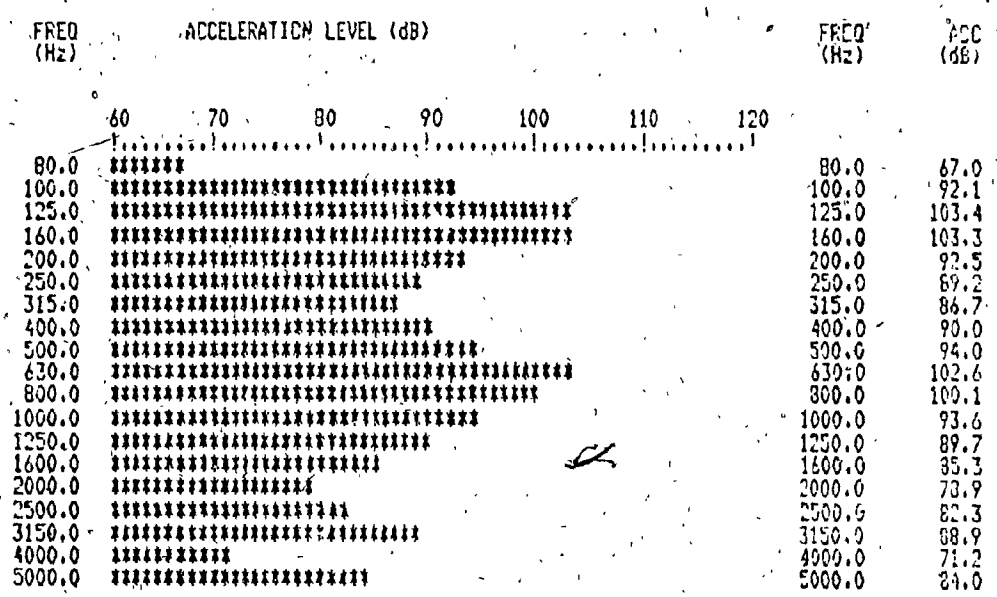
RMS ACCELERATION LEVEL 32 sec LIN avg
29in sqp 6in baffle with diffusers 110A



FREQ (Hz)	ACC (dB)
80.0	67.0
100.0	92.7
125.0	103.8
160.0	103.5
200.0	93.5
250.0	87.1
315.0	86.8
400.0	91.0
500.0	95.4
630.0	101.7
800.0	94.0
1000.0	92.4
1250.0	87.5
1600.0	83.7
2000.0	77.5
2500.0	81.7
3150.0	88.7
4000.0	79.2
5000.0	83.0

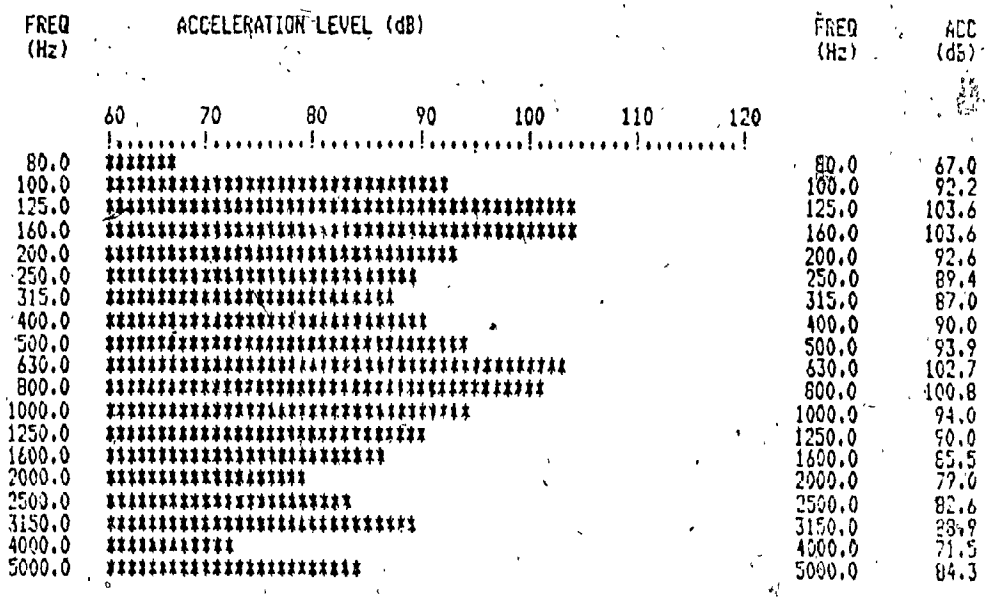
fst 073

RMS ACCELERATION LEVEL 32 sec LIN avg
29in 6in baffle inA without diffusers



tst 021

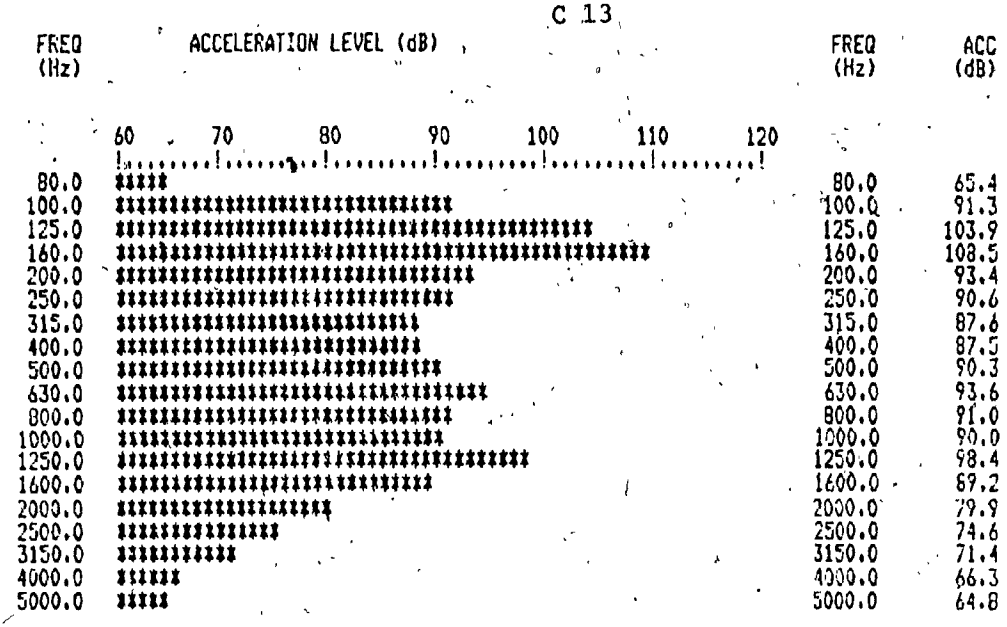
RMS ACCELERATION LEVEL 32 sec LIN avg
29in sup 12in baffle inA with diffuser



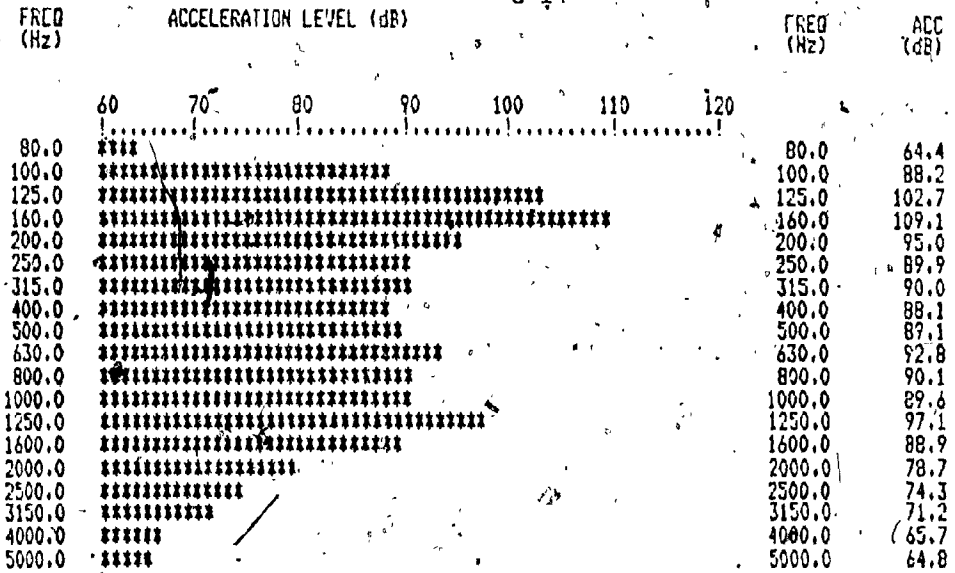
FREQ (Hz)	ACC (dB)
80.0	67.0
100.0	92.2
125.0	103.6
160.0	103.6
200.0	92.6
250.0	89.4
315.0	87.0
400.0	90.0
500.0	93.9
630.0	102.7
800.0	100.8
1000.0	94.0
1250.0	90.0
1600.0	85.5
2000.0	79.0
2500.0	82.6
3150.0	88.9
4000.0	71.5
5000.0	84.3

1st022

RMS ACCELERATION LEVEL 32 sec LIN avg
29in sup, 12in baffle inA without diffuser

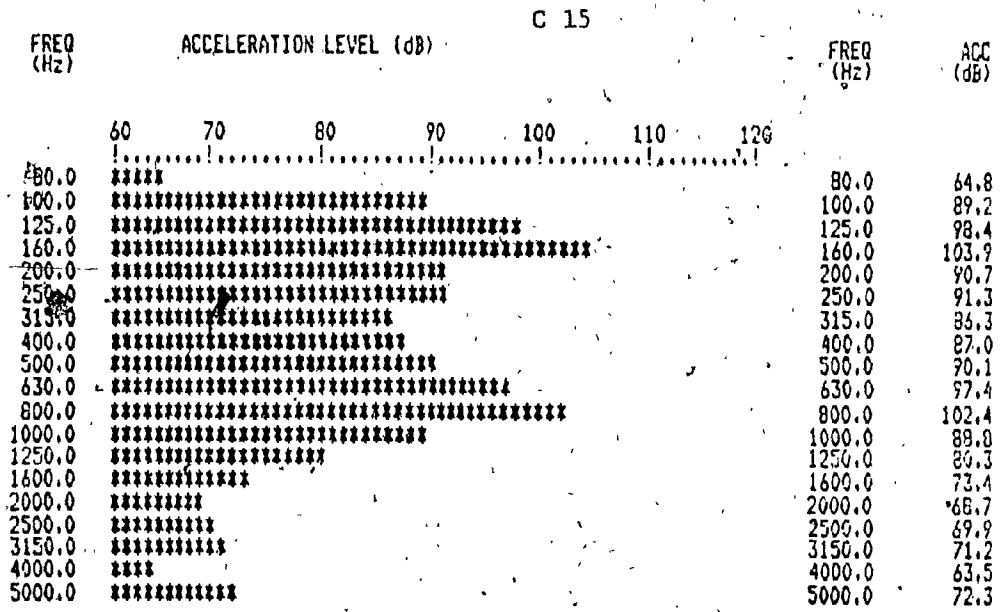


RMS ACCELERATION LEVEL 32 sec LIN avg
tst037 29in 2xsyp inA roobA receiving with diffusers



FREQ (Hz)	ACC (dB)
80.0	64.4
100.0	88.2
125.0	102.7
160.0	109.1
200.0	95.0
250.0	89.9
315.0	90.0
400.0	88.1
500.0	89.1
630.0	92.8
800.0	90.1
1000.0	89.6
1250.0	97.1
1600.0	88.9
2000.0	78.7
2500.0	74.3
3150.0	71.2
4000.0	65.7
5000.0	64.8

RMS ACCELERATION LEVEL 32 sec LIN avg
st036 29in 2xsyp inA roomA receiving without diffusers

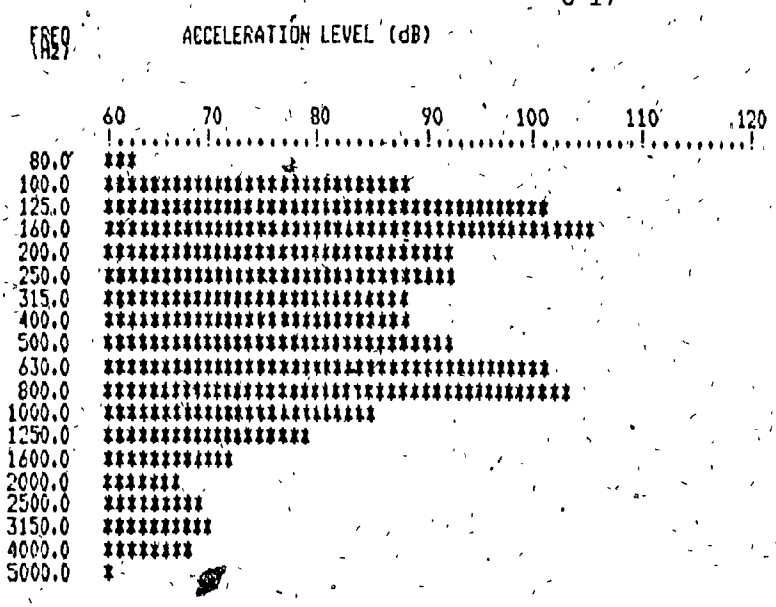


FREQ (Hz)	ACC (dB)
80.0	64.8
100.0	89.2
125.0	98.4
160.0	103.9
200.0	90.7
250.0	91.3
315.0	86.3
400.0	87.0
500.0	90.1
630.0	97.4
800.0	102.4
1000.0	88.8
1250.0	89.3
1600.0	73.4
2000.0	68.7
2500.0	69.9
3150.0	71.2
4000.0	63.5
5000.0	72.3

RMS ACCELERATION LEVEL 32 sec LIN avg
tst033 29in 2xsyp 6in baffle inA with diffusers

FREQ (Hz)	ACCELERATION LEVEL (dB)	FREQ (Hz)	ACC (dB)
	60 70 80 90 100 110 120		
80.0	###	80.0	63.0
100.0	##########################	100.0	85.3
125.0	###################################	125.0	97.0
160.0	##	160.0	104.9
200.0	################################	200.0	91.7
250.0	##############################	250.0	88.9
315.0	###########################	315.0	87.0
400.0	############################	400.0	87.7
500.0	################################	500.0	90.0
630.0	###################################	630.0	96.4
800.0	##	800.0	101.8
1000.0	##############################	1000.0	89.3
1250.0	###################	1250.0	79.1
1600.0	###########	1600.0	72.4
2000.0	########	2000.0	67.8
2500.0	#########	2500.0	69.0
3150.0	###########	3150.0	71.0
4000.0	####	4000.0	64.0
5000.0	###########	5000.0	71.7

RMS ACCELERATION LEVEL 32 sec LIN avg
tst034 29in 2xgyp 6in baffle inA without diffusers

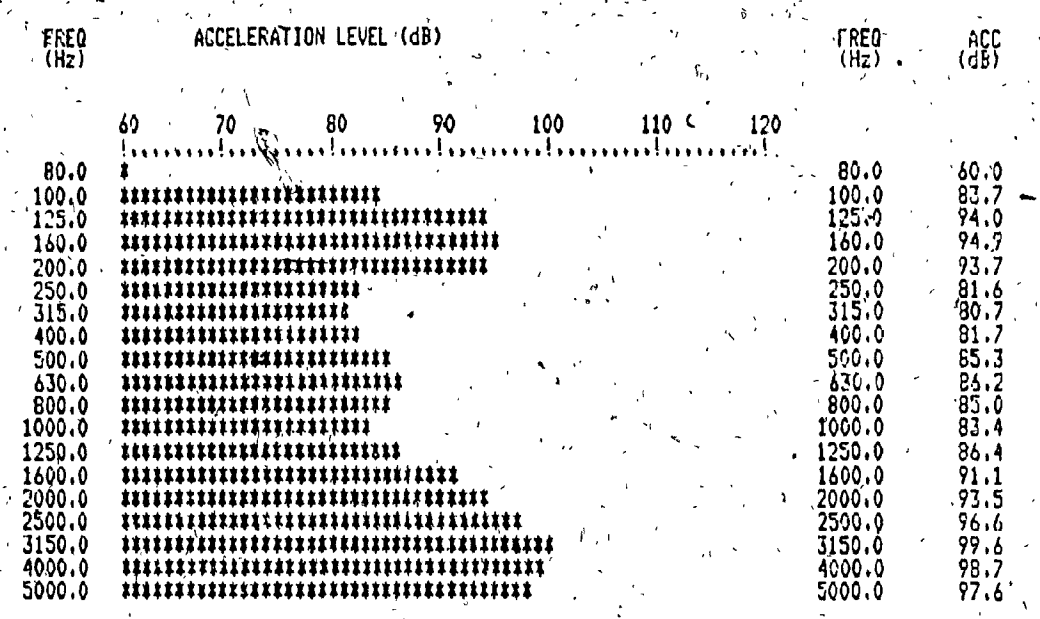


FREQ (Hz)	ACC (dB)
80.0	63.0
100.0	83.3
125.0	101.4
160.0	105.4
200.0	91.8
250.0	91.8
315.0	87.6
400.0	88.4
500.0	92.4
630.0	100.8
800.0	103.1
1000.0	85.0
1250.0	79.0
1600.0	71.9
2000.0	67.4
2500.0	69.4
3150.0	70.1
4000.0	67.9
5000.0	60.0

RMS ACCELERATION LEVEL 32 sec LIN avg
29in 2Xgyp 12inbaffle inA with diffusers

FREQ (Hz)	ACCELERATION LEVEL (dB)	FREQ (Hz)	ACC (dB)
	60 70 80 90 100 110 120		
80.0	##	80.0	62.4
100.0	##########################	100.0	85.1
125.0	##	125.0	99.7
160.0	##	160.0	106.0
200.0	##################################	200.0	93.7
250.0	###############################	250.0	90.4
315.0	###############################	315.0	89.5
400.0	############################	400.0	88.1
500.0	##################################	500.0	93.1
630.0	###	630.0	102.0
800.0	###	800.0	102.0
1000.0	########################	1000.0	83.4
1250.0	###################	1250.0	78.1
1600.0	############	1600.0	71.7
2000.0	######	2000.0	66.3
2500.0	########	2500.0	68.3
3150.0	###########	3150.0	70.9
4000.0	########	4000.0	66.5
5000.0	#	5000.0	60.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst031 29in 2Xsys 12in baffle in A without diffusers

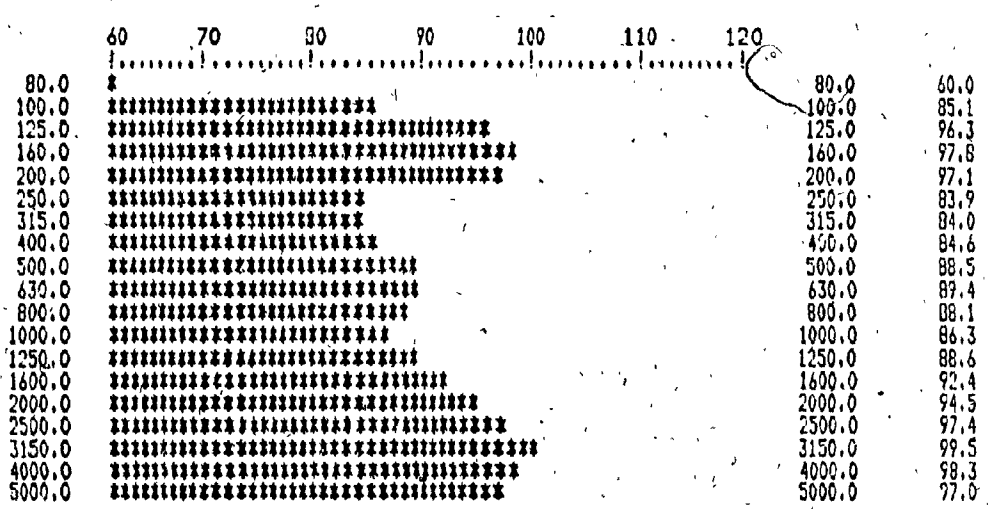


RMS ACCELERATION LEVEL 32 sec LIN avg
tst045 29in glass inB roB receiving with diffusers

FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0	*	80.0	61.0
100.0	**********	100.0	86.7
125.0	**********	125.0	97.0
160.0	**********	160.0	98.2
200.0	**********	200.0	96.9
250.0	*********	250.0	84.3
315.0	*********	315.0	82.9
400.0	*********	400.0	85.2
500.0	**********	500.0	89.4
630.0	**********	630.0	89.4
800.0	**********	800.0	87.7
1000.0	*********	1000.0	86.4
1250.0	**********	1250.0	88.9
1600.0	**********	1600.0	92.1
2000.0	**********	2000.0	94.9
2500.0	**********	2500.0	97.3
3150.0	**********	3150.0	99.7
4000.0	**********	4000.0	97.9
5000.0	**********	5000.0	97.3

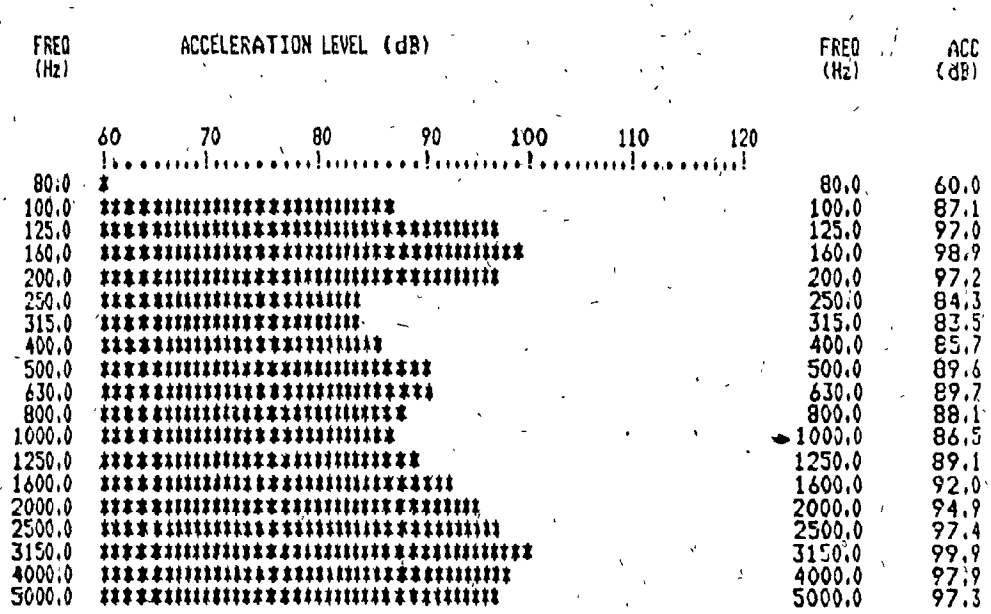
RMS ACCELERATION LEVEL 32 sec LIN avg
tst043 29in glass inB rmB receiving without diffusers

30/7/90



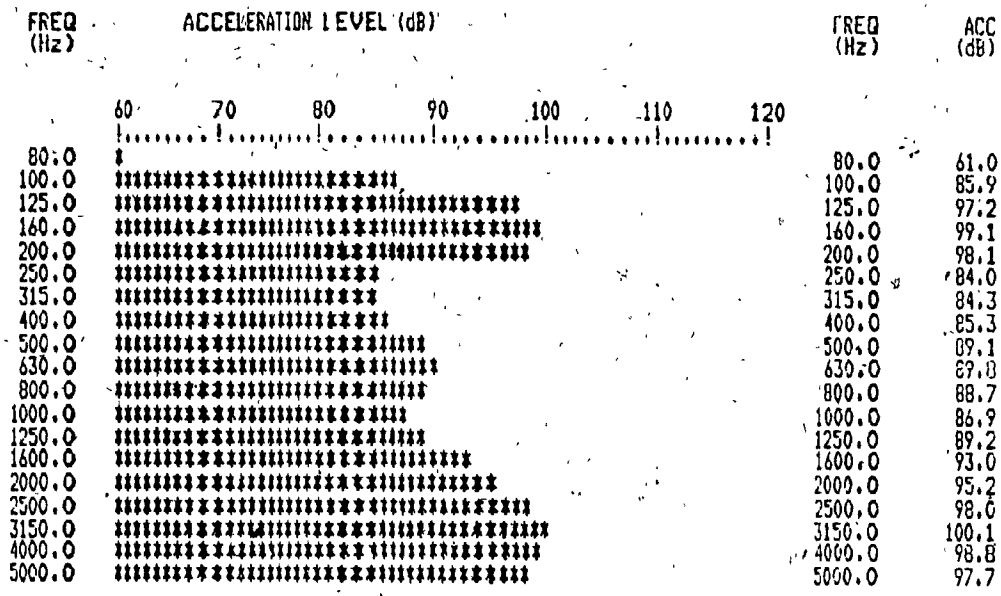
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	85.1
125.0	96.3
160.0	97.8
200.0	97.1
250.0	83.9
315.0	84.0
400.0	84.6
500.0	88.5
630.0	89.4
800.0	88.1
1000.0	86.3
1250.0	88.6
1600.0	92.4
2000.0	94.5
2500.0	97.4
3150.0	99.5
4000.0	98.3
5000.0	97.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst041 29in glass 6in baffle inB with diffusers

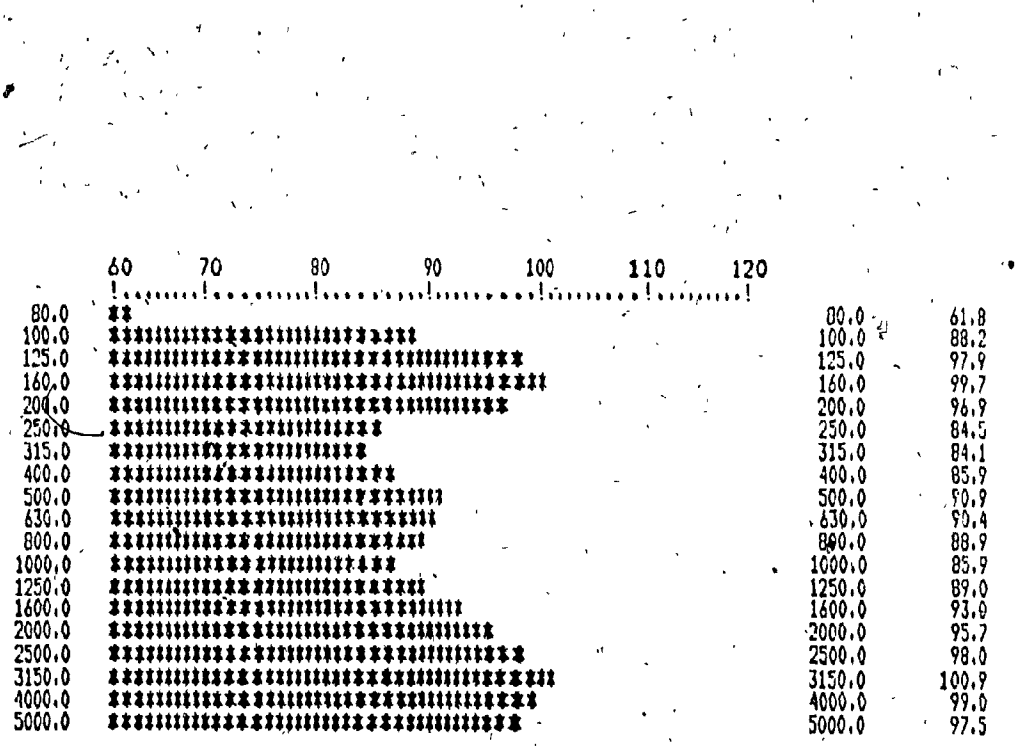


FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	87.1
125.0	97.0
160.0	98.9
200.0	97.2
250.0	84.3
315.0	83.5
400.0	85.7
500.0	89.6
630.0	89.7
800.0	88.1
1000.0	86.5
1250.0	89.1
1600.0	92.0
2000.0	94.9
2500.0	97.4
3150.0	99.9
4000.0	97.9
5000.0	97.3

RMS ACCELERATION LEVEL 32 sec LIN avg
tst042 29in glass 6in baffle inB without diffusers

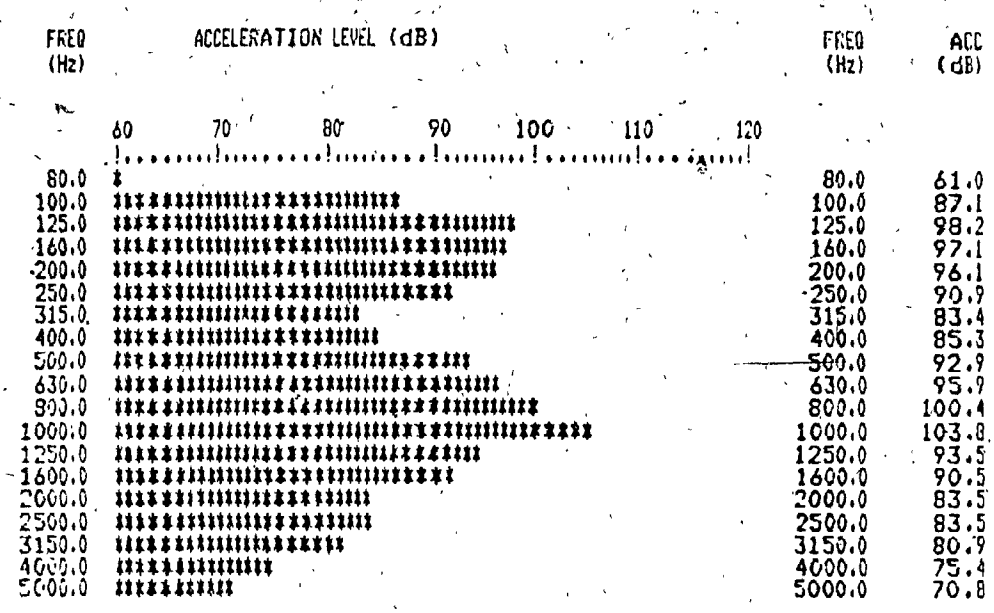


RMS ACCELERATION LEVEL 32 sec LIN avg
tst040 29in glass 12in baffle inB with diffusers

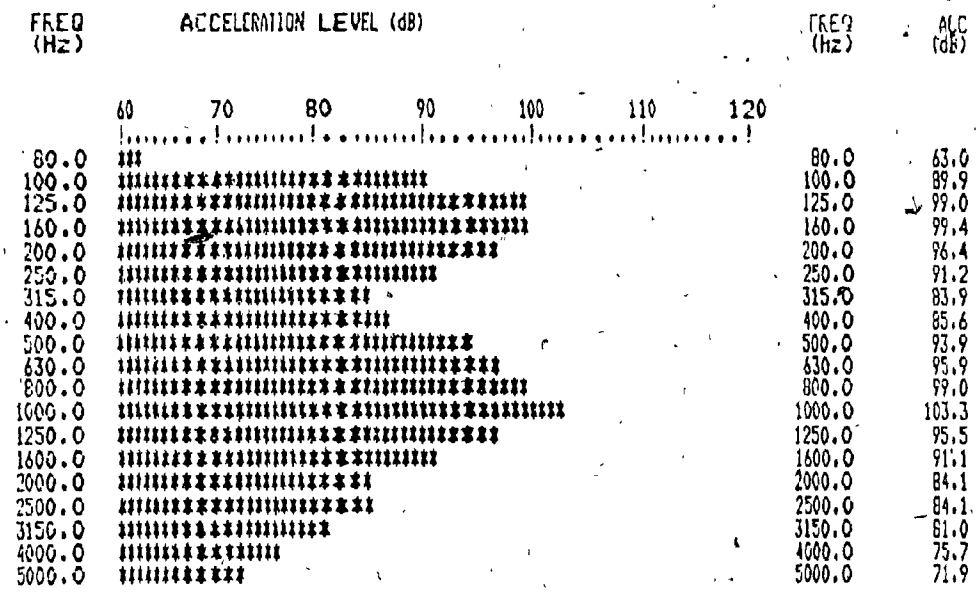


FREQ (Hz)	ACC (dB)
80.0	61.8
100.0	88.2
125.0	97.9
160.0	99.7
200.0	96.9
250.0	84.5
315.0	84.1
400.0	85.9
500.0	90.9
630.0	90.4
800.0	88.9
1000.0	85.9
1250.0	89.0
1600.0	93.0
2000.0	95.7
2500.0	98.0
3150.0	100.9
4000.0	99.0
5000.0	97.5

RMS ACCELERATION LEVEL 32 sec LIN avg
tst039 29in glass 12in baffle inB without diffusers

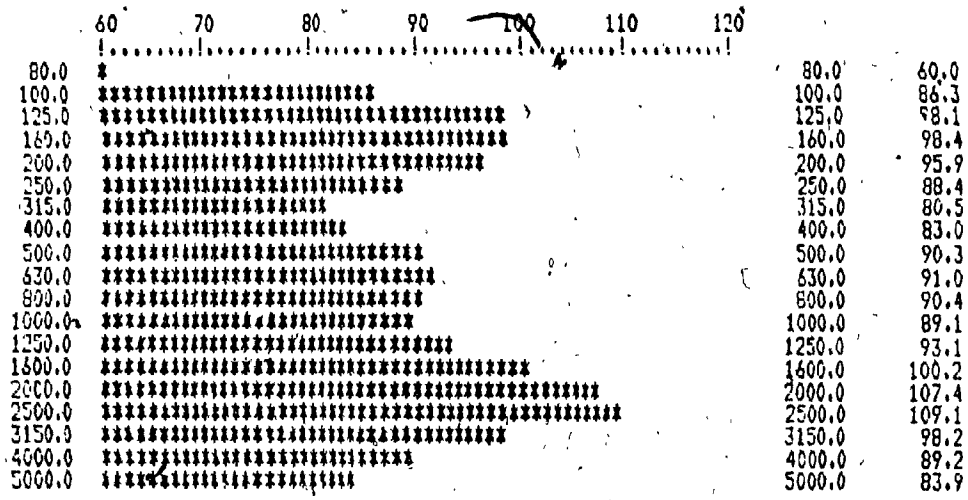


RMS ACCELERATION LEVEL 32 sec LIN avg
tst054 29in sup inB roomB receiver with diffusers



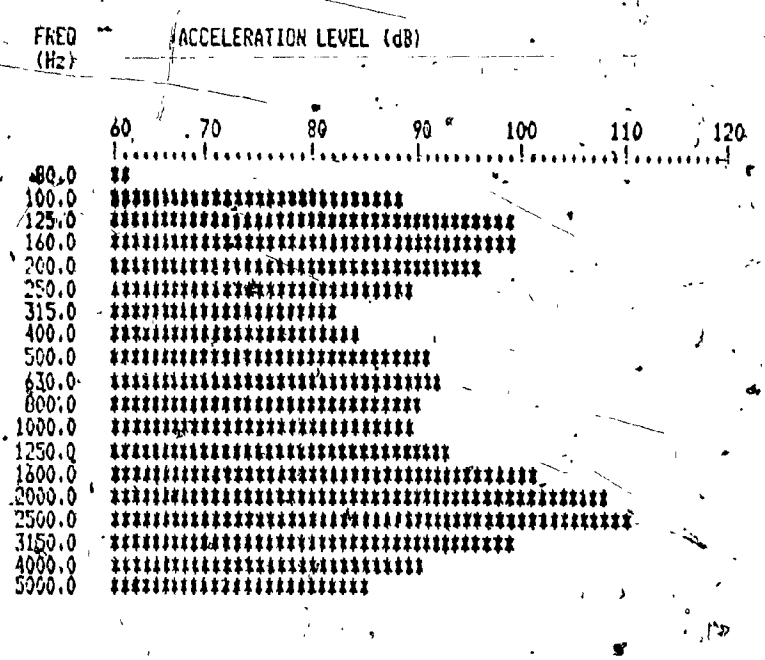
FREQ (Hz)	ALC (dB)
80.0	63.0
100.0	89.9
125.0	99.0
160.0	99.4
200.0	96.4
250.0	91.2
315.0	83.9
400.0	85.6
500.0	93.9
630.0	95.9
800.0	99.0
1000.0	103.3
1250.0	95.5
1600.0	91.1
2000.0	84.1
2500.0	84.1
3150.0	81.0
4000.0	75.7
5000.0	71.9

RMS ACCELERATION LEVEL 32 sec LIN avg
tst052 29in dyp inB roomB receiving without diffusers



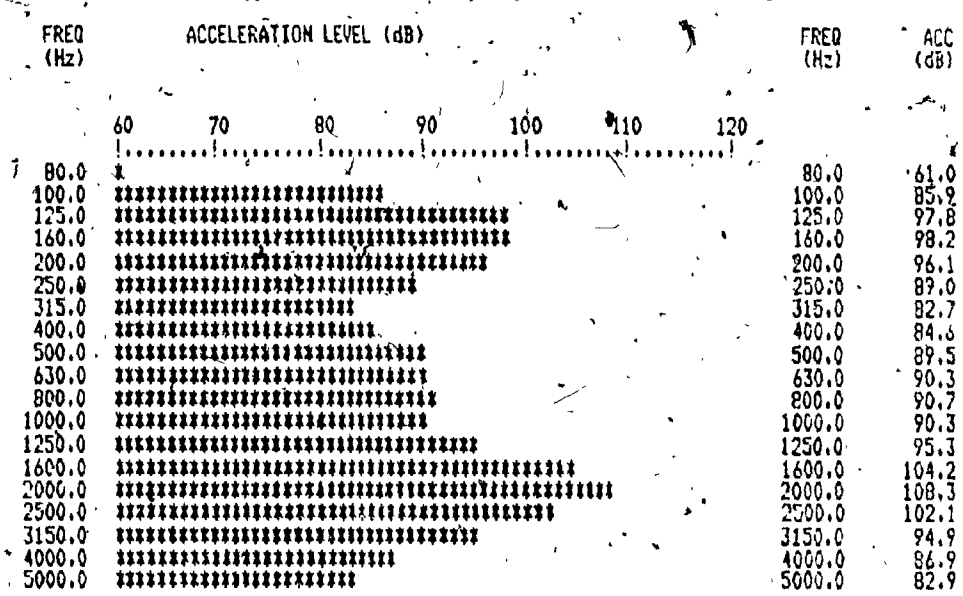
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	86.3
125.0	98.1
160.0	98.4
200.0	95.9
250.0	88.4
315.0	80.5
400.0	83.0
500.0	90.3
630.0	91.0
800.0	90.4
1000.0	89.1
1250.0	93.1
1600.0	100.2
2000.0	107.4
2500.0	109.1
3150.0	98.2
4000.0	89.2
5000.0	83.9

RMS ACCELERATION LEVEL 32 sec LIN avg
tst049 29in gap\6in baffle inB with diffusers
07/31/80

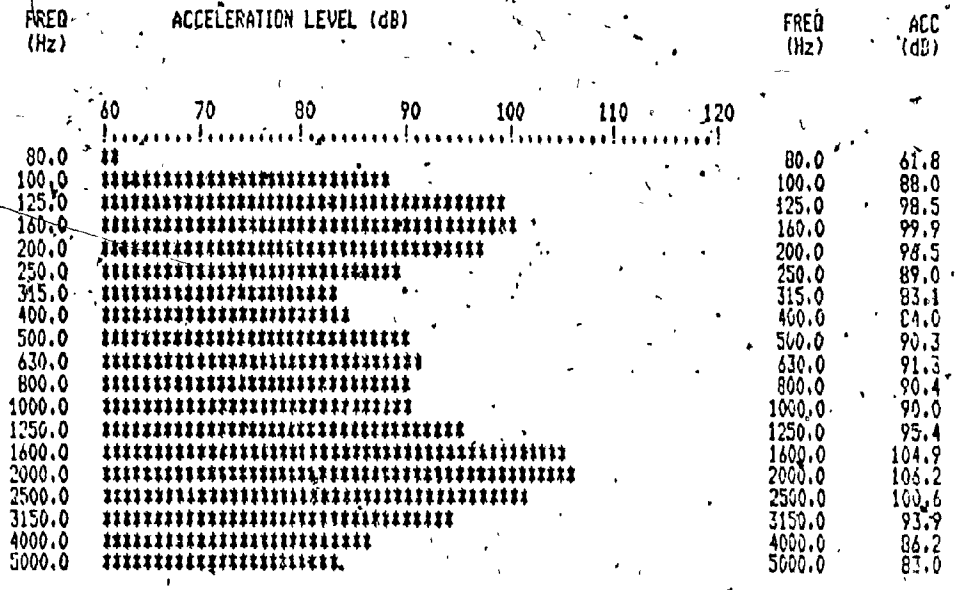


FREQ (Hz)	ACC (dB)
80.0	82.4
100.0	86.2
125.0	98.8
160.0	99.1
200.0	95.9
250.0	89.0
315.0	81.6
400.0	83.7
500.0	91.4
630.0	91.8
800.0	90.4
1000.0	88.9
1250.0	93.4
1600.0	100.7
2000.0	107.6
2500.0	109.6
3150.0	98.7
4000.0	89.9
5000.0	84.6

RMS ACCELERATION LEVEL 32 sec LIN avg
tst050 29in sup 6in baffle inB without diffusers
07/31/80

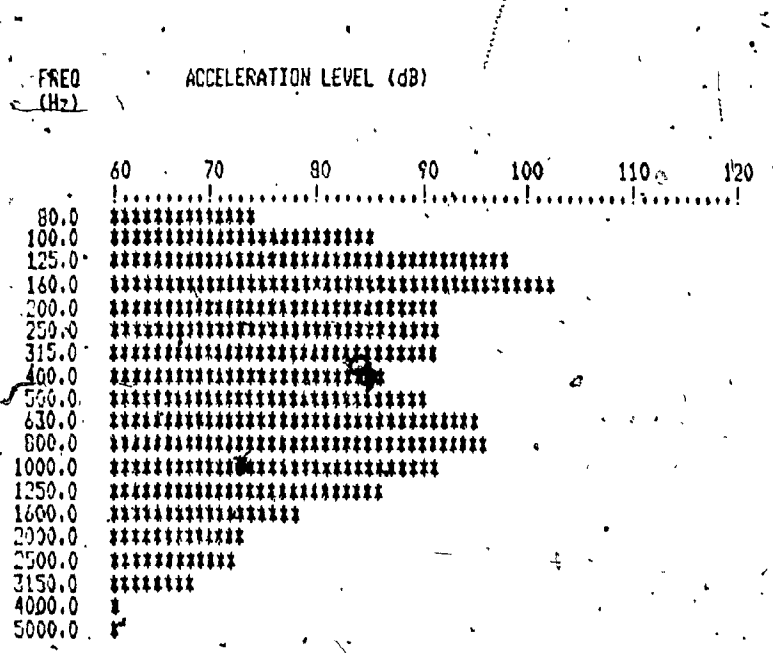


RMS ACCELERATION LEVEL 30 sec LIN avg
tst048 29in gyp 12in baffle in8 with diffusers
07/31/80



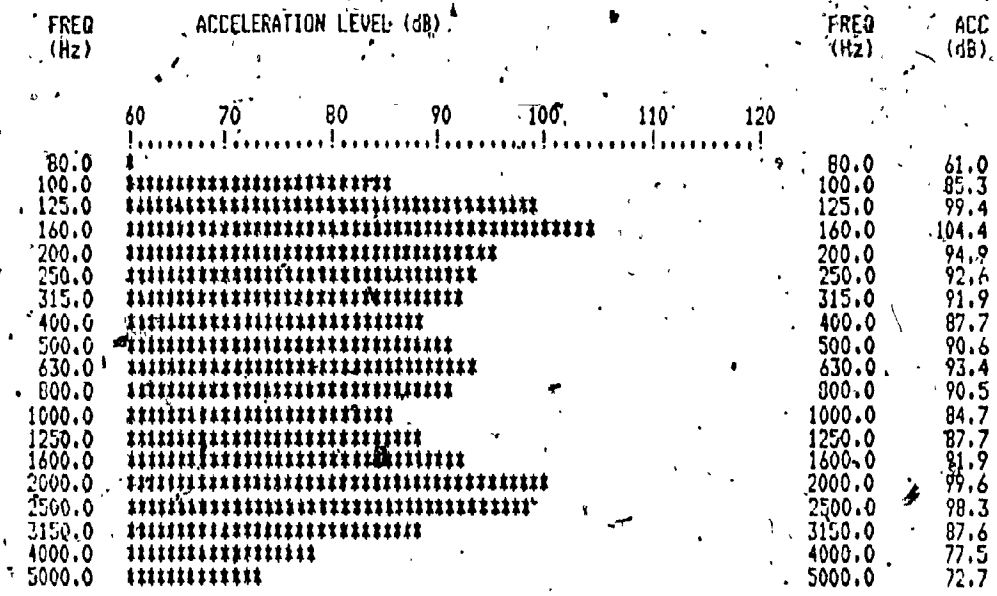
FREQ (Hz)	ACC (dB)
80.0	61.8
100.0	88.0
125.0	98.5
160.0	99.9
200.0	98.5
250.0	89.0
315.0	83.1
400.0	84.0
500.0	90.3
630.0	91.3
800.0	90.4
1000.0	90.0
1250.0	95.4
1600.0	104.9
2000.0	106.2
2500.0	100.6
3150.0	93.9
4000.0	86.2
5000.0	83.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst047 29in sqr 12in baffle in8 without diffusers
07/31/80



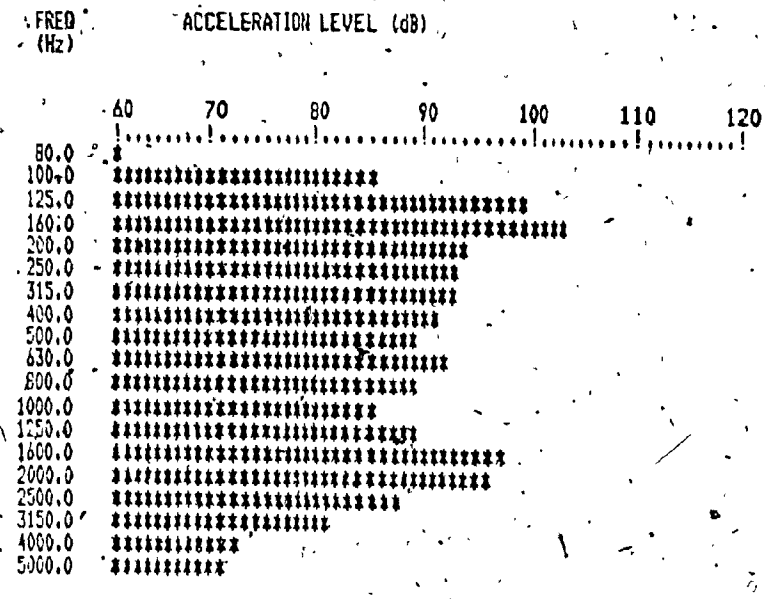
FREQ (Hz)	ACC (dB)
80.0	73.5
100.0	84.6
125.0	98.4
160.0	102.3
200.0	91.1
250.0	90.7
315.0	91.0
400.0	85.5
500.0	90.3
630.0	95.0
800.0	95.7
1000.0	91.4
1250.0	85.5
1600.0	77.6
2000.0	73.2
2500.0	72.0
3150.0	68.1
4000.0	61.0
5000.0	60.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst059 29in 2xsyp inB roopB receiving WITH DIFFUSERS



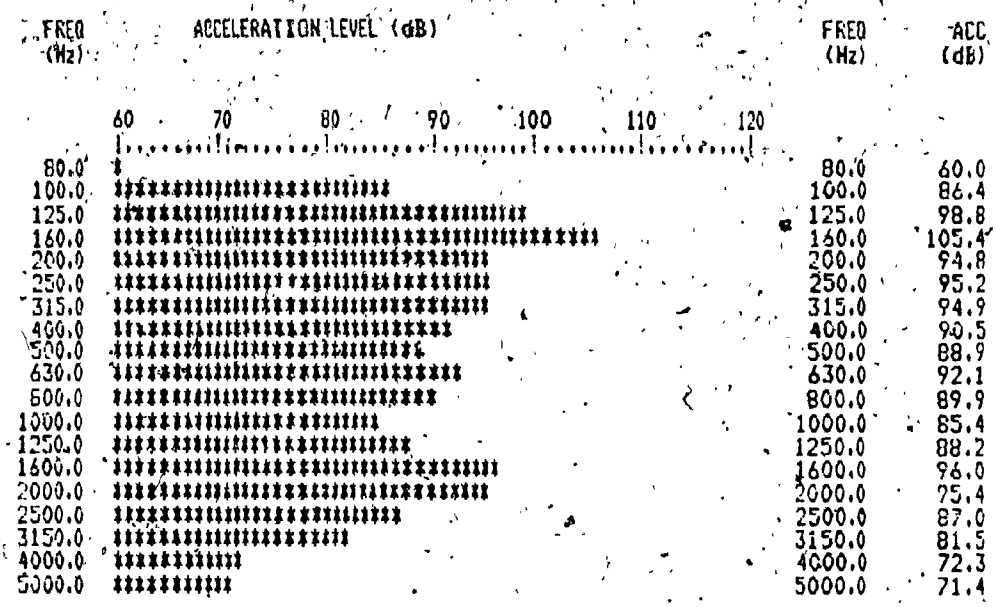
FREQ (Hz)	ACC (dB)
80.0	61.0
100.0	85.3
125.0	99.4
160.0	104.4
200.0	94.9
250.0	92.6
315.0	91.9
400.0	87.7
500.0	90.6
630.0	93.4
800.0	90.5
1000.0	84.7
1250.0	87.7
1600.0	91.9
2000.0	99.6
2500.0	98.3
3150.0	87.6
4000.0	77.5
5000.0	72.7

RMS ACCELERATION LEVEL 32 sec LIN avg
tst061 29in 2xgyp inB roomB receiving witout diffusers



FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	84.7
125.0	98.9
160.0	103.3
200.0	94.2
250.0	93.0
315.0	92.6
400.0	91.0
500.0	88.9
630.0	92.4
800.0	89.4
1000.0	85.4
1250.0	89.0
1600.0	96.6
2000.0	95.8
2500.0	86.9
3150.0	81.1
4000.0	72.0
5000.0	70.7

RMS ACCELERATION LEVEL 32 sec LIN avg
tst058 29in 2xgyp 6in baffle inB with diffusers
08/01/80

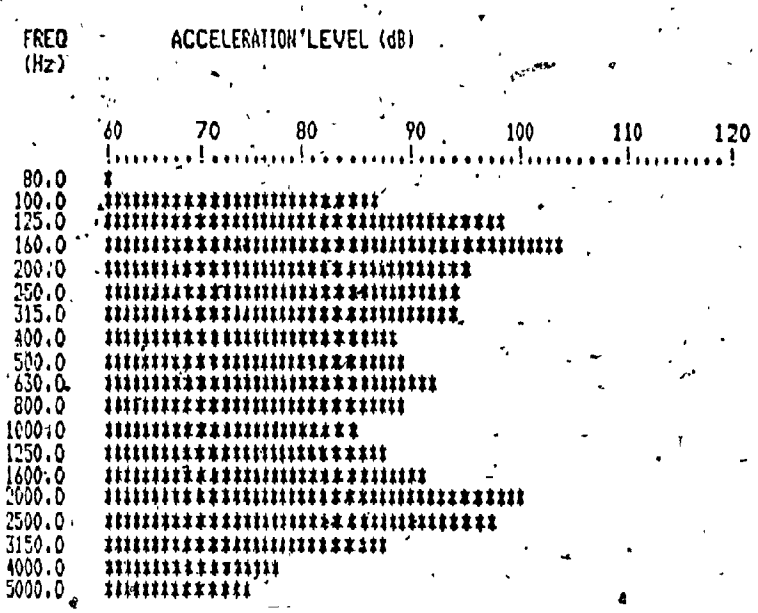


FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	86.4
125.0	98.8
160.0	105.4
200.0	94.8
250.0	95.2
315.0	94.9
400.0	90.5
500.0	88.9
630.0	92.1
800.0	89.9
1000.0	85.4
1250.0	88.2
1600.0	96.0
2000.0	95.4
2500.0	87.0
3150.0	81.5
4000.0	72.3
5000.0	71.4

RMS ACCELERATION LEVEL 32 sec LIN avg
tst057 29in 2xgyp 6in baffle inB without diffusers
08/01/80

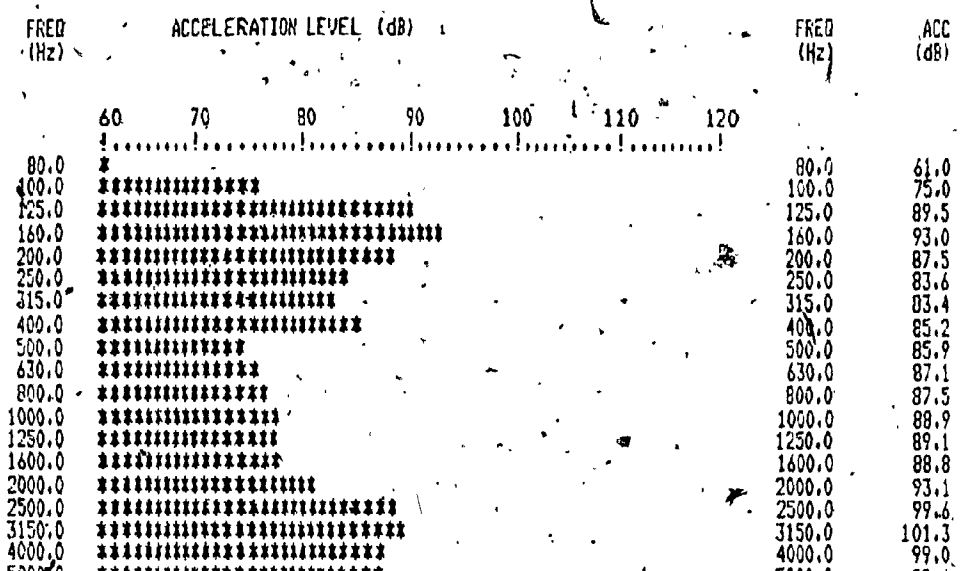
FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0		80.0	60.0
100.0	#####	100.0	80.5
125.0	##########	125.0	95.9
160.0	##########	160.0	100.5
200.0	#########	200.0	92.5
250.0	#########	250.0	89.9
315.0	#########	315.0	88.9
400.0	########	400.0	85.1
500.0	########	500.0	87.1
630.0	########	630.0	89.9
800.0	########	800.0	86.4
1000.0	######	1000.0	81.7
1250.0	########	1250.0	84.9
1600.0	########	1600.0	88.8
2000.0	##########	2000.0	98.0
2500.0	##########	2500.0	95.4
3150.0	########	3150.0	84.5
4000.0	#####	4000.0	74.7
5000.0	#####	5000.0	71.4

RMS ACCELERATION LEVEL 32 sec LIN avg
tst055 29in 2xdvp 12in baffle inB with diffusers
08/01/80



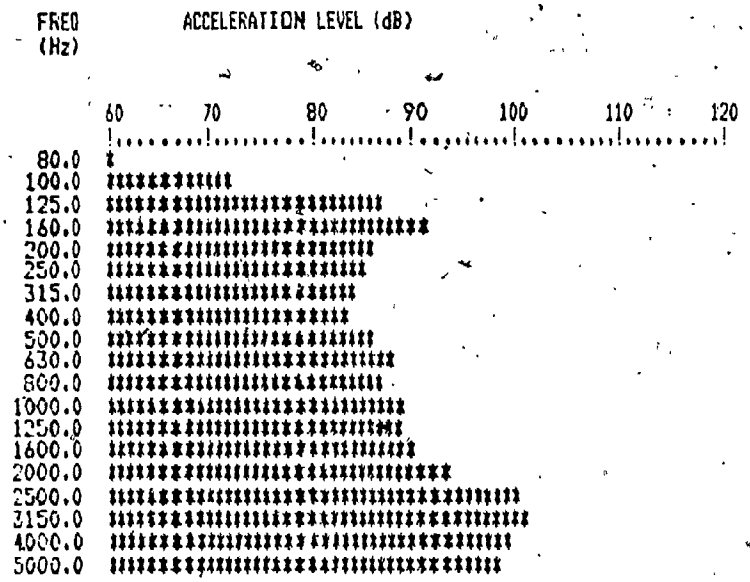
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	86.0
125.0	98.1
160.0	103.9
200.0	94.6
250.0	94.4
315.0	94.2
400.0	87.5
500.0	89.4
630.0	92.0
800.0	88.9
1000.0	84.0
1250.0	86.7
1600.0	90.9
2000.0	99.9
2500.0	97.4
3150.0	87.0
4000.0	76.7
5000.0	73.8

RMS ACCELERATION LEVEL 32 sec LIN avg
tst056 29in 2xsyp 12in baffle inB without diffusers
08/01/80



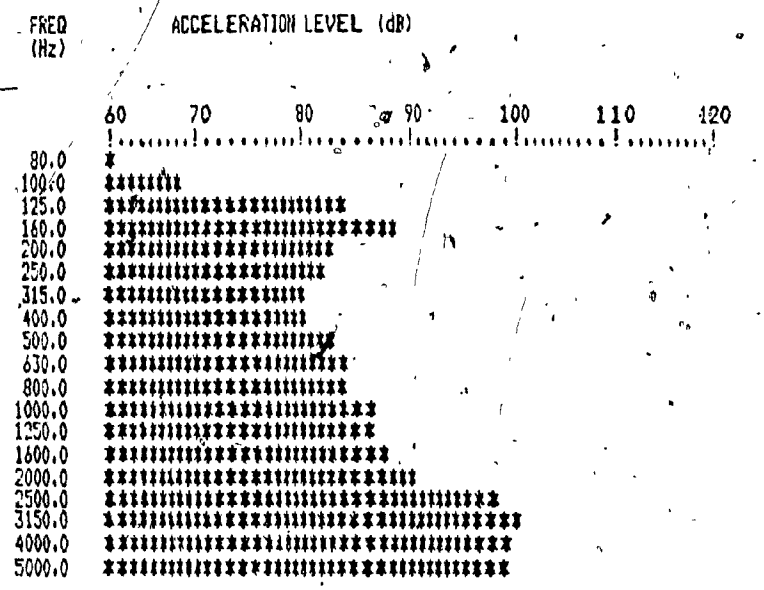
FREQ (Hz)	ACC (dB)
80.0	61.0
100.0	75.0
125.0	89.5
160.0	93.0
200.0	87.5
250.0	83.6
315.0	83.4
400.0	85.2
500.0	85.9
630.0	87.1
800.0	87.5
1000.0	88.9
1250.0	89.1
1600.0	88.8
2000.0	93.1
2500.0	99.6
3150.0	101.3
4000.0	99.0
5000.0	98.6

RMS ACCELERATION LEVEL 32 sec LIN avg
tst070 60in glass inA roomA receiving with diffusers



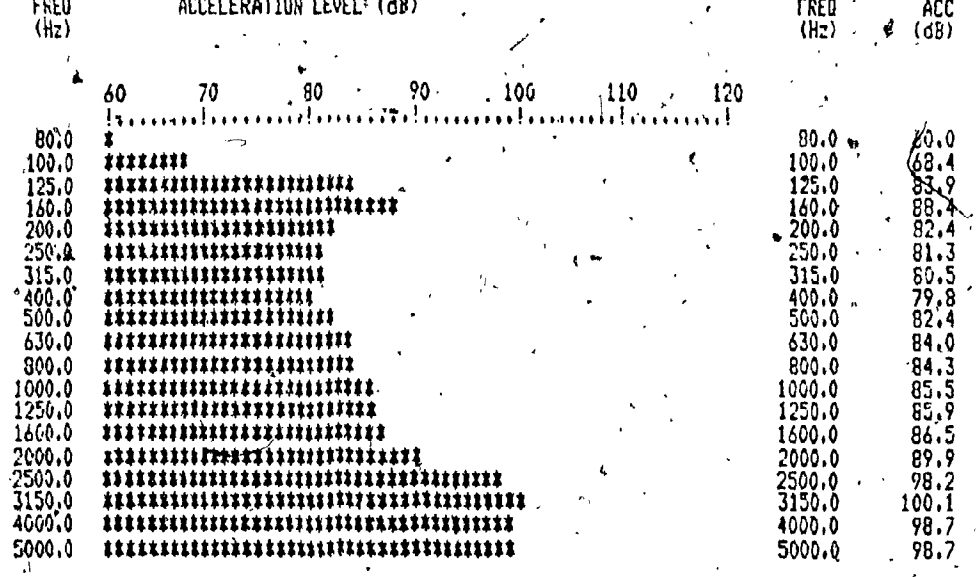
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	71.7
125.0	86.7
160.0	91.4
200.0	85.9
250.0	84.5
315.0	83.7
400.0	83.1
500.0	85.8
630.0	87.5
800.0	87.3
1000.0	88.6
1250.0	88.9
1600.0	89.5
2000.0	92.7
2500.0	99.5
3150.0	101.0
4000.0	98.9
5000.0	98.4

RMS ACCELERATION LEVEL 32 sec LIN avg
tst067 60in glass inA roomA receiving without diffusers



FREQ (Hz)	ACC (dB)
80.0	80.0
100.0	68.3
125.0	83.9
160.0	88.3
200.0	83.1
250.0	81.6
315.0	80.4
400.0	79.9
500.0	82.5
630.0	84.0
800.0	84.3
1000.0	85.5
1250.0	85.7
1600.0	86.5
2000.0	89.9
2500.0	98.1
3150.0	100.0
4000.0	98.6
5000.0	98.7

RMS ACCELERATION LEVEL 32 sec LIN avg
tst065 60in glass 6in baffle inA with diffuser

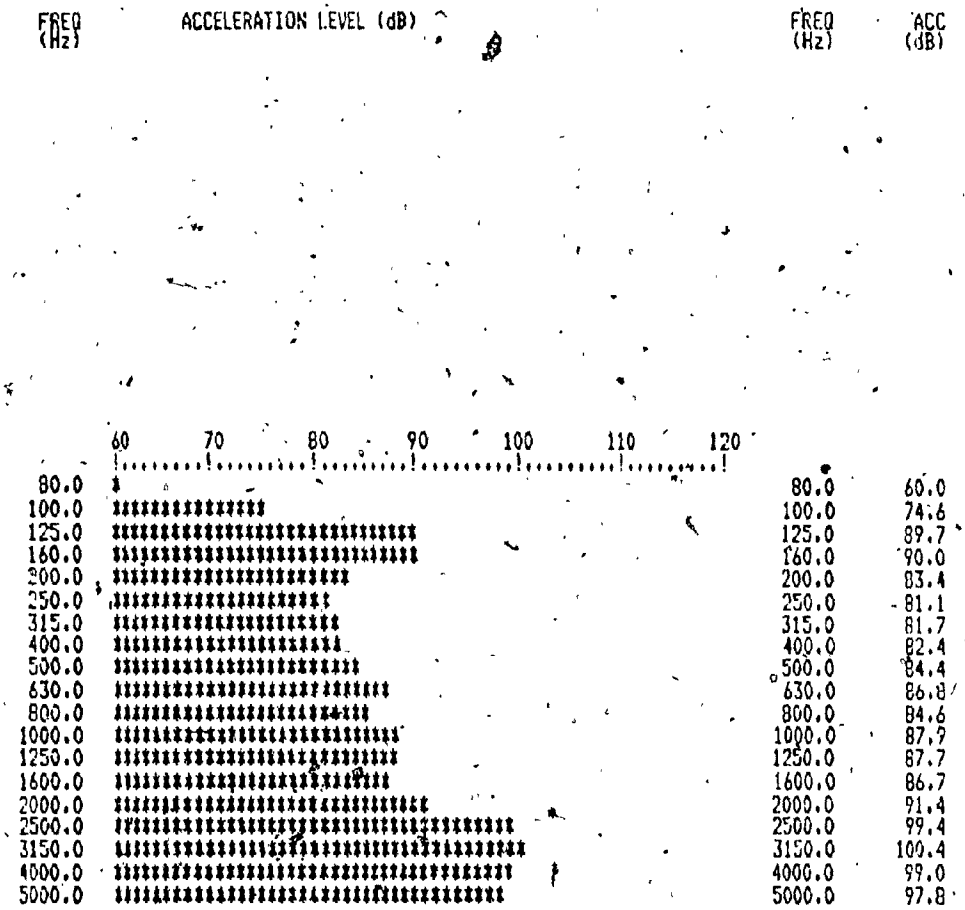


FREQ (Hz)	ACC (dB)
80.0	70.0
100.0	68.4
125.0	83.9
160.0	88.4
200.0	82.4
250.0	81.3
315.0	80.5
400.0	79.8
500.0	82.4
630.0	84.0
800.0	84.3
1000.0	85.5
1250.0	85.9
1600.0	86.5
2000.0	89.9
2500.0	98.2
3150.0	100.1
4000.0	98.7
5000.0	98.7

RMS ACCELERATION LEVEL 32 sec LIN avg
tst066 60in glass 6in baffle inA without diffusers

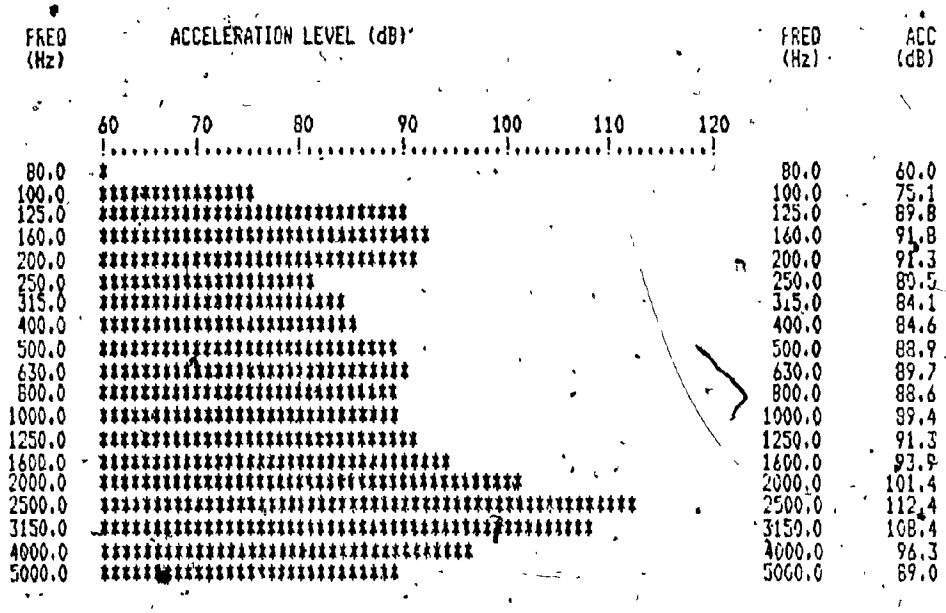
FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0	*	80.0	60.0
100.0	**********	100.0	74.6
125.0	**********	125.0	90.0
160.0	**********	160.0	90.1
200.0	**********	200.0	83.0
250.0	**********	250.0	81.1
315.0	**********	315.0	81.4
400.0	**********	400.0	82.4
500.0	**********	500.0	84.4
630.0	**********	630.0	87.0
800.0	**********	800.0	84.7
1000.0	**********	1000.0	87.9
1250.0	**********	1250.0	87.9
1600.0	**********	1600.0	86.7
2000.0	**********	2000.0	91.4
2500.0	**********	2500.0	99.5
3150.0	**********	3150.0	100.4
4000.0	**********	4000.0	99.0
5000.0	**********	5000.0	97.7

RMS ACCELERATION LEVEL 32 sec LIN avg
tst064 80in glass 12in baffle with diffusers



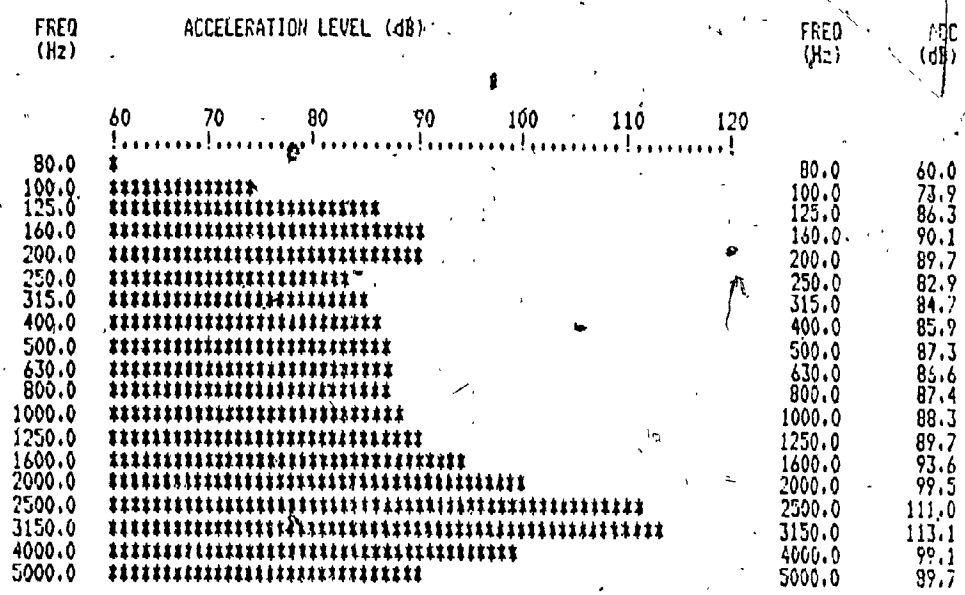
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	74.6
125.0	89.7
160.0	90.0
200.0	83.4
250.0	81.1
315.0	81.7
400.0	82.4
500.0	84.4
630.0	86.8
800.0	84.6
1000.0	87.9
1250.0	87.7
1600.0	86.7
2000.0	91.4
2500.0	99.4
3150.0	100.4
4000.0	99.0
5000.0	97.8

RMS ACCELERATION LEVEL 32 sec LIN avg
tst063 60in slass 12inbottle inA without diffusers



FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	75.1
125.0	89.8
160.0	91.8
200.0	91.3
250.0	89.5
315.0	84.1
400.0	84.6
500.0	88.9
630.0	89.7
800.0	88.6
1000.0	89.4
1250.0	91.3
1600.0	93.9
2000.0	101.4
2500.0	112.4
3150.0	108.4
4000.0	96.3
5000.0	89.0

RMS ACCELERATION LEVEL - 32 sec LIN avg
tst077 60in sup inA rmA receiving with diffusers
right side 08/08/80

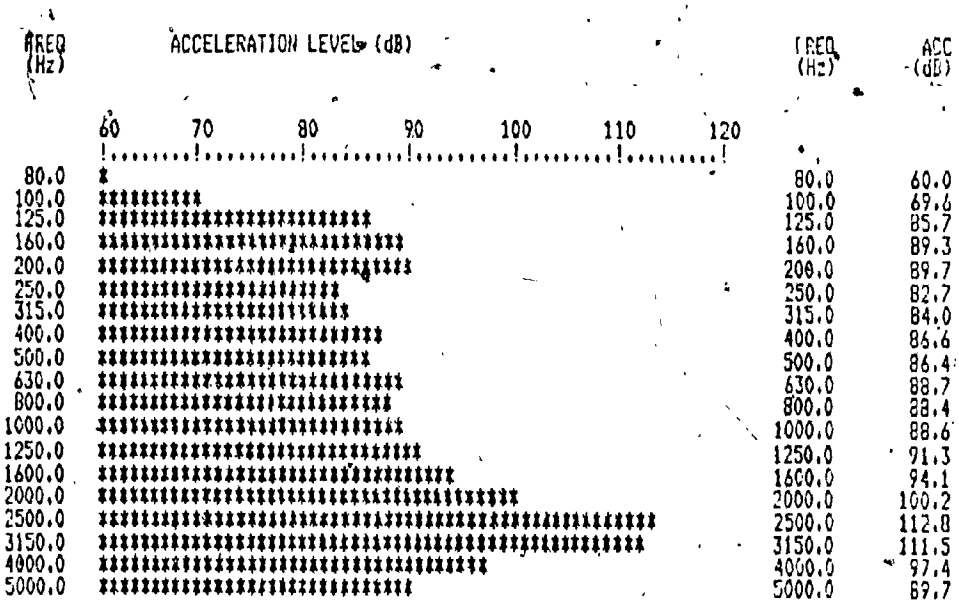


FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	73.9
125.0	86.3
160.0	90.1
200.0	89.7
250.0	82.9
315.0	84.7
400.0	85.9
500.0	87.3
630.0	86.6
800.0	87.4
1000.0	88.3
1250.0	89.7
1600.0	93.6
2000.0	99.5
2500.0	111.0
3150.0	113.1
4000.0	99.1
5000.0	99.7

RMS ACCELERATION LEVEL 32 sec LIN avg
tst077 60in sup inA rmA receiving with diffusers
left side 03/08/80

FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0	*	80.0	60.0
100.0	##########	100.0	72.6
125.0	##########################	125.0	87.3
160.0	##################################	160.0	[illegible]
200.0	###########################	200.0	[illegible]
250.0	########################	250.0	84.0
315.0	#########################	315.0	84.5
400.0	########################	400.0	85.3
500.0	###########################	500.0	88.3
630.0	##################################	630.0	90.6
800.0	###########################	800.0	88.2
1000.0	################################	1000.0	91.3
1250.0	##################################	1250.0	94.4
1600.0	##	1600.0	101.7
2000.0	##	2000.0	107.2
2500.0	##	2500.0	101.7
3150.0	##################################	3150.0	94.7
4000.0	##########################	4000.0	87.1
5000.0	######################	5000.0	82.3

RMS ACCELERATION LEVEL 32 sec LIN avg
tst078 60in sup inA rmA receiving without diffusers
right side 08/06/80

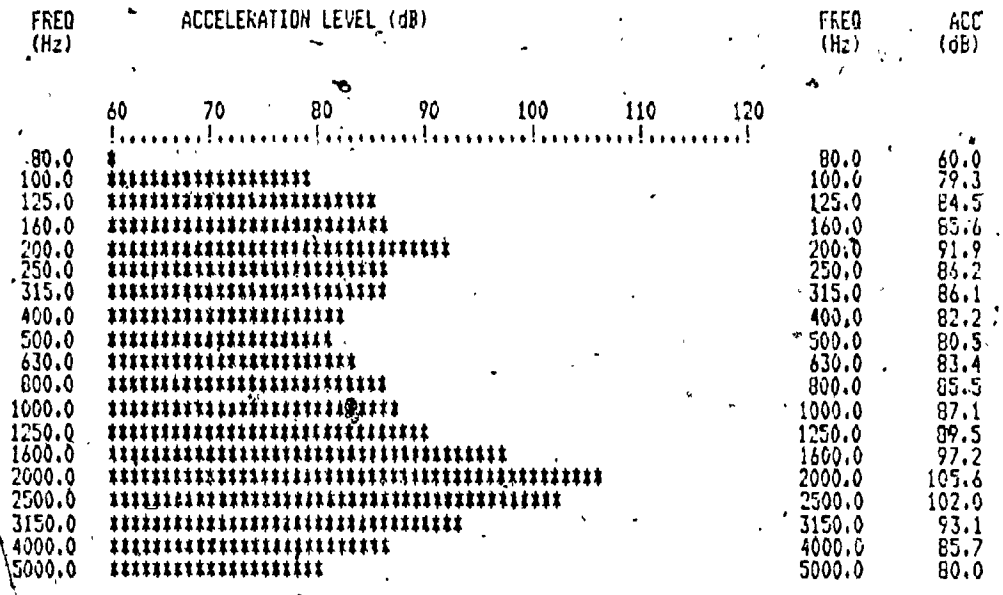


FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	69.6
125.0	85.7
160.0	89.3
200.0	89.7
250.0	82.7
315.0	84.0
400.0	86.6
500.0	86.4
630.0	88.7
800.0	88.4
1000.0	88.6
1250.0	91.3
1600.0	94.1
2000.0	100.2
2500.0	112.8
3150.0	111.5
4000.0	97.4
5000.0	89.7

RMS ACCELERATION LEVEL 32 sec LIN avg
tst076 60in sup inA rmA receiving without diffusers
left side 09/03/30

FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0	##	80.0	62.4
100.0	#####################	100.0	80.8
125.0	###########################	125.0	87.0
160.0	############################	160.0	87.6
200.0	###################################	200.0	93.4
250.0	#########################	250.0	84.6
315.0	###########################	315.0	86.3
400.0	######################	400.0	81.1
500.0	#######################	500.0	81.5
630.0	##########################	630.0	83.8
800.0	############################	800.0	84.5
1000.0	##############################	1000.0	89.1
1250.0	###################################	1250.0	92.5
1600.0	###	1600.0	101.0
2000.0	###	2000.0	100.9
2500.0	######################################	2500.0	96.6
3150.0	###########################	3150.0	88.2
4000.0	######################	4000.0	82.3
5000.0	###################	5000.0	79.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst073.60in sup 6in baffle inA with diffusers
.RIHGT SIDE 08/12/80

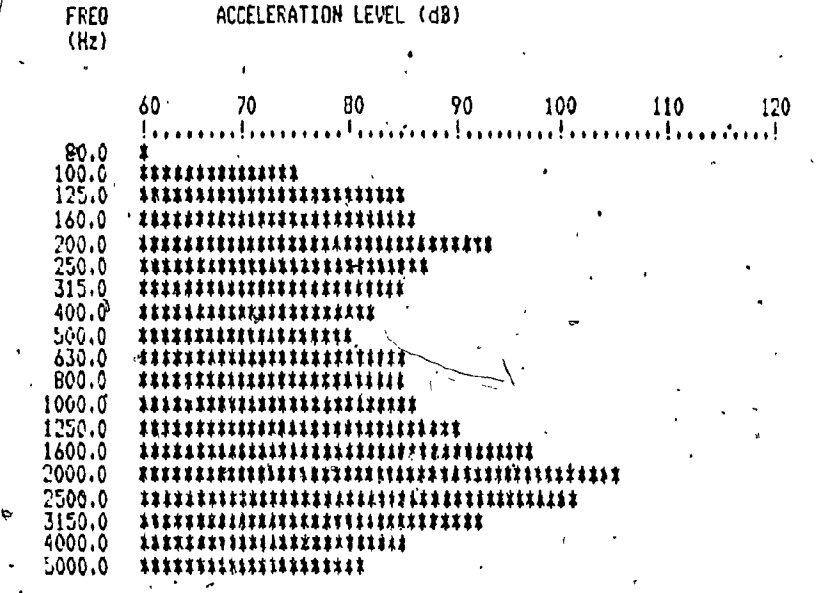


FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	79.3
125.0	84.5
160.0	85.6
200.0	91.9
250.0	86.2
315.0	86.1
400.0	82.2
500.0	80.5
630.0	83.4
800.0	85.5
1000.0	87.1
1250.0	89.5
1600.0	97.2
2000.0	105.6
2500.0	102.0
3150.0	93.1
4000.0	85.7
5000.0	80.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst073 60in gap 6in baffle inA with diffusers
LEFT SIDE 08/12/80

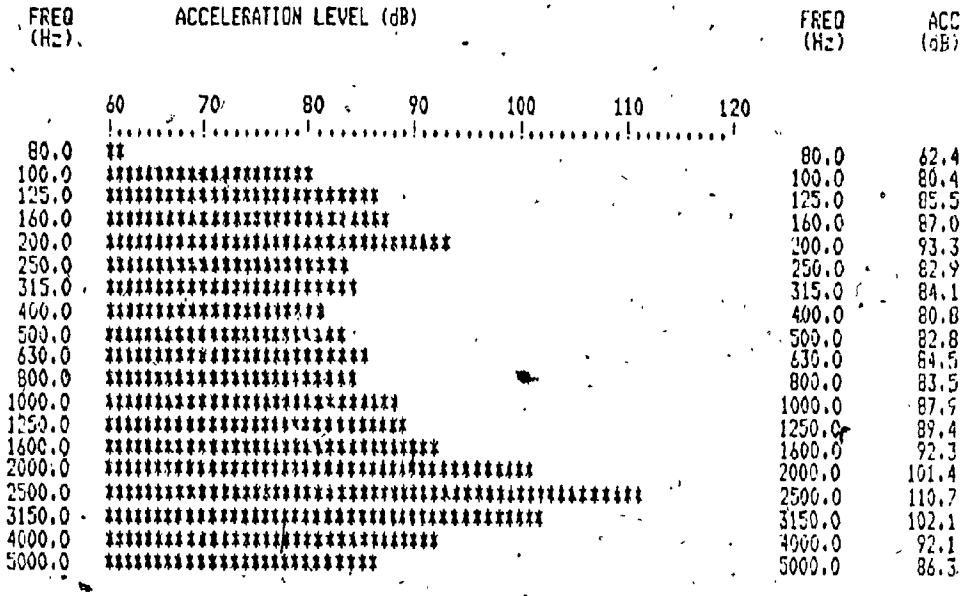
FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0		80.0	60.0
100.0		100.0	79.5
125.0		125.0	85.6
160.0		160.0	87.1
200.0		200.0	91.1
250.0		250.0	85.8
315.0		315.0	86.2
400.0		400.0	81.5
500.0		500.0	81.0
630.0		630.0	83.5
800.0		800.0	84.0
1000.0		1000.0	88.0
1250.0		1250.0	90.6
1600.0		1600.0	94.9
2000.0		2000.0	106.1
2500.0		2500.0	106.5
3150.0		3150.0	94.8
4000.0		4000.0	88.3
5000.0		5000.0	82.5

RMS ACCELERATION LEVEL 32 sec LIN avg
tst074 60in sup 6in baffle inA without diffusers
RIGHT SIDE 08/12/80



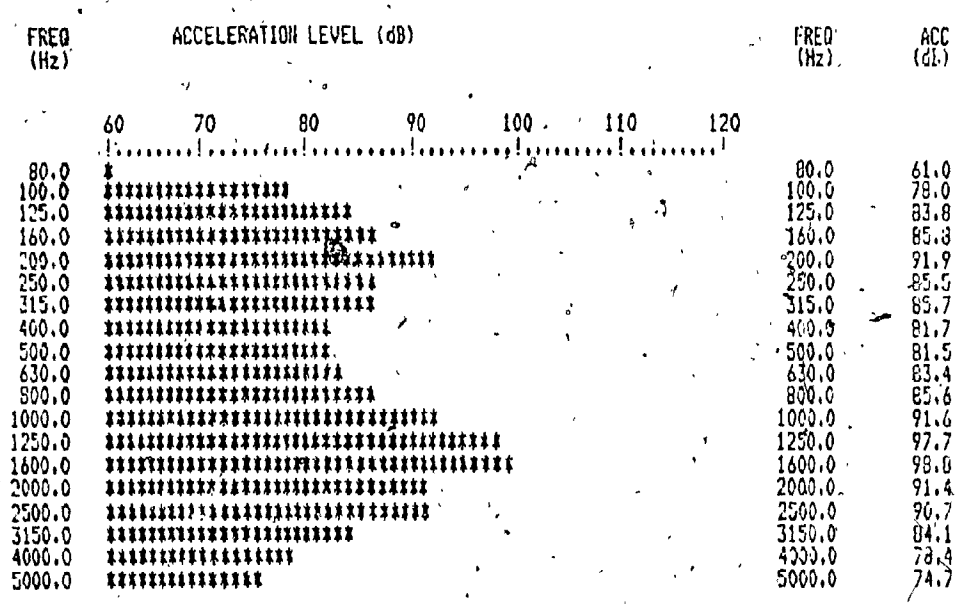
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	74.7
125.0	84.6
160.0	85.7
200.0	92.7
250.0	86.8
315.0	85.3
400.0	82.4
500.0	80.0
630.0	84.5
800.0	85.0
1000.0	85.7
1250.0	90.4
1600.0	97.0
2000.0	104.5
2500.0	100.6
3150.0	91.5
4000.0	85.3
5000.0	80.7

RHS ACCELERATION LEVEL 32 sec LIN avg
tst074 60in sep 6in baffle inA without diffusers
LEFT SIDE 08/12/80



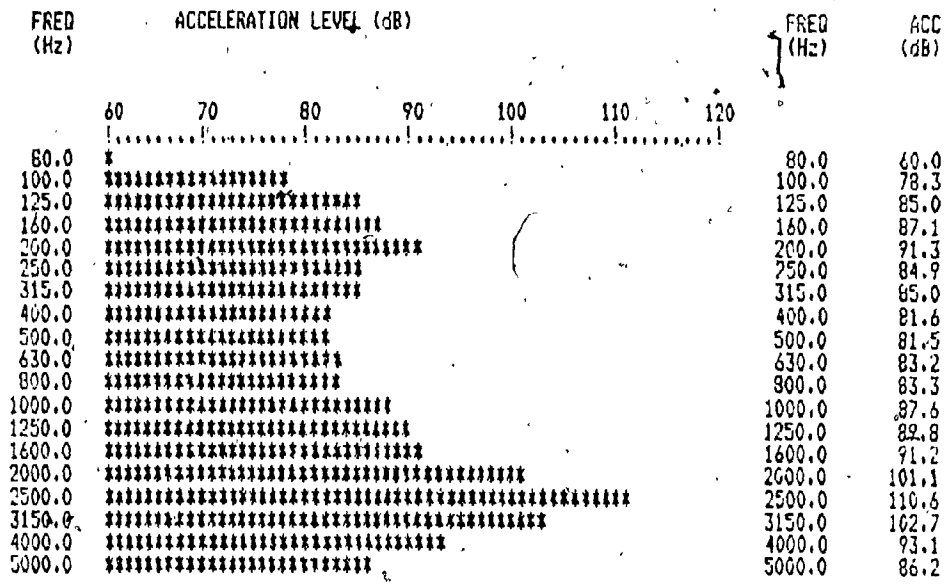
FREQ (Hz)	ACC (dB)
80.0	62.4
100.0	80.4
125.0	85.5
160.0	87.0
200.0	93.3
250.0	82.9
315.0	84.1
400.0	80.8
500.0	82.8
630.0	84.5
800.0	83.5
1000.0	87.9
1250.0	89.4
1600.0	92.3
2000.0	101.4
2500.0	110.7
3150.0	102.1
4000.0	92.1
5000.0	86.3

RMS ACCELERATION LEVEL 32 sec LIN avg
tst072.60in sup 12in baffle inA with diffusers
RIGHT SIDE 08/12/80

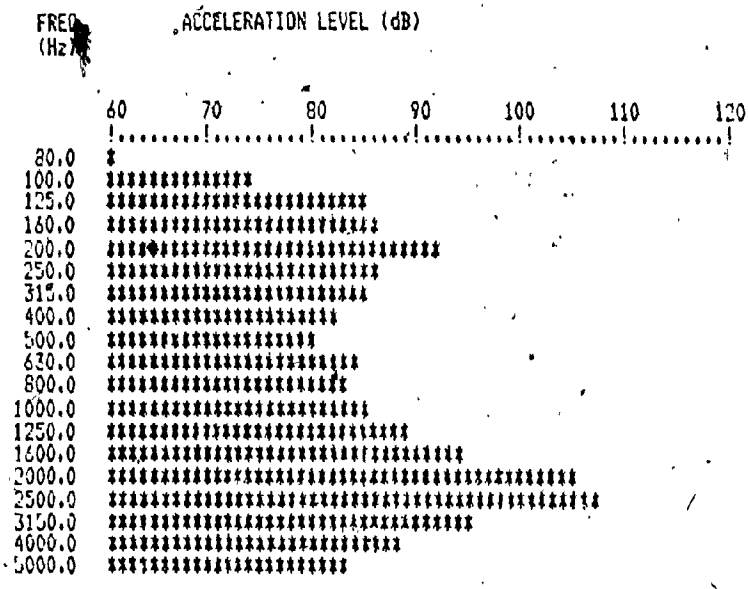


FREQ (Hz)	ACC (dB)
80.0	61.0
100.0	78.0
125.0	83.8
160.0	85.3
200.0	91.9
250.0	85.5
315.0	85.7
400.0	81.7
500.0	81.5
630.0	83.4
800.0	85.6
1000.0	91.6
1250.0	97.7
1600.0	98.0
2000.0	91.4
2500.0	90.7
3150.0	84.1
4000.0	78.4
5000.0	74.7

RMS ACCELERATION LEVEL 32 sec LIN avg
tst072 60in sep 12in baffle inA with diffusers
LEFT SIDE 08/12/80

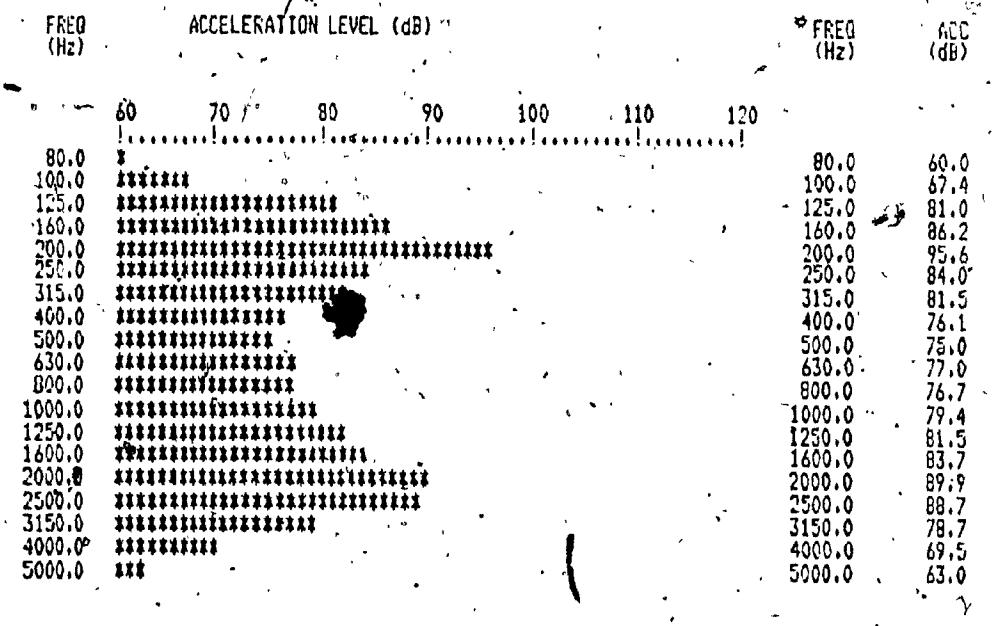


RMS ACCELERATION LEVEL 32 sec LIN avg
tst071 60in gap 12in baffle inA without diffusers
RIGHT SIDE 08/12/80



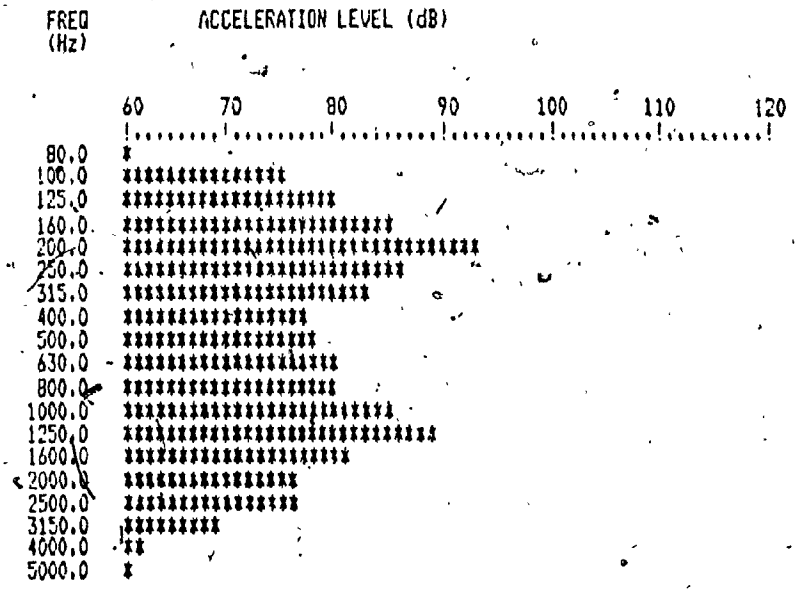
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	73.7
125.0	84.7
160.0	86.3
200.0	92.3
250.0	86.4
315.0	85.1
400.0	82.0
500.0	80.4
630.0	84.1
800.0	83.3
1000.0	85.2
1250.0	89.2
1600.0	93.6
2000.0	105.4
2500.0	106.7
3150.0	94.8
4000.0	87.6
5000.0	82.6

RMS ACCELERATION LEVEL 32 sec LIN avg
tst071 60in sup 12in baffle inA without diffusers
LEFT SIDE 08/12/80



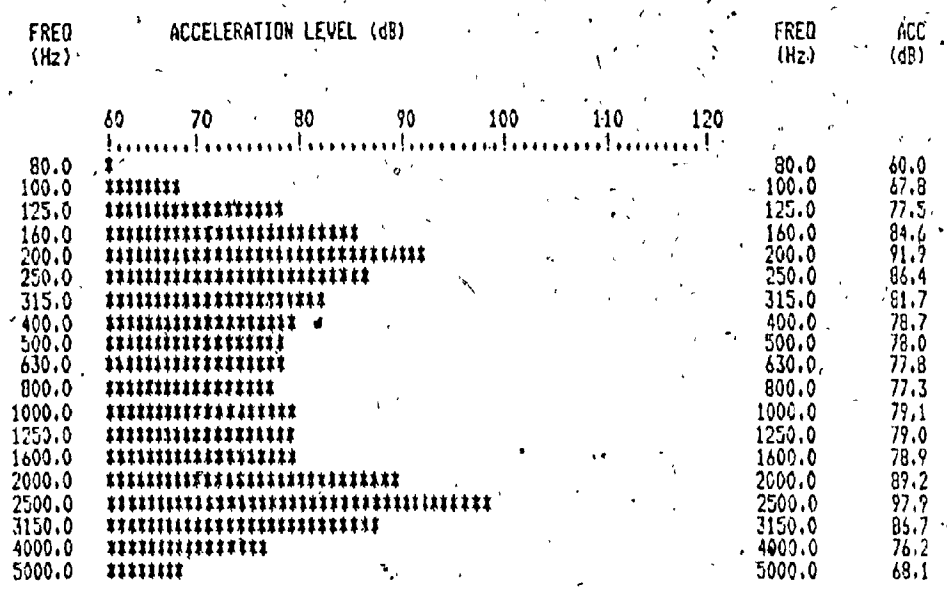
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	67.4
125.0	81.0
160.0	86.2
200.0	95.6
250.0	84.0
315.0	81.5
400.0	76.1
500.0	75.0
630.0	77.0
800.0	76.7
1000.0	79.4
1250.0	81.5
1600.0	83.7
2000.0	89.9
2500.0	88.7
3150.0	78.7
4000.0	69.5
5000.0	63.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst084 60in 2xsyp and rmA receiving with diffusers
RIGHT SIDE 08/15/80



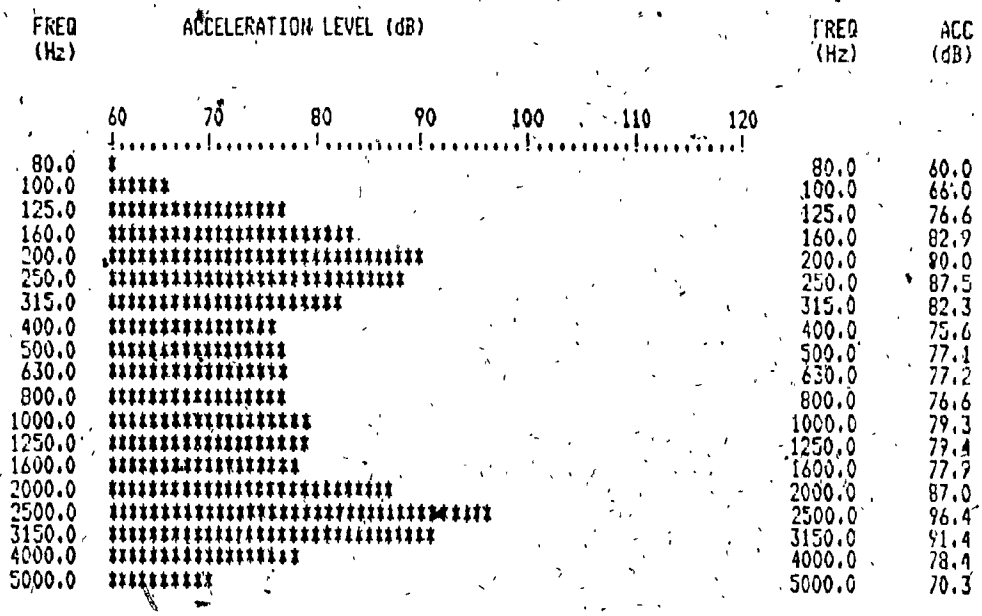
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	74.8
125.0	80.4
160.0	84.6
200.0	93.4
250.0	85.5
315.0	83.0
400.0	77.3
500.0	77.8
630.0	80.1
800.0	79.8
1000.0	84.7
1250.0	89.3
1600.0	81.3
2000.0	75.6
2500.0	75.5
3150.0	68.7
4000.0	61.8
5000.0	60.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst084 60in 2xsyp inA rnA receivins with diffusers
LEFT SIDE 08/15/80



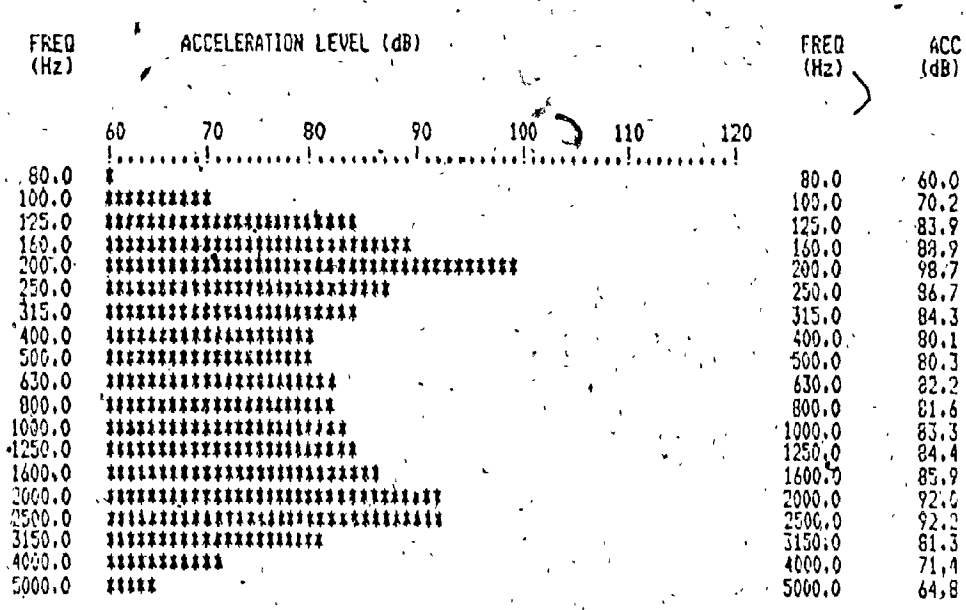
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	67.8
125.0	77.5
160.0	84.6
200.0	91.9
250.0	86.4
315.0	81.7
400.0	78.7
500.0	78.0
630.0	77.8
800.0	77.3
1000.0	79.1
1250.0	79.0
1600.0	78.9
2000.0	89.2
2500.0	97.9
3150.0	85.7
4000.0	76.2
5000.0	68.1

RMS ACCELERATION LEVEL 32 sec LIN avg
tst086 60in 2xsyp inA raA receiving without diffusers
RIGHT SIDE 08/15/80



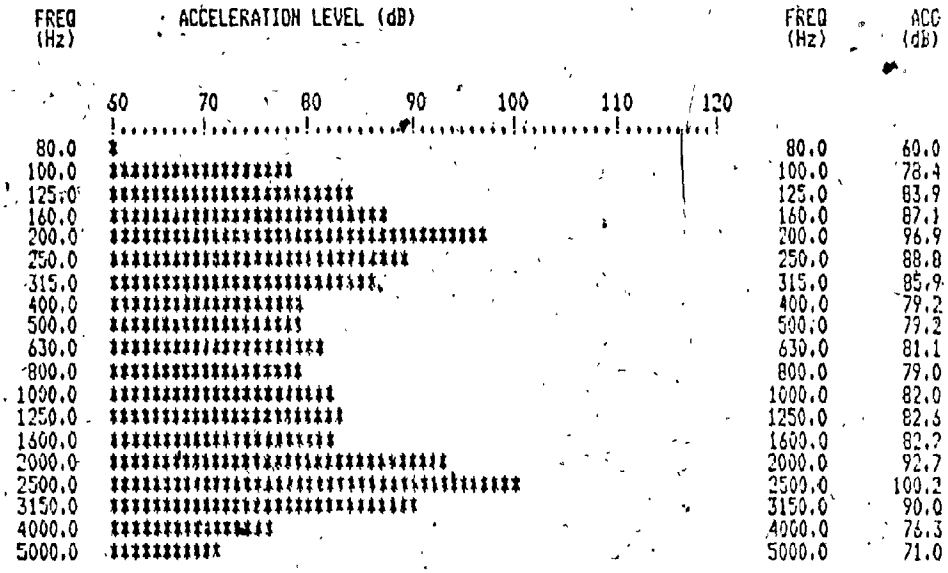
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	66.0
125.0	76.6
160.0	82.9
200.0	80.0
250.0	87.5
315.0	82.3
400.0	75.6
500.0	77.1
630.0	77.2
800.0	76.6
1000.0	79.3
1250.0	79.4
1600.0	77.9
2000.0	87.0
2500.0	96.4
3150.0	91.4
4000.0	78.9
5000.0	70.3

RMS ACCELERATION LEVEL 32 sec LIN avg
tst086 60in 2xgyp inA rmA receiving without diffusers
LEFT SIDE 08/15/80



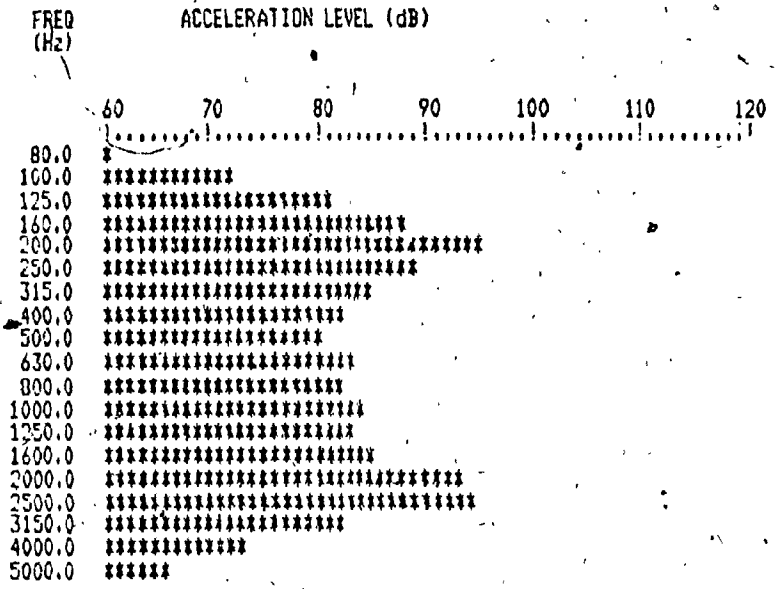
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	70.2
125.0	83.9
160.0	88.9
200.0	98.7
250.0	96.7
315.0	84.3
400.0	80.1
500.0	80.3
630.0	82.2
800.0	81.6
1000.0	83.3
1250.0	84.4
1600.0	85.9
2000.0	92.0
2500.0	92.2
3150.0	81.3
4000.0	71.4
5000.0	64.8

RMS ACCELERATION LEVEL 32 sec LIN avg
tst082.60in 2xgyp 6in baffle inA with diffusers
RIGHT SIDE 08/14/80



FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	78.4
125.0	83.9
160.0	87.1
200.0	96.9
250.0	88.8
315.0	85.9
400.0	79.2
500.0	79.2
630.0	81.1
800.0	79.0
1000.0	82.0
1250.0	82.6
1600.0	82.2
2000.0	92.7
2500.0	100.2
3150.0	90.0
4000.0	76.3
5000.0	71.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst082 60in 2xsyp 6in baffle inA with diffusers
LEFT SIDE 08/14/80

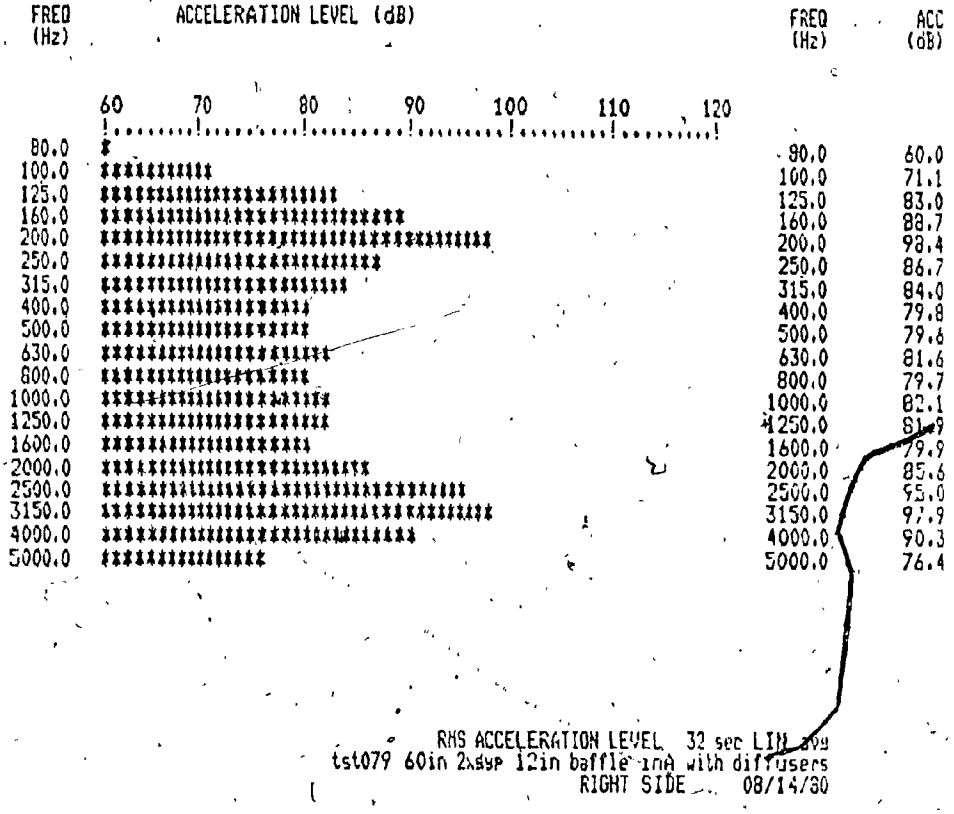


FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	71.9
125.0	80.5
160.0	87.5
200.0	95.2
250.0	88.7
315.0	84.7
400.0	81.5
500.0	80.4
630.0	82.7
800.0	82.2
1000.0	83.9
1250.0	82.9
1600.0	85.2
2000.0	92.7
2500.0	93.9
3150.0	81.6
4000.0	72.9
5000.0	66.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst081 60iq 2xgyp 6in baffle inA without diffusers
RIGHT SIDE 08/14/80

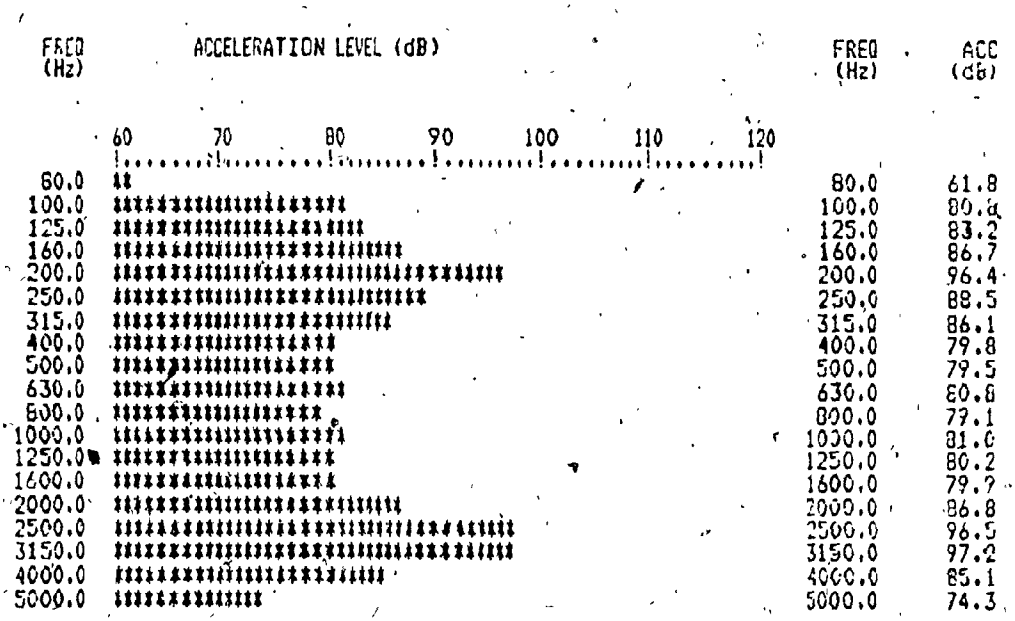
FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0	#	80.0	60.0
100.0	##########	100.0	69.9
125.0	#####################	125.0	80.3
160.0	###########################	160.0	85.7
200.0	###################################	200.0	93.4
250.0	###################################	250.0	91.5
315.0	###########################	315.0	86.2
400.0	###################	400.0	79.3
500.0	###################	500.0	79.1
630.0	###################	630.0	80.4
800.0	###################	800.0	79.1
1000.0	########################	1000.0	83.2
1250.0	###################	1250.0	82.9
1600.0	###################	1600.0	83.2
2000.0	################################	2000.0	72.1
2500.0	##	2500.0	97.9
3150.0	############################	3150.0	86.9
4000.0	###############	4000.0	74.5
5000.0	##########	5000.0	70.3

RMS ACCELERATION LEVEL 32 sec LIN avg
tst081 60in 2xsyp 6in baffle inA without diffusers
LEFT SIDE 08/14/80

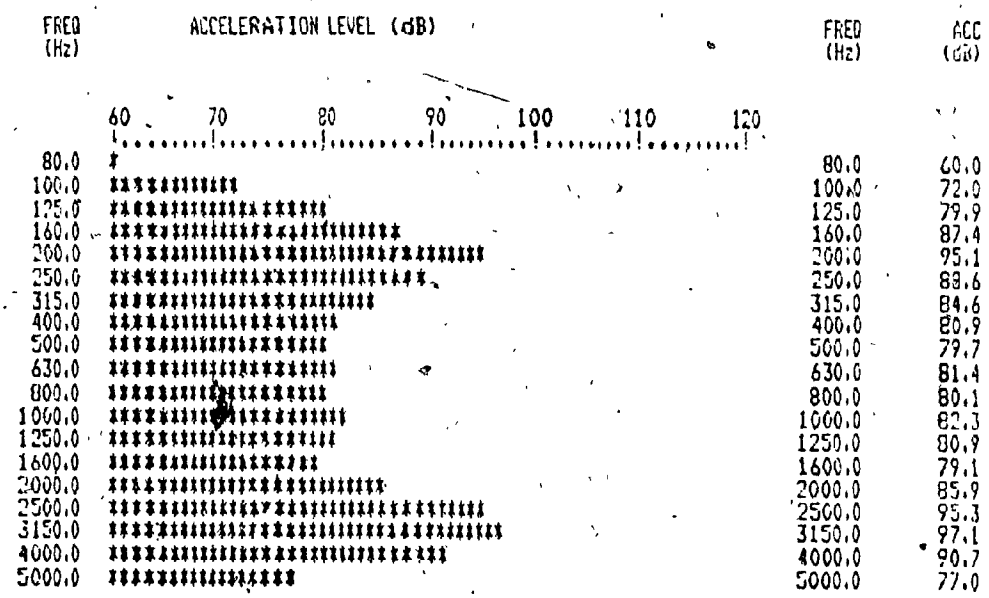


FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	71.1
125.0	83.0
160.0	88.7
200.0	98.4
250.0	86.7
315.0	84.0
400.0	79.8
500.0	79.6
630.0	81.6
800.0	79.7
1000.0	82.1
1250.0	81.9
1600.0	79.9
2000.0	85.6
2500.0	95.0
3150.0	97.9
4000.0	90.3
5000.0	76.4

RMS ACCELERATION LEVEL 32 sec LIN avg
tst079 60in 2xGyp 12in baffle inA with diffusers
RIGHT SIDE 08/14/30

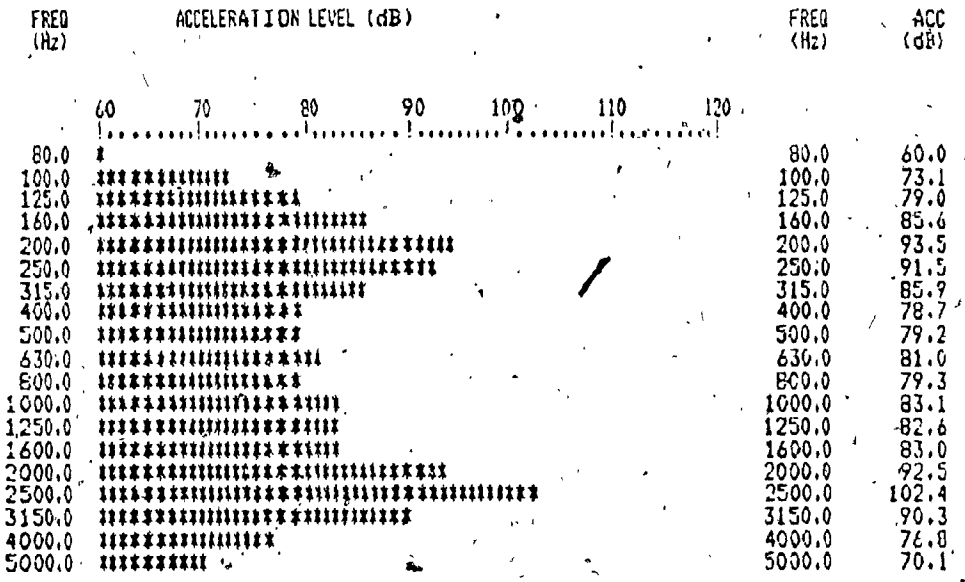


RMS ACCELERATION LEVEL * 32 sec LIN avg
tst079 60in 2x4ga 12in baffle inA with diffusers
LEFT SIDE 08/13/80



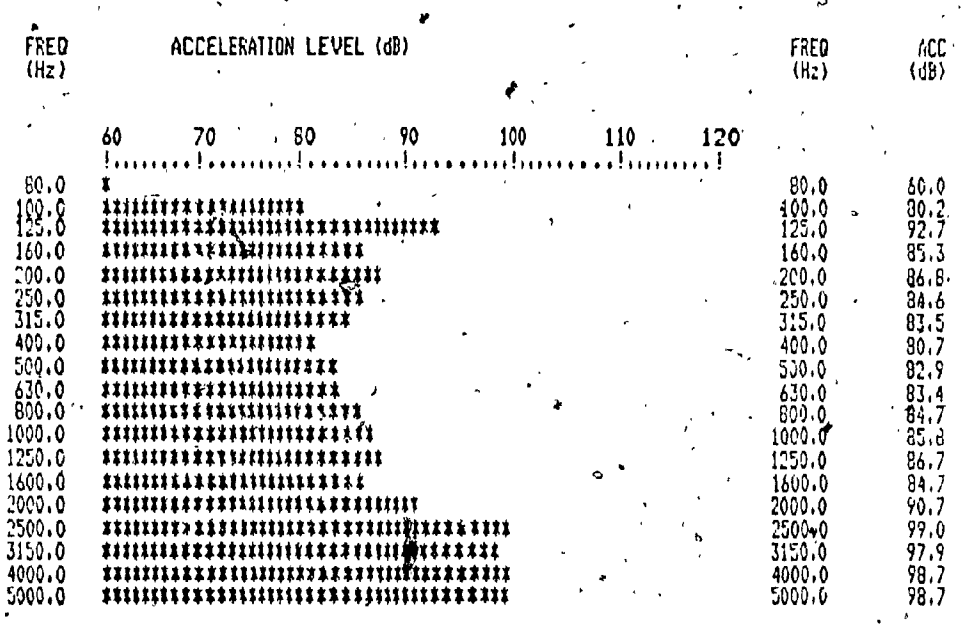
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	72.0
125.0	79.9
160.0	87.4
200.0	95.1
250.0	88.6
315.0	84.6
400.0	80.9
500.0	79.7
630.0	81.4
800.0	80.1
1000.0	82.3
1250.0	80.9
1600.0	79.1
2000.0	85.9
2500.0	95.3
3150.0	97.1
4000.0	90.7
5000.0	77.0

RMS ACCELERATION LEVEL 32 sec LIN avs
tst080 60in 2x8yp 12in baffle inA without diffusers
RIGHT SIDE 08/14/80

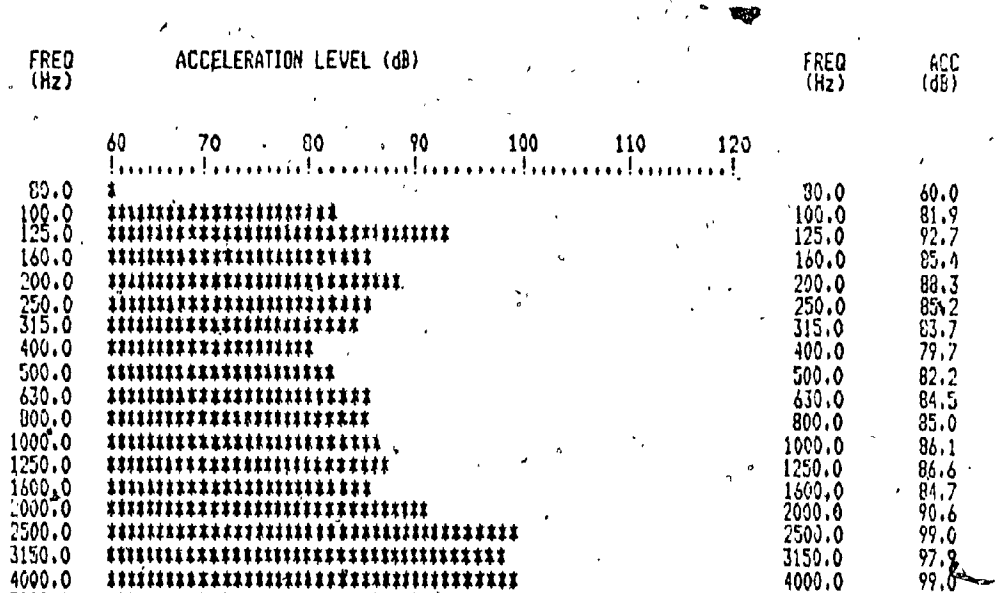


FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	73.1
125.0	79.0
160.0	85.6
200.0	93.5
250.0	91.5
315.0	85.9
400.0	78.7
500.0	79.2
630.0	81.0
800.0	79.3
1000.0	83.1
1250.0	82.6
1600.0	83.0
2000.0	92.5
2500.0	102.4
3150.0	90.3
4000.0	76.8
5000.0	70.1

RMS ACCELERATION LEVEL 32 sec LIN avg
tst080 60in 2x6yp 12in baffle inA without diffusers
LEFT SIDE 08/14/90



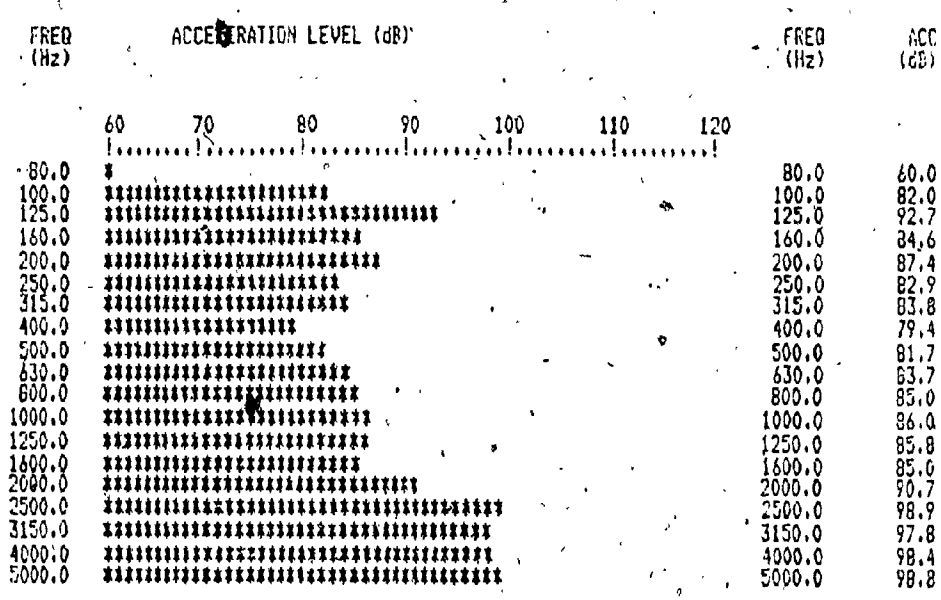
RMS ACCELERATION LEVEL 32 sec LIN avg
tst093 60in glass inB rmB receiving with diffusers 2B1
CENTRE 08/20/60



RMS ACCELERATION LEVEL 32 sec LIN avg
tst091 60in glass inB rmB receiving without diffusers, 2BI
CENTRE 08/20/80

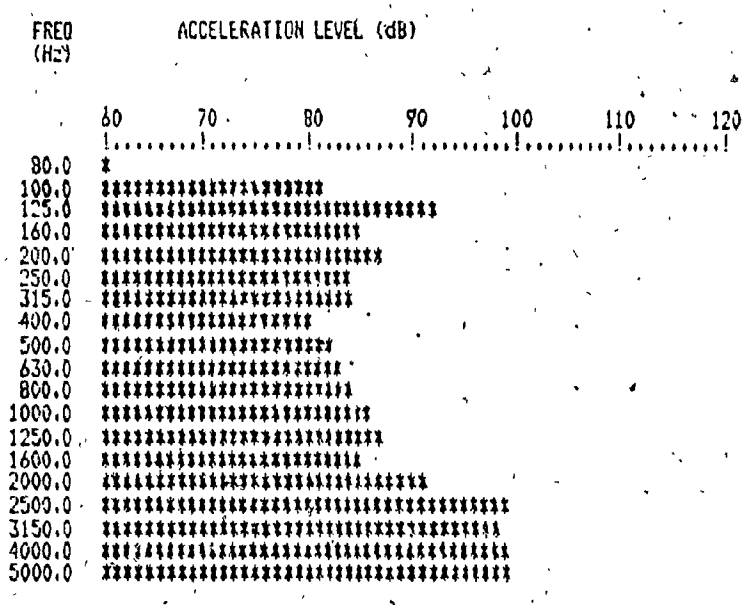
FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0		80.0	60.0
100.0		100.0	80.9
125.0		125.0	92.4
160.0		160.0	83.6
200.0		200.0	86.9
250.0		250.0	83.2
315.0		315.0	84.1
400.0		400.0	80.0
500.0		500.0	82.2
630.0		630.0	83.0
800.0		800.0	84.1
1000.0		1000.0	85.4
1250.0		1250.0	86.1
1600.0		1600.0	84.9
2000.0		2000.0	91.0
2500.0		2500.0	99.1
3150.0		3150.0	97.7
4000.0		4000.0	97.8
5000.0		5000.0	98.3

RMS ACCELERATION LEVEL 32 sec LIN avg
tst089 60in glass 6ip baffle inB with diffusers 2B1
CENTRE 08/19/80



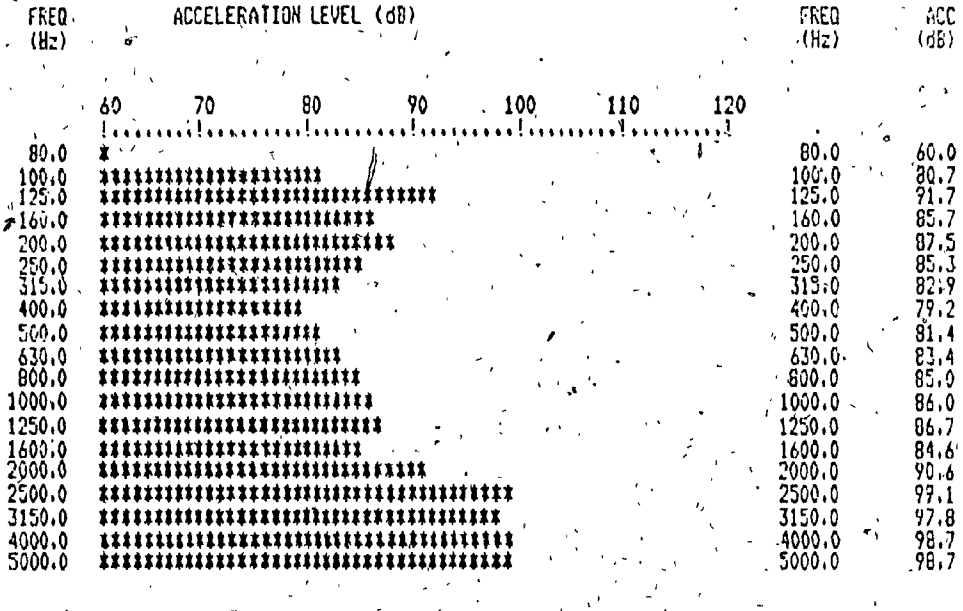
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	82.0
125.0	92.7
160.0	84.6
200.0	87.4
250.0	82.9
315.0	83.8
400.0	79.4
500.0	81.7
630.0	83.7
800.0	85.0
1000.0	86.0
1250.0	85.8
1600.0	85.0
2000.0	90.7
2500.0	98.9
3150.0	97.8
4000.0	98.4
5000.0	98.8

RMS ACCELERATION LEVEL 32 sec LIN avg
tst090 60in glass 6in baffle inB without diffusers 2B1
CENTRE 08/19/80

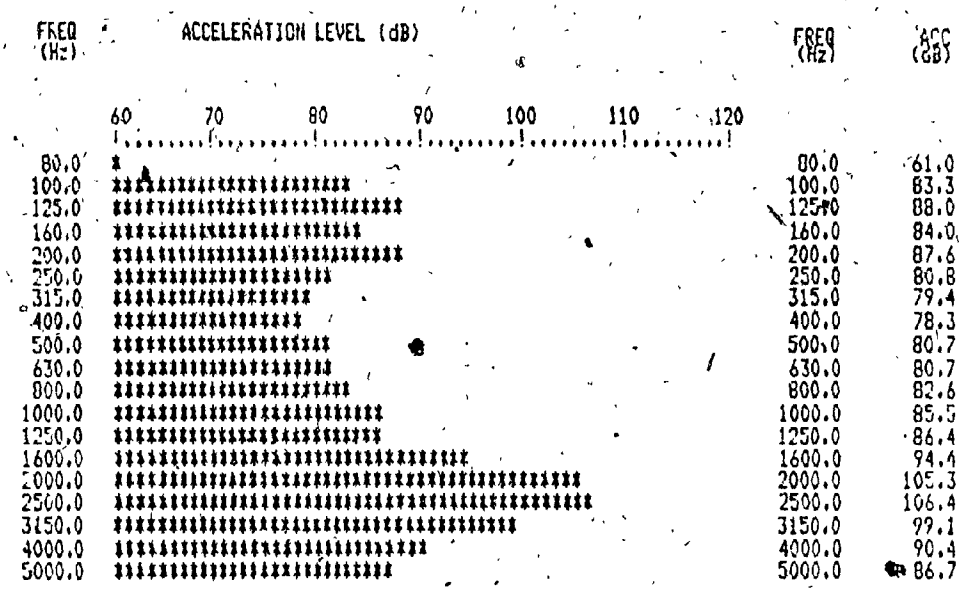


FREQ (Hz)	ACC (dB)
80.0	80.0
100.0	80.7
125.0	91.9
160.0	85.4
200.0	87.1
250.0	84.0
315.0	83.6
400.0	80.4
500.0	82.0
630.0	83.3
800.0	84.3
1000.0	85.6
1250.0	86.7
1600.0	84.6
2000.0	90.7
2500.0	99.1
3150.0	93.0
4000.0	98.7
5000.0	98.9

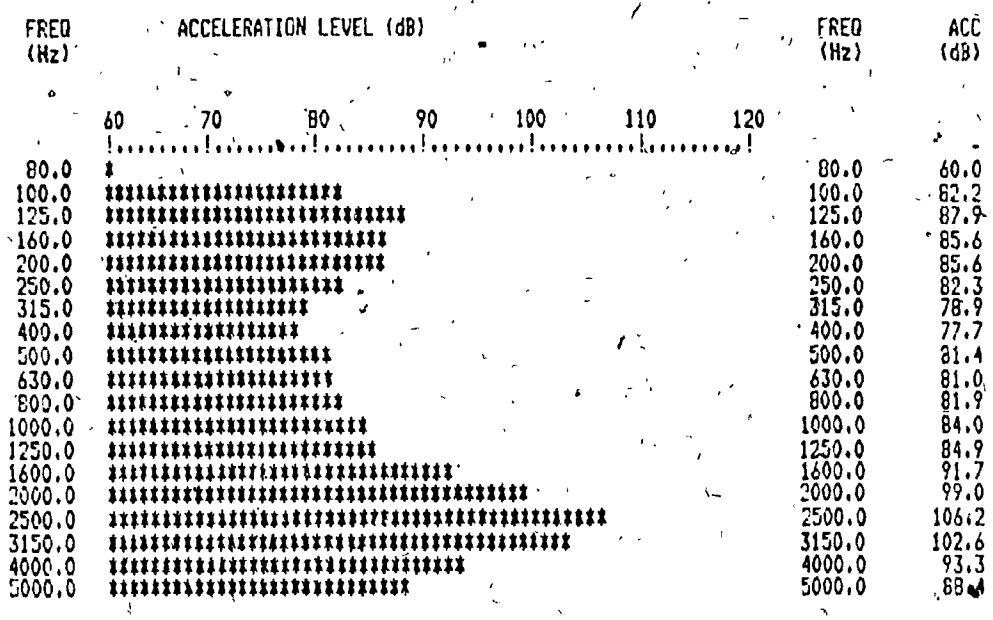
RMS ACCELERATION LEVEL 32 sec LIN avg
tst088 60in.glass 12in baffle inR with diffusers 2B1
CENTRE 08/19/80



RMS ACCELERATION LEVEL 32 sec LIN avg
tst087 60in glass 12in baffle inB without diffusers 2B1
CENTRE 08/19/80

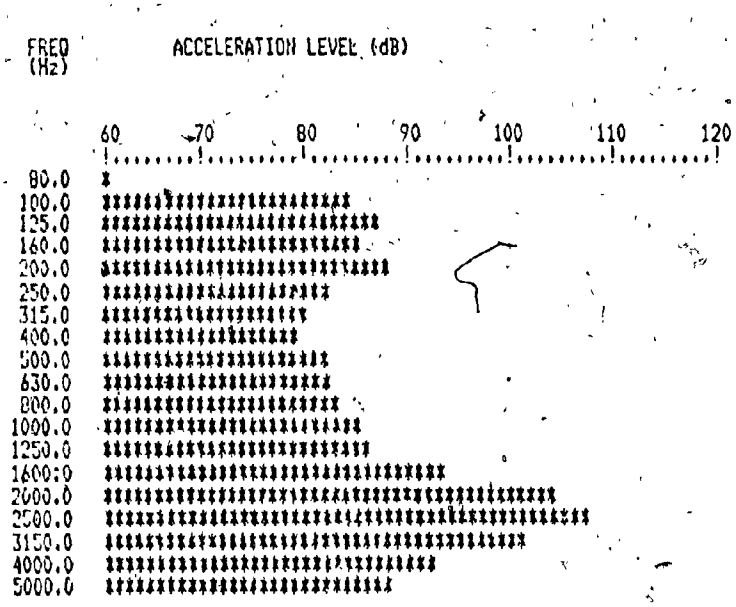


RMS ACCELERATION LEVEL 32 sec LIN avg
tst109 60in sym inB rmB receiving with diffusers 2B2
RIGHT SIDE 08/26/80



FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	82.2
125.0	87.9
160.0	85.6
200.0	85.6
250.0	82.3
315.0	78.9
400.0	77.7
500.0	81.4
630.0	81.0
800.0	81.9
1000.0	84.0
1250.0	84.9
1600.0	91.7
2000.0	99.0
2500.0	106.2
3150.0	102.6
4000.0	93.3
5000.0	88.4

RMS ACCELERATION LEVEL 32 sec LIN avg
tst109 60in gyp inB roB receiving with-diffusers 2B2
LEFT SIDE 08/26/80

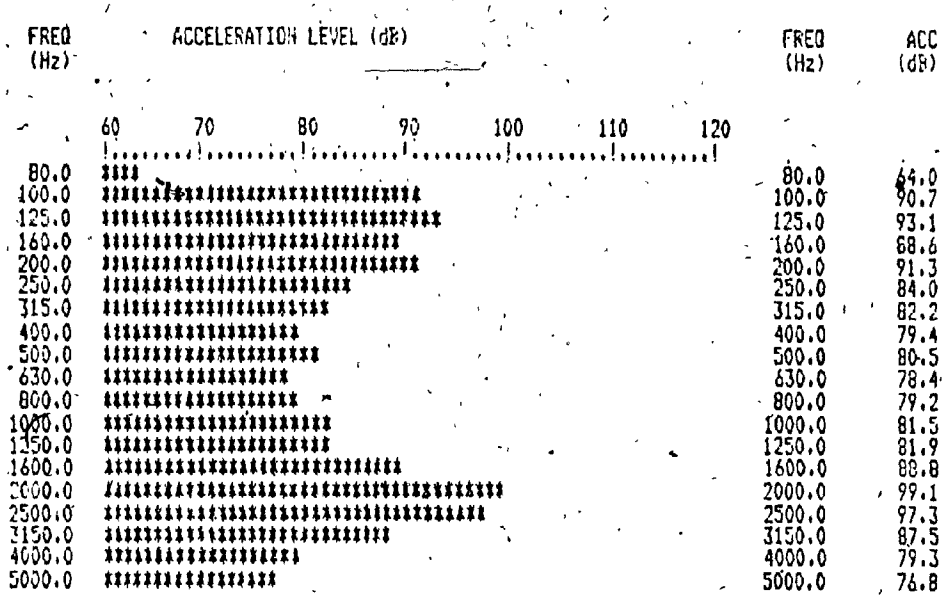


FREQ (Hz)	ACC (dB)
80.0	61.0
100.0	83.9
125.0	87.0
160.0	84.6
200.0	87.6
250.0	81.6
315.0	80.3
400.0	78.7
500.0	81.7
630.0	81.5
800.0	82.5
1000.0	84.6
1250.0	85.9
1600.0	93.4
2000.0	103.8
2500.0	106.7
3150.0	101.4
4000.0	92.1
5000.0	88.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst107 60in sup inB room B receiving without diffusers
RIGHT SIDE 08/25/80

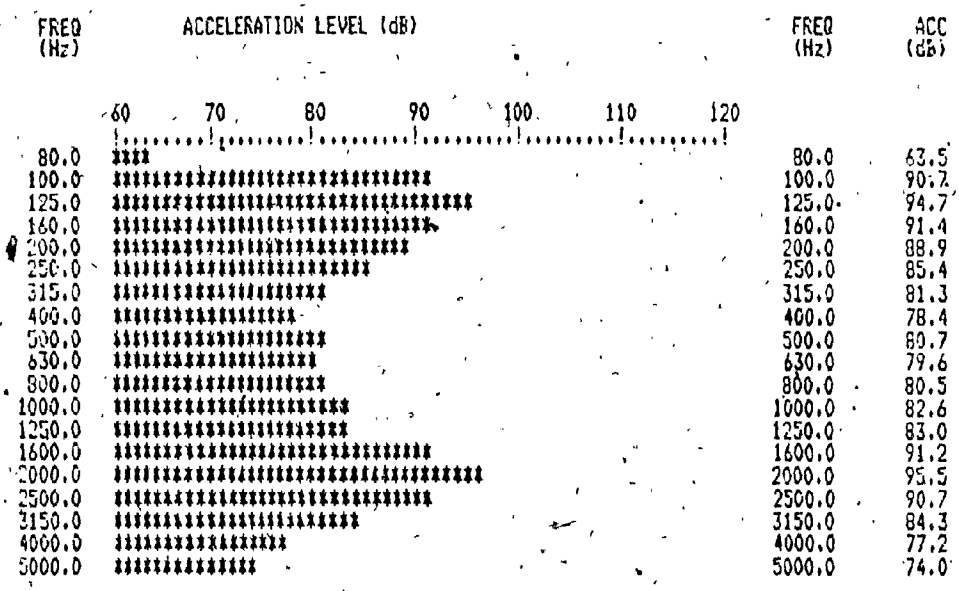
FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0	*	80.0	60.0
100.0	**********	100.0	83.9
125.0	************	125.0	88.3
160.0	**********	160.0	84.6
200.0	**********	200.0	83.4
250.0	********	250.0	80.3
315.0	********	315.0	79.0
400.0	********	400.0	77.5
500.0	**********	500.0	80.9
630.0	**********	630.0	80.9
800.0	**********	800.0	82.1
1000.0	**********	1000.0	85.4
1250.0	**********	1250.0	86.8
1600.0	**********	1600.0	93.0
2000.0	**********	2000.0	101.4
2500.0	**********	2500.0	105.1
3150.0	**********	3150.0	98.9
4000.0	**********	4000.0	90.9
5000.0	**********	5000.0	88.1

RMS ACCELERATION LEVEL 32 sec LIN avg
tst107 60in gyp inB room B receiving without diffusers
LEFT SIDE 08/25/80

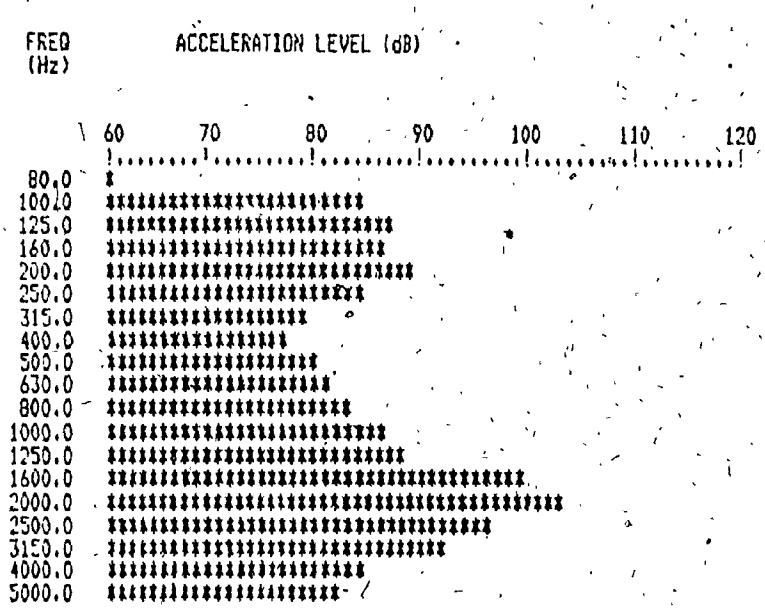


FREQ (Hz)	ACC (dB)
80.0	64.0
100.0	90.7
125.0	93.1
160.0	68.6
200.0	91.3
250.0	84.0
315.0	82.2
400.0	79.4
500.0	80.5
630.0	78.4
800.0	79.2
1000.0	81.5
1250.0	81.9
1600.0	88.8
2000.0	99.1
2500.0	97.3
3150.0	87.5
4000.0	79.3
5000.0	76.8

RMS ACCELERATION LEVEL 32 sec LIN avg
tst105 60in sup 6in baffle inB with diffusers 2B2
RIGHT SIDE 08/25/80

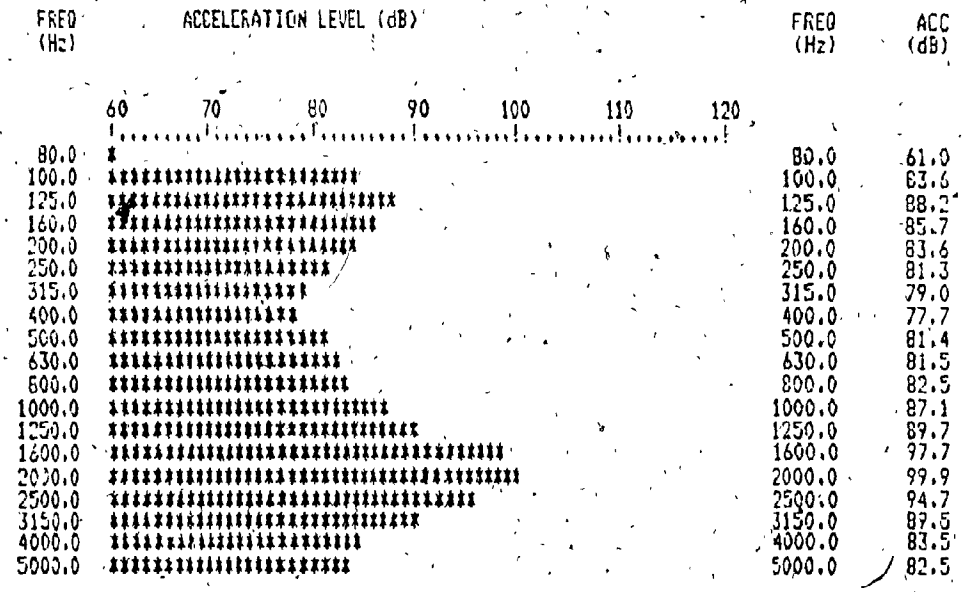


RMS ACCELERATION LEVEL 32 sec LIN avg
tst105 60in gyp 6in baffle inB with diffusers 2B2
LEFT SIDE 08/25/80

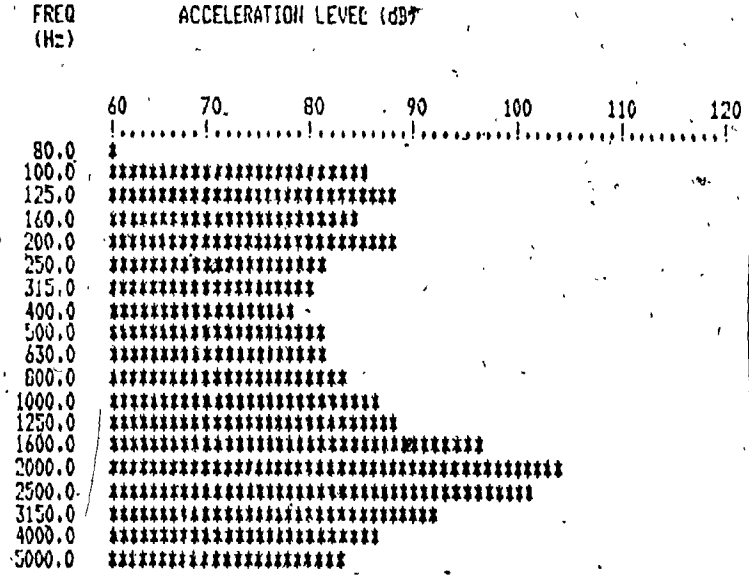


FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	83.5
125.0	87.0
160.0	85.5
200.0	89.4
250.0	83.9
315.0	78.9
400.0	76.6
500.0	80.4
630.0	80.6
800.0	82.8
1000.0	85.8
1250.0	87.9
1600.0	99.3
2000.0	102.5
2500.0	96.4
3150.0	91.7
4000.0	84.1
5000.0	82.1

RMS ACCELERATION LEVEL 32 sec LIN avg
tst106 60in sep 6in baffle inB without diffusers 2B2
RIGHT SIDE 08/25/80



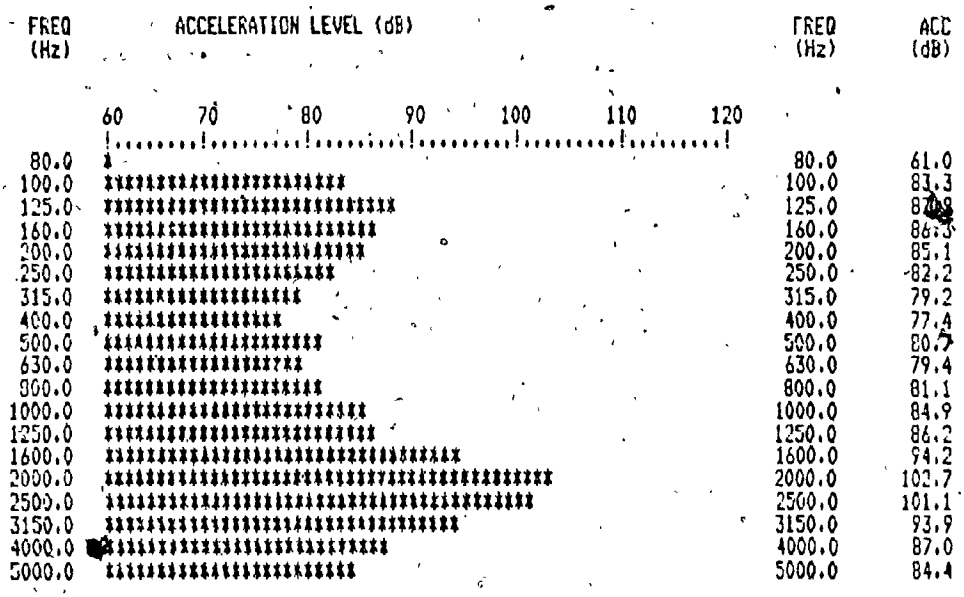
RMS ACCELERATION LEVEL 32 sec LIN avg
tst106 60in gap 6in baffle inB without diffusers 282
LEFT SIDE 08/25/80



FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	84.6
125.0	87.6
160.0	84.0
200.0	87.6
250.0	81.4
315.0	80.2
400.0	78.3
500.0	81.3
630.0	80.8
800.0	82.6
1000.0	85.5
1250.0	87.9
1600.0	96.1
2000.0	104.4
2500.0	101.4
3150.0	92.4
4000.0	85.9
5000.0	83.4

RMS ACCELERATION LEVEL 32 sec LIN avg
tst104 60in sqe 12in baffle inB with diffusers 2B2
RIGHT SIDE 08/25/80

subtract 1 dB from values



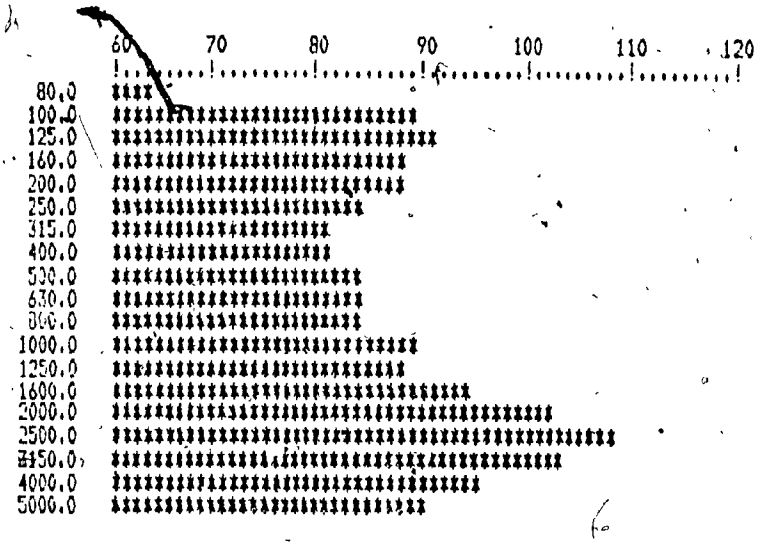
FREQ (Hz)	ACC (dB)
80.0	61.0
100.0	83.3
125.0	87.8
160.0	86.3
200.0	85.1
250.0	82.2
315.0	79.2
400.0	77.4
500.0	80.7
630.0	79.4
800.0	81.1
1000.0	84.9
1250.0	86.2
1600.0	94.2
2000.0	102.7
2500.0	101.1
3150.0	93.9
4000.0	87.0
5000.0	84.4

RMS ACCELERATION LEVEL 32 sec LIN avg
tst104 60in gyp 12in baffle inB with diffusers 2B2
LEFT SIDE 08/25/80

subtract 1dB from values

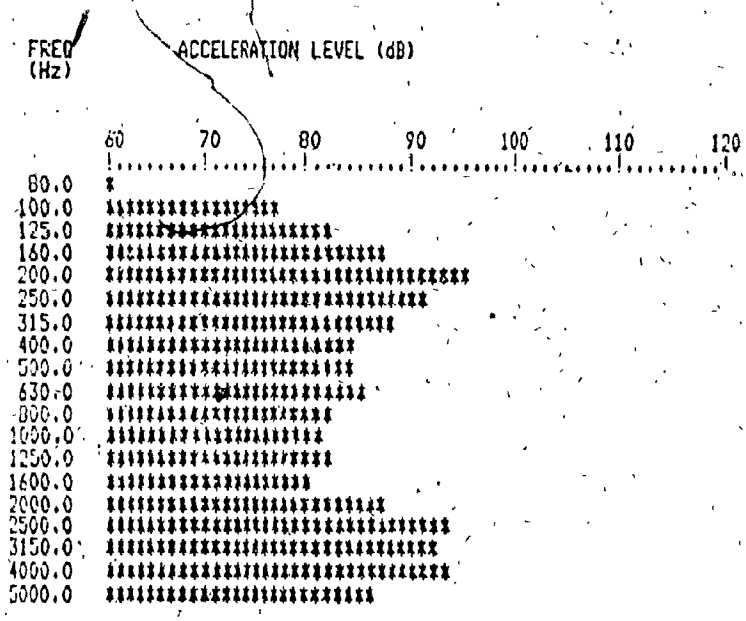
FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0	###	80.0	63.0
100.0	###########################	100.0	89.7
125.0	############################	125.0	90.0
160.0	#########################	160.0	86.7
200.0	############################	200.0	91.1
250.0	########################	250.0	85.5
315.0	######################	315.0	82.6
400.0	###################	400.0	81.0
500.0	########################	500.0	84.1
630.0	######################	630.0	83.7
800.0	########################	800.0	84.7
1000.0	##########################	1000.0	86.5
1250.0	##########################	1250.0	88.0
1600.0	############################	1600.0	93.1
2000.0	##	2000.0	104.2
2500.0	##	2500.0	111.5
3150.0	##	3150.0	104.9
4000.0	##################################	4000.0	94.9
5000.0	###############################	5000.0	90.4

RMS ACCELERATION LEVEL .32 sec LIN avg
tst103 60in sup 12in baffle inB without diffusers 2B2
RIGHT SIDE 08/22/80



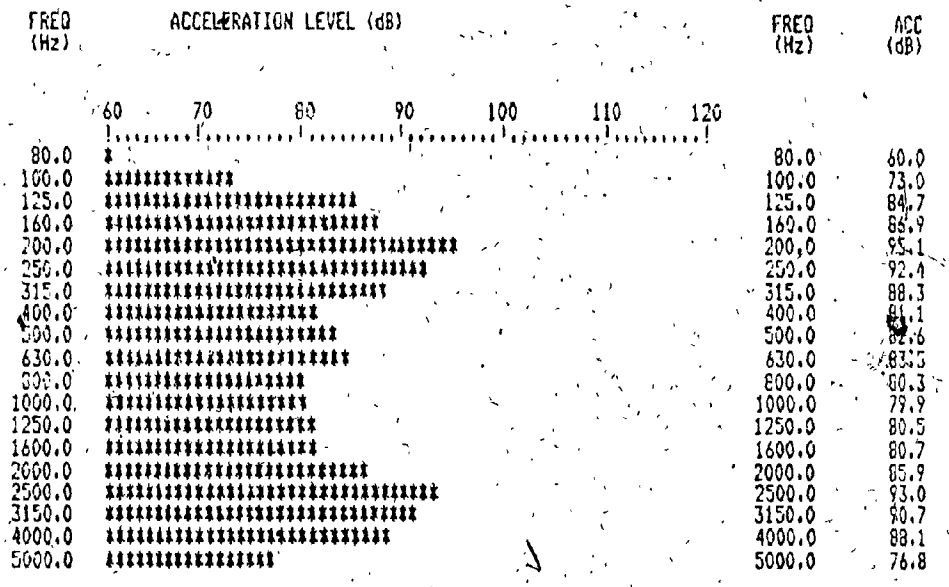
FREQ (Hz)	ACC (dB)
80.0	63.5
100.0	88.9
125.0	91.2
160.0	88.0
200.0	87.7
250.0	84.4
315.0	80.6
400.0	81.1
500.0	83.9
630.0	83.7
800.0	83.7
1000.0	88.5
1250.0	87.7
1600.0	94.3
2000.0	101.7
2500.0	107.9
3150.0	103.1
4000.0	94.6
5000.0	89.9

RMS ACCELERATION LEVEL 32 sec LIN avg
tst103 60in sup 12in baffle inB without diffusers 282
LEFT SIDE 08/22/80



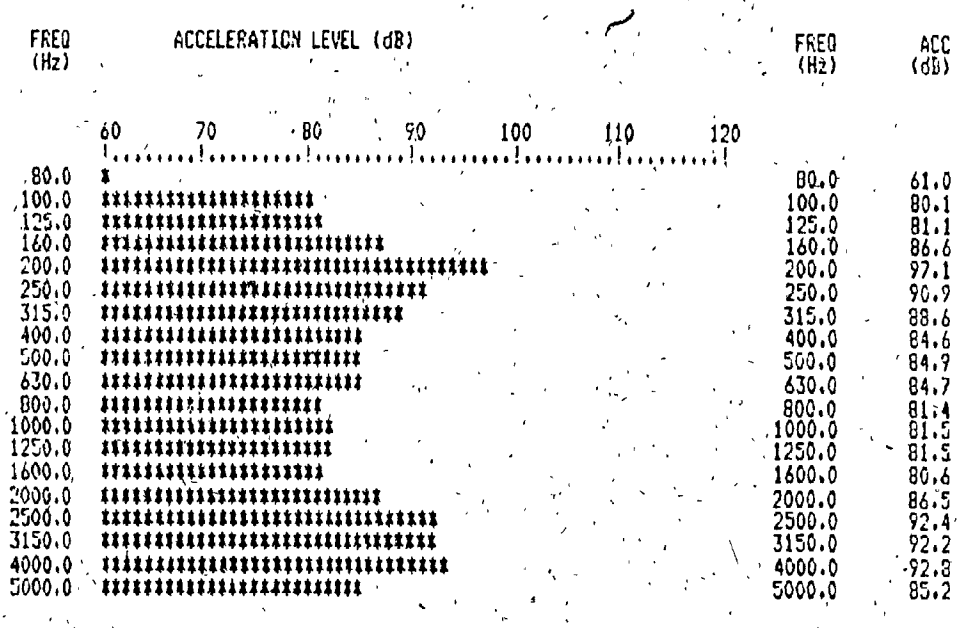
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	77.3
125.0	81.6
160.0	86.6
200.0	95.0
250.0	90.7
315.0	87.7
400.0	84.3
500.0	84.4
630.0	85.3
800.0	81.7
1000.0	81.4
1250.0	82.2
1600.0	80.4
2000.0	86.6
2500.0	93.1
3150.0	92.2
4000.0	92.8
5000.0	85.6

RMS ACCELERATION LEVEL, 32 sec LIN avg
1st100 60in 2xgyp inB rmB receiving with diffusers 283
RIGHT SIDE 08/22/80



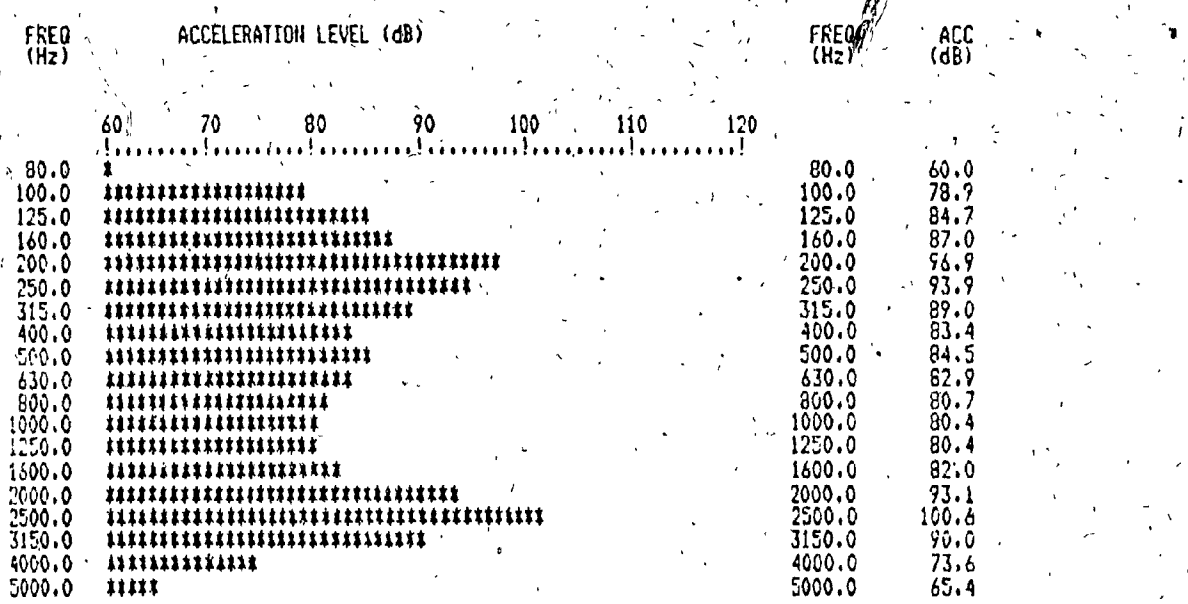
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	73.0
125.0	84.7
160.0	86.9
200.0	95.1
250.0	92.4
315.0	88.3
400.0	81.1
500.0	82.6
630.0	83.5
800.0	80.3
1000.0	79.9
1250.0	80.5
1600.0	80.7
2000.0	85.9
2500.0	93.0
3150.0	90.7
4000.0	88.1
5000.0	76.8

RMS ACCELERATION LEVEL 32 sec LIN avg
tst100 60in 2x6yp inB rmB receiving with diffusers 2B3
LEFT SIDE 08/22/80

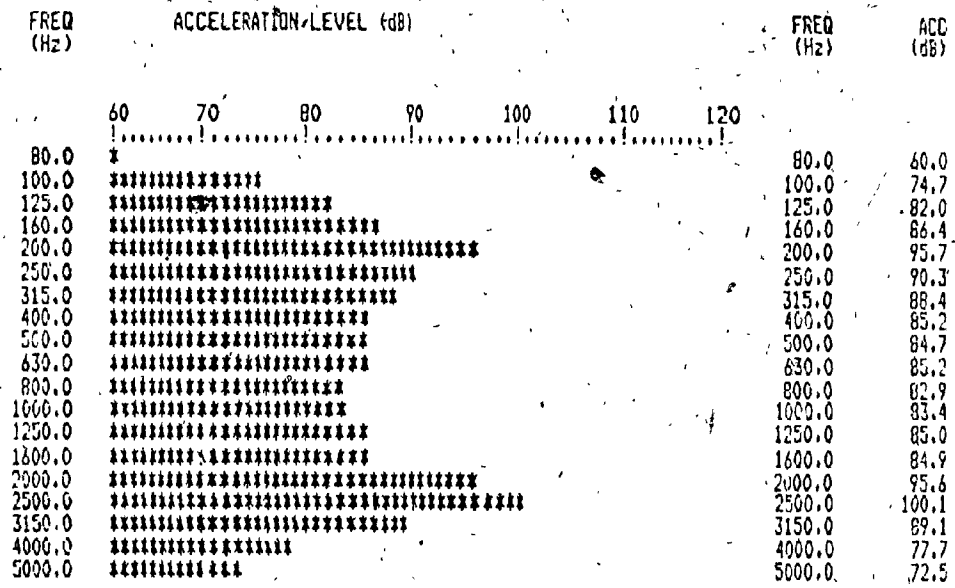


FREQ (Hz)	ACC (dB)
80.0	61.0
100.0	80.1
125.0	81.1
160.0	86.6
200.0	97.1
250.0	90.9
315.0	88.6
400.0	84.6
500.0	84.9
630.0	84.7
800.0	81.4
1000.0	81.5
1250.0	81.5
1600.0	80.6
2000.0	86.5
2500.0	92.4
3150.0	92.2
4000.0	92.8
5000.0	85.2

RMS ACCELERATION LEVEL 32 sec LIN avg
tst100b 60in 2xsyp inB r&B receiving without diffusers 283
RIGHT 08/22/80



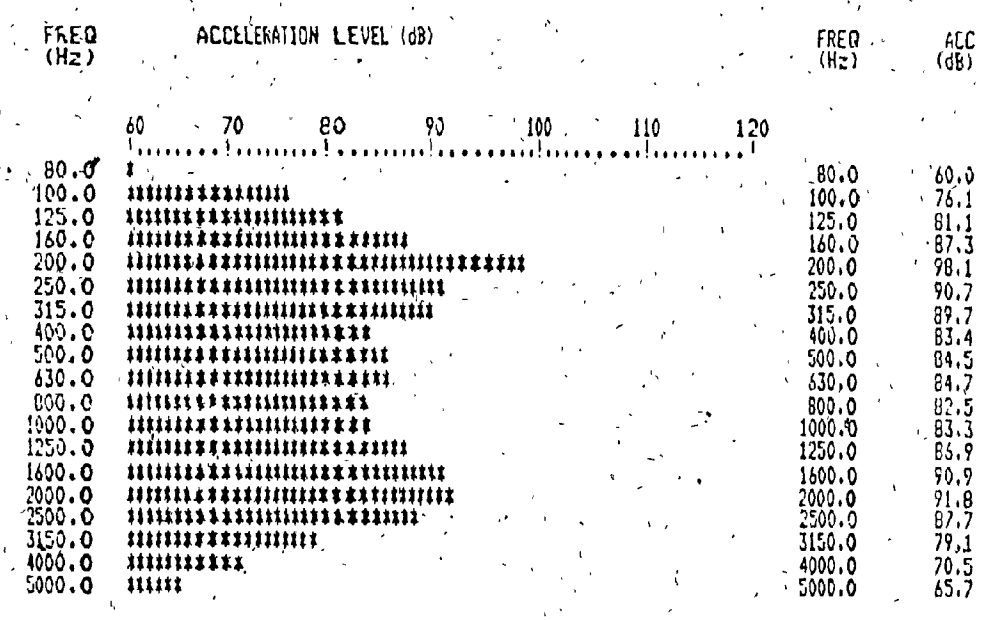
RMS ACCELERATION LEVEL 32 sec LIN avg
tst10Q 60in 3xgyp inB roB receiving without diffusers 2R3
LEFT 08/22/80



RMS ACCELERATION LEVEL 32 sec LIN avg
tst098 60in 2xgyp 6in baffle inB with diffusers 263
RIGHT SIDE 08/22/80

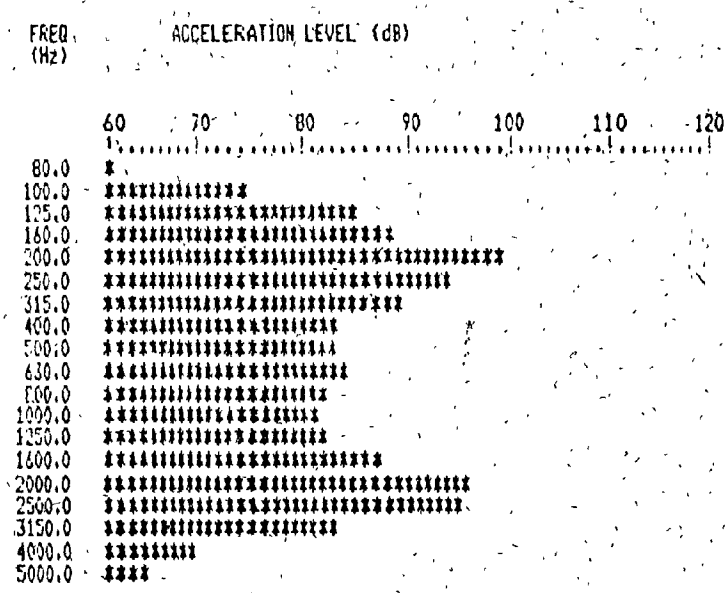
FREQ (Hz)	ACCELERATION LEVEL (dB)	FREQ (Hz)	ACC (dB)
	60 70 80 90 100 110 120		
80.0	*	80.0	60.0
100.0	**********	100.0	70.5
125.0	************************	125.0	84.6
160.0	*****************************	160.0	87.9
200.0	**********************************	200.0	95.7
250.0	*****************************	250.0	92.4
315.0	**************************	315.0	87.5
400.0	********************	400.0	82.2
500.0	**********************	500.0	82.9
630.0	************************	630.0	83.7
800.0	********************	800.0	81.3
1000.0	**********************	1000.0	81.7
1250.0	********************	1250.0	81.6
1600.0	************************	1600.0	84.9
2000.0	**********************************	2000.0	95.3
2500.0	**	2500.0	99.5
3150.0	*****************************	3150.0	87.3
4000.0	**********	4000.0	71.9
5000.0	*********	5000.0	68.7

RMS ACCELERATION LEVEL 32 sec LIN avg
tst098 60in 2xgyp 6in baffle inB with diffusers 2B3
LEFT SIDE 08/22/80



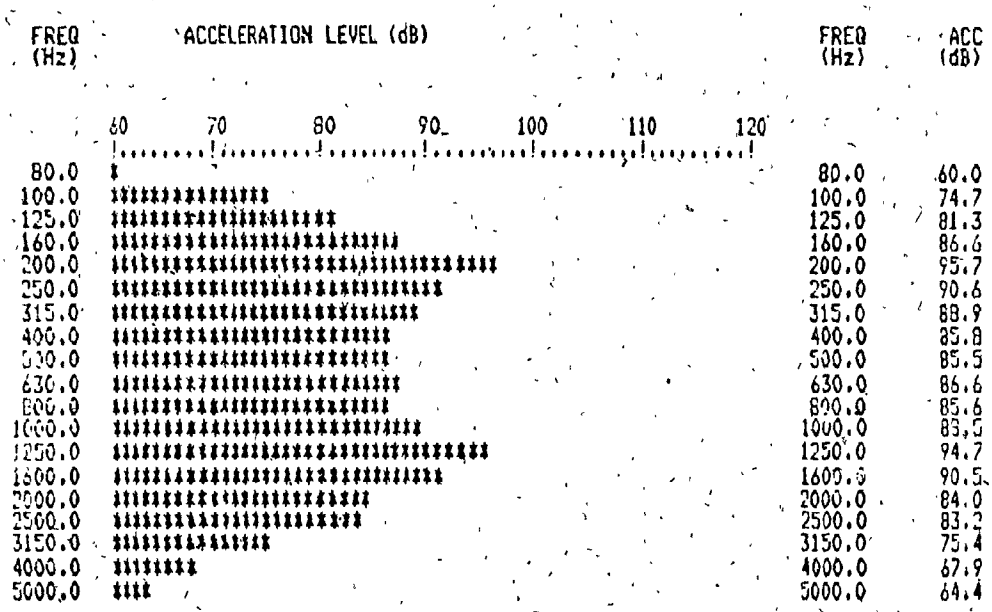
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	76.1
125.0	81.1
160.0	87.3
200.0	98.1
250.0	90.7
315.0	89.7
400.0	83.4
500.0	84.5
630.0	84.7
800.0	82.5
1000.0	83.3
1250.0	86.9
1600.0	90.9
2000.0	91.8
2500.0	87.7
3150.0	79.1
4000.0	70.5
5000.0	65.7

RMS ACCELERATION LEVEL 32 sec LIN avg
lst097 60in 2x6yp 6in baffle inB without diffusers 283
RIGHT SIDE 08/22/80



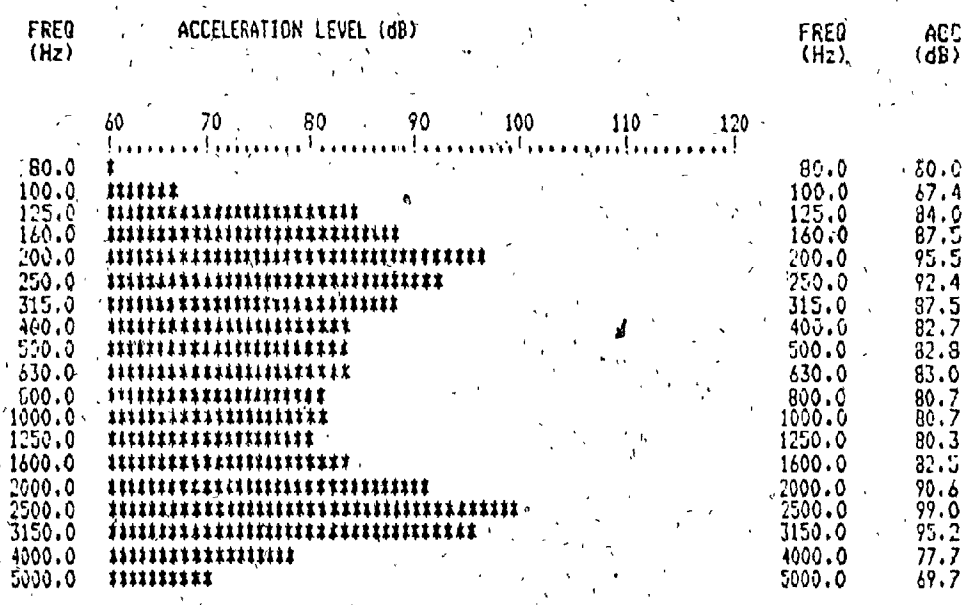
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	73.8
125.0	85.3
160.0	88.2
200.0	98.7
250.0	94.1
315.0	88.5
400.0	83.3
500.0	83.1
630.0	83.7
800.0	81.5
1000.0	81.4
1250.0	82.3
1600.0	86.6
2000.0	95.5
2500.0	94.9
3150.0	83.1
4000.0	69.3
5000.0	64.4

RMS ACCELERATION LEVEL 32 sec LIN avg
tst097 60in 2xdye 6in baffle inB without diffusers 283
LEFT SIDE 08/22/80

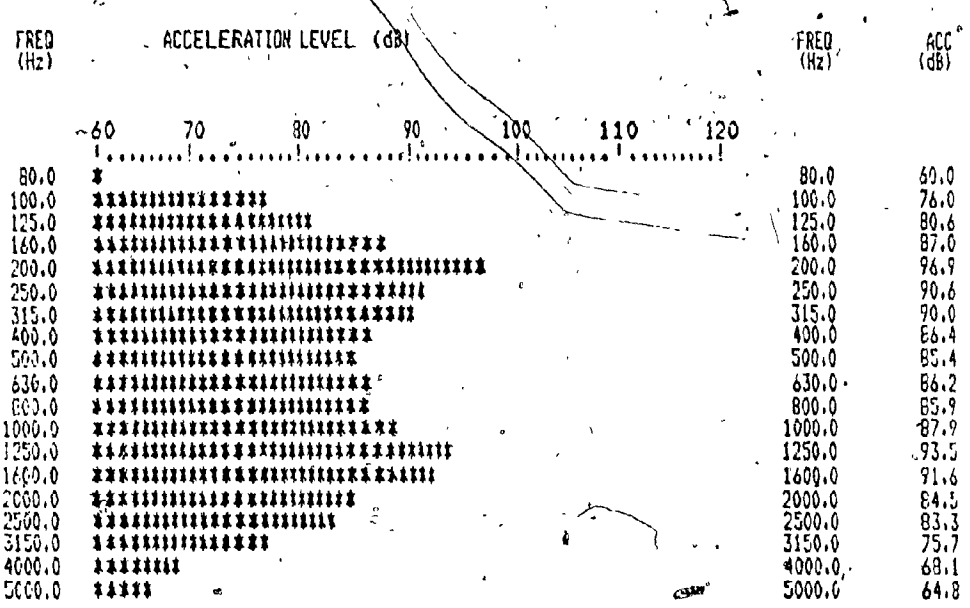


FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	74.7
125.0	81.3
160.0	86.6
200.0	95.7
250.0	90.6
315.0	88.9
400.0	85.8
500.0	85.5
630.0	86.6
800.0	85.6
1000.0	85.5
1250.0	94.7
1600.0	90.5
2000.0	84.0
2500.0	83.2
3150.0	75.4
4000.0	67.9
5000.0	64.4

RMS ACCELERATION LEVEL 32 sec LIN avg
tst095 60in 2xgyp 12in baffle inB with diffusers 283
RIGHT SIDE 08/22/80

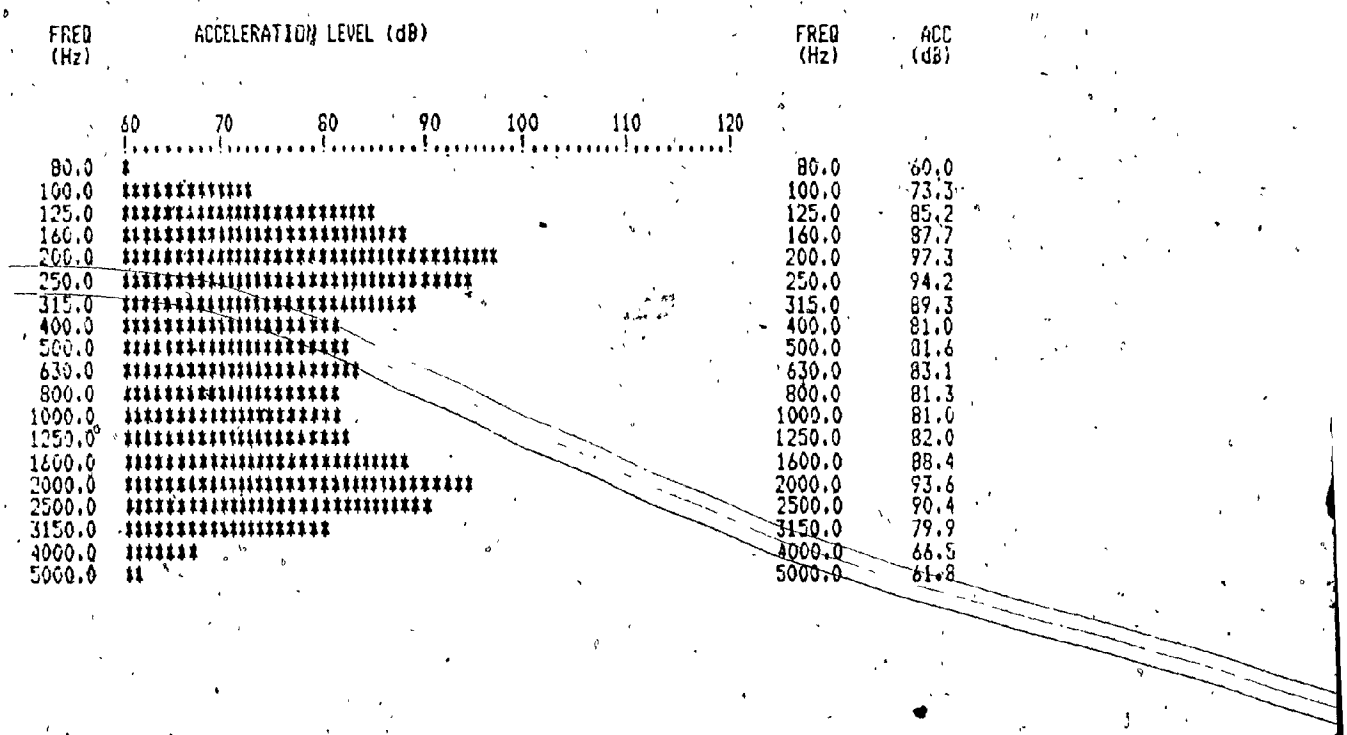


RMS ACCELERATION LEVEL 32 sec LIN avg
tst095 60in 2xgyp 12in baffle inB with diffusers 2B3
LEFT SIDE 08/22/80

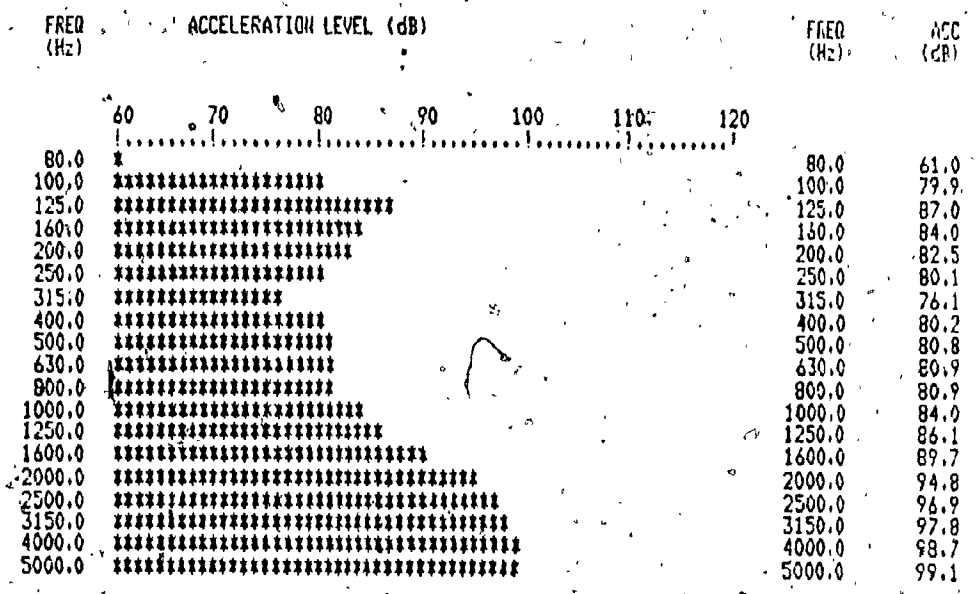


FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	76.0
125.0	80.6
160.0	87.0
200.0	96.9
250.0	90.6
315.0	90.0
400.0	86.4
500.0	85.4
630.0	86.2
800.0	85.9
1000.0	87.9
1250.0	93.5
1600.0	91.6
2000.0	84.3
2500.0	83.3
3150.0	75.7
4000.0	68.1
5000.0	64.8

RMS ACCELERATION LEVEL 32 sec LIN avg
t'st096 60in 2xgyp 12in baffle 1nB without diffusers 2B3
RIGHT SIDE 09/22/80

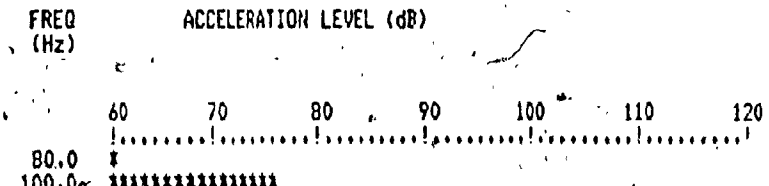


RMS ACCELERATION LEVEL 32 sec LIN avg
tst096 60in 2xgyp 12in baffle inB without diffusers 283
LEFT SIDE 08/22/80



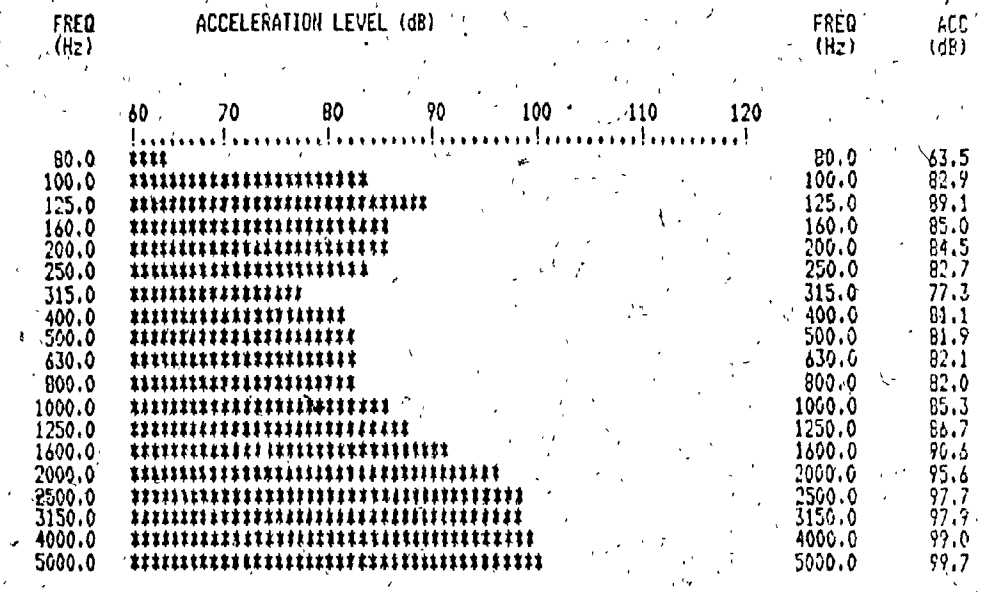
FREQ (Hz)	ACC (dB)
80.0	61.0
100.0	79.9
125.0	87.0
160.0	84.0
200.0	82.5
250.0	80.1
315.0	76.1
400.0	80.2
500.0	80.8
630.0	80.9
800.0	80.9
1000.0	84.0
1250.0	86.1
1600.0	89.7
2000.0	94.8
2500.0	96.9
3150.0	97.8
4000.0	98.7
5000.0	99.1

RMS ACCELERATION LEVEL 32 sec LIN avg
tst142 78in slass inA roA receiving with diffusers 3A1
CENTRE OF PANEL 12/11/80



FREQ (Hz)	ACC (dB)
80.0	61.0
100.0	76.3
125.0	87.4
160.0	85.2
200.0	84.6
250.0	81.5
315.0	80.5
400.0	82.9
500.0	79.2
630.0	82.4
800.0	81.5
1000.0	84.7
1250.0	86.8
1600.0	89.5
2000.0	95.8
2500.0	97.4
3150.0	97.5
4000.0	98.3
5000.0	99.3

RMS ACCELERATION LEVEL 32 sec LIN avg
tst149 78in glass inA raN receiving without diffusers 3A1
CENTRE OF PANEL 12/11/80

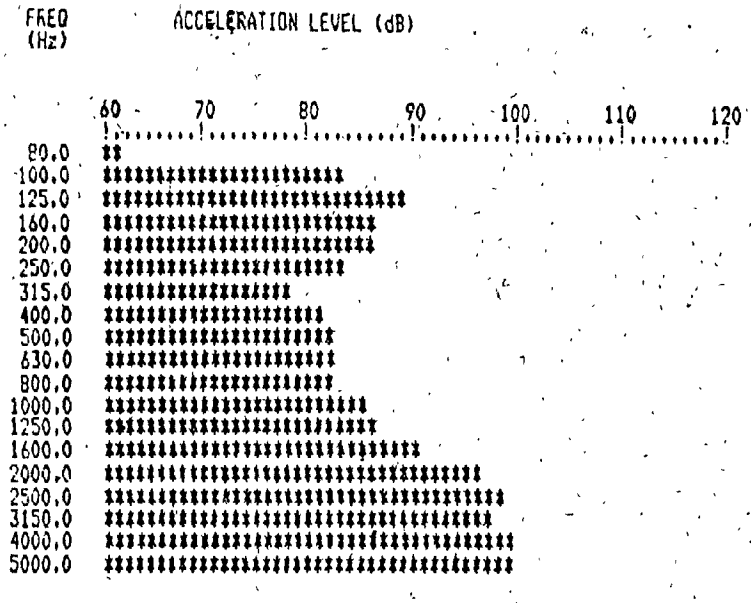


FREQ (Hz)	ACC (dB)
80.0	83.5
100.0	82.9
125.0	89.1
160.0	85.0
200.0	84.5
250.0	82.7
315.0	77.3
400.0	81.1
500.0	81.9
630.0	82.1
800.0	82.0
1000.0	85.3
1250.0	86.7
1600.0	90.6
2000.0	95.6
2500.0	97.7
3150.0	97.9
4000.0	99.0
5000.0	99.7

RMS ACCELERATION LEVEL 32 sec LIN avg
tst138 78in glass 6in baffle inA with diffusers 3AI
CENTRE OF PANEL 12/11/80

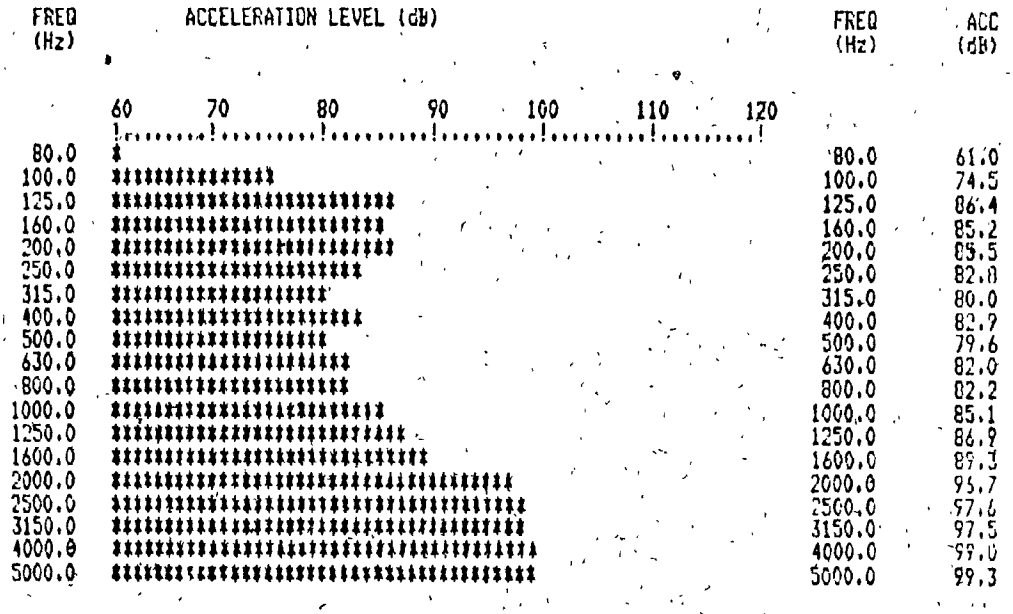
FREQ (Hz)	ACCELERATION LEVEL (dB)	FREQ (Hz)	ACC (dB)
	60 70 80 90 100 110 120		
80.0	#####	80.0	63.5
100.0	##################	100.0	76.5
125.0	############################	125.0	87.7
160.0	###########################	160.0	85.4
200.0	############################	200.0	85.7
250.0	#########################	250.0	82.7
315.0	######################	315.0	80.9
400.0	#########################	400.0	83.0
500.0	###################	500.0	79.4
630.0	#########################	630.0	82.6
800.0	######################	800.0	82.0
1000.0	###########################	1000.0	85.2
1250.0	############################	1250.0	86.1
1600.0	##############################	1600.0	88.9
2000.0	###################################	2000.0	96.0
2500.0	#####################################	2500.0	97.6
3150.0	#####################################	3150.0	97.8
4000.0	######################################	4000.0	98.9
5000.0	######################################	5000.0	100.1

RMS ACCELERATION LEVEL 32 sec LIN avg
tst139 78in glass 6in baffle inA without diffusers 3A1
CENTRE OF PANEL 12/11/80



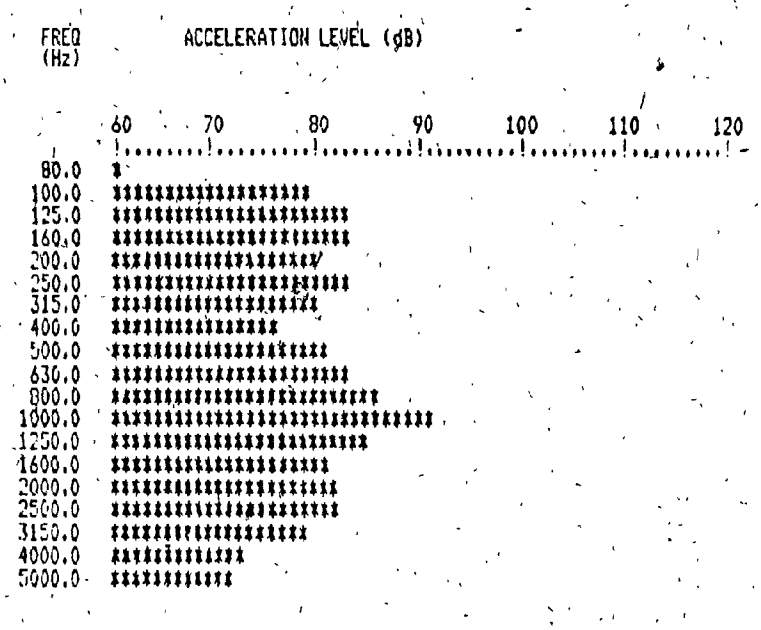
FREQ (Hz)	ACC (dB)
80.0	61.8
100.0	62.6
125.0	89.2
160.0	85.9
200.0	85.6
250.0	83.3
315.0	77.9
400.0	81.0
500.0	81.5
630.0	82.0
800.0	81.9
1000.0	85.3
1250.0	86.4
1600.0	90.3
2000.0	95.6
2500.0	97.6
3150.0	97.4
4000.0	98.7
5000.0	99.1

RMS ACCELERATION LEVEL 32 sec*1IN avg
tst137 78in glass 12in baffle inA with diffusers 3A1
CENTRE OF PANEL 12/10/80



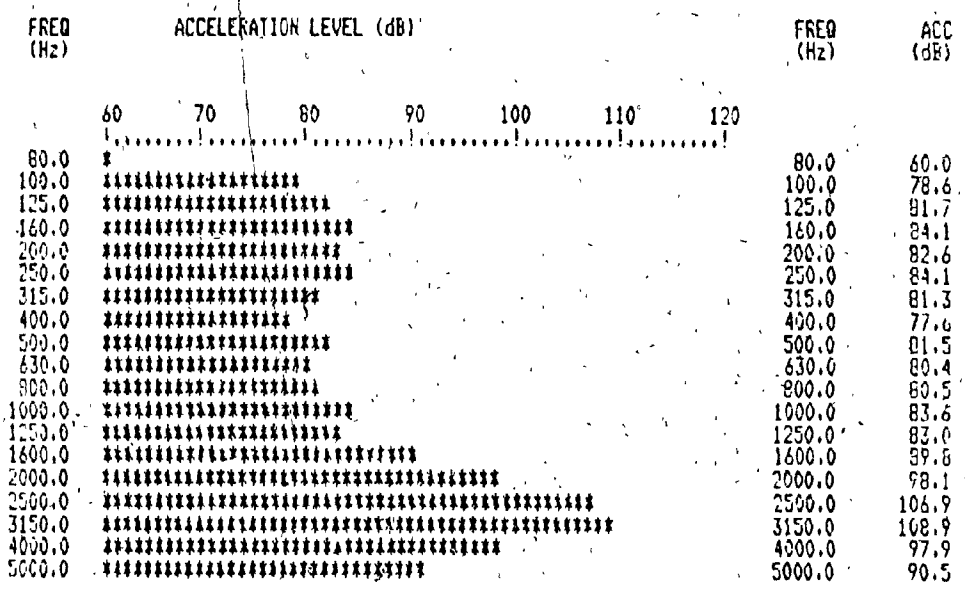
FREQ (Hz)	ACC (dB)
80.0	61.0
100.0	74.5
125.0	86.4
160.0	85.2
200.0	85.5
250.0	82.8
315.0	80.0
400.0	82.9
500.0	79.6
630.0	82.0
800.0	82.2
1000.0	85.1
1250.0	86.9
1600.0	89.3
2000.0	95.7
2500.0	97.6
3150.0	97.5
4000.0	99.0
5000.0	99.3

RMS ACCELERATION LEVEL 32 sec LIN avg
tst136 78in plass 12in baffle inA without diffusers 3A1
CENTRE OF PANEL 12/10/80

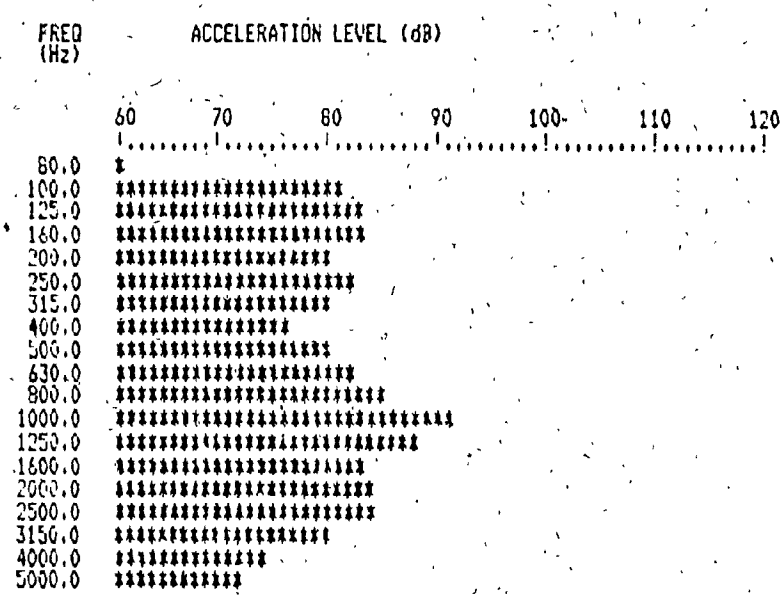


FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	78.7
125.0	82.5
160.0	83.2
200.0	79.9
250.0	82.6
315.0	79.7
400.0	76.4
500.0	80.6
630.0	82.6
800.0	86.0
1000.0	91.2
1250.0	85.2
1600.0	81.3
2000.0	82.4
2500.0	82.4
3150.0	79.6
4000.0	72.6
5000.0	71.7

RMS ACCELERATION LEVEL 32 sec LIN avg
tst118 78in gap inA room A receiving with diffusers 3A2
CENTRE LARGE PANEL 09/04/80

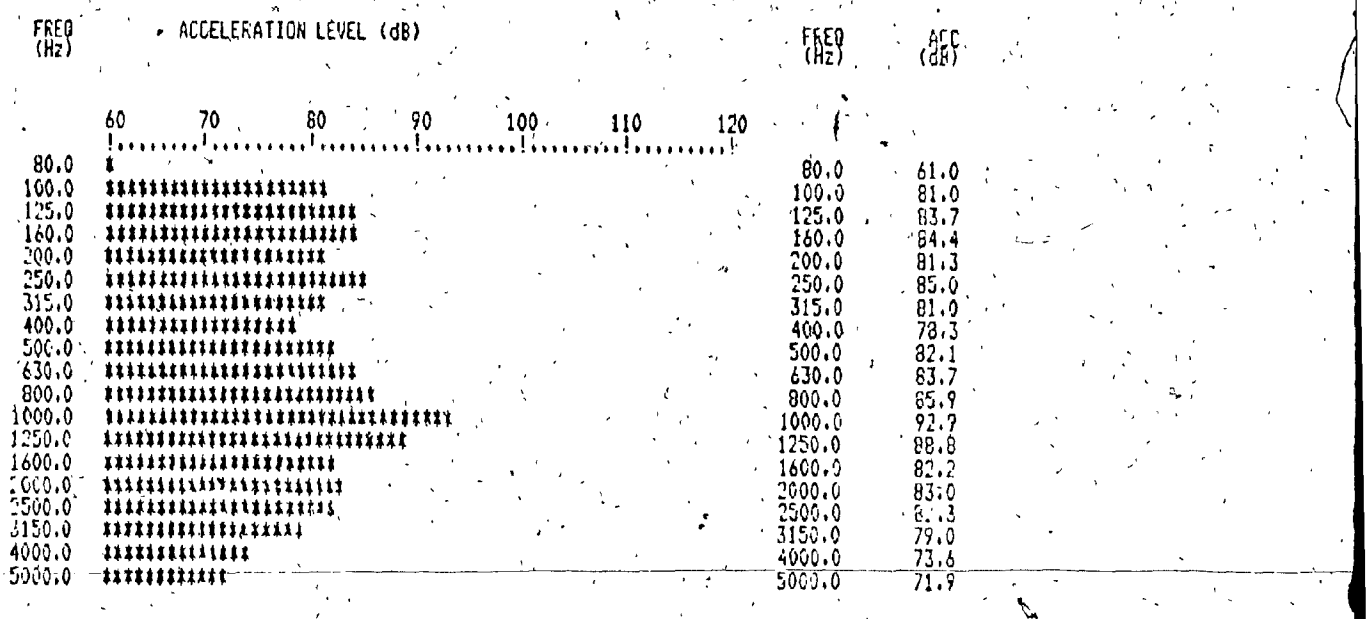


RMS ACCELERATION LEVEL 32 sec LIN avg
tst120 78in gyp inA rmA receiving without diffusers 3A2
CENTRE LARGE PANEL 09/05/80

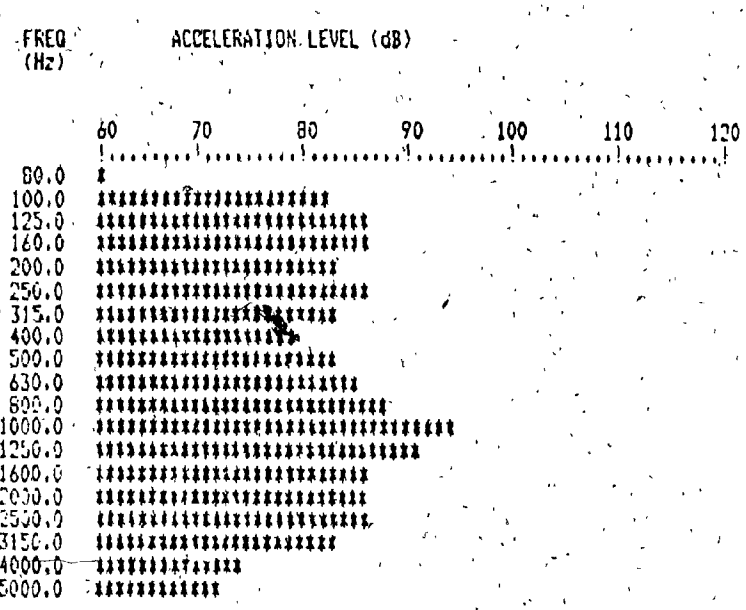


FREQ (Hz)	ACC (dB)
80.0	61.0
100.0	80.7
125.0	83.1
160.0	82.8
200.0	79.7
250.0	82.2
315.0	80.1
400.0	76.1
500.0	80.4
630.0	82.1
800.0	85.0
1000.0	90.6
1250.0	88.1
1600.0	82.9
2000.0	83.9
2500.0	83.9
3150.0	79.8
4000.0	73.6
5000.0	72.1

RMS ACCELERATION LEVEL 32 sec LIN avg
tst114 78in sup 6in baffle inA with diffusers 3A2
CENTRE LARGE PANEL 09/04/80

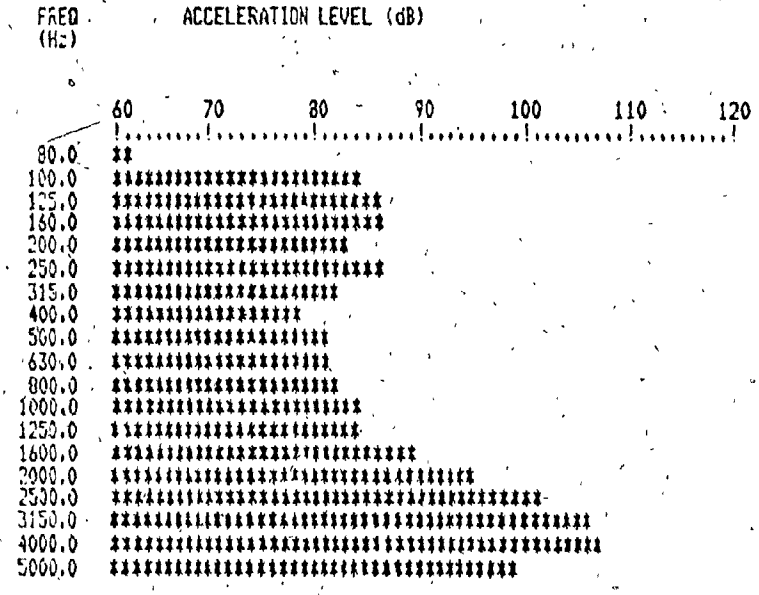


RMS ACCELERATION LEVEL 32 sec LIN avg
tst113 78in-sqr 6in baffle inA without diffusers .3A2
CENTRE LARGE PANEL 09/04/80



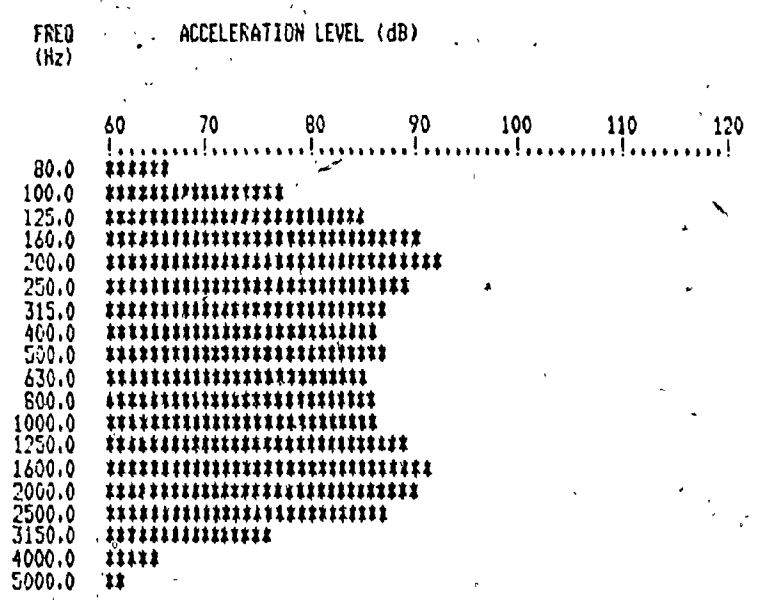
FREQ (Hz)	ACC (dB)
80.0	61.0
100.0	82.1
125.0	89.6
160.0	85.8
200.0	82.6
250.0	85.8
315.0	82.9
400.0	78.7
500.0	83.0
630.0	85.4
800.0	88.1
1000.0	94.0
1250.0	90.7
1600.0	85.6
2000.0	86.3
2500.0	86.3
3150.0	82.6
4000.0	74.0
5000.0	72.3

RMS ACCELERATION LEVEL 32 sec LIN avs
tst117 78in gyp 12in baffle inA with diffusers *** 3A2
CENTRE LARGE PANEL retset of tst111 09/04/80



FREQ (Hz)	ACC (dB)
80.0	61.8
100.0	84.1
125.0	86.0
160.0	85.5
200.0	82.9
250.0	85.6
315.0	82.2
400.0	78.4
500.0	81.1
630.0	81.1
800.0	81.9
1000.0	83.8
1250.0	83.9
1600.0	87.2
2000.0	95.2
2500.0	101.7
3150.0	105.7
4000.0	106.7
5000.0	98.9

RMS ACCELERATION LEVEL 32 sec LIN avg
tst112 78in sup 12in baffle inA without diffusers 3A2
CENTRE LARGE PANEL 09/03/80

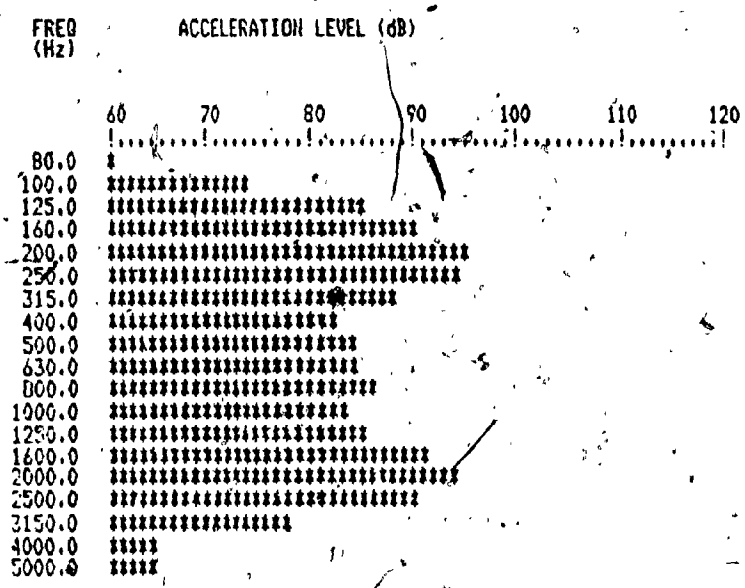


FREQ (Hz)	ACC (dB)
80.0	66.0
100.0	76.5
125.0	84.9
160.0	90.4
200.0	91.8
250.0	89.1
315.0	86.6
400.0	85.6
500.0	86.6
630.0	84.5
800.0	85.9
1000.0	85.9
1250.0	88.5
1600.0	91.2
2000.0	89.7
2500.0	86.7
3150.0	75.7
4000.0	64.8
5000.0	62.4

RMS ACCELERATION LEVEL 32 sec LIN avg
tst132 7Bin 2xgyp inA rmA receiving with diffusers 3A3
CENTRE LARGE PANEL 11/05/80

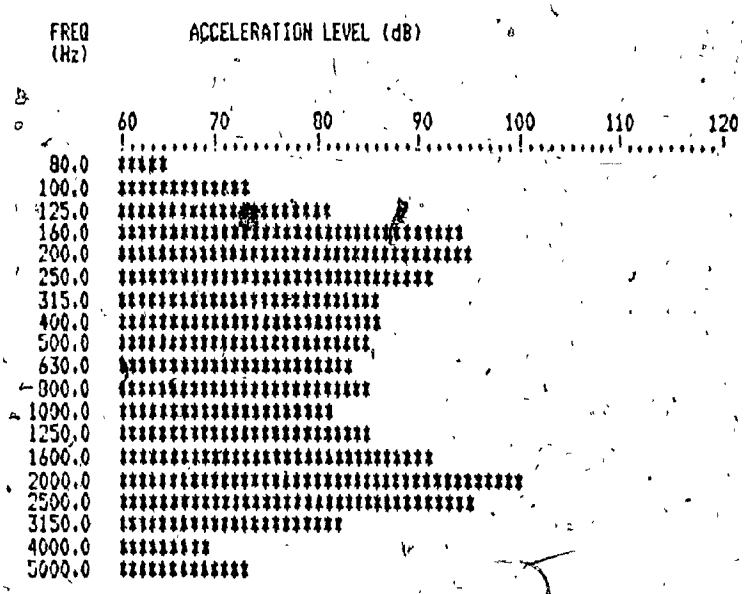
FREQ (Hz)	ACCELERATION LEVEL (dB) 60 70 80 90 100 110 120	FREQ (Hz)	ACC (dB)
80.0	##	80.0	62.4
100.0	###########	100.0	72.1
125.0	########################	125.0	83.1
160.0	##################################	160.0	94.0
200.0	#################################	200.0	92.4
250.0	###############################	250.0	89.7
315.0	##############################	315.0	87.7
400.0	###########################	400.0	86.9
500.0	############################	500.0	87.1
630.0	###########################	630.0	85.7
800.0	############################	800.0	87.3
1000.0	###########################	1000.0	86.2
1250.0	############################	1250.0	88.0
1600.0	###########################	1600.0	87.0
2000.0	########################	2000.0	85.5
2500.0	######################	2500.0	84.0
3150.0	############	3150.0	73.3
4000.0	####	4000.0	63.5
5000.0	#	5000.0	60.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst134 78in 2xsyp inA rmA receiving without diffusers JAJ
CENTRE LARGE PANEL 11/05/80



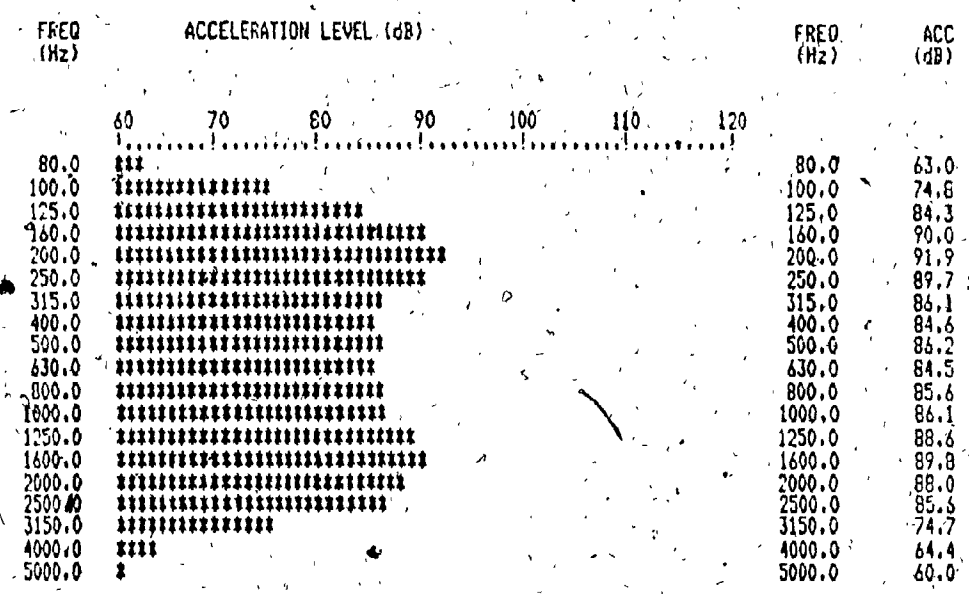
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	74.0
125.0	85.3
160.0	90.3
200.0	94.9
250.0	93.7
315.0	87.5
400.0	82.2
500.0	84.0
630.0	83.9
800.0	85.7
1000.0	82.5
1250.0	85.1
1600.0	91.2
2000.0	94.4
2500.0	90.0
3150.0	78.3
4000.0	65.4
5000.0	65.1

RMS ACCELERATION LEVEL 32 sec LIN avg
tst128 78in 2xsyp 6in baffle inA with diffusers 3A3
CENTRE LARGE PANEL 11/03/80



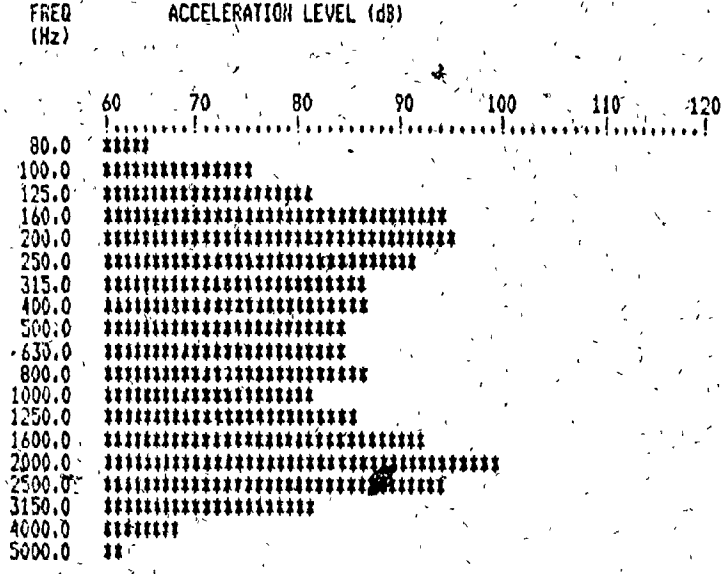
FREQ (Hz)	ACC (dB)
80.0	65.1
100.0	72.9
125.0	80.6
160.0	93.5
200.0	94.8
250.0	91.3
315.0	85.5
400.0	86.3
500.0	84.5
630.0	82.9
800.0	85.4
1000.0	81.0
1250.0	84.9
1600.0	91.0
2000.0	100.1
2500.0	95.4
3150.0	82.0
4000.0	69.1
5000.0	73.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst129 78in 2xsyp 6in baffle in~~A~~ diffusers 3A3 without diff.
CENTRE LARGE PANEL 11/04/80



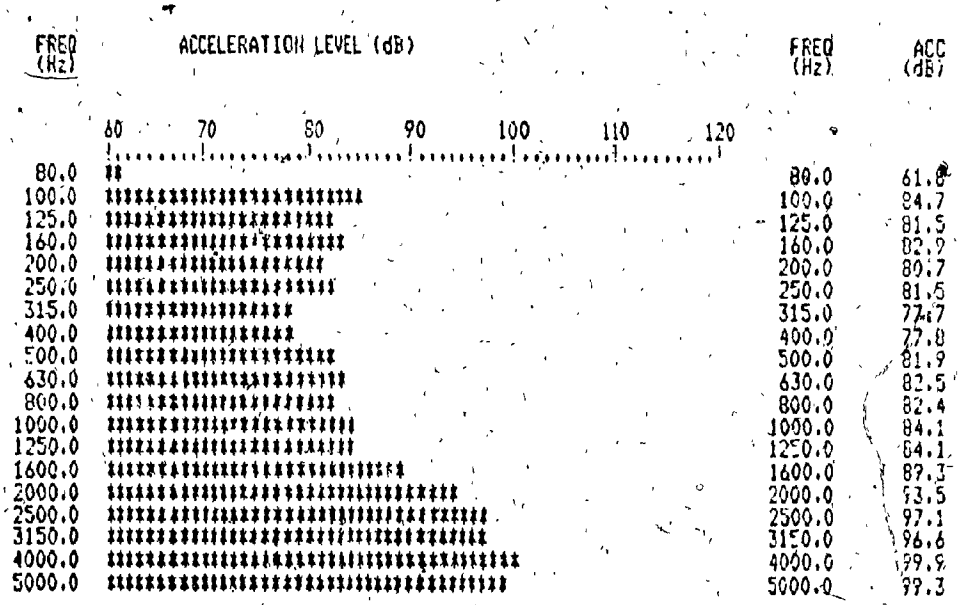
FREQ (Hz)	ACC (dB)
80.0	63.0
100.0	74.8
125.0	84.3
160.0	90.0
200.0	91.9
250.0	89.7
315.0	86.1
400.0	84.6
500.0	86.2
630.0	84.5
800.0	85.6
1000.0	86.1
1250.0	88.6
1600.0	89.8
2000.0	88.0
2500.0	85.6
3150.0	74.7
4000.0	64.4
5000.0	60.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst131 78in 2xgyp 12in baffle inA with diffusers 3AJ
CENTRE LARGE PANEL 11/05/80

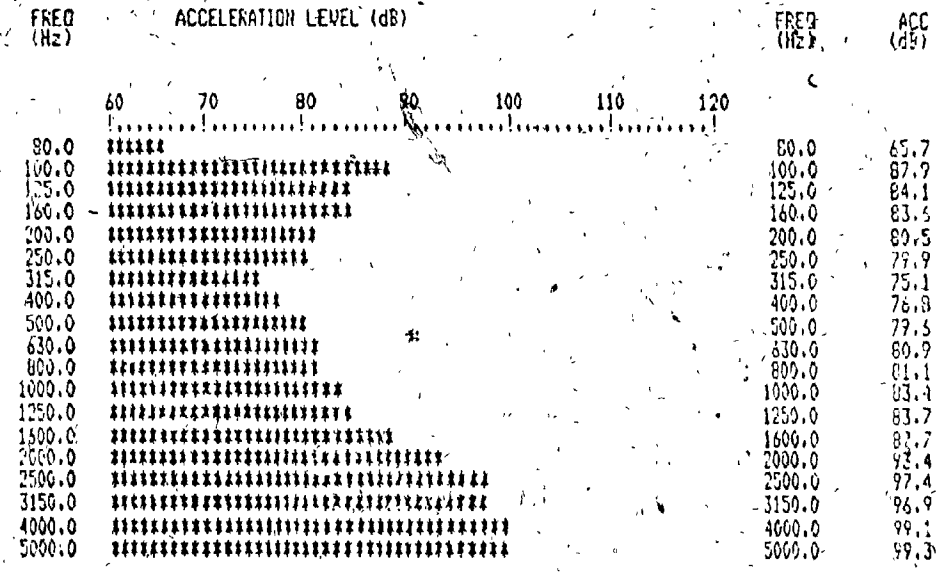


FREQ (Hz)	ACC (dB)
80.0	65.4
100.0	75.0
125.0	80.7
160.0	93.9
200.0	94.8
250.0	91.1
315.0	85.7
400.0	85.9
500.0	83.9
630.0	83.5
800.0	85.0
1000.0	80.8
1250.0	84.7
1600.0	91.6
2000.0	98.3
2500.0	94.2
3150.0	80.5
4000.0	68.3
5000.0	61.8

RMS ACCELERATION LEVEL 32 sec LIN avg
tst130 78in 2xgyp 12in baffle inA without diffusers 3A3
CENTRE LARGE PANEL 11/04/80



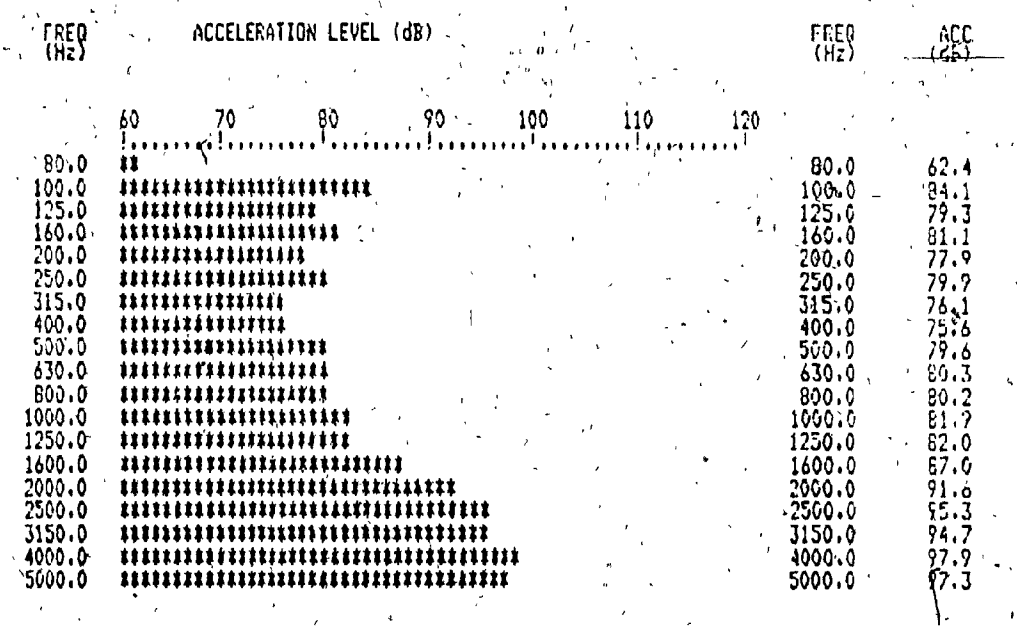
RMS ACCELERATION LEVEL, 32 sec LIN avg
tst148 78in glass inB roR receiving with diffusers 381
CENTRE OF PANEL 01/27/81



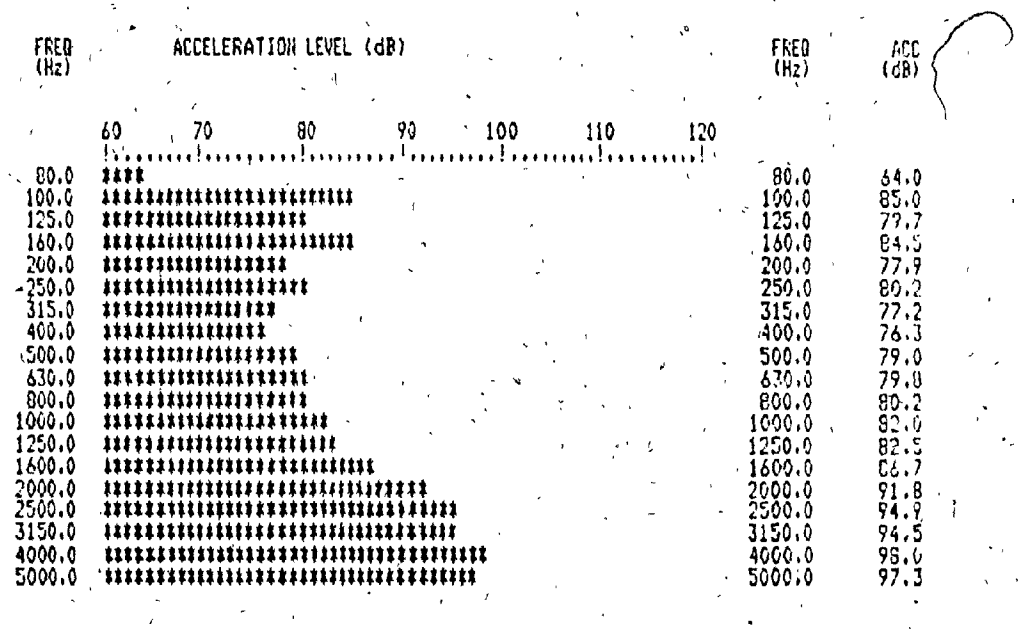
FREQ (Hz)	ACC (dB)
80.0	65.7
100.0	87.9
125.0	84.1
160.0	83.6
200.0	80.5
250.0	79.9
315.0	75.1
400.0	76.8
500.0	79.5
630.0	80.9
800.0	81.1
1000.0	83.1
1250.0	83.7
1600.0	82.7
2000.0	93.4
2500.0	97.4
3150.0	96.9
4000.0	99.1
5000.0	99.3

RMS ACCELERATION LEVEL 32 sec LIN avg

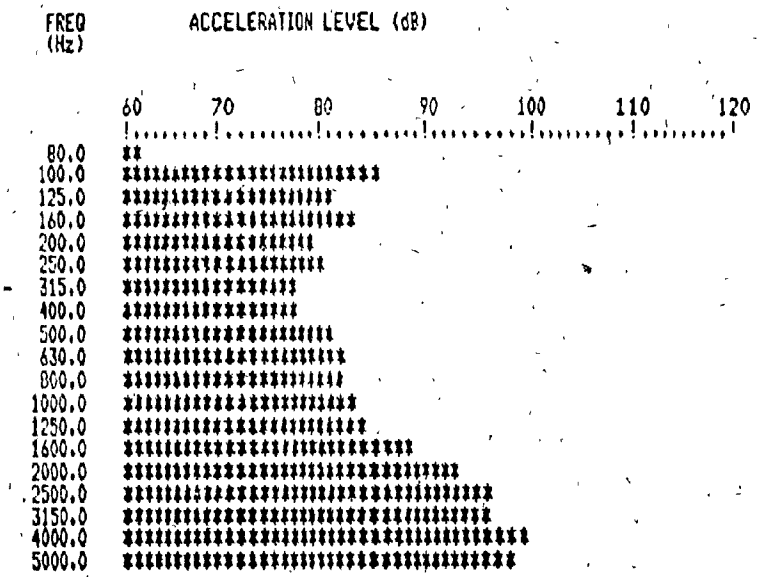
tst150 78in slass inB rmB receiving without diffusers 3B1
CENTRE OF PANEL 02/02/81



RMS ACCELERATION LEVEL 32 sec LIN avg
tst147 78in glass 6in baffle inB with diffusers 3B1
CENTRE OF PANEL 01/26/81

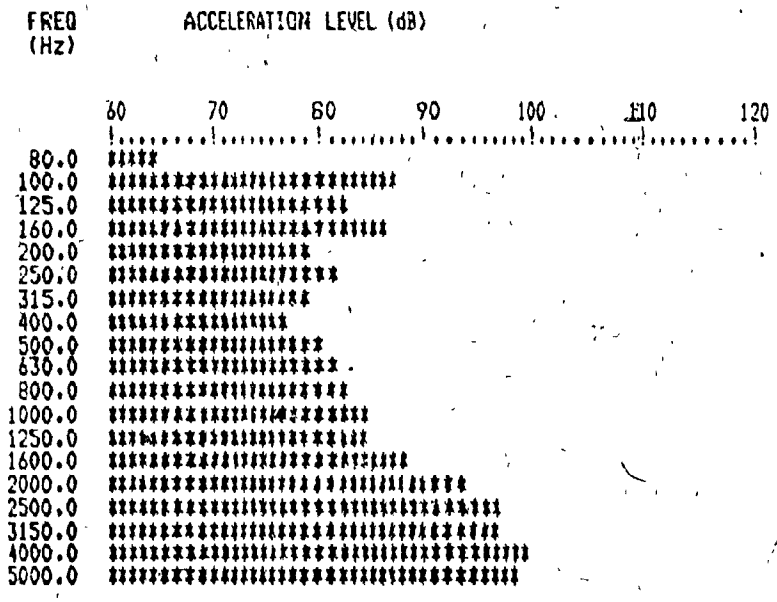


RMS ACCELERATION LEVEL 32 sec LIN avg
tst146 78in glass 6in baffle in8 without diffusers -381
CENTRE OF PANEL 01/26/81



FREQ (Hz)	ACC (dB)
80.0	62.4
100.0	85.0
125.0	80.5
160.0	82.8
200.0	79.4
250.0	79.9
315.0	76.9
400.0	76.7
500.0	80.8
630.0	81.6
800.0	81.9
1000.0	83.4
1250.0	83.6
1600.0	88.3
2000.0	92.8
2500.0	96.0
3150.0	95.9
4000.0	98.9
5000.0	98.3

RMS ACCELERATION LEVEL 32 sec LIN avg
lst144 78in glass 12in baffle inB with diffusers. 3B1
CENTRE OF PANEL 01/22/81



FREQ (Hz)	ACC (dB)
80.0	64.0
100.0	87.1
125.0	81.9
160.0	86.2
200.0	79.0
250.0	81.1
315.0	78.6
400.0	77.4
500.0	80.3
630.0	81.1
800.0	81.6
1000.0	83.6
1250.0	84.1
1600.0	88.3
2000.0	93.1
2500.0	96.3
3150.0	95.6
4000.0	99.0
5000.0	98.1

RMS ACCELERATION LEVEL 32 sec LIN avg
tst145 78in glass 12in baffle inB without diffusers JB1
CENTRE OF PANEL. 01/22/81

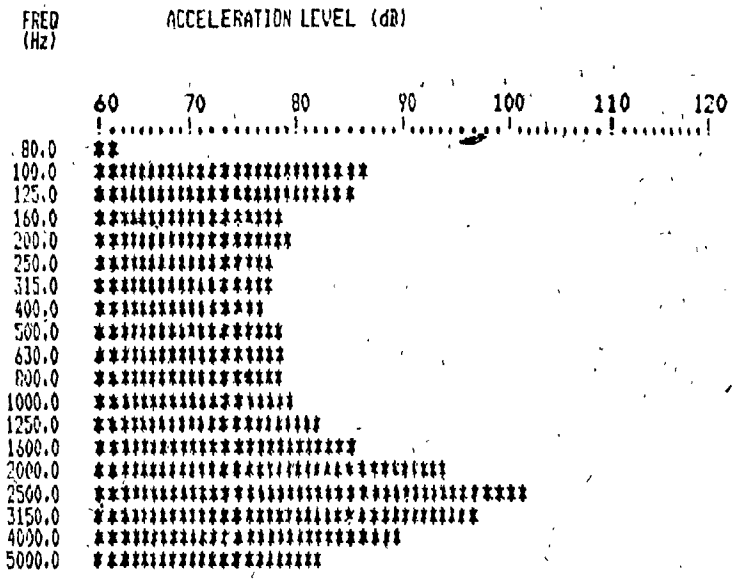
C 121

FREQ (Hz)	ACCELERATION LEVEL (dB)	FREQ (Hz)	ACC (dB)
	60 70 80 90 100 110 120		
80.0	##	80.0	71.8
100.0	########################	100.0	85.3
125.0	########################	125.0	84.0
160.0	###################	160.0	78.9
200.0	###################	200.0	78.0
250.0	##################	250.0	78.4
315.0	##################	315.0	75.9
400.0	##################	400.0	76.1
500.0	###################	500.0	78.0
630.0	###################	630.0	78.3
800.0	###################	800.0	79.3
1000.0	###################	1000.0	78.7
1250.0	##########################	1250.0	81.9
1600.0	#########################	1600.0	85.0
2000.0	################################	2000.0	93.0
2500.0	##	2500.0	100.1
3150.0	################################	3150.0	94.1
4000.0	#########################	4000.0	85.5
5000.0	###################	5000.0	78.0

RMS ACCELERATION LEVEL 32 sec LIN avg
tst159 78in sup inB rsh recieving with diffusers JB2
CENTRE OF PANEL 03/10/81

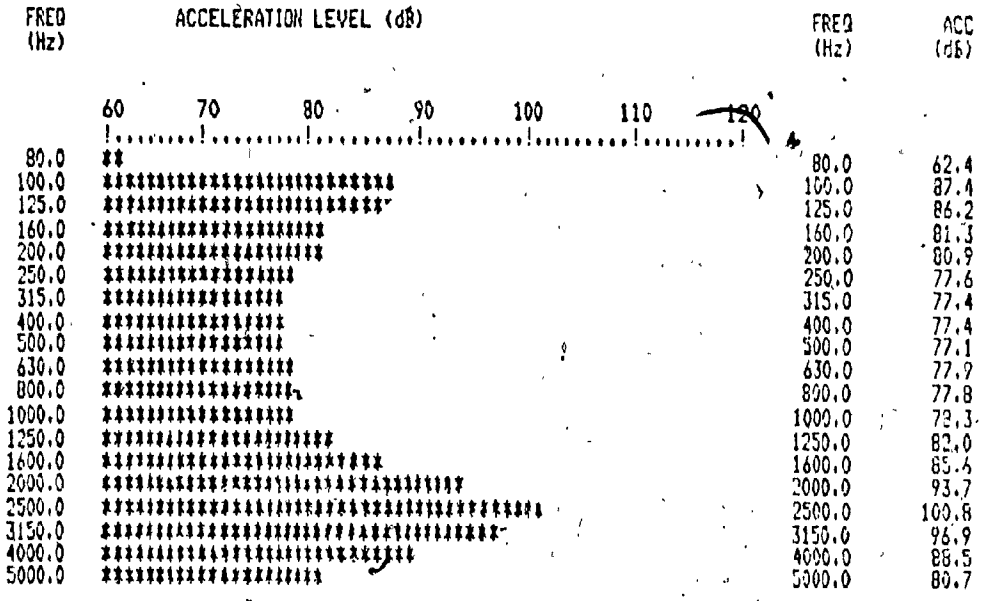
FREQ (Hz)	ACCELERATION LEVEL (dB)	FREQ (Hz)	ACC (dB)
	60 70 80 90 100 110 120		
80.0	**	80.0	61.8
100.0	**********	100.0	86.8
125.0	*********	125.0	85.0
160.0	********	160.0	81.1
200.0	*******	200.0	79.3
250.0	*******	250.0	77.3
315.0	*******	315.0	77.1
400.0	*******	400.0	77.0
500.0	*******	500.0	77.3
630.0	********	630.0	78.4
800.0	*******	800.0	77.9
1000.0	*******	1000.0	78.4
1250.0	********	1250.0	81.9
1600.0	**********	1600.0	85.5
2000.0	**********	2000.0	93.7
2500.0	**********	2500.0	99.5
3150.0	**********	3150.0	94.3
4000.0	********	4000.0	85.9
5000.0	*******	5000.0	77.8

RMS ACCELERATION LEVEL 32 sec LIN avg
tst157 78in gyp inB Rm B recieving without diffuers 382
CENTRE OF PANEL 03/10/81



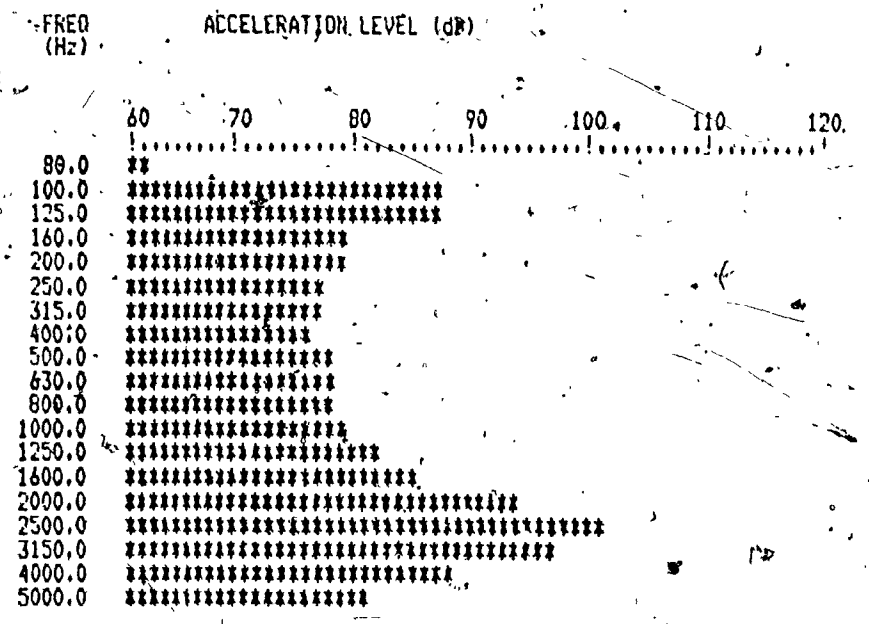
FREQ (Hz)	ACC (dB)
80.0	62.4
100.0	86.4
125.0	84.7
160.0	78.1
200.0	78.5
250.0	76.9
315.0	77.4
400.0	76.4
500.0	78.0
630.0	78.1
800.0	78.0
1000.0	79.1
1250.0	82.0
1600.0	85.2
2000.0	93.6
2500.0	101.2
3150.0	96.9
4000.0	88.5
5000.0	81.5

RMS ACCELERATION LEVEL 32 sec LIN avg
tst154 78in dsp 6in baffle inB with diffusers 382
CENTRE OF PANEL 03/10/81



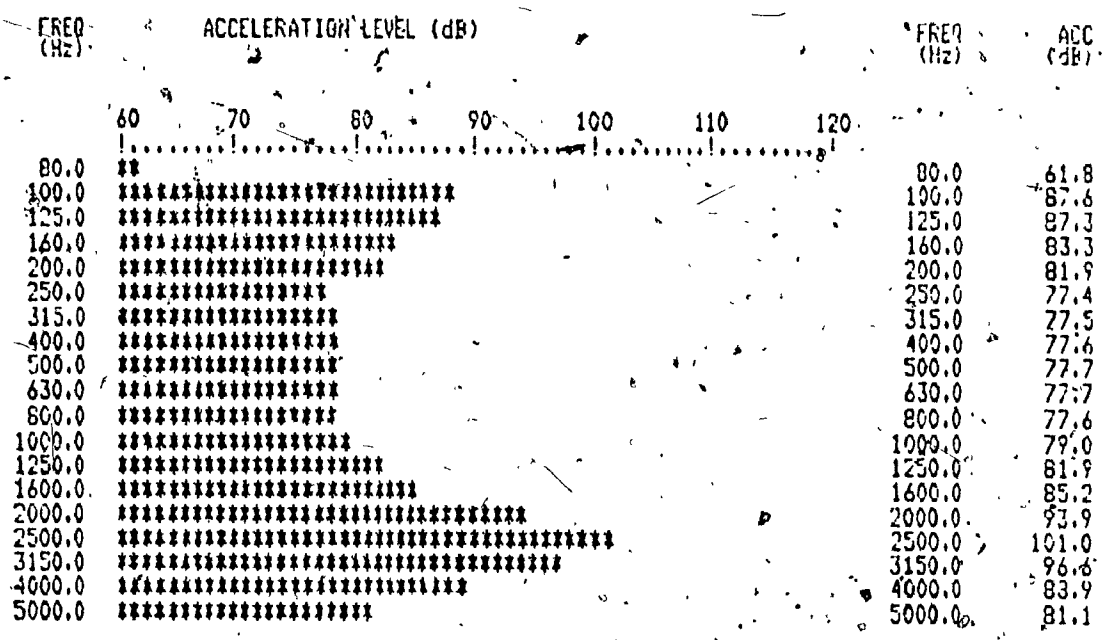
FREQ (Hz)	ACC (dB)
80.0	62.4
100.0	87.4
125.0	86.2
160.0	81.3
200.0	80.9
250.0	77.6
315.0	77.4
400.0	77.4
500.0	77.1
630.0	77.9
800.0	77.8
1000.0	78.3
1250.0	82.0
1600.0	85.4
2000.0	93.7
2500.0	100.8
3150.0	96.9
4000.0	88.5
5000.0	80.7

RMS ACCELERATION LEVEL 32 sec LIN avg
1st155 78in sqr 6in baffle inB without diffusers 382.
CENTRE OF PANEL 03/10/81



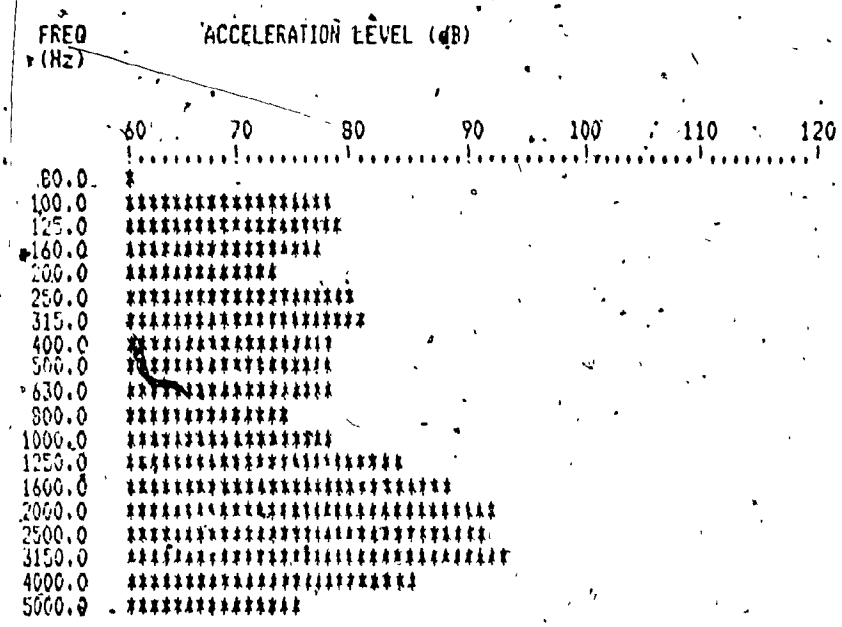
FREQ (Hz)	ACC (dB)
80.0	62.4
100.0	66.6
125.0	86.6
160.0	79.4
200.0	78.7
250.0	77.0
315.0	77.4
400.0	76.4
500.0	78.1
630.0	78.1
800.0	78.1
1000.0	79.3
1250.0	82.2
1600.0	85.1
2000.0	93.5
2500.0	100.9
3150.0	96.6
4000.0	88.3
5000.0	81.4

RMS ACCELERATION LEVEL 32 sec LIN avg
tst152 78in sup 12in baffle in8 with diffusers 382
CENTRE OF PANEL 03/10/21



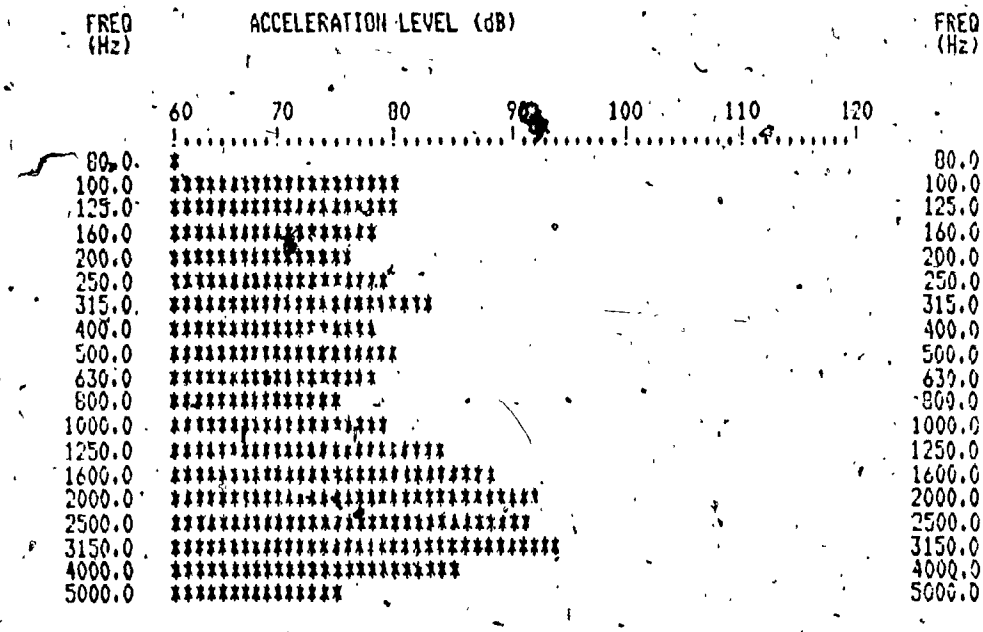
FREQ (Hz)	ACC (dB)
80.0	61.8
100.0	87.6
125.0	87.3
160.0	83.3
200.0	81.9
250.0	77.4
315.0	77.5
400.0	77.6
500.0	77.7
630.0	77.7
800.0	77.6
1000.0	79.0
1250.0	81.9
1600.0	85.2
2000.0	93.9
2500.0	101.0
3150.0	96.6
4000.0	83.9
5000.0	81.1

RMS ACCELERATION LEVEL 32 sec LIN avg
tst153 78in ssp 12in baffle in8 without diffusers 3R2
CENTRE OF PANEL : 03/10/81



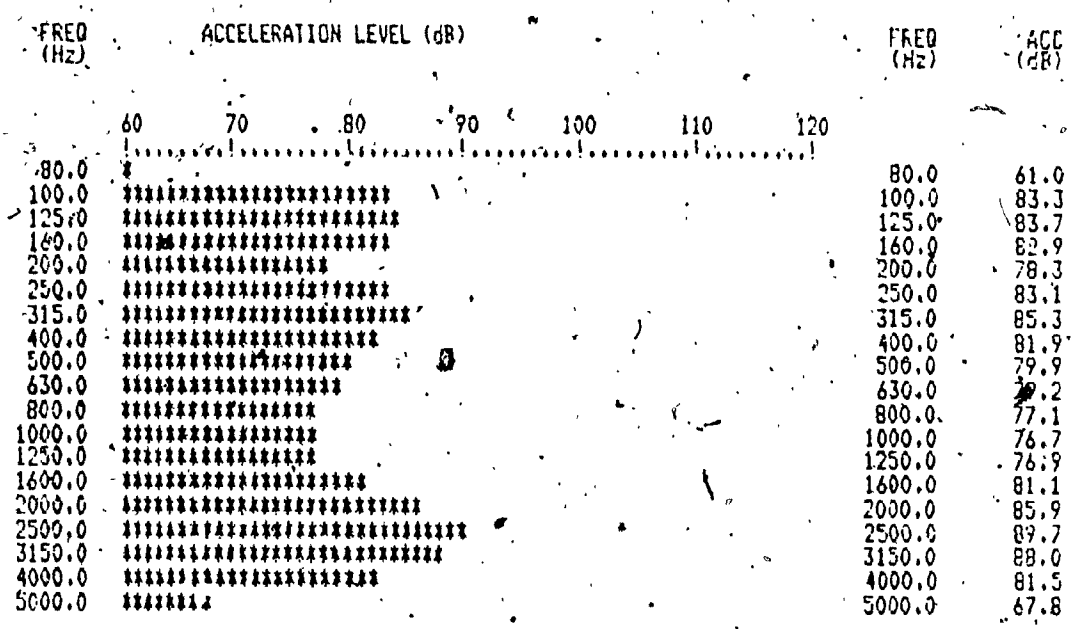
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	78.4
125.0	79.1
160.0	76.6
200.0	72.6
250.0	79.5
315.0	81.0
400.0	77.5
500.0	77.8
630.0	77.7
800.0	74.3
1000.0	79.3
1250.0	84.4
1600.0	88.2
2000.0	91.7
2500.0	93.6
3150.0	93.0
4000.0	84.9
5000.0	74.7

RMS ACCELERATION LEVEL 32 sec LIN avg
t&t165 78in 2xGyp 1mB rmB receiving with diffusers 383
CENTRE OF PANEL 03/26/81



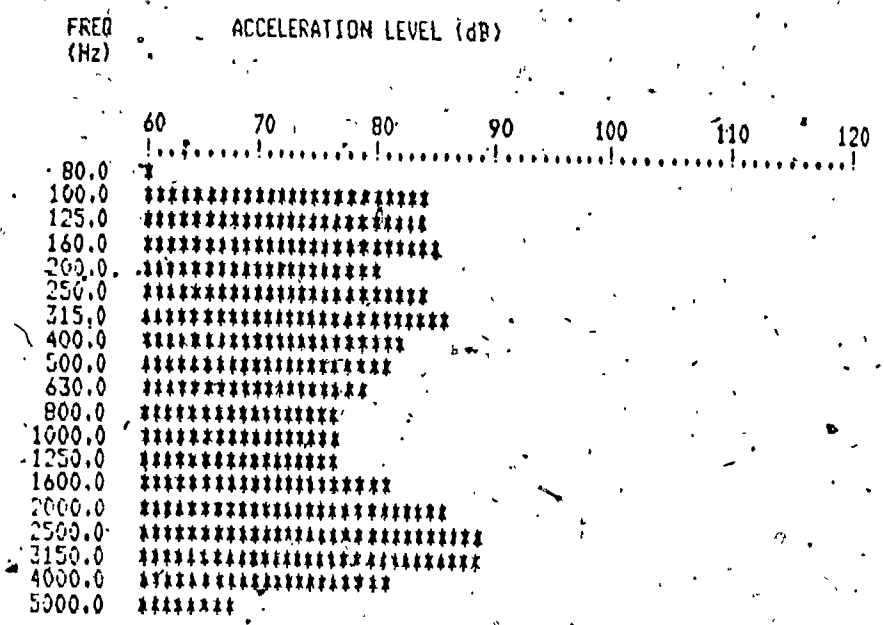
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	80.2
125.0	80.1
160.0	78.4
200.0	75.6
250.0	79.1
315.0	82.9
400.0	78.3
500.0	79.8
630.0	78.3
800.0	75.1
1000.0	78.6
1250.0	83.9
1600.0	89.1
2000.0	92.1
2500.0	91.1
3150.0	93.9
4000.0	85.4
5000.0	74.6

RMS ACCELERATION LEVEL 32 sec LIN avg
tst166 78in 2xsyp inB rmB receiving without diffusers 383
CENTRE OF PANEL 03/27/81



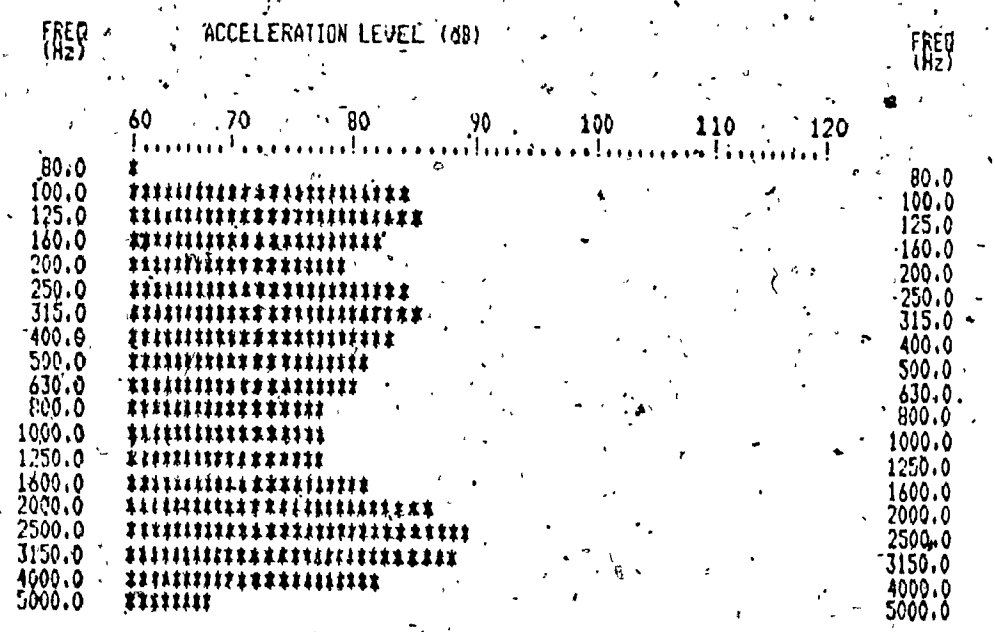
FREQ (Hz)	ACC (dB)
80.0	61.0
100.0	83.3
125.0	83.7
160.0	82.9
200.0	78.3
250.0	83.1
315.0	85.3
400.0	81.9
500.0	79.9
630.0	79.2
800.0	77.1
1000.0	76.7
1250.0	76.9
1600.0	81.1
2000.0	85.9
2500.0	89.7
3150.0	88.0
4000.0	81.5
5000.0	67.8

RMS ACCELERATION LEVEL 32 sec LIN avg
tst163 78in 2xsyp 6in baffle inR with diffusers 383
CENTRE OF PANEL 03/26/81



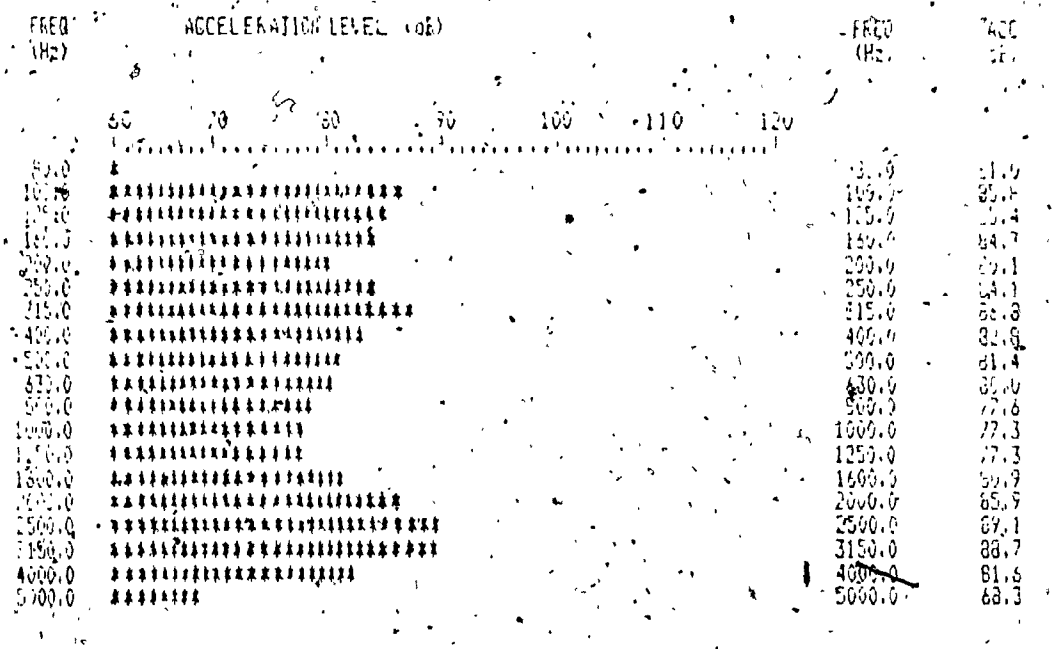
FREQ (Hz)	ACC (dB)
80.0	60.0
100.0	84.1
125.0	84.3
160.0	84.6
200.0	80.3
250.0	83.5
315.0	86.3
400.0	82.0
500.0	80.9
630.0	79.3
800.0	77.3
1000.0	77.2
1250.0	77.2
1600.0	80.9
2000.0	85.8
2500.0	89.2
3150.0	88.7
4000.0	81.3
5000.0	67.8

RMS ACCELERATION LEVEL 32 sec LIN avg
tst162 78in 2xsyr 6in baffle inB without diffusers 383
CENTRE OF PANEL 03/26/81



FREQ (Hz)	ACC (dB)
80.0	80.0
100.0	84.3
125.0	85.3
160.0	82.4
200.0	78.9
250.0	83.9
315.0	85.1
400.0	82.6
500.0	80.5
630.0	80.2
800.0	76.6
1000.0	76.8
1250.0	77.2
1600.0	81.4
2000.0	85.9
2500.0	89.0
3150.0	88.0
4000.0	82.0
5000.0	68.3

RMS ACCELERATION LEVEL, 32 sec LIN avg
tst160 78in 2xsyp 12in baffle inB with diffusers 3B3
CENTRE OF PANEL 03/26/81



RMS ACCELERATION LEVEL 32 sec LIN avg
tst161 78in 2-way 12in baffle inB without diffusers 3B3
CENTRE OF PANEL 03/26/81