Preliminary Exercises & Etudes In Contemporary Techniques for Saxophone

By Ronald L. Caravan

Introduction

The tonal resources of woodwind instruments have been greatly expanded in recent years. Among the numerous unconventional techniques called for in contemporary music are multiphonics (production of more than one audible tone simultaneously), quarter tones, timbre variation, glissando, portamento, vibrato manipulation, non-traditional methods of attack and release, percussive effects, vocal sounds, and air sounds. Once the peculairities of a few experimenters and jazz musicians, many unconventional sounds have, during the second half of the twentieth century, become accepted as viable material for contemporary serious musical composition.

The purpose of the present volume is to provide material which may assist the saxophonist in developing flexibility with some of the non-traditional techniques often required in the performance of contemporary music. The exercises and etudes contained here deal principally with three techniques which generally involve unconventional fingerings—variation of timbre, quarter-tone production, and the performance of multiple sonorities, or multiphonics. Fingering diagrams are included throughout this study material to guide the saxophonist in his execution of the various sounds as they occur in the notation, as is generally the case with most contemporary music utilizing such techniques. A key to the fingering diagrams, which are designed to be as practical and immediately communicative to the performer as possible, is provided below.

The material in this volume is divided into three basic sections. The first deals with timbre variation, the second with quarter tones, and the third with multiphonics. There is no set, prescribed manner as to how one should proceed through the book; one might work out of all three sections simultaneously, or go from the beginning to the end in order. In the event one would choose to do the latter, the effectiveness of this course might be enhanced by the fact that the first section (timbre variation) contains primarily a technical challenge (i.e., getting used to reading the fingering diagrams at sight), the second (quarter tones) adds more of an aural challenge, and the third (multiphonics) additionally introduces a much greater challenge to the performer's tone-production flexibility.

For the fairly advanced student who possesses good basic playing habits, the material in this volume may be able to serve as appropriate introduction to the unconventional sounds involved. In my own teaching experience, utilizing many of these exercises and etudes in this way, I have even had students utilize some of the etudes as performance material at the studio-recital level, in what has often been a good introductory experience for them in performing with sounds which are generally quite new to them.

There is an important warning which I feel must be rendered to the student saxophonist who may be approaching unconventional techniques such as these, perhaps for the first time. I suggest that material such as this is not something to be dealing with unless there already exists, presumably through more traditional studies and disciplines, a reasonable degree of solidification of basic saxophone tone production and technique. Particularly with regard to the study of multiphonics, these unconventional sounds often involve significant and complex deviations from normal tone-production habits—potentially healthy deviations if built on a well-established, disciplined technique, and potentially unhealthy deviations if added to an unsolidified, inconsistent tone production. The student who is undergoing or has yet to undergo a solidification with basic aspects such as proper breathing and the abdominal support, embouchure, or light staccato tonguing, may be well advised to delay studies in unconventional sounds until a later time.

About the Author

Ronald L. Caravan (b.1946), a performer of both the clarinet and the saxophone, received degrees of Master of Arts in music theory and Doctor of Musical Arts in music education from the Eastman School of Music, Rochester, N.Y., U.S.A. He also earned the Performer's Certificate from that institution. His doctoral dissertation, *Extensions of Technique for Clarinet and Saxophone*, is a widely recognized source on performance, pedagogy, and composition of unconventional sound resources for these instruments. Among Dr. Caravan's other works utilizing extended techniques for saxophone are *Sketch for Alto Saxophone* (Seesaw Music Corp.), *Monologue* for alto saxophone (Ethos Publications), *Lament for an Unknown Infant Victim of War* for Saxophone Quartet and Grand Pianos (Ethos Publications), and *Paradigms I* (Dorn Productions), a graded set of 10 compositions utilizing unconventional sounds.

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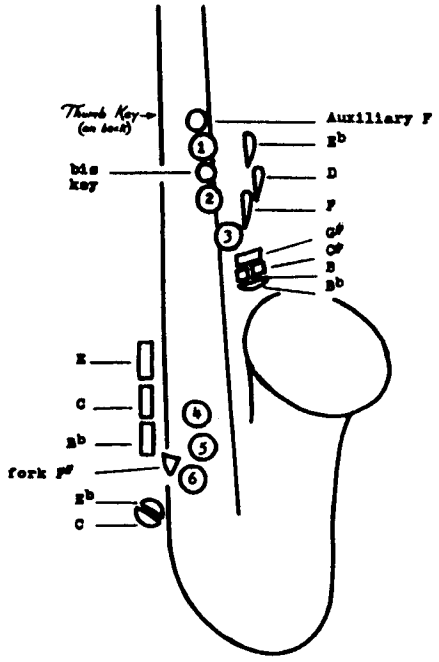
Guide to Fingering Diagrams

Keys and Open Holes on Instrument



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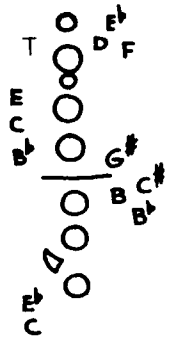


○ - Open hole or undepressed key.

● - Hole closed or key depressed with an appropriate finger.

( ) - Optional for considerations of tuning or timbre.

N. - Use normal or regular fingering.

A Selected List of Extensions of Technique for Saxophone

I. Timbre Variation.
- A. Changing timbre while sustaining or repeating a pitch.
- B. Changing timbre of successive pitches.
- C. Timbre trills.

II. Quarter Tones.

III. Multiphonics.
- A. Use of conventional fingerings with distorted tone production.
- B. Use of special fingerings.
  1. Isolated and combined multiphonics.
  2. Multiple sonorities linked to single tones.
  3. Multiphonic trills.
- C. Use of the voice.

IV. Vibrato Manipulation.
- A. Variation of rate.
- B. Variation of width.

V. Glissando. (Rapid chromatic or possibly diatonic movement)

VI. Portamento. (Sliding movement)

VII. Variation in Articulation.
- A. Flutter tonguing.
- B. Slap tonguing.
- C. Smorzato. (Attact & decay with embouchure pressure; no tonguing)
- D. Reverse envelope of attack and decay.
- E. Glissando attack and release. (Or portamento)

VIII. Percussive Effects.
- A. Key clicks.
- B. Key Pops (Key slaps).
- C. Hand pops.

IX. Air Sounds.

X. Vocal Sounds.

XI. Mouthpiece Alone.

XII. Lip Buzz.

An Important Note Concerning the Fingerings in this Book—

All of the fingerings contained in this volume for timbre variation, quarter tones, and multiphonics have been derived and thoroughly tested utilizing the E-flat alto saxophone. This does not preclude the possibility of using other sizes of saxophones, such as soprano or tenor, in these study materials, but in many cases fingering adjustments may be necessary for tuning purposes in the timbre-variation and quarter-tone fingerings; some of the multiphonic fingerings may not respond well at all on saxophones other than the alto. It is also noteworthy that the actual pitch content of the multiphonics will often differ from one performer and/or instrument to another.

Timbre Variation

The issue of timbre, or tone quality, as a parameter which can be predictably manipulated by the performer suggests a wide range of manifestations. The development of a performer's characteristic tone quality is itself, in the final analysis, the development of his ability to achieve and consistently manifest his tonal concepts throughout the pitch and dynamic ranges of the instrument. But, of course, this tone quality is not a single timbre resulting from a fixed pattern of harmonics (overtones) throughout the range of the instrument. The harmonic spectrum, and hence the timbre, changes with every pitch and dynamic nuance which is played. (Other elements which enter into the acoustically complex issue of timbre are formants, phase, noise elements, presence of inharmonic partials, transients, and radiation properties of the instruments. Additionally, there are moment-to-moment changes in the balance of harmonics in a humanly-produced sustained tone.)

For all of the variables involved in the tone-production processes of the individual saxophonist (*e.g.*, embouchure components, tongue positions, air pressure), an effectively consistent tone quality is generally achieved by the more mature player (the frustrations of different reeds, mouthpieces, and even instruments notwithstanding!). However, it would be futile to attempt to define precisely the exact effects of these variables, with their complex interactions, in even one player, not to mention from one player to the next.

The fact emerges that the most effective and most easily standardized method of achieving a variety of tone colors on a particular pitch on the saxophone is to employ several fingering combinations, in addition to the most conventional one, which produce different harmonic spectra from one to the other and hence, varied timbres. Using alternate fingerings is the most predictable method of varying tone color on the saxophone since the different resonances inside the instrument which result are more predictable than the human components which enter into the tone-production process.

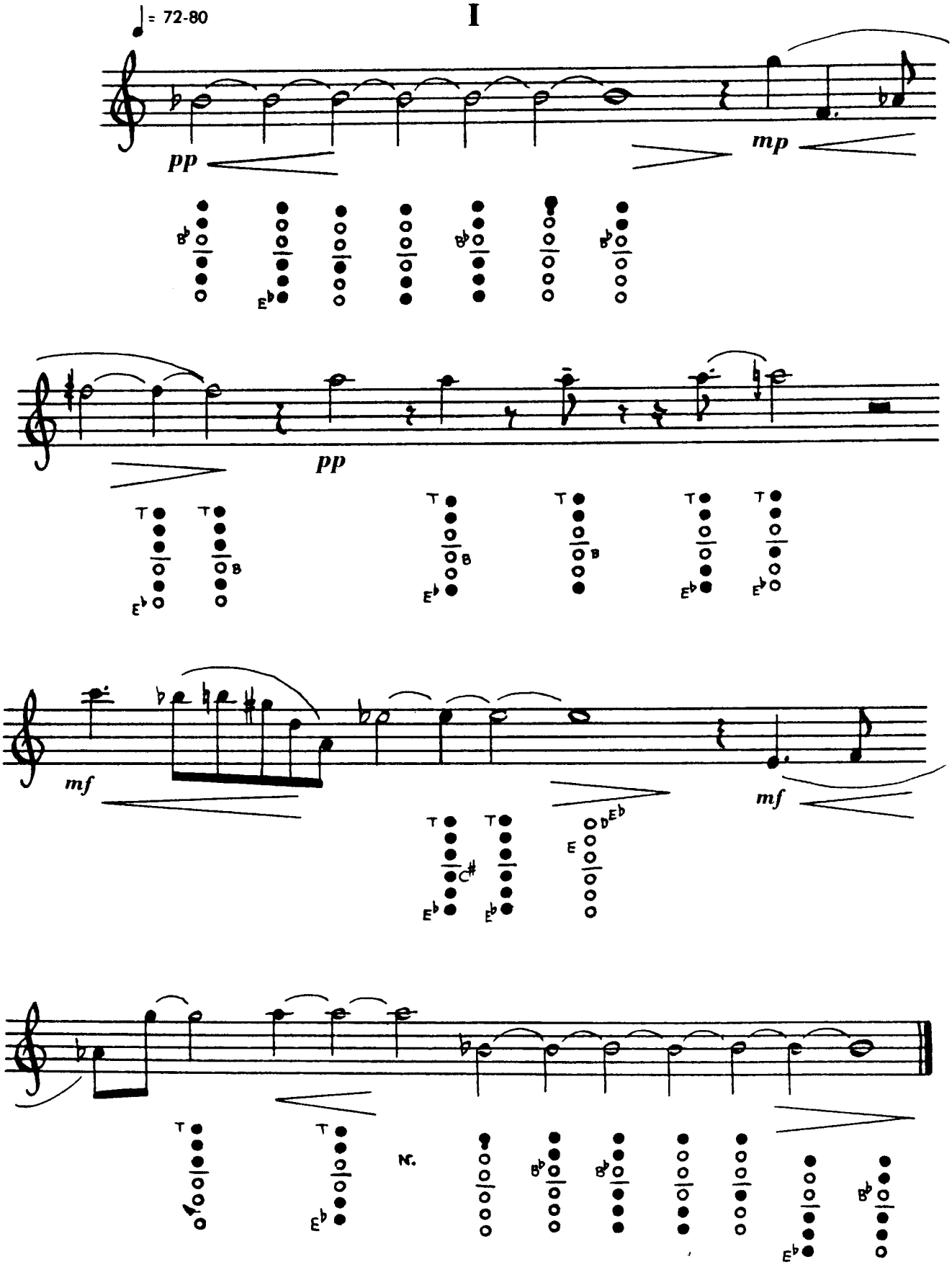
The *Etudes on Timbre Variation* which follow exploit some of the possibilities for tone-color variation through the use of various fingering alternatives. Many of the alternate fingerings employed may seem awkward at first, but the performer should experience no difficulty once he is used to adjusting his fingers to the unconventional patterns involved. It will probably be necessary for the saxophonist to focus his eyes more on the fingering diagrams than on the music notation in the course of playing, at least in the early stages.

With regard to changes in embouchure, oral cavity, or air speed components in the course of performing tone-color variations with alternate fingerings, there are at least two circumstances when tone-production adjustments might be appropriate. First, some of the unconventional fingerings will result in minute pitch variations as well as tone-color changes; by careful "favoring," the performer might be able to minimize pitch fluctuation in a succession of timbre changes involving different fingerings. A second and more subtle consideration is that of utilizing one's tone-production flexibility to complement the tendency of a given alternate fingering. For example, a slight amount of supportive tone-production adjustment added to a succession of fingerings on a constant pitch going from "dark" to "bright" can enhance the effect of the overall gesture.

With the possibility of predictable timbre variations through the use of alternate fingerings, the potential also exists for producing trills between two different tone qualities (where the fingerings employed are plausible for rapid alternation). Timbre trills are utilized in the fourth and sixth of the etudes which follow; the graphic undulating line above the staff indicates relative trill speed.

Etudes on Timbre Variation for Saxophone

I



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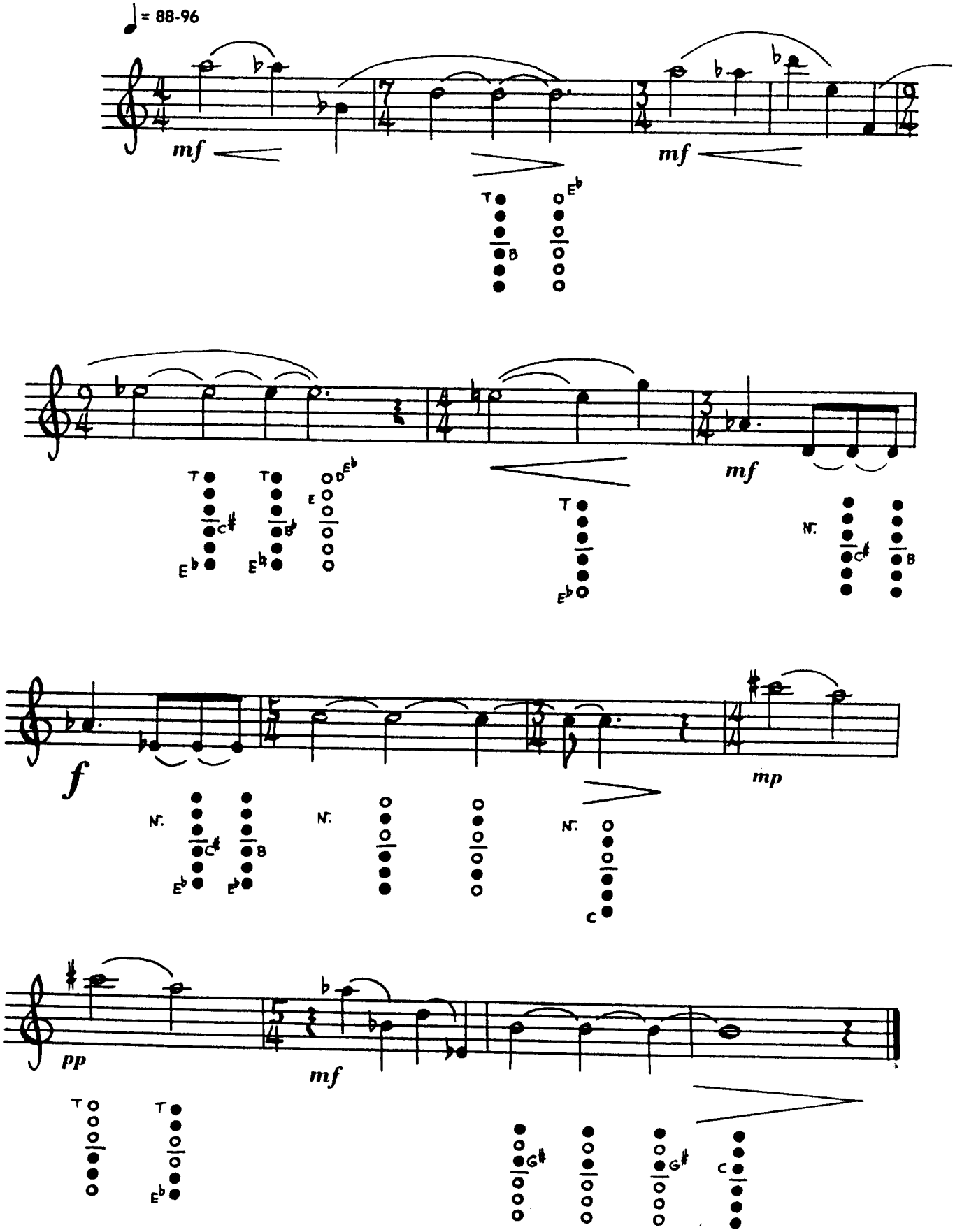

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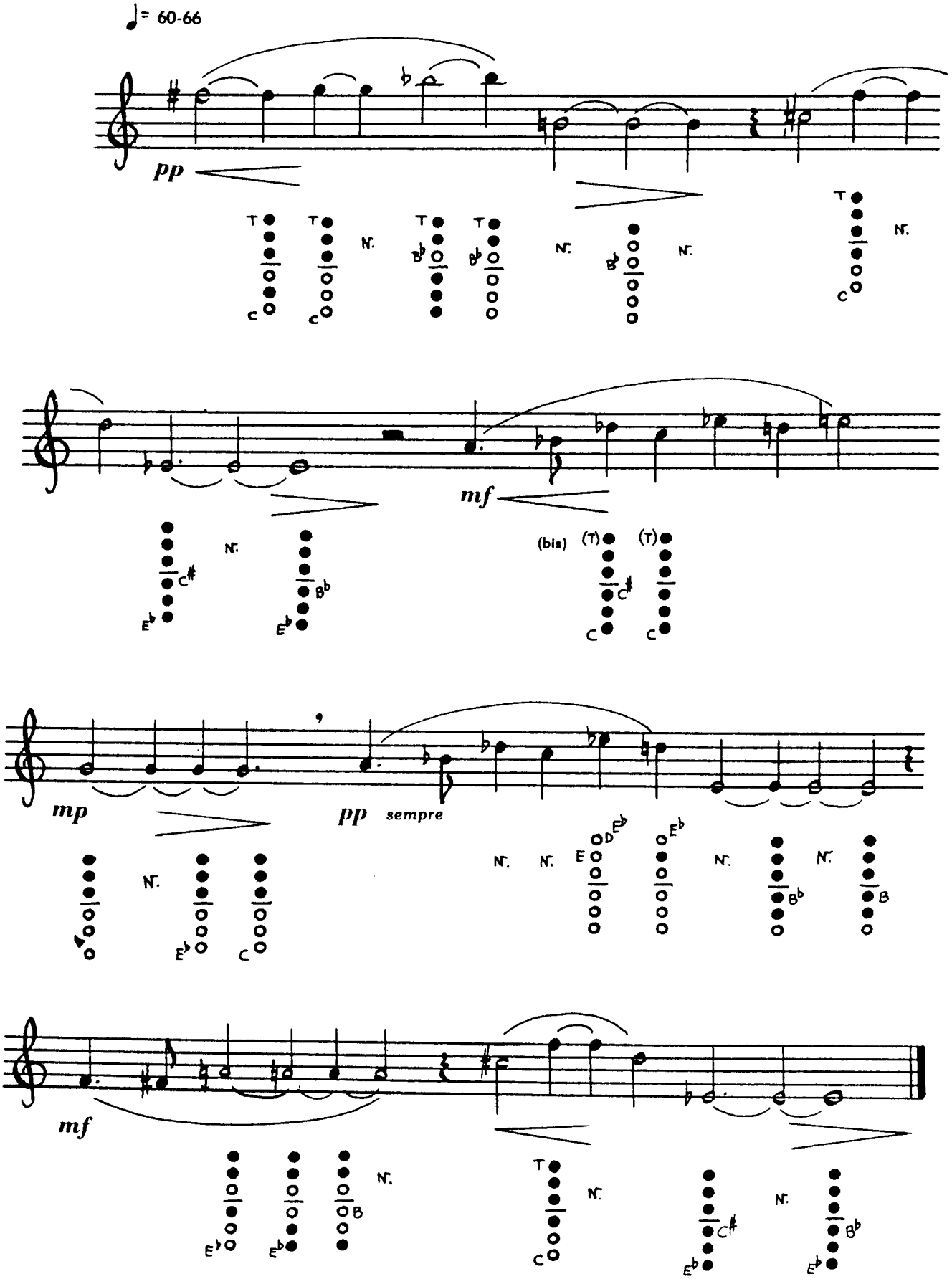

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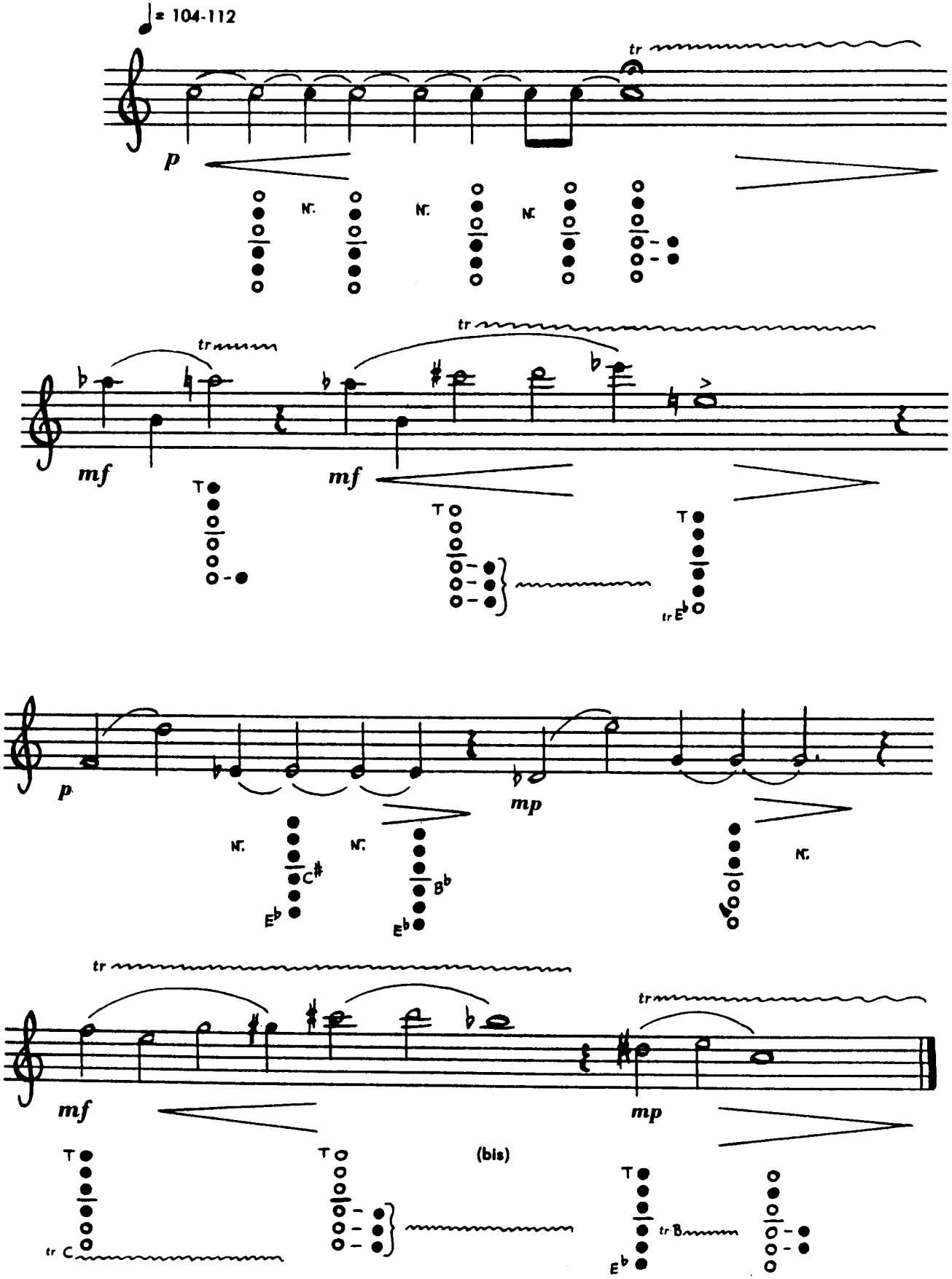
♩= 104-112
tr
p
N.
N.
N.
tr
tr
mf
mf
T
T
T
tr E♭
p
mp
N.
N.
N.
C♯
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(bis)
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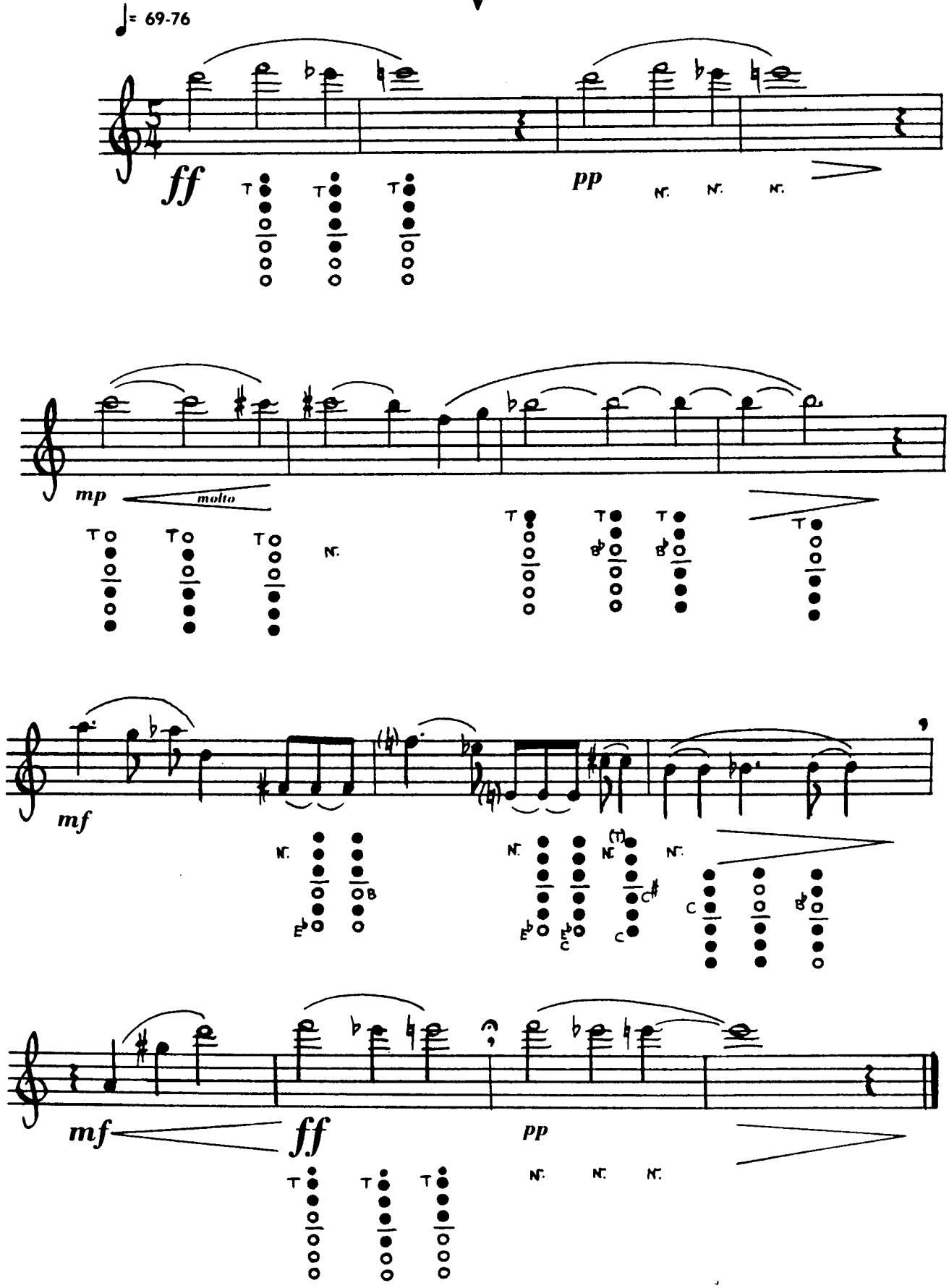
tr C
tr B
E♭

V



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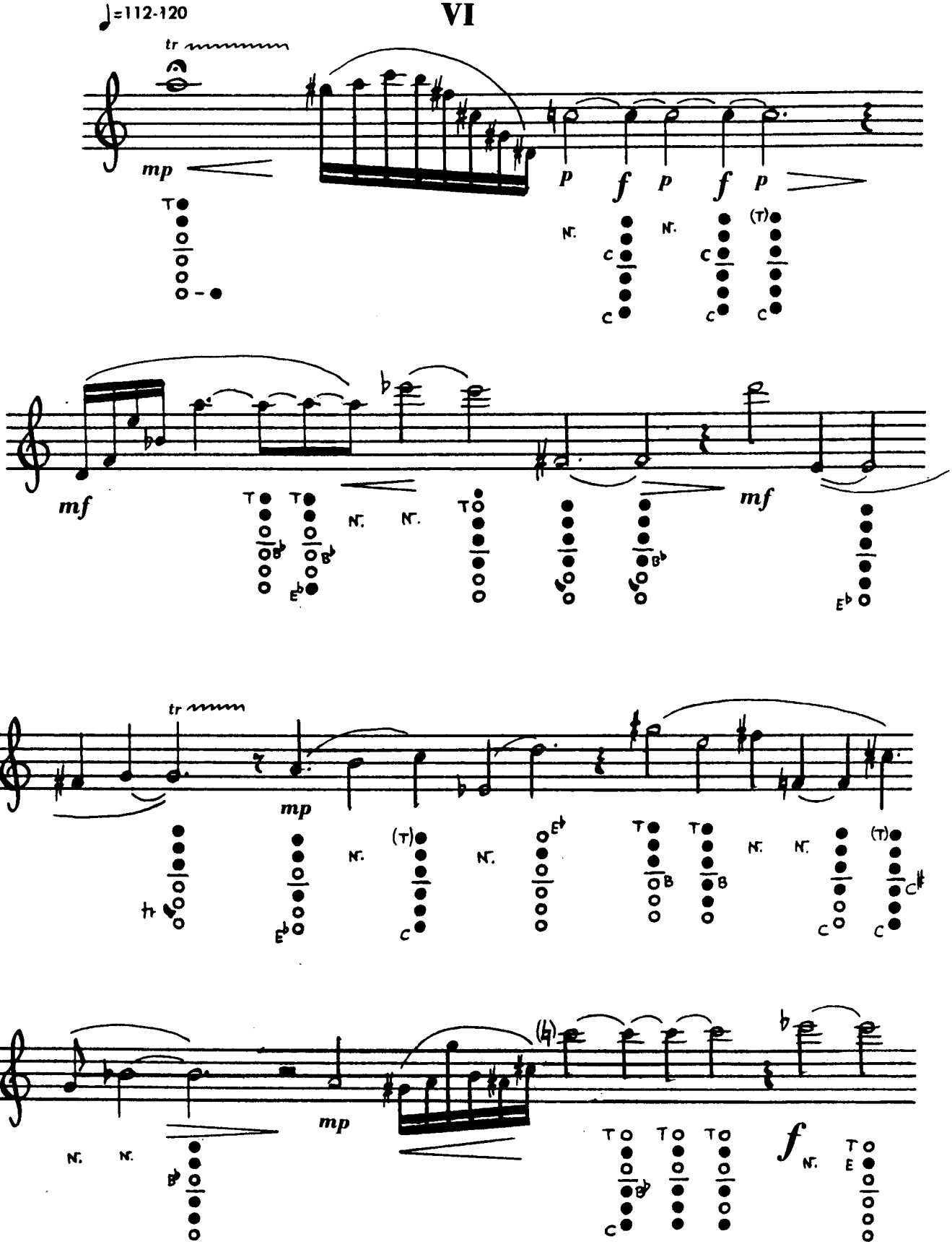
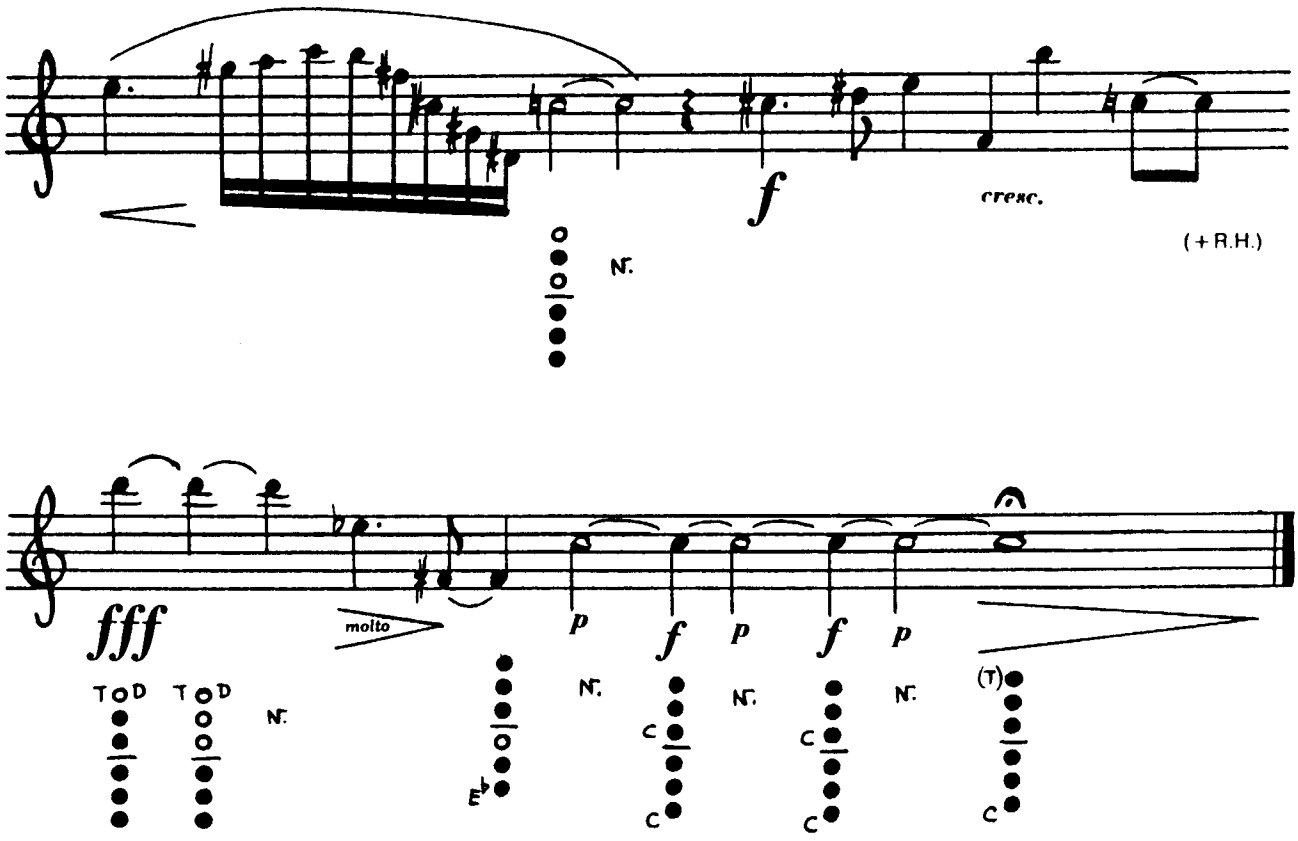




Quarter Tones

Without making structural adjustments to the conventional saxophone key mechanism, quarter-tone intervals can be played on the instrument through the use of special fingerings to produce the pitches between the conventional tones of the chromatic scale. However, since the standard key mechanism was not made to produce intervals smaller than a semitone, the production of quarter tones on the saxophone will generally involve using numerous "cross fingerings," some of which can be quite complicated from an acoustical as well as mechanical standpoint. [The term "cross fingering" describes that situation in which there are one or more closed holes below an open hole (which for all practical purposes terminates the tube length) and then additional open holes below that (*e.g.*, low F-sharp on the saxophone, not employing the chromatic, or "fork" fingering.)]

While the entire semitonal chromatic scale can generally be played on the saxophone without the use of any cross fingerings, few quarter tones are available which do not require them. Since cross fingerings affect the resonances in the air column in such a way as to reduce the harmonic content of the pitch being sounded (or otherwise distort the spectrum compared with the non-cross fingerings), wide timbre differences may occur between the quarter-tone fingerings and the conventional fingerings. Generally, the practical result is that the quarter-tone fingerings produce "darker" or "duller" tone qualities. The performer, by means of tone-production adjustments (*e.g.*, embouchure, tongue position), can minimize these tone-color disparities to some extent in the context of a given melodic line. But it should be realized that some timbre deviation in passages involving quarter tones is simply characteristic of the instrument.

Although playing quarter tones should not place many additional technical demands on saxophonists, there are certain aspects which deserve particular attention. The most important consideration is the refinement of the performer's interval discrimination. One must be able to hear and imagine the interval of a quarter tone accurately enough to be able to adjust the tone production for intonation purposes. The quarter-tone fingerings are no different from conventional fingerings in respect to this. The player will have to be prepared to temper pitch frequently. (This may be conceptualized very differently among different players, with the manifestation of these adjustments taking on such descriptions as "lipping," "focusing," "voicing," and so forth.)

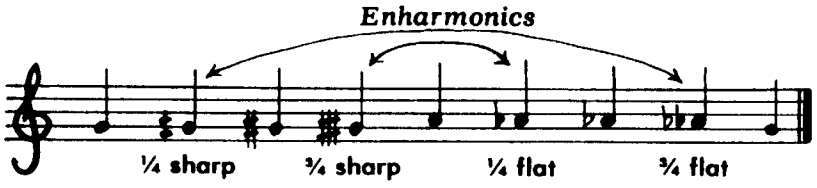
The fundamental challenge is that compared with hearing in the traditional semitonal chromatic system, a greater degree of pitch sensitivity will be necessary for accurate quarter-tone playing. An excellent course of practice for the purpose of familiarity is for the performer to play isolated quarter-tone intervals or successions of adjacent quarter tones for a while, subsequently turning to other melodic progressions involving quarter t

as the etudes provided in this section. Among other things, the effect of psychological conditioning will soon become apparent. This is perhaps best evidenced when a succession of adjacent quarter tones is played for a few moments followed immediately by the playing of a semitone. The half step will probably seem larger than it ever has at that point!

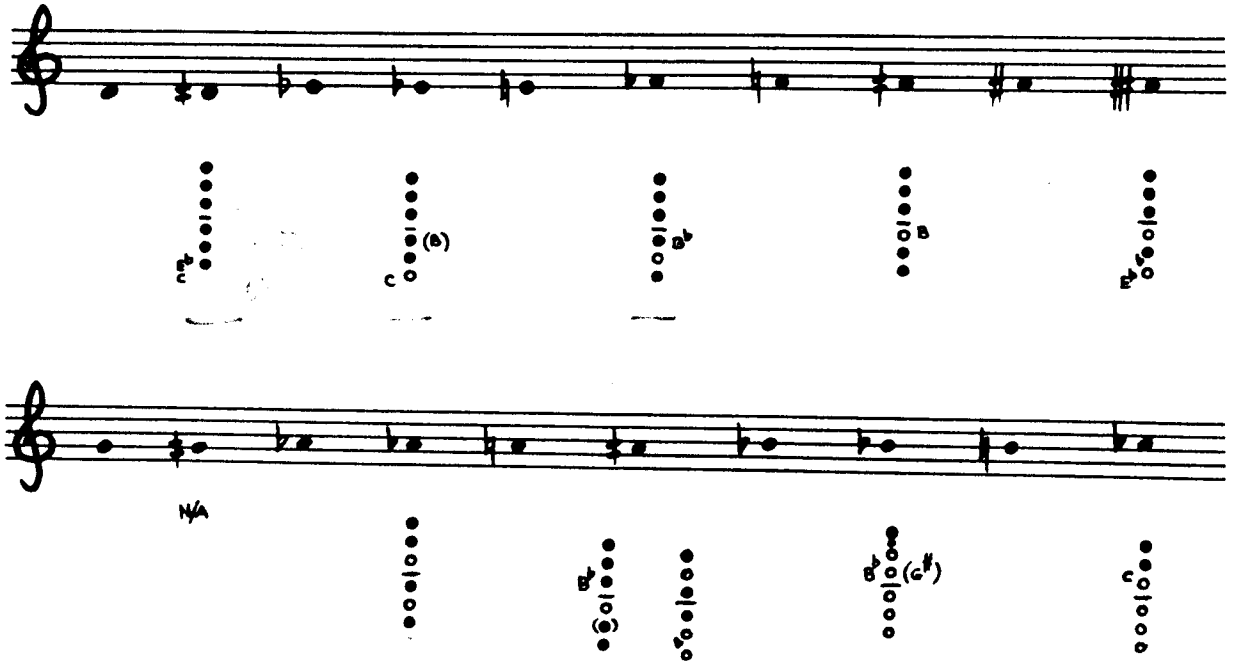
In order to facilitate this type of activity, the quarter-tone fingering chart which precedes the quarter-tone etudes is provided primarily as a raw material from which the creative saxophonist might fashion his own preliminary exercises. While an activity as basic as simply playing ascending and descending quarter-tone scales can be very profitable, not all such preliminary exercises with the new quarter-tone fingerings necessarily need to involve quarter-tone intervals. It might be quite profitable, from an aural as well as tone-production standpoint, to utilize just the quarter-tone fingerings to play more conventional chromatic or diatonic successions or patterns.

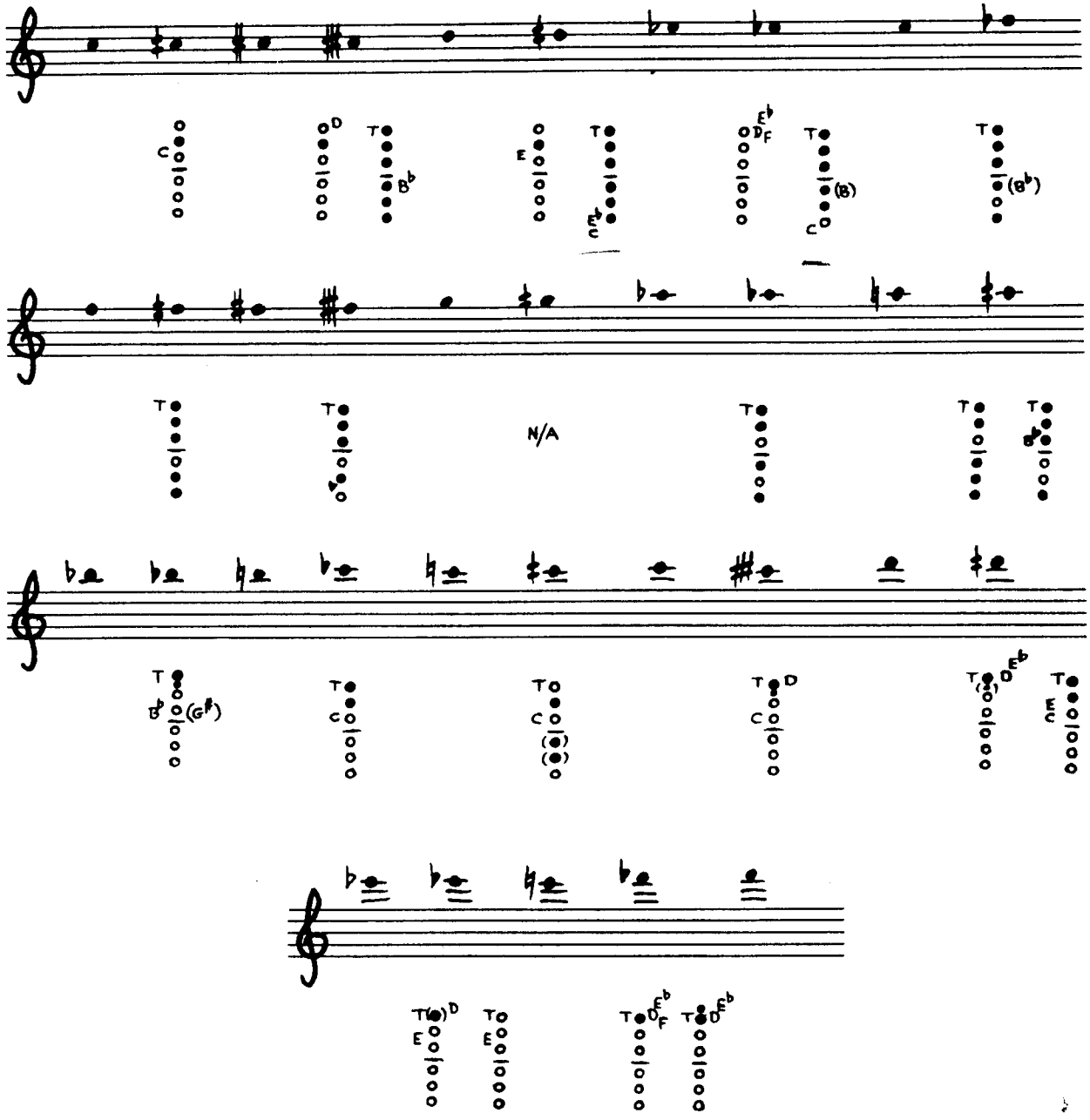
A final note of introduction is given in regard to the accidentals employed in this volume for quarter tones. For the notation of sharps in quarter-tone increments, the conventional sharp symbol (♯) is assumed and each vertical line is taken to represent one quarter of a tone. Hence, the quarter sharp is represented by 𝄲 and the three-quarters sharp is notated as ♯𝄲. This further relates to a conventional, but less-frequently used double sharp, 𝄪, which involves four verticals. For the notation of quarter tones in flats, the use of the filled-in, or black flat (𝄬) to represent a quarter tone, or half of a semitone (open, or white flat) draws its relationship from the conventional use of a black note head to represent a quarter note and a white note head for a half note. The musician, already conditioned to the idea that the filled-in symbol is half the value of the open one, will have no trouble adjusting to this system. Since the conventional symbol for a double flat is 𝄫, it is logical that the flat symbols for the quarter-tone intervals be 𝄬, ♭, ♭𝄬, and 𝄫.

Quarter-Tone Accidentals



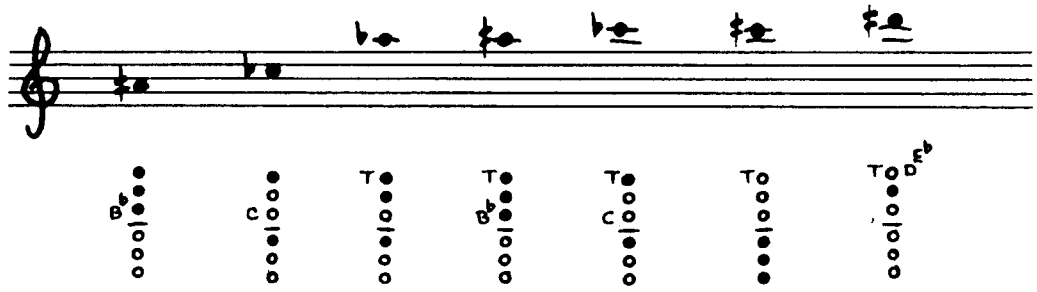
Quarter-Tone Fingerings for Saxophone





Supplemental Quarter-Tone Fingerings
For Soprano Saxophone

The following fingerings for selected quarter tones may be found to be more feasible for use on most soprano saxophones, compared with their counterparts on the main chart.



Quarter-Tone Etudes for Saxophone

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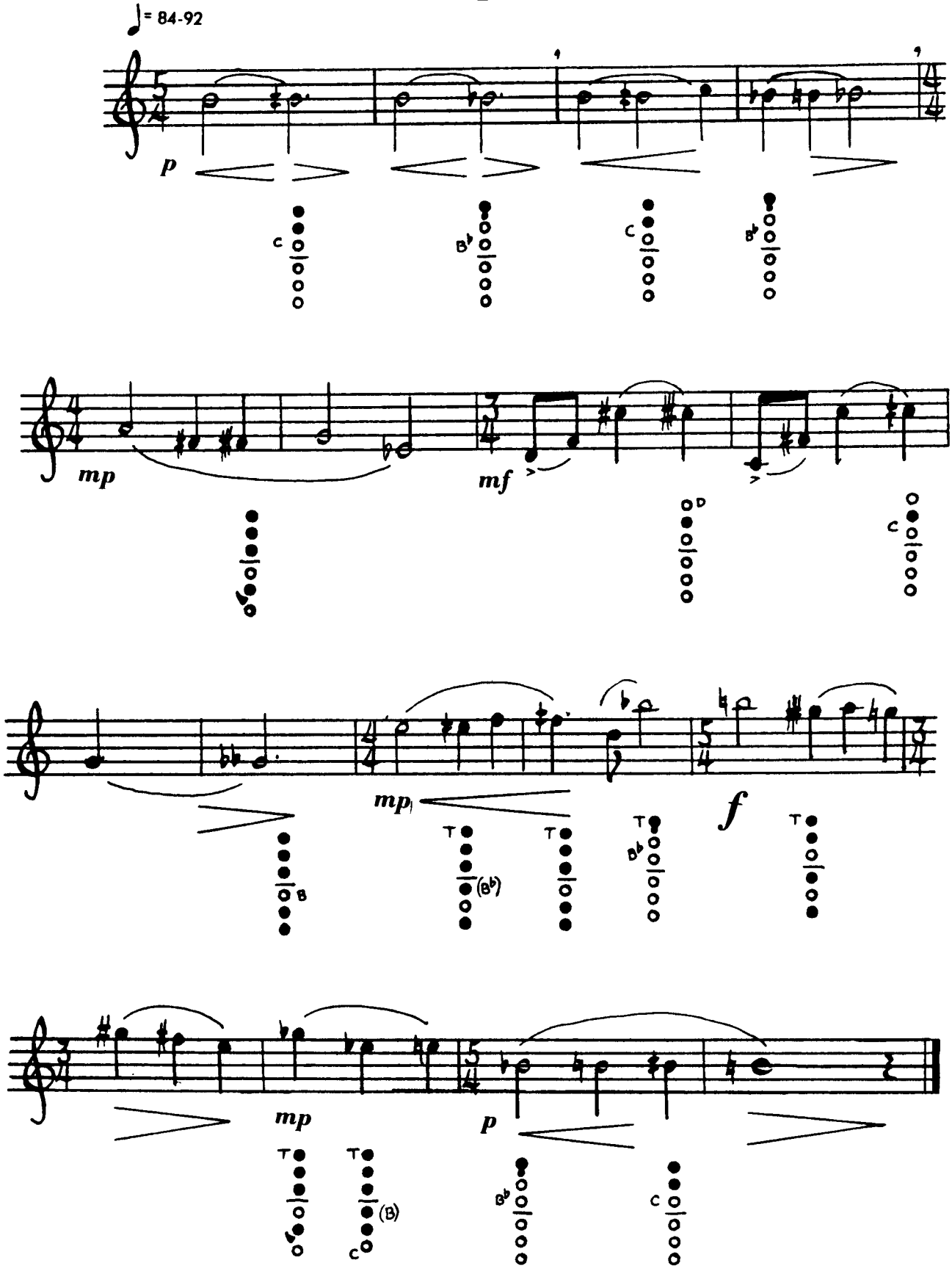

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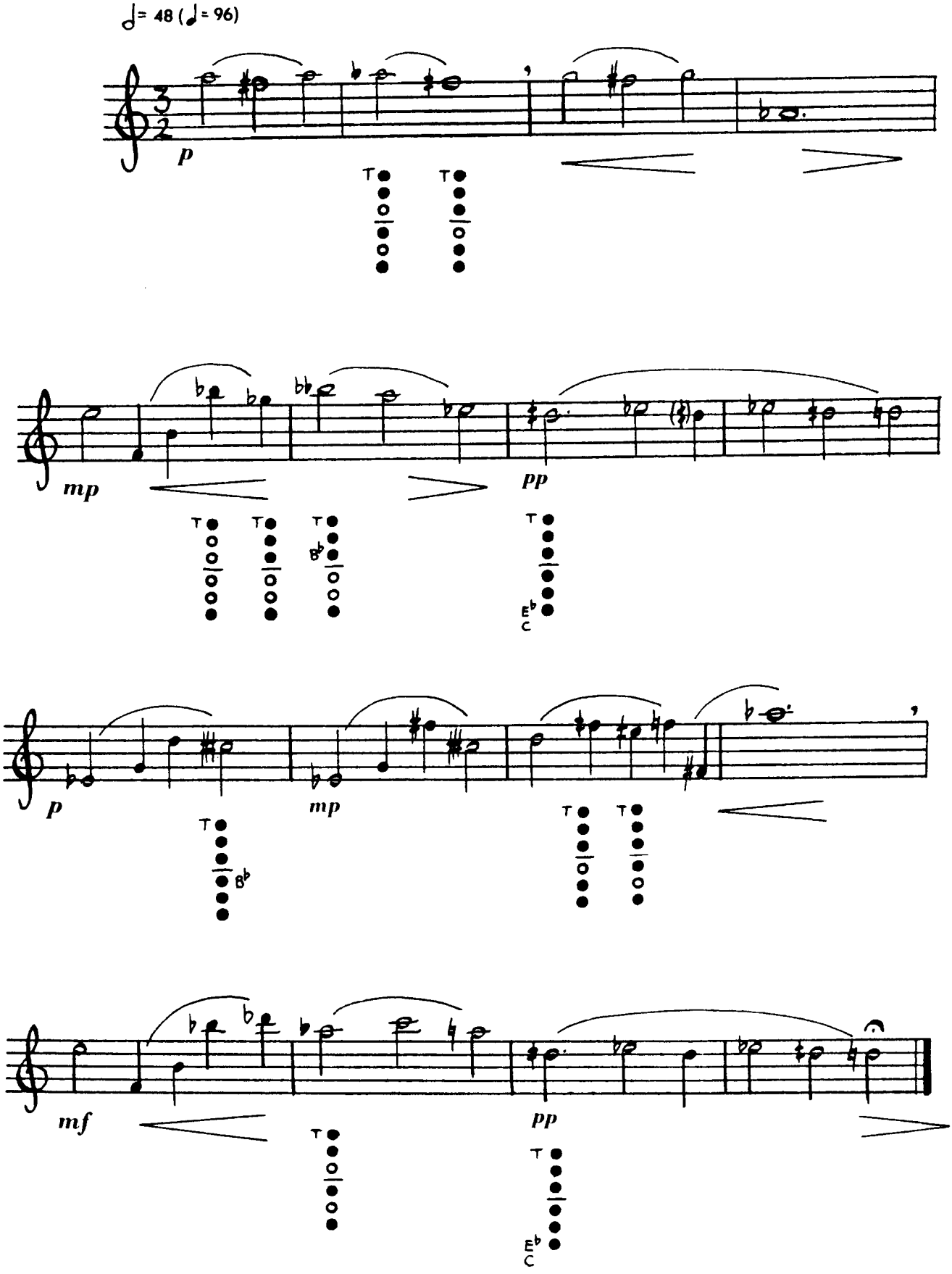

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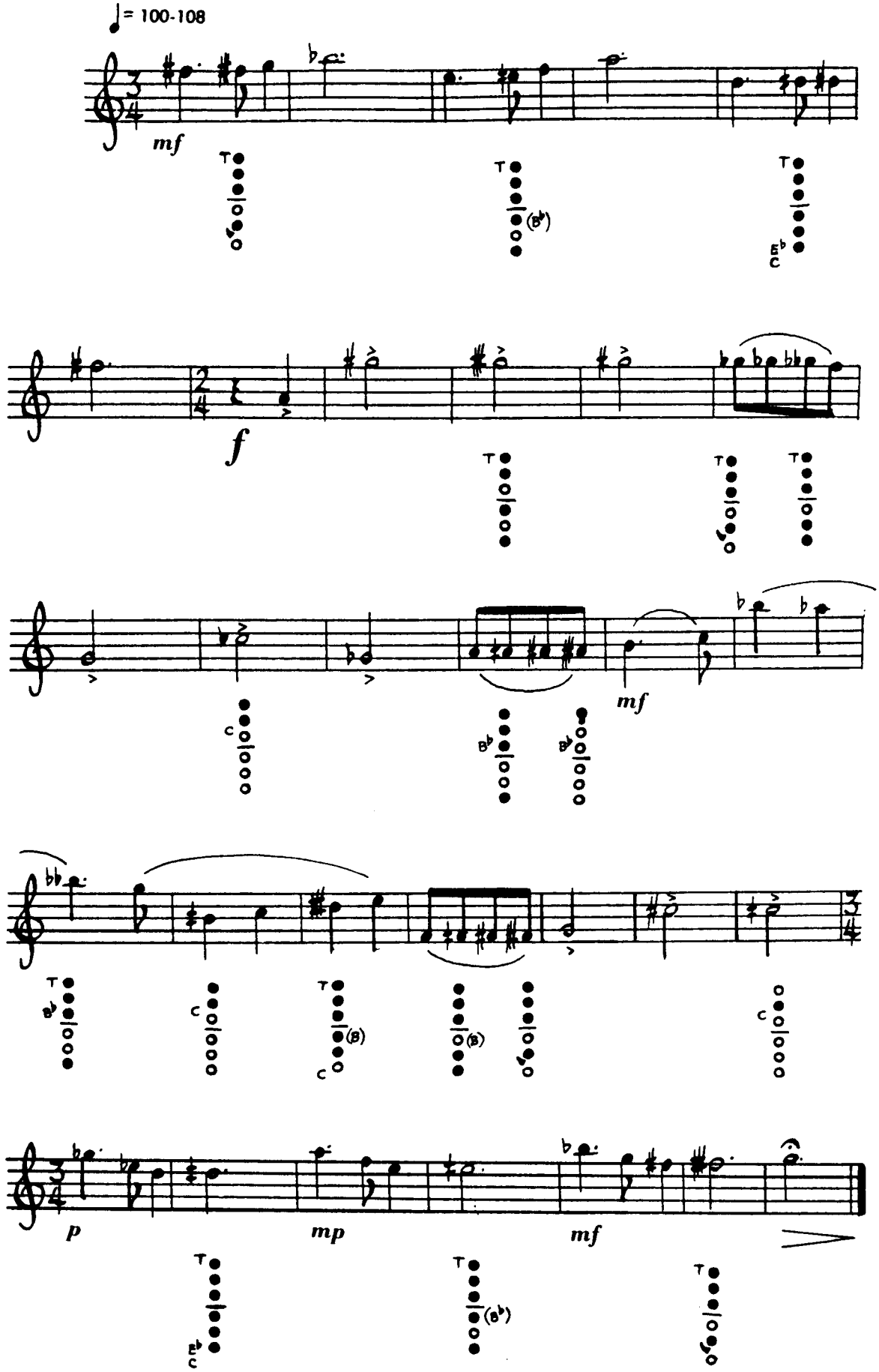

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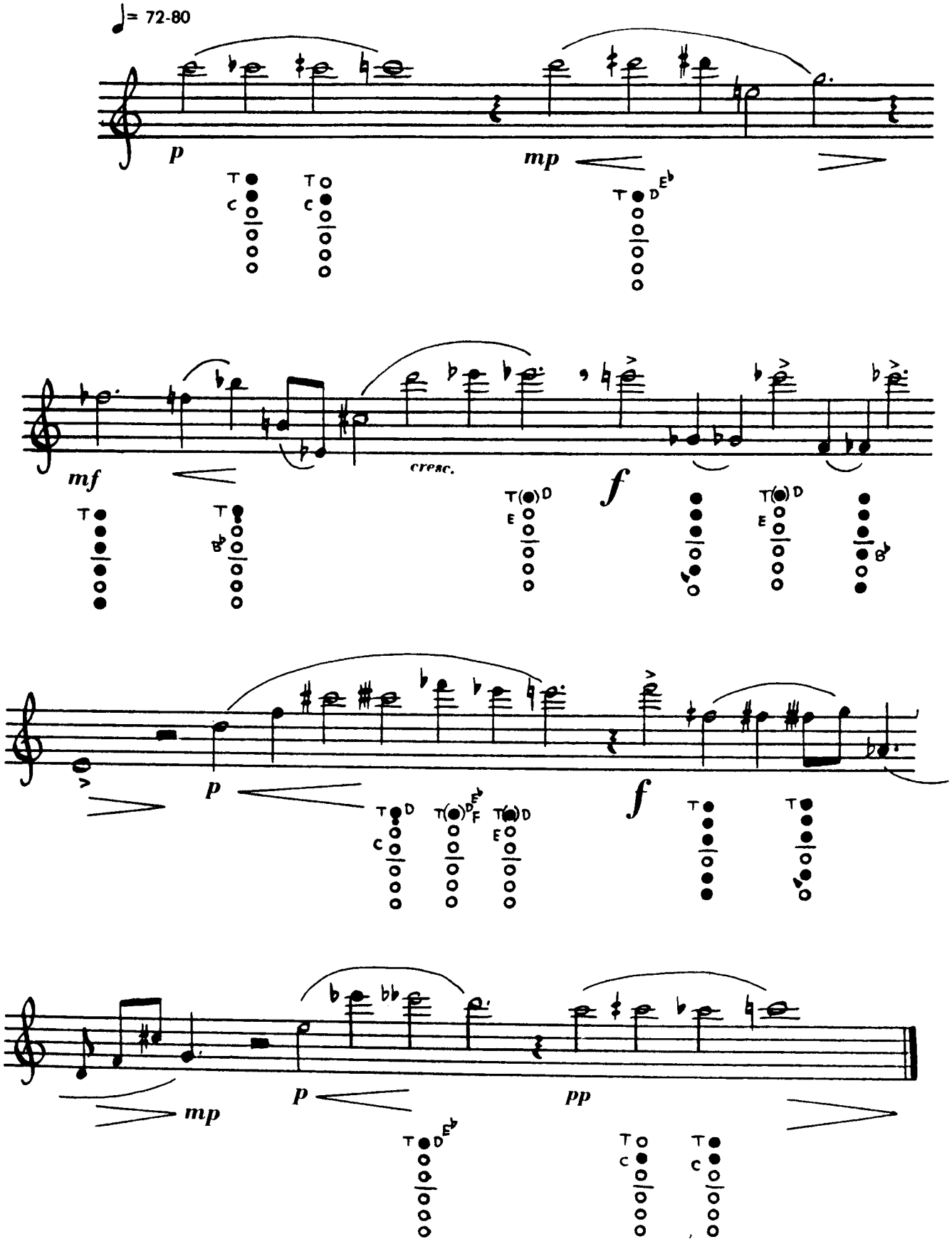

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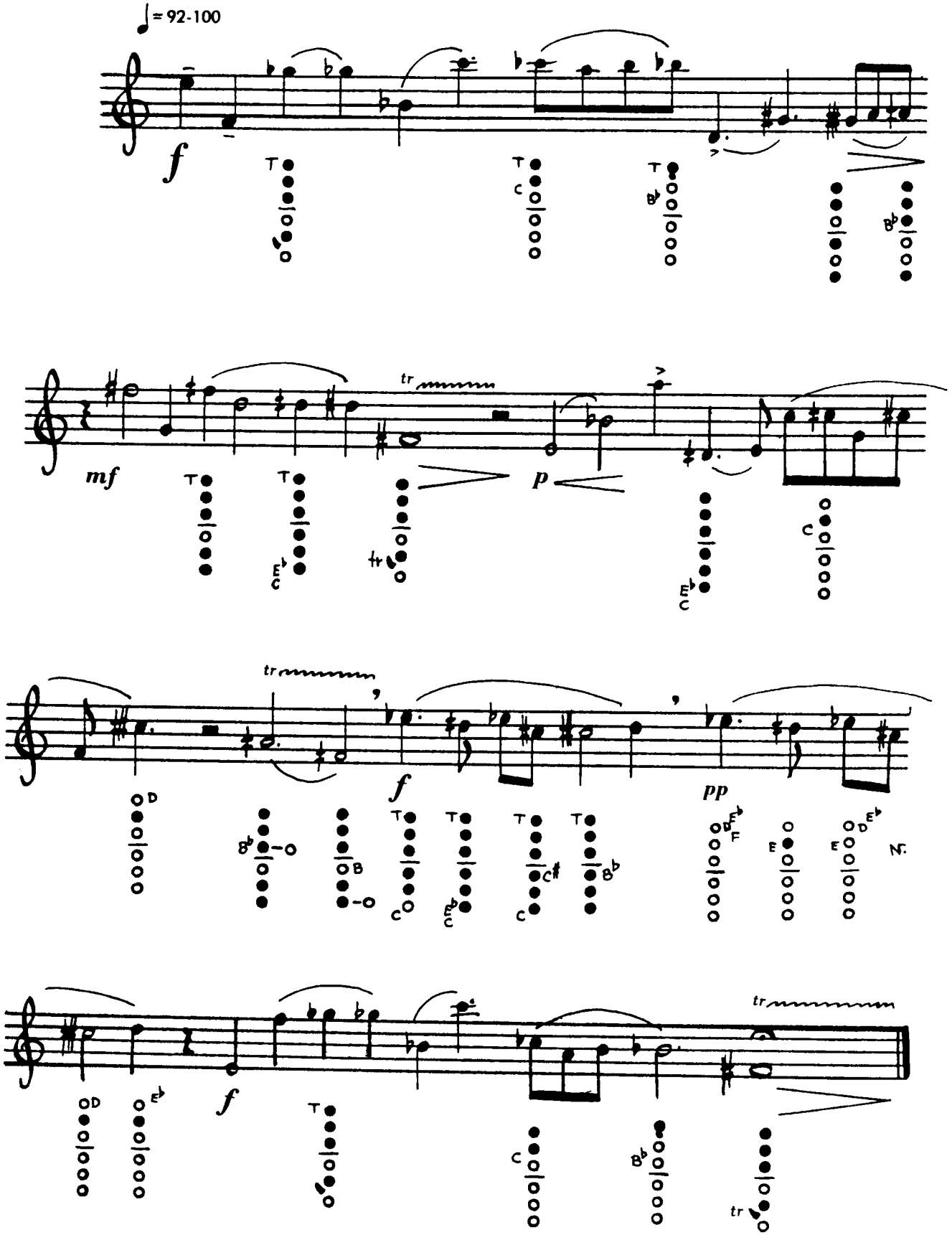

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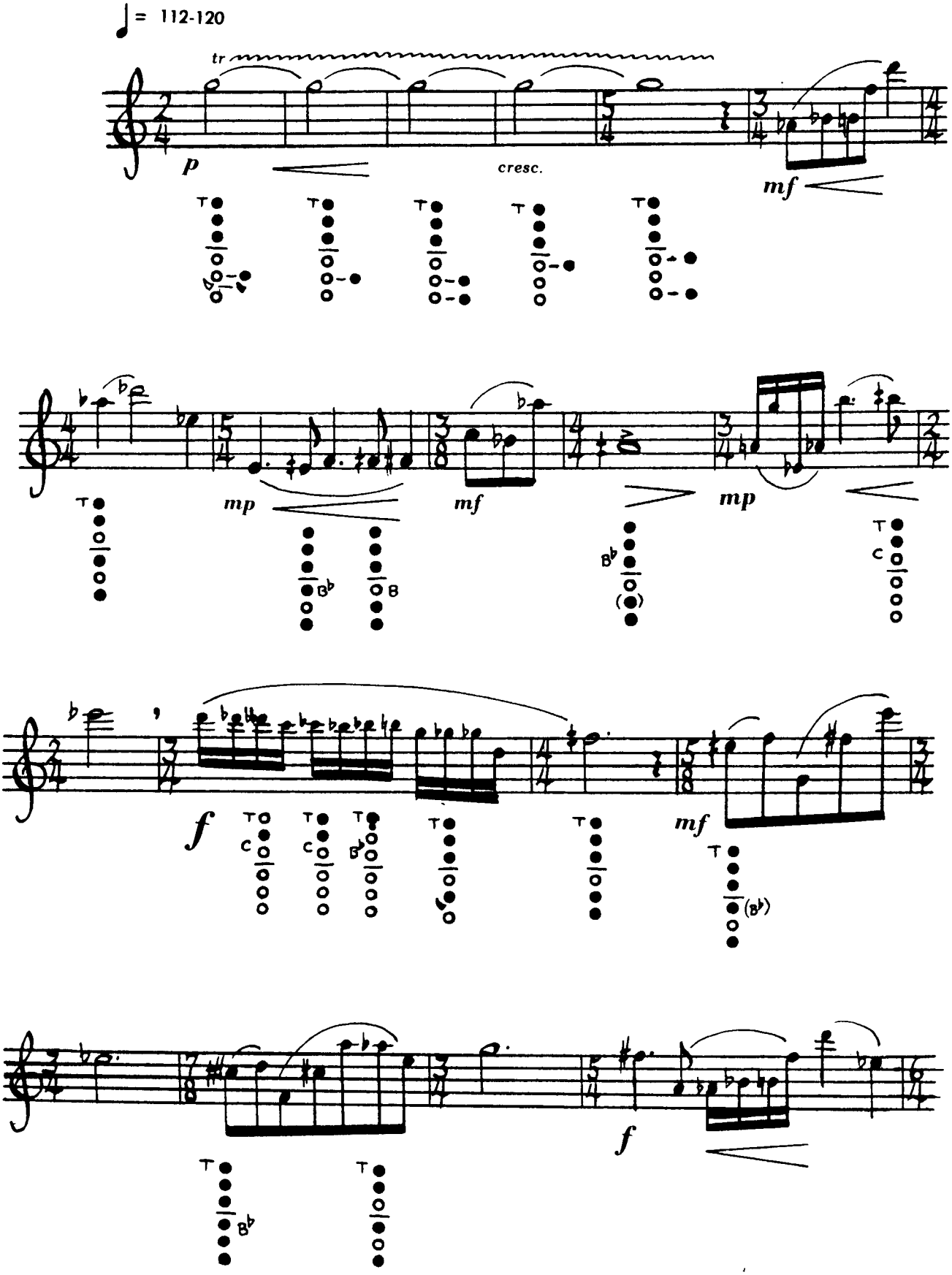

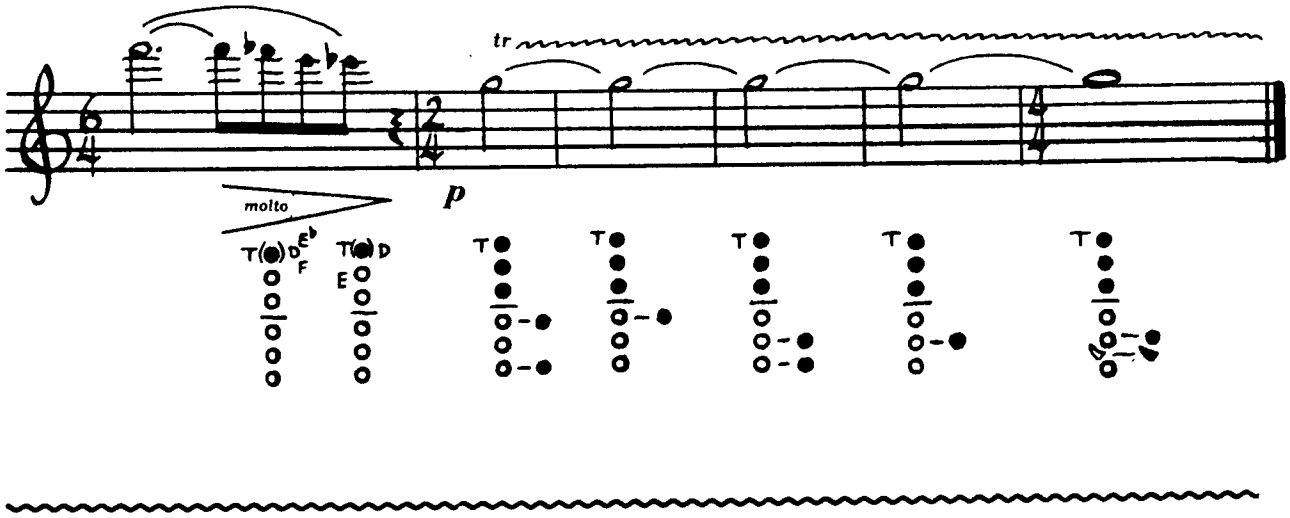

Multiphonics

Among the numerous unconventional sound resources which began to appear in saxophone literature during the second half of the twentieth century, perhaps the most fascinating and acoustically intriguing is the simultaneous production of more than one audible tone. The composite sounds resulting from this sort of production have been referred to as "multiple sonorities," "multiple sounds," or "multiphonics."

Aside from equipment modification, there are two basic ways of achieving multiple sounds with the saxophone. One technique is to combine conventional saxophone tone production with vocal tones produced simultaneously by the performer. The other basic source for the simultaneous production of more than one tone does not lie in introducing another tone generator (*i.e.*, the voice), but in altering the resonance of the air column inside the instrument so that two or more tones are rendered rather than just one.* This can be executed by the performer utilizing a maximum of tone-production distortion (*e.g.*, embouchure, oral cavity, air speed) on fingerings as unlikely as normal, traditional single-tone fingerings, or by utilizing special unconventional fingerings which tend to enhance these more complex resonances, often requiring a minimum of tone-production adjustment. (In general usage, it is this type of sound rather than the simultaneous use of the instrument and the voice which is usually thought of as multiphonic production.)

The text and preliminary exercises which precede the etudes in this section are divided into three areas. The first section deals with the production of multiple sounds through the use of conventional single-tone fingerings with distorted tone production. Although this is generally a more difficult method of multiphonic production compared with utilizing special multiphonic fingerings, it provides very advantageous study material because of the flexibility with tone production which the performer must attain to gain even minimal results. The second section deals with multiple sounds using special fingerings, and the third provides an introduction and study material in singing while playing.

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*For some basic introductory acoustical information on multiphonics, see: Ronald L. Caravan, *Extensions of Technique for Clarinet and Saxophone*, Unpublished D.M.A. dissertation, Eastman School of Music of the University of Rochester, 1974, Chapter II, "Acoustical Properties of Multiple Sonorities," pp. 95-120. (Available through University Microfilms, P.O. Box 1307, Ann Arbor, Michigan, 48106, No. 75-578.)

Multiphonics—

I. - Use of Conventional Fingerings with Distorted Tone Production

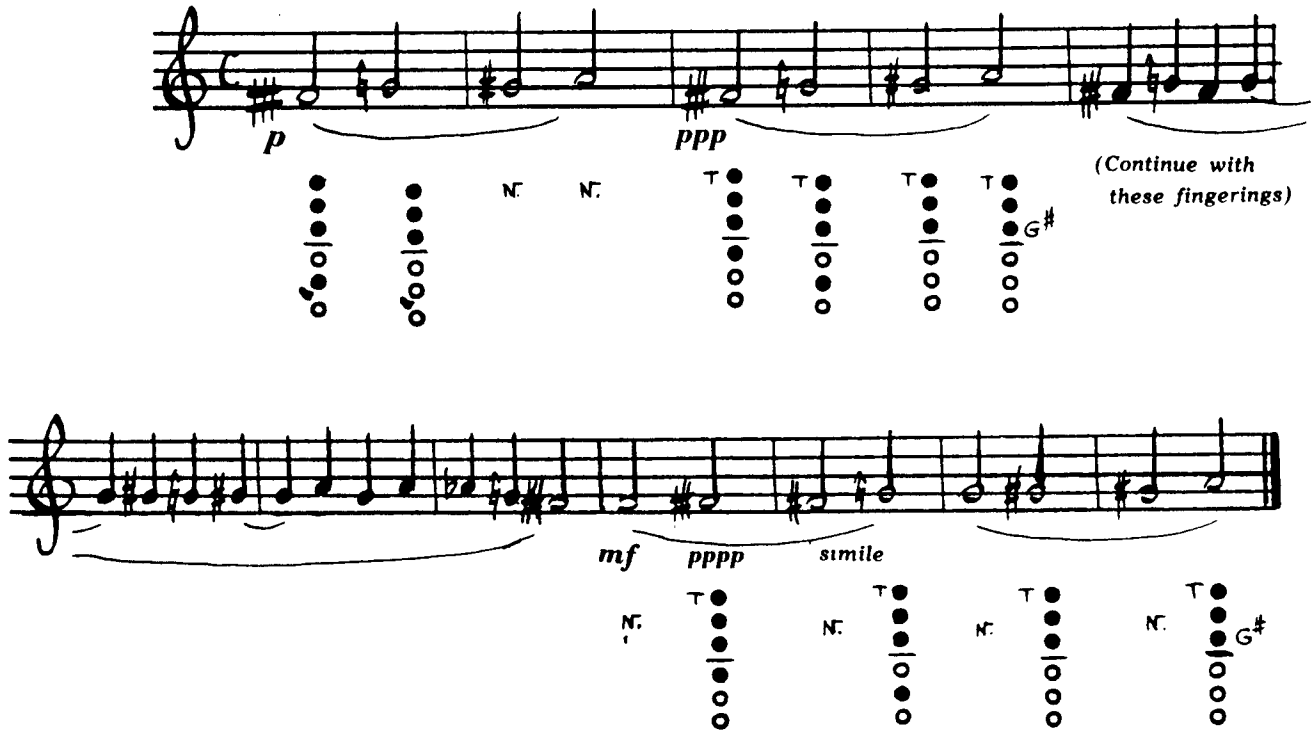
In producing multiple sounds from conventional single-tone fingerings, probably the most frequently employed as well as most approachable procedure is for the saxophonist to use a fingering for an upper-register (second partial) tone and cause it to produce a fundamental as well as a second-partial tone. Often, one or more higher tones (*i.e.*, higher than the second-register tone associated with the fingering) are also heard as part of the composite sonority. From an acoustical standpoint, what basically happens is that the performer's distorted tone production affects the resonances in the instrument in such a manner than the open register key acts as a tube-length determinant (causing the fundamental-register "undertone") at the same time that it acts as a register vent (causing the upper partial or partials).

In the preliminary exercises which follow, the saxophonist is provided with a framework for practicing the production of fundamental-register tones with the register key depressed as well as the simultaneous production of fundamental and second-partial tones. These exercises can easily be expanded to include other parts of the second-partial register as well as third, fourth, fifth partial fingerings, and so on (altissimo range).

These preliminary exercises constitute the only material in this volume where multiphonics are derived from normal single-tone fingerings; the etudes which complete this section utilize special multiphonic fingerings exclusively.

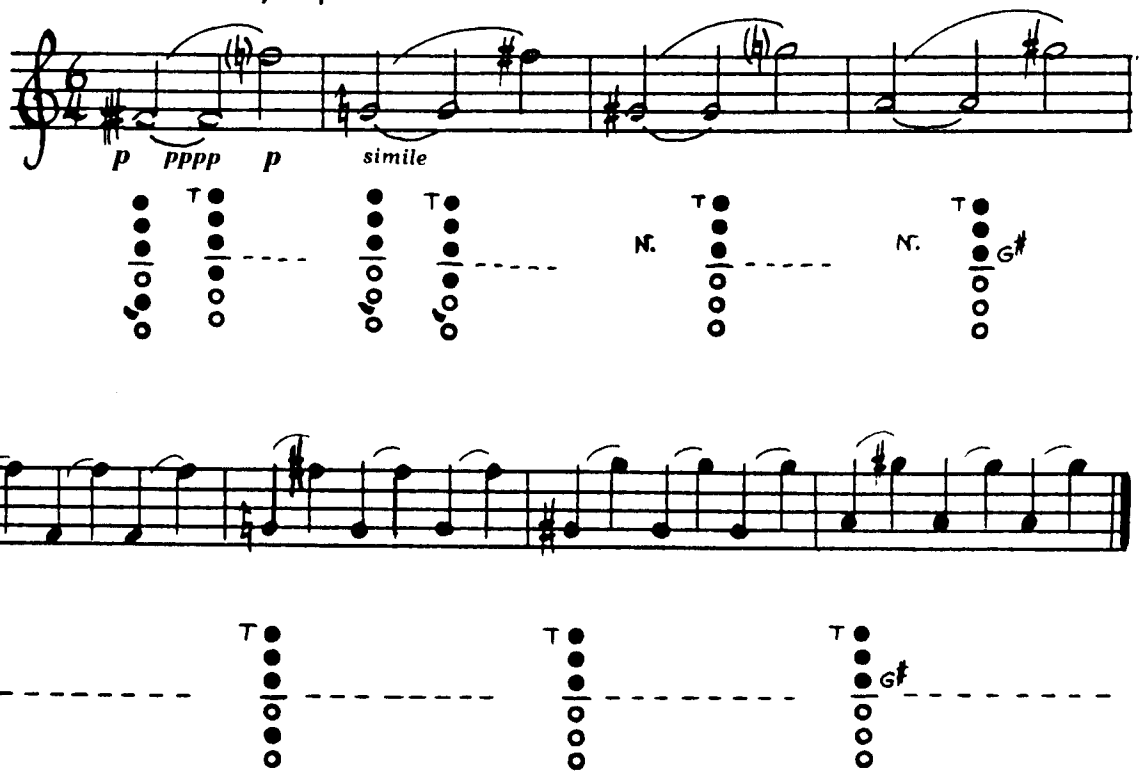
Preliminary Exercises

1. Fundamental-register tones with octave key depressed.

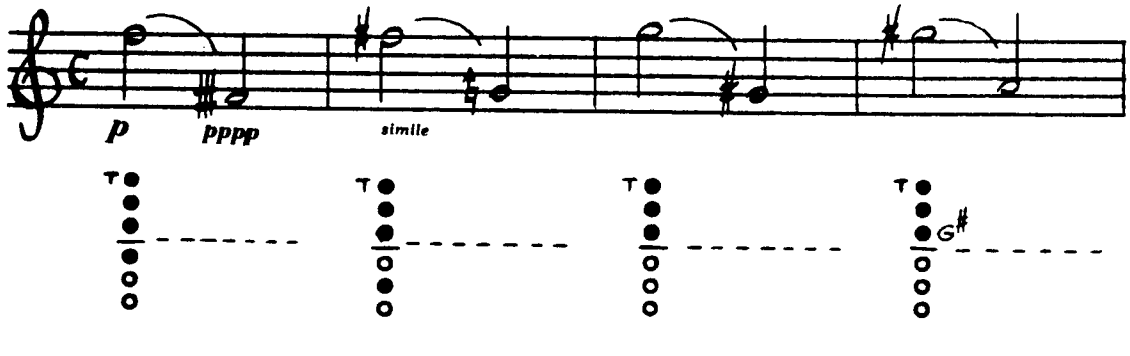


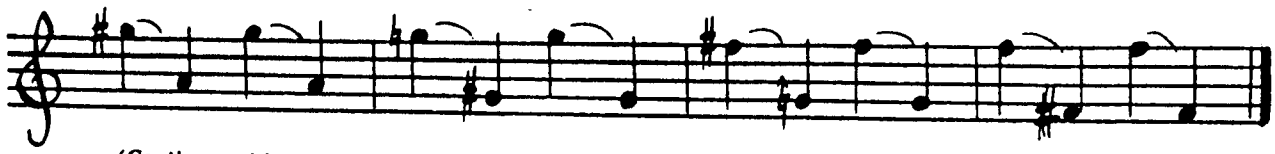
[N - Use normal or regular fingering]

2. Slurring from fundamental to second register with octave key depressed.



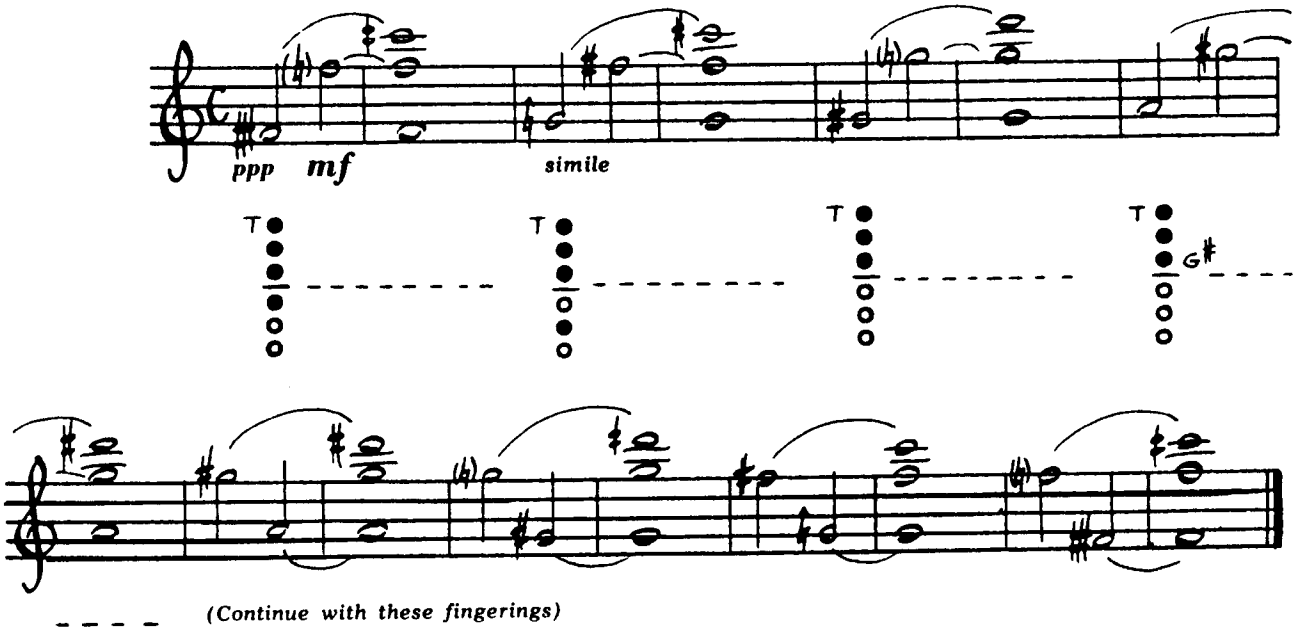
3. Slurring from second to fundamental register with octave key depressed.





(Continue with these fingerings)

4. Introduction of fundamental and second register tones simultaneously.



(Continue with these fingerings)

Multiphonics—

II. - Use of Special Fingerings

Generally, the most easily produced, most dependable, and most manageable multiphonics for saxophone are those which are produced by means of unconventional fingering configurations which seem to encourage the peculiar balance of resonances in the air column which result in more than one audible tone. Multiphonics produced with special fingerings usually require less deviation from normal playing technique, depending on how efficiently the fingering patterns affect the air column.

However, for saxophonists inexperienced at producing multiple sounds, utilizing a specific multiphonic fingering may not necessarily lead to immediate success. As in the production of single tones, while a particular fingering may enhance the possibility that a specific sound will result, this in and of itself is not totally adequate for the production of that exact sound. The performer must be able to affect the result by manipulating the air stream in various ways just before it enters the instrument. For multiphonic production, some degree of adjustment in tongue position, embouchure, and/or air speed will probably be necessary, and the extent and nature of these adjustments is likely to vary substantially among different multiphonic fingerings.

In approaching the production of multiphonics (as well as numerous other unconventional techniques), it is important that the performer possess an adequate flexibility with the tone-production processes. He must gain the capacity to substantially manipulate the embouchure, tongue position, and air speed.

Often, it is the aspect of oral-cavity manipulation (*i.e.*, tongue position) which the saxophonist has experienced the least. Among various activities one might use in working toward greater flexibility with tongue position, a valuable procedure can be the practicing of harmonic, or overtone exercises. Typically, this involves sounding a pitch in the lowest, or fundamental register and then, with no change in fingering, sounding as many of the overtones as can be achieved. On saxophone, a good starting point is probably the lowest B-flat. A second-partial B-flat, third-partial F, and perhaps fourth-partial B-flat would be the overtones to aim toward producing initially. (The third-partial F will probably be attained most easily.)* Use a breath attack rather than attempting to tongue or slur from the fundamental register.

If one experiences initial difficulty producing the overtones after the fundamental, perhaps a productive approach would be to play the third-partial tone with the normal fingering, then release the register key and sustain a decrescendo. When this can be executed successfully without having the tone change partials at some point in the long decrescendo, the necessary tongue position has probably been achieved and a widened flexibility has already begun.

Another activity which can be very profitable for achieving and exercising a greater tongue-position flexibility is that of tone bending. This involves sustaining a tone and then, with no change of fingering, bending it down in pitch as far as possible. For the saxophonist, it is probably best to use tones around C just above the staff or higher. A related activity aimed toward helping to develop the same flexibility would be to use the mouthpiece alone (or possibly the mouthpiece and barrel alone) and practice producing a portamento or even a scale.

In approaching flexibility activities such as these, it is important to realize that the key factor is oral-cavity manipulation as determined by varying the tongue position. Slight embouchure variations will doubtlessly enter into procedures such as these, but there should be little if any conscious emphasis of this. It is the flow of the air stream which must be affected, and this is done mainly in the oral cavity.

In addressing the issue of multiphonic production, as well as that of undertaking such activities as overtone exercises, perhaps the most important consideration of all is that of developing the aural flexibility. As important as the physical flexibilities may be, the performer who does not possess a clear aural concept of the sound which he seeks to produce has a much lower potential for success in his endeavors. He must be able to imagine the sound—visualize it—actually hear it in his mind before attempting to produce it. While success with multiphonics will in great part depend on how flexible the performer can be in his approach to blowing the instrument, this finely sensitized tone production presupposes the existence of a clear mental image of what is to be played in advance of the actual execution. This factor of aural imagery cannot be overemphasized.

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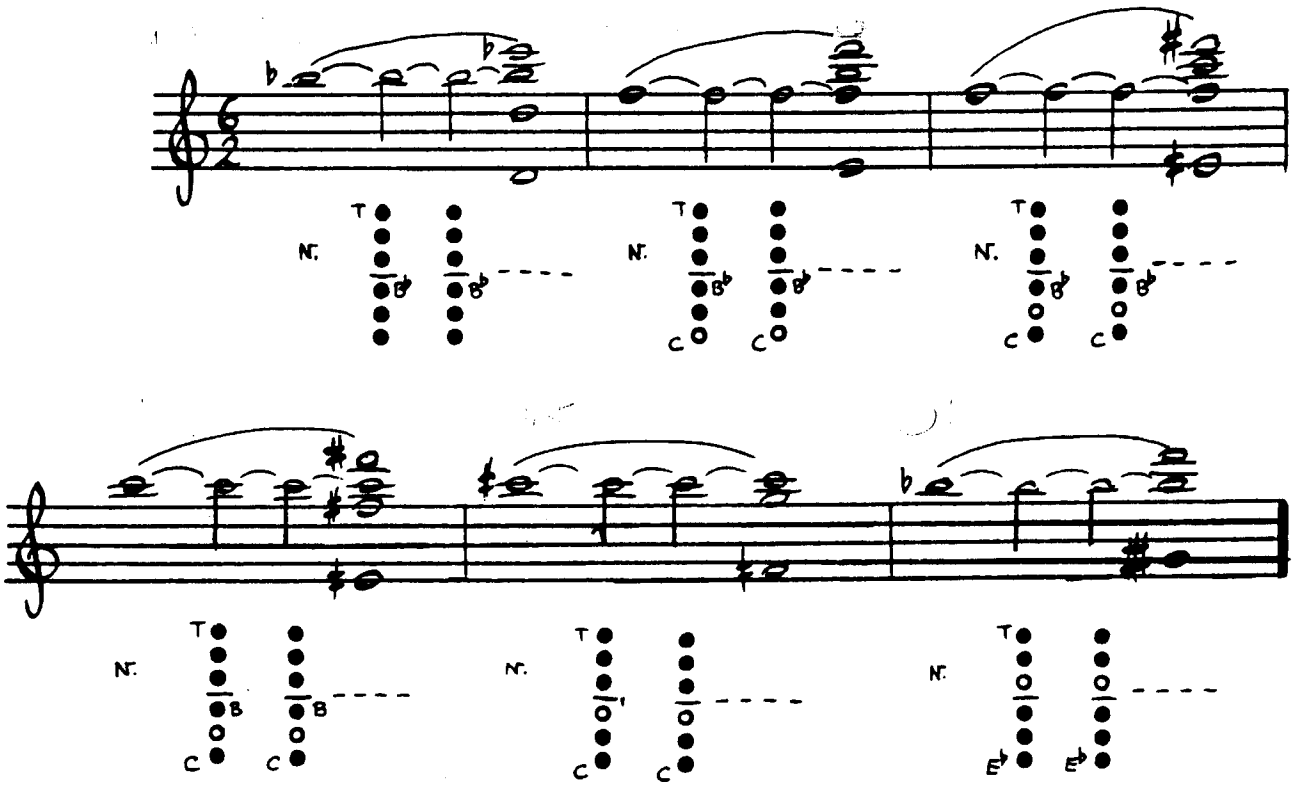
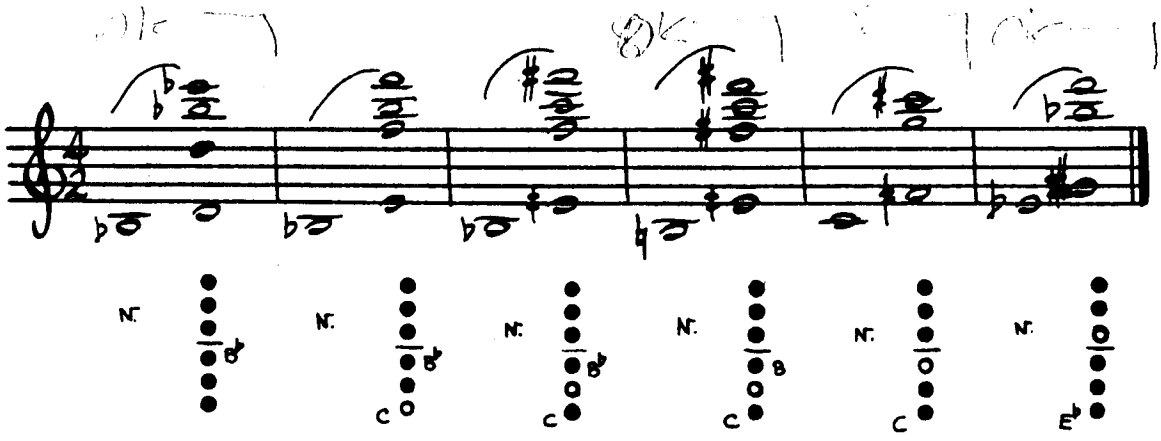
*For a comprehensive approach to overtone exercises, see Sigurd M. Rascher, *Top Tones for the Saxophone*, Carl Fischer Inc.

Use of Special Multiphonic Fingerings - Preliminary Exercises

1. Approaching multiphonics from second-register tones.

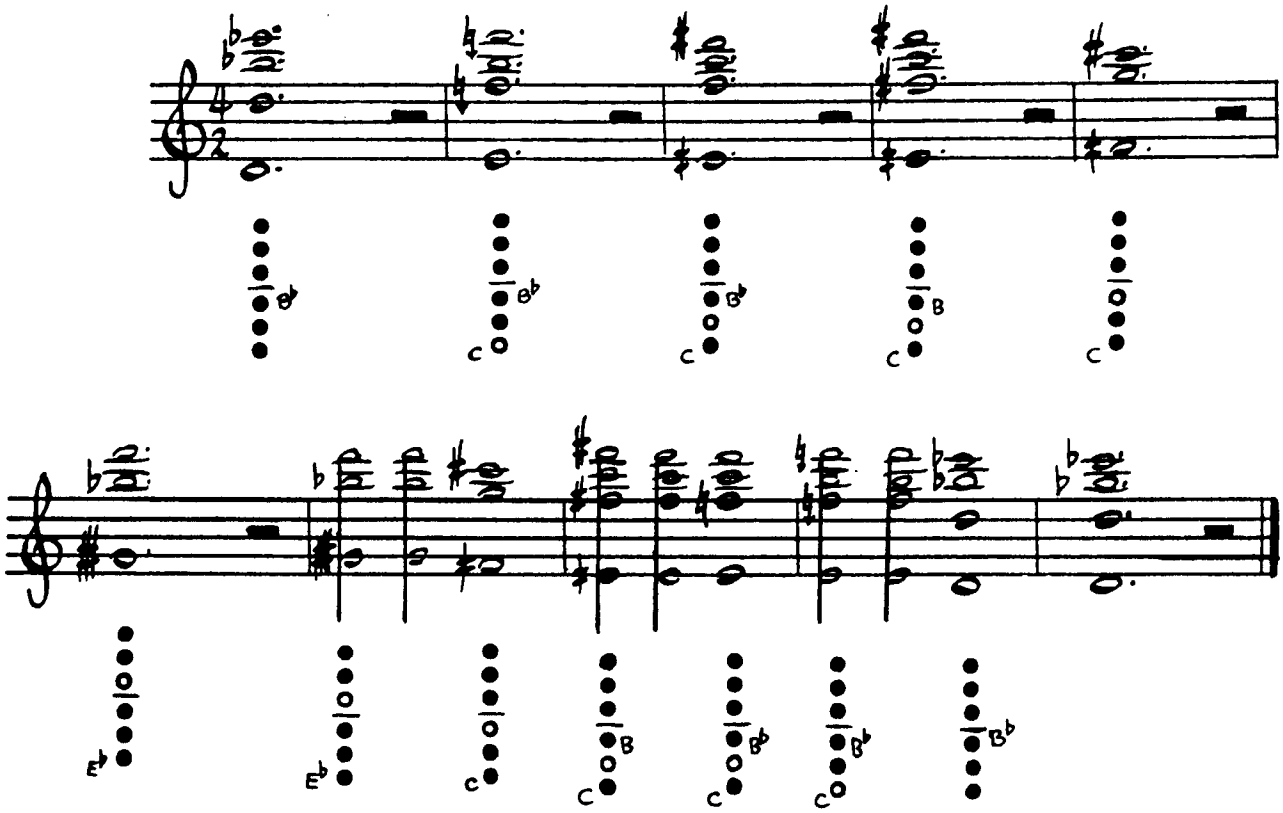


2. Approaching multiphonics from fundamental-register tones.

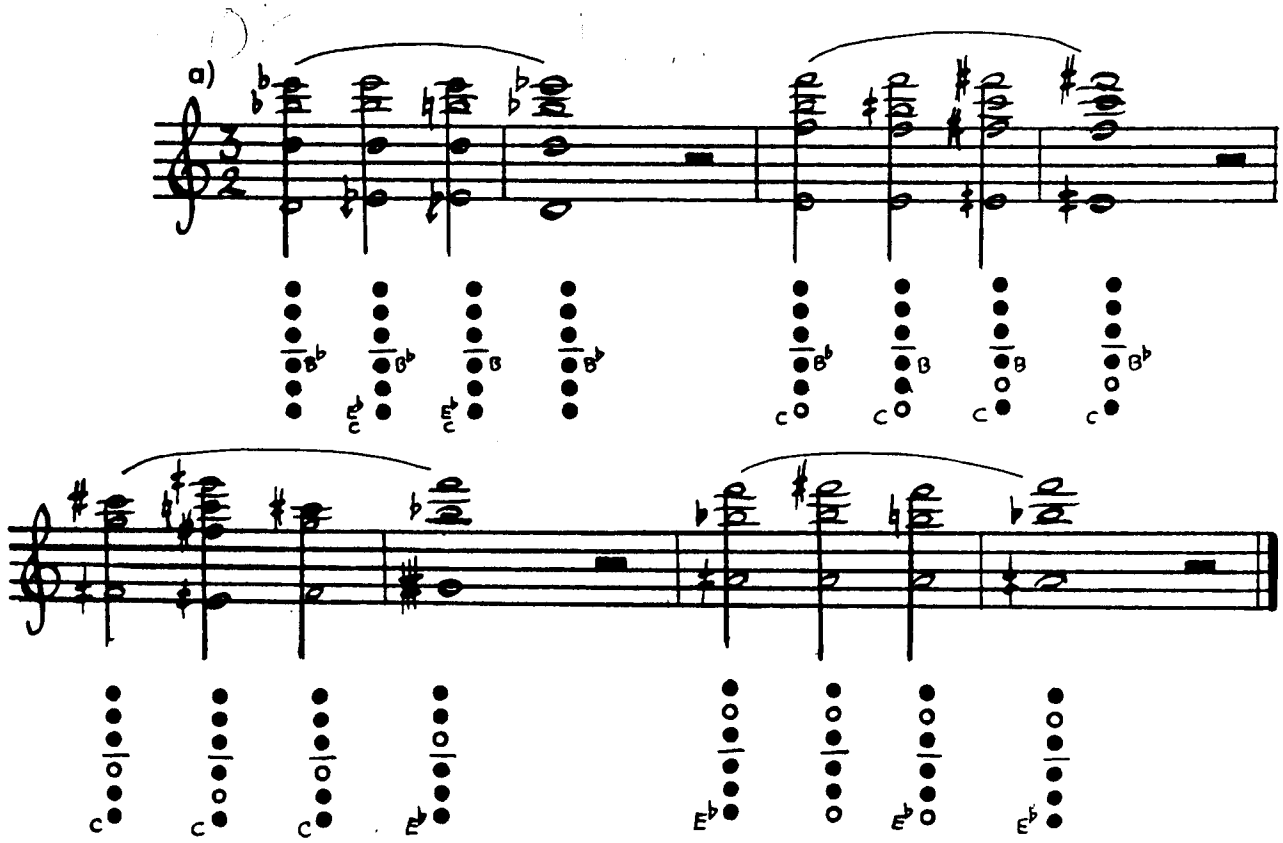


[N - Use normal or regular fingering]

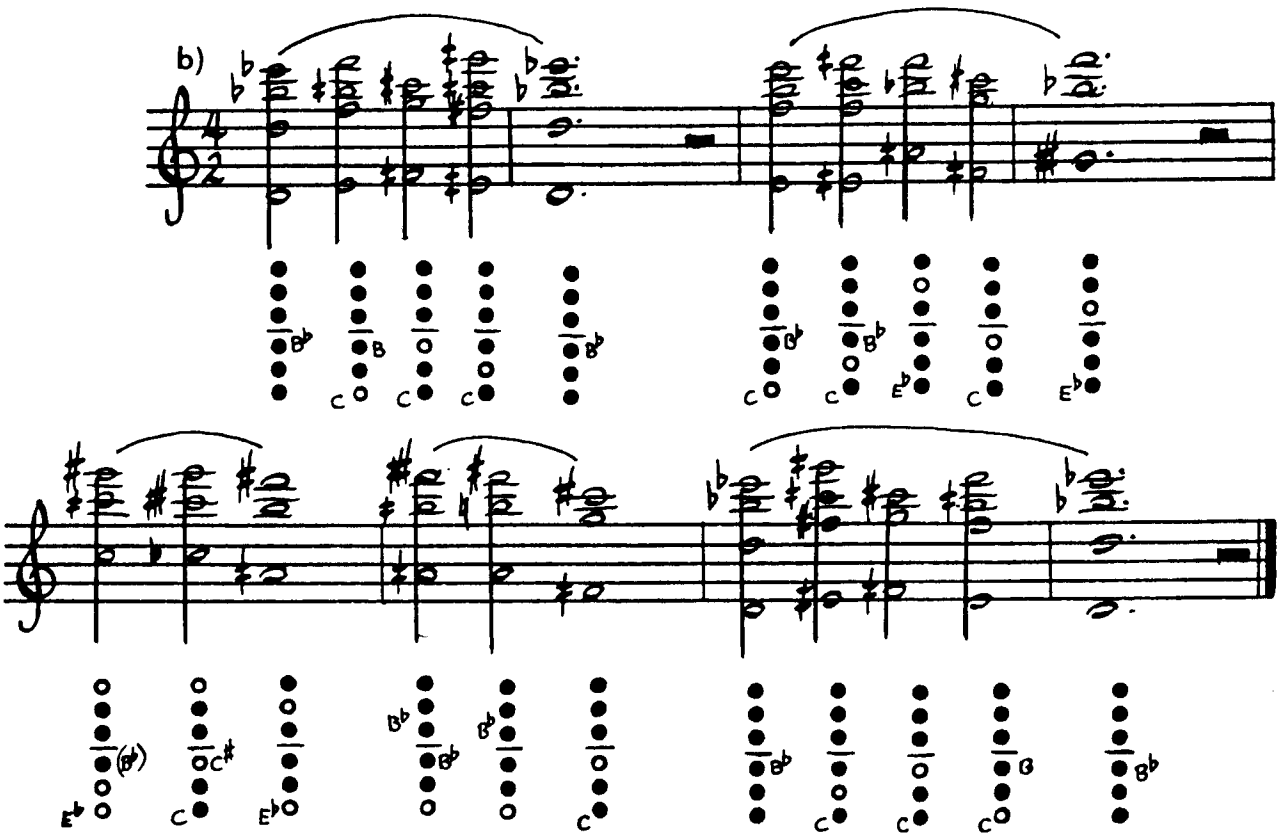
3. Attacking multiphonics directly.



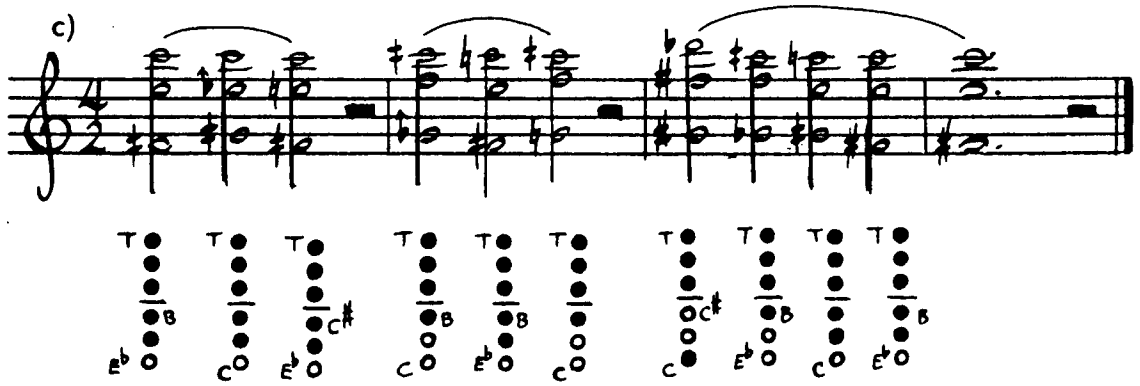
4. Connecting multiphonics.



b)

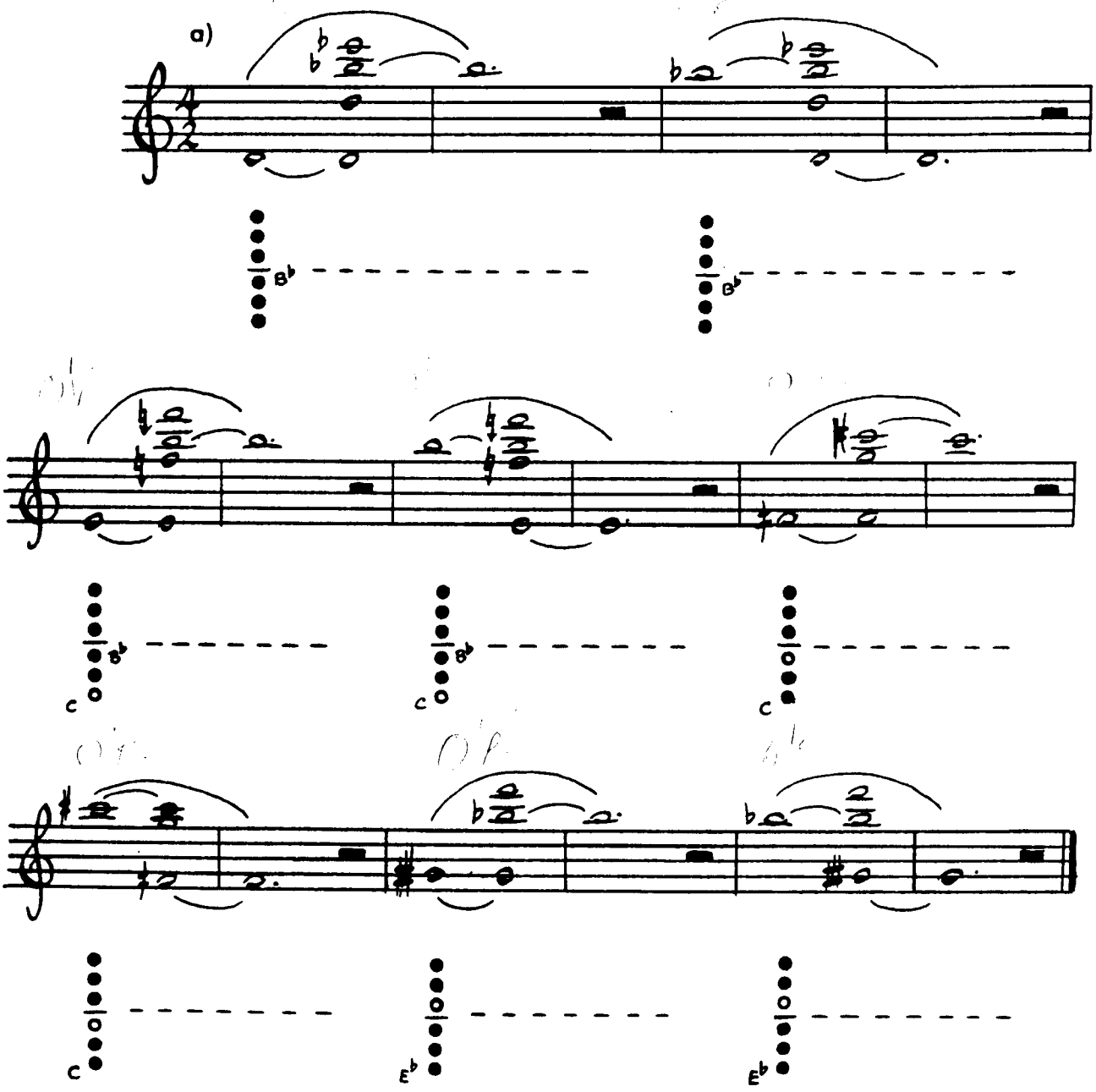


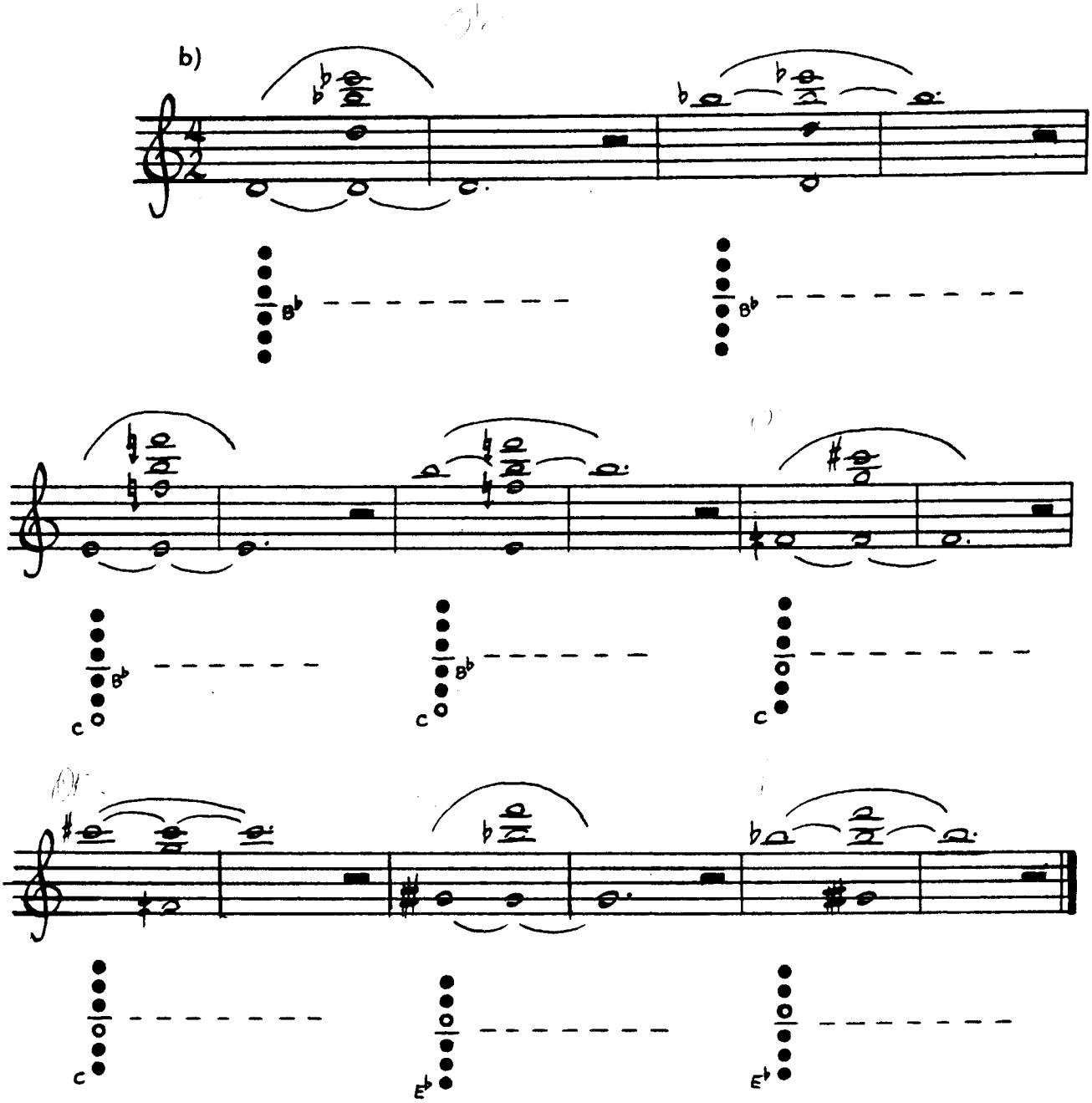
c)



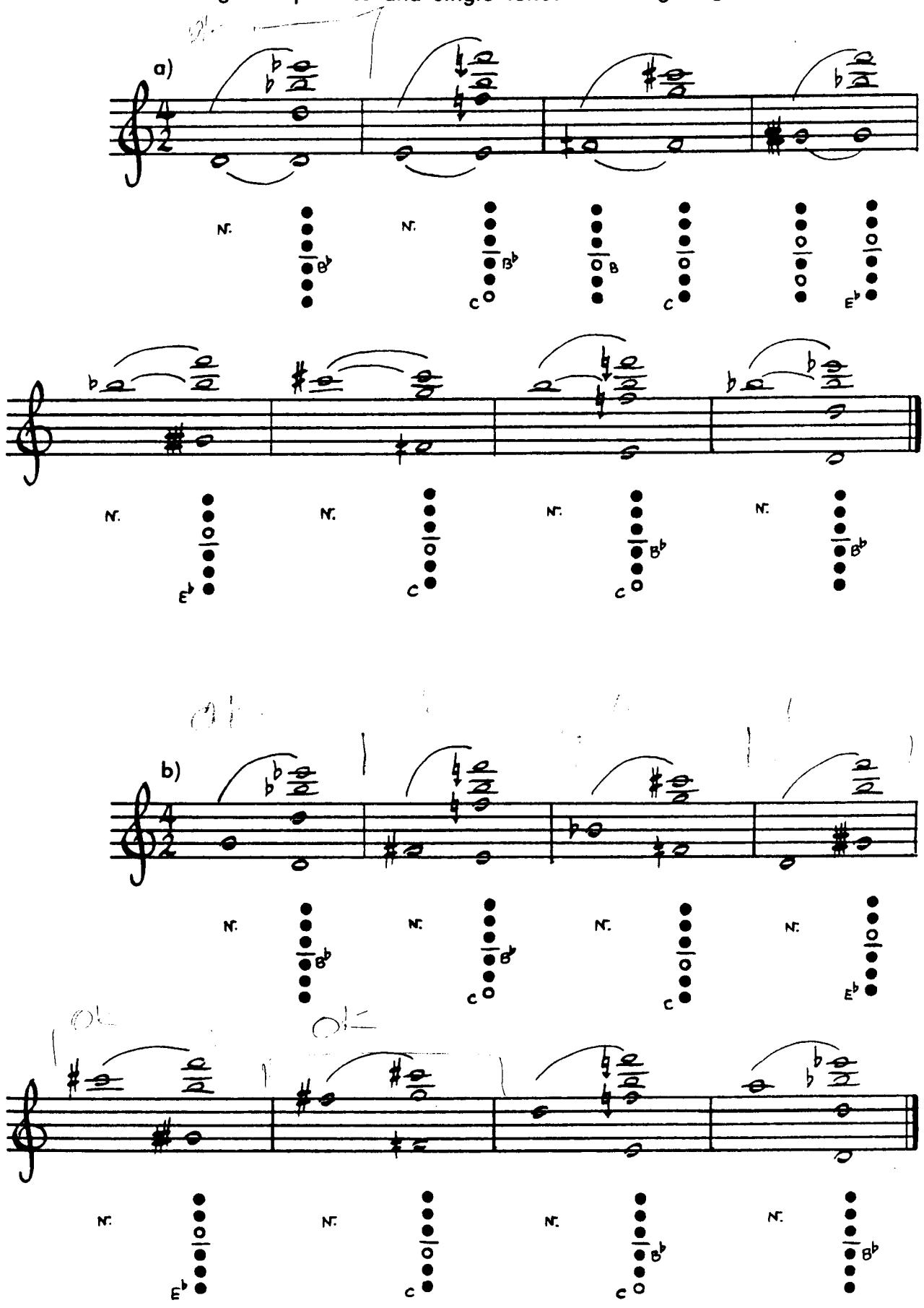
Preliminary Exercises in Linking Multiphonics and Single Tones

1. Linking multiphonics and single tones with no fingering change.




b)
B♭
B♭
C
B♭
C
C
C
E♭
E♭

2. Linking multiphonics and single tones with fingering change.



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Multiphonics—

III. - Singing while Playing

By producing tones with the voice in combination with normal playing on the saxophone, harmonic intervals as well as simultaneoous melodic lines can be performed. Singing while playing has been utilized extensively over the years by woodwind performers in the jazz idiom where a "growling tone," or "buzz tone" is often produced by singing an unspecified pitch while performing a melodic line on the instrument. Composers of music other than jazz have made use of this type of sound in the recent past, and occasionally the performer is even called upon to coordinate the production of tones of the instrument with specific tones produced by the voice.

The simultaneous production of tones in this manner is often difficult for the saxophonist who has done little or no experimenting with this technique. Typically, the most difficult hurdle is getting used to the feel of singing and blowing into the instrument at the same time. (The demand on the air stream is substantial, and correct breathing habits are essential.)*

The exercises which follow are intended to assist the saxophonist's earliest efforts in attempting to coordinate the voice and playing the instrument. Even prior to attempting these examples, the saxophonist might find it beneficial to improvise some vocal-coordination exercises such as producing isolated harmonic intervals, a succession of harmonic intervals where the voice holds a pedal tone against moving saxophone tones, or perhaps vocal manipulations (including portamento) while the saxophonoe holds a constant pedal. To expand material for practice beyond the exercises provided here, the saxophonist could vary these examples in different ways (*e.g.*, transposition) or create similar ones of his own.

Once the performer has achieved some initial success in coordinating the voice with his instrumental production, attention should be directed toward careful balancing of the two sources. In performing two melodies simultaneously in this manner, the most common difficulty is keeping the sung part loud enough and/or the played part soft enough to assure appropriate balance. Regarding the balancing of two parts, it might be advisable for the saxophonist to employ the aid of a tape recorder in practicing. Since he hears in part through bone conduction while he is playing, listening to a playback of himself might be most revealing.

Concerning the notation of the preliminary exercises as well as the "duet" sections in the etude section, all of the pitches, whether intended for the instrument or the voice, are transposed and written in the treble clef. Because of individual differences in vocal range and tessitura, it may be necessary or simply beneficial for the saxophonist to transpose the exercises and etudes entirely in order to accomodate his or her particular voice. (Use of different sizes of saxophones is another way of effecting upward or downward transposition.)

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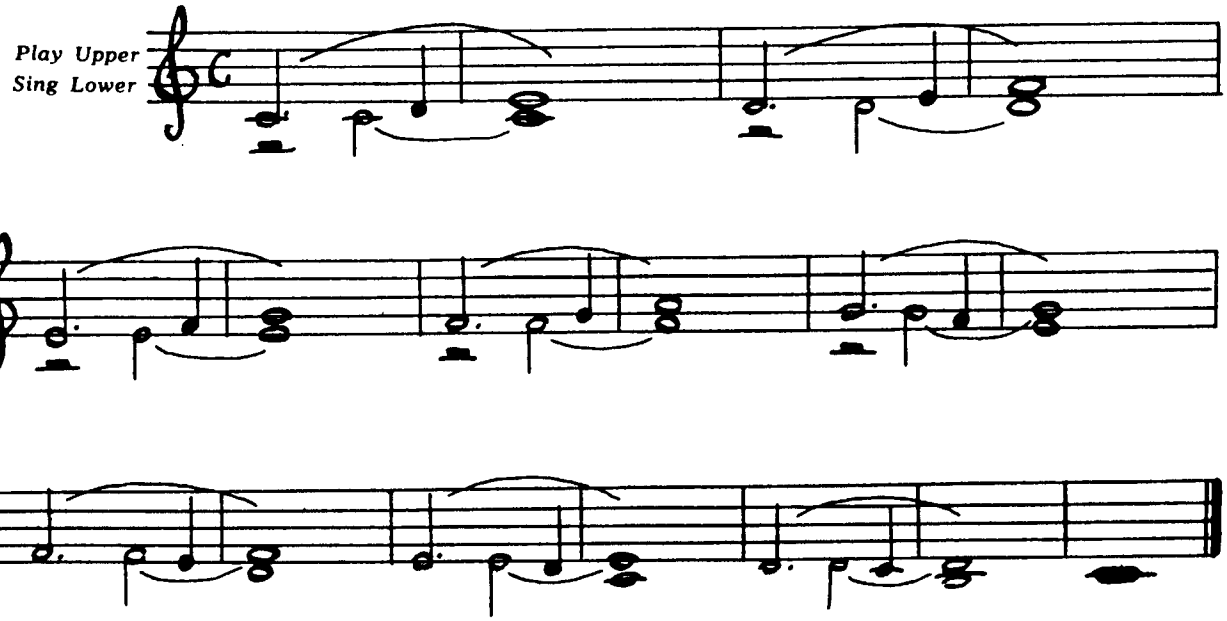
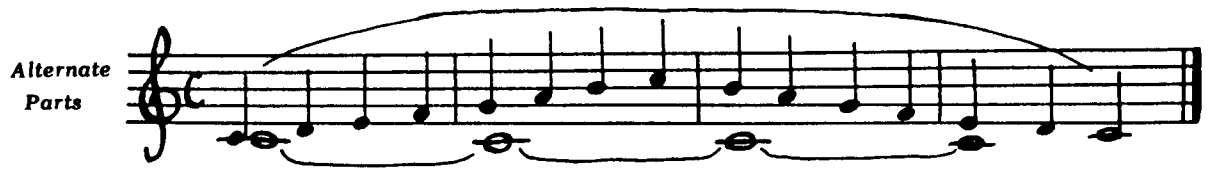
*Probably the larger sized saxophone used, the more difficult this technique will be due to the greater volume of air required.

Use of the Voice while Playing - Preliminary Exercises

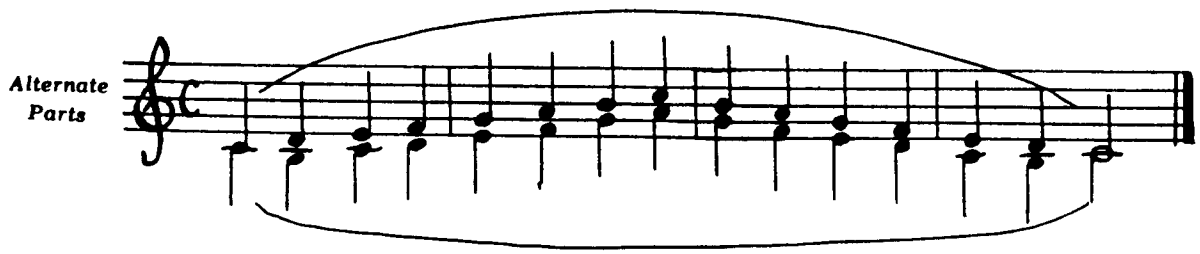
1. Matching Pitches.



2. Scale with Pedal (slowly, tune each interval).



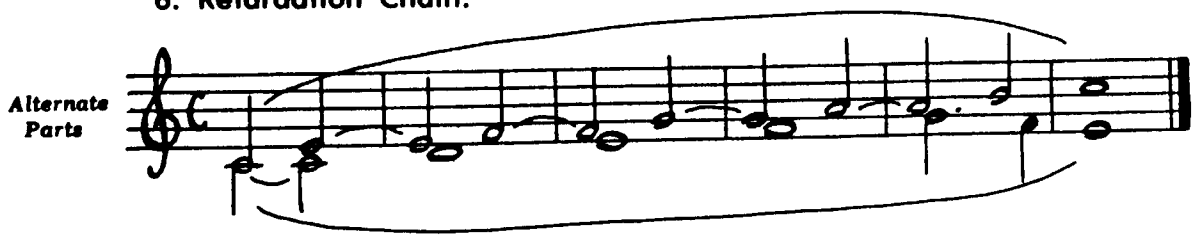
3. Scale in Parallel Thirds.



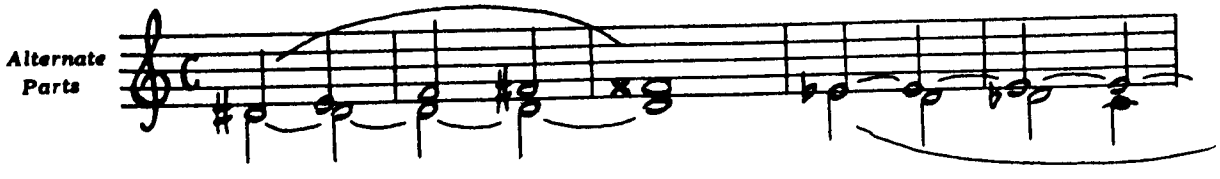
4. Scale in Thirds, Canonic Treatment.

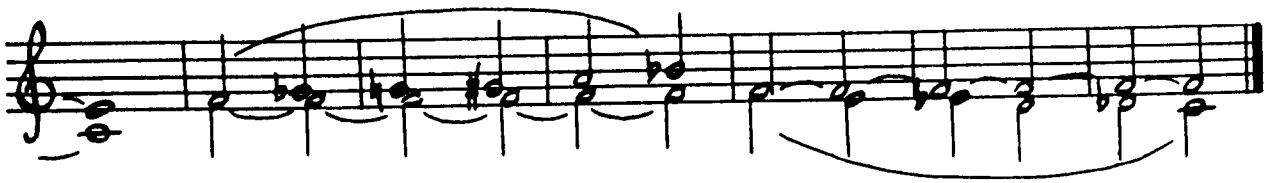
5. Suspension Chain.

6. Retardation Chain.

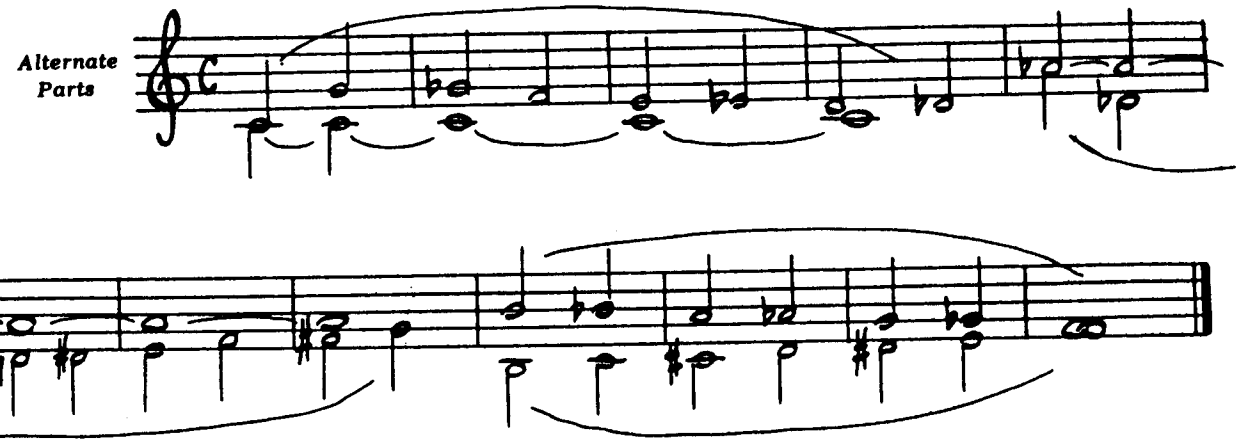


7. Expanding Intervals

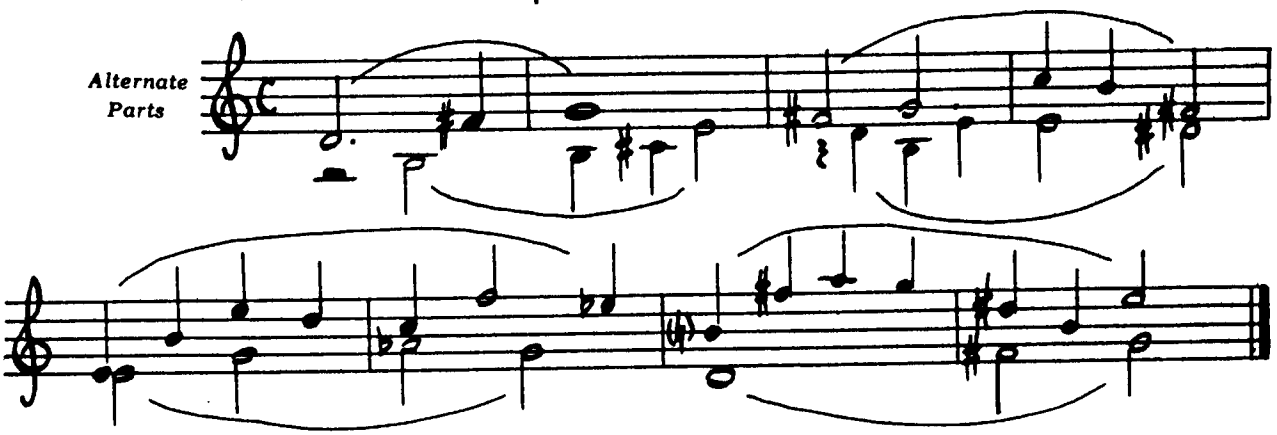




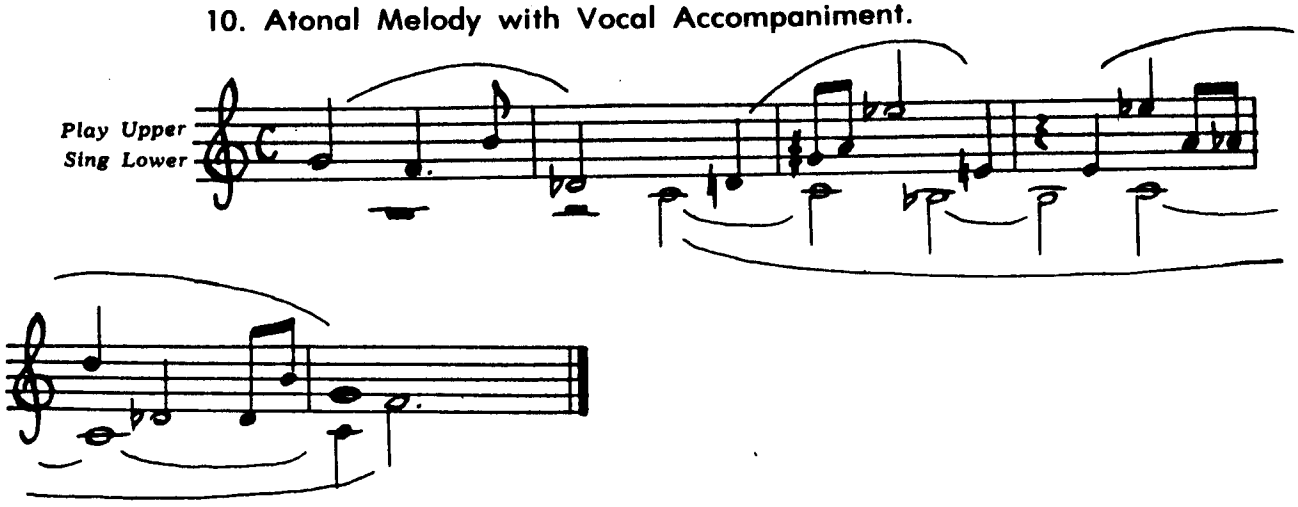
8. Contracting Intervals



9. More Melodic Leaps.

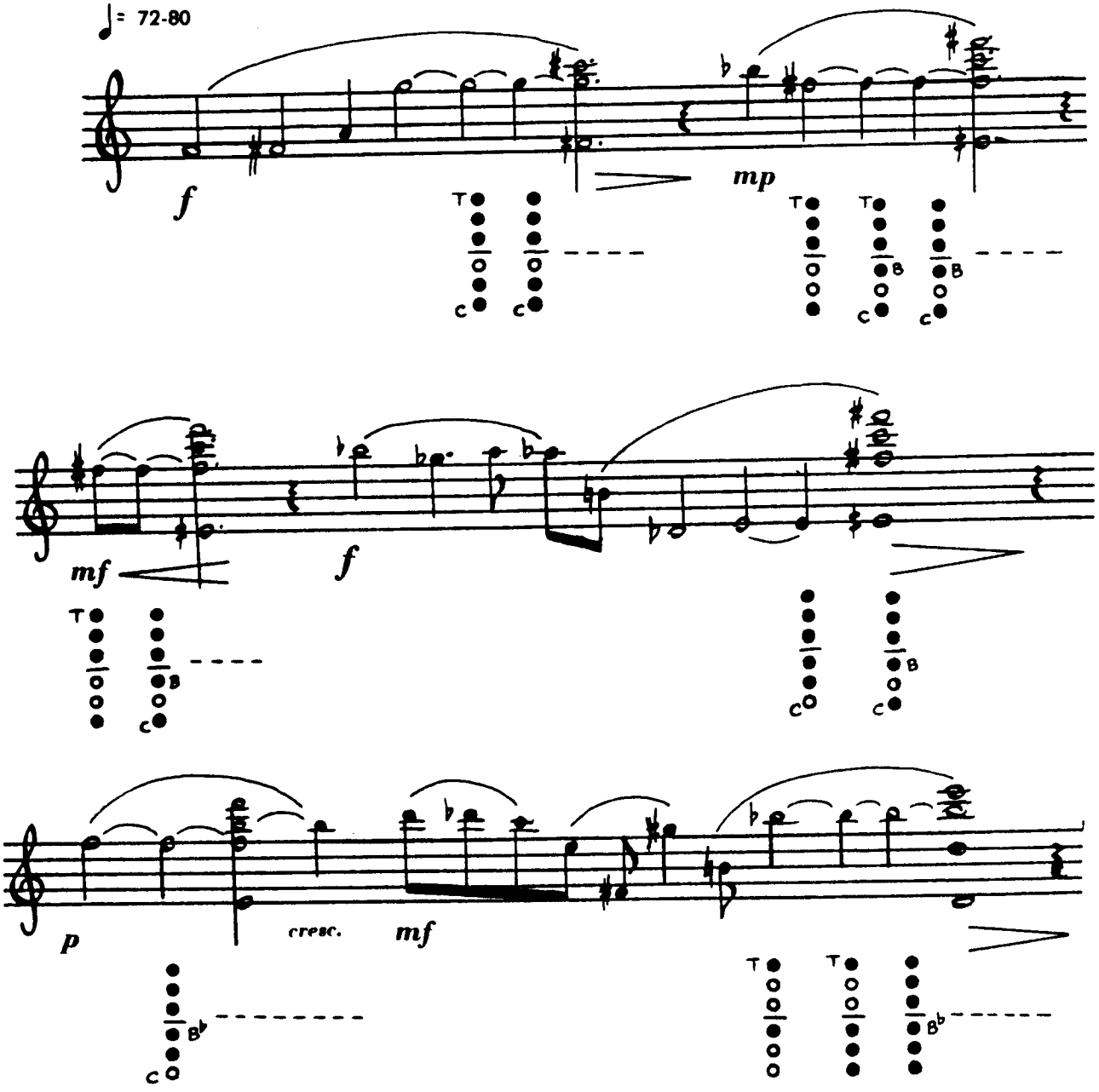


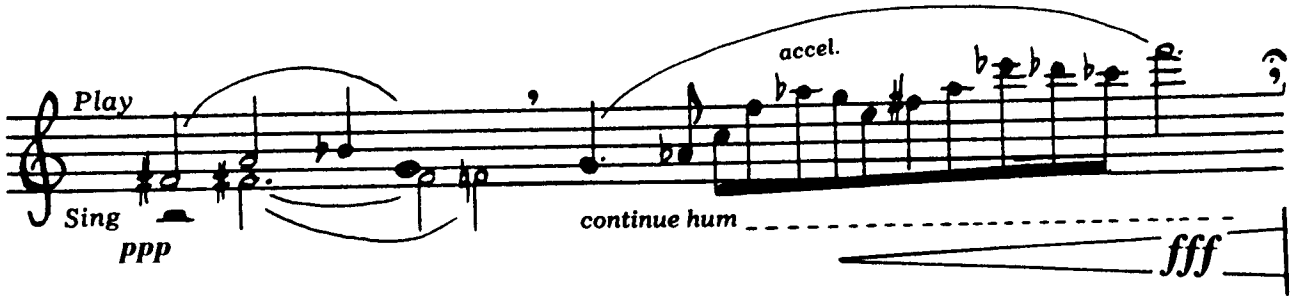
10. Atonal Melody with Vocal Accompaniment.

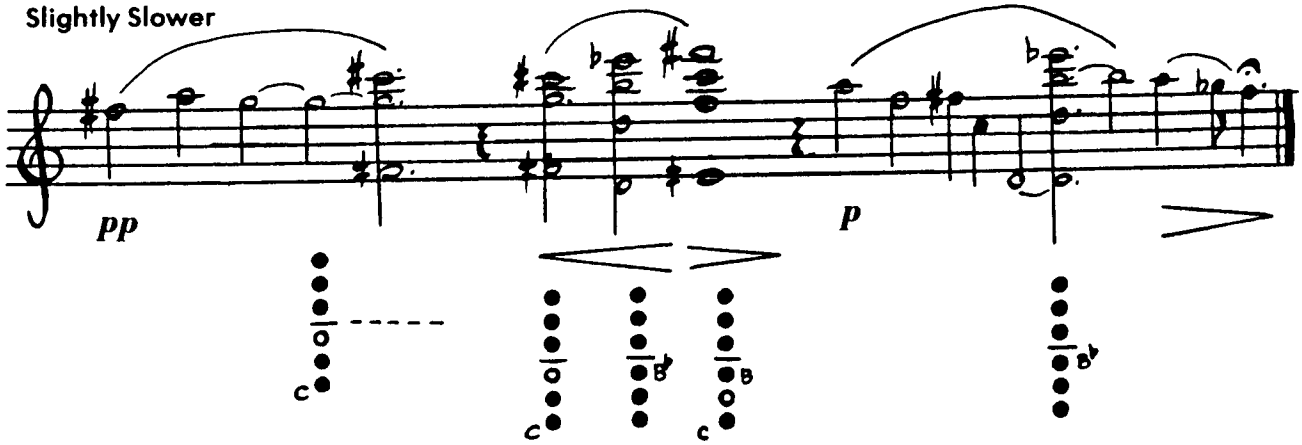


Multiphonic Etudes for Saxophone

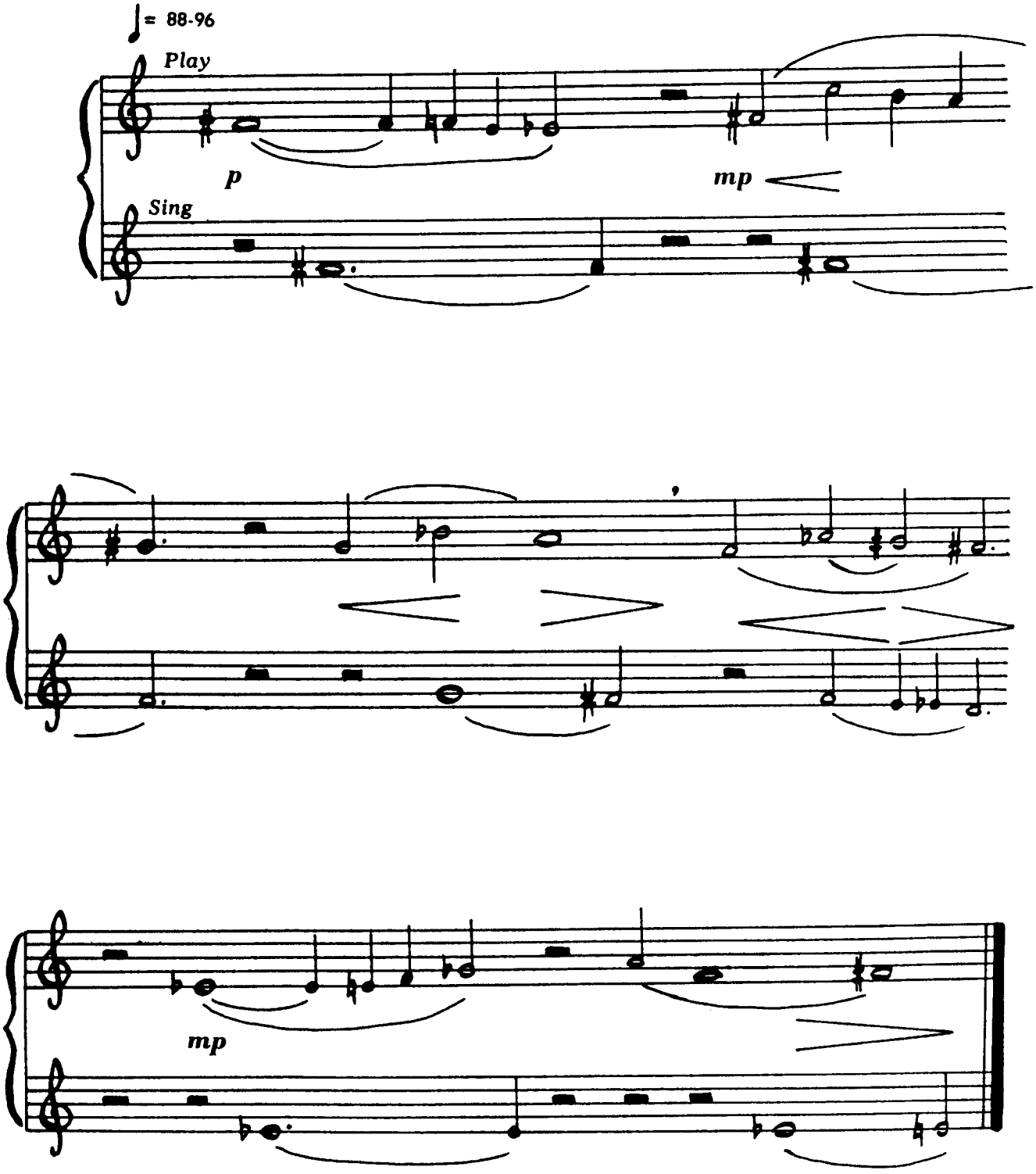
I



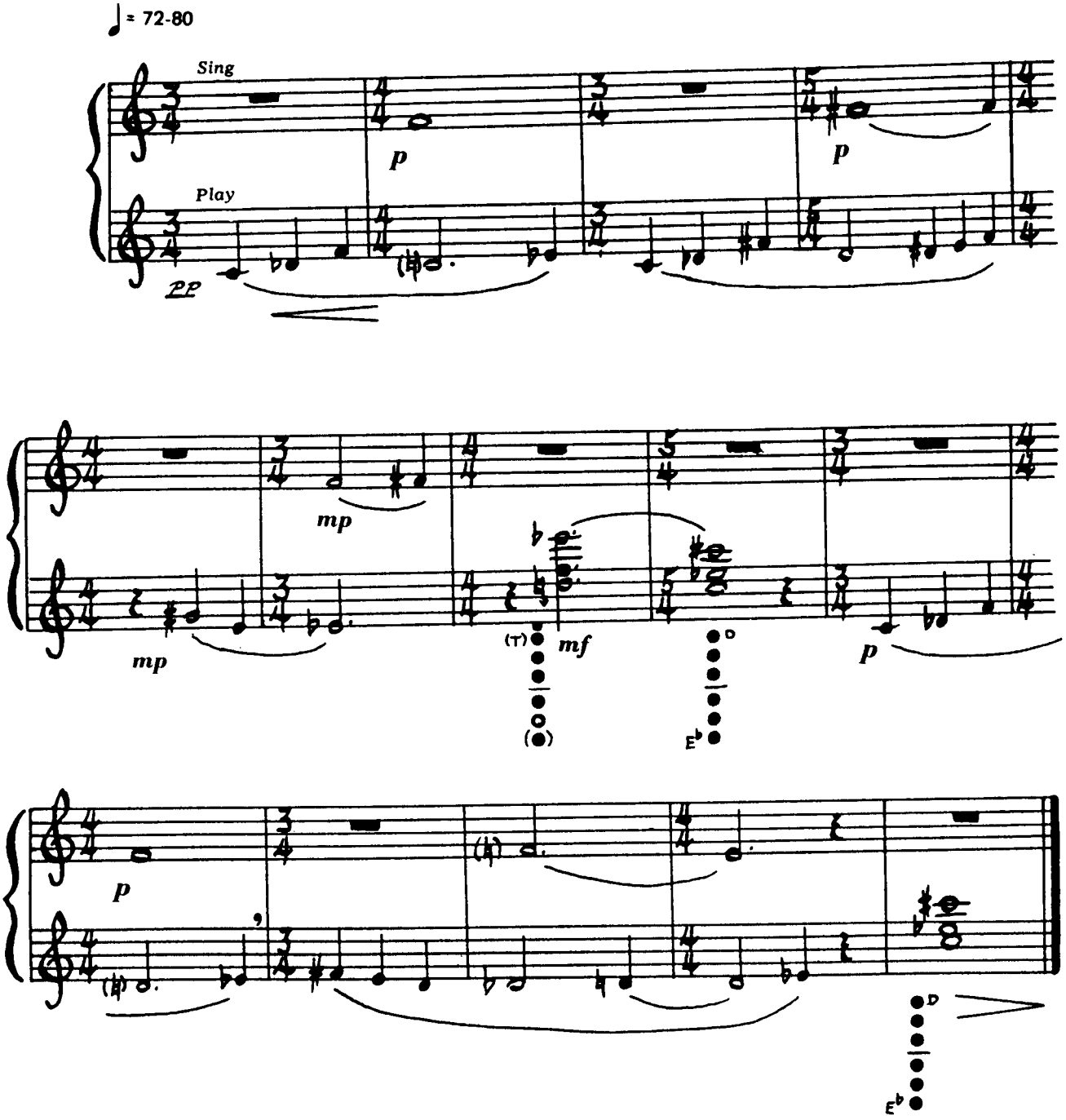

Play
Sing
ppp
accel.
continue hum
fff


Slightly Slower
pp
p

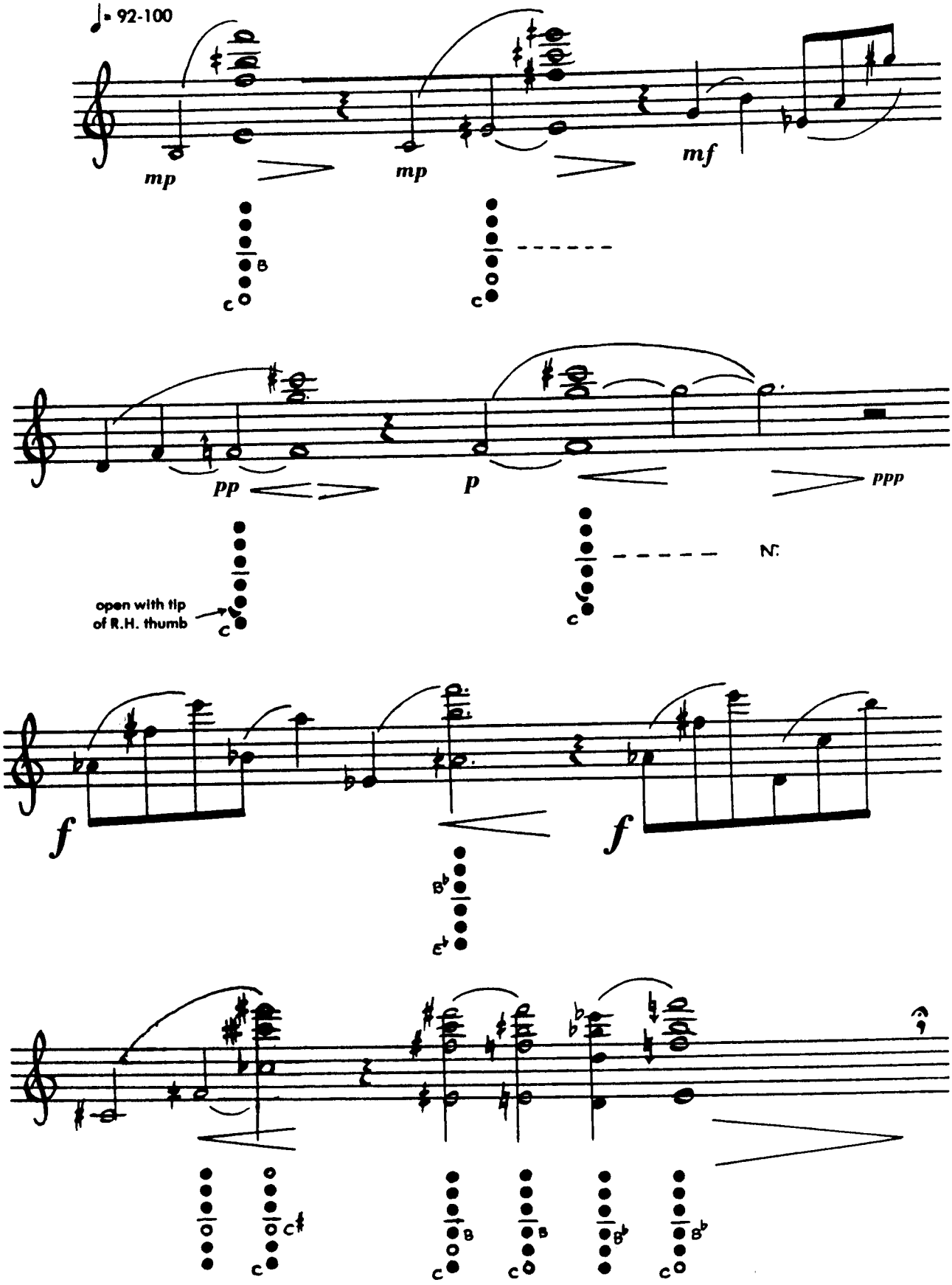
II

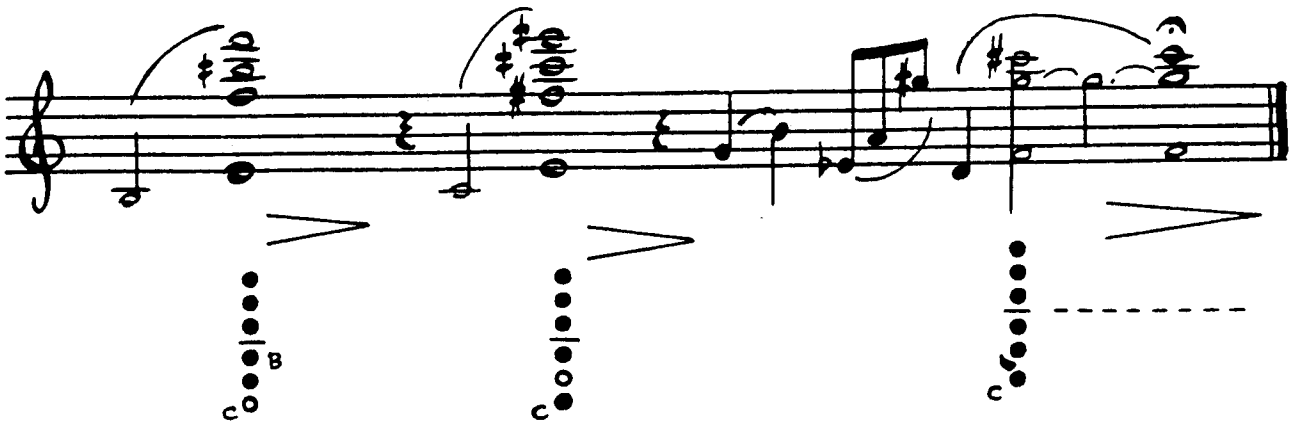


III

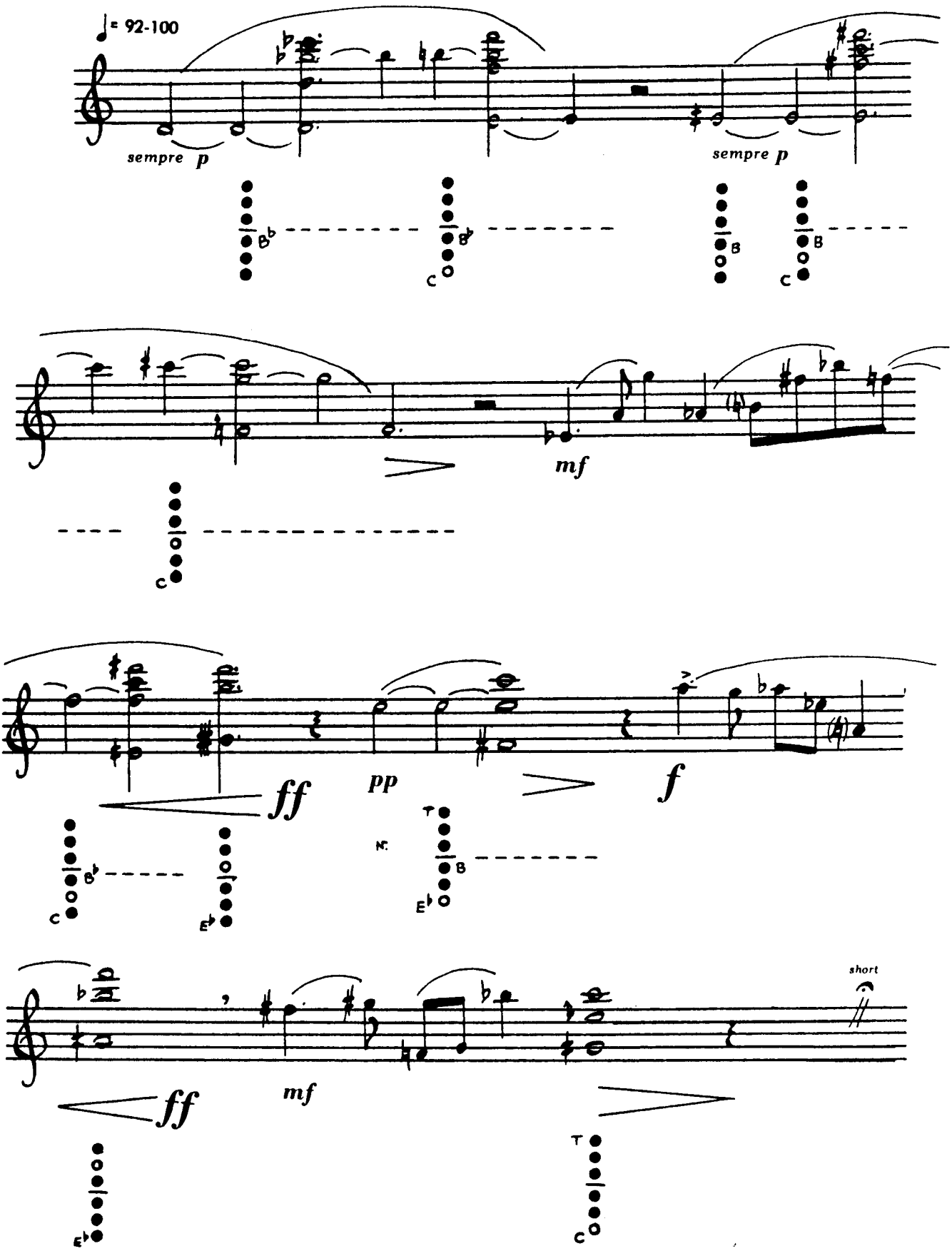


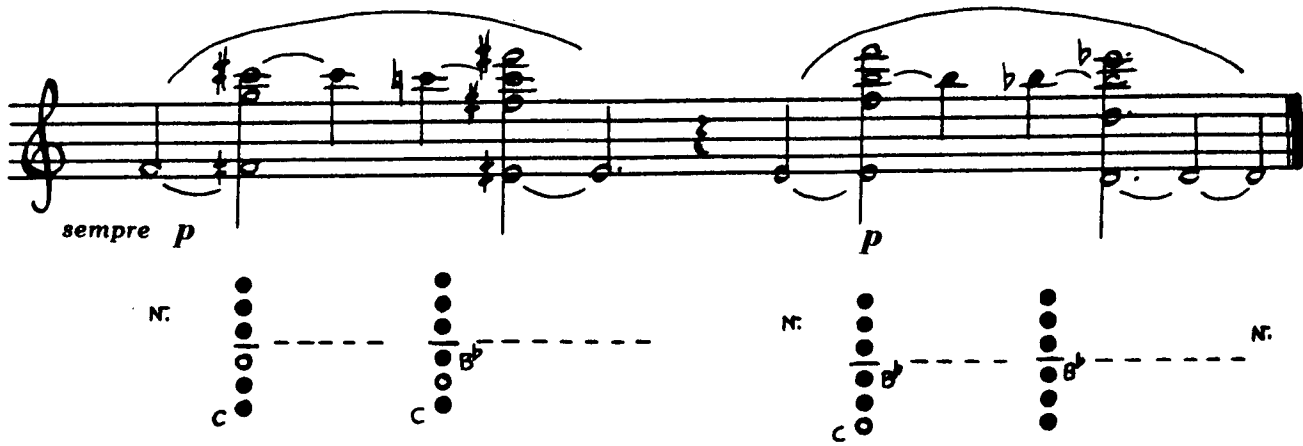
IV




B
C
C
C

V




sempre p
p
N:
C
B♭
C
N:
B♭
C
B♭
N:

VI