

VEILS - Studies in Textural Transformations.

Paul Dolden 1984-1985.

Listeners Score.

Duration: 28'30"

Introductory Comments.....pages A to D
Scorepages 1 to 13

Veils is a series of textures or walls of sound which act as an invitation for the listener to explore an environment where new acoustic sensations and associations can be discovered. The texture, a sustained chord of usually 14-56 notes, is constantly transforming by changing the instrument type that is articulating the sound (e.g. from strings to voice, to brass, to piano, to marimba, to glass, etc.) No electronic effects were used and only straight recordings and mixing of acoustic instruments were used. However the sound source or instrument type at any moment is not usually obvious to the listener, hence the sound sources are "veiled". This veiled sound is created by three main factors: the extensive multitracking (180-280 tracks of the same instrument are used at any one moment), the tuning of the chords which is new microtonal intervals that do not occur in our normal 12-Tone Equal Tempered Tuning System and the recording method of close miking in a dead acoustical space which brings out aspects of each instrument type that we normally do not hear. The title is also an analogy to a real veil where one can switch between seeing individual strands and viewing the overall pattern. In Veils it is imagined that the listener can freely drift from one type of perception to another (i.e. micro to macro level or individual layer to mass effect).

Long Program Notes

Veils. Studies in Textural Transformations.
Paul Dolden 1984-85.

Work on the computer has shown us that it is possible to create music based upon timbral transformations. By manipulating the dynamic behavior (i.e. amplitude) of individual sidebands or partials, the composer is able to compose timbre and transformations from one timbre to another. In an analogous manner one can imagine composing textures in which one slowly changes or transforms the elements that are constituting the sound in order to change the timbre or colour of the texture. In Veils these transformations are achieved by sustaining a chord and slowly changing from one instrumental family or type to another (e.g. strings, voice, winds, brass, reeds and pitched percussion). On the average there are 180-280 tracks of sound holding a chord varying from 14 to 56 notes. Each note has been recorded four to sixteen times in order to create choral effect and to create a perfectly sustained sound. (The attacks on the brass and reeds are completely attenuated so that only the steady state spectrum of these sounds occur.) Only one sound type is used at a time. Therefore the formant and spectrum qualities of each sound type reinforce each other to create the transparent effect that we are used to with string sections and large choirs. However, in Veils this effect is expanded to create an orchestra of 250 flutes, 250 brass, 250 reeds, etc.

With such multitracking the listener is much better able to deal with the full nature of each sound type. For example, the noise of the bow, the breath and sibilances of the voice, or the passing of air through a brass bell seem to become detached from the pitched element of the sound and form a sound world of their own. This effect is increased by recording all tracks with extremely close miking in a dead acoustical space.

Therefore two types of transformations occur: the transformation of the timbre (i.e. the characteristic dynamic behavior of the overtones which is unique to each family or type of sound), and secondly the transformation of the noise or unpitched aspect of the sound. It is often the latter transformation that the ear notices the most and for this reason electronic sounds are not used. Electronic sounds have a certain "sameness" to them and it would be impossible to create, as occurs in Veils, a steady state texture in which the sound changes from a sense of being scraped (i.e. bowed strings) to a sense of being activated by breath pressure (i.e. wind instruments).

The unique sound of the textures in Veils is also created by the tunings of the chords. Microtonal interval sizes are used which do not occur in our normal 12-Tone Equal Tempered System. The predominance of smaller sized intervals is in order to prevent the ear from disentangling component frequencies or notes. Therefore the textures or chords are perceived as fused timbres or unified gestalt impressions. The analogy here is the higher harmonics (e.g. above seven) of a single tone. These harmonics, lying within the same Critical Bandwidth, can not be separated out by the ear and therefore are experienced as a unified timbre or single sound.

However the listener can often pick out individual sounds in the massed texture. In this manner the piece is like a real veil in that the overall pattern is noticed from a distance. With a closer look the viewer can pick out individual strands or patterns that contribute to the overall pattern. In Veils it is imagined that the listener can freely drift from one type of perception to another (i.e. micro to macro level or individual layer to mass effect). In addition, a veil is associated with concealing the real nature of a face or object. By analogy Veils is used here to describe the multi-tracked textures which conceal or prevent the ear from completely hearing an individual sound. In this situation identification of sound type (except notably voice) is nearly impossible.

The textures of Veils are meant to surround or envelope the listener in a wall of sound. Like an environment the listener is invited to explore a world where new sonic sensations and associations can be discovered.

Veils - Studies in Textural Transformations. Paul Dolden 1984-1985. Listeners Score.

Explanation of the Score.

All frequencies are written on or right above the line they refer to. A set of frequencies occurring at any moment have a particular tuning relationship which is usually documented at the top of all the frequencies. For example on page one at the 1'15" mark occurs: "Each frequency 70 cents apart." Therefore all the frequencies below the arrow (i.e. 425.6,408.8,392.5,377.0,361.9 etc.) are 70 cents apart. For a frequency reference to the 12-Tone Equal Tempered Tuning system a chart is provided:

Frequency equivalents in hertz of the pitches of the equal tempered scale over the range of the piano keyboard									
Pitch	Octave No.								
	0	1	2	3	4	5	6	7	8
C		32.7032	65.4064	130.8128	261.6256	523.2511	1046.5023	2093.0045	4186.0090
C#/Db		34.6478	69.2957	138.5913	277.1826	554.3653	1108.7305	2217.4610	
D		36.7081	73.4162	146.8324	293.6648	587.3295	1174.6591	2349.3181	
D#/Eb		38.8909	77.7817	155.5635	311.1270	622.2540	1244.5079	2489.0159	
E		41.2034	82.4069	164.8138	329.6276	659.2551	1318.5102	2637.0205	
F		43.6535	87.3071	174.6141	349.2282	698.4565	1396.9129	2793.8259	
F#/Gb		46.2493	92.4986	184.9972	369.9944	739.9888	1479.9777	2959.9554	
G		48.9994	97.9989	195.9977	391.9954	783.9909	1567.9817	3135.9635	
G#/Ab		51.9131	103.8262	207.6523	415.3047	830.6094	1661.2188	3322.4376	
A	27.5000	55.0000	110.0000	220.0000	440.0000	880.0000	1760.0000	3520.0000	
A#/Bb	29.1352	58.2705	116.5409	233.0819	466.1638	932.3275	1864.6550	3729.3101	
B	30.8677	61.7354	123.4708	246.9417	493.8833	987.7666	1975.5332	3951.0664	

General dynamic markings are provided at the bottom of the page. Crescendo and decrescendo markings that occur refer to individual layers or frequencies. These particular crescendos and decrescendos were usually created by filtering. (i.e. removing a low pass filter for a crescendo or applying a low pass filter for a decrescendo).

The start and end times for a transition to a new instrument are given at the top of the page. Between these times, each one of the usually seven recordings of a single frequency change instrumentation in a pre-established pattern. For example a linear transition of fourteen seconds would involve each of the seven tracks changing instrumentation at a two second interval. An example of a geometric transition would involve each of the seven tracks changing instrumentation at 0", 6", 9", 10.5", 11.5", 12.2", 13", 13.5". Another type of transition occurs frequently on pages five to seven where the transition is created by each frequency or layer at a different moment changing abruptly to the new instrumentation. (i.e. all seven tracks of a particular frequency change at the same time to the new instrumentation.)

Technical Remarks.

Veils was created almost entirely with the straight recording of acoustic sounds and no use of electronic effects. The sound of Veils is created by three main factors. First the multiplicity of the tracking; usually 180 - 280 tracks of the same instrument recorded in an identical manner which therefore reinforces the same formant, spectral, and unpitched qualities of each instrument. These fused timbres create a very "transparent" effect in which recognition of the instrument is often difficult. The second main contributing factor to the sound of Veils is the close miking that was used on all instruments. Therefore the more subtle quiet unpitched aspects of each sound is brought "forward" for the listener to contemplate. The third factor is that the intervals used to make up the large chord /sound masses of Veils do not occur in our Western 12-Tone Equal Tempered tuning system. (A fuller discussion of these topics occurs in a paper written for the composition). The only use of an electronic "device-effect" sound (i.e. digital delay) is notated on page seven. The only other studio technique used is the playing back of a sound at a different tape speed than it was recorded at. For example Piano 4X refers to the playing back of piano sounds at four times the tape speed it was recorded at. Therefore the pitch is two octaves higher. Only doubling, and quadrupling of piano and bowed strings occur (pages five to eight). In addition on pages twelve and thirteen male voice at one-half the normal tape speed appears.

Production Method.

Veils was first compsed on paper (the tunings, timings of the transitions, and the structure). This information was then transcribed into the computer in order to get "click" or tuning tracks of the exact frequencies. The performers then listened to these tones on headphones and adjusted their instruments to achieve the desired pitch. In the case of instruments with fixed tunings (i.e. vibraphone, marimba, piano) the closest semi-tone of the 12-Tone tuning system was found on the instrument. Then the variable speed on the taperecorder was moved slightly so that the click track came in tune with the instrument. After recording the instrument, and returning the variable speed to normal position, the instrument is pitched at the desired frequency. All performers played in a smooth and continuous manner at approximately a mezzo-forte level. (so that the sound had a balanced full spectrum without too much energy shifted to the high harmonics, which occurs when these instruments are played very loud). The performers were placed in an "acoustically-dead" closet and listened to their tuning tone on headphones. Each frequency was recorded a minimum of four times but usually seven, twelve or sixteen times. (The only exception being page eight where each frequency was recorded once). With such multitracking all aspects of each instrument turns into a continuous wash of sound which allows for the observation of the full nature of each sound type. For example the sound of the breath, the bow, paino hammers or mallets form a band of unpitched sound which often seems to separate from the pitched aspect of the sound (i.e. the fundamental and its integer harmonics). Therefore the transition from one sound type to another includes the changes that occur in both the pitched and unpitched part of the sound.

Each instrument was recorded with a combination of three microphones: a AKG 451, Sennheiser 441, and a Beyer M 160 (ribbon microphone). Recordings were done on an eight track taperecorder (1/2" tape). Usually two sets of eight tracks, or sixteen tracks, were mixed together into one stereo image. Fouteen of these stereo images were then mixed together to make the final stereo master.

C.

On many of the instruments a boost was given to the high end. This was in order to compensate for the loss of high end that occurs with pre-mixing and final mixing. In Part one of Veils (pages one to seven) the initial attack of each note on the brass and saxphones was attenuated at the board during the recording process. This was done because the initial attacks had a "clipping" distorted quality to them which would have been noticeable when mixed with other tracks.

Final Comments.

The reserach for Veils (exploration of new tunings and different recording and multitracking techniques) occurred between May and August 1984. The piece was composed on paper from September to December 1984. During January 1985 the score was transcribed into the computer. From February to May 1985 the instruments were recorded and pre-mixed together. From June to October 1985 the final digital master was made and the score and paper documenting the composition.

A large number of tracks were premixed together in order to create Veils. Although quality control was maintained as much as possible at each generation some sound quality loss is unavoidable. The author has found that a digital master at the final mastering stage is far superior to an analogue master. The main reason being that a digital recording has essentially the same sound quality as the mixdown tapes, whereas an analogue recording is a recording that is one more generation. The author believes that the sound on an analogue master has too much lose of detail and clarity. Therefore it is emphasized the importance of hearing the composition from a digital master since the piece is an invitation to listen and explore an endless world of sound at the level of detail.

A very special thanks must be mentioned to the performers who included: Clemens Rettich (flutes and male voice below middle C -260 Hz.), Nicola Czink (female voice above middle C), Andrew Czink (piano), Brett Dowler (trumpet), Brent Taylor (bass trombone), Graham Howell (saxphones), Ian Campbell and Tom Hajdu (pitched percussion). These performers gave a great deal of time and energy for this project- thank you.

Paul Dolden August 1985.

D.

Recording History of Work.

This work was originally produced during the 1980s and/or 90s on the audio gear detailed in the score introduction. The work was first published on the Tronia label disc called: "The Threshold of Deafening Silence." In 1990, or on the double CD: "L'ivresse de la vitesse" published on empreintes DIGITALes in 1994 (IMED 9417-18) and re-released in 1999 (IMED 9917-18). All my works were remixed using the original recordings, processed, and mastered in the period 2000-2002. This work remastered appears on one of the following three CDs, all of which are on empreintes DIGITALes:

- 1) Seuil de silences. (IMED 0369)
- 2) L'ivresse de la vitesse 1. (IMED 0317)
- 3) L'ivresse de la vitesse 2. (IMED 0318)

It is very important to be listening to the remastered version because of their increased clarity and depth of sound. During the 1980s and 90s I had to use gear that was insufficient audio quality for mixing several hundred tracks of audio together. With the new masters I was able to achieve the balance between voices that I had so carefully notated in the original scores. I invite you to discover many new levels of meaning and clarity in the new masters, which are much closer to my original artistic thought.

For the tape part of a mixed work (mixed work works for live instrument(s) and tape), you can obtain a copy of the tape portion, (the 2000-2002) remastered tape parts, from:

- 1) The Canadian Music Center In Toronto. (20 St Joseph St.,)
 - 2) From me: you can obtain my email address at the web site for empreintes DIGITALes. I love to hear from people who are playing my music.
 - 3) I have left copies of the tape part with my publisher, empreintes DIGITALes.
- You should only be using a digital copy of the digital master.

Paul Dolden

Born 1956, Ottawa, Canada

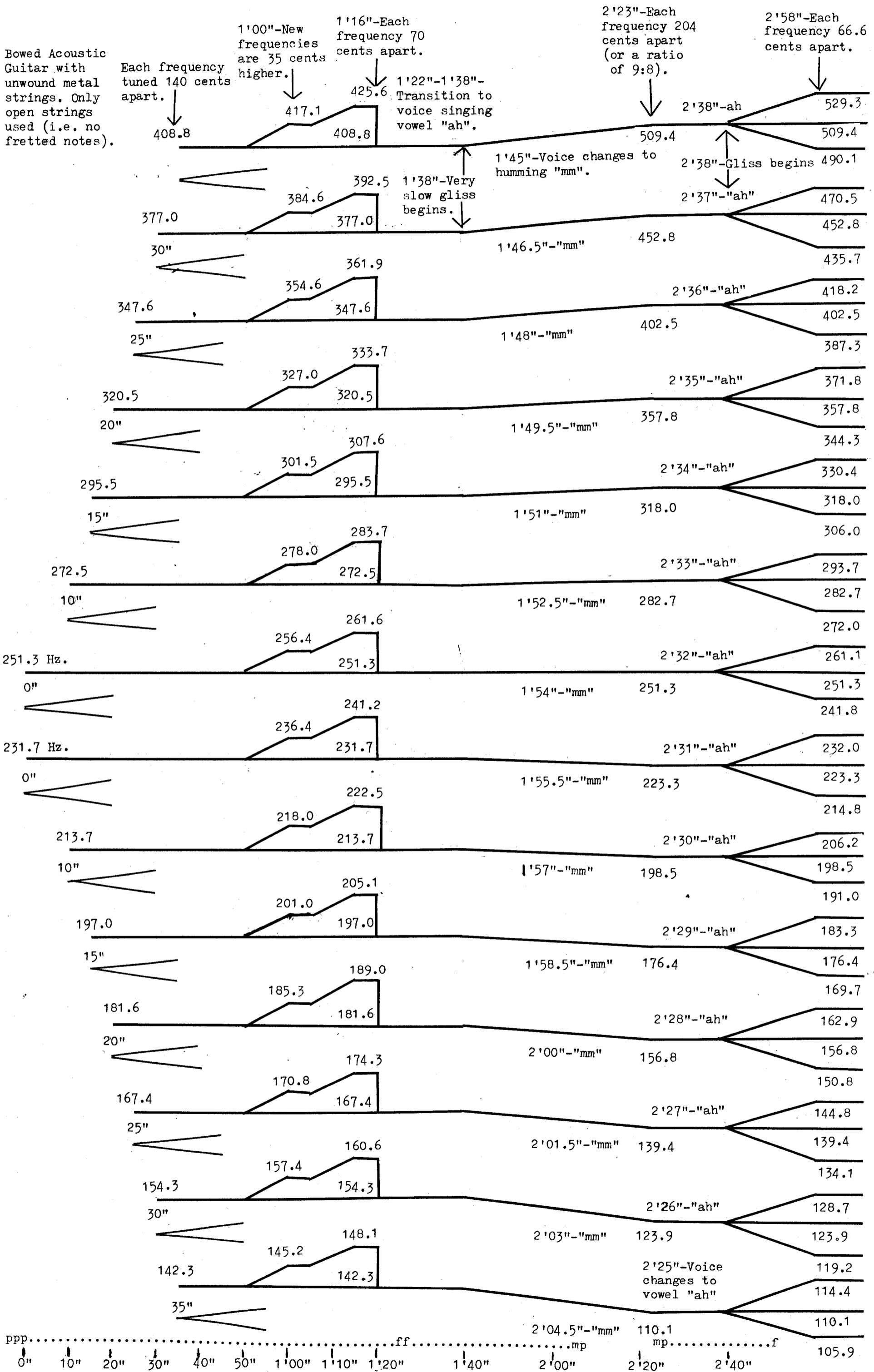
Paul Dolden begins his career at age 16 as a professional electric guitarist, violinist and cellist. Excited by the possibilities offered by recording technologies, Paul Dolden turns to contemporary modes of production and dissemination in the creation of his music. At age 29, he wins the first of a string of European awards that establish him as a composer. Now the winner of over twenty international awards, Paul Dolden's music is performed in Europe and North America to wildly enthusiastic audiences.

In a career spanning over twenty five years, Paul Dolden has perfected his unique approach to audio technology, using it as a platform from which to launch or capture otherwise impossible musical performances. In this way, he makes his computer behave like a new, virtual orchestra and manipulates it with as much sensitivity as he would a traditional one. His compositions are characterised by a maximalist aesthetic in which hundreds of digitally recorded instrumental and vocal performances are combined in multiple layers.

Paul Dolden's music has been described as the "missing link" between jazz and rock and the high-brow concert tradition. Critics have called it "music for the information age, enlisting noise, complexity and beauty in its quest for excess," and characterised it as "apocalyptic hyper-modernism."

The early works employ a unified approach to timbral and harmonic variation. Under the influence of post-modernism, Paul Dolden's concerns have shifted to include the juxtaposition and superimposition of disparate musical styles evident throughout the *Resonance Cycle* of works (1992-96). Always working to surpass himself, with the *Twilight Cycle* of recent years Paul Dolden boldly investigates the forbidden fruit of contemporary new music—melody and dance rhythms.

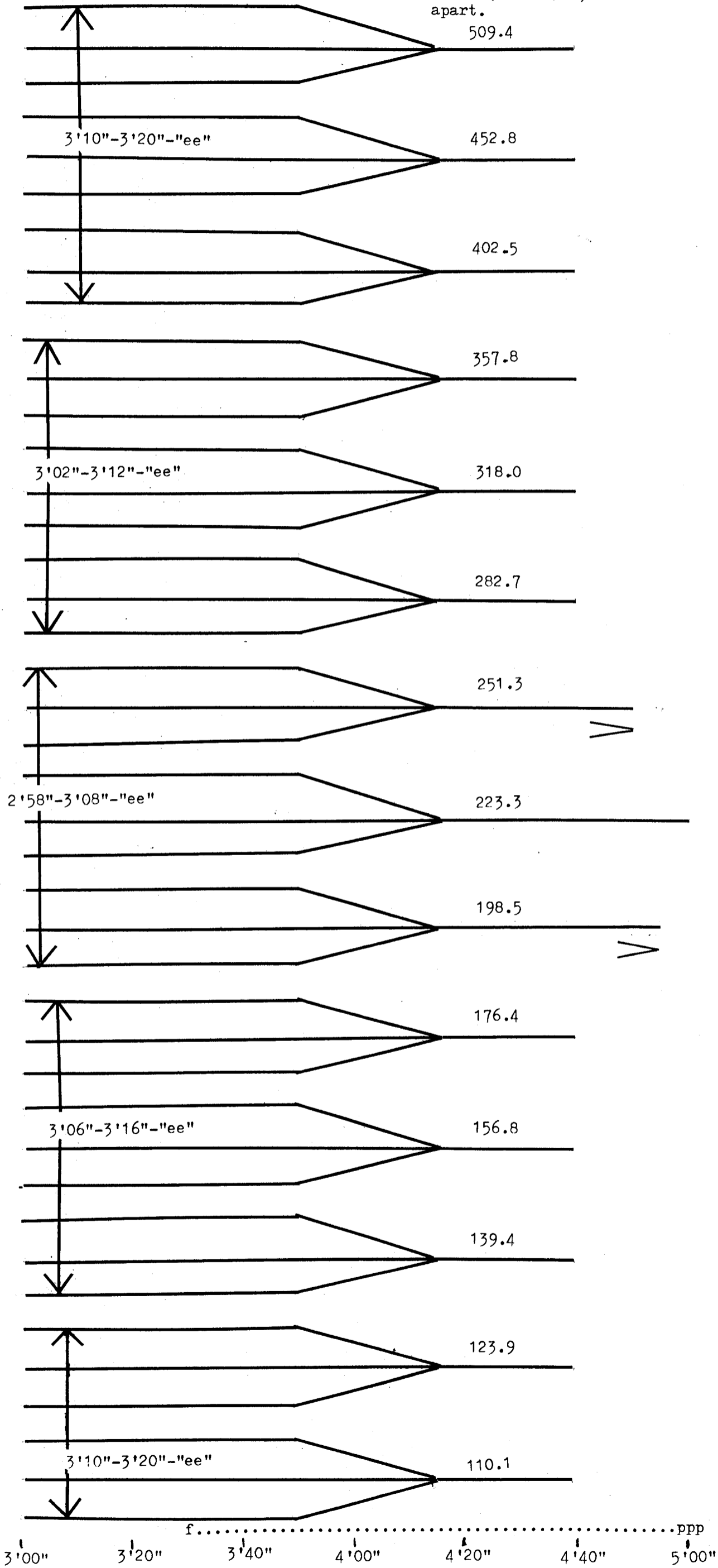
Bowed Acoustic Guitar with unwound metal strings. Only open strings used (i.e. no fretted notes).



Asynchronous
vowel changes
between the
frequencies
as indicated.

3'23"-All
frequencies
change to
"ee".
3'23"-3'48"-
Transition
to brass.

Each frequency 204
cents (ratio 9:8)
apart.



2"-3" pause.
Timer re-indexed
to zero starting
on next page.

Bowed Sitar.
(below 90 Hz.
double bass
used through-
-out this page).

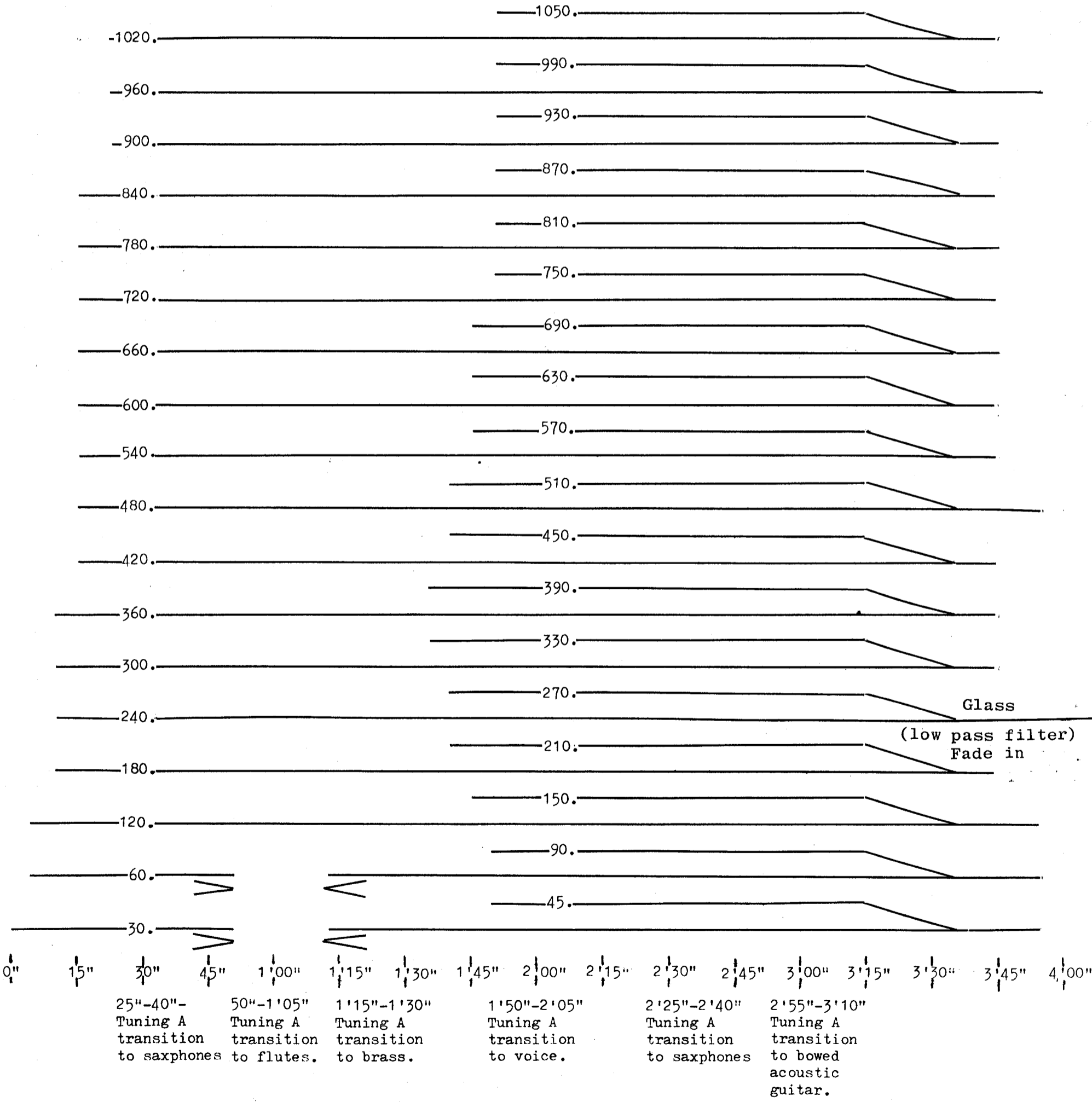
All frequencies
are in an integ-
-er relationship
to the fundament-
-al of 60 Hz.
(i.e. 2:1,3:1,
4:1.....17:1)
This set of
frequencies is
Tuning A.

New frequencies
are voice sing-
-ing vowel "ah".

Starting on 90 Hz
all frequencies
are 60 Hz apart.
This new set of
frequencies is
Tuning B.

2'10"-2'25"
Tuning B
transition
to saxphones

2'40"-2'55"
Tuning B
transition
to bowed
acoustic
guitar.

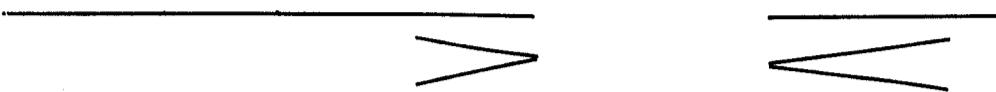


All instruments on this page tuned to 240 Hz

Piano-4X



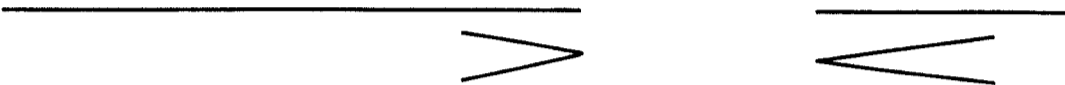
Piano-2X



Vibraphone (Hard mallets)



Marimba (Hard mallets)



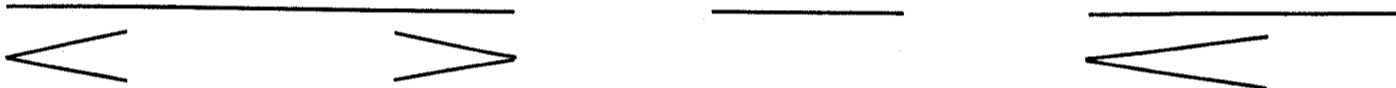
Saxophone



Trumpet



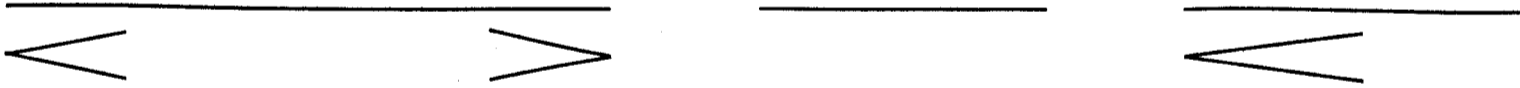
Trombone



Male Voice



Female Voice



Bowed Sitar



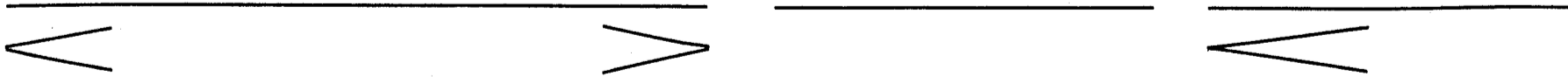
Flute



Recorder



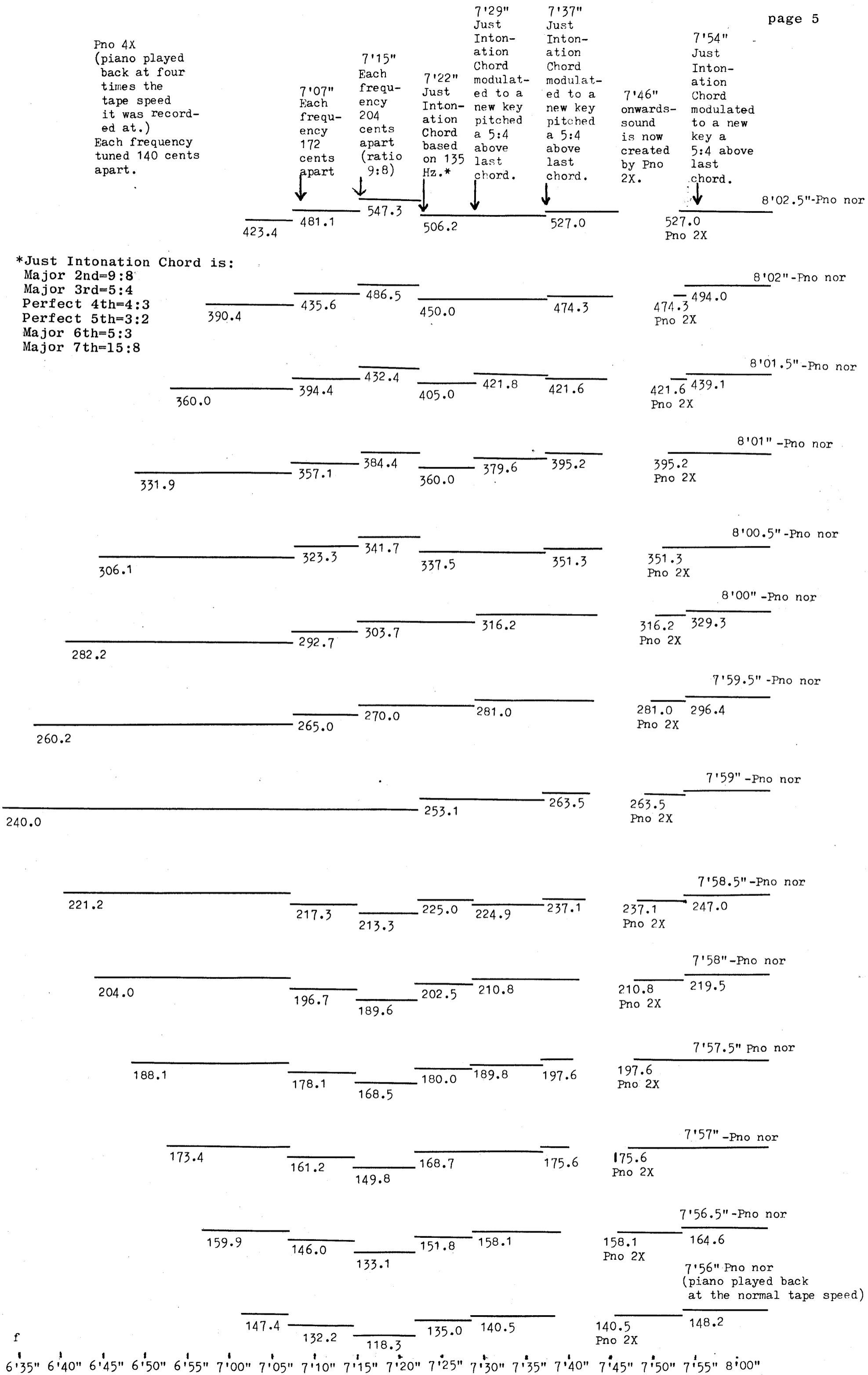
Bowed Vibraphone



Glass



Pno 4X
(piano played
back at four
times the
tape speed
it was record-
ed at.)
Each frequency
tuned 140 cents
apart.



8'17"-
8'32"
Trans-
ition
to
vibra-
phone.

8'19"-
Each
frequ-
ency
is 204
cents
apart
(ratio
9:8)

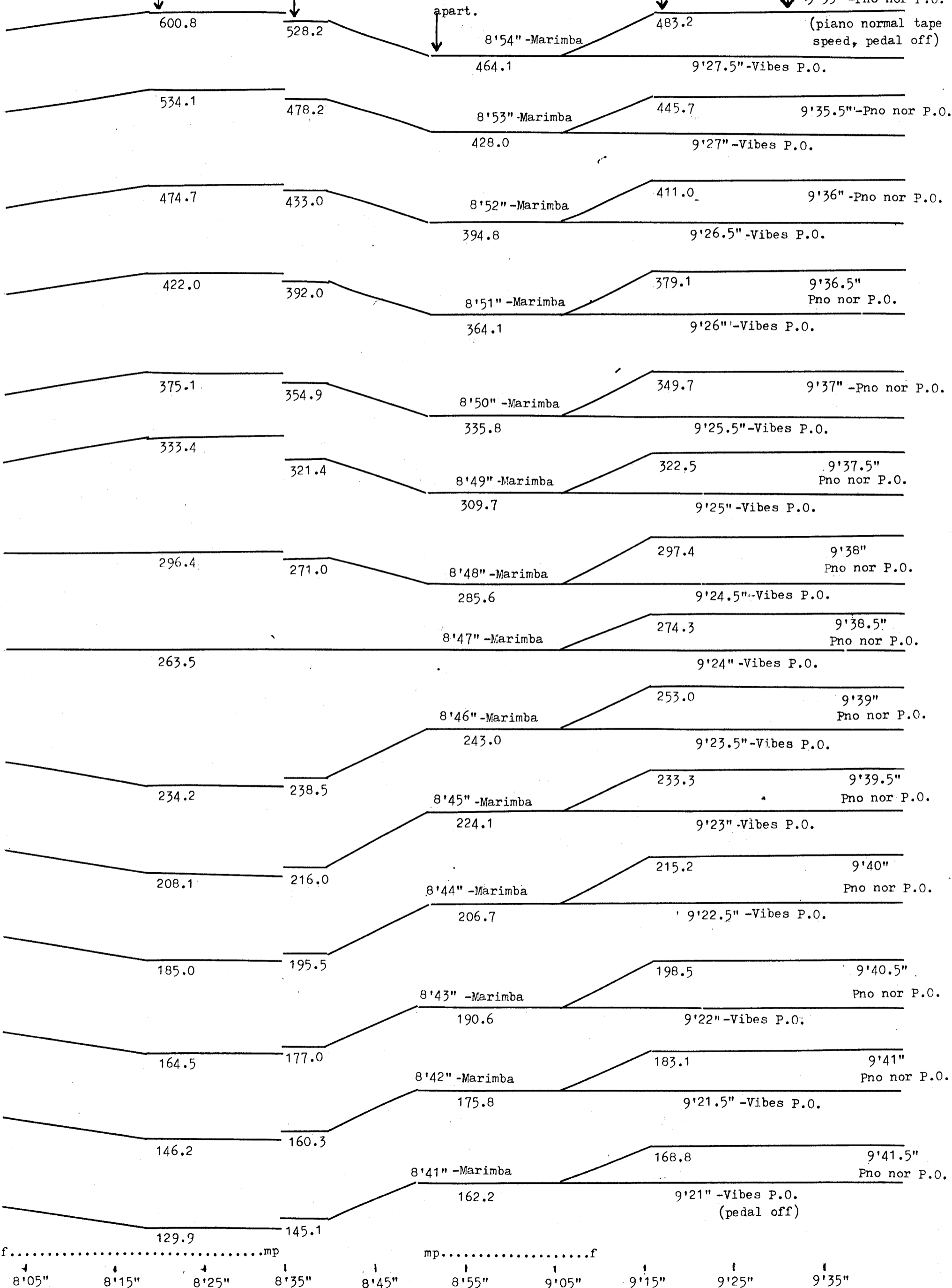
8'35"-
Each
frequ-
ency
is 172
cents
apart.

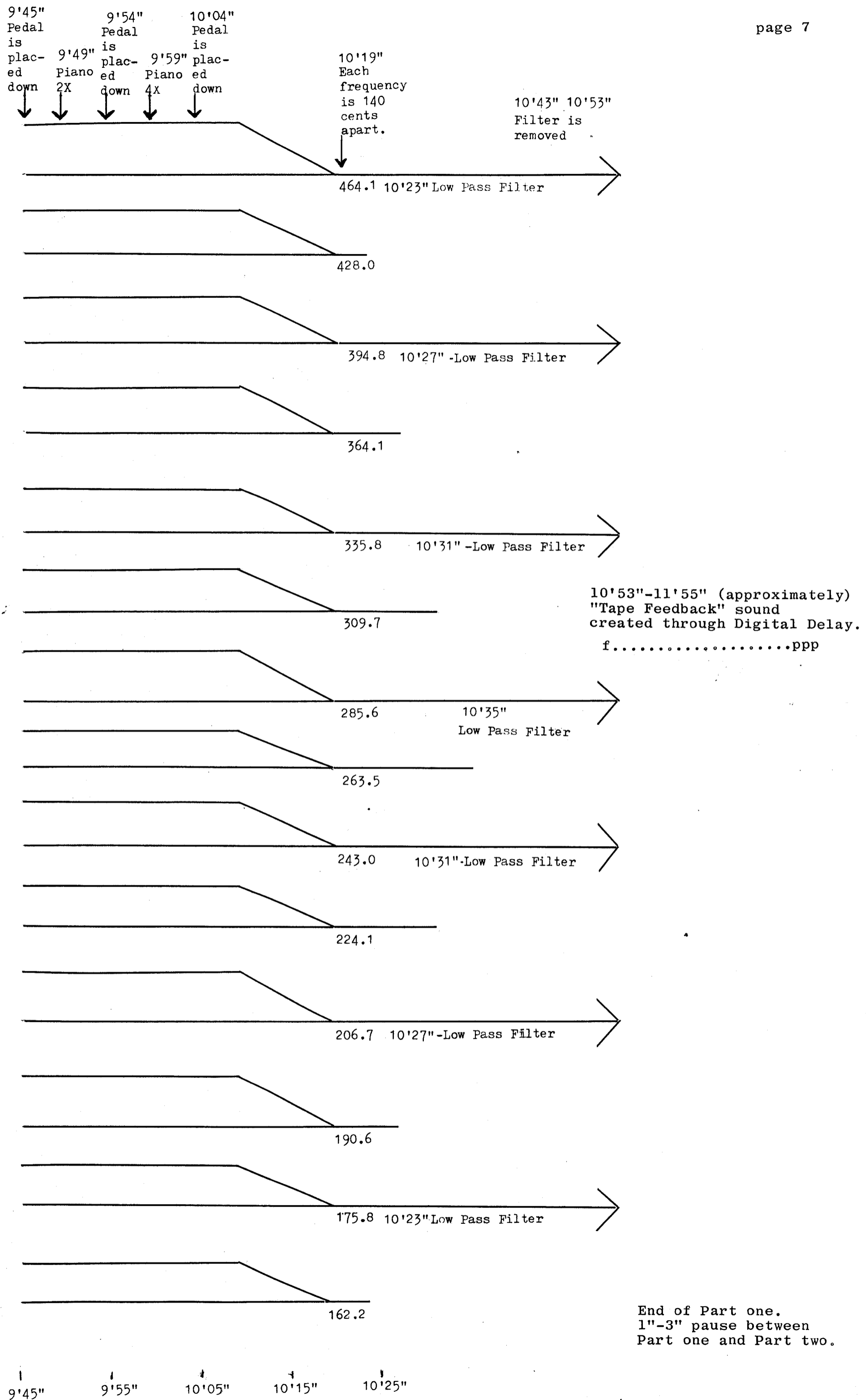
8'50"-
Each
fre-
quency
is 140
cents
apart.

9'16"
Each
frequ-
ency
is 70
cents
apart.

9'31"
Pedal
is
placed
down
on all
tracks.

9'35" -Pno nor P.O.
(piano normal tape
speed, pedal off)



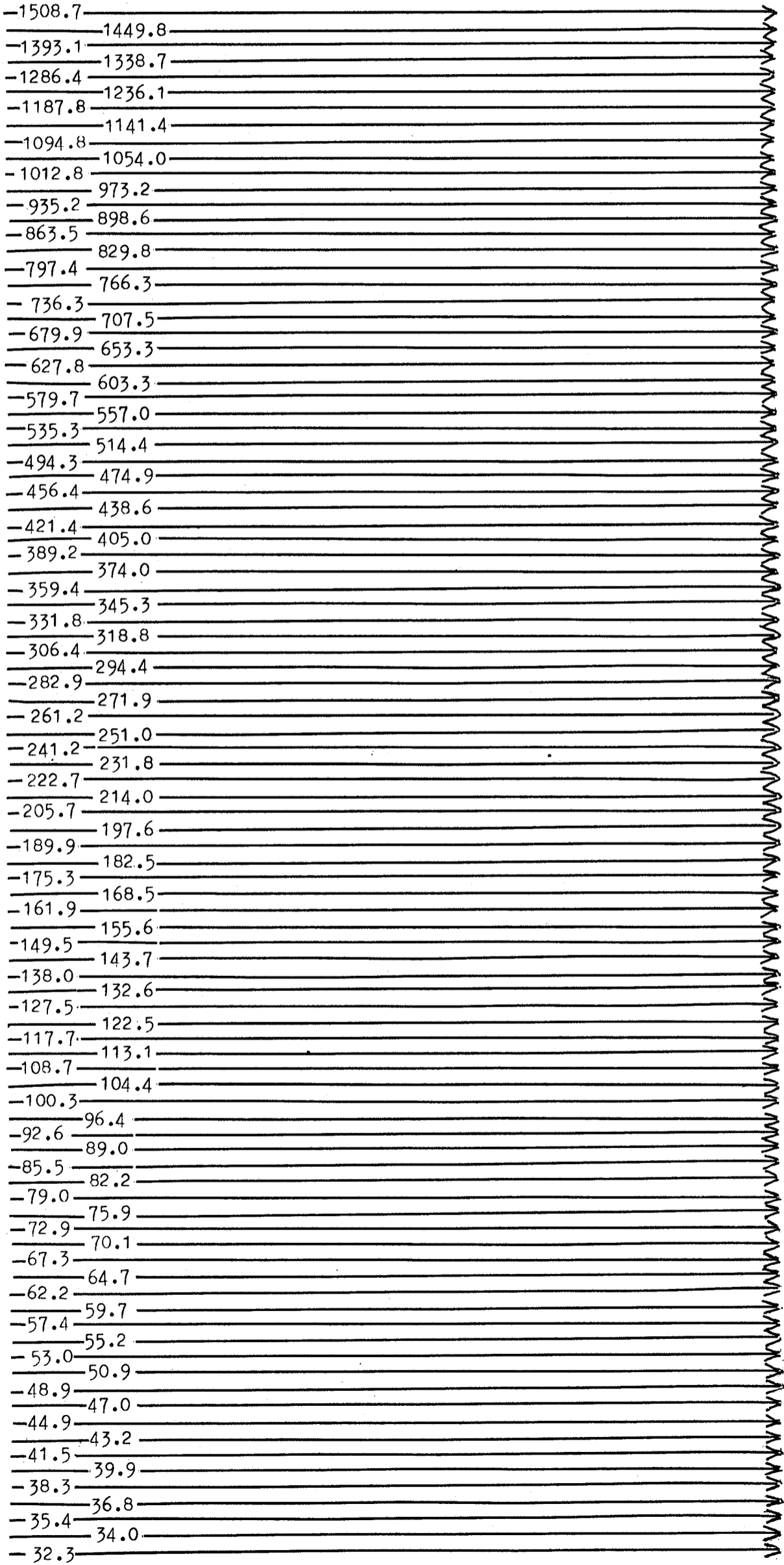


Double Bass
and Violin.
Each frequency
69 cents apart.

20"-to
natural
harmonic
producing
a pitch
one octave
higher than
starting
pitch.
(1st natural
harmonic)

36"-to
natural
harmonic
producing
a pitch one
octave and
a fifth higher
than starting
pitch. (2nd
natural harm-
onic).

52"-to
natural
harmonic
producing
a pitch
two octaves
above start-
ing pitch.
(3rd natural
harmonic).



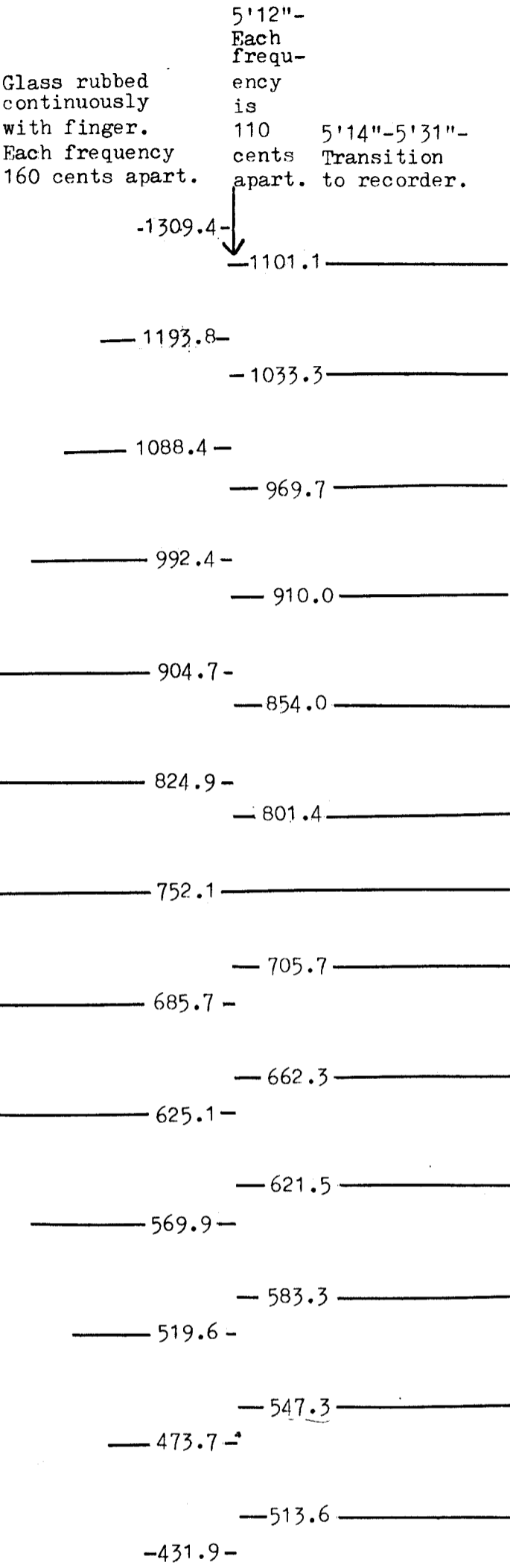
1'16"-2'06"-Entire
structure of 0"-1'16"
played back at twice
the tape speed it was
recorded at. Therefore
all frequencies are one
octave higher.
1'27"-1st natural harmonic
1'35"-2nd natural harmonic
1'43"-3rd natural harmonic

2'06"-2'40"-Entire
structure of 0"-1'16"
played back at four
times the tape speed
it was recorded at.
Therefore all frequencies
are two octaves higher.
2'11"-1st natural harmonic
2'15"-2nd natural harmonic
2'19"-3rd natural harmonic

2'40"-2'45"-All frequencies
gliss downwards approximately
a fifth. Sounds are still
being played back at four
times the tape speed they
were recorded at.

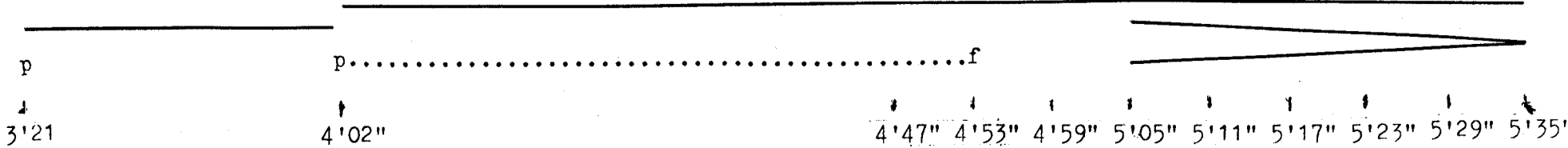
2'46"-2'56"-The same downward
gliss played back at twice
the normal tape speed.

2'56"-3'14"-The same downward
gliss played back at the
tape speed it was recorded at.



3'21"-4'02"- Low E string of a double bass tuned down to about 25 Hz.

4'02"-Lowest A (27.5 Hz) of a piano played continuously through a High Pass Filter. 4'12"-4'37"-Filter is slowly removed.



Glass.
Each
frequ-
ency is
60 cents
apart.

6'31"-6'41"-
Transition
to bowed
vibraphone.

6'46"-6'56"-
Transition
to flute.

Each
frequency
is 60
cents
apart.

5'38"-5'53"-
Transition
to glass.

— 925.9 —————

— 894.4 —————

— 863.9 —————

— 834.5 —————

— 806.0 —————

— 778.6 —————

— 752.1 —————

— 726.4 —————

— 701.7 —————

— 677.8 —————

— 654.7 —————

— 632.4 —————

— 610.8 —————

— 1755.7 —————	
— 1695.9 —————	
— 1638.1 —————	
— 1582.3 —————	
— 1528.4 —————	
— 1475.3 —————	
— 1426.0 —————	
— 1377.5 —————	
— 1330.6 —————	
— 1285.3 —————	
— 1241.5 —————	
— 1199.2 —————	
— 1158.3 —————	
— 1118.9 —————	
— 1080.8 —————	
— 1044.0 —————	
— 1008.4 —————	
— 974.0 —————	
— 940.9 —————	
— 908.8 —————	
— 877.8 —————	
— 847.9 —————	
— 819.1 —————	
— 791.2 —————	
— 764.2 —————	
— 738.2 —————	
— 713.0 —————	
— 688.7 —————	
— 665.3 —————	
— 642.6 —————	
— 620.7 —————	
— 599.6 —————	
— 579.1 —————	
— 559.4 —————	
— 540.4 —————	
— 522.0 —————	
— 504.2 —————	
— 487.0 —————	
— 470.4 —————	
— 454.4 —————	
— 438.9 —————	
— 423.9 —————	
— 409.5 —————	
— 395.6 —————	
— 382.1 —————	
— 369.1 —————	
— 356.5 —————	
— 344.3 —————	
— 332.6 —————	
— 321.3 —————	
— 310.3 —————	
— 299.8 —————	
— 289.5 —————	
— 279.7 —————	
— 270.2 —————	
— 261.0 —————	

7'04"-7'18"-
Flutter
tonguing
starting
with lowest
frequency
and rising up.

7'20"-7'33"-
Transition
to marimba.

7'38"-7'48"-
Transition to
acoustic guitar
played continuously
with a plectrum.
Wrist placed down
on bridge to mute
the sound.

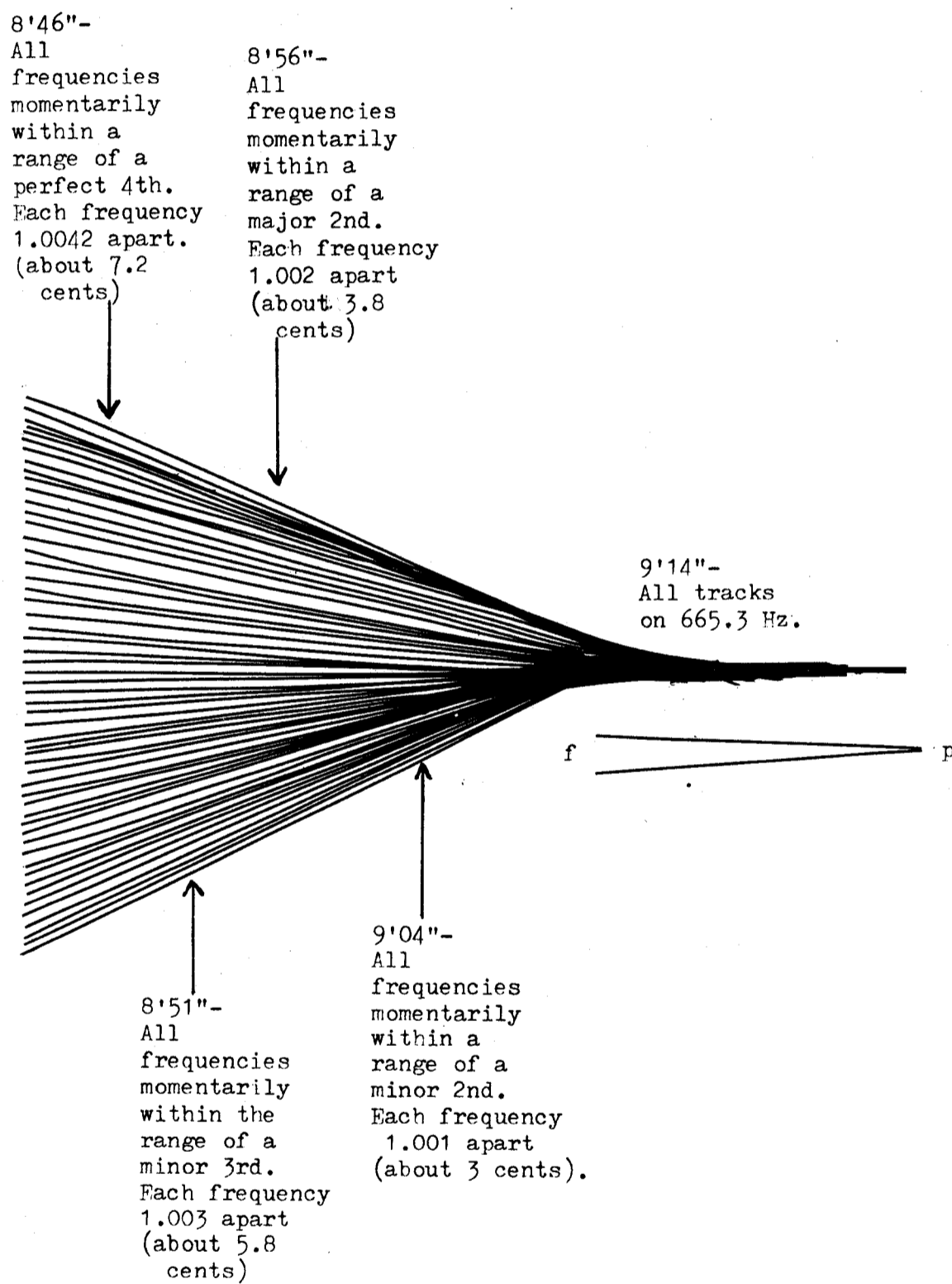
7'53"-8'07"-
Wrist mute
removed over
a ten second
period, start-
ing with the lowest
frequencies and
rising up.

page 11

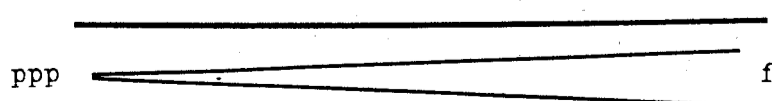
8'21"-Glissando
towards centre
frequency begins.

8'41"-All frequencies
momentarily within
the range of a
major 6th. Each
frequency 1.0085
apart (about
14.5 cents)

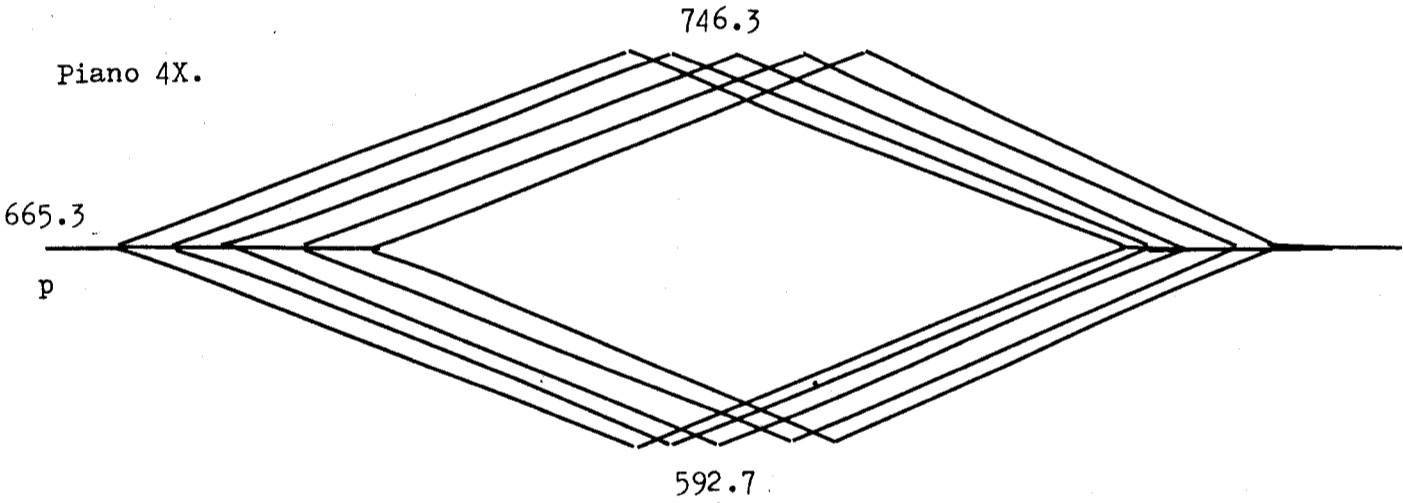
7'05" 7'10" 7'15" 7'20" 7'25" 7'30" 7'35" 7'40" 7'45" 7'50" 7'55" 8'00" 8'05" 8'10" 8'15" 8'20" 8'25" 8'30" 8'35" 8'40"



Slow fade in of male voice
singing "ah". Played back
at one half the tape speed
it was recorded at.
Pitch is about 32 Hz.



8'40" 8'45" 8'50" 8'55" 9'00" 9'05" 9'10" 9'15" 9'20" 9'25" 9'30" 9'35" 9'40"



Voice at 32 Hz. continued

10'59"-11'30"-
Sound of breath
inhaling and exhaling
at one half the tape
speed it was recorded at.

The End.

