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QUINCUNX

VOLUME I

A COMPOSITION

WITH SUPPORTING ANALYTICAL DOCUMENT

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the degree of

DOCTOR OF MUSICAL ARTS

BY

PAUL STEINBERG

Norman, Oklahoma

1978

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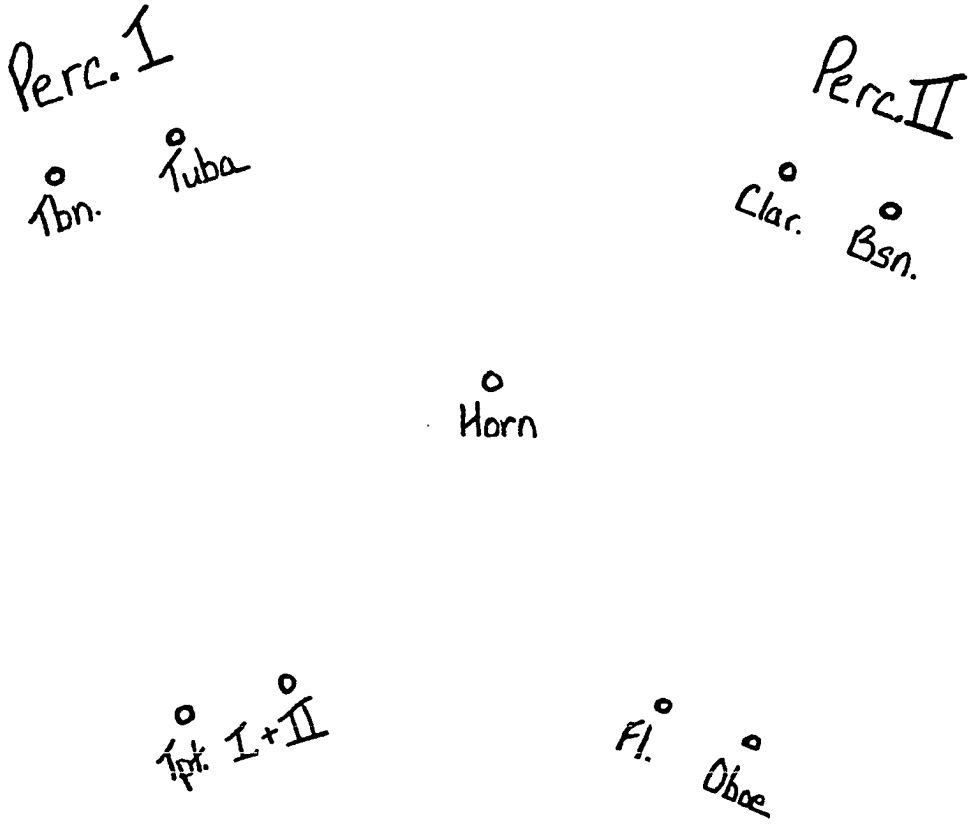
PREFACE

According to Webster's Third New International Dictionary, an arrangement of five objects with one at each corner and one in the middle is a quincunx. The physical arrangement of the instruments in this work is a double quincunx, diagrammed in Figure O.

Figure O Quincunx Stage Arrangement



QUINCUNX

CHAPTER I

PURPOSE OF THE STUDY

The purpose of this study is to compose a three-movement work for chamber ensemble. The work contains serial elements in combination with non-serialized materials. Each of the three movements is approximately five minutes in length. Some sections are unified by rhythmic elements which are jazz oriented.

The instrumentation is for woodwind and brass quintets with the addition of percussion. Since the horn is the one instrument common to both ensembles, only one horn performer is used. The use of brass, winds, and percussion allows experimentation with more extensive timbral combinations than those afforded by the single brass group, woodwind quintet, or percussion ensemble and fulfills this composer's penchant for coloristic effects. Another consideration is the exploration of instrumental doubling, increasing the timbral permutations possible for this number of players.

This study also investigates the construction of tone rows manipulated in a serial manner, combined, and juxtaposed

with non-serialized pitch materials. Both the serialized and non-serialized pitch materials are set into rhythmic structures influenced primarily by jazz rhythms.

Personal stylistic characteristics in this work include soloistic part-writing and complex rhythmic structures. Also incorporated into the larger structure is the order of tempo for the three movements into a fast-slow-fast grouping rather than this composer's traditional slow-fast-slow order. The realistic possibility for live performance in choice of instrumentation is also of major consideration in writing this work.

CHAPTER II

ANALYSIS

The analysis of Quincunx is achieved at macrocosmic and microcosmic levels with detailed subdivisions at the microcosmic level. On the macrocosmic level both instrumentation and large formal structure are discussed while the microcosmic level contains information concerning serialistic events, motivic structure, harmonic analysis, rhythmic analysis, sub-structures, and precise information regarding instrumentation where timbre is closely controlled.

The capital letters "X", "Y", and "Z" are used to indicate the three different rows in this work. The letter "O" refers to the original forms of the row, the letter "I" to the inverted forms of the row, the letter "R" to the retrograded forms of the row, and the letters "IR" to the inverted-retrograde forms of the row. Transposed versions of each of the forms of the rows are indicated by their beginning pitch name rather than a numbering system. For example, if row X, used in its inverted form on the beginning pitch of c# is discussed, it will be referred to in the text as row $X(I_{c\#})$.

Figure 1 Formal Diagram - Movement One

Level I	A											
Measure Numbers	1-60											
Level II	A											
Measure Numbers	1-60											
Level III	A#1					A#2		A#3	A#4			A#5
Measure Numbers	1-21					22-33		34-39	40-50			51-60
Level IV	A#1a	A#1b	A#1c	A#1d	A#1e	A#2a	A#2b	A#3	A#4a	A#4b	A#4c	A#5
Measure Numbers	1-4	5-8	8-12	13-16	17-21	22-27	28-33	34-39	40-44	44-47	47-50	51-60

Figure 1 Formal Diagram - Movement One (continued)

Level I	B					
Measure Numbers	61-158					
Level II	B		C	D		
Measure Numbers	61-107		108-123	123-158		
Level III	B#1	B#2	C	D#1	D#2	D#3
Measure Numbers	61-85	86-107	108-123	123-129	130-153	154-158
Level IV	B#1	B#2	C	D#1	D#2	D#3
Measure Numbers	61-85	86-107	108-123	123-129	130-153	154-158

Figure 1 Formal Diagram - Movement One (continued)

Level I	A'						
Measure Numbers	159-194						
Level II	A'						Coda
Measure Numbers	159-184						185-194
Level III	A'#1			A'#2			Coda
Measure Numbers	159-172			173-184			185-194
Level IV	A'#1a	A'#1b	A'#1c	A'#2a	A'#2b	A'#2c	Coda
Measure Numbers	159-166	167-170	171-172	173-178	179	180-184	185-194

MOVEMENT ONE

Macrocosm

Formally, Movement One may be considered a large ternary form, A B A', with the A and A' sections consisting primarily of motivic writing and the B section containing longer, more lyric lines. As may be noted in the formal diagram, Figure 1, the movement may be divided further into A B C D A' and Coda with still smaller subdivisions observable within each lettered section.

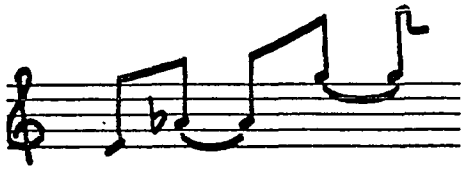
Instrumentation in Movement One includes flute, oboe, clarinet in B♭, horn in F, bassoon, two trumpets in B♭, trombone, tuba, and marimba. For most of the movement the woodwind quintet is contrasted with the brass quintet with the marimba serving as the fifth member of the brass group. In many cases the woodwinds are used in pairs or groups of three and are answered by brass in similar groupings.

Microcosm

Section A #1 (M. 1-21)

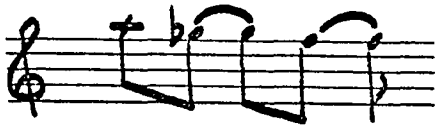
Movement One opens with non-serialized materials organized into a three-note angular motive, Example 1.1, hereafter referred to as Motive A.

Example 1.1 Motive A - Movement One



This motive is first stated by bassoon and flute and is constructed melodically of ascending intervals of a diminished fourth followed by a major seventh and rhythmically of a brief syncopated jazz figure. Against this the oboe and bassoon play motive A^1, Example 1.2, which is a transformation of motive A.

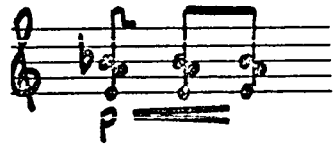
Example 1.2 Motive A^1



The clarinet solo beginning in measure 5 emphasizes the interval of a minor second, its inversion and octave displacement. Throughout the entire work, manipulation of the minor second interval plays an important structural part. The tuba and marimba statement of motive A^1 in measure 9 differs from the original of measure 2 in that the starting pitches are transposed down a whole step and the meter signatures in this statement are $\frac{4}{4}$, $\frac{3}{4}$, $\frac{4}{4}$, and $\frac{5}{8}$ as compared to $\frac{4}{4}$, $\frac{3}{4}$, $\frac{4}{4}$, and $\frac{3}{8}$ in the original statement. Major sevenths found in the first statement of motive A are deleted from the brass statement here.

The trumpet solo in measure 13 is again built on major sevenths and minor seconds. Motive A reappears in measures 14 and 15. Against this, in second trumpet, trombone, and tuba, is motive B, Example 1.3.

Example 1.3 Motive B

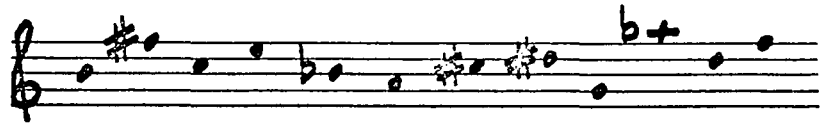


Measures 17 through 22 contain a transition section which is similar to the opening material but intervallically expanded and intertwined with motive B.

Section A #2 (M. 22-33)

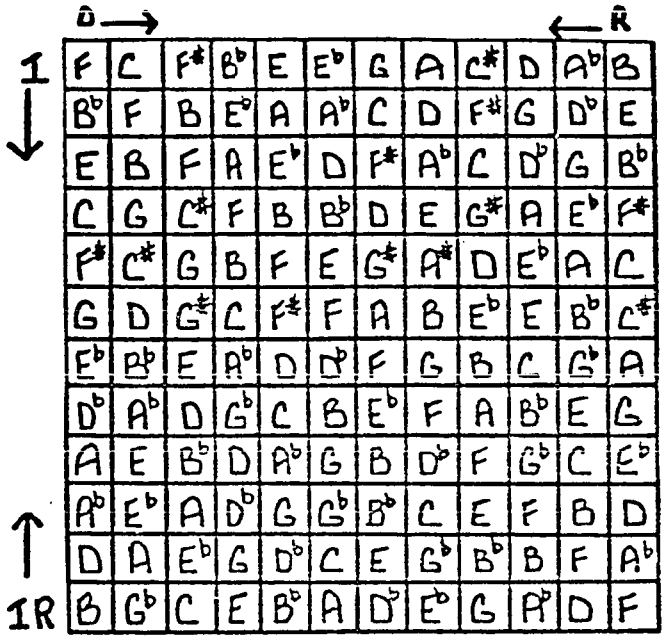
This portion of section A contains the first row material to be used in Movement One. It is found in measure 22 in the tuba, row $X(O_b)$, Example 1.4.

Example 1.4 Row X, Original



The matrix for row X follows in Figure 2.

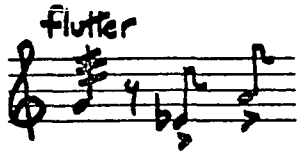
Figure 2 Matrix, Row X



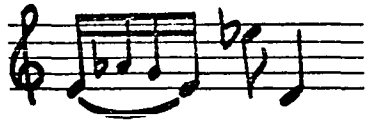
F	C	F♯	B♭	E	E♭	G	A	C♯	D	A♭	B
B♭	F	B	E♭	A	A♭	C	D	F♯	G	D♭	E
E	B	F	A	E♭	D	F♯	A♭	C	D♭	G	B♭
C	G	C♯	F	B	B♭	D	E	G♯	A	E♭	F♯
F♯	C♯	G	B	F	E	G♯	A♯	D	E♭	A	C
G	D	G♯	C	F♯	F	A	B	E♭	E	B♭	C♯
E♭	B♭	E	A♭	D	D♭	F	G	B	C	G♭	A
D♭	A♭	D	G♭	C	B	E♭	F	A	B♭	E	G
A	E	B♭	D	A♭	G	B	D♭	F	G♭	C	E♭
A♭	E♭	A	D♭	G	G♭	B♭	C	E	F	B	D
D	A	E♭	G	D♭	C	E	G♭	B♭	B	F	A♭
B	G♭	C	E	B♭	A	D♭	E♭	G	A♭	D	F

At measure 22, the row is rhythmically divided into a set of 4 + 3 + 3 + 2. This is followed by row $X(O_e)$ in the horn, divided 3 + 4 + 3 + 2, and in measure 26 by the oboe using row $X(I_a)$ divided as 3 + 3 + 4 + 2. Motive C, Example 1.5, motive D, Example 1.6, motive E, Example 1.7, and motive F, Example 1.8, are introduced against the rows at this point in this order: motive C at measures 21=22 in the clarinet, motive D at measures 22-23 in the flute, motive C at measures 24-25 in the trombone, motive D in inversion at measure 25 in the marimba, motive E in measure 25 in the first trumpet, motive F at measure 26 in the trombone, motive C at measure 26 in the second trumpet, and motive B at measure 27 in the trumpets and trombone.

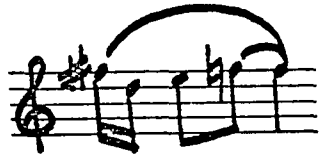
Example 1.5 Motive C



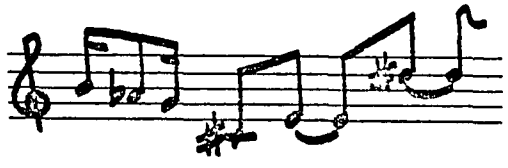
Example 1.6 Motive D



Example 1.7 Motive E



Example 1.8 Motive F



Measures 28-33 are essentially a repeat of measures 21-27. Row $X(O_b)$ is doubled by the trombone and clarinet, divided rhythmically into 4 + 3 + 3 + 2. Again, this is followed by row $X(O_e)$ doubled by flute and second trumpet and rhythmically divided into 3 + 4 + 3 + 2. The final statement of the row, however, rather than begin $X(I_a)$ is $X(I_f)$; rhythmically, it is 3 + 3 + 4 +2. The motives used against these

row forms are: motive E (measures 28-29) in the horn, motive D in inversion (measure 29) in oboe, motive C (measures 29-30) in the marimba, motive C (measures 30-31 in bassoon, motive B (measure 31) in trumpet, trombone, and tuba, motive D (measure 31) in clarinet, motive D (measures 31-32) in oboe, motive D expanded (measures 32-33) in flute, motive F (measures 32-33) in trombone, motive B (measure 33) in tuba.

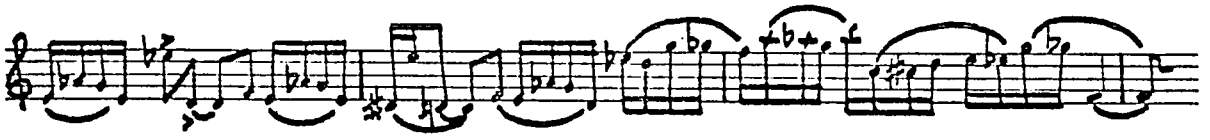
Section A #3 (M. 34-39)

This section, which acts as a transition, is based on a dialog among the clarinet, horn, and bassoon as the wind group and the trumpets and trombone as the brass group. The dialog materials are taken from motive B. Against this, motive A returns in the oboe doubled by tuba in measure 36 and further doubled by flute and marimba in measure 37.

Section A #4 (M. 40-50)

The next section begins in measure 40 with the clarinet and bassoon playing a rhythmically juxtaposed ostinato based on the interval of a minor seventh. Over this ostinato is a soloistic passage for oboe derived from motive D, Example 1.6. The expansion of this motive can be clearly seen in the following example taken from measures 42-44.

Example 1.9 Oboe passage, measures 42-44



In the anacrusis to measure 45 the flute starts the passage an octave higher while in measures 47-51, the clarinet plays the passage, extended chiefly through the use of sequence as can be seen in measure 49. As the flute begins the statement, the bassoon and clarinet end the ostinato, and the accompaniment returns to the row materials of the previous section, measures 22-33. Here, however, the rhythmic pattern is emphasized not just by accent, as in the previous section, but also by the transfer of instruments at the sub-divisions of the pattern. The rows can be traced beginning in measure 45 as: row $X(O_b)$ in the pattern 4 + 3 + 3 + 2 from trombone to horn to marimba to second trumpet. The next statement, row $X(O_e)$ in measures 46-47, 3 + 3 + 3 (diminuted) + 3, can be traced from tuba to trombone to marimba to horn. Row $X(O_a)$ follows in the pattern 4 + 3 + 2 +4 (diminuted), while the next row is $X(O_d)$ in measures 49-50 in 3 + 4 + 2 + 3 from horn to trombone to second trumpet to first trumpet. Simultaneously in measures 49-50 is row $X(I_e)$ in a 3 (diminuted) + 4 + 2 + 3 pattern. This section is essentially a showcase for the three

woodwinds playing the soloistic passages and leads into an instrumentally contrasting section of brass soloistic writing.

Section A #5 (M. 51-60)

The section beginning in measure 51 opens with a canon for trumpets and tuba with materials from motive F, Example 1.8, motive A, Example 1.1, and free contrapuntal writing. The accompanimental figuration found in marimba and trombone in measures 53-57 was first used in the bassoon and clarinet lines in measure 40. This section ends with a sequential passage in the trumpets and tuba in measures 58-60.

Section B (M. 61-107)

The next major section occurs at measure 61 with a basic change in pulse. Previously, the quarter or eighth note is used as the basic pulse; now it becomes the dotted quarter. The accompaniment here is based on motive B, Example 1.3. In measures 68, 73, 74, 80, and 82 this accompaniment pattern is interrupted by free melodic material in the marimba and bassoon. Over the accompaniment pattern and free melodic interruptions is a lyric horn solo in long note values with pitch materials from rows $X(R_b)$ in measures 64-76 and $X(IR_b)$ truncated, using the first ten notes of this row only, in measures 77-85. In measure 86 this solo, transposed up a perfect fifth to f#, is repeated by the first trumpet. Also at measure 86 the accompaniment changes to a canon between the marimba which enters at measure

86 and the clarinet which enters at measure 88. The canon is built on free melodic materials and uses many minor seconds and major sevenths, intervals which permeate the work as a whole.

The canon is interrupted in measure 97 by a statement of motive B in the woodwinds after which the canon continues in measure 98 with the clarinet leading and marimba following in measure 100. The section ends in measure 107 with the entry of muted trombone and second trumpet.

Section C (M. 108-123)

From the beginning of the movement through measure 107 the rhythm has been very strong and unrelenting. The purpose of the section beginning at measure 108 through measure 123 is to provide contrast to the unrelenting rhythmic drive of the previous sections and to somewhat obliterate the pulse. The melodic line in the flute is essentially lyric and is derived from free melodic materials stressing minor seconds and major sevenths as primary intervals contained within the line. The accompaniment is carried by muted second trumpet and trombone, both using straight mutes. Materials for the trumpet line are derived from the following sources: measures 108-112 from row $X(I_{bb})$, measures 112-115 from row $X(O_e)$, measures 116-119 from row $X(IR_b)$, measures 119-120 from row

$X(R_f)$ truncated, using only the first four pitches, and measure 121 from a melodic transformation of measure 120. Materials for the trombone line may be traced from these sources: measures 108-111 from row $X(O_b)$, measures 112-115 from row $X(I_f)$, measures 116-119 from row $X(R_{b\flat})$, measures 119-120 from row $X(IR_e)$, and measure 121 from free melodic material.

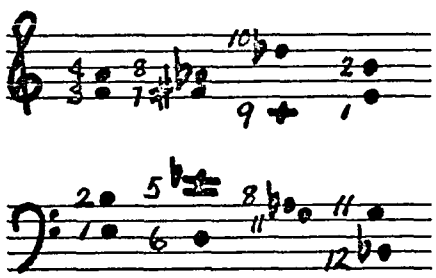
Rhythmic structure of both accompaniment lines is designed to obliterate the pulse and drive of previous sections. It may be noted that when the trumpet and trombone complete one row, they exchange rhythmic structures. The trumpet begins with a dotted quarter and an eighth note against a quarter-note triplet tied to a single quarter note in the trombone. In measure 112 as the new form of the row begins, the trumpet rhythmic pattern is a quarter-note triplet tied to a single quarter note, and the trombone figure is constructed of a dotted quarter and an eighth note. Rhythmic patterns reverse again in measures 116 and 120.

One further contrast present in this section as compared to previous sections is that the melodic material in measures 108-123 is free in nature and the accompaniment is serialized whereas in previous sections the melodic materials were serialized and the accompaniment free.

Section D (M. 123-158)

The section from measures 123-158 returns to a strong pulse and rhythmic drive. In measure 123 brass chords derived from row $X(O_e)$ elide the last note of the flute line from the previous section and serve as an introduction to the upcoming section, Example 1.10.

Example 1.10 Brass chords, measure 123



These chords, found throughout the remainder of the section, are used both as rhythmic accent, see measures 137-138, and as lyric interlude, see measures 145-146.

In measure 130 the bassoon and marimba begin a two-measure isorhythmic pattern in $\frac{4}{4}$ followed by $\frac{3}{4}$. This meter signature pattern is occasionally extended to $\frac{4}{4}$ followed by $\frac{4}{4}$, such as in measures 134-135 and 140-141. The pattern is also truncated at times to $\frac{4}{4}$ followed by $\frac{2}{4}$, as in measures 142-143. Melodic materials in this isorhythmic pattern are from row $X(IR_{f\#})$ which is repeated continually but is constantly rhythmically displaced by the isorhythmic pattern.

Against the isorhythmic pattern the brass play the first chord from Example 1.10, while the woodwinds play a group of

chords beginning in measure 136 which have no serial derivation. The woodwind chords show the following intervallic content when subjected to a Hanson analysis seen in Figure 3.

Figure 3 Hanson Analysis - Woodwind Chords, measures 136-139, 141-145, 148-152

measures 136-139				
1 pdt	2 nsd	3 mnd	4 pdt	5 nsd
measures 141-145				
1 pmd	2 nsd	3 mnd	4 mnd	
measures 148-152				
1 pdt	2 nsd	3 mnd	4 pdt	5 & 6 mnd nsd

The prevalence of minor seconds may be noted as an integral part of the chords. The analysis procedure shows that although the voicing in the first group, measures 136-139, and in the third group, measures 148-152, differs, the basic intervallic

structure is the same. Although not a feature of the Hanson analysis, it may also be noted that in contrast to the brass chords, the woodwind chords are noticeably less percussive than the brass.

The transition in measures 154-158 begins with a dialog based on motive D in the woodwinds which is interspersed with motive A^1 augmented. This technique lends an unstable quality to the section and leads back to the recapitulation section beginning in measure 159.

Section A' (M. 159-184)

Measures 159-166 are comparable to measures 1-4. In measure 159, however, the first trumpet and trombone begin motive A^1 with motive A entering in measure 161 in flute and oboe. The first trumpet and trombone continue motive A^1 as an accompaniment to motive A. Both of these entrances are transposed down a half-step from their original pitches at the beginning of the movement. The section is extended by statements of motive A imitatively beginning in measure 163 with second trumpet and tuba and in measure 164 in bassoon and clarinet on the pitches A and B♭ respectively. The section is closed by a marimba statement of motive A^1 on G in measure 165.

The next sub-section of the recapitulation, measures 167-170, may be compared to the clarinet solo in measures 5-

8. Rather than an exact repeat of the clarinet solo, however, the melodic line has been transformed and is played in dialog fashion by the trombone and oboe. The melody has also been rhythmically displaced with a rest at the beginning. The section is shorter than the first one because of the overlapping of motive A statements in measures 159-166.

The short transition section which follows in measures 171-172 is constructed from the chords of motive B; see Example 1.3. This transition section may be compared to measures 19-21.

In measures 173-184 all the materials from measures 22-60 are, essentially, condensed. Measures 173-178 contain the same materials as measures 22-33; row $X(O_c)$ is doubled in bassoon and tuba in measures 173-174 with a rhythmic pattern of 4 + 3 + 3 + 2. Row $X(O_{f\#})$ is stated in measures 175-177 in clarinet and first trumpet in a 3 + 4 + 3 + 2 pattern. Measures 177-178 contain row $X(I_{b\flat})$ in the marimba in a pattern of 3 + 3 + 4 + 2. Played against the above row forms are the following motives: motive C in second trumpet in measures 174-175, motive E in horn in measure 176, motive C in tuba in measure 177, and motive D in bassoon in measure 178.

In measure 179 the above materials are interrupted by a one-measure duet in oboe and second trumpet, which is comparable to measure 52 transposed up a half-step. In measure

180 the row forms against motivic materials are resumed, reminiscent of the pointillistic row treatment found in measures 45-50. Row materials in measures 180-184 may be traced as follows: row $X(O_{ab})$ in measures 180-181 in the pattern 3 + 3 + 2 +4 in first trumpet and bassoon, to trombone and oboe, to tuba and horn, to second trumpet and flute; row $X(O_{c\#})$ in measures 181-183 in the pattern 3 + 2 + 3 + 2 + 2 in horn and marimba, to first trumpet and bassoon, to trombone and oboe, to horn and marimba, to both trumpets; row $X(I_{f\#})$ in measures 183-185 in the pattern 3 + 3 + 4 + 2 in bassoon and tuba, to oboe and horn, to tuba and marimba, to oboe and horn.

Against these rows are motive C in measure 180 in marimba and motive B in measure 181 in trombone. In measures 182-184, also used against the rows, are a soloistic passage in flute and clarinet which is analogous to measures 42-44, a marimba accompaniment motive in measure 183 which may be compared to measures 40-44, and motive B in measure 184 in both trumpets and trombone. The end of the final statement of row $X(I_{f\#})$ in measure 185 elides to the coda.

Coda (M. 185-194)

The movement is concluded with a coda. The materials are freely derived and melodically have no connection with preceding materials. Rhythmically, however, the drive and

syncopation found in the coda is similar to much of the rest of the movement.

Beginning in measure 185, the trombone and tuba reiterate a B pedal above which is a melodic hexachord comprosed of the pitches A-C-B♭-D-C-F. This hexachord is rhythmically broken, syncopated across the bar line, and built up in a terraced fashion with the values finally augmented. The following Hanson intervallic structure is heard in the final chord in measure 193: $p^3\ m^4\ n^4\ s^4\ d^5\ t$. The dissonance present in this chord, five minor seconds and four major seconds, gives a final vertical emphasis to what has been predominantly a linear unfolding of the primary intervallic contant of the movement.

MOVEMENT TWO

Macrocosm

The composer's purpose in this movement is one of extreme contrast to the first movement. In Movement One, very direct, strong pulse and rhythmic structures are present; in Movement Two, pulse and rhythmic figures are written with obscurity as a goal. Pulse is subservient to the floating quality of the rhythmic figuration. While the first movement is noted for contrapuntal writing with little homophony, the second movement is characterized by chordal writing.

Major changes in the instrumentation in this movement include the addition of mutes to all the brass, substitution of vibraphone for marimba, and addition of cymbals, temple blocks, and bongos to the percussion ensemble. Three of the woodwind performers double: flute becomes alto flute at measure 19, English horn is used rather than oboe, and bass clarinet substitutes for clarinet. Brass and woodwinds are mixed in groupings much more in this movement than in Movement One. In Movement One brass and woodwind groups are pitted against each other, whereas in Movement Two, all instruments are blended to make more homogeneous and unique timbres. For example, see the chordal structures in measures 1-10.

Formal aspects of Movement Two are more dependent on perpetual variation since this movement is almost totally derived from row Y. In the first movement sections changed abruptly for the most part; in this movement section changes are not as distinct.

Formal structure as diagrammed in Figure 4 is divided into six large sections with subdivisions indicated on the second level of the diagram.

Figure 4 Formal Diagram - Movement Two

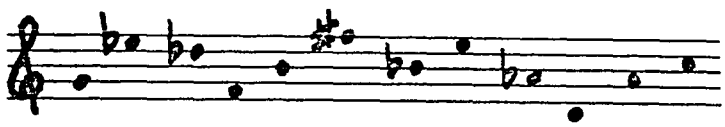
Level I	A		B			C	D			E	F
Measure Numbers	1-16		17-28			29-36	37-52			52-64	65-72
Level II	A#1	A#2	B#1	B#2	B#3	C	D#1	D#2	D#3	E	F
Measure Numbers	1-9	10-16	17-18	19-25	25-28	29-36	37-43	43-48	48-52	52-64	65-72

Microcosm

Section A (M. 1-16)

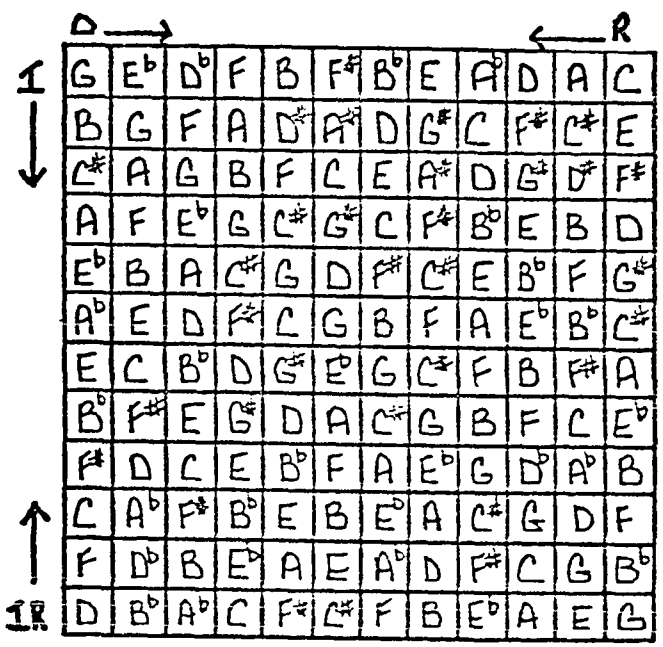
In contrast to Movement One which used both dodecaphonic and non-serialized pitch materials, Movement Two is almost entirely based on row Y, Example 2.1.

Example 2.1 Row Y, Original



The matrix for row Y follows in Figure 5.

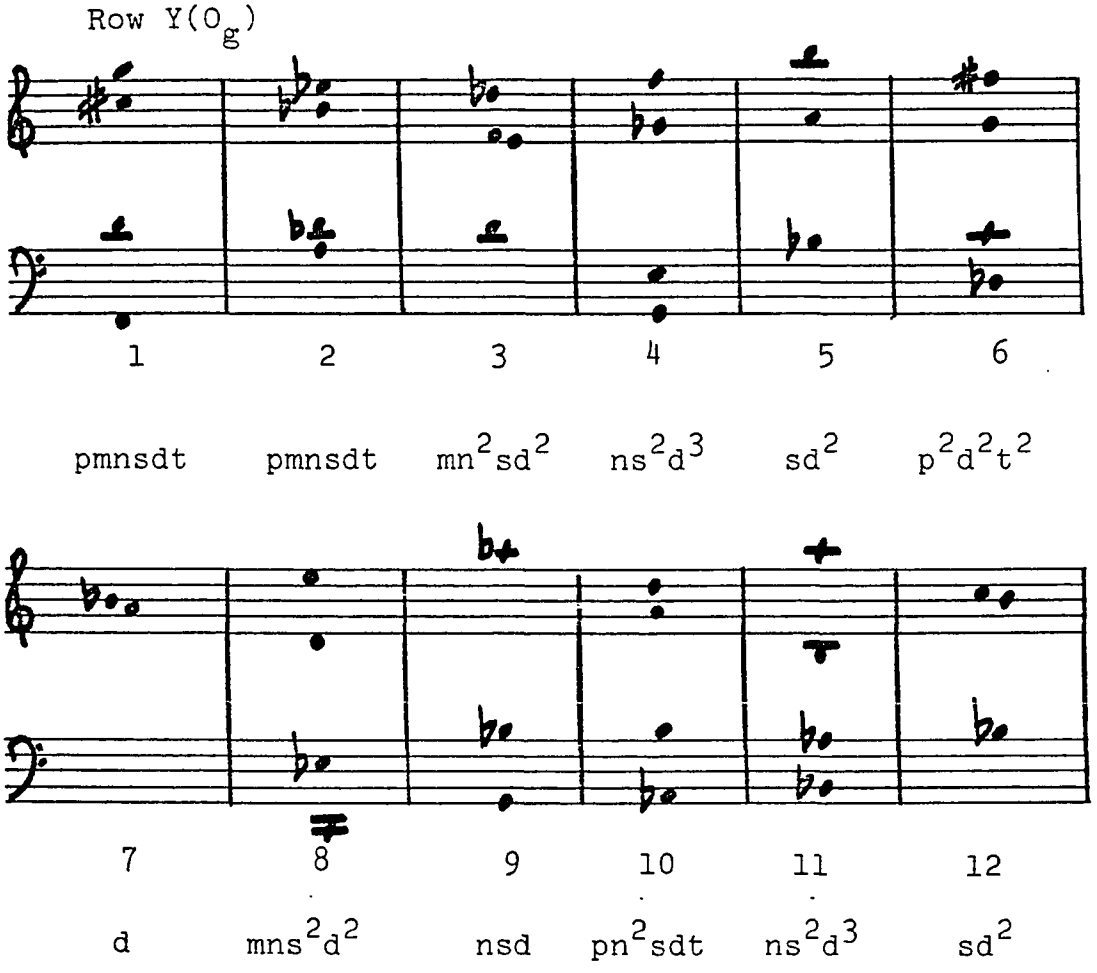
Figure 5 Matrix, Row Y



G	E♭	D♭	F	B	F♯	B♭	E	A♭	D	A	C
B	G	F	A	D♯	A♯	D	G♯	C	F♯	C♯	E
C♯	A	G	B	F	C	E	A♯	D	G♯	D♯	F♯
A	F	E♭	G	C♯	G♯	C	F♯	B♭	E	B	D
E♭	B	A	C♯	G	D	F♯	C♯	E	B♭	F	G♯
A♭	E	D	F♯	C	G	B	F	A	E♭	B♭	C♯
E	C	B♭	D	G♯	E♭	G	C♯	F	B	F♯	A
B♭	F♯	E	G♯	D	A	C♯	G	B	F	C	E♭
F♯	D	C	E	B♭	F	A	E♭	G	D♭	A♭	B
C	A♭	F♯	B♭	E	B	E♭	A	C♯	G	D	F
F	D♭	B	E♭	A	E	A♭	D	F♯	C	G	B♭
D	B♭	A♭	C	F♯	C♯	F	B	E♭	A	E	G

Movement Two begins with a series of chords, Example 2.2, built on row $Y(O_g)$ with the row used as the soprano note in the progression. Other chord members are freely invented; a Hanson intervallic analysis of this progression is shown with the example. All chords in the progression contain at least one minor second interval.

Example 2.2 Movement Two, Opening Chords



The chord progression in Example 2.2 acts as an introduction to the primary melodic line of the section which begins in the English horn in measure 10. Instrumentation of each chord is shown in Figure 6. This chord progression serves to increase and relax tension through the building and dissolving of dissonance and also through the instrumentation used.

In reference to the title of the work, Quincunx, the number five plays an important role in this movement. Quintuplet patterns are heard in the temple blocks in measures 4, 9, and 14; the cymbals also have five attacks in measures 10-12. Melodic fragments from row $Y(O_g)$ are also structured in quintuplets in the following instruments: vibraphone in measure 5 with pitches 1-5 of the row, bass clarinet in measure 7 with pitches 6-10, flute in measure 11 with pitches 11-12-1-2-3, and trombone in measure 12 with pitches 4-8.

The primary melodic line is stated by the English horn in measures 10-15 and is based on row $Y(O_g)$ in measures 10-13 and row $Y(I_g)$ in measures 13-15. In measure 15 (beat 4) the English horn ends on a quintuplet figure which is then taken up by the first trumpet, horn (in inversion), and flute, building to a climax in stacked minor seconds in measure 16. Below these stacked minor seconds, the vibraphone plays a quintuplet followed by a sextuplet figure based on row $Y(R_b)$ which brings the section to a close.

Figure 6 Instrumentation of Opening Chords, Movement Two

Chord Number	1	2	3	4	5	6
Measure Number	1	2	3	4	5	6
Instruments	flute bass cl. trumpet II trombone	vibes	Eng.horn bass cl. horn bassoon	trumpets trombone tuba	flute bassoon trumpet I	vibes
Chord Number	7	8	9	10	11	12
Measure Number	9	9	10	11	13	14
Instruments	horn trombone	bass cl. bassoon trumpet I tuba	horn trumpet II trombone	vibes	horn bass cl. trumpet I trombone	bass cl. trumpet II vibes

Section B (M. 17-28)

The second large section begins with a slight increase in tempo, and the first chord from the opening of the movement is heard in English horn, bassoon, second trumpet, and trombone in measures 17-18 which provides an elision from the previous section. The quintuplet figure is repeated as an accompaniment in the temple blocks in measures 17-25. Melodic material in this section is presented by alto flute and first trumpet in canon using the following rows: alto flute, row $Y(R_f)$ in measures 19-21 and row $Y(I_c)$ elided in measures 21-23; first trumpet, row $Y(R_{bb})$ in measures 19-21 and row $Y(I_f)$ elided in measures 22-23. The trumpet entry occurs two beats after the alto flute at the interval of a perfect fourth, and the canon ends on the interval of a minor second in measure 23. Chord number two from the opening passage (see Example 2.2) is heard in measure 23, beat 4, in English horn, horn, second trumpet, and trombone to complete the sub-section and lead into the transition passage in measures 25-28. This section is comprised of the remaining ten chords from the opening (chords 3-12 in Example 2.2.)

Section C (M. 29-36)

The third major section begins in the vibraphone with quarter-note quintuplets using row $Y(O_g)$. The same row re-

appears in the bass clarinet beginning in measure 30 with the quintuplet in diminution. The first trumpet begins in measure 30 with row $Y(I_{d\flat})$ primarily in eighth-note patterns and starting with a quintuplet group. Alto flute is replaced by C flute in measure 31 and answers the trumpet in diminution using the same row. In measures 32-35 the flute rhythmic pattern changes to sextuplets while continuing the same row. Chord number one from the opening of the movement is heard in horn, bass clarinet, second trumpet, and tuba in measure 31 and is followed by row $Y(I_{a\flat})$ in the trombone in measures 32-35 and row $Y(I_{a})$ in measures 33-35 in the horn.

This section creates a complex texture unified by the quintuplets in the vibraphone. The climax of the section occurs in measures 35-36 with quarter-note quintuplets in the vibraphone against sixteenth notes in the first trumpet against sixteenth-note quintuplets in the bass clarinet against sixteenth-note sextuplets in the flute.

Section D (M. 37-52)

Section D begins with a chordal introduction, measures 37-43, in which chords taken from the opening passage of the movement are planed. The planing continues throughout the section as an accompaniment to the melodic materials. Chords one through four are used in various orders and in various

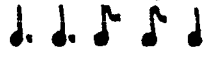
instrumental groupings; although some of the chords are revoiced or redistributed, intervallic content remains identical to the original forms. The trombone enters in measure 43 with row $Y(R_c)$ eliding to $Y(I_g)$ in measure 46 as the basic melodic line. This solo ends in measure 48 where the flute begins a melodic statement using row $Y(O_c)$ eliding to row $Y(I_f)$ in measure 50.

Section E (M. 52-64)

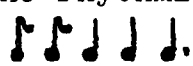
Section E, the fifth major section, is articulated by the entrance of the vibraphone which was not heard in the previous section. Pitch materials are the twelve chords from the opening of the movement played as melodic fragments in measures 52, 55, and 59, as cluster chords in measures 56-61, and as tremolos in measures 57, 62, and 63. Since the pedal is engaged throughout the section, the effect is one of panchromaticism, vertically as well as horizontally.

Rhythmically, the section is punctuated by small fragments in the bongos and divided into instrumental groups creating a pointillistic approach to the orchestration.

Group one: Row $Y(I_e)$, pitches 1-5, measures 53-54, English horn to tuba to first trumpet to bassoon to trombone in the rhythmic pattern



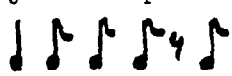
Group two: Row Y(I_e), pitches 6-10, measures 55-56, horn to second trumpet to flute to bass clarinet to English horn in the rhythmic pattern



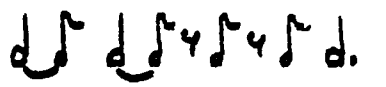
Group three: Row Y(I_e), pitches 11-12 and elision row Y(O_b), pitches 1-3, measures 57-58, trombone to first trumpet to bassoon to horn in the rhythmic pattern

Note that the pattern here is derived by adding a quarter note to each preceding value.

Group four: Row Y(O_b), pitches 4-8, measures 60-61, flute to tuba to first trumpet to bassoon to second trumpet in the rhythmic pattern



Group five: Row Y(O_b), pitches 9-1, measures 61-64, trombone to English horn to bass clarinet to first trumpet to tuba in the rhythmic pattern



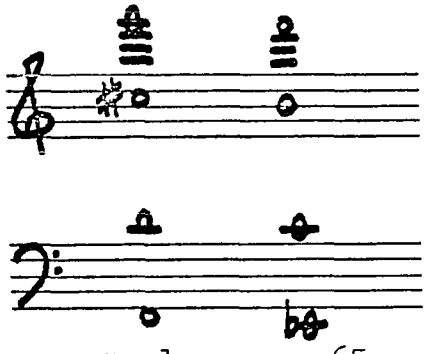
The rhythmic patterns in the above five groups form a symmetrical pattern: two groups of five attacks followed by one group of four attacks followed by two groups of five. Also, the fifth rhythmic pattern is a modified augmentation of the first pattern.

Section F (M. 65-72)

The final section resembles the first section in that the first seven chords are present, transposed down a whole

step and with somewhat different instrumentation. Many of the voicings are quite similar as evidenced in Example 2.3.

Example 2.3 Chord Voicings, Movement Two
Measures 1 and 65



Melodic fragments are handled in dialog fashion between tuba and vibraphone using rows $Y(O_f)$ and $Y(I_{bb})$; these occur in five-note groupings with the exception of the last group which contains only four notes.

MOVEMENT THREE

Macrocosm

The formal structure of Movement Three may be divided into three large sections with a coda. The sections may be

further divided into subdivisions as indicated by the formal diagram shown in Figure 7. Certain portions of Movement Three contain materials from Movement One; these will be further discussed in the microcosm section.

As in the first movement, the woodwind group contains flute, oboe, clarinet, and bassoon while the brass consists of two trumpets, trombone, and tuba with each group sharing the horn. The percussion ensemble includes tympani, snare drum, tom-toms, and vibraphone. Because of the fugal structure of the first section of this movement, each instrumental line contains a soloistic statement based on either the fugue row or the countersubject. In the third large section of the movement, measures 81-149, brass and woodwinds are juxtaposed in groups as they were in the first movement.

Figure 7 Formal Diagram - Movement Three

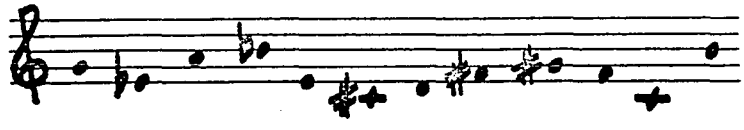
Level I	A		B			C					Coda		
Measure Numbers	1-24		25-80			81-149					150-167		
Level II	A#1	A#2	B#1	B#2	B#1'	C#1	C#2			C#1'	Sec.1 Coda	Sec.2 Coda	Sec.3 Coda
Measure Numbers	1-7	8-24	25-33	34-68	69-80	81-102	103-133			134-149	150-156	157-164	165-167
Level III	A#1	A#2	B#1	B#2a	B#2b	B#1'	C#1	C#2a	C#2b	C#2a'	C#2b'	C#1'	Sec.1 Coda	Sec.2 Coda	Sec.3 Coda
Measure Numbers	1-7	8-24	25-33	34-51	51-68	69-80	81-102	103-115	116-124	125-129	130-133	134-149	150-156	157-164	165-167

Microcosm

Section A #1 (M. 1-7)

Row Z, Example 3.1, contains the primary pitch materials for the movement.

Example 3.1 Row Z, Original



Matrix for row Z is shown in Figure 8.

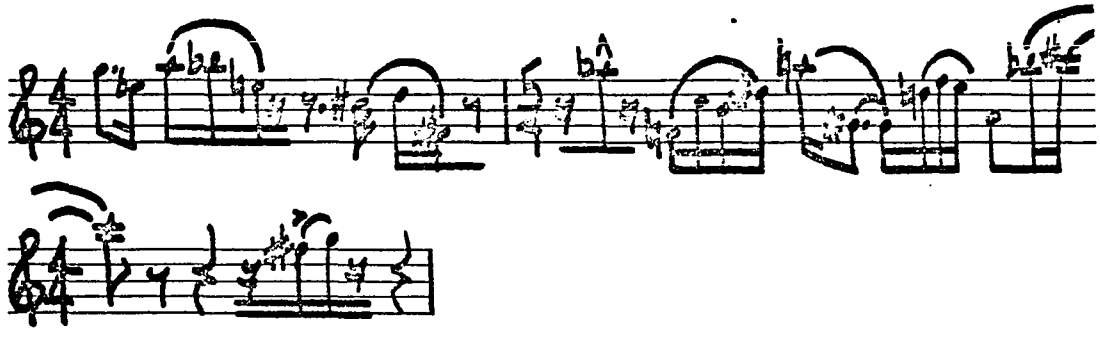
Figure 8 Matrix, Row Z

O →									← R		
G	E♭	A	B♭	E	C♯	D	F♯	G♯	F	C	B
B	G	C♯	D	G♯	F	F♯	A♯	C	A	E	D♯
F	D♭	G	A♭	D	B	C	E	F♯	E♭	B♭	A
E	C	F♯	G	D♭	B♭	B	E♭	F	D	A	A♭
B♭	G♭	C	D♭	G	E	F	A	B	A♭	E♭	D
C♯	A	E♭	E	B♭	G	A♭	C	D	B	G♭	F
C	A♭	D	E♭	A	G♭	G	B	C	B♭	F	E
A♭	E	B♭	B	F	D	E♭	G	A	F♯	C♯	C
F♯	D	A♭	A	E♭	C	D♭	F	G	E	B	B♭
A	F	B	C	F♯	D♯	E	G♯	A♯	G	D	C♯
D	A♯	E	F	B	G♯	A	C♯	D	C	G	F♯
IR ↑ E♭	B	F	F♯	C	A	B♭	D	D♯	C♯	G♯	G

I ↓

Movement Three opens with a three-voice fugue; the exposition is contained in measures 1-7. The subject is first heard in flute and clarinet in measures 1-3; pitch materials in the subject are from row $Z(O_g)$ and row $Z(I_b)$, Example 3.2.

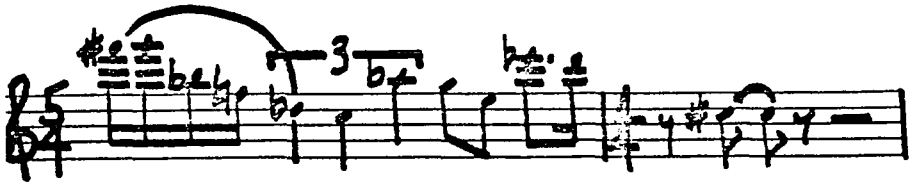
Example 3.2 Fugue Subject, Movement Three



The answer occurs in measure three in the first trumpet doubled by the trombone at the pitch level down a perfect fourth from the initial subject entry. The third subject entry occurs in measure 5, oboe and horn, returning to the opening pitch level.

The countersubject is non-serialized and occurs in measures 4-5 in flute and clarinet and measures 6-7 in first trumpet and trombone, Example 3.3.

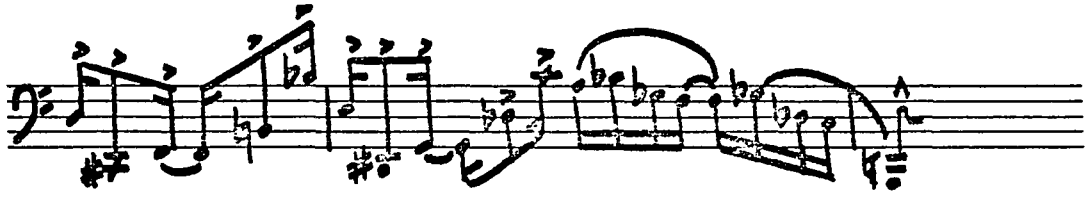
Example 3.3 Countersubject, Movement Three



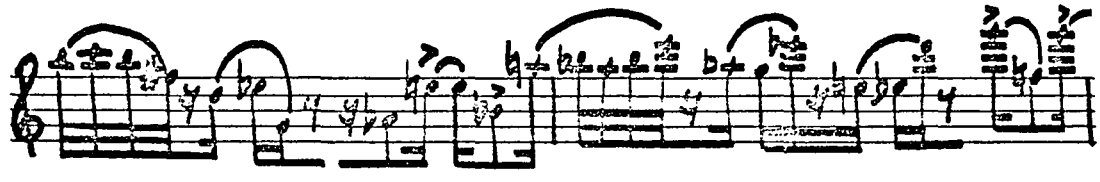
Section A #2 (M. 8-24)

Developmental material begins in measure 8 with a fragmentation of melodic materials from both the subject and countersubject. Within this section, measures 8-24, development of the subject and countersubject occurs. Jazz rhythms, Examples 3.4 and 3.5, dominate the section.

Example 3.4 Bassoon line, Movement Three
measures 9-11



Example 3.5 Flute line, Movement Three
measures 17-18

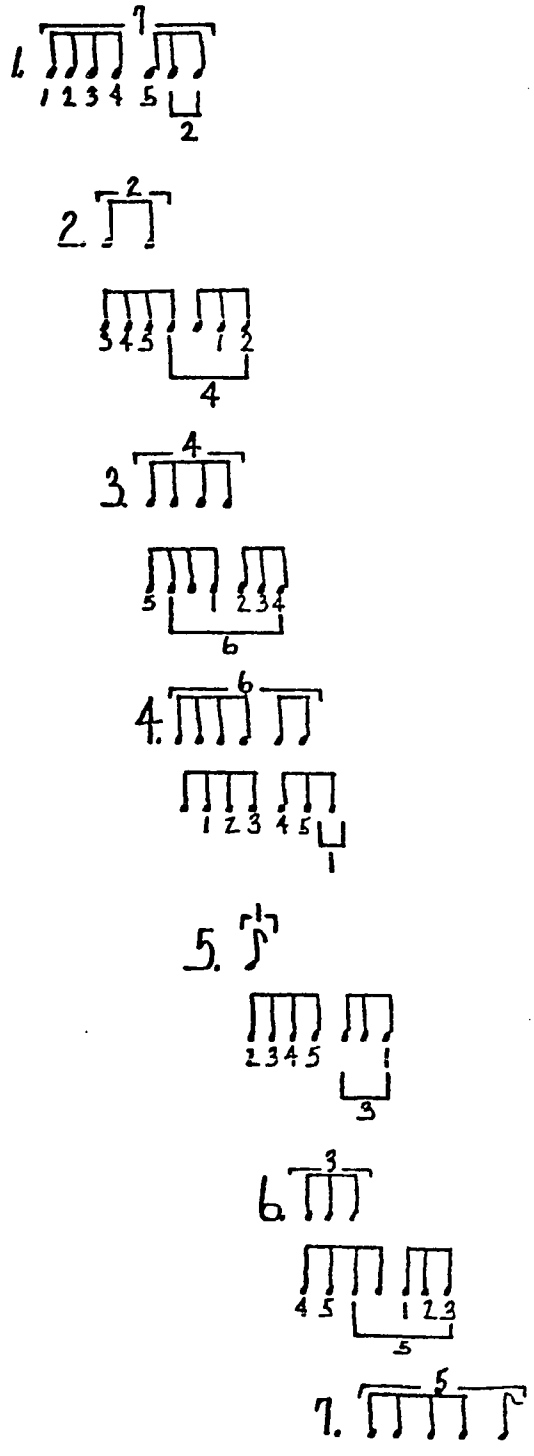


Section B #1 (M. 25-33)

Section B #1 opens with tympani and snare drum. This marks the first use of percussion in this movement. Tympani, tuned to F-A-G#-B, play motive A from Movement One (Example 1.1.) This percussion material is punctuated by rhythmic and melodic fragments in other instruments handled in a pointillistic fashion. Also from Movement One, specifically row $X(O_b)$ and row $X(I_a)$, are the flute materials in measures 26-33. A rhythmic row occurs in this section and is constructed by subtracting five from an initial group of seven until seven groups are realized, Figure 9.

The rhythmic row may be traced as follows: group 1, seven sixteenth-note attacks, measures 26-27 in first trumpet; group 2, two sixteenth-note attacks, measure 27 in snare drum; group 3, four sixteenth-note attacks, measure 28 in horn; group 4, six sixteenth-note attacks, measure 30 in trombone; group 5, one sixteenth-note attack, deleted in this section; group 6, three sixteenth-note attacks, measure 31, both trumpets at the interval of a major second; and group 7, five sixteenth-note attacks, measure 32 in trombone and horn at the interval of a minor second. Pitch materials in the rhythmic rows are repetitions of the first nine notes of row $Z(IR_{bb})$.

Figure 9 Rhythmic Row Derivation, Movement Three, beginning measure 26



Section B #2 (M. 34-68)

In contrast with the first sub-section, the second sub-section is lyrical in nature with the melody first appearing in oboe doubled by clarinet with pitches from row $Z(R_b)$, $Z(O_f)$, and $Z(O_{ab})$. The tympani line continues from the previous section as an accompaniment figure accentuated by snare drum with brushes. Bass line accompaniment by the tuba comes from rows $Z(I_b)$, $Z(IR_f)$, and $Z(I_{bb})$. The second part of this sub-section contains the same melody line in first trumpet and trombone transposed down a perfect fifth and rhythmically displaced. Bass line accompaniment switches from tuba to bassoon at measure 51 with pitch material from rows $Z(I_{f\#})$, $Z(IR_{g\#})$, and $Z(I_{c\#})$. The section closes with a ritard at measure 66 leading to a fermata in measure 68 which is followed by complete silence.

Section B #1' (M. 69-80)

The third sub-section is basically a recapitulation of measures 25-33 with the following changes: the clarinet in measures 70-74 plays motive A from Movement One in augmentation; the flute line beginning in measure 26 with row $X(O_b)$ is rhythmically altered and played by second trumpet in measures 70-72; the tuba accompaniment line in measures 73-76 is taken from row $X(O_e)$ and played with straight mute; a

dialog with pitch materials from rows $X(I_f)$ and $X(I_{eb})$ is added in measures 77-80 among both trumpets and tuba; the rhythmic row from measures 26-32 is retrograded and extended in measures 71-80.

Section C #1 (M. 81-102)

The third large section begins with a meter and tempo change, flute switches to piccolo, and snare drum changes to tom-toms. The first sub-section, measures 81-102, is instrumentally much like Movement One in that the brass and woodwinds are juxtaposed. This is a very percussive, syncopated section with woodwinds and brass sometimes pitted against percussion. Chord structures from the second movement (see Example 2.2) are found in measures 81, 85, 86-90, 94-96, and 101-102. Melodic materials are made up of row $Z(O_{bb})$, pitches 1-10, syncopated in the woodwinds in measures 82-84, further truncated using only pitches 1-7 in measures 92-93, and used imitatively in measures 98-100.

Section C #2 (M. 103-133)

The second sub-section is delineated by a change in meter from $\frac{4}{4}$ to $\frac{6}{8}$. In measure 103 a canon begins, at the distance of three measures, between tom-tom and tympani. This canon continues throughout the sub-section. At measure 116

both trumpets enter with a melodic line based on row $Z(IR_{e\flat})$; woodwinds enter at measure 117 with a countermelody based on row $Z(R_d)$, pitches 1-6, which is tonally sequenced. Melodic activity ends with rips and flutters in measures 123-124, and the percussion canon continues without the additional melodic material from measures 125-129. At measure 130 the trumpets enter again with the same melodic materials found in measure 116 but rhythmically altered and somewhat extended.

Section C #1' (M. 134-149)

The third sub-section is a truncated version of the sub-section in measures 81-102 with the brass and woodwind materials reversed. This makes a small A B A' formal structure within the third large section.

Coda (M. 150-167)

The coda begins in measure 150 with a six-measure introduction using motive A from the first movement stated by the oboe which is joined by clarinet in measure 152 and flute and bassoon at measure 154. In the second sub-section of the coda a truncated version of the fugue subject, measures 1-3 of Movement Three, is presented by the trumpets in measures 157-159. Stretto entrances follow in the trombone, up a perfect fifth, measures 158-160, and in the tuba, up a perfect fifth from the trombone entry, measures 160-162. Above these entries

the woodwinds play material from row $Z(O_{ab})$, measures 159-163, and the sub-section ends with snare drum and vibraphone presenting melodic material taken from measure 41 of Movement One. A fermata on beat one of measure 165 is followed by complete silence. The last three measures of the coda contain a modified sequential pattern in sixteenth notes taken from row $Z(IR_{c\#})$. Brass material, which enters in the second half of measure 166, is motive A from Movement One in a quarter-note triplet figure. The movement ends, tutti, on an eighth-note C#.

CONCLUSION

During the neo-classic period following World War I, composers such as Stravinsky began to write for unusual chamber groups. The trend toward chamber writing influenced many composers who followed Stravinsky and was a major influence in the selection of instrumentation for Quincunx.

Other elements in the writing of this work that can be attributed to Stravinsky include the rhythmic drive which permeates the entire work, passages of soloistic writing for all instruments, and the cellular-motivic writing which forms much of the technical basis of the composition.

Another obvious influence is that of Schoenberg, particularly the basic theory which underlies his dodecaphonic system. As in Schoenberg's serial works, Quincunx has an aurally perceivable formal structure which is readily accessible to the listener. Also, the Germanic and seemingly paradoxical combination of the extreme logic found in serialization and traditional emotional romanticism, both evidenced in Schoenberg's works, are a subtle but definite influence on this work.

The rhythmic serialization present in the third movement of Quincunx is based on the study of two specific works: Three Pieces for Piano by Milton Babbitt and Structures by Pierre Boulez. The rhythmic structures in this work are also

strongly influenced by third-stream jazz as evidenced in works by composers such as Leonard Bernstein.

In determining the origins of creative endeavors, one is at times obligated to acknowledge ideas and influences which come from others as well as to present one's own thoughts in an articulate manner. The preceding analysis is a personal statement; this conclusion is a brief but sincere acknowledgement.

THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

QUINCUNX

VOLUME II

A COMPOSITION

WITH SUPPORTING ANALYTICAL DOCUMENT

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF MUSICAL ARTS

BY

PAUL STEINBERG

Norman, Oklahoma

1978

QUINCUNX

INSTRUMENTATION

Flute, Alto Flute, Piccolo

Oboe, English Horn

B♭ Clarinet, Bass Clarinet

Bassoon

French Horn

Trumpet I

Trumpet II

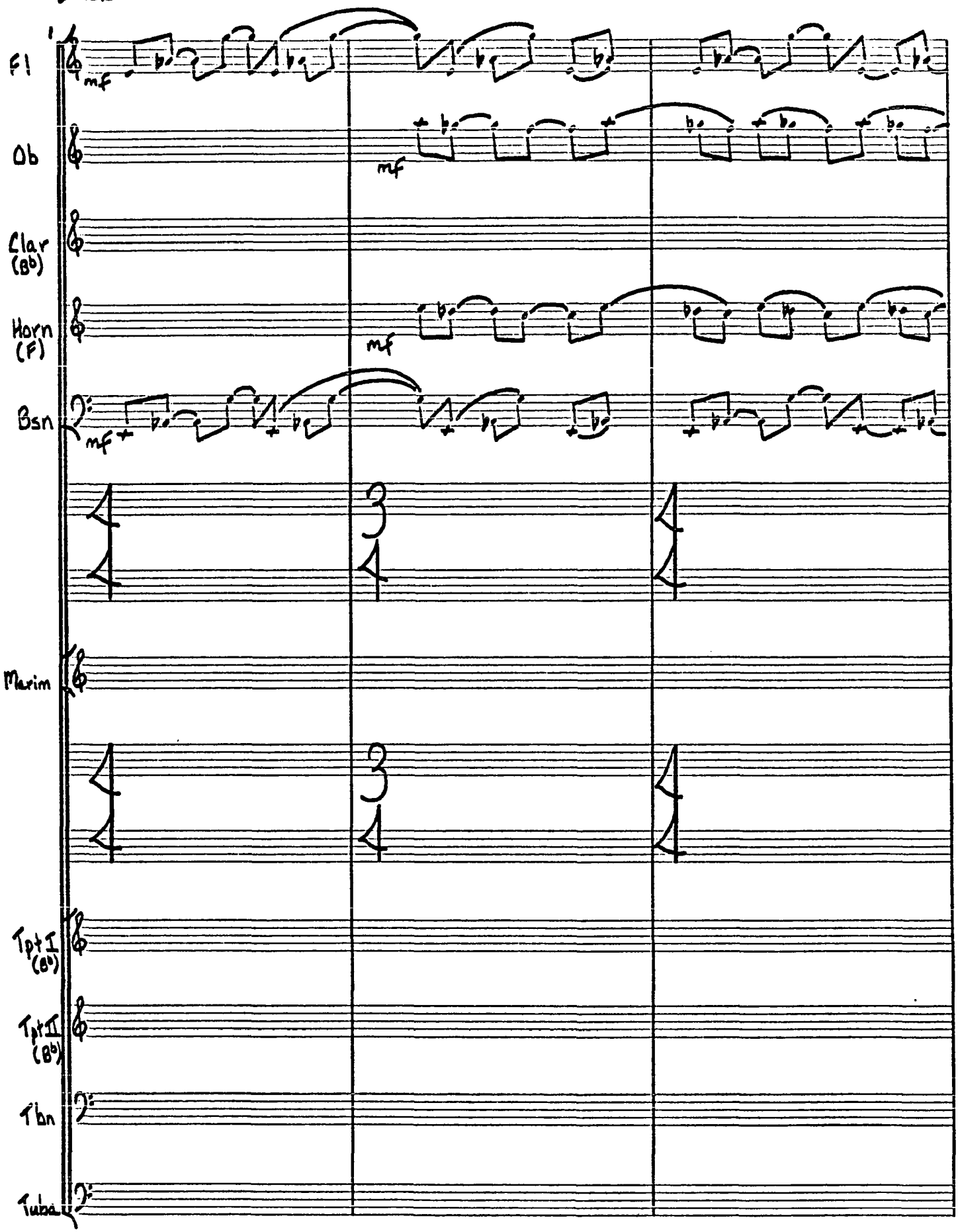
Trombone

Tuba

Marimba, Vibraphone, Tympani

Cymbals, Temple Block, Bongos, Snare Drum, Tom-tom

♩=132



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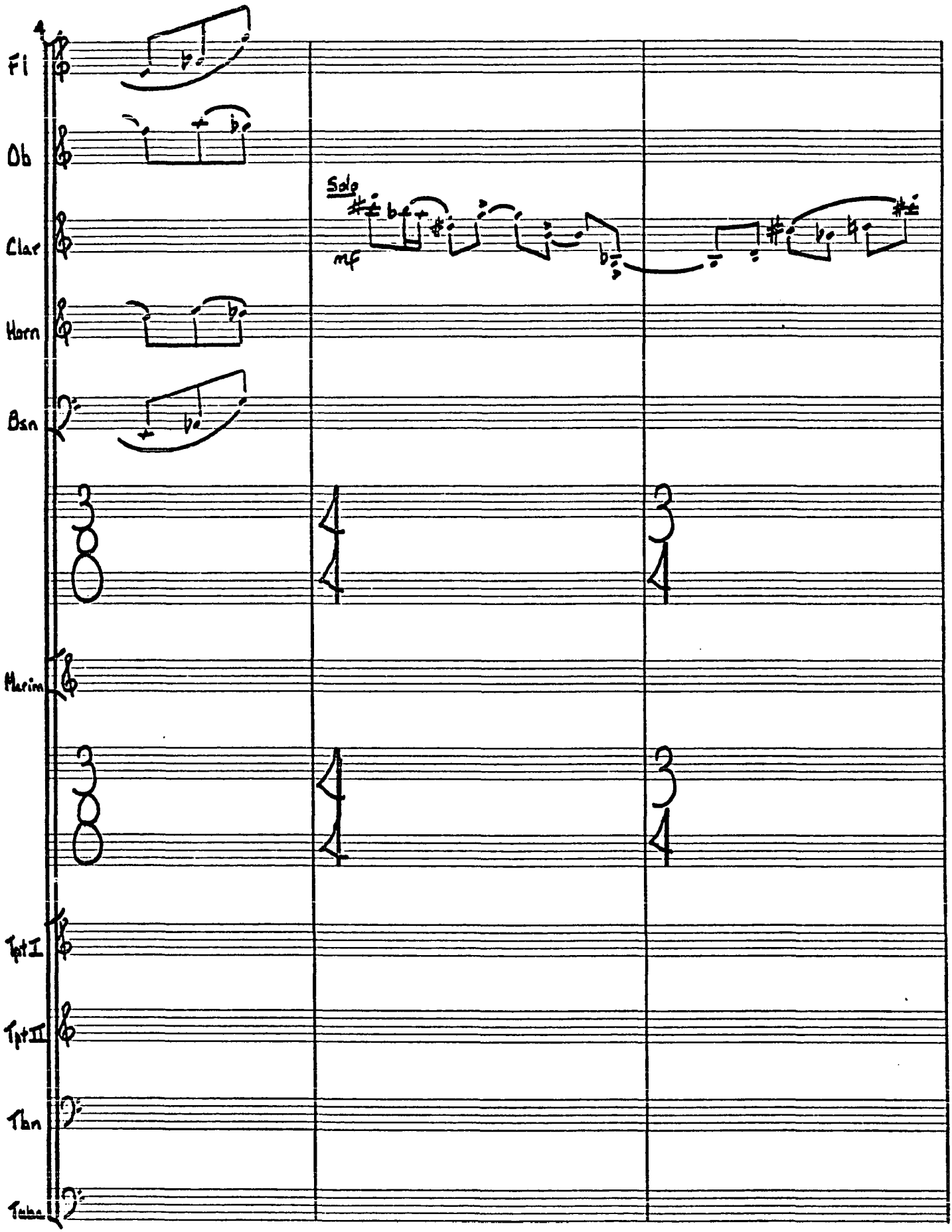
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Horn
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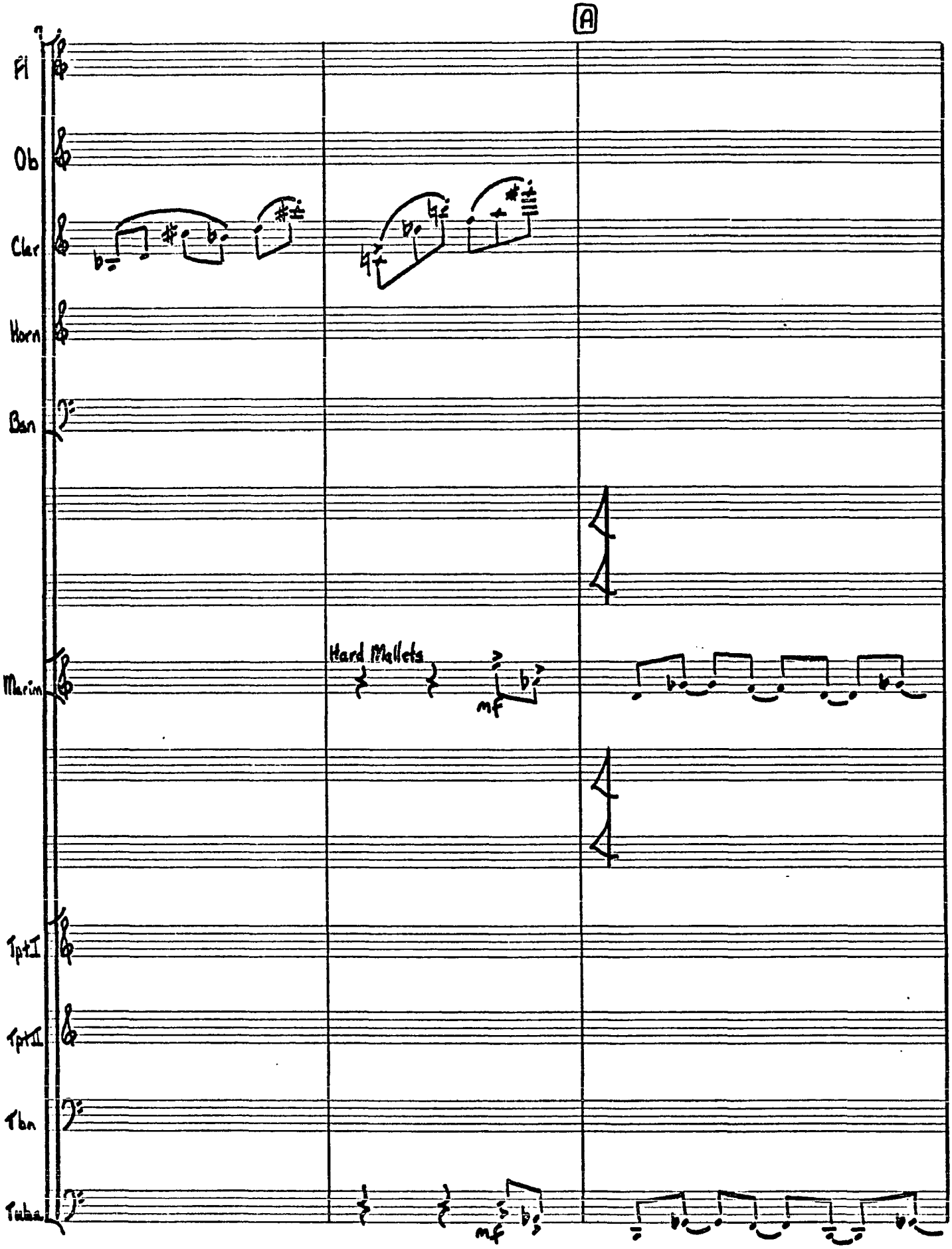
Marim
TptI
TptII
Tbn
Tuba



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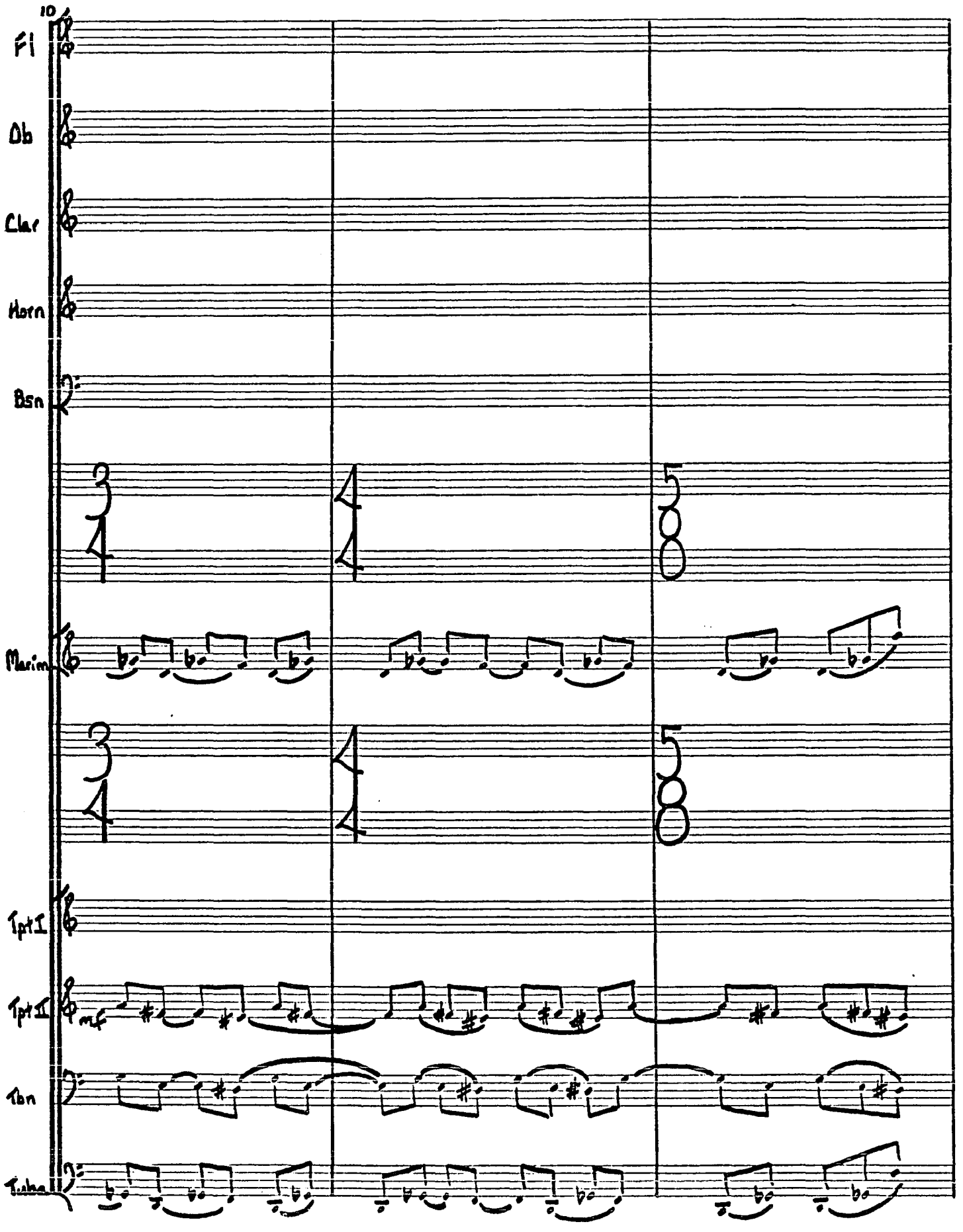

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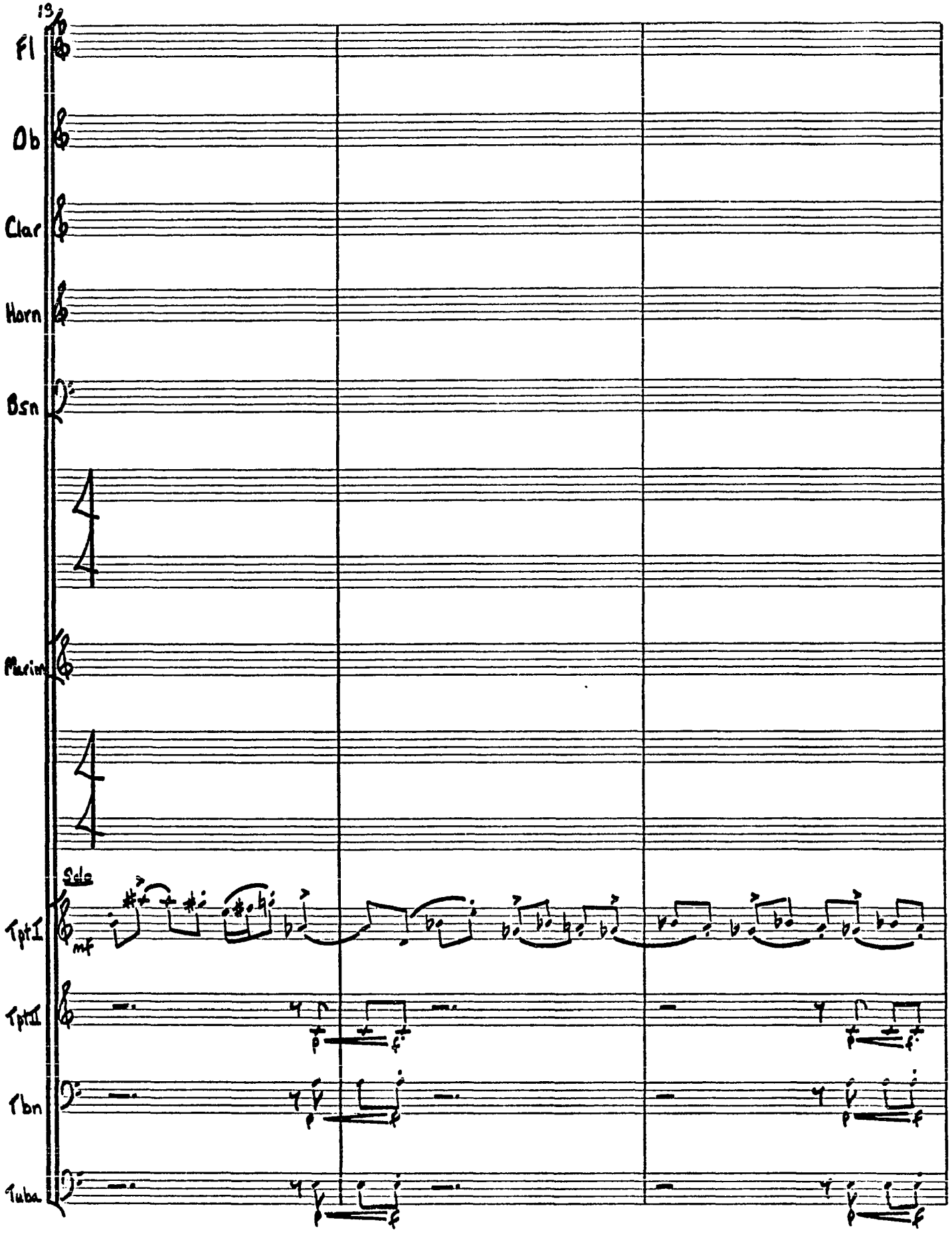

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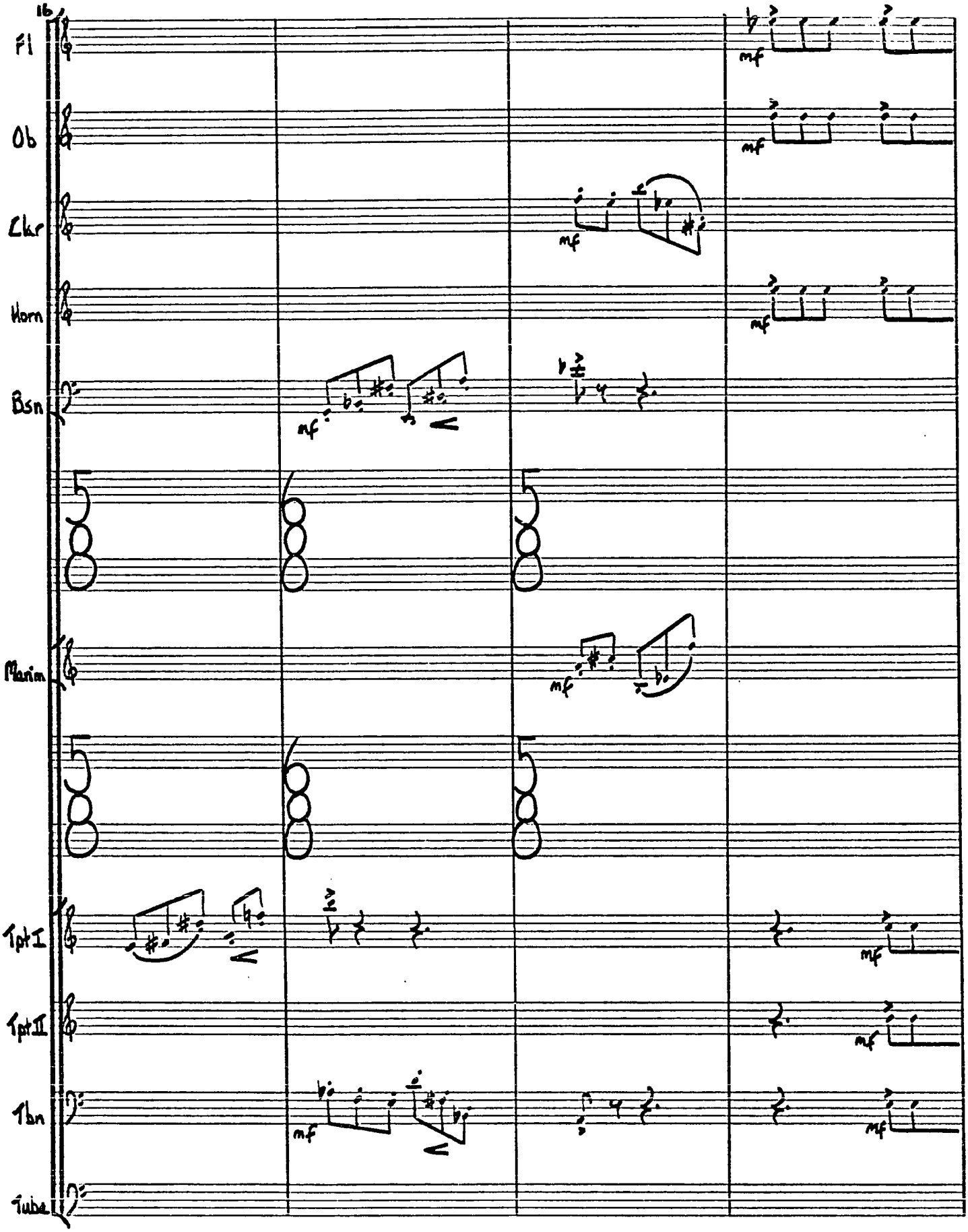

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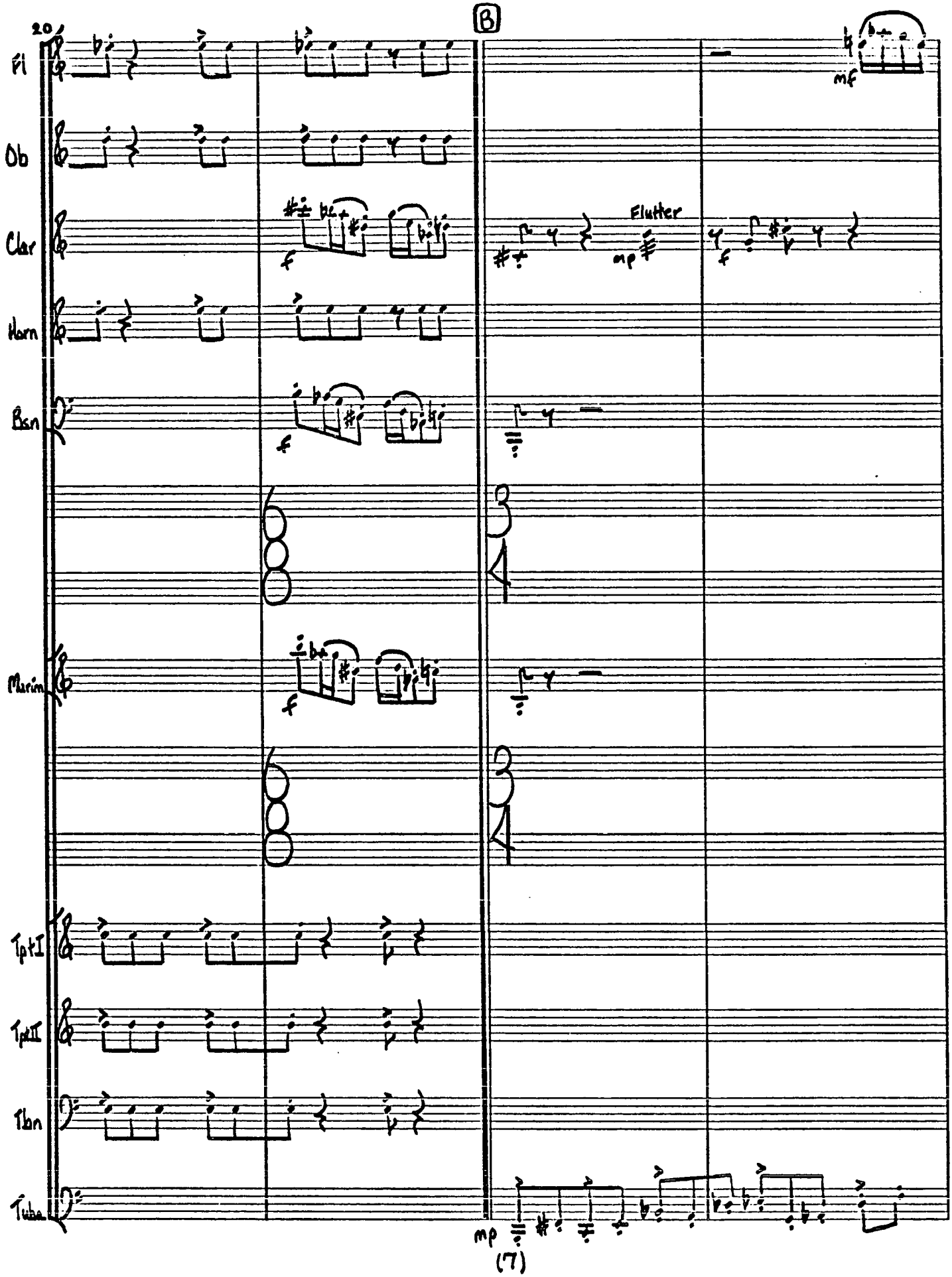
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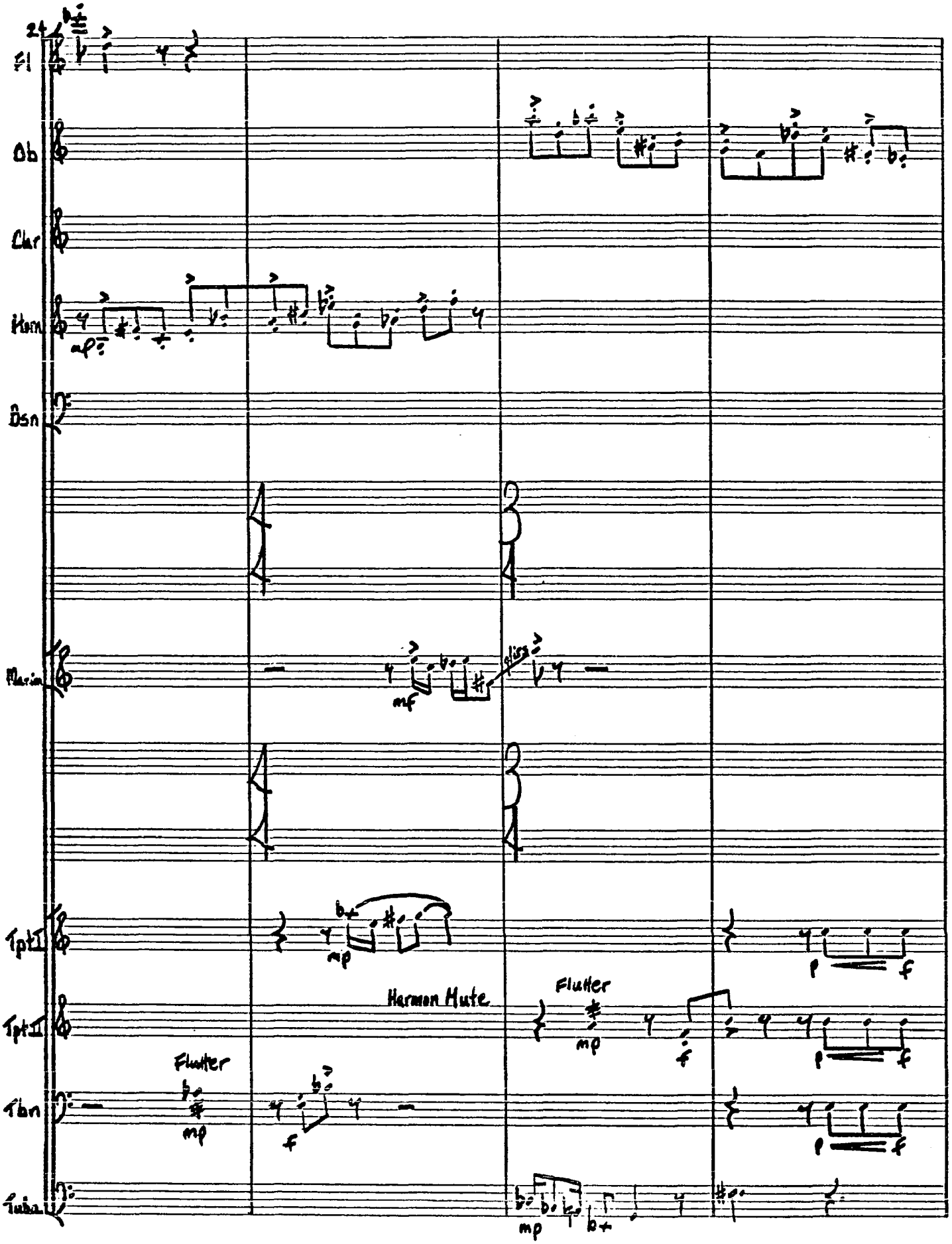

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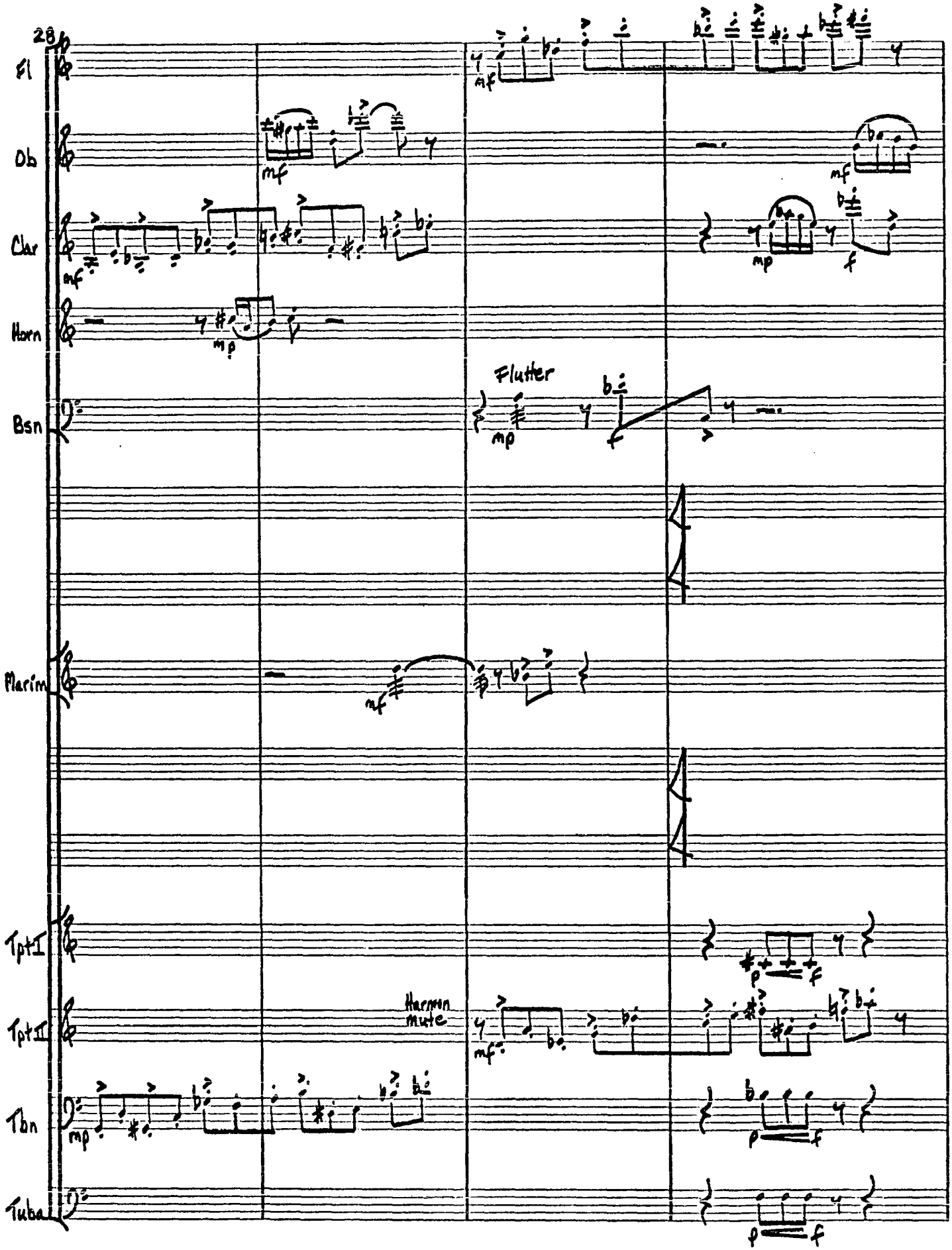

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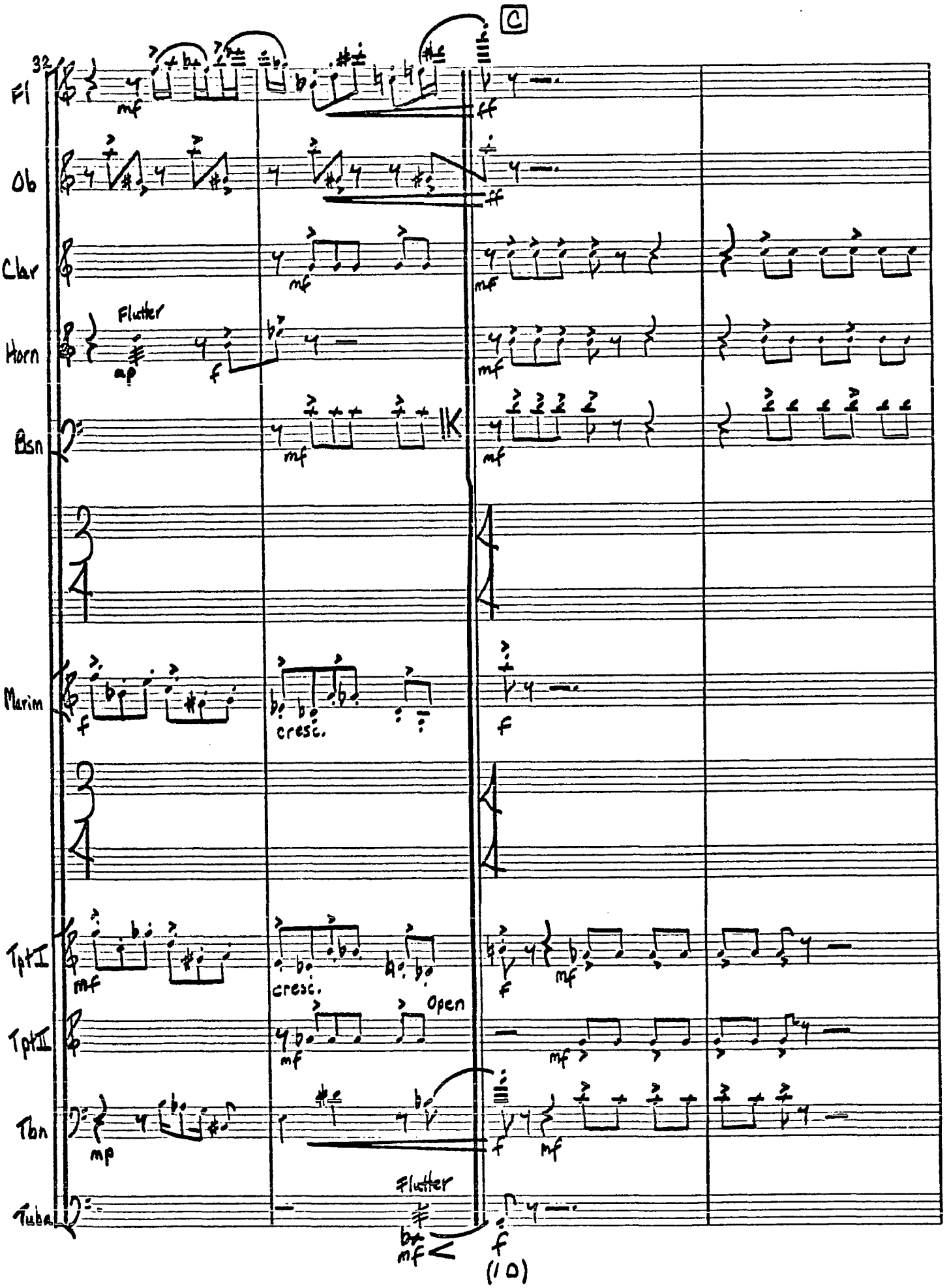
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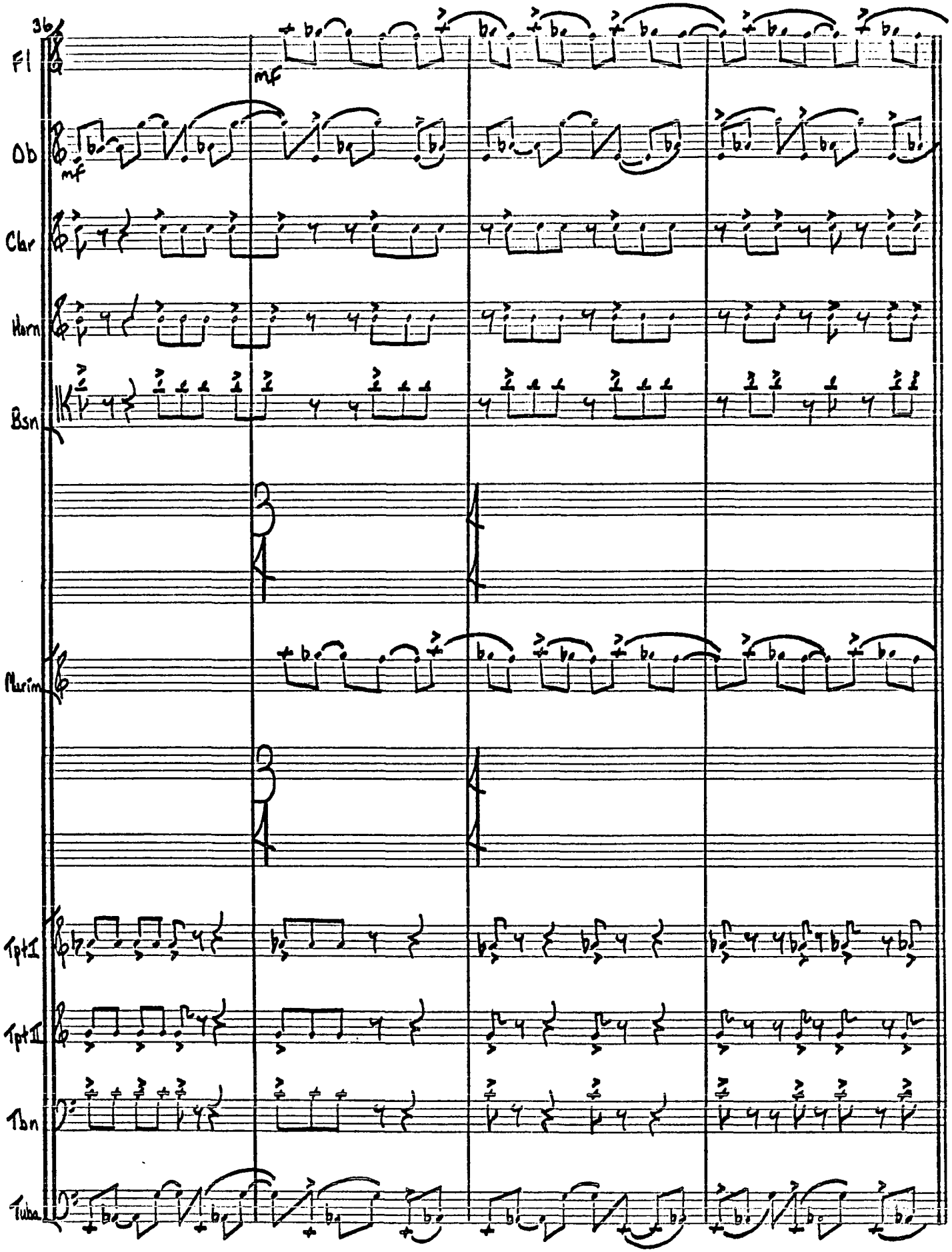

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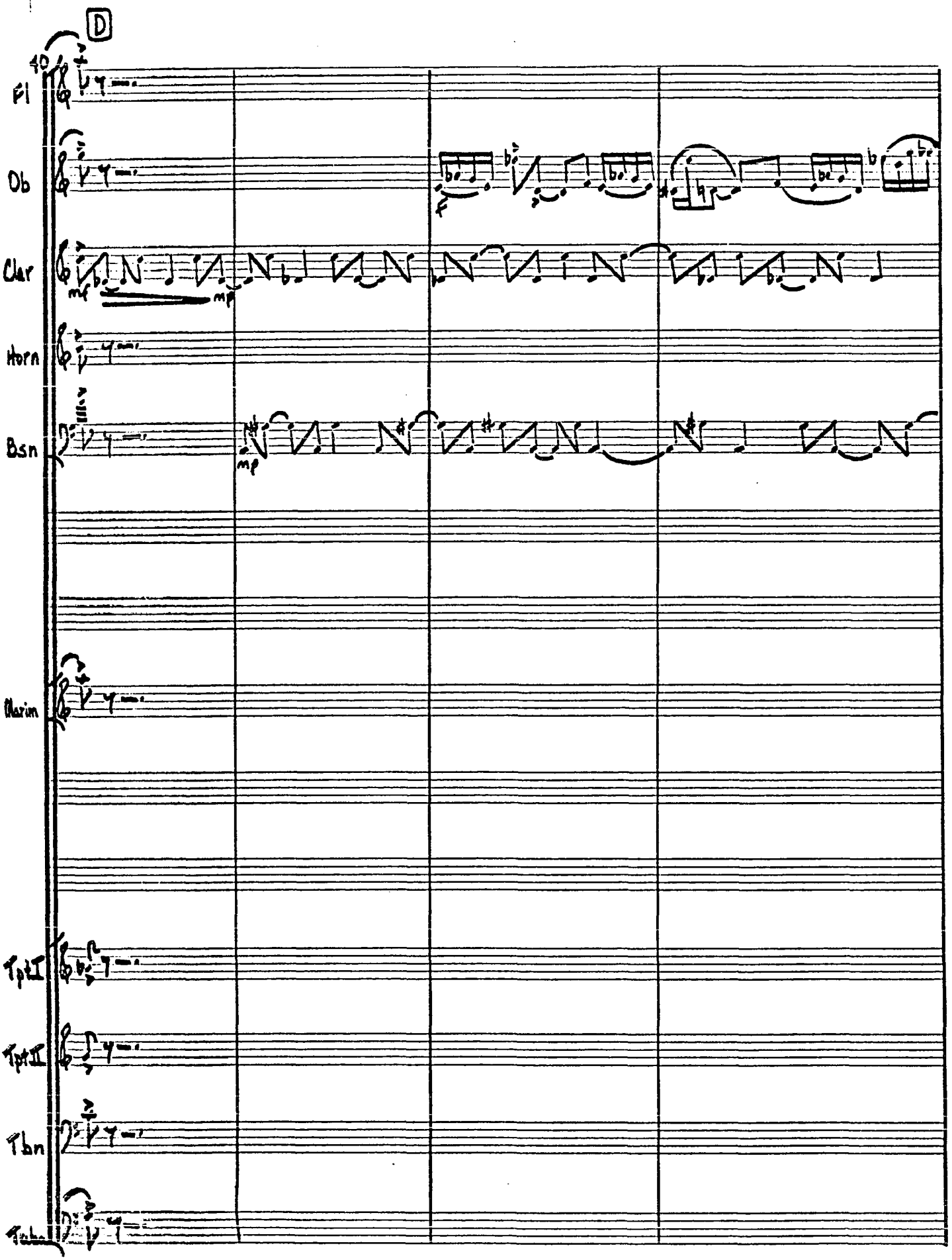

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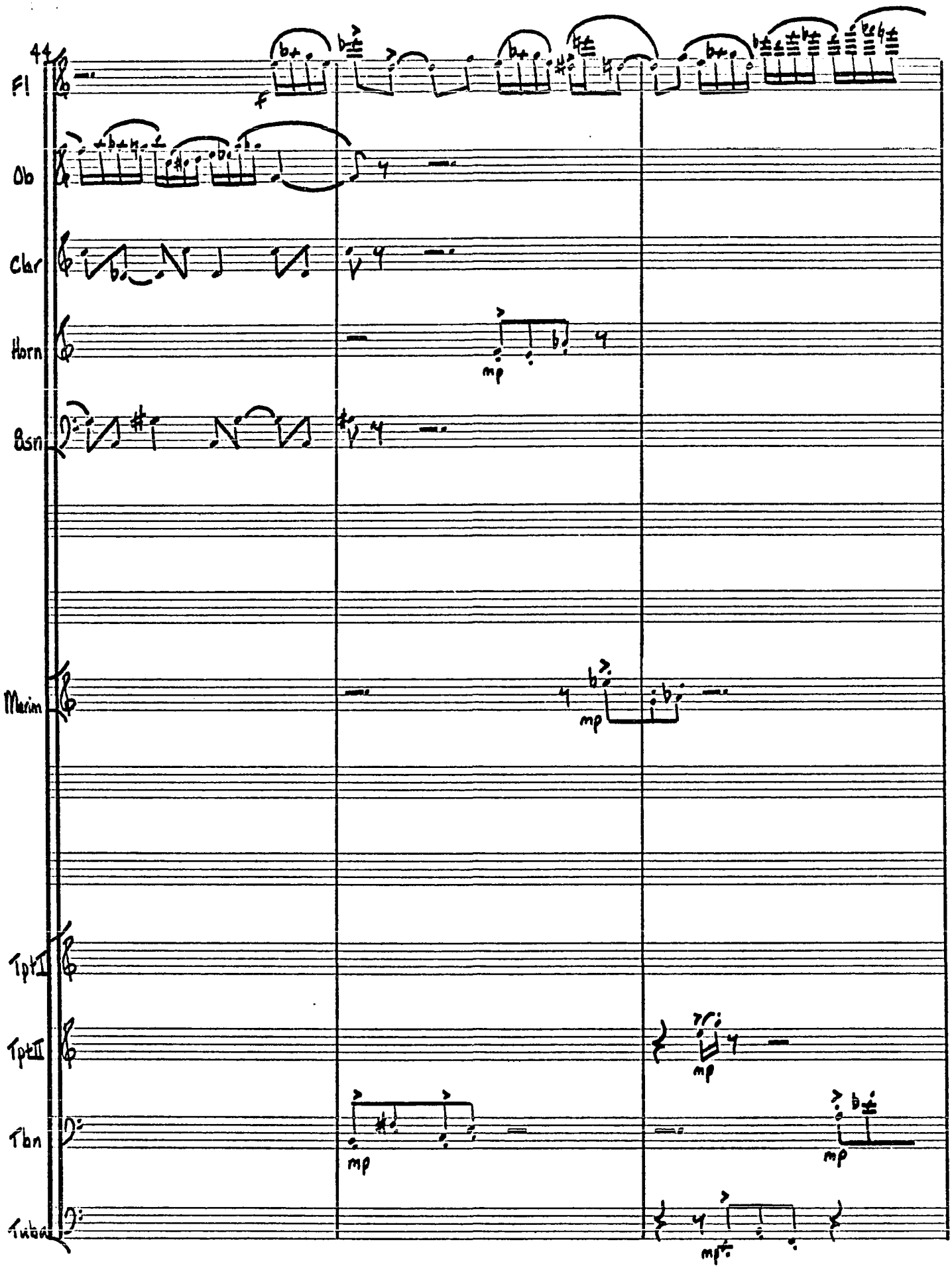

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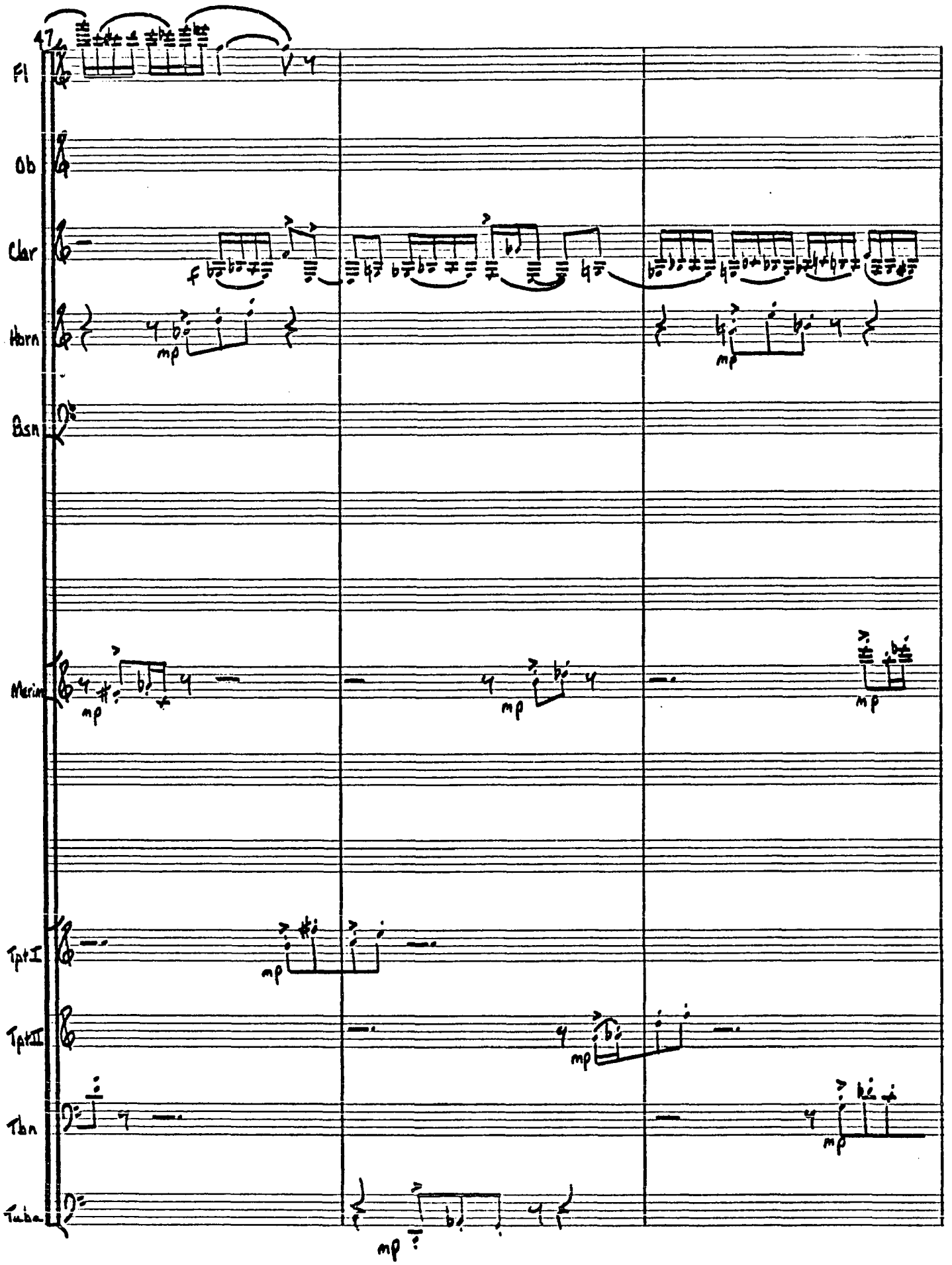

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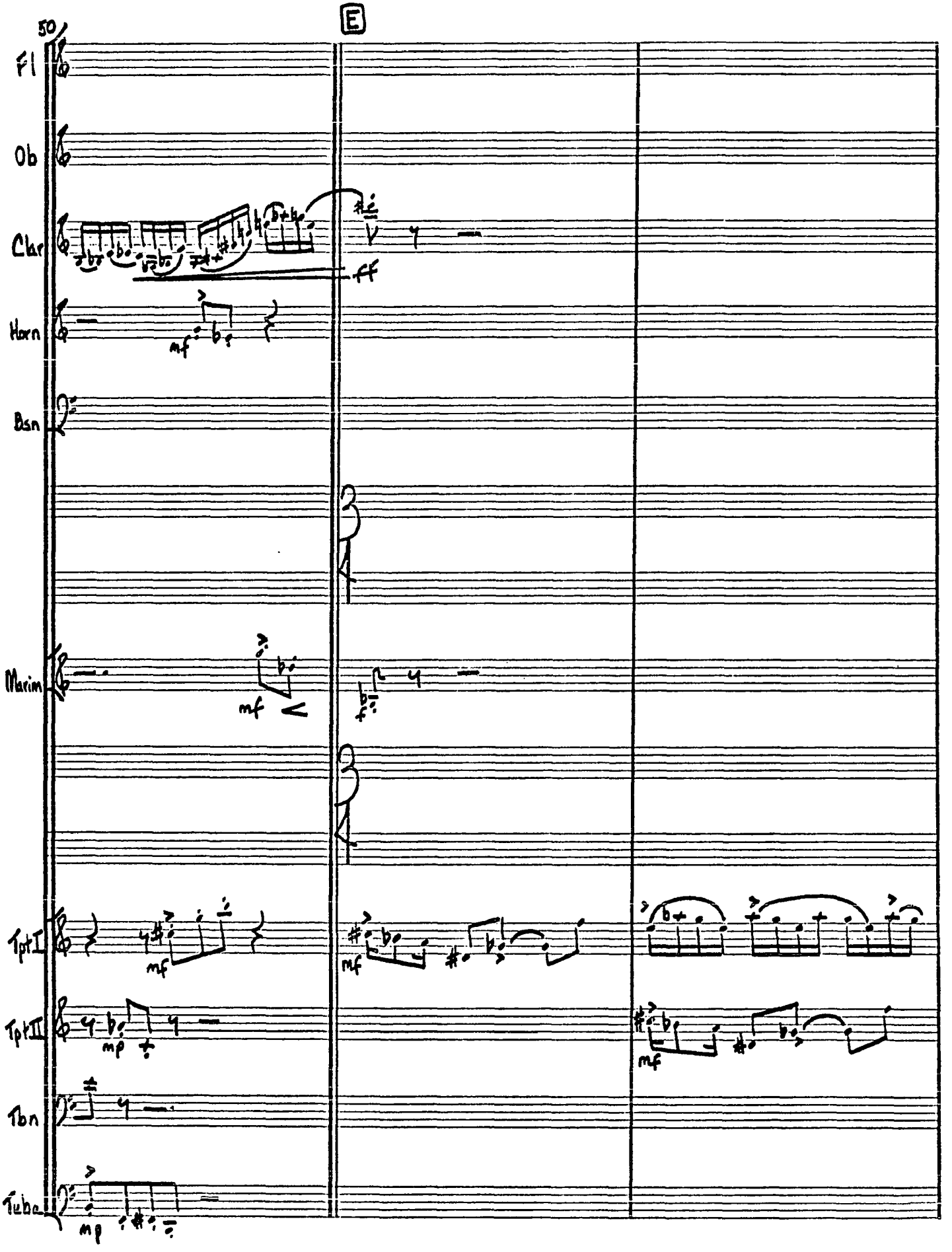

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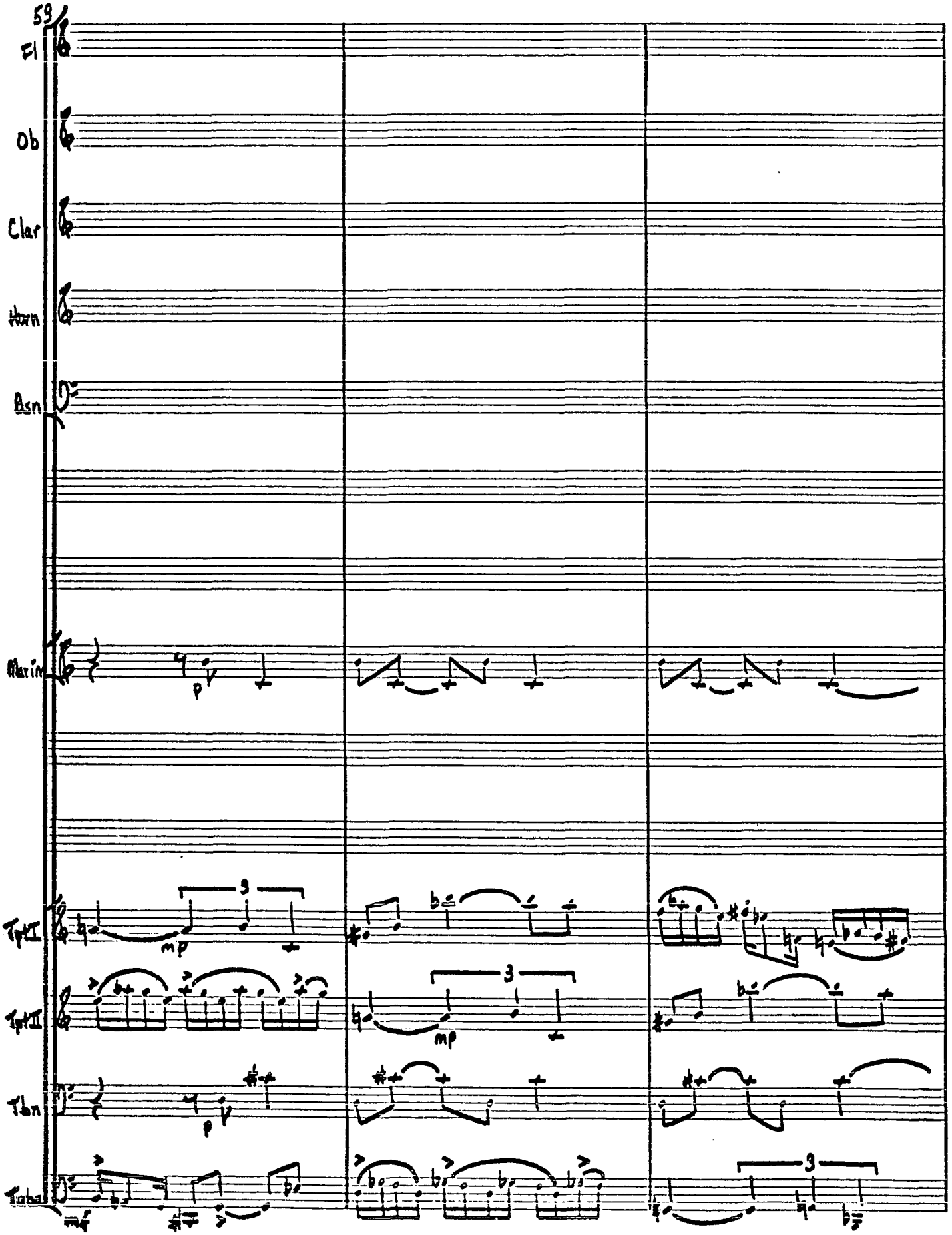

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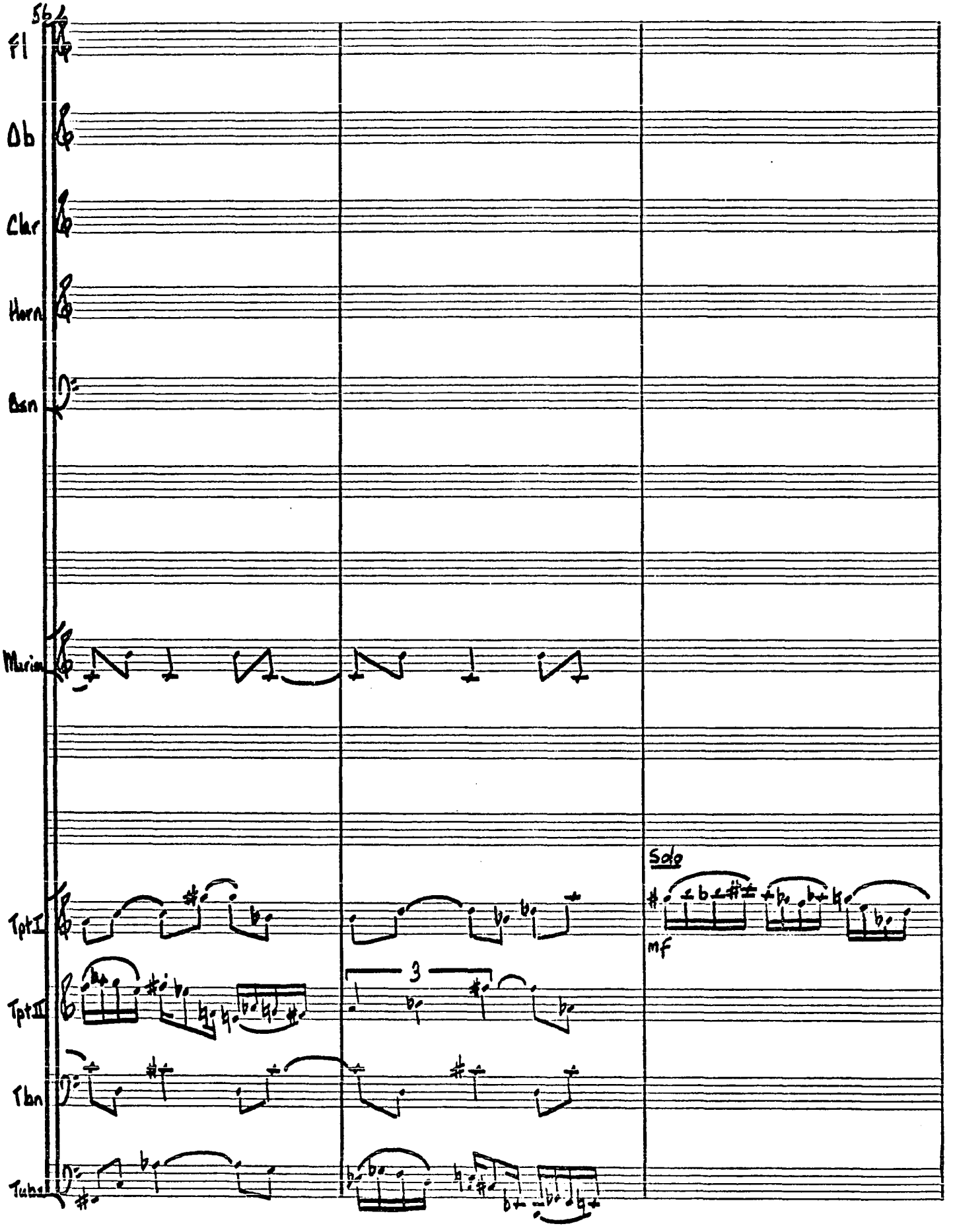

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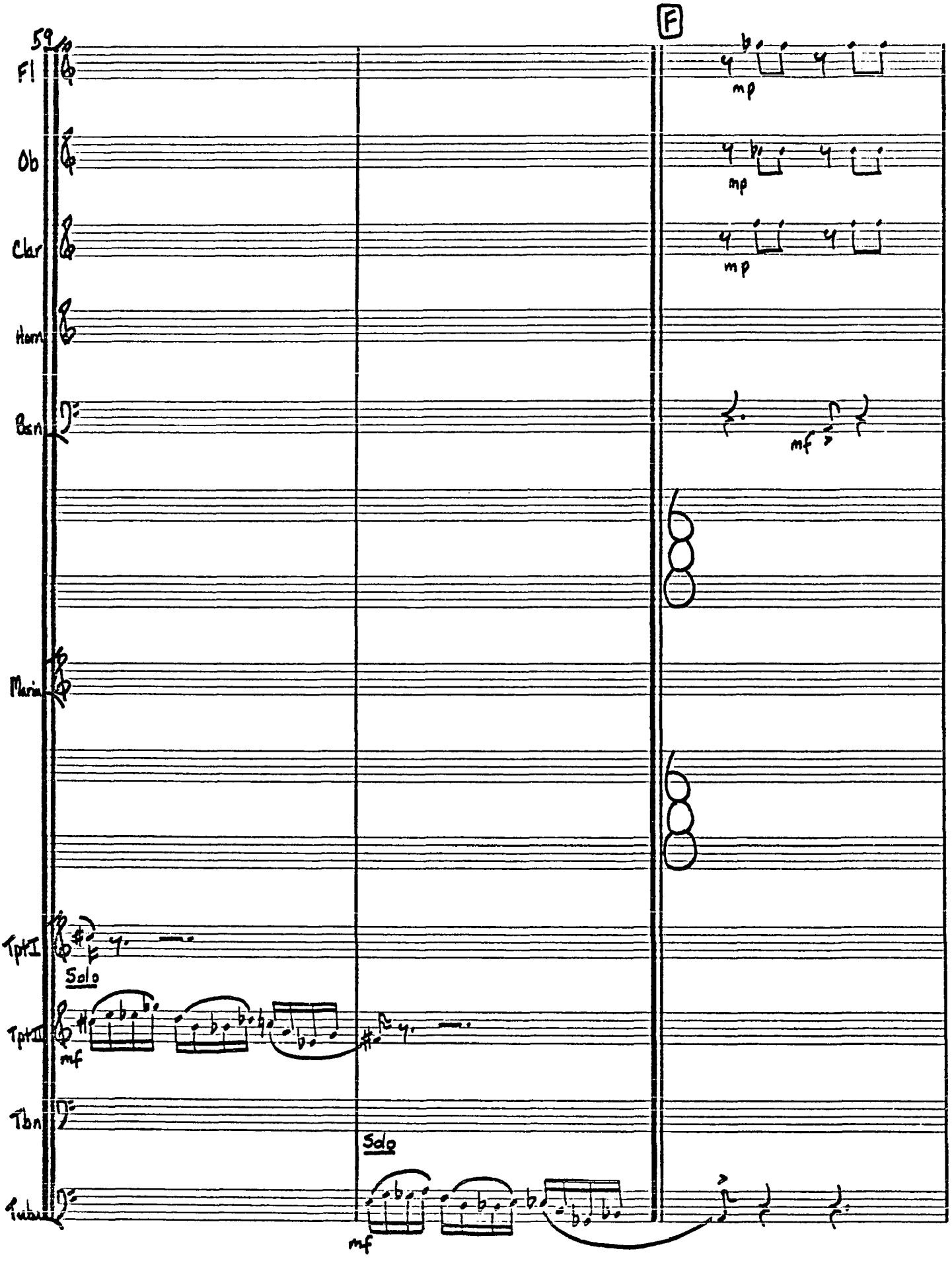

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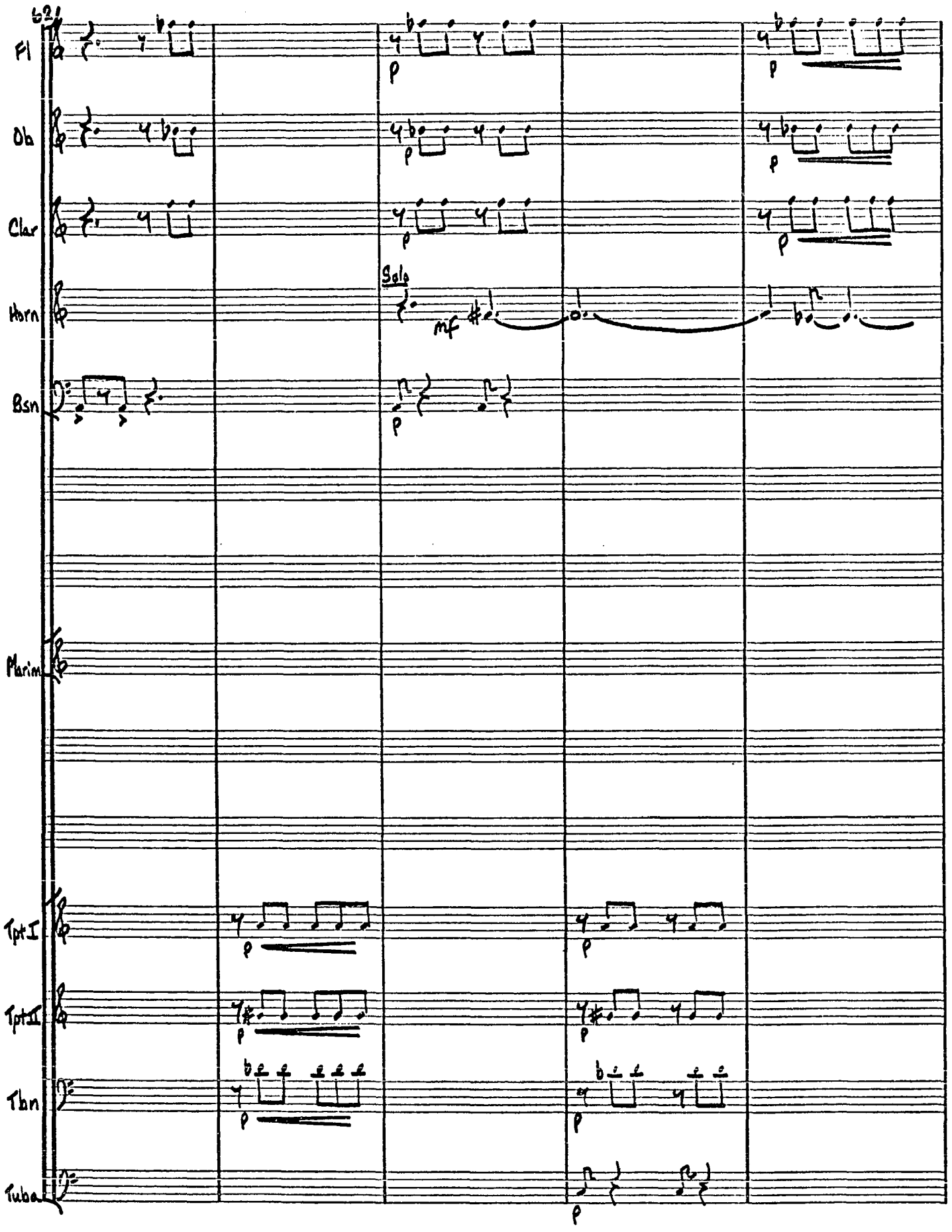

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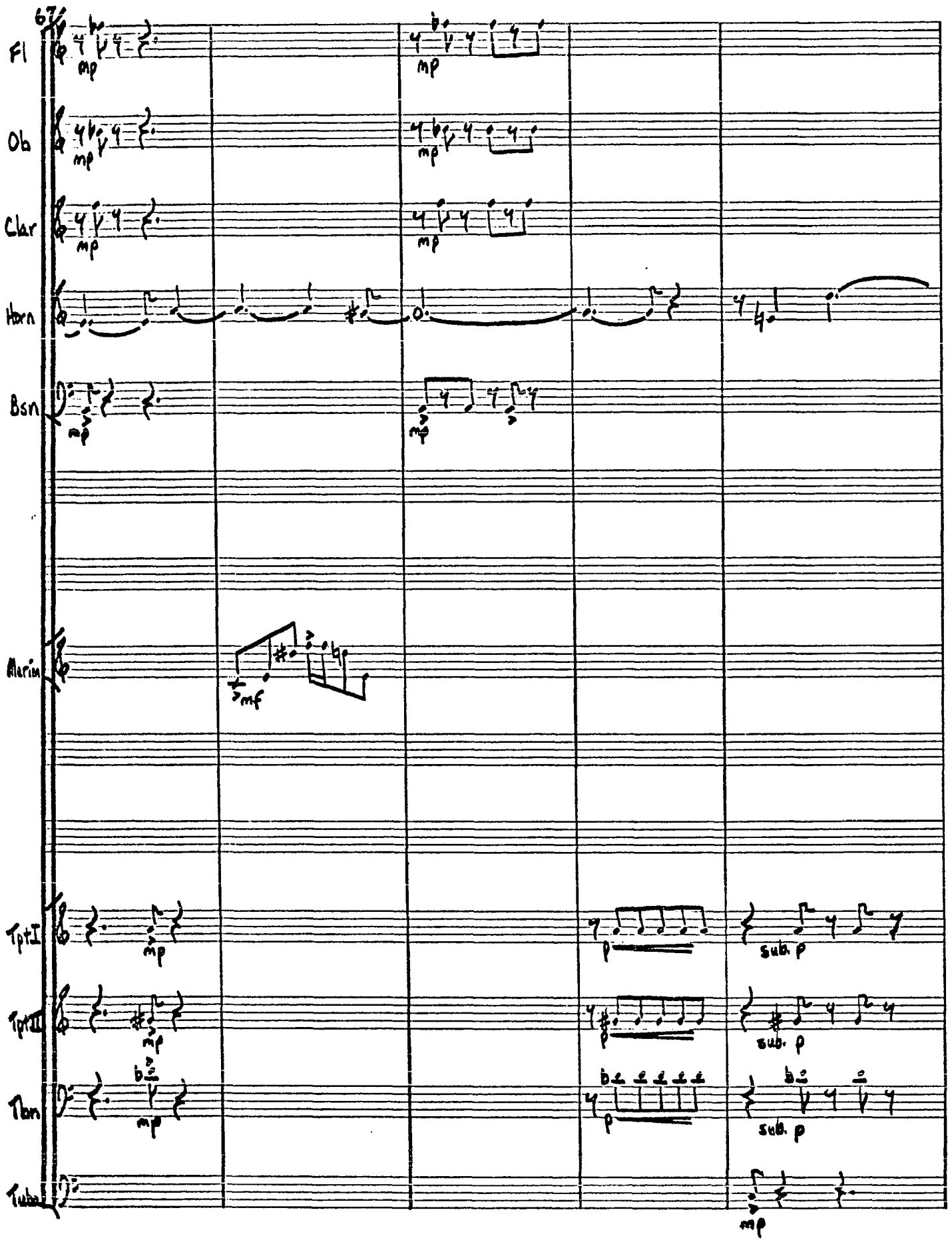

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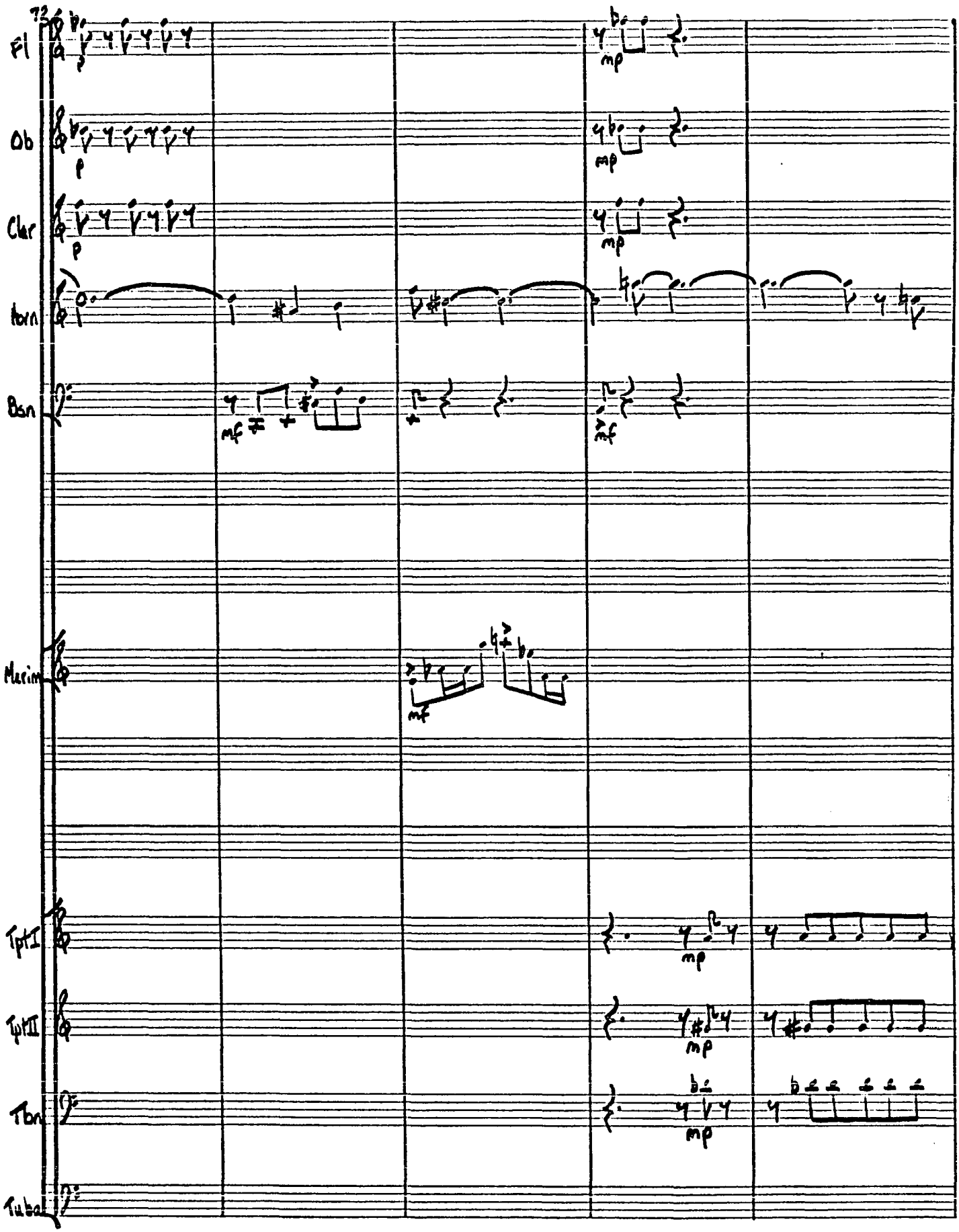

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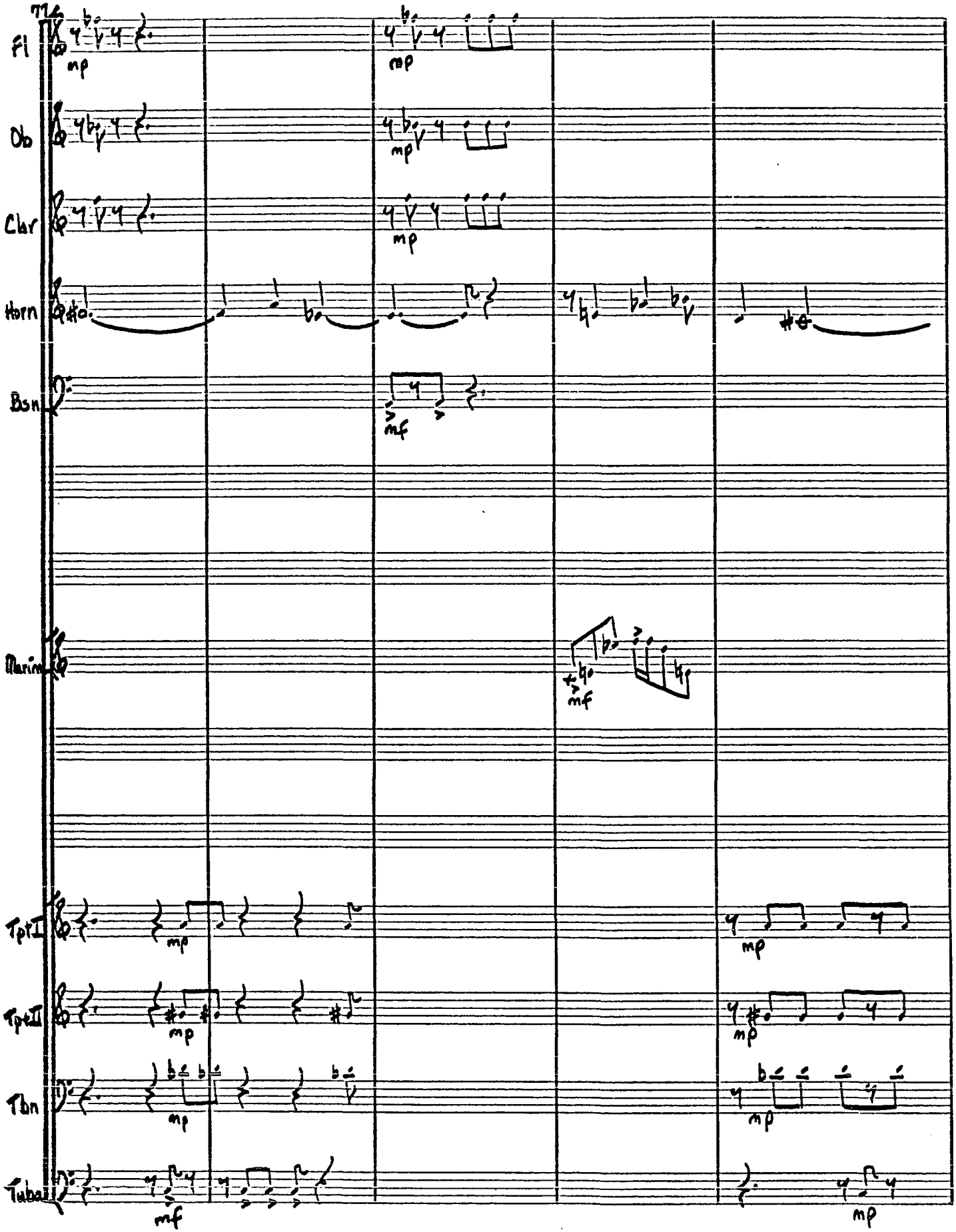

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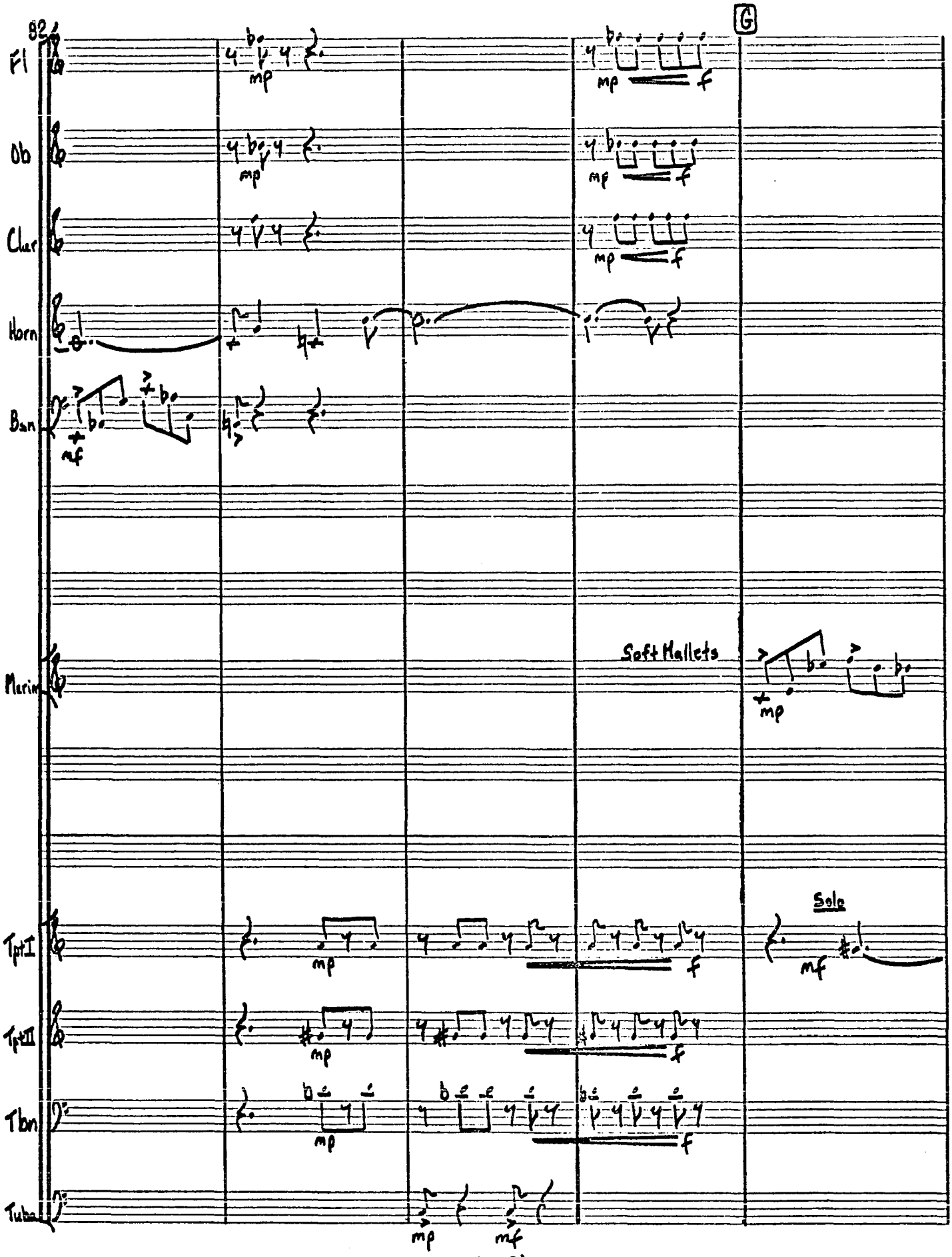

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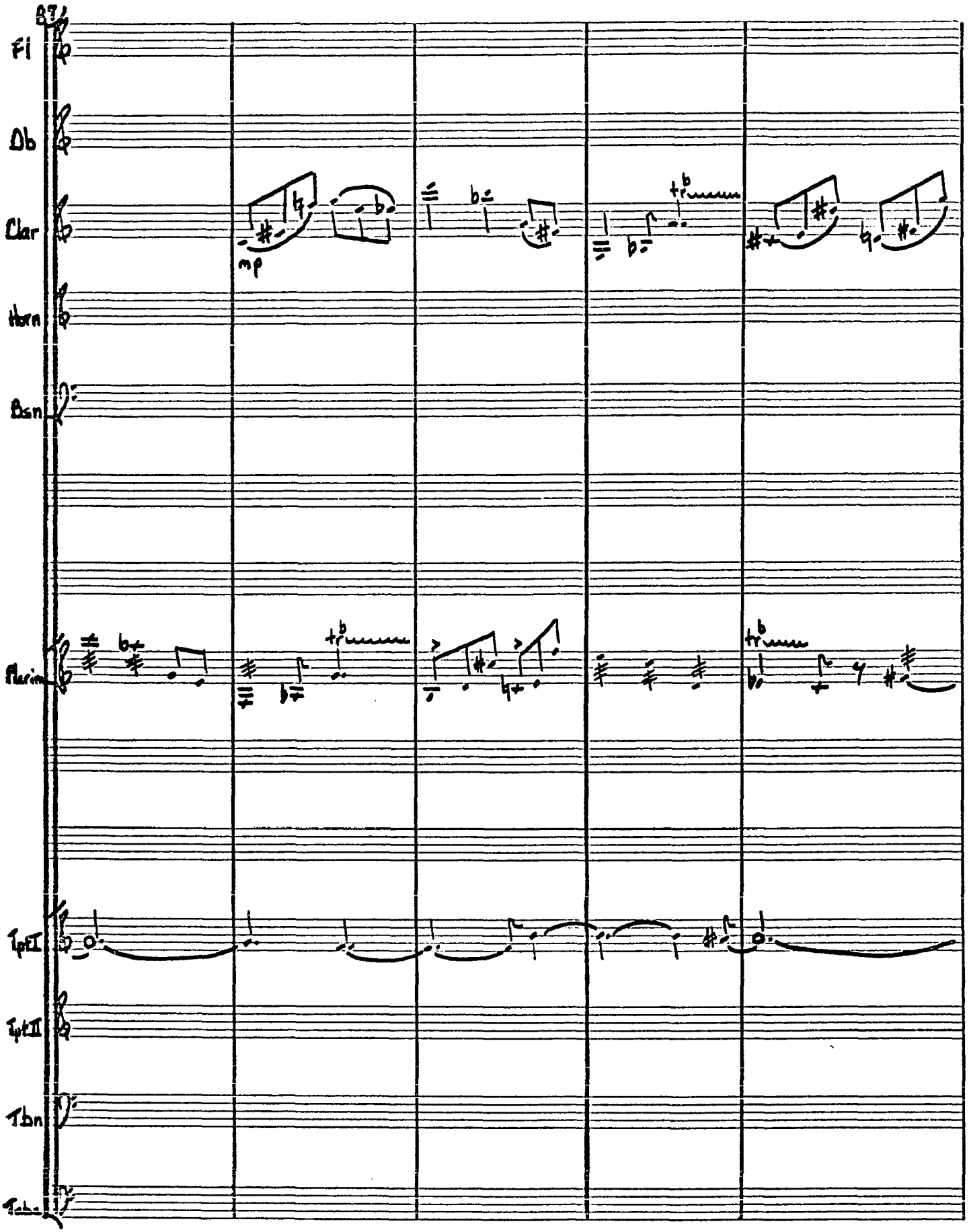

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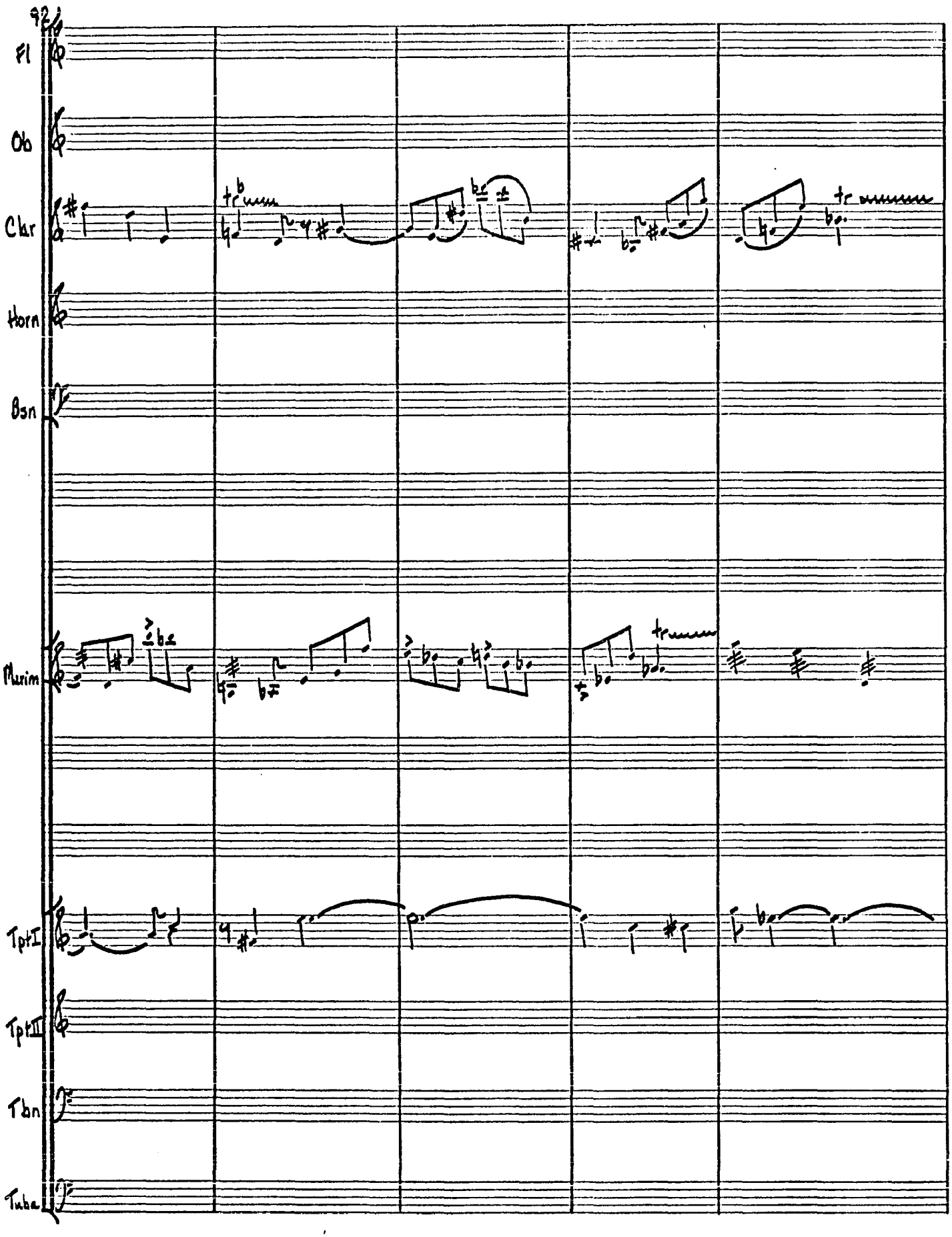

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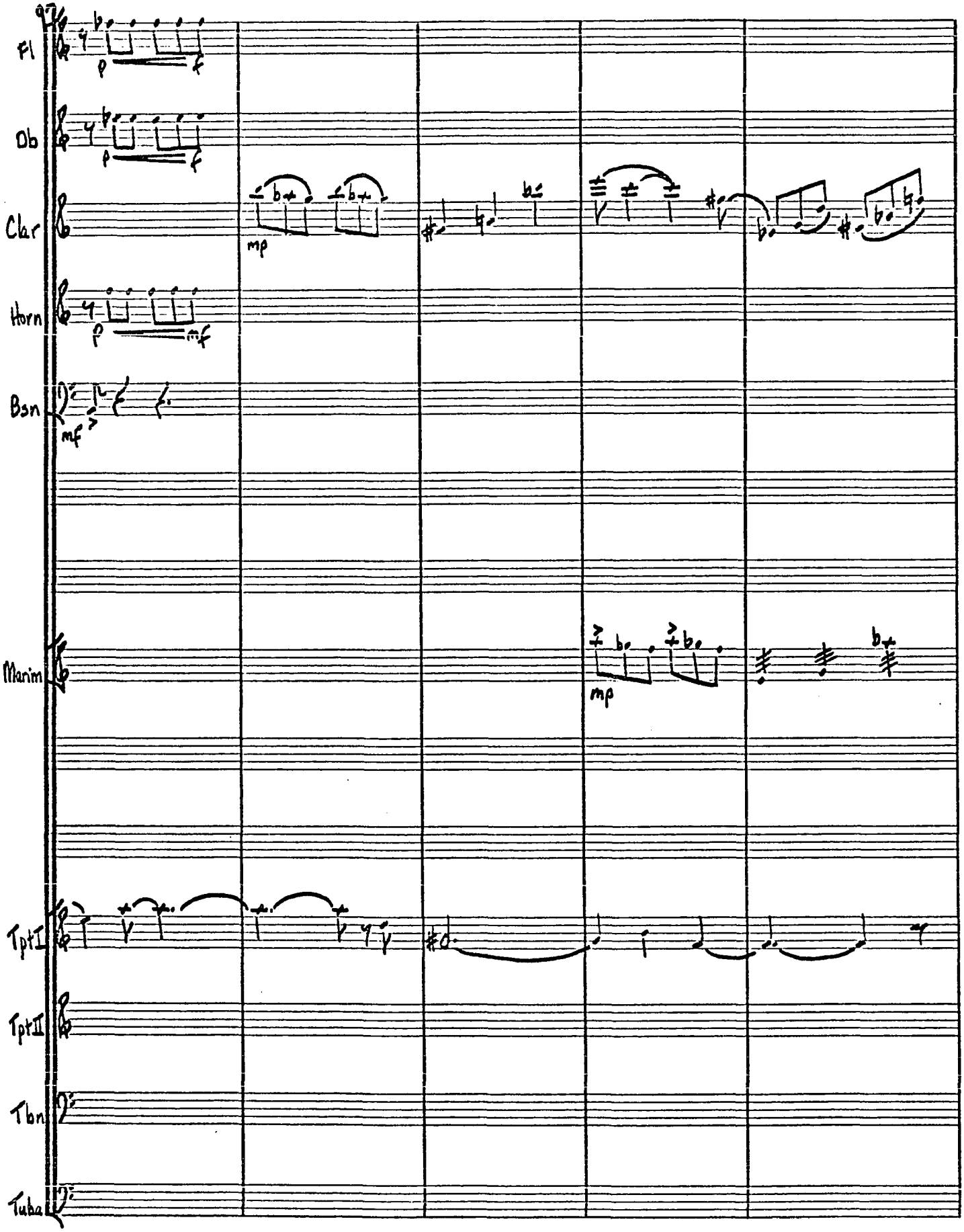

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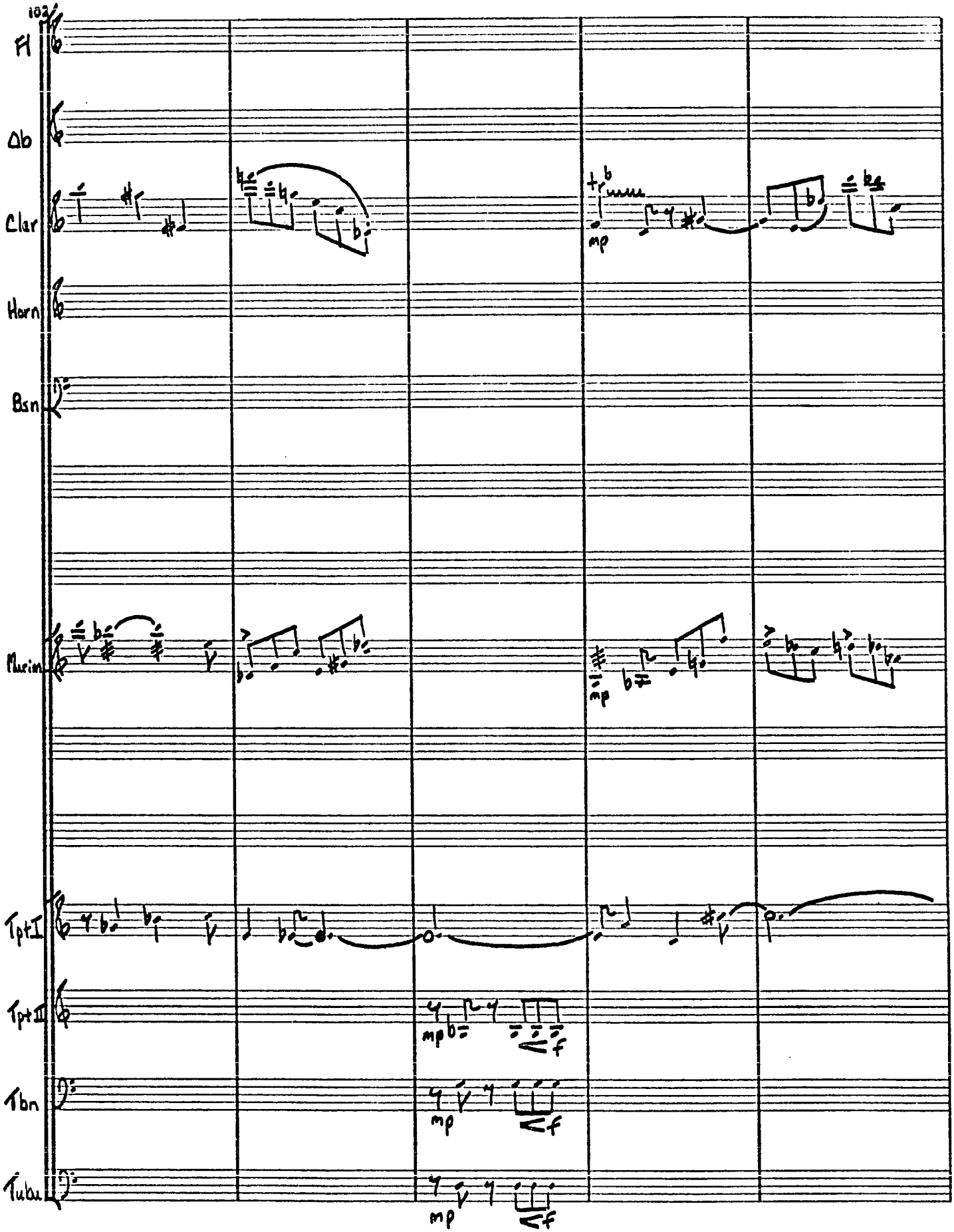

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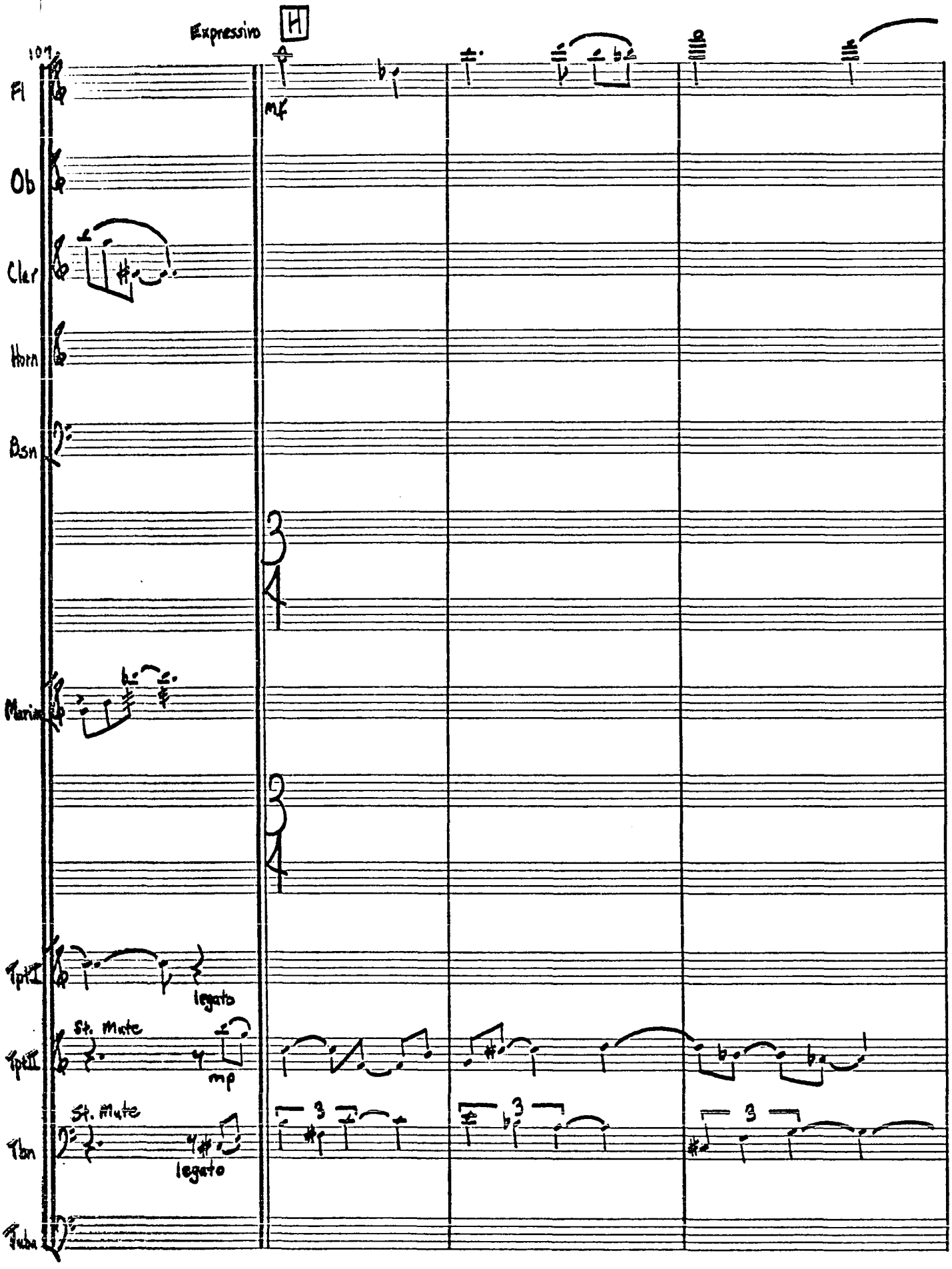

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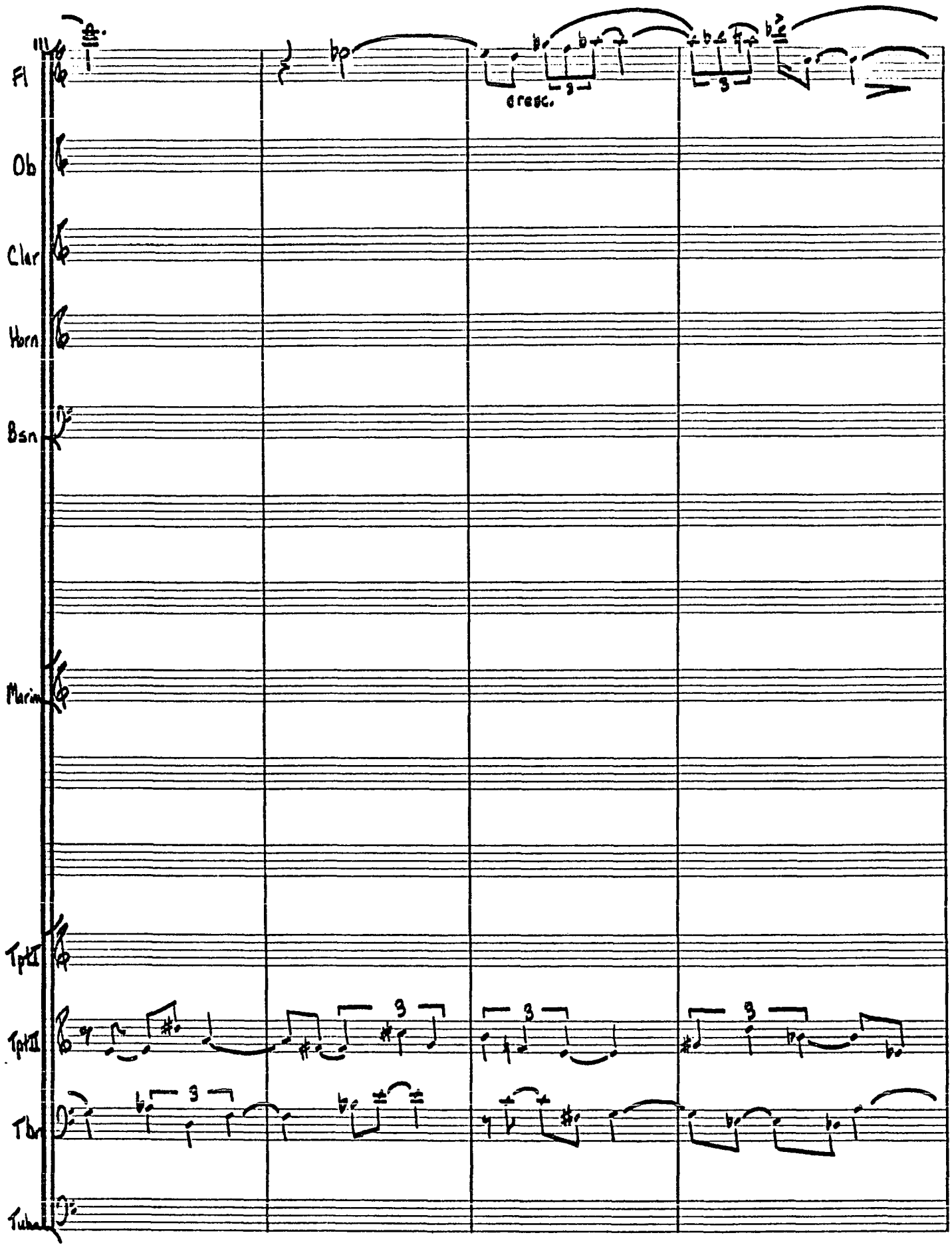

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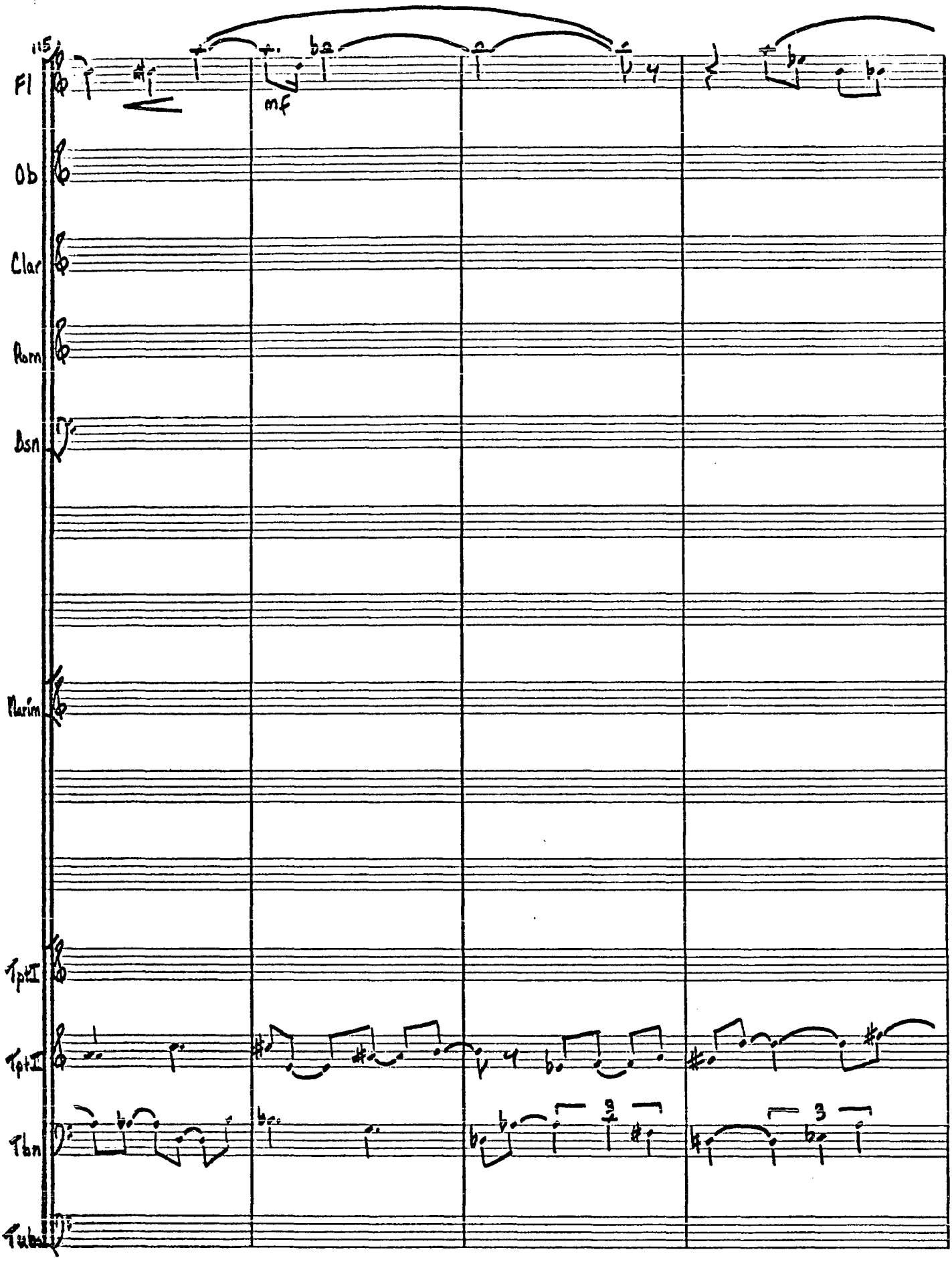

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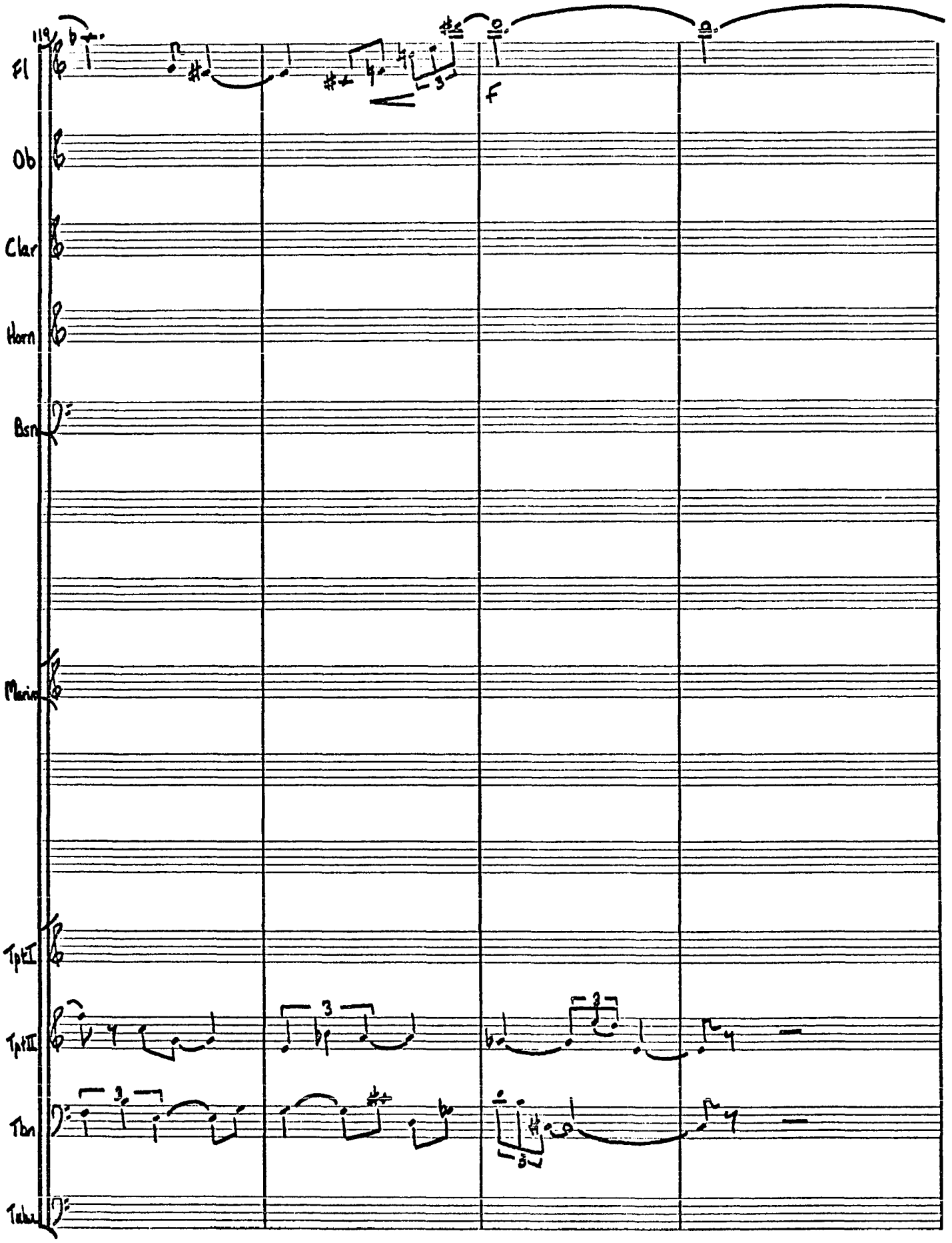

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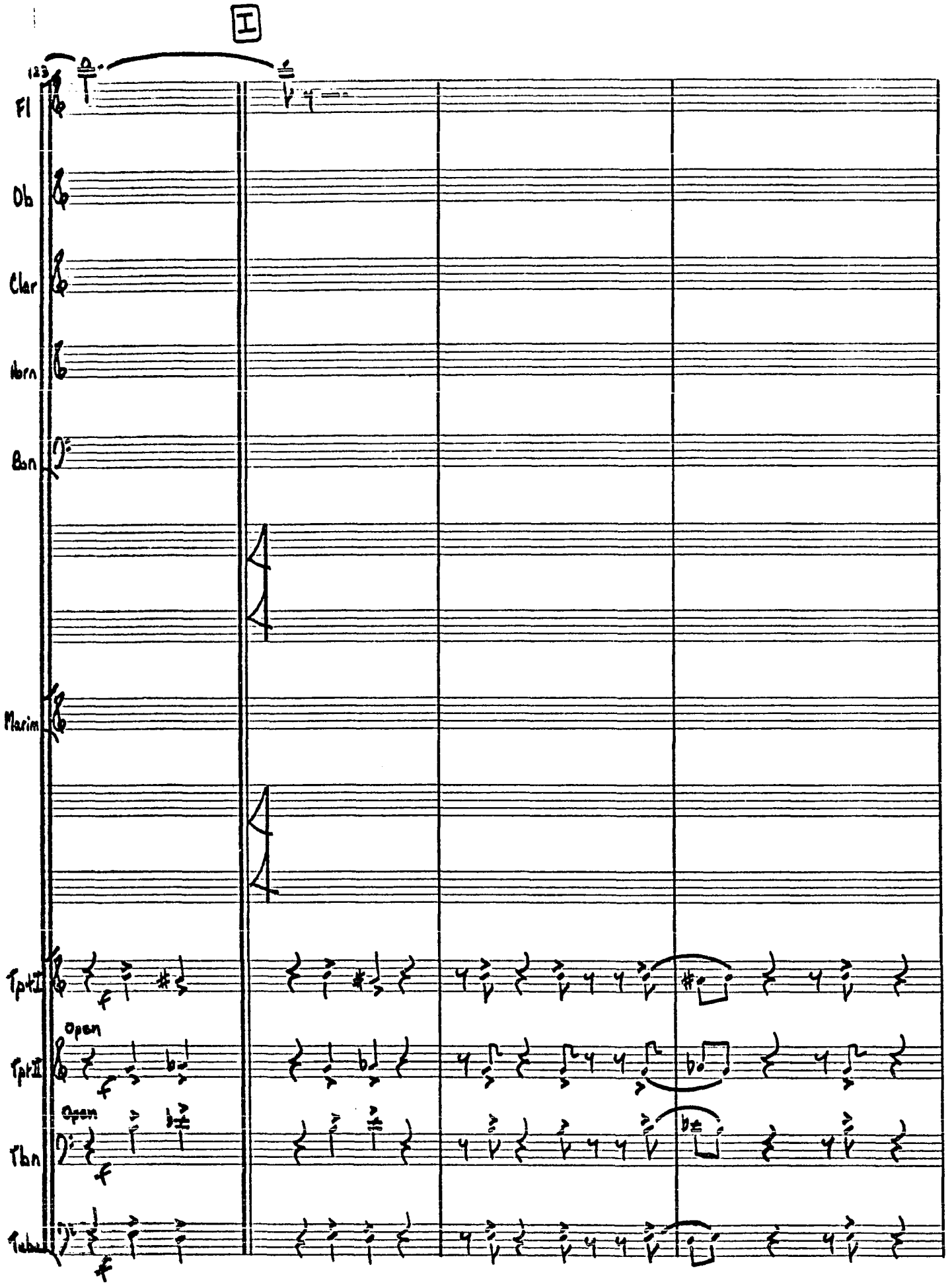

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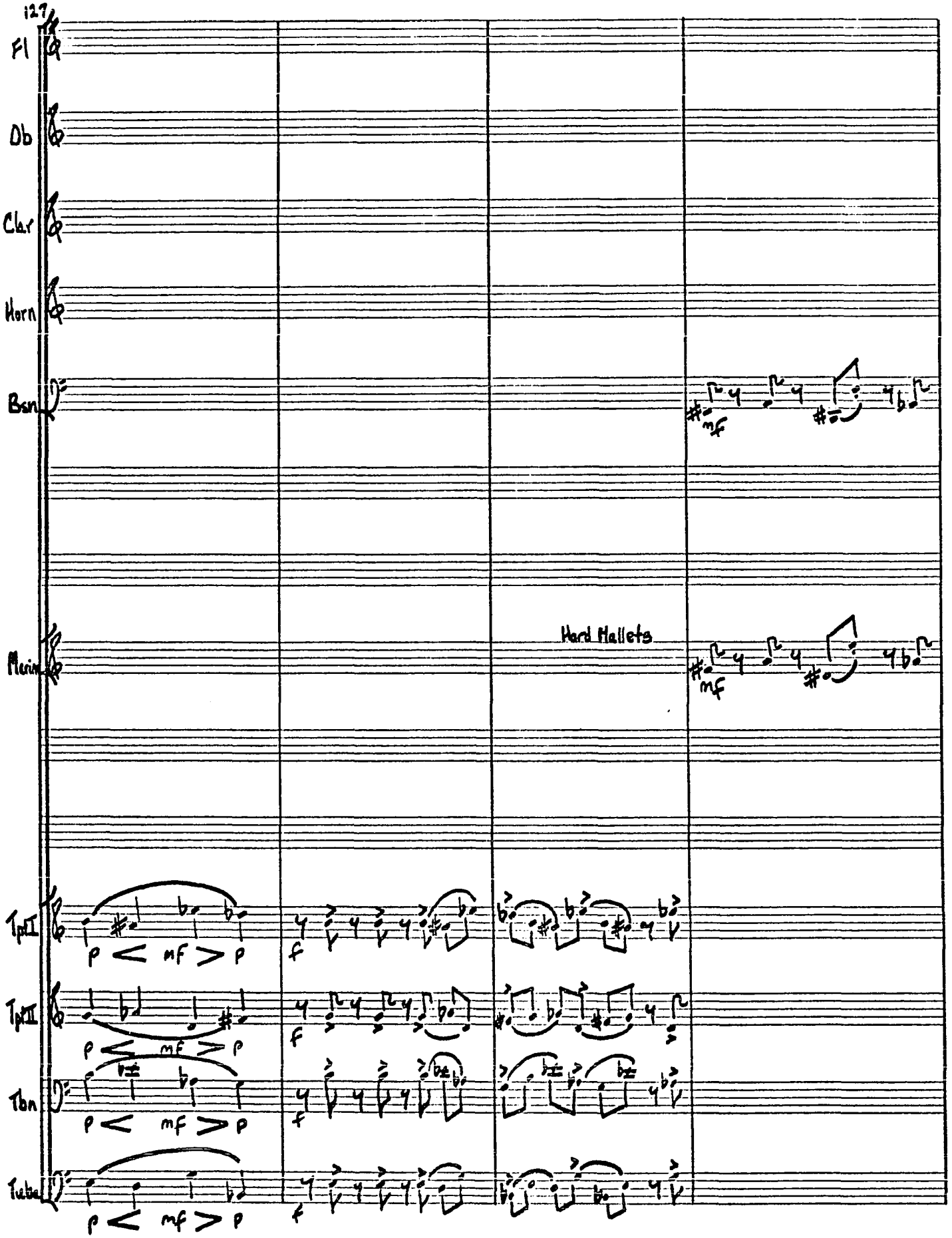

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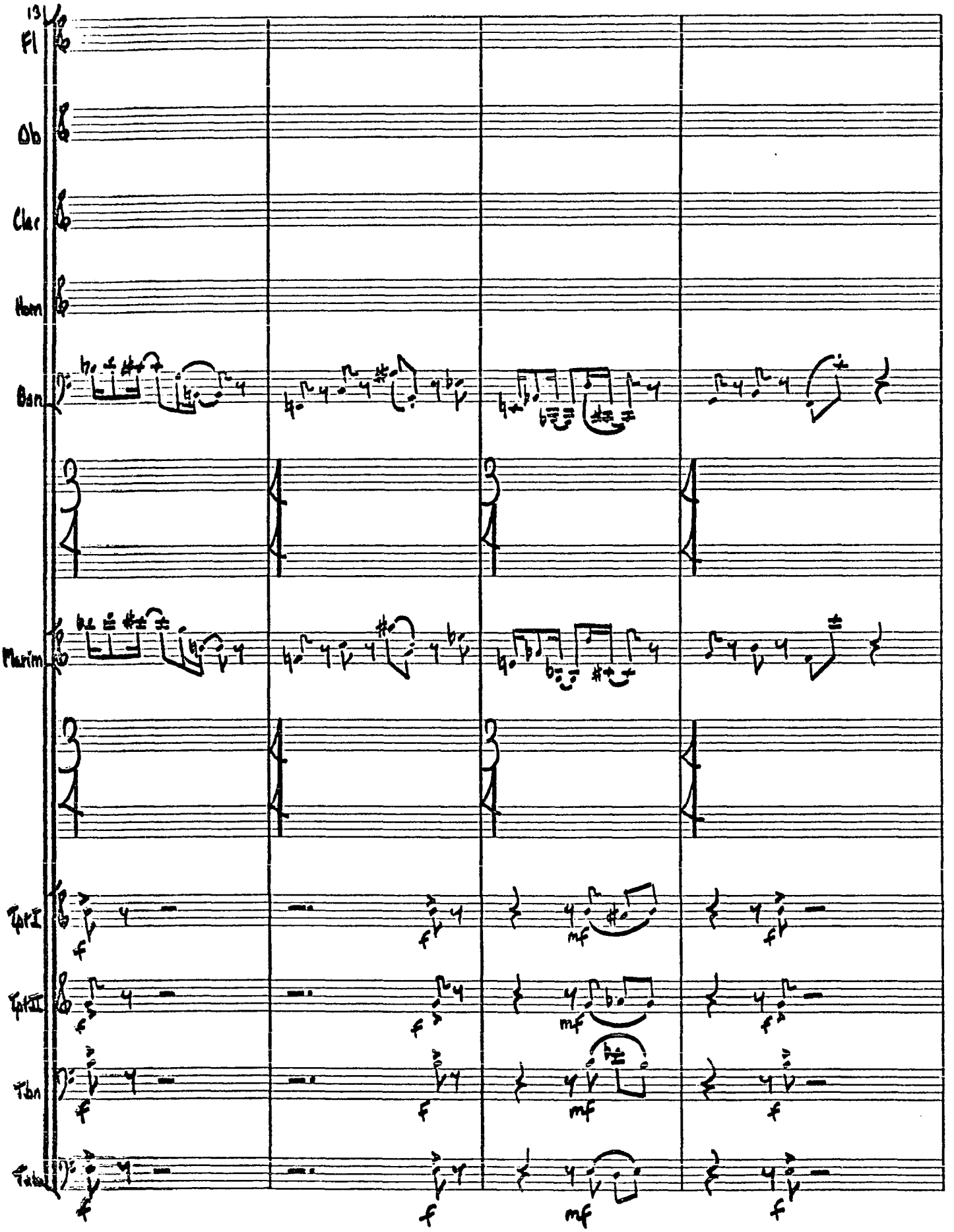

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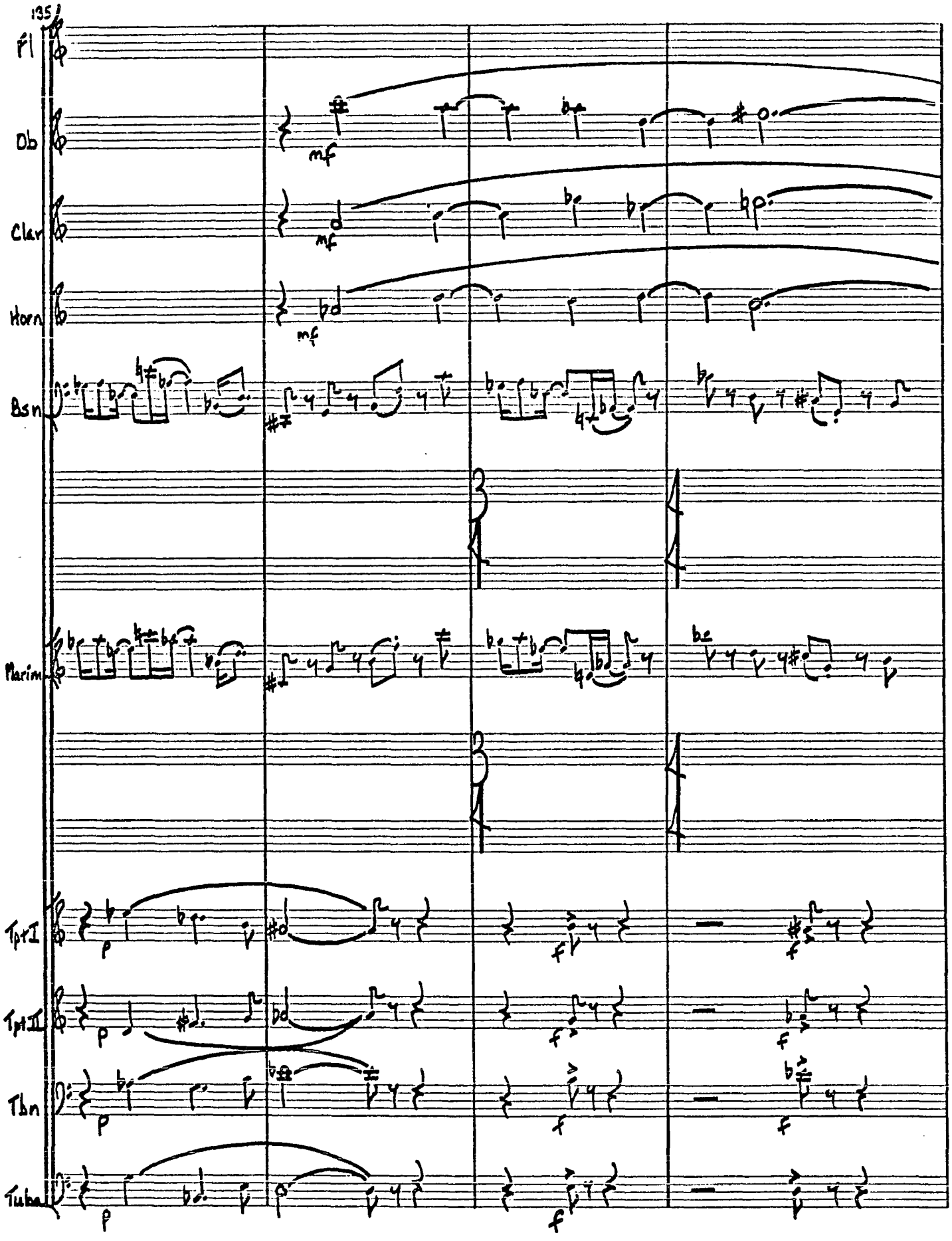

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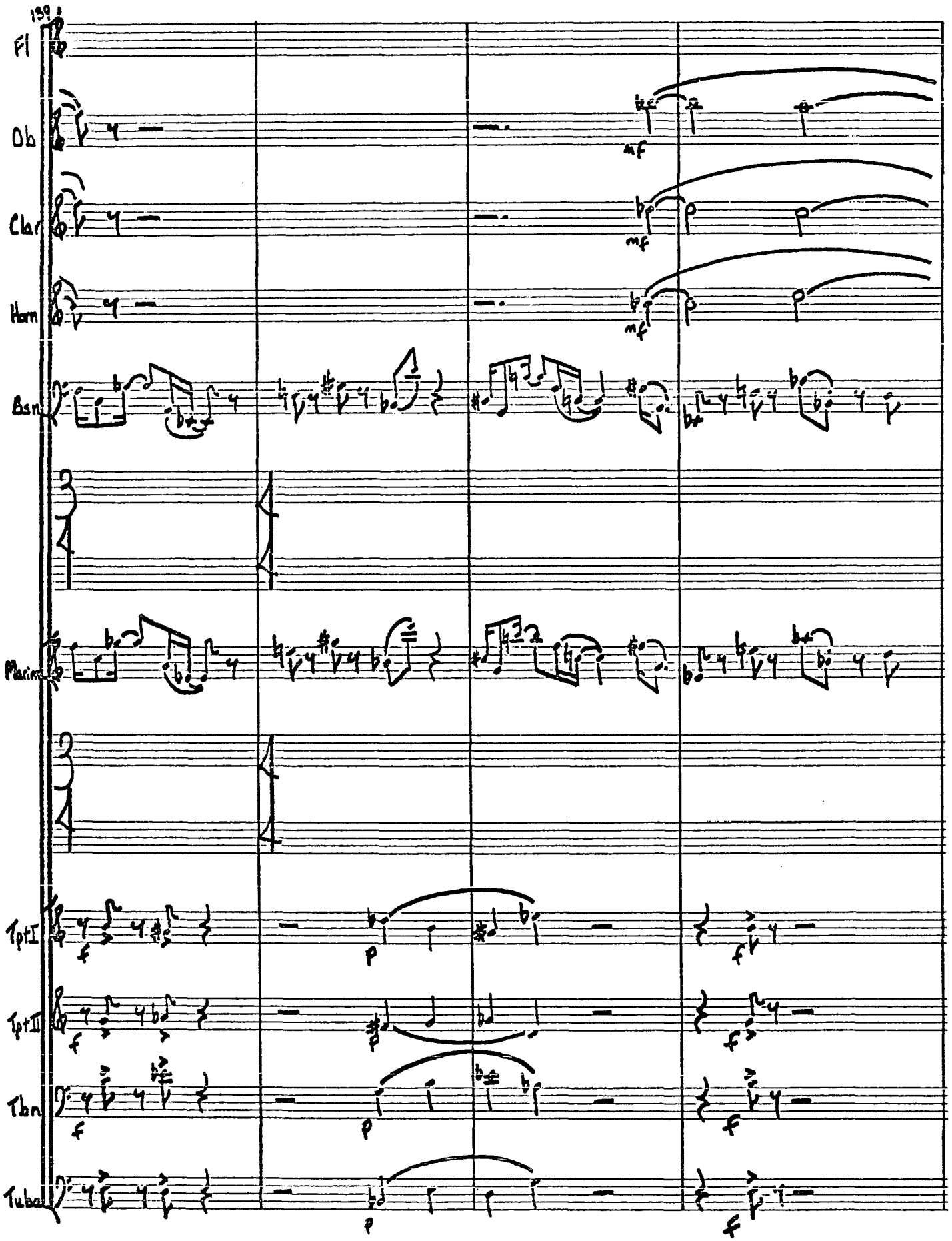

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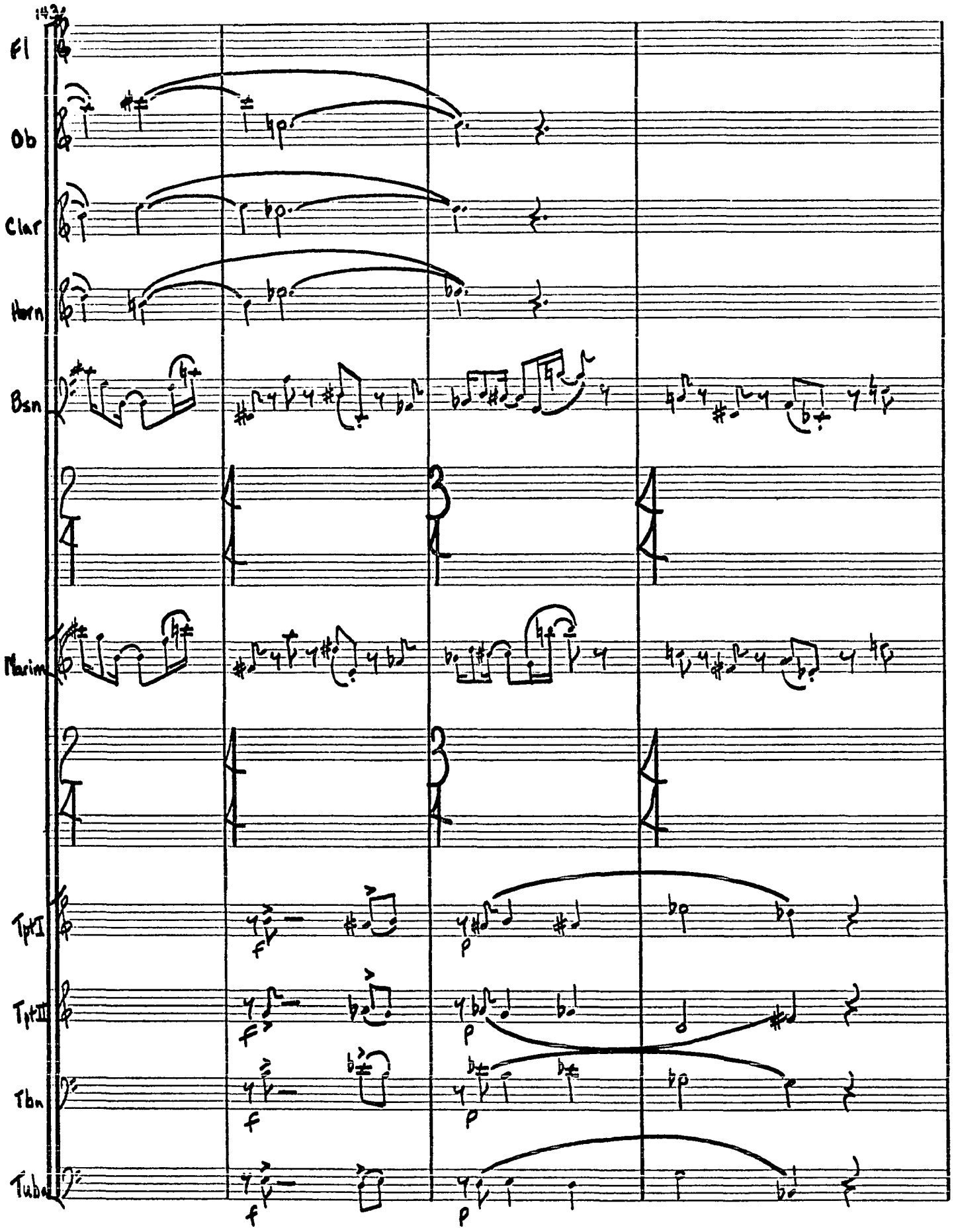

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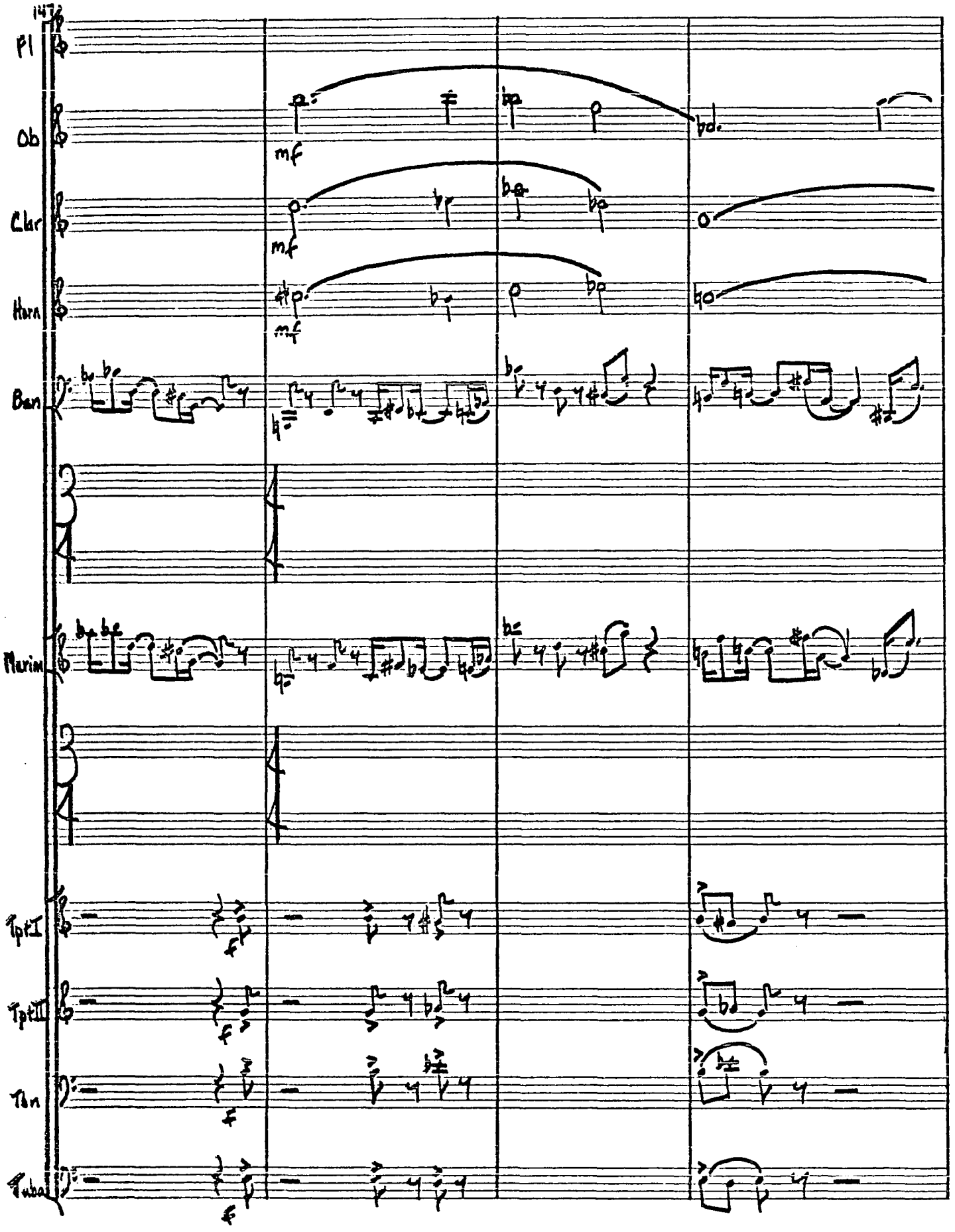

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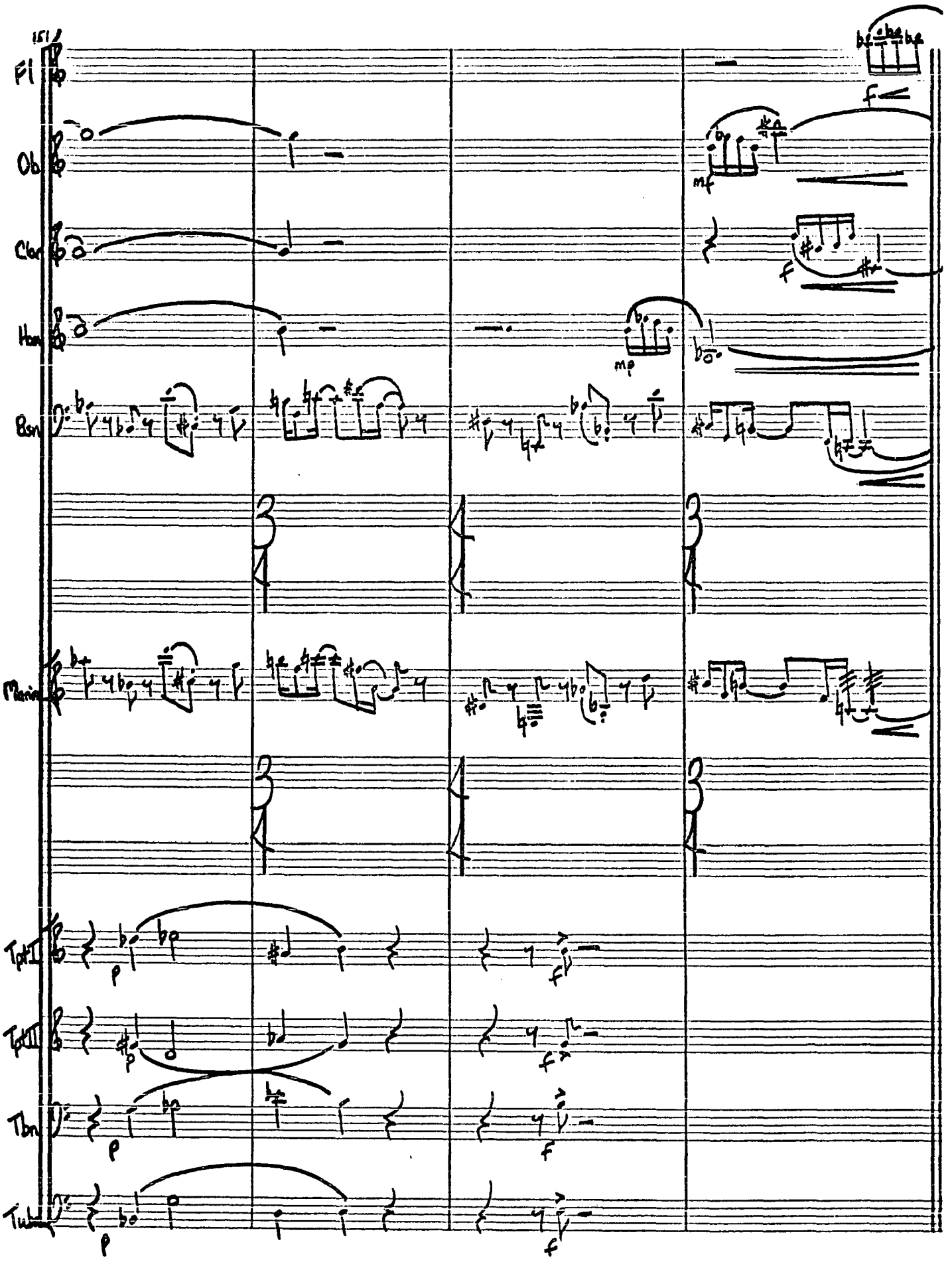

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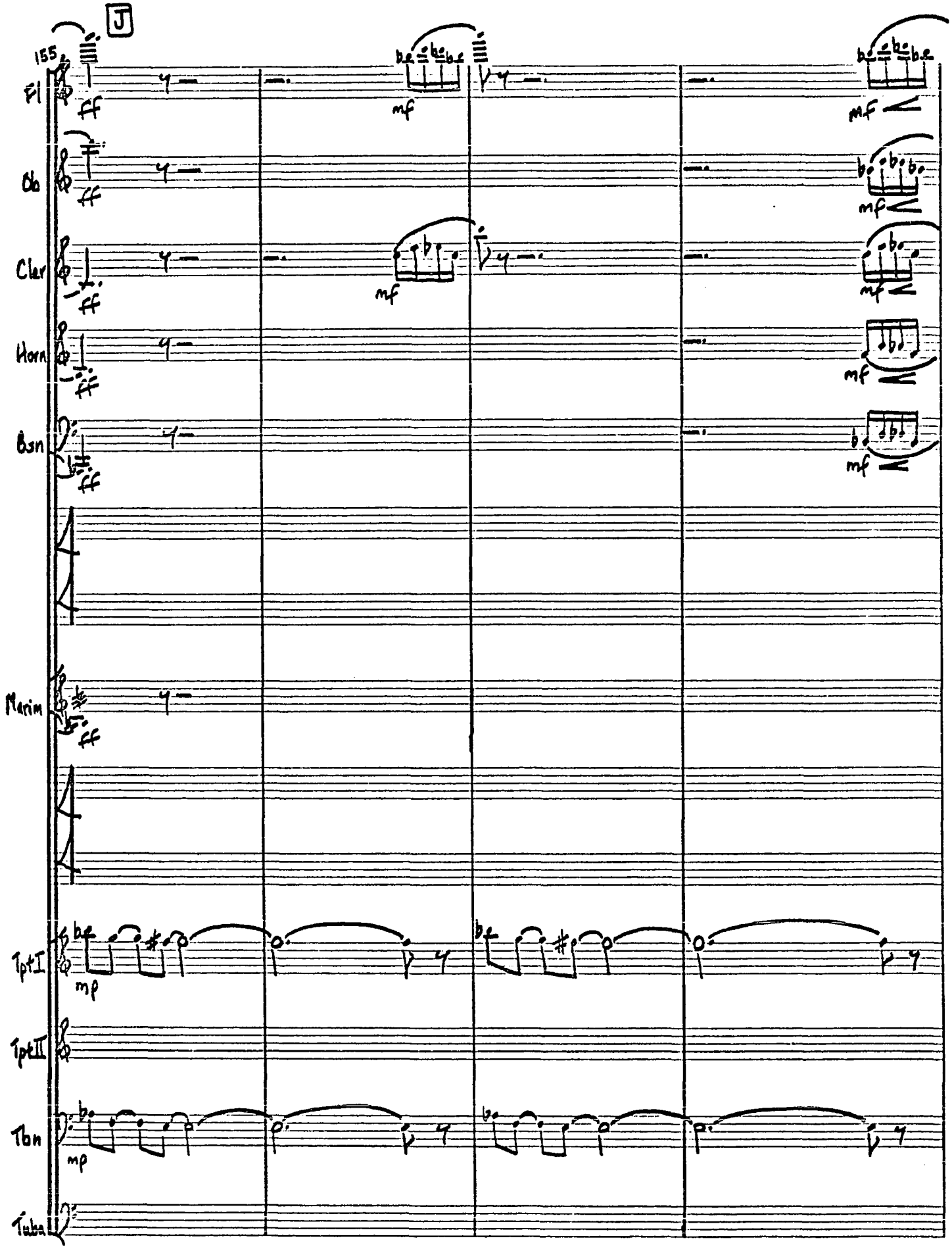

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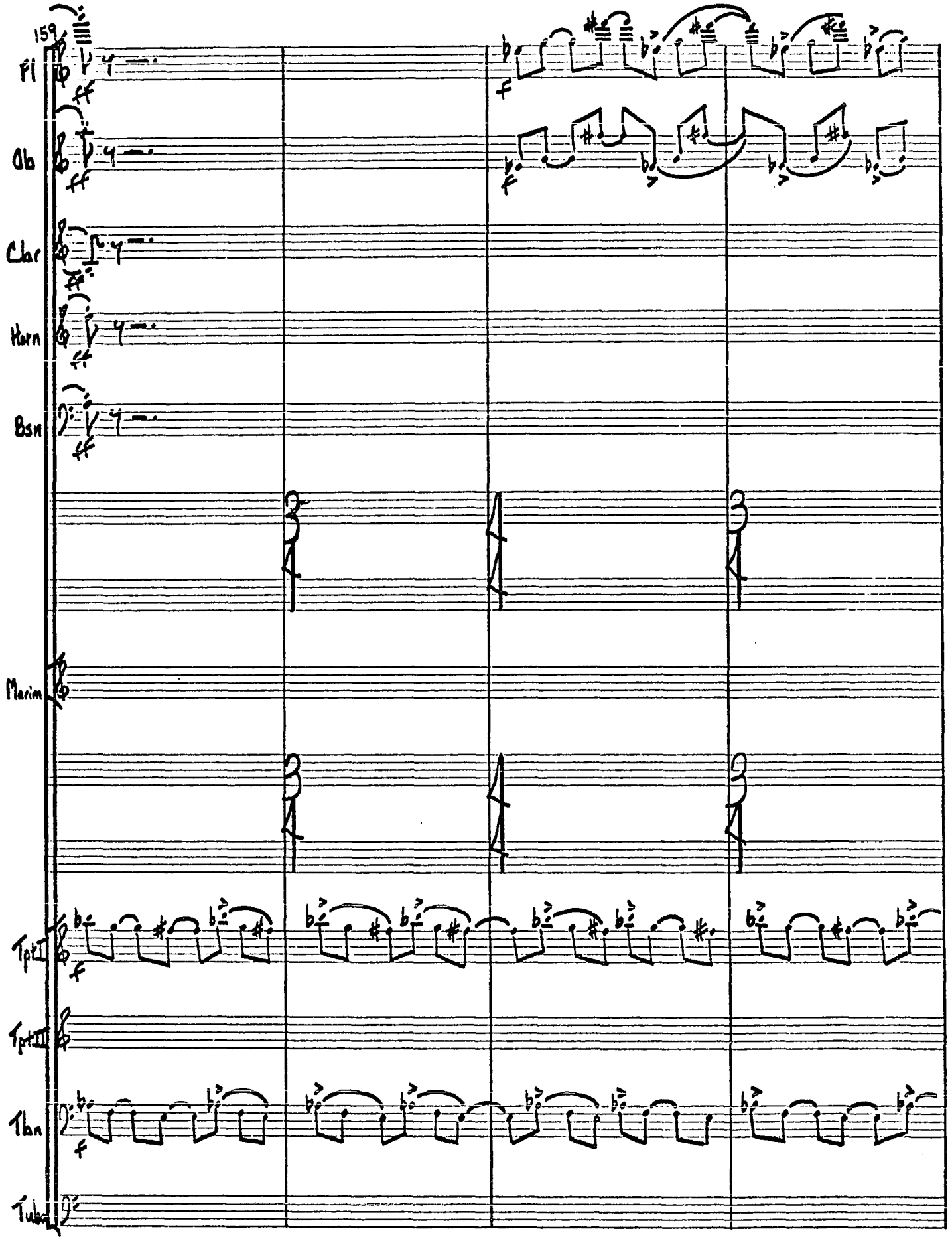
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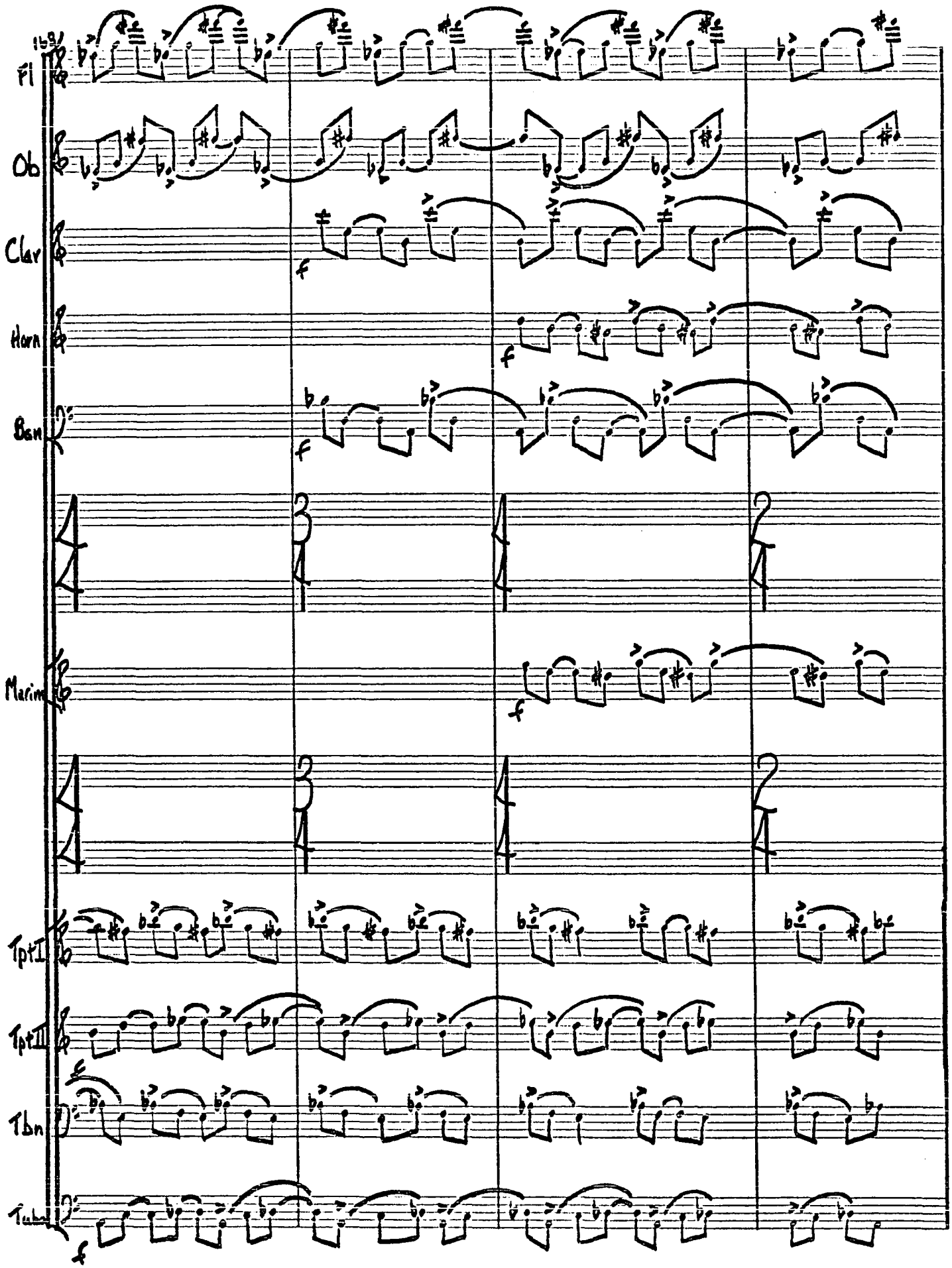

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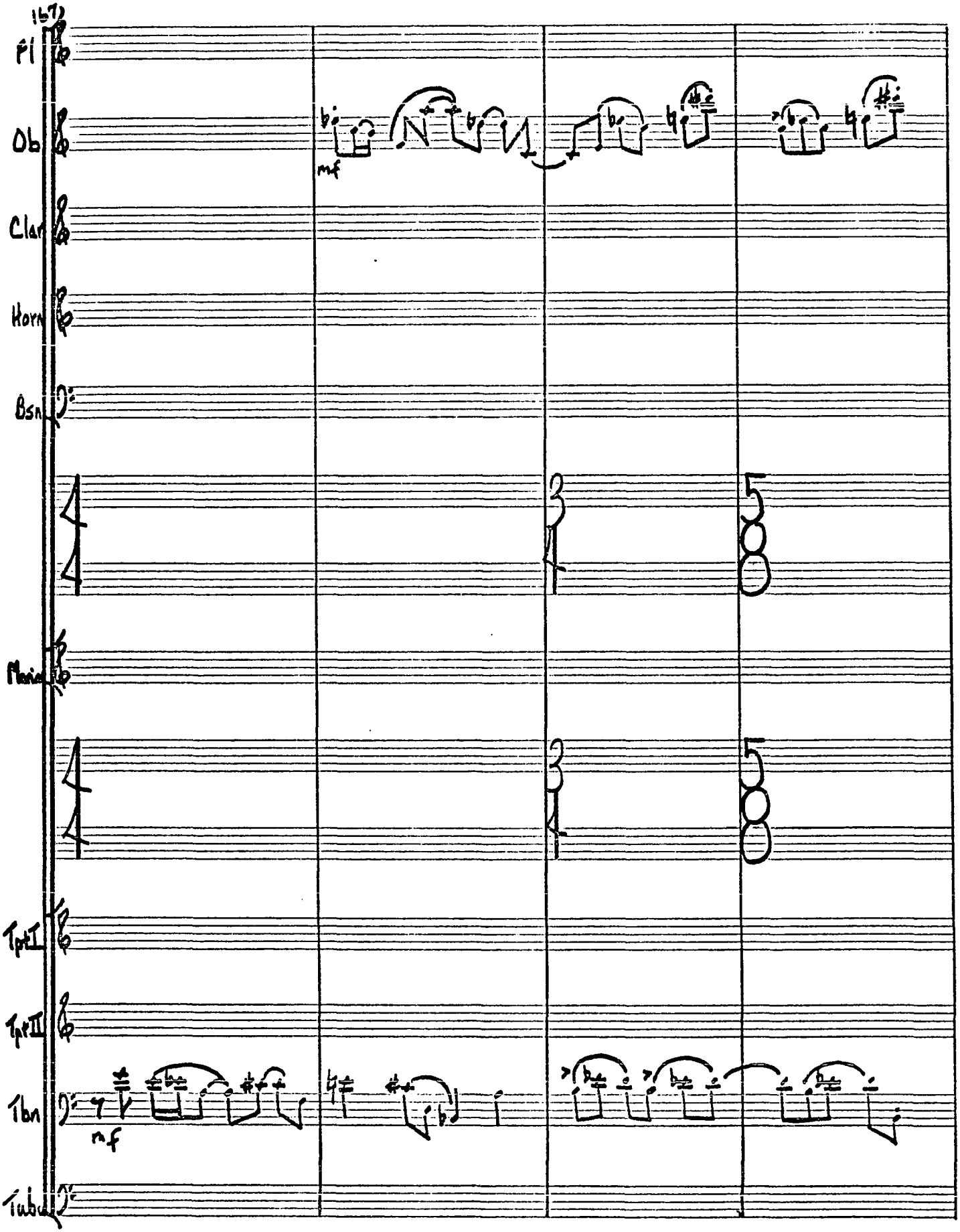

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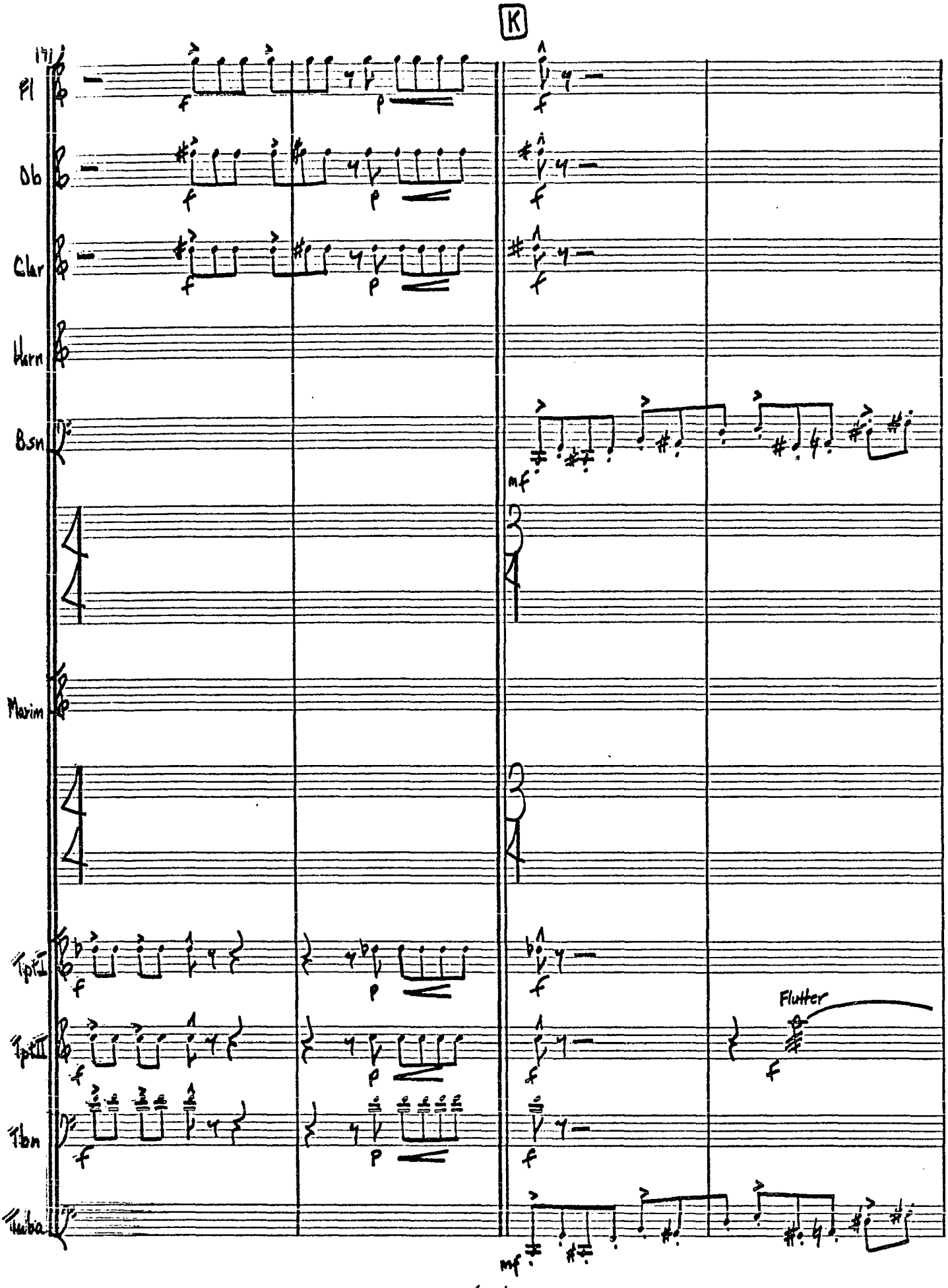

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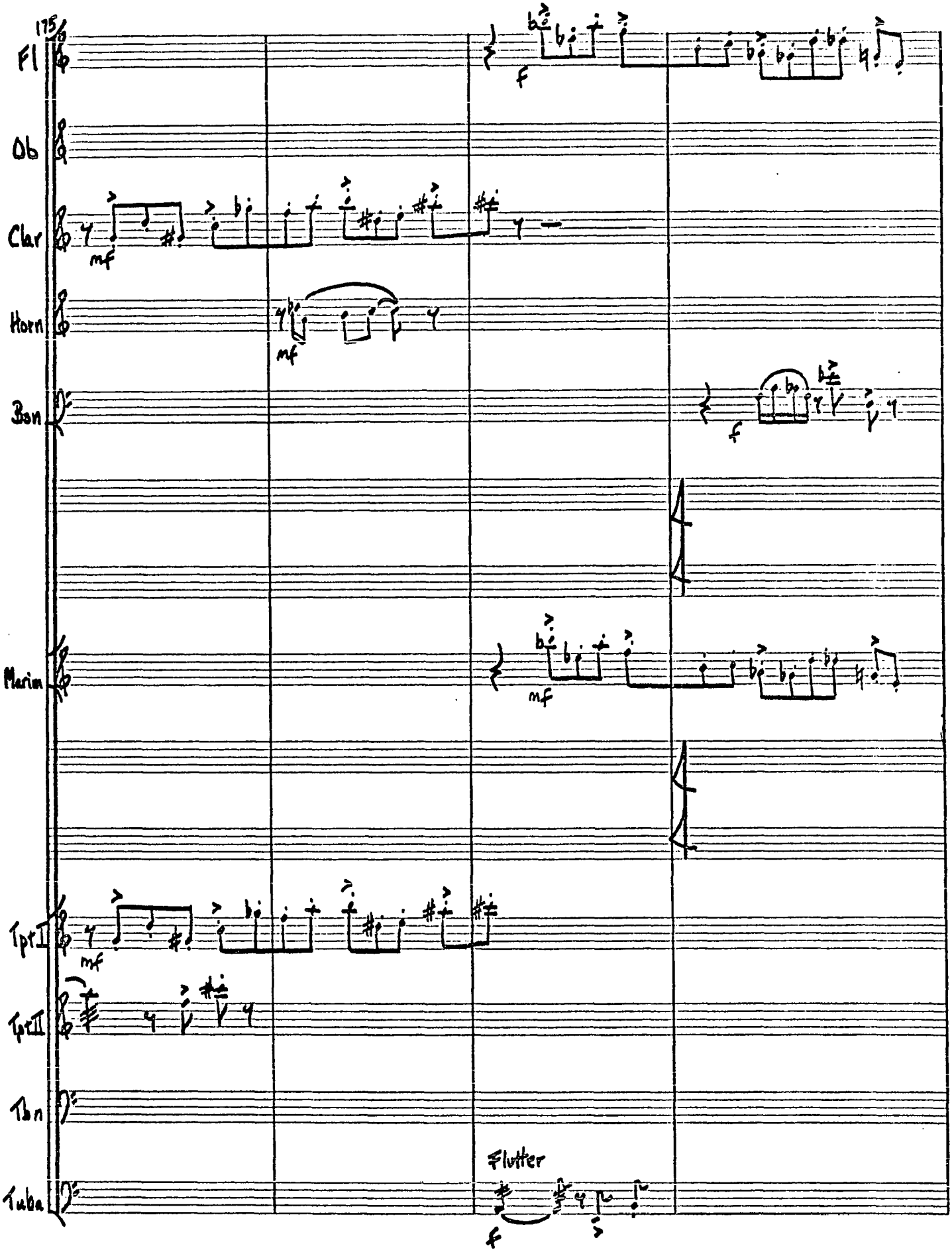

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Hollywood Calif
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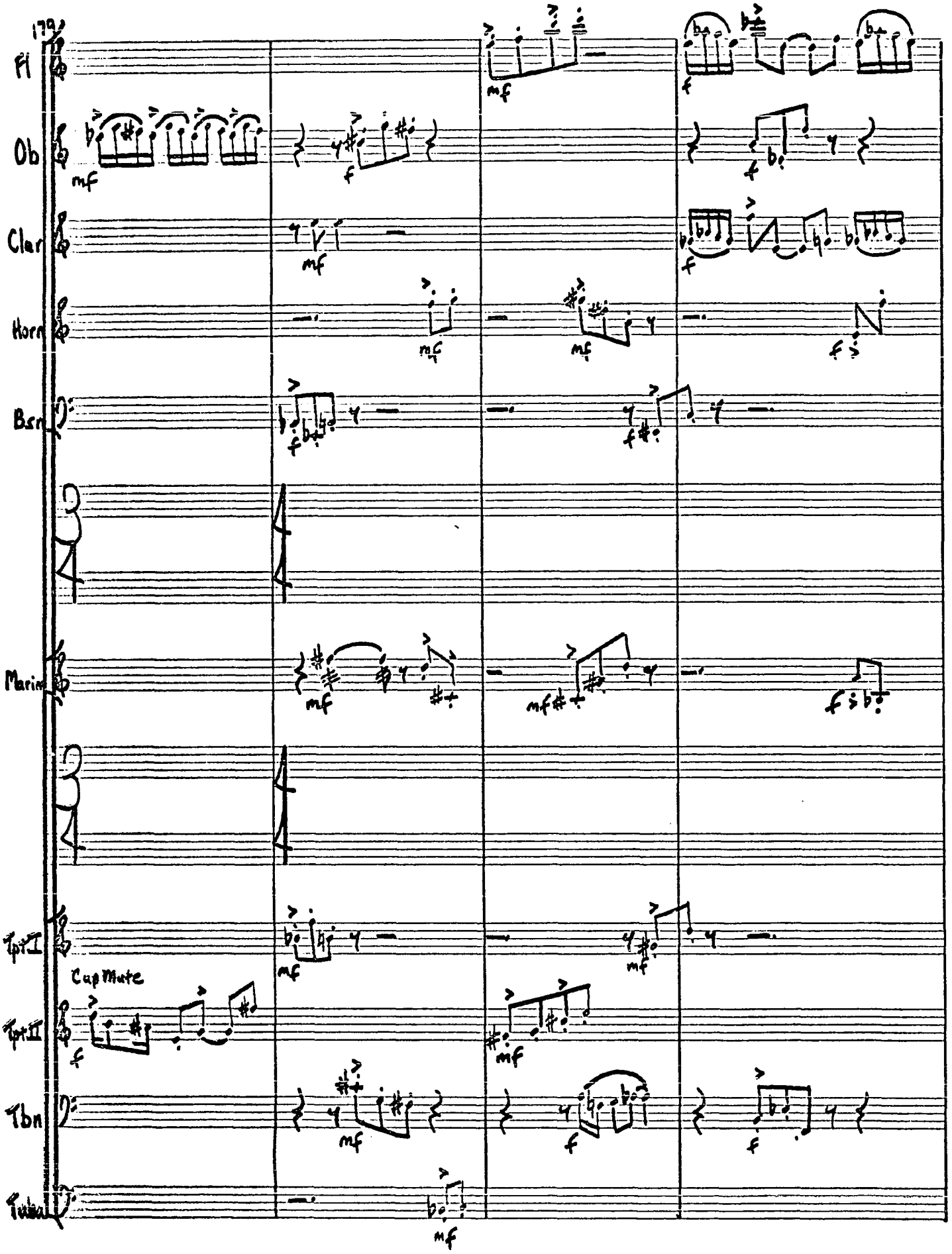
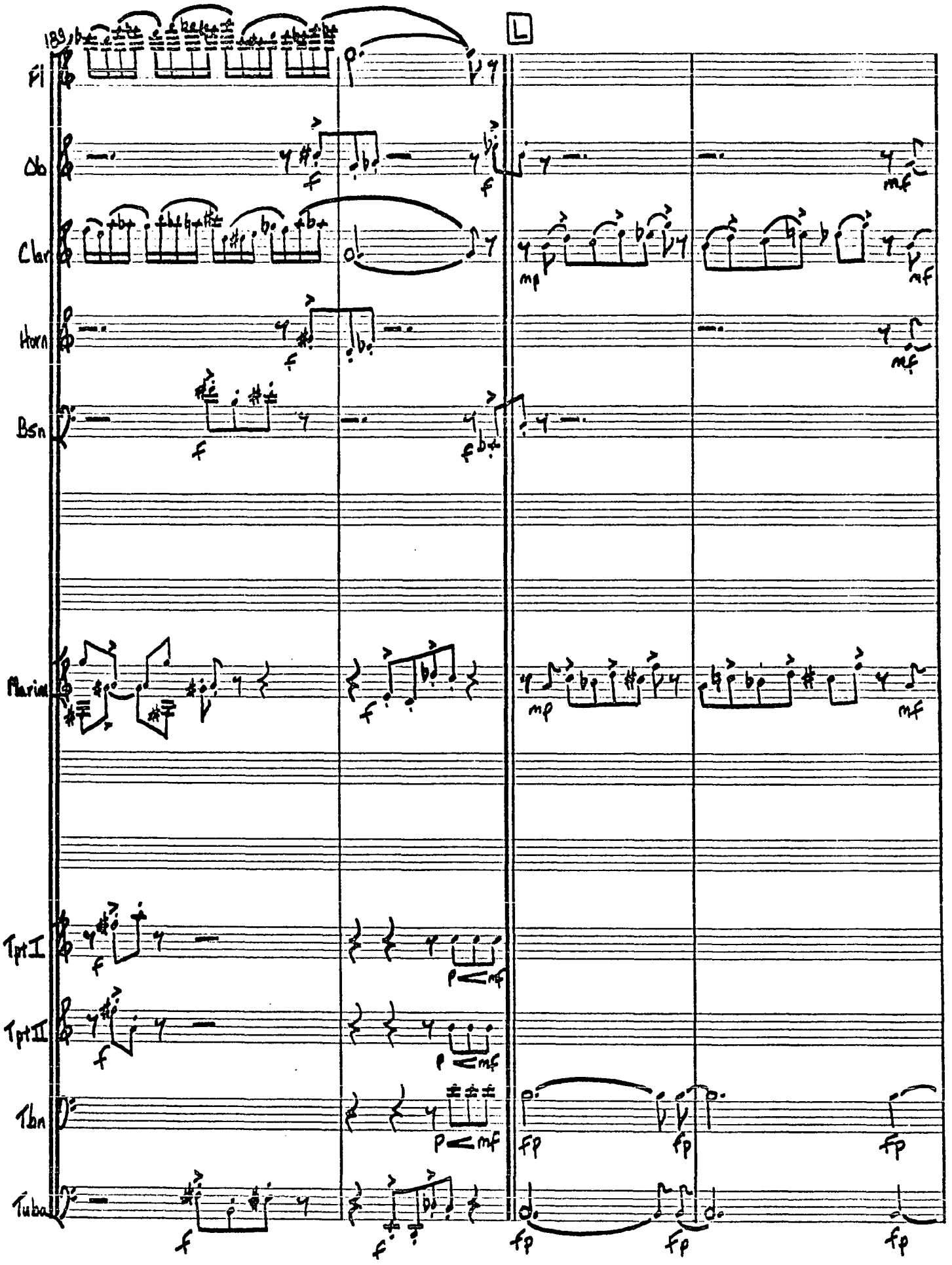
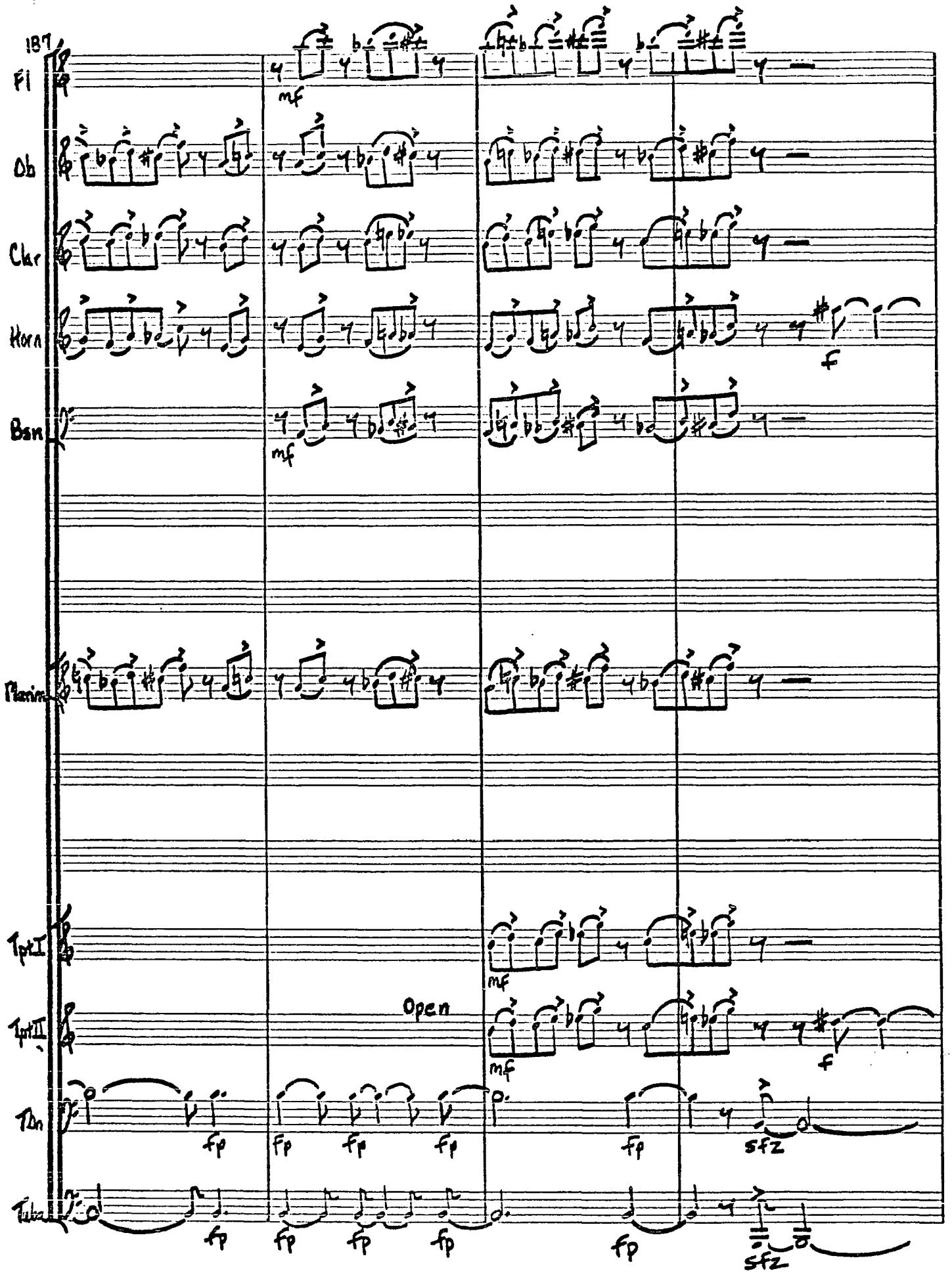


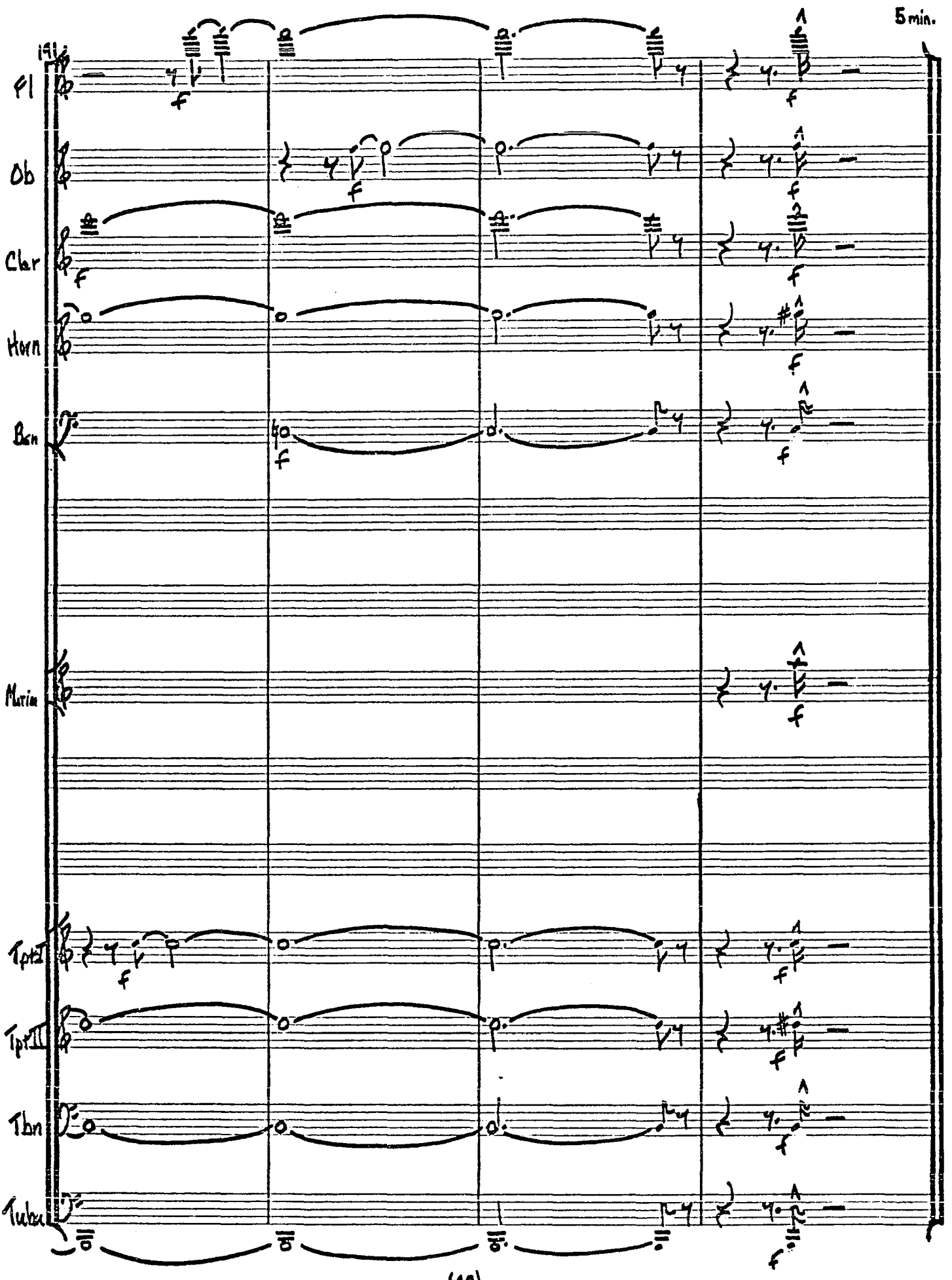
Alphouse Music Corp
Hollywood, Calif
V 44



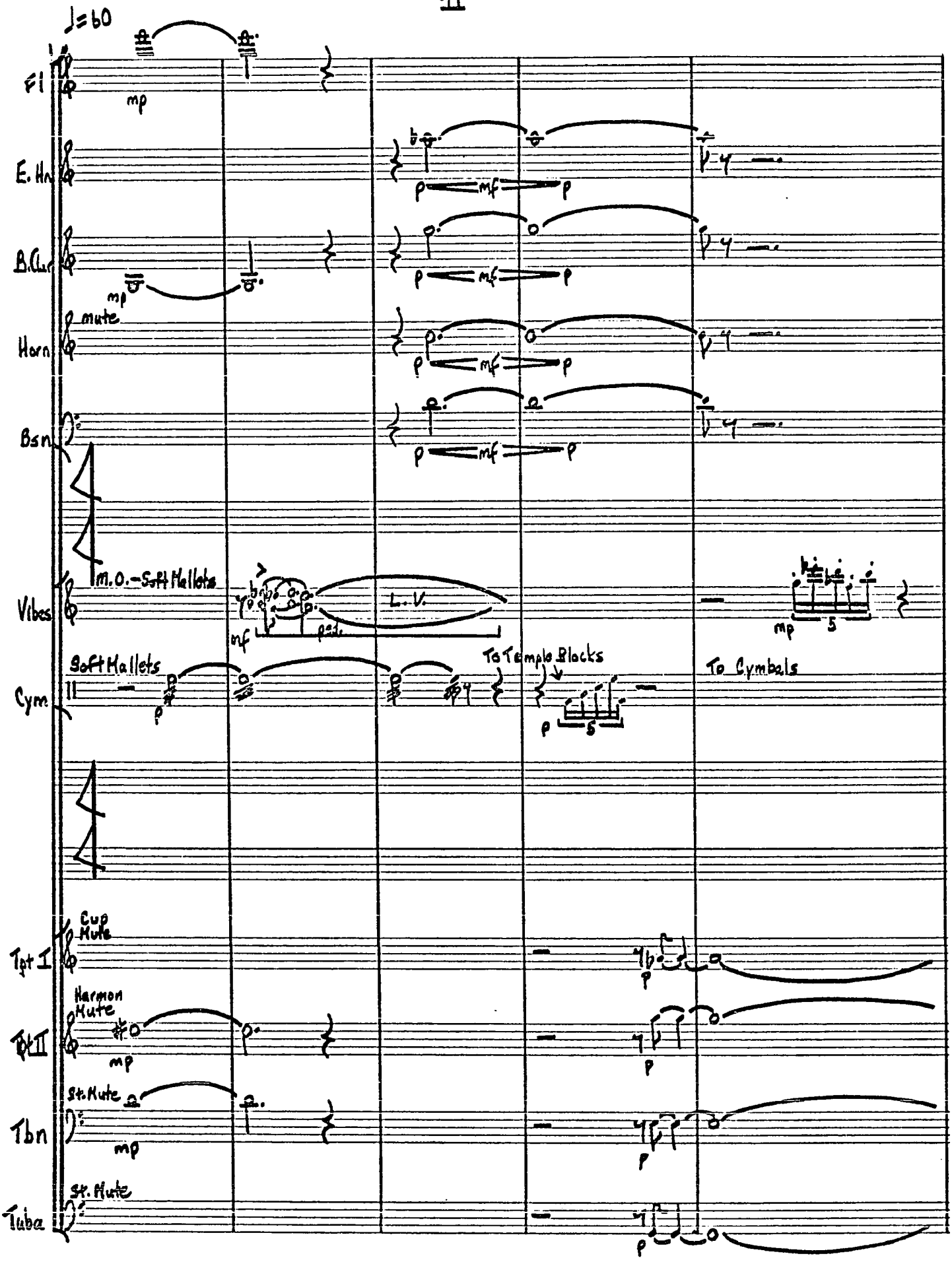
Alpheus Music Corp
Hollywood Calif
V 44



Alpheus Music Corp
Hollywood, Calif
V 44



Alpheus Music Corp
Hollywood, Calif
V 44



Alpheus Music Corp
Hollywood, Calif
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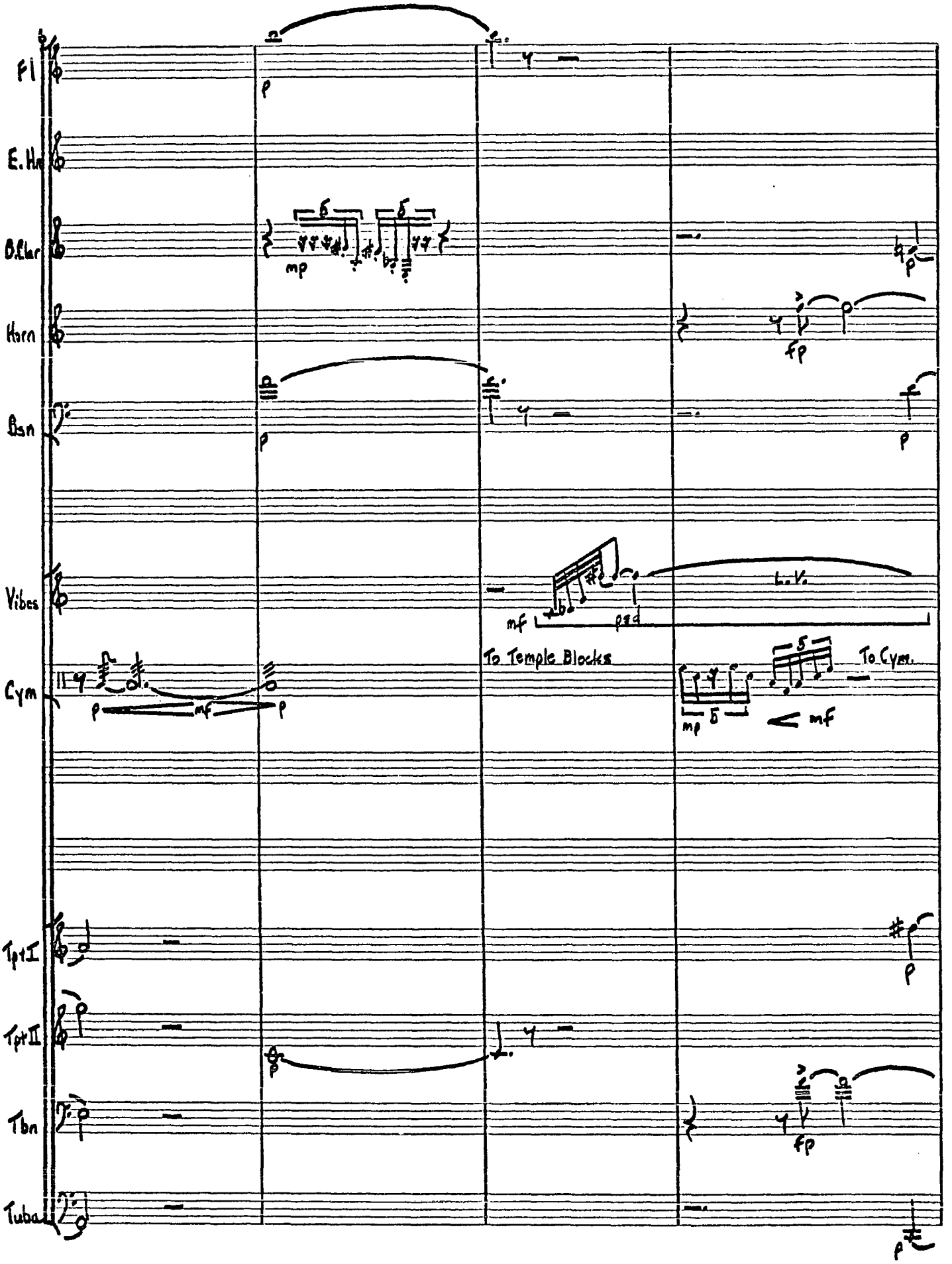
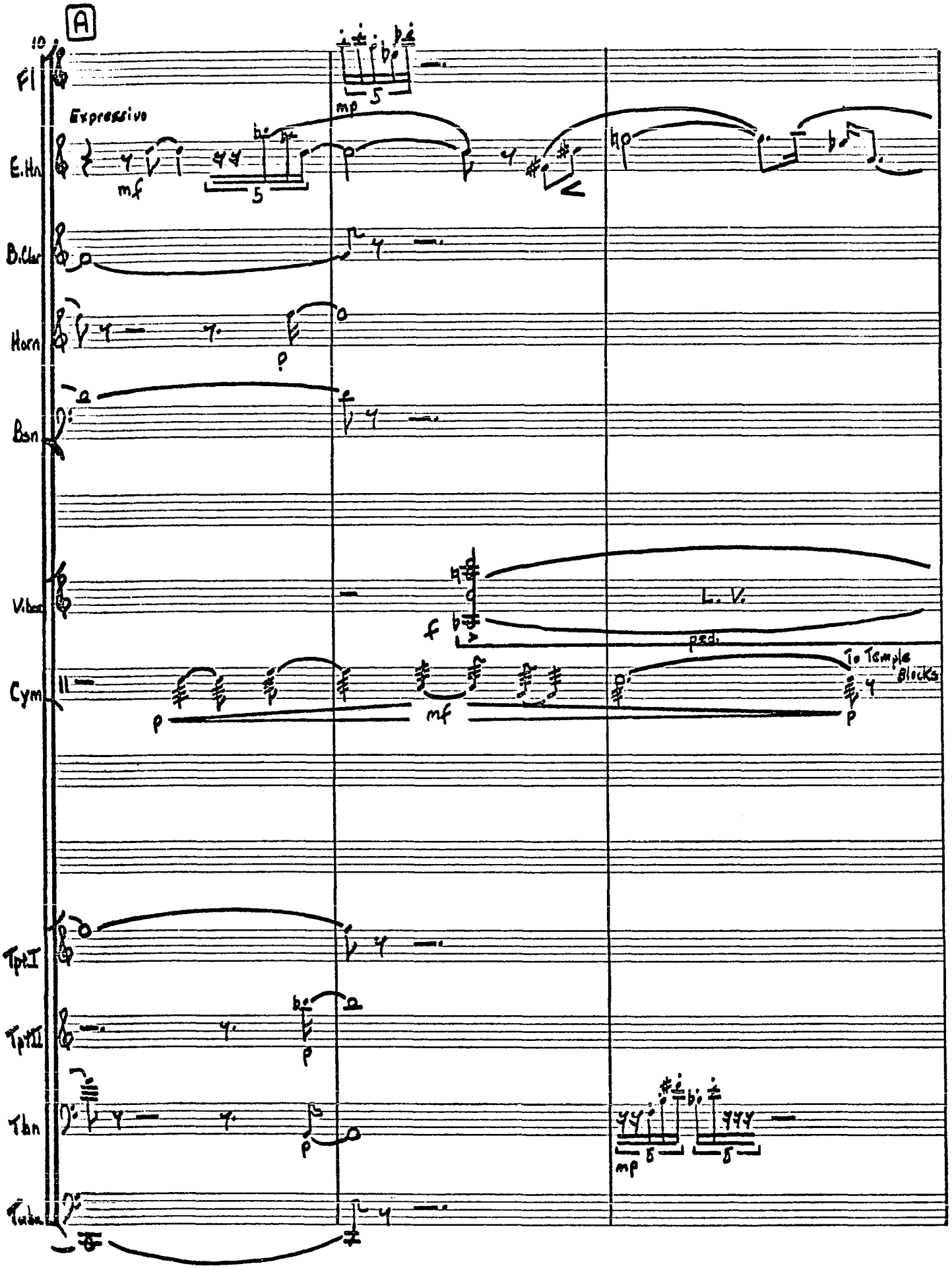


Alpheus Music Corp
Hollywood Calif
V-44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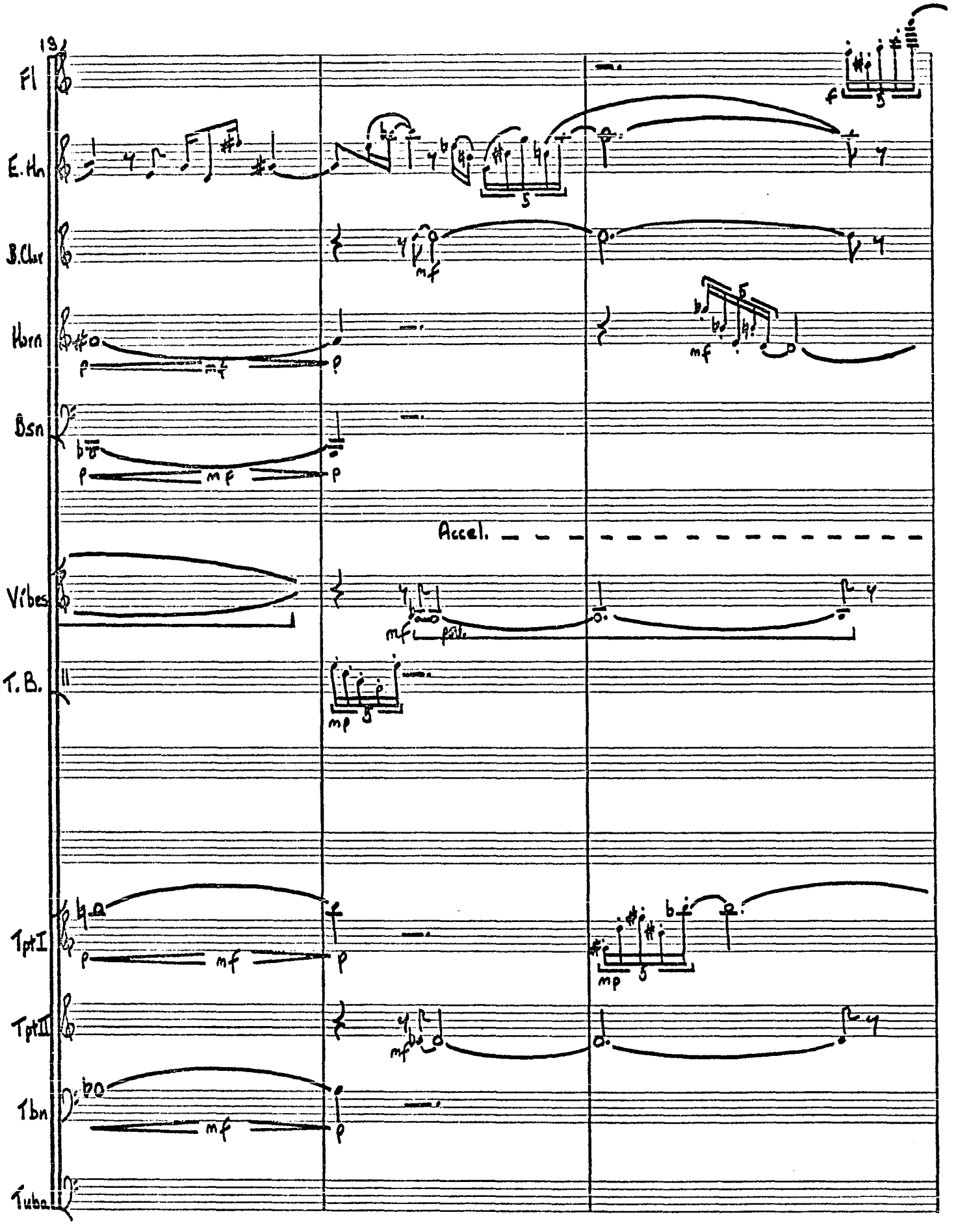

Alpheus Music Corp
Hollywood, Calif
V 44

B

A little faster

16

to Alto Flute

Fl

E.Hn

B.Clar

Horn

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Vibes

T.B.

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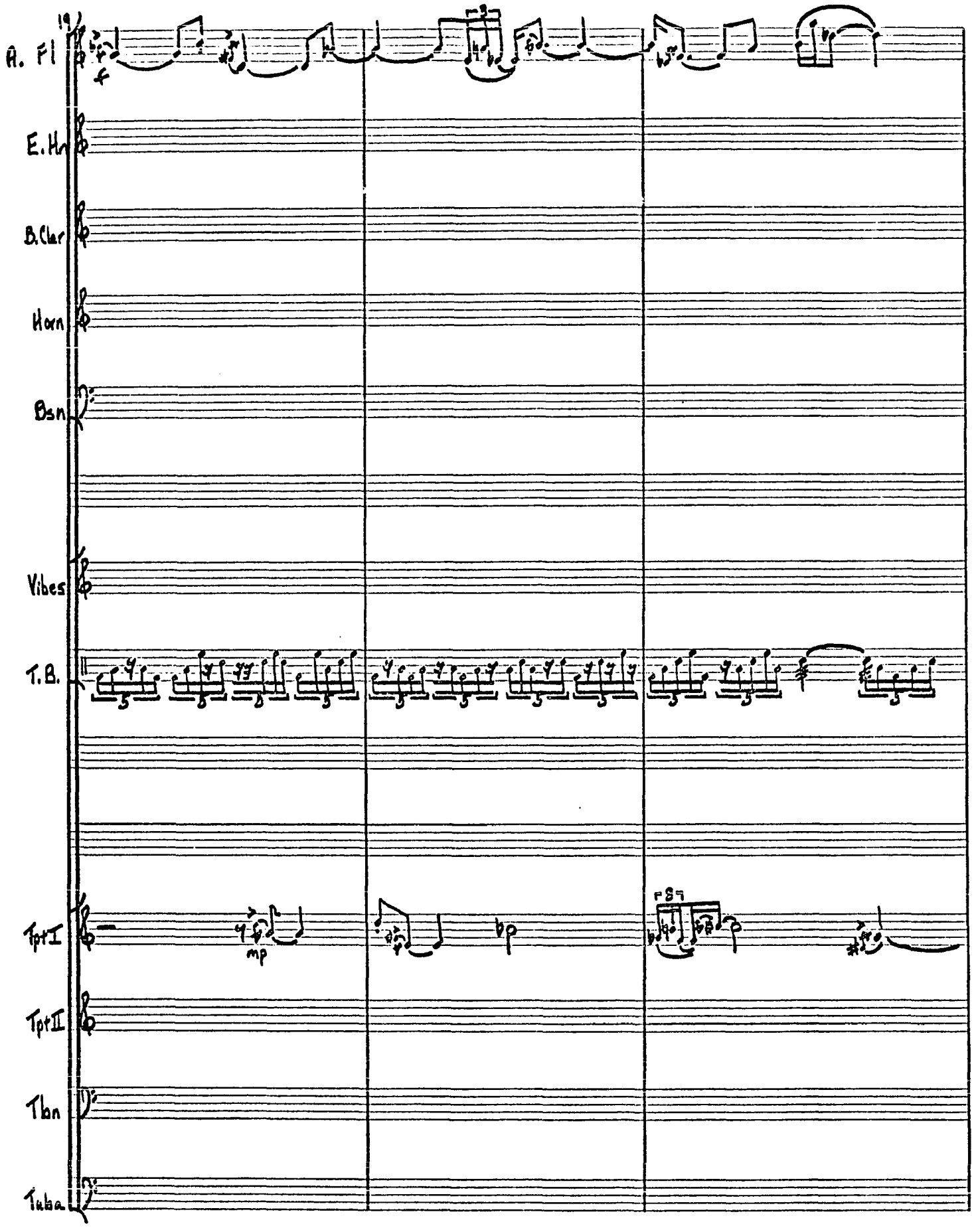
TptII

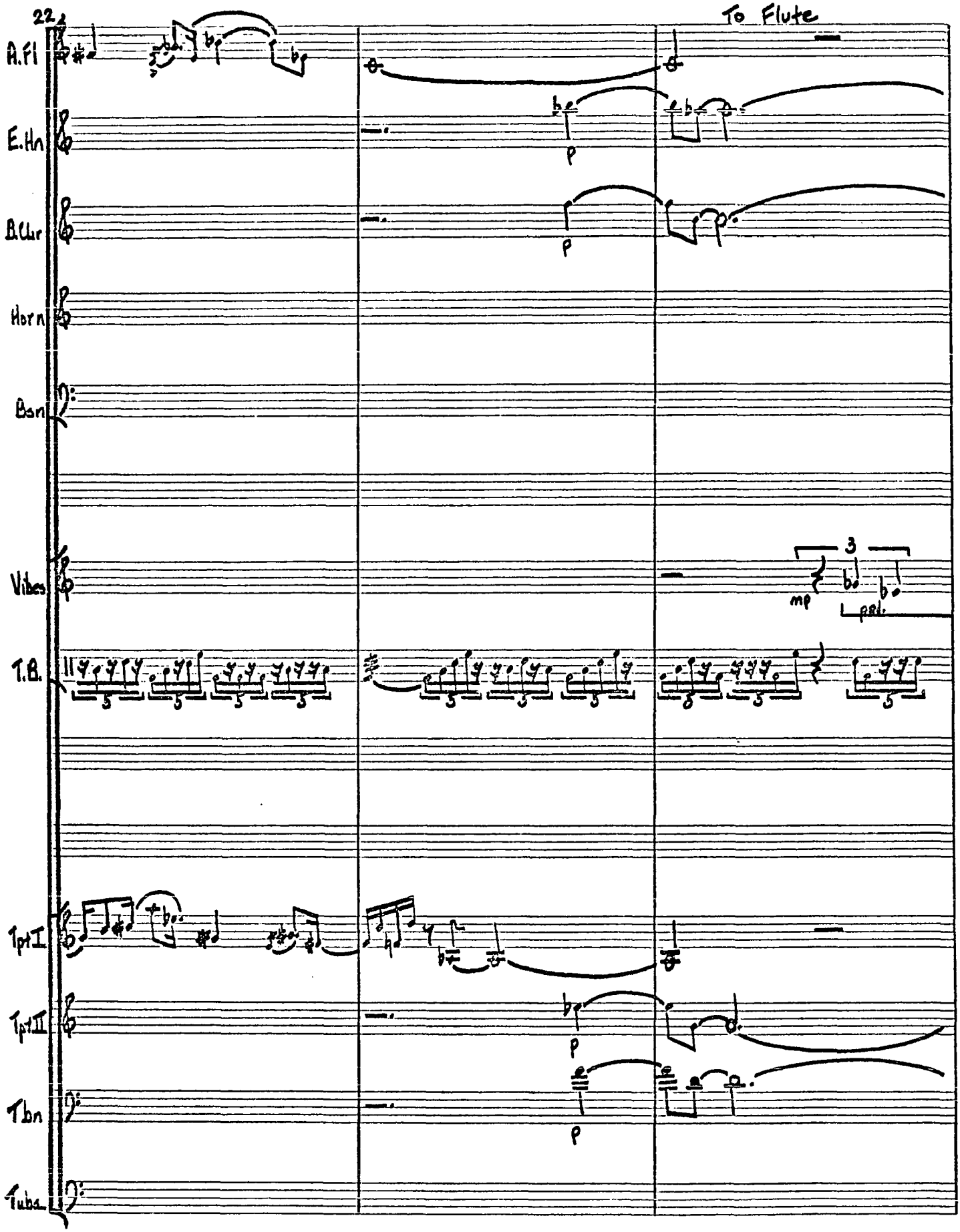
Tbn

Tuba

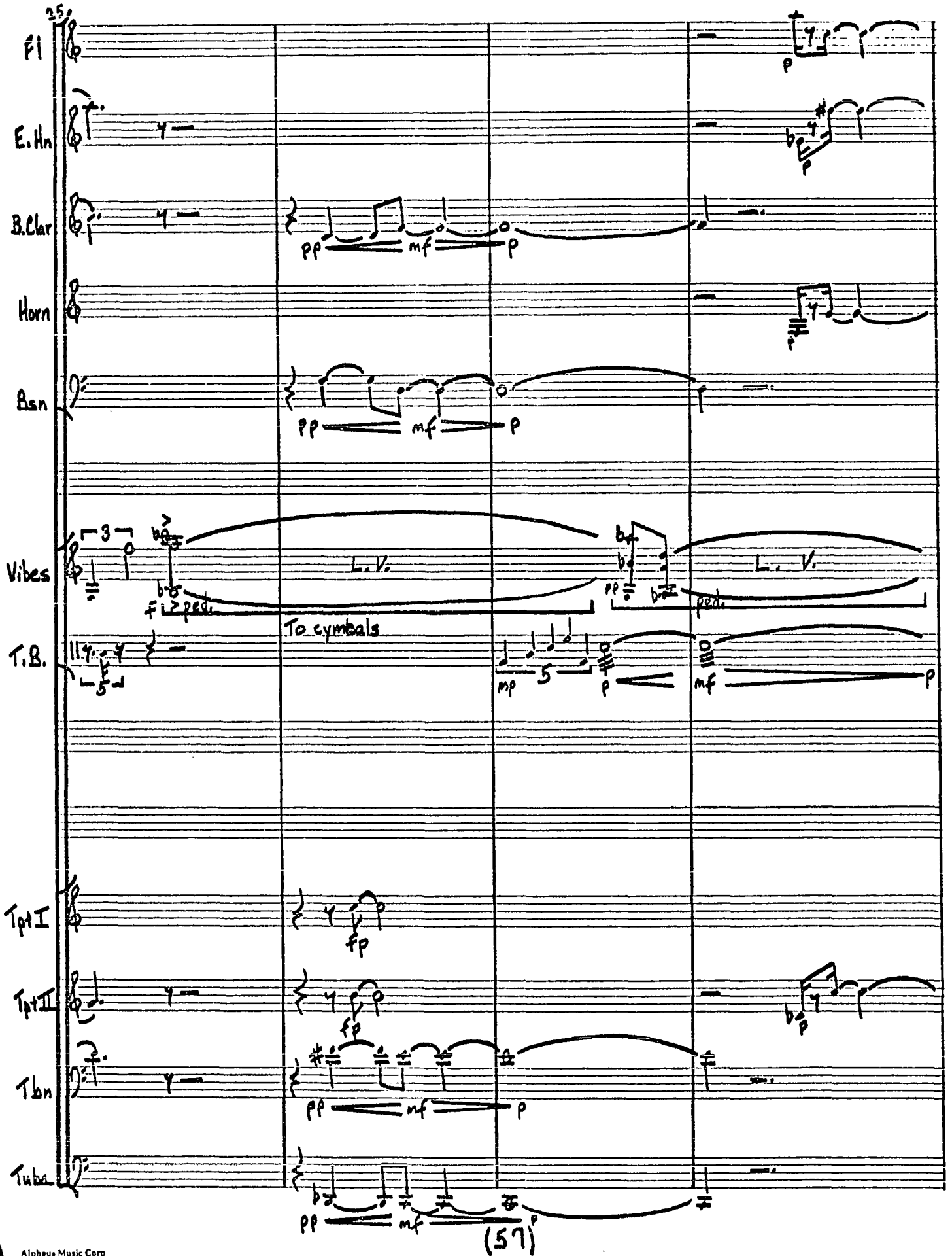
Alpheus Music Corp
Hollywood Calif
V 44



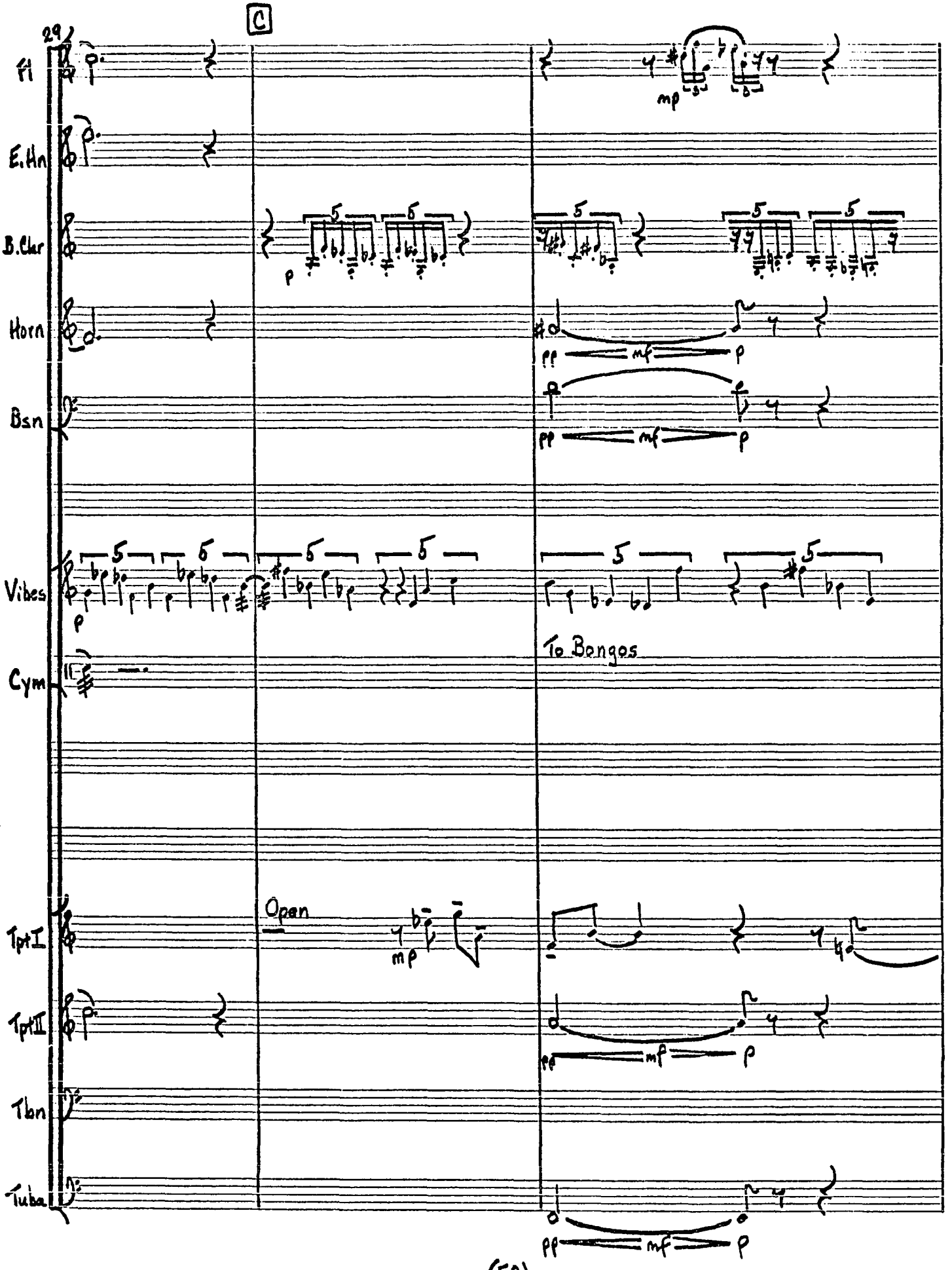
Alpheus Music Corp
Hollywood, Calif
V-44



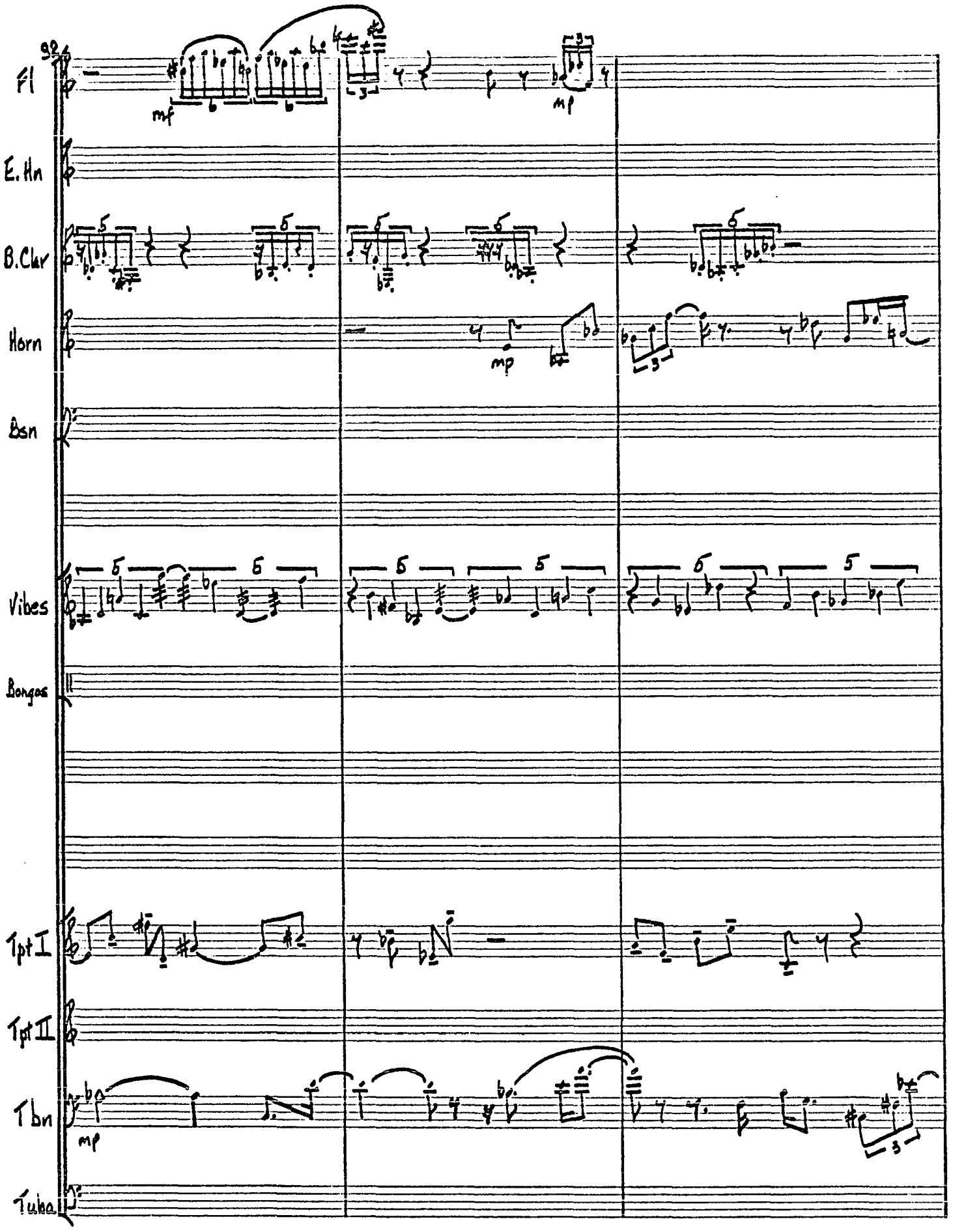
Alpheus Music Corp
Hollywood Calif
V 44



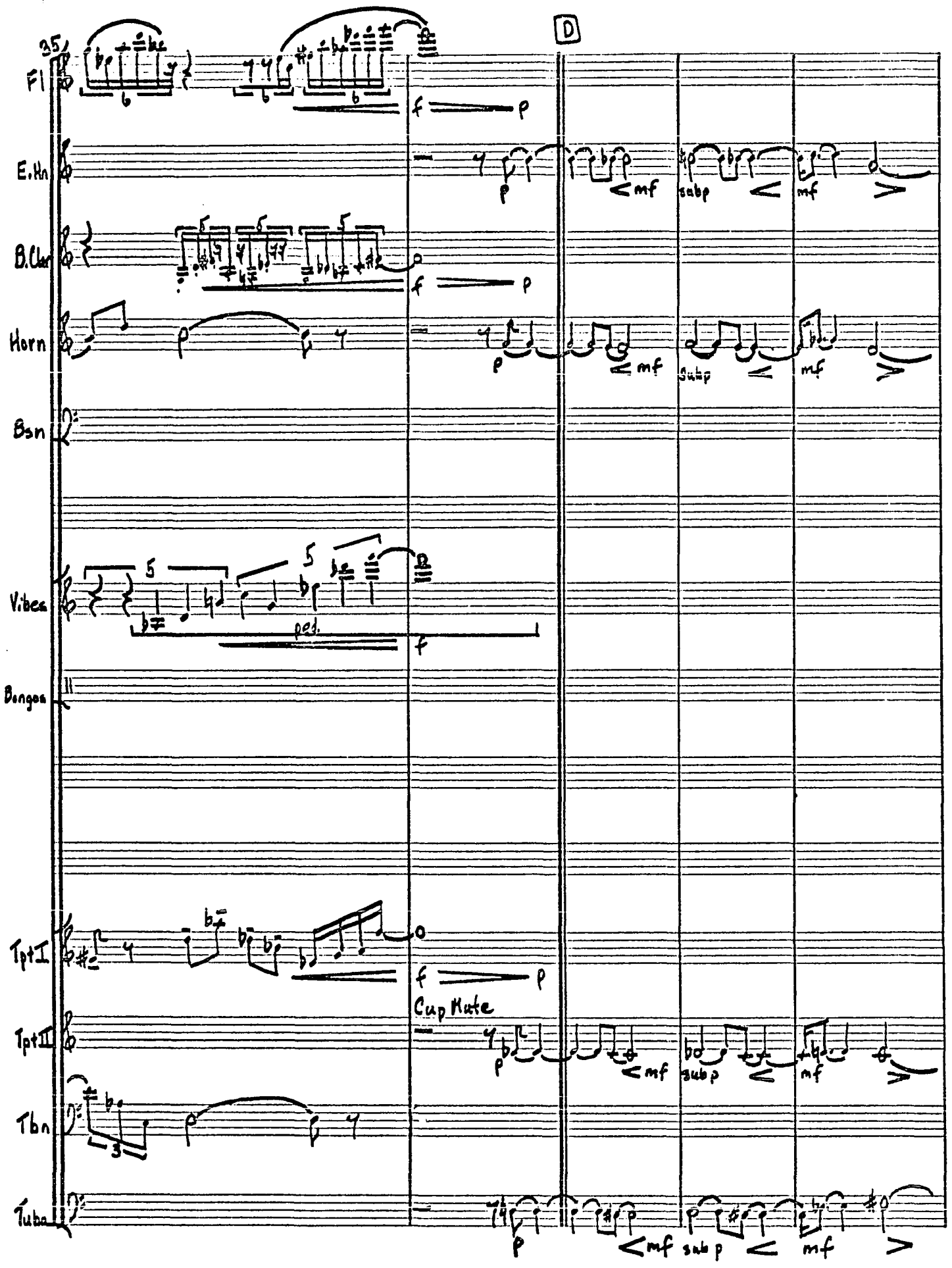
Alpheus Music Corp
Hollywood Calif
V-44



Alpheus Music Corp
Hollywood, Calif
V 44



Alpheus Music Corp
Hollywood, Calif
V-44



Alpheus Music Corp
Hollywood, Calif
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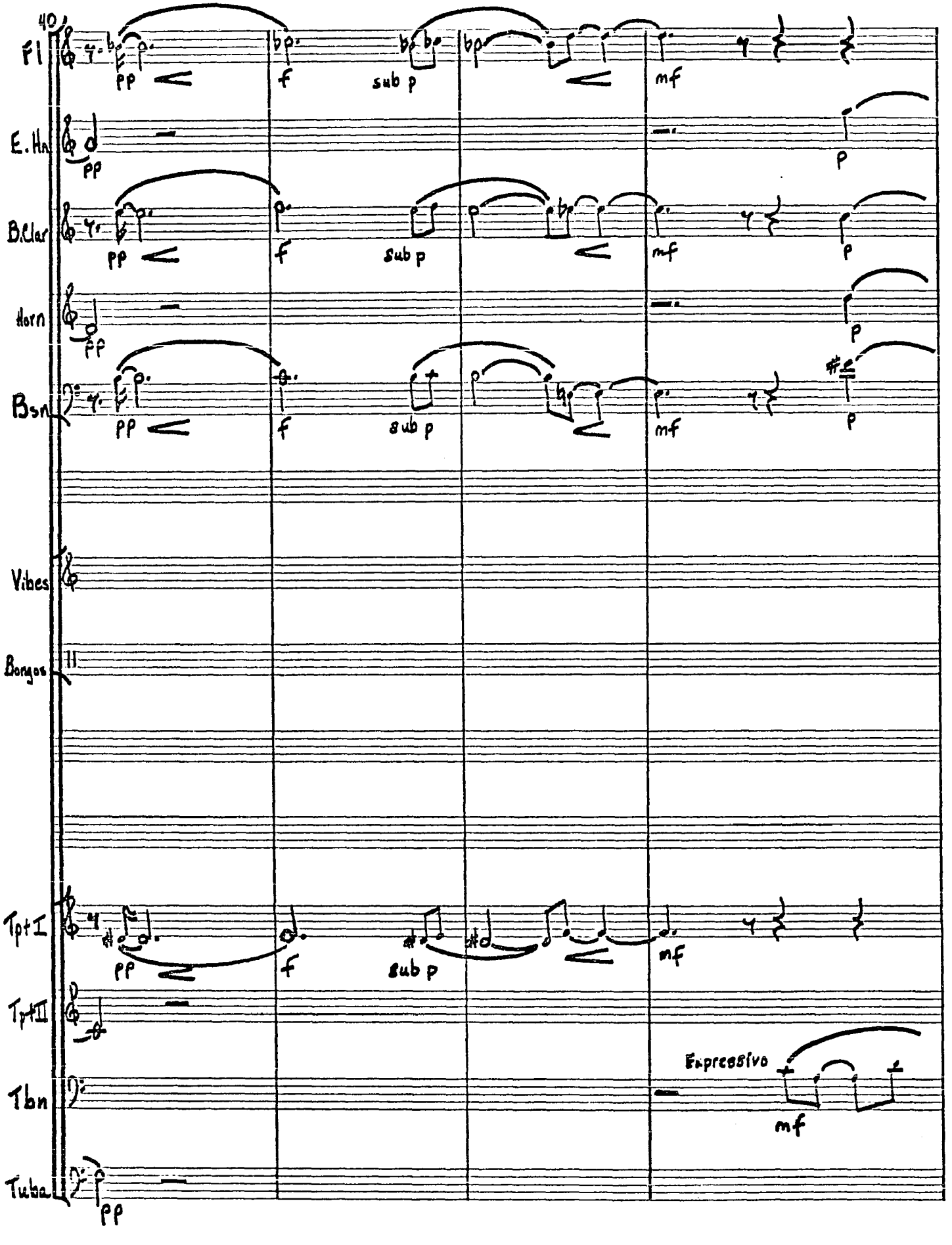
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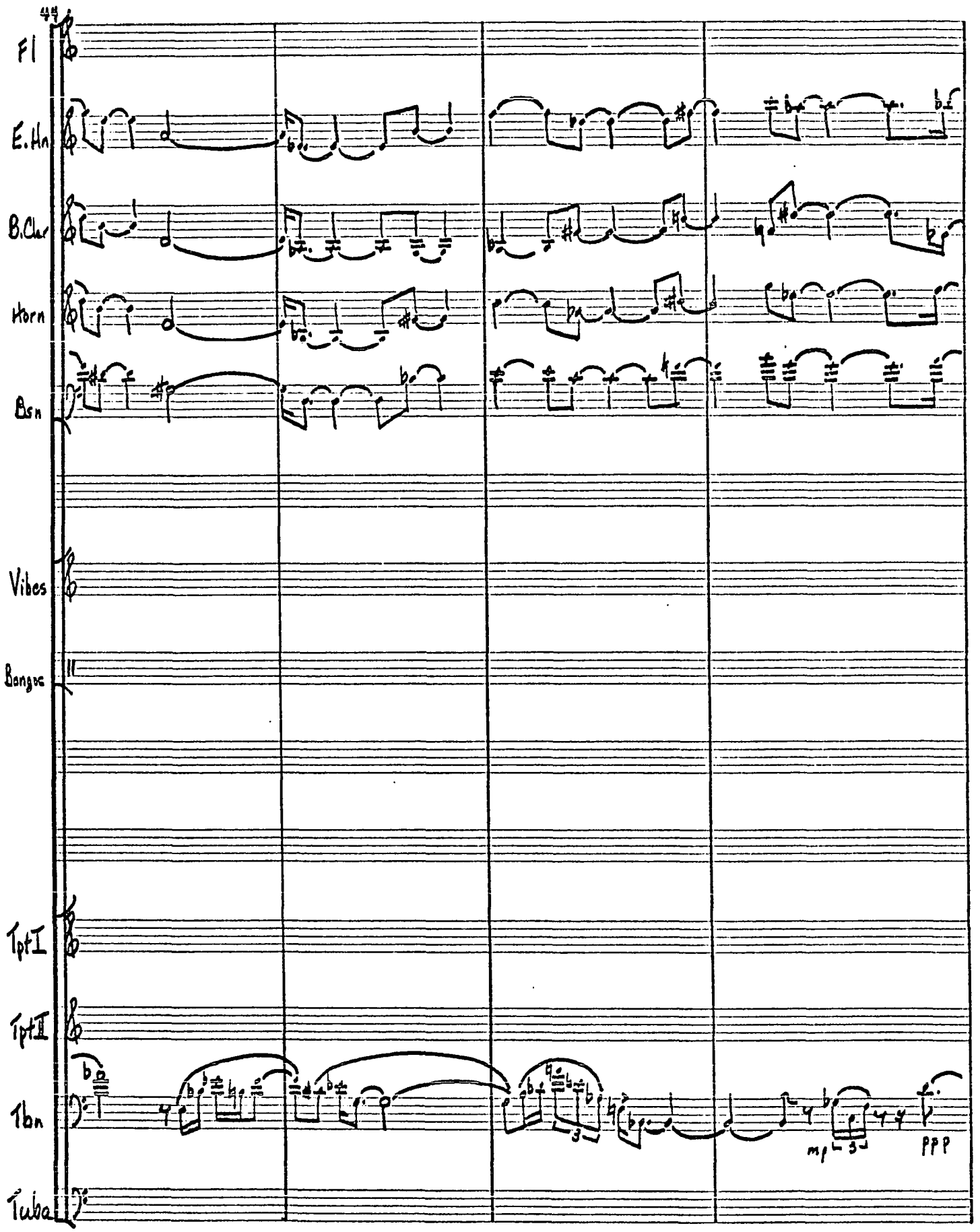
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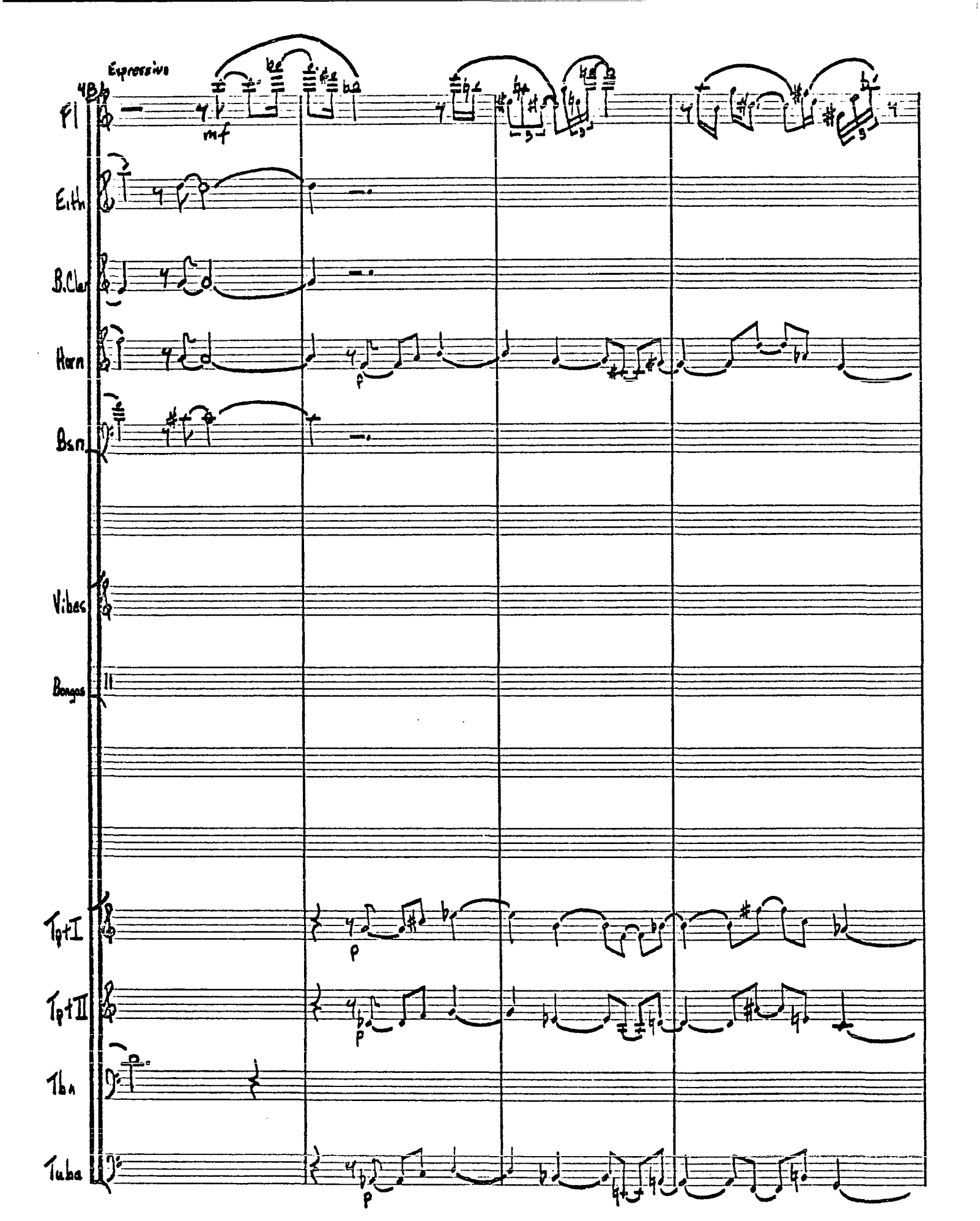
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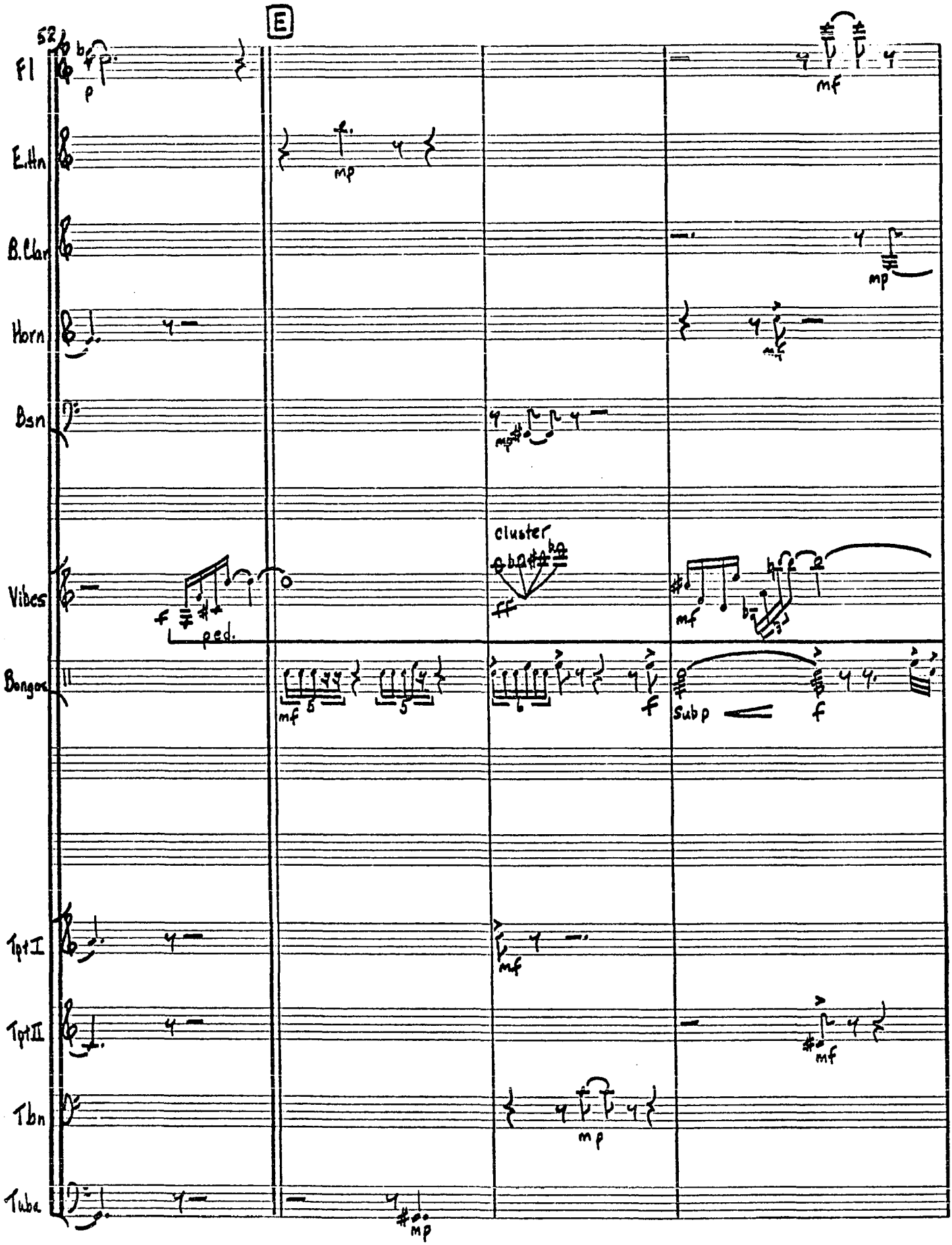
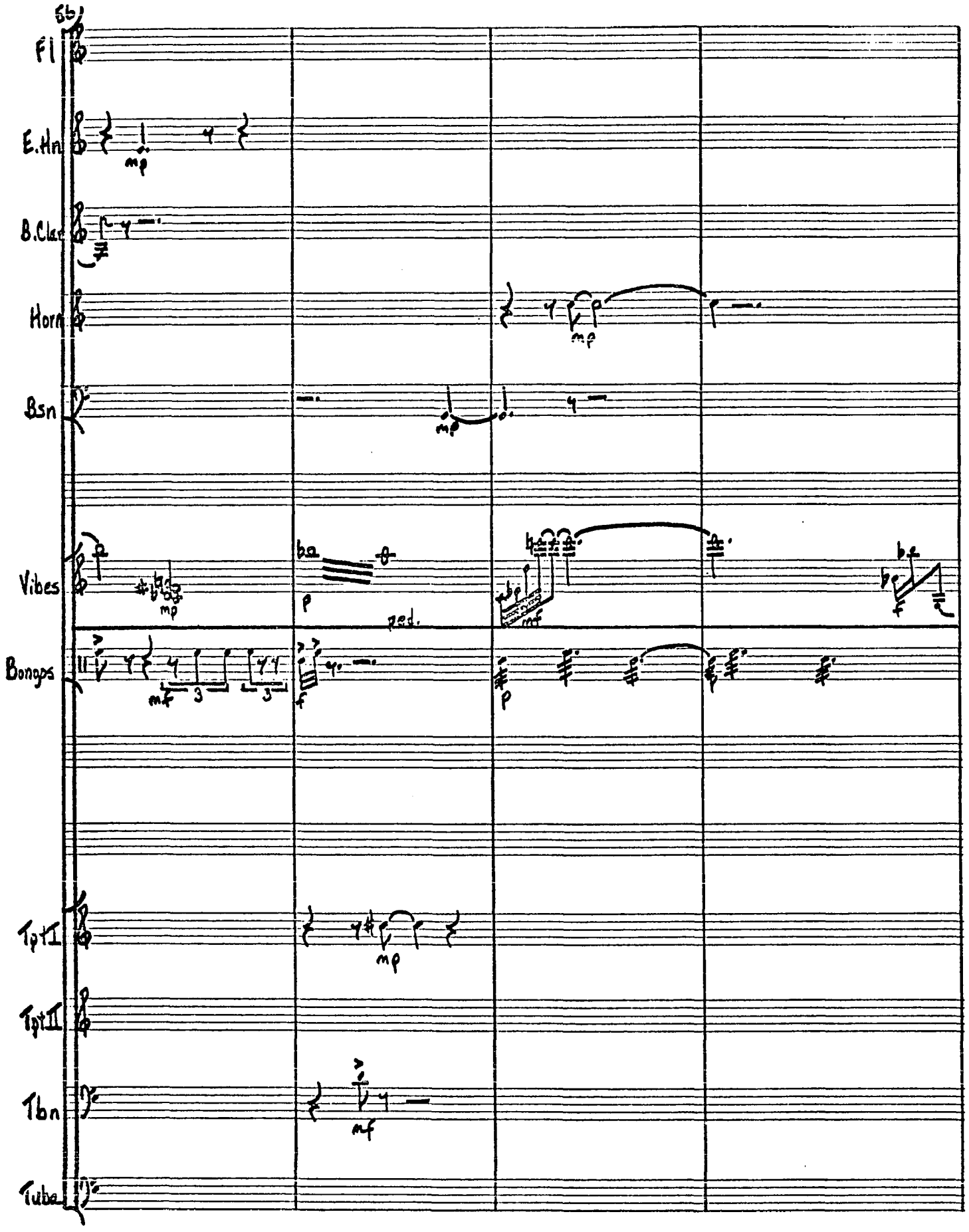
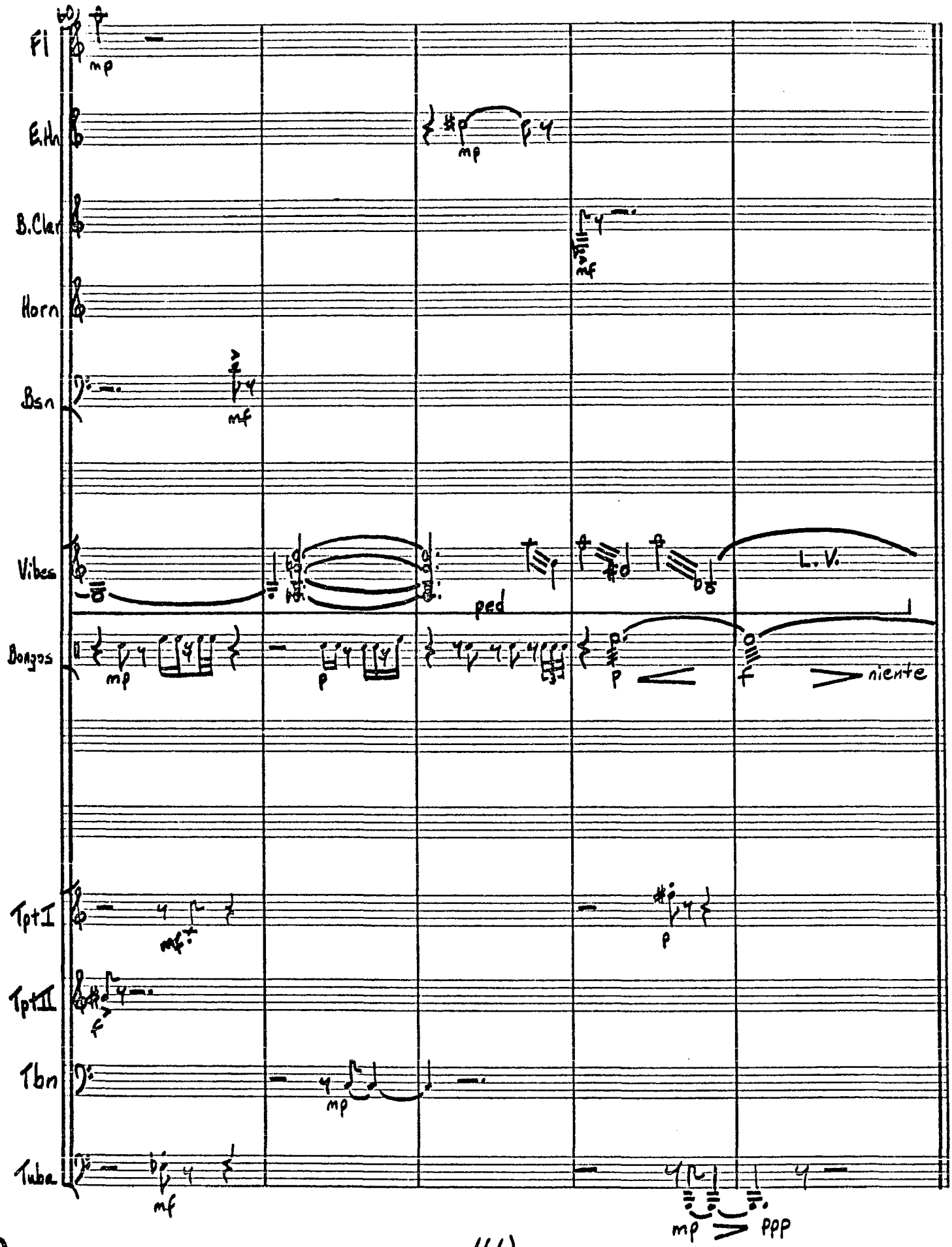


Alpheus Music Corp
Hollywood Calif V 44



Alpheus Music Corp
Hollywood Calif
V 44



Alpheus Music Corp
Hollywood Calif
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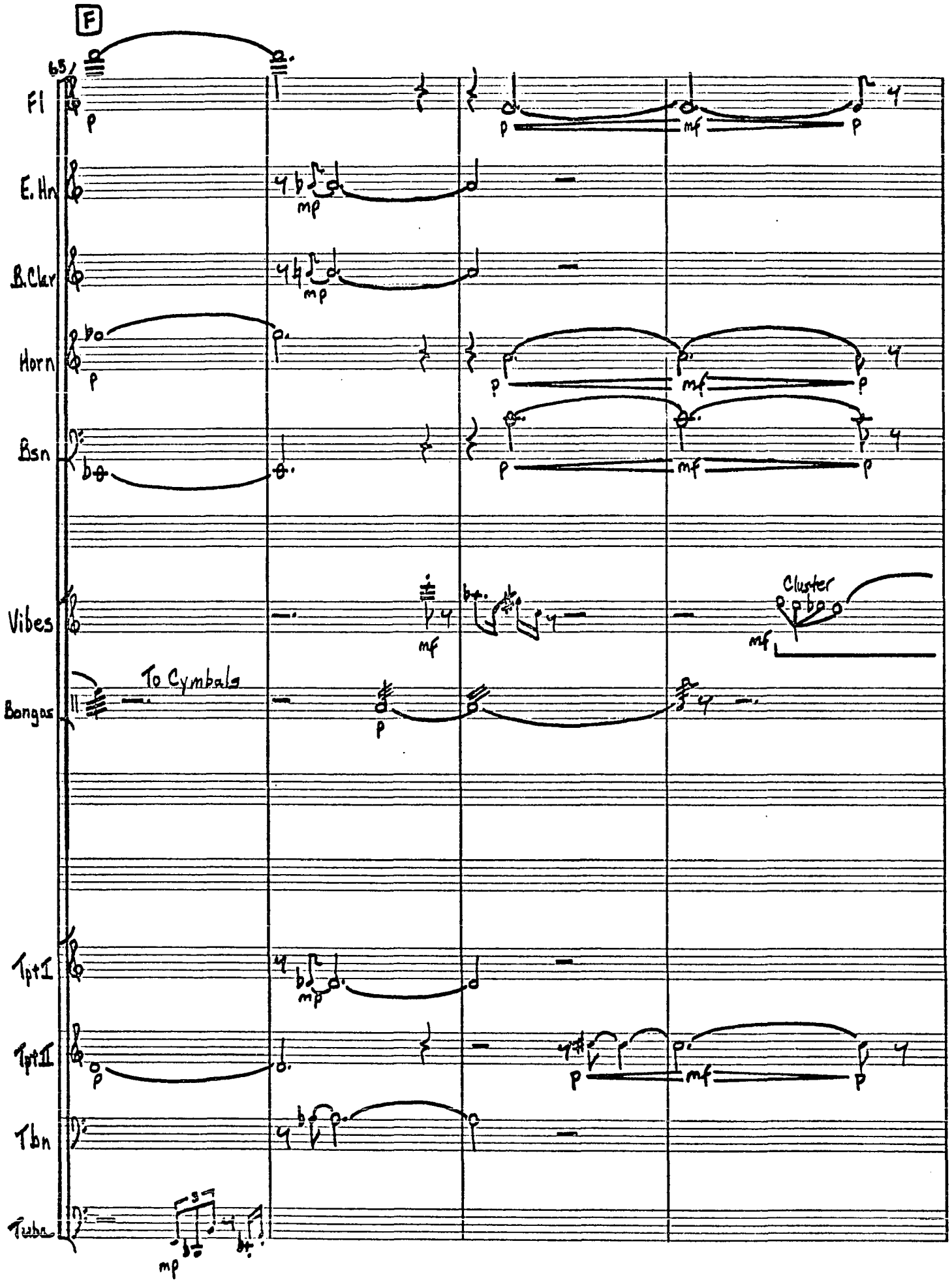

Alpheus Music Corp
Hollywood, Calif
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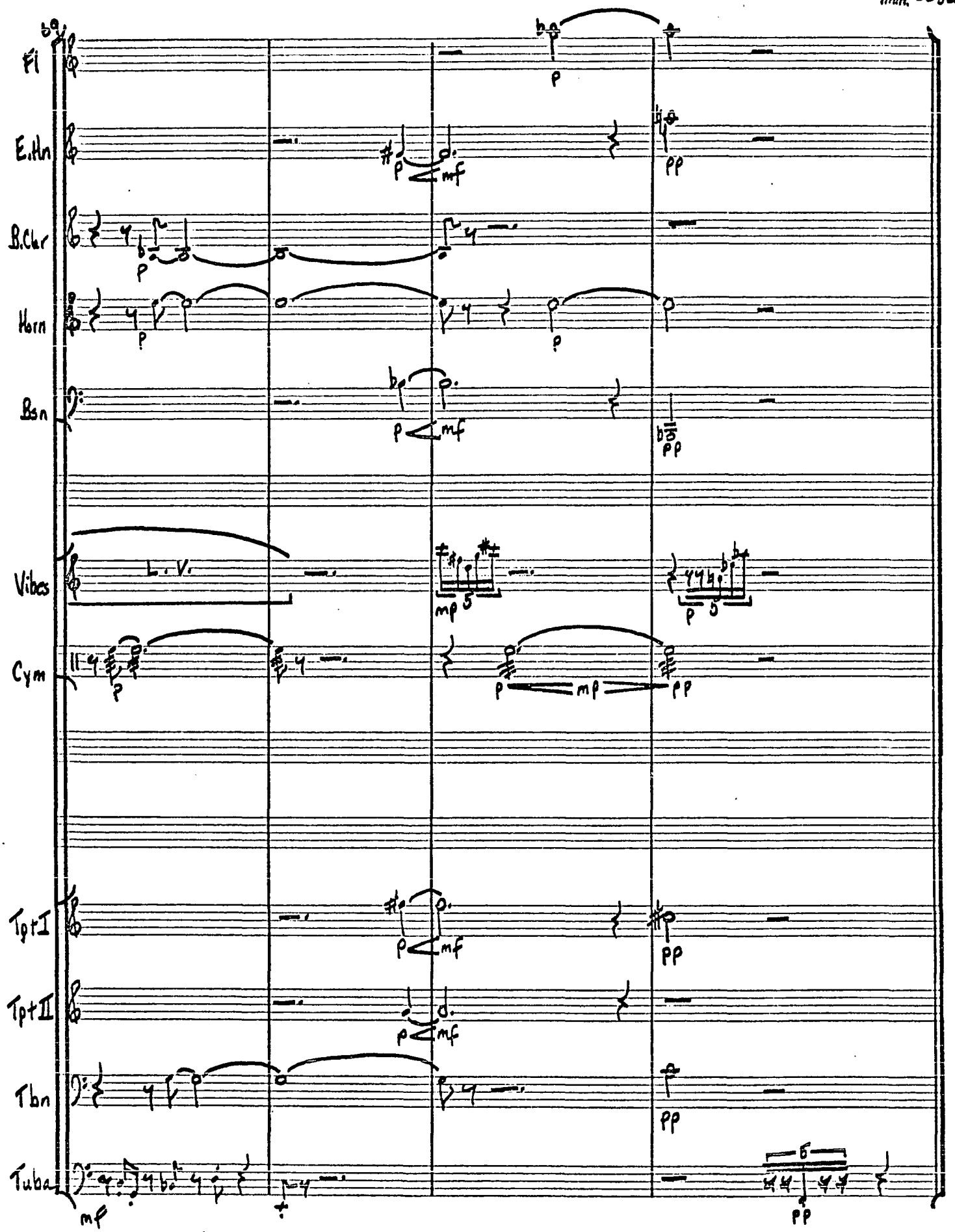

Alpheus Music Corp
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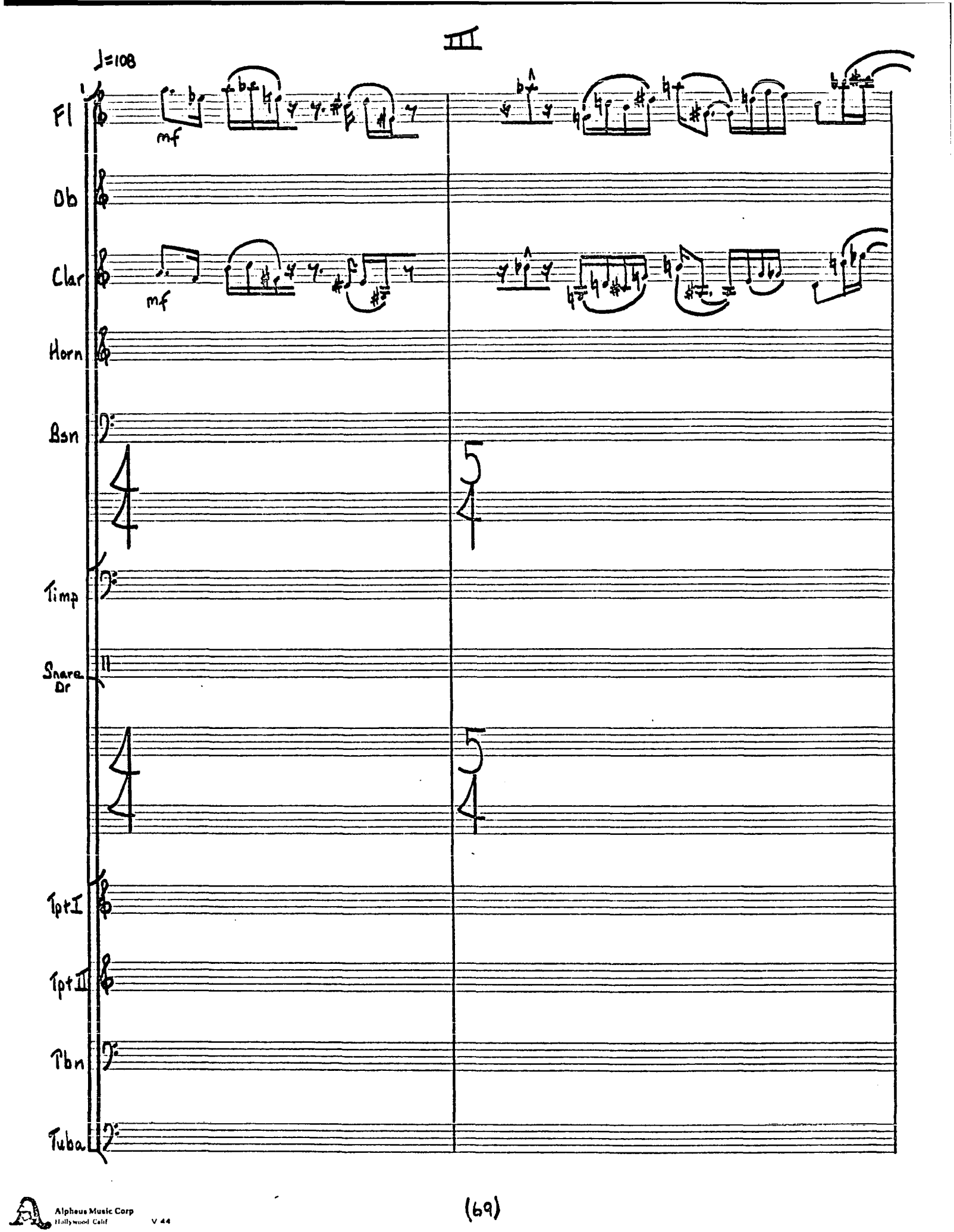
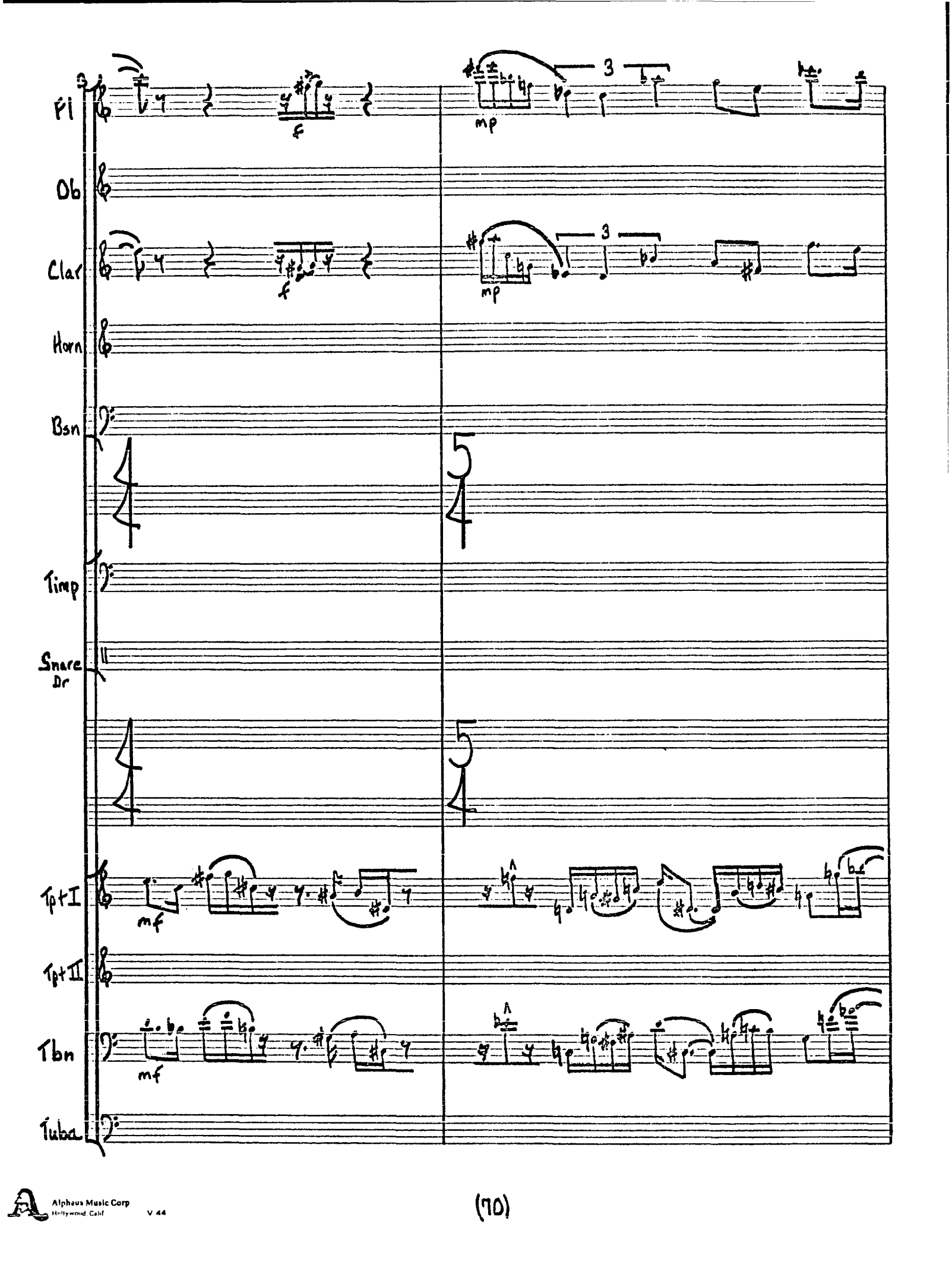
V. 44



Alpheus Music Corp
Hollywood Calif V 44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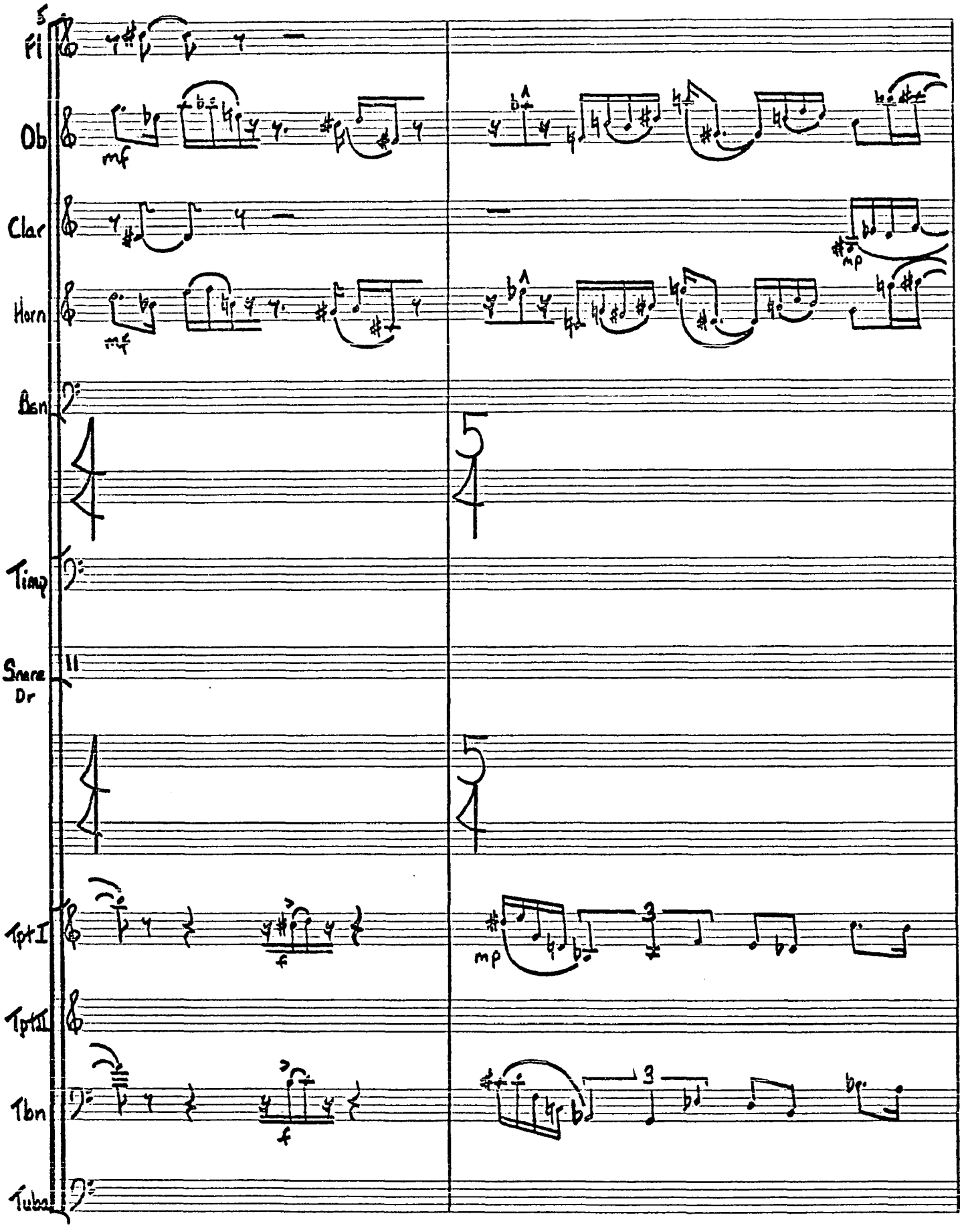

Alpheus Music Corp
Hollywood, Calif
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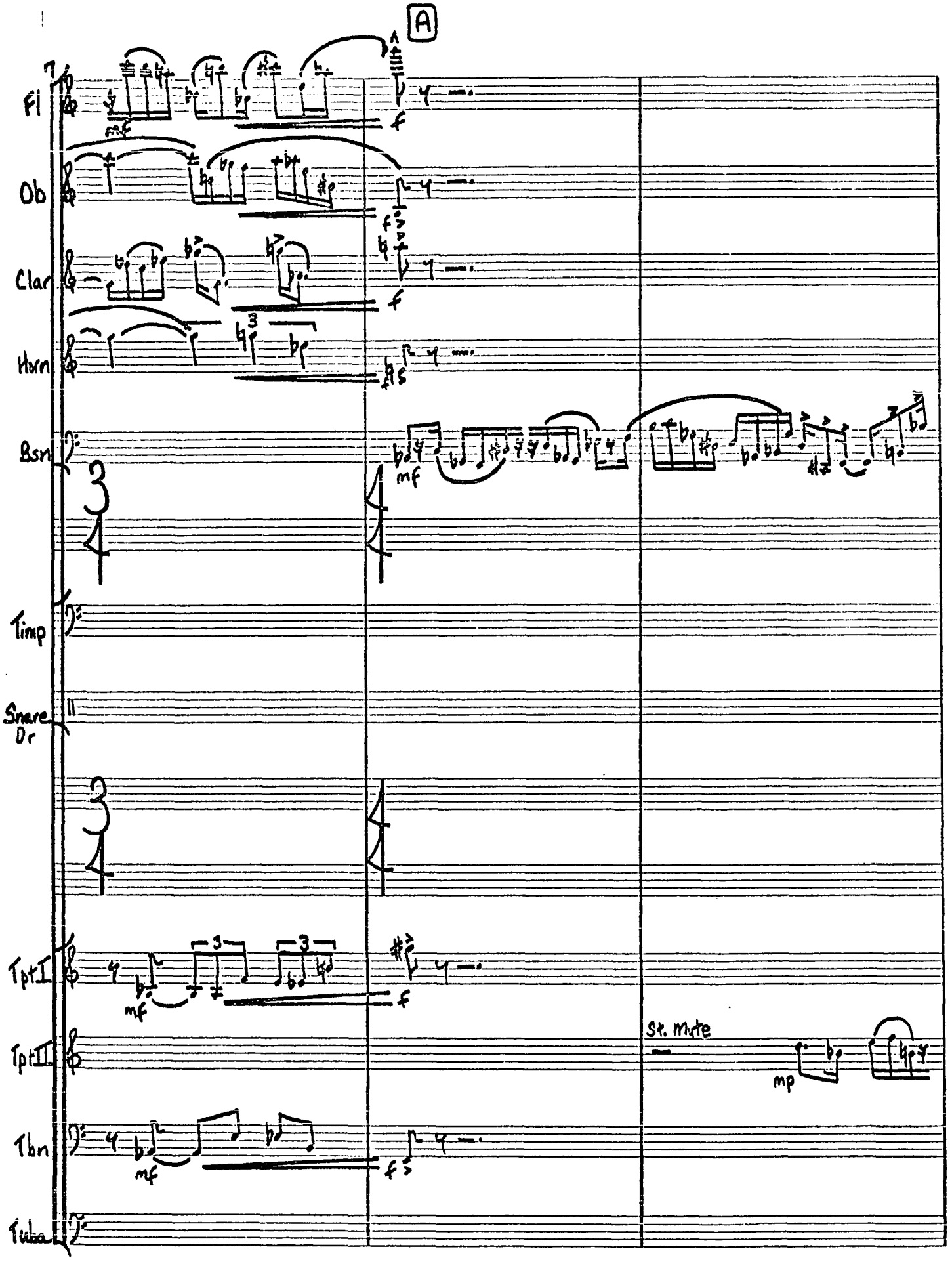

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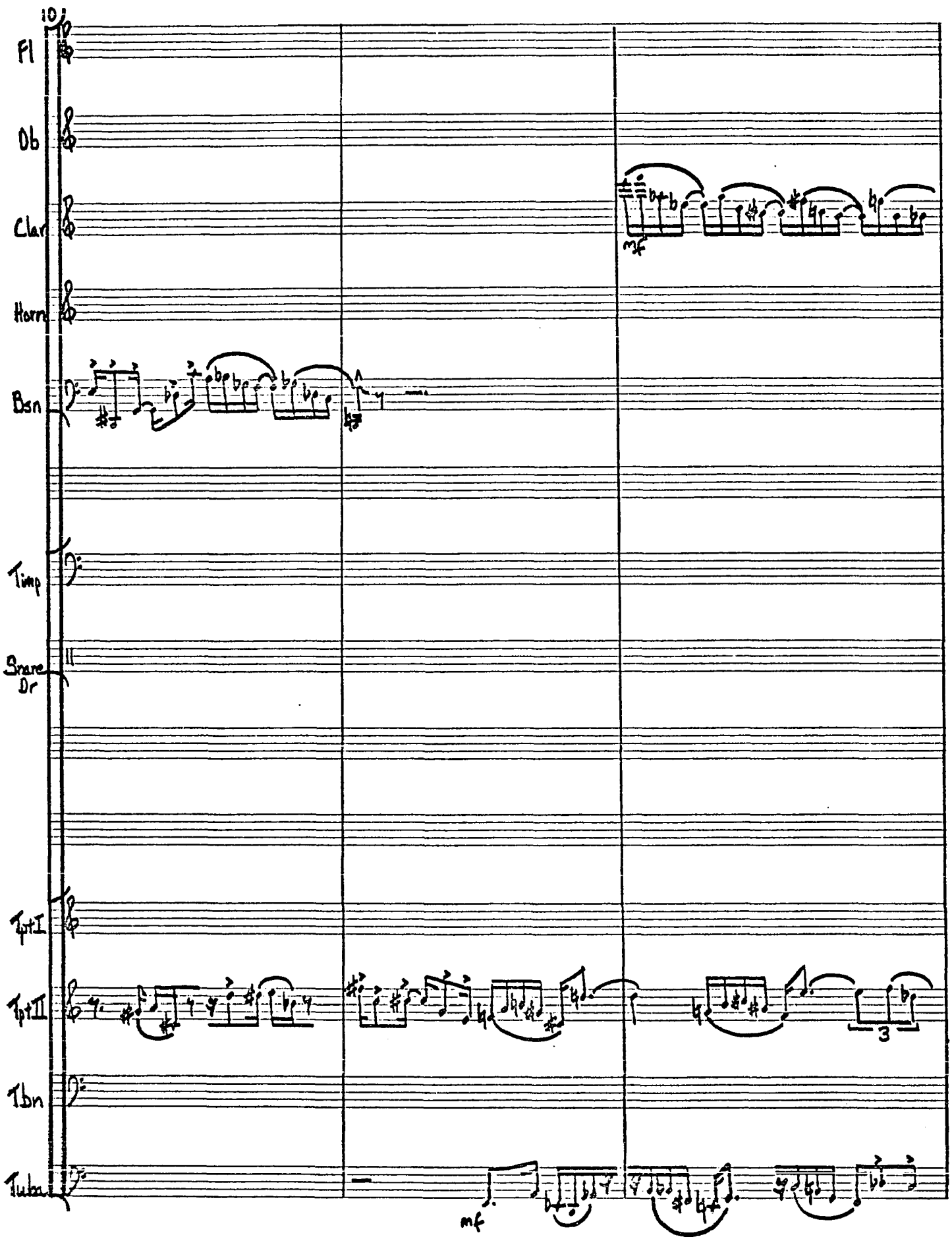

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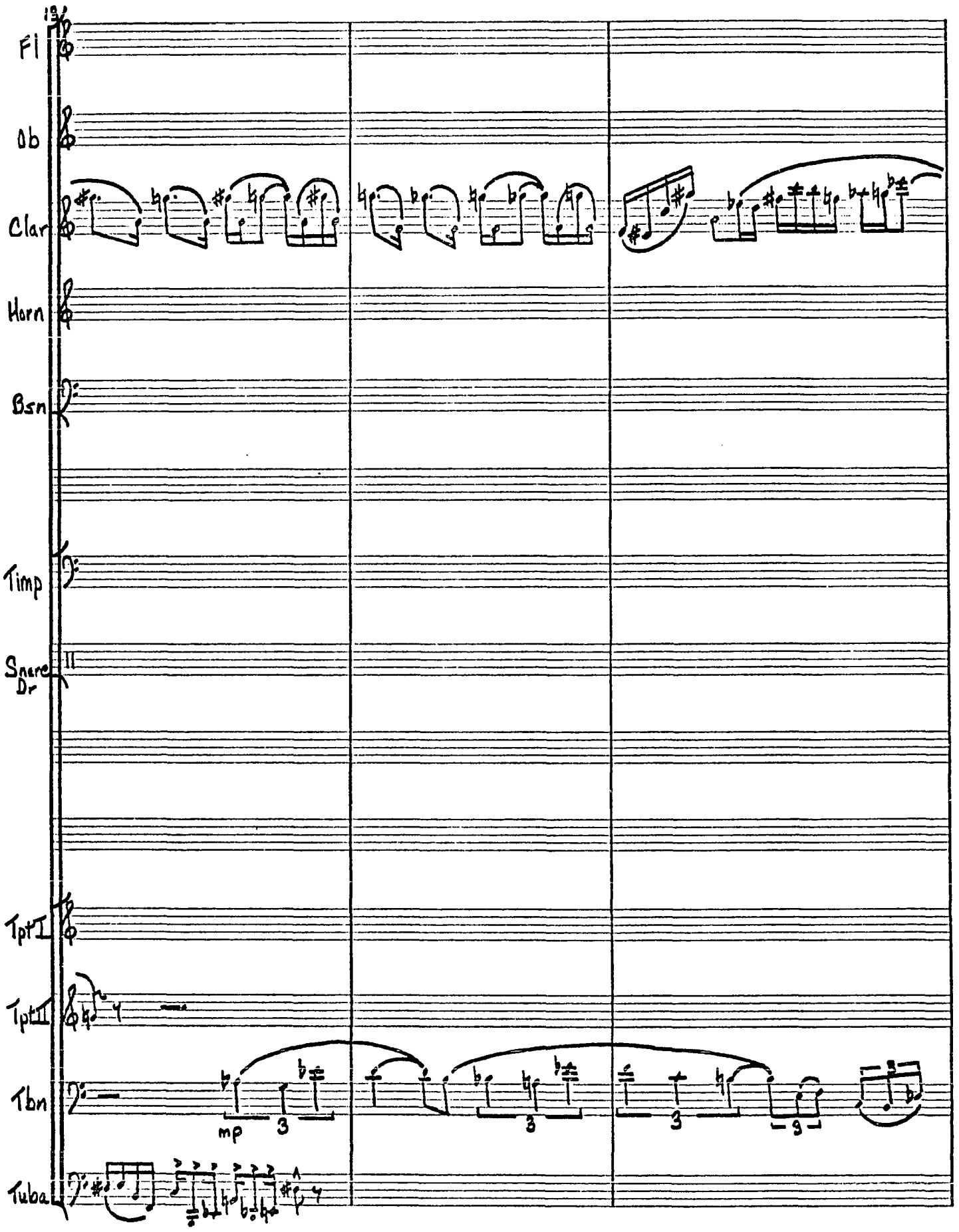

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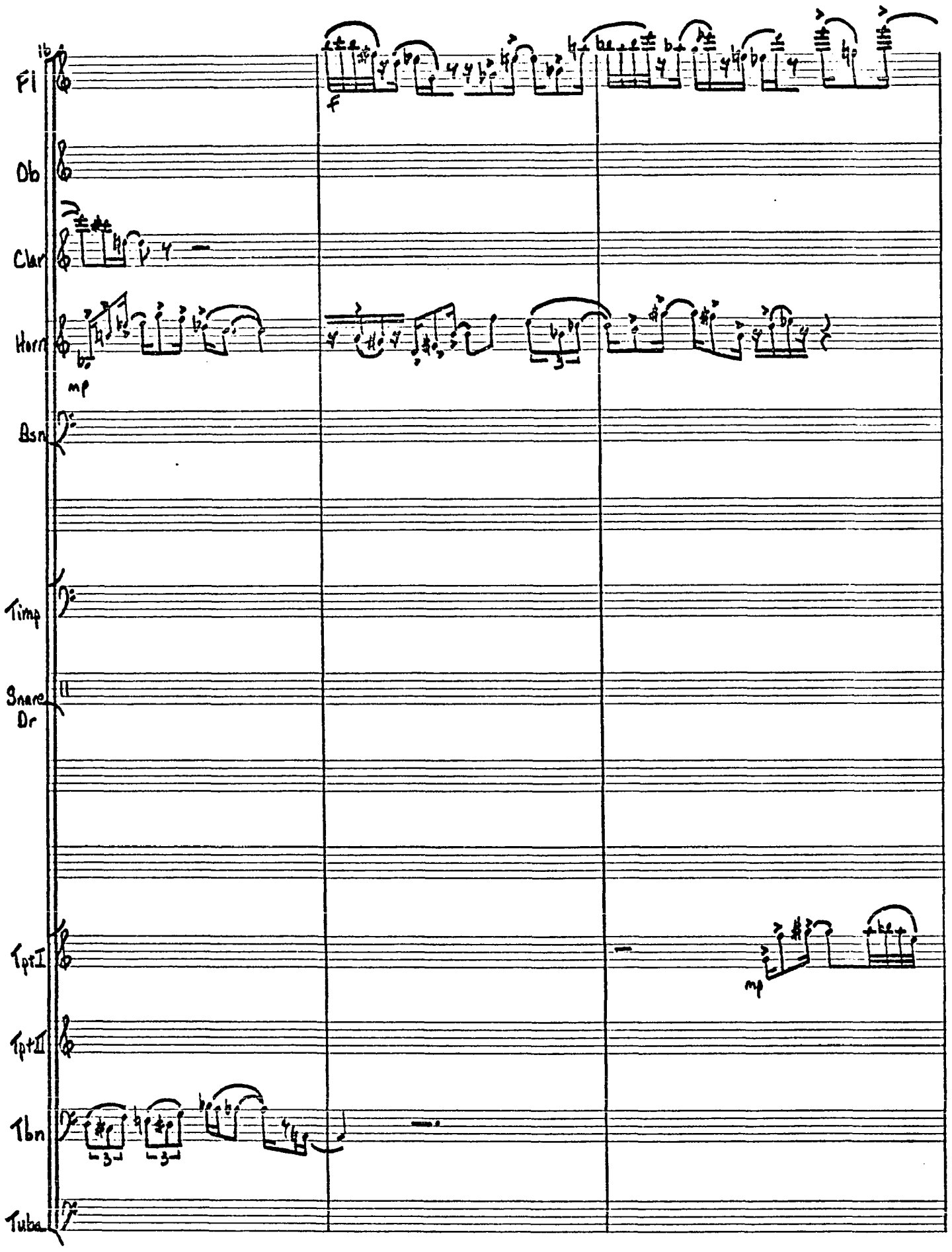

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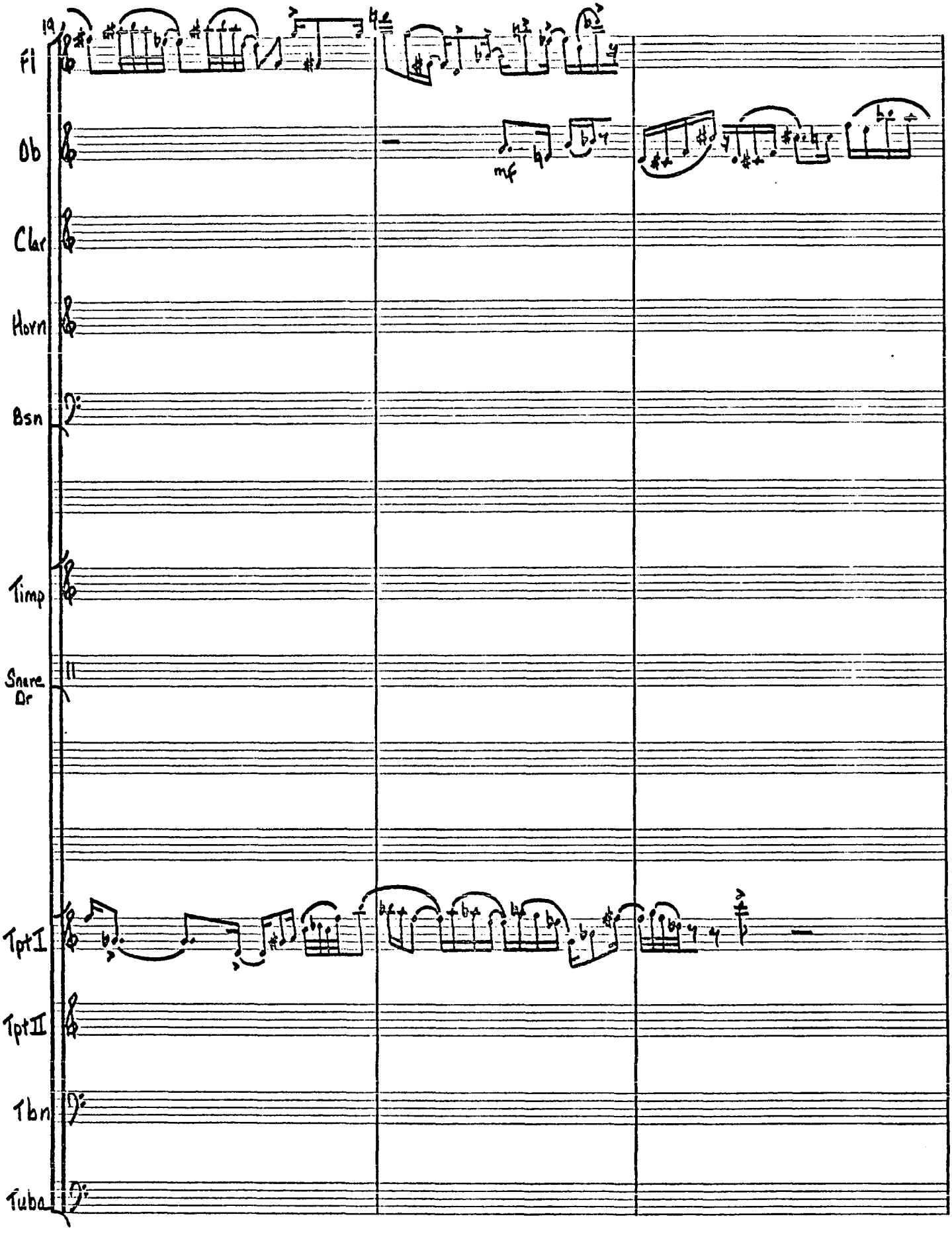
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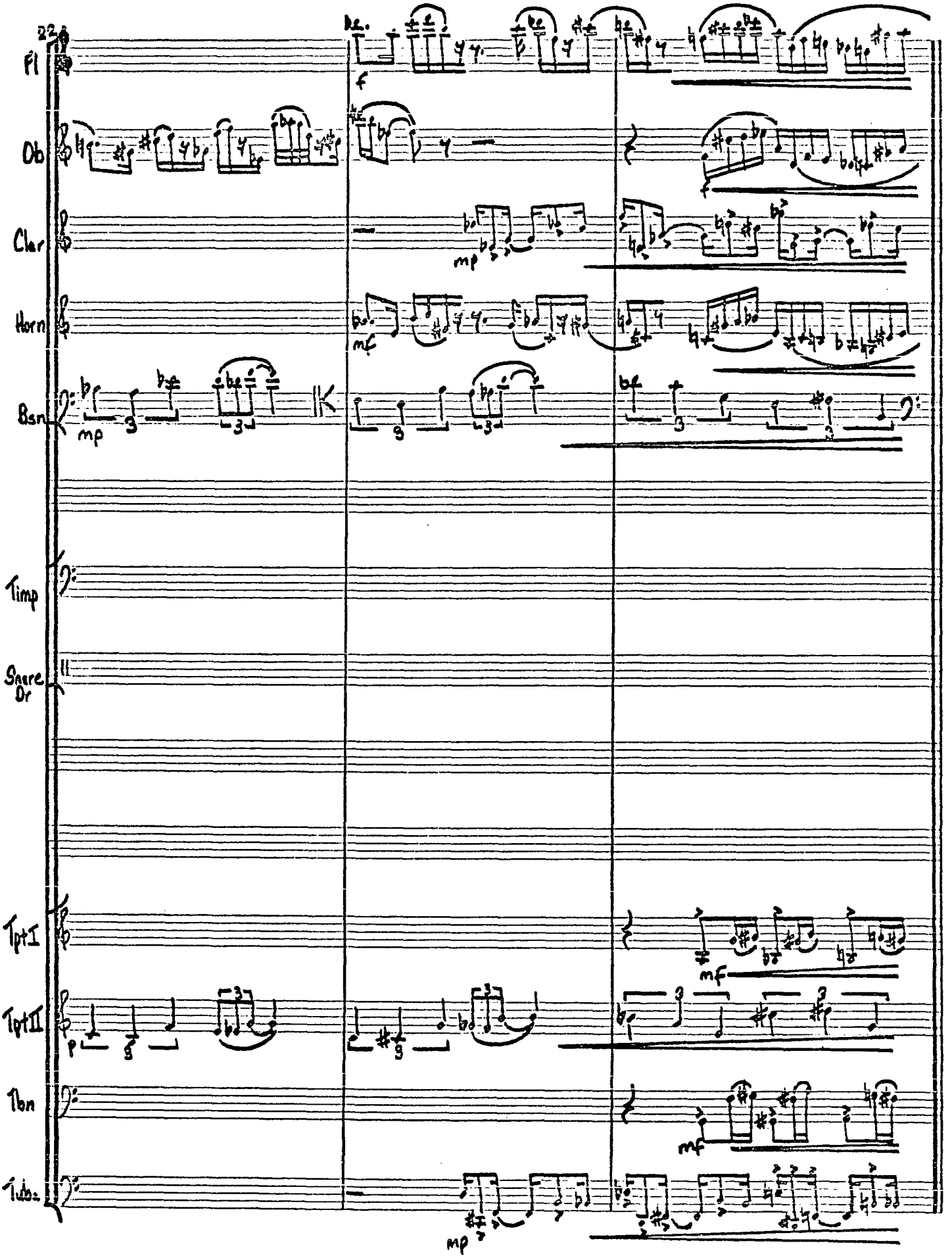

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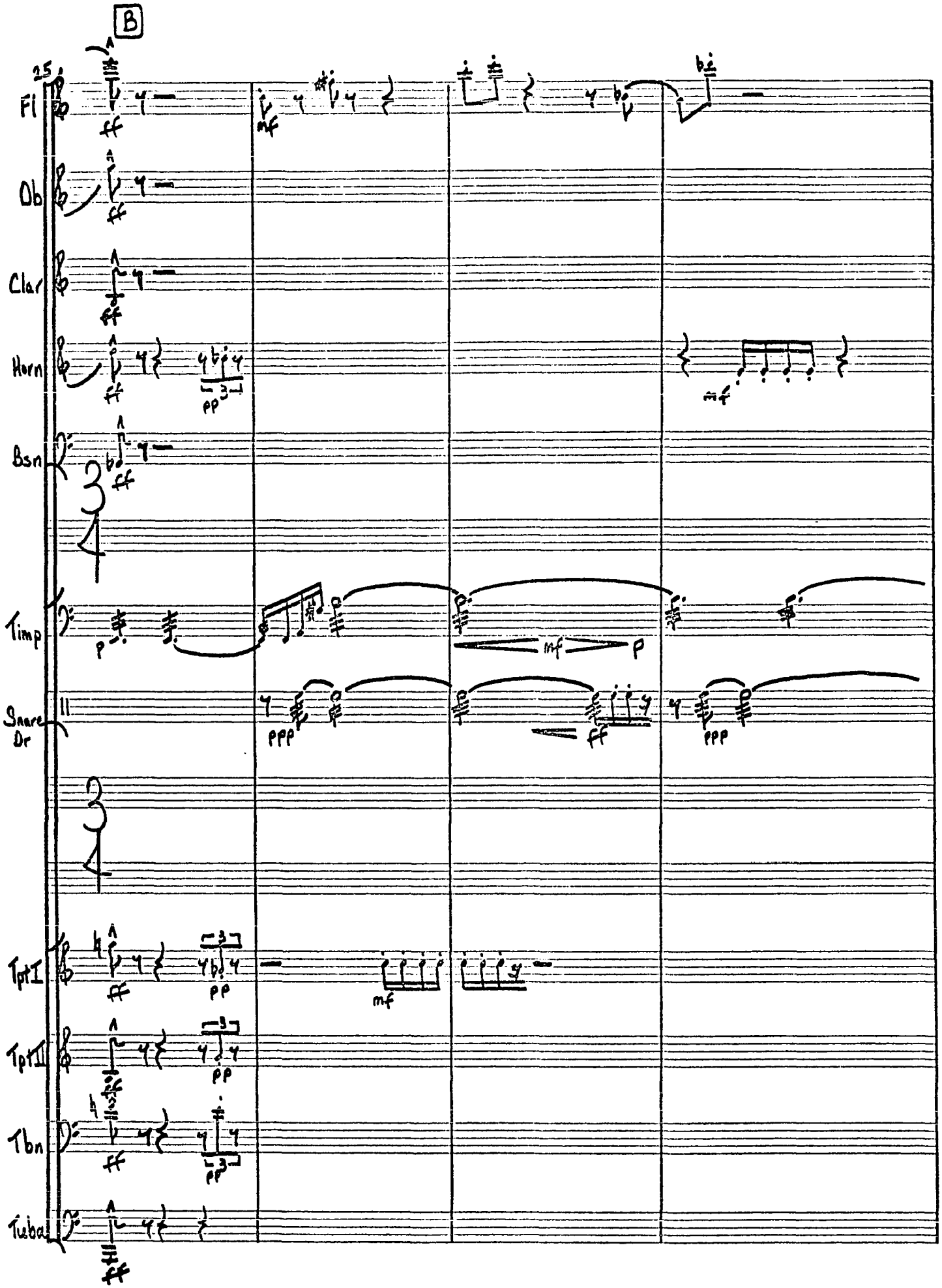

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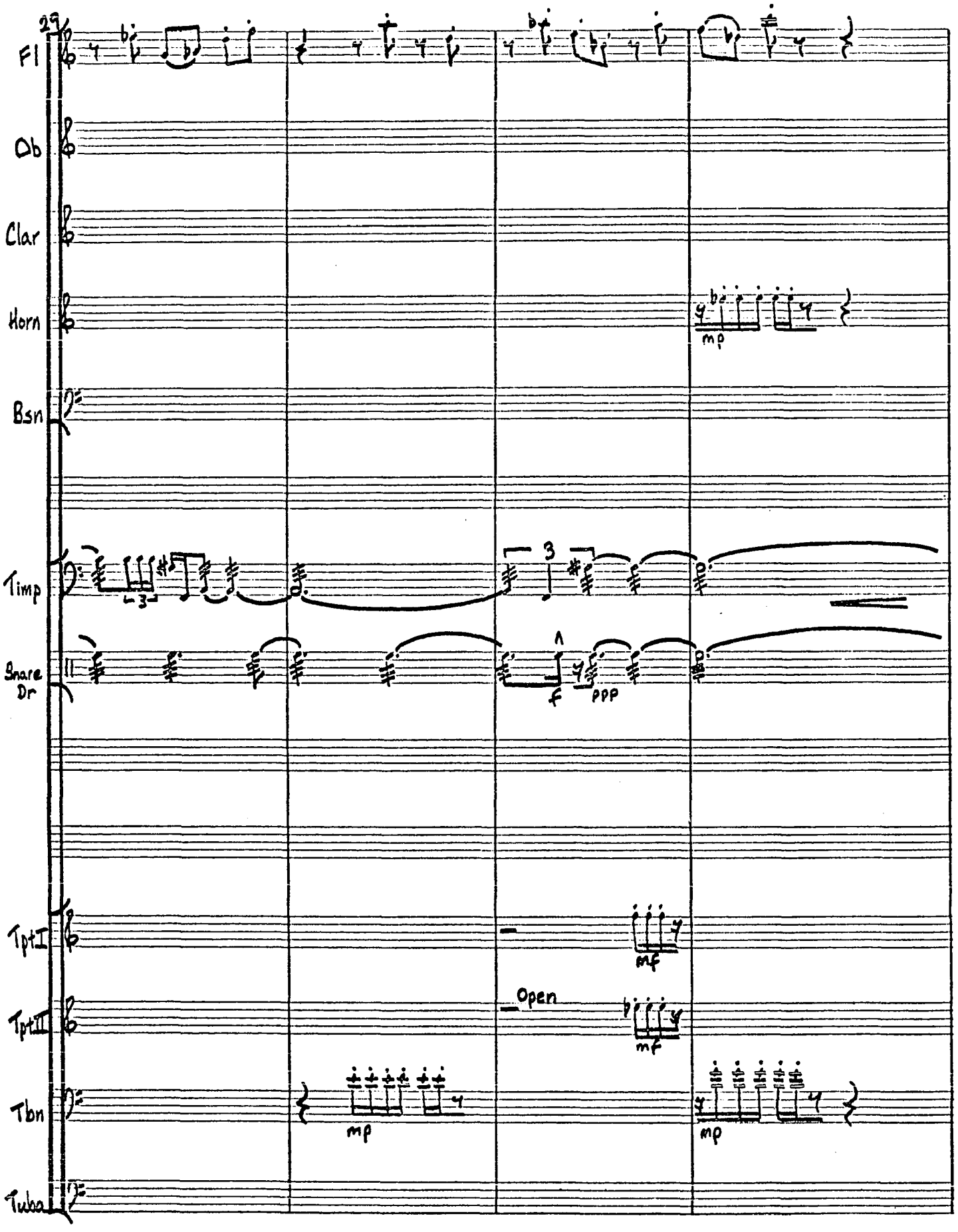
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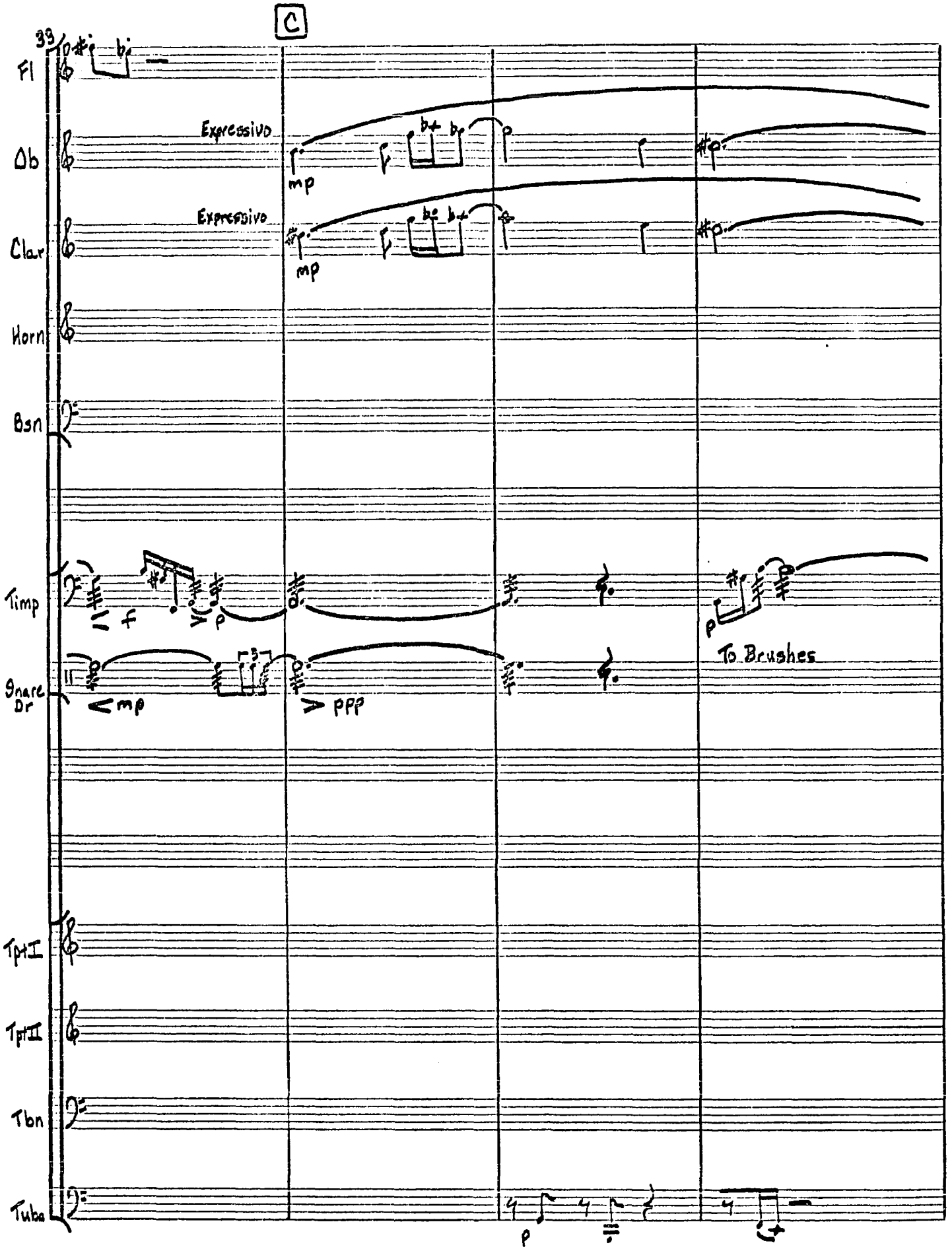

Alpheus Music Corp
Hollywood Calif
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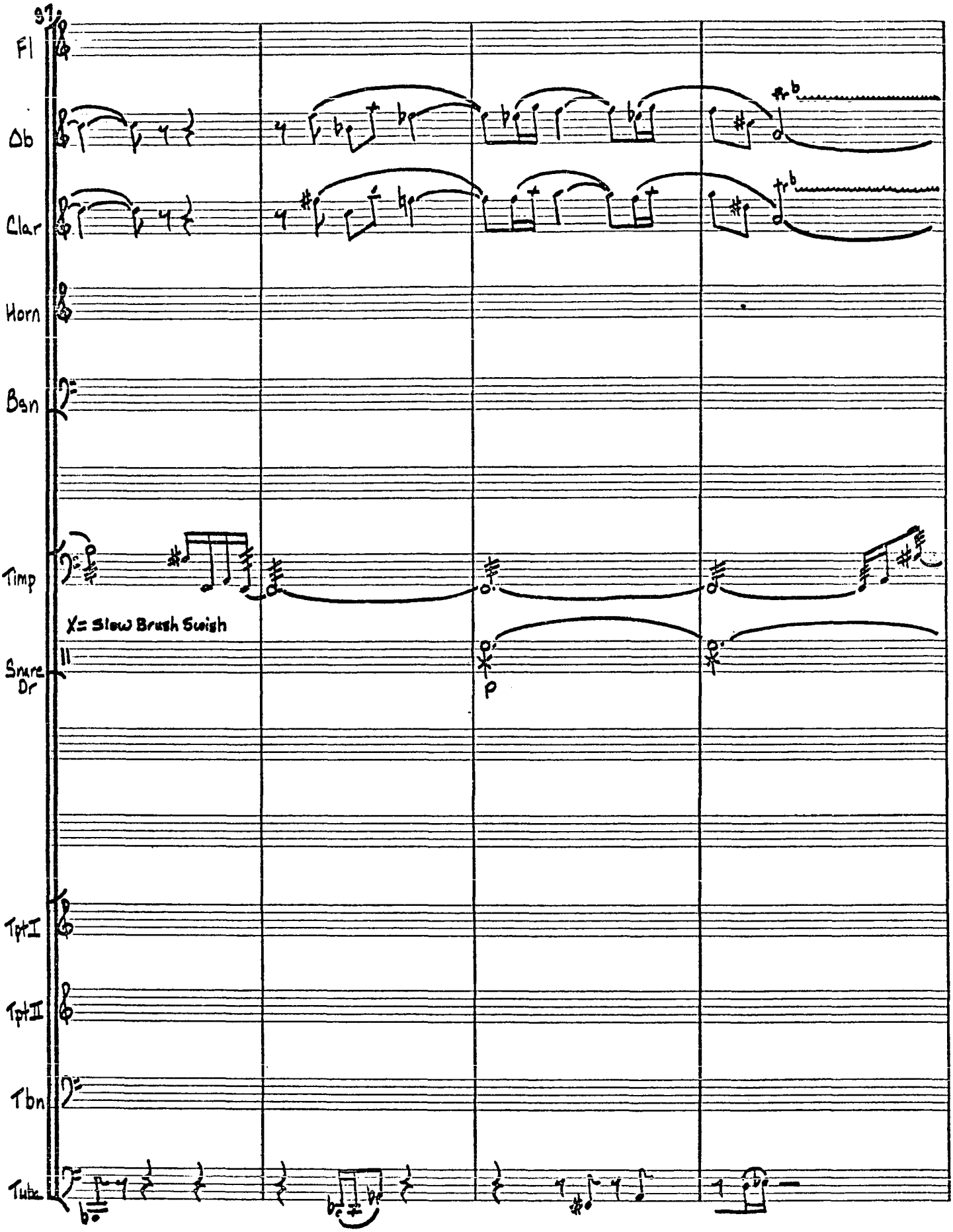
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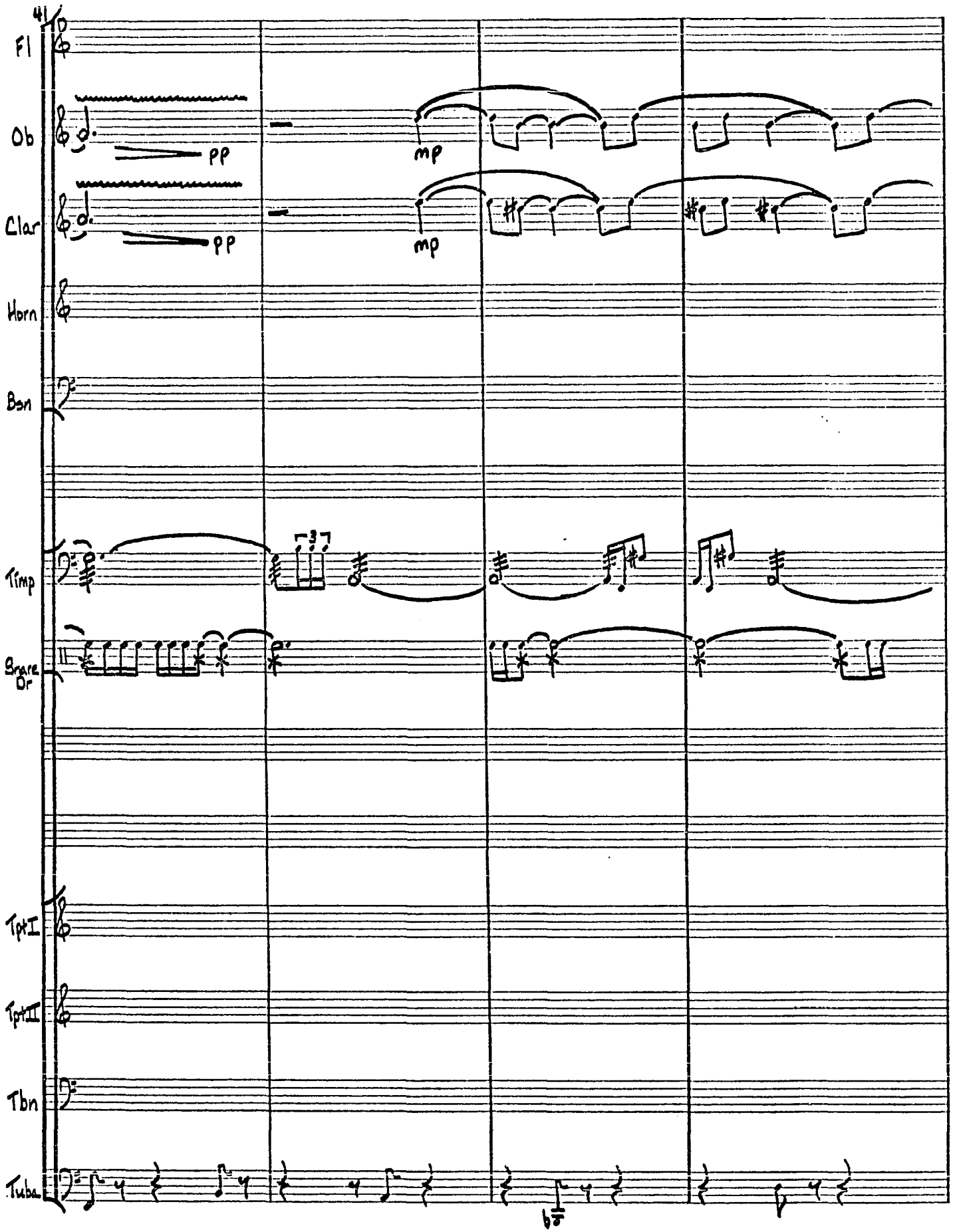
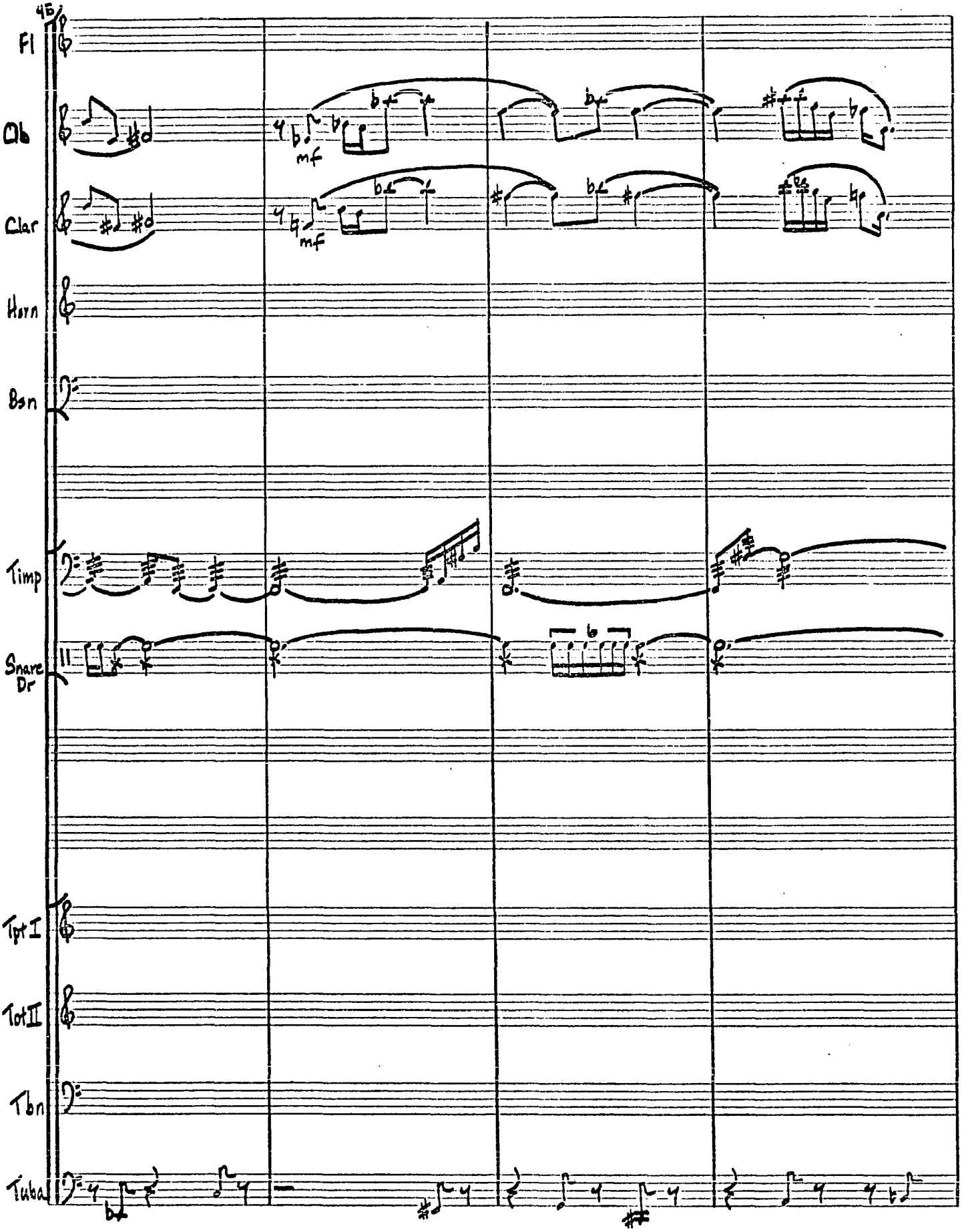


Alpheus Music Corp
Hollywood, Calif
V 44



Alpheus Music Corp
Hollywood Calif
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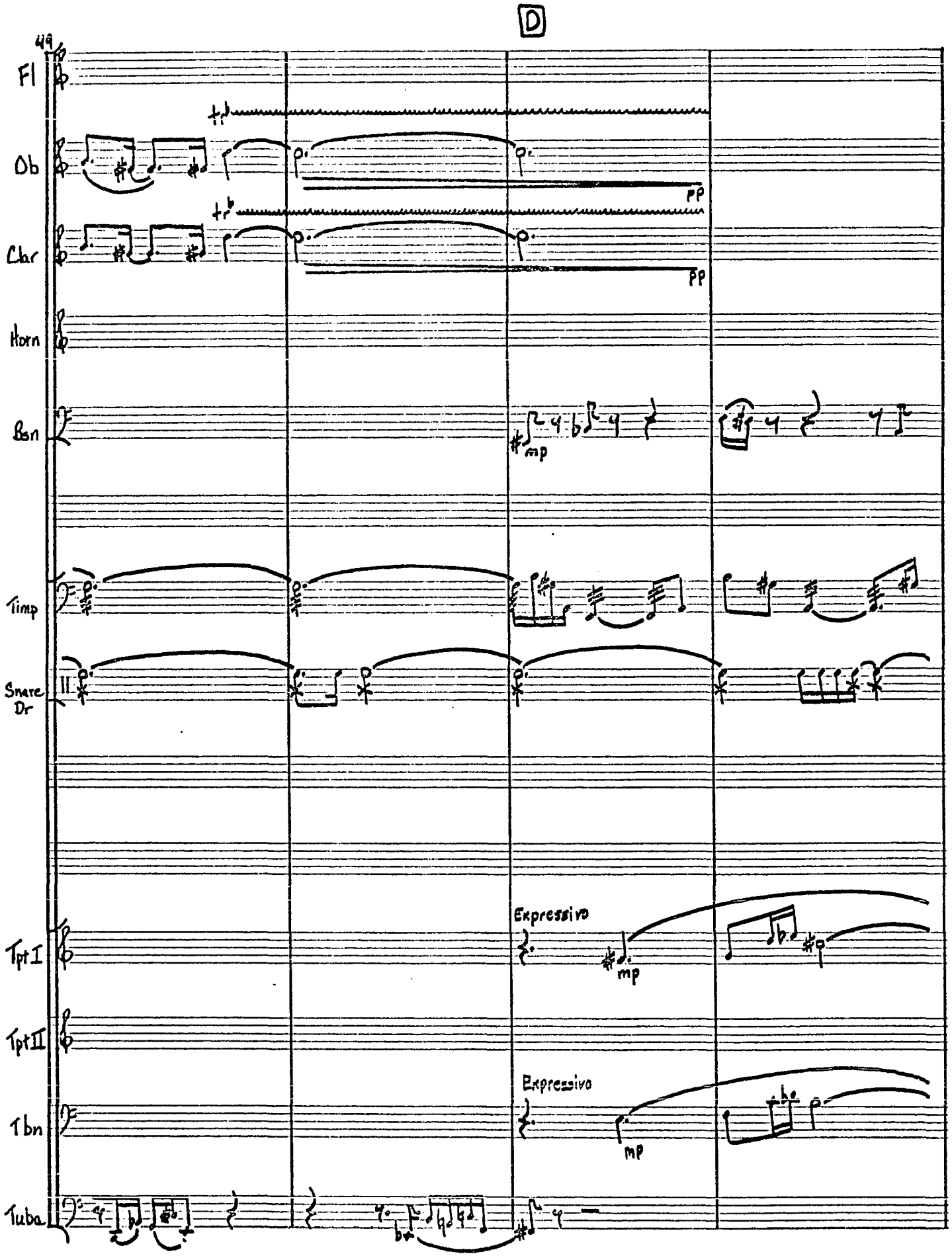
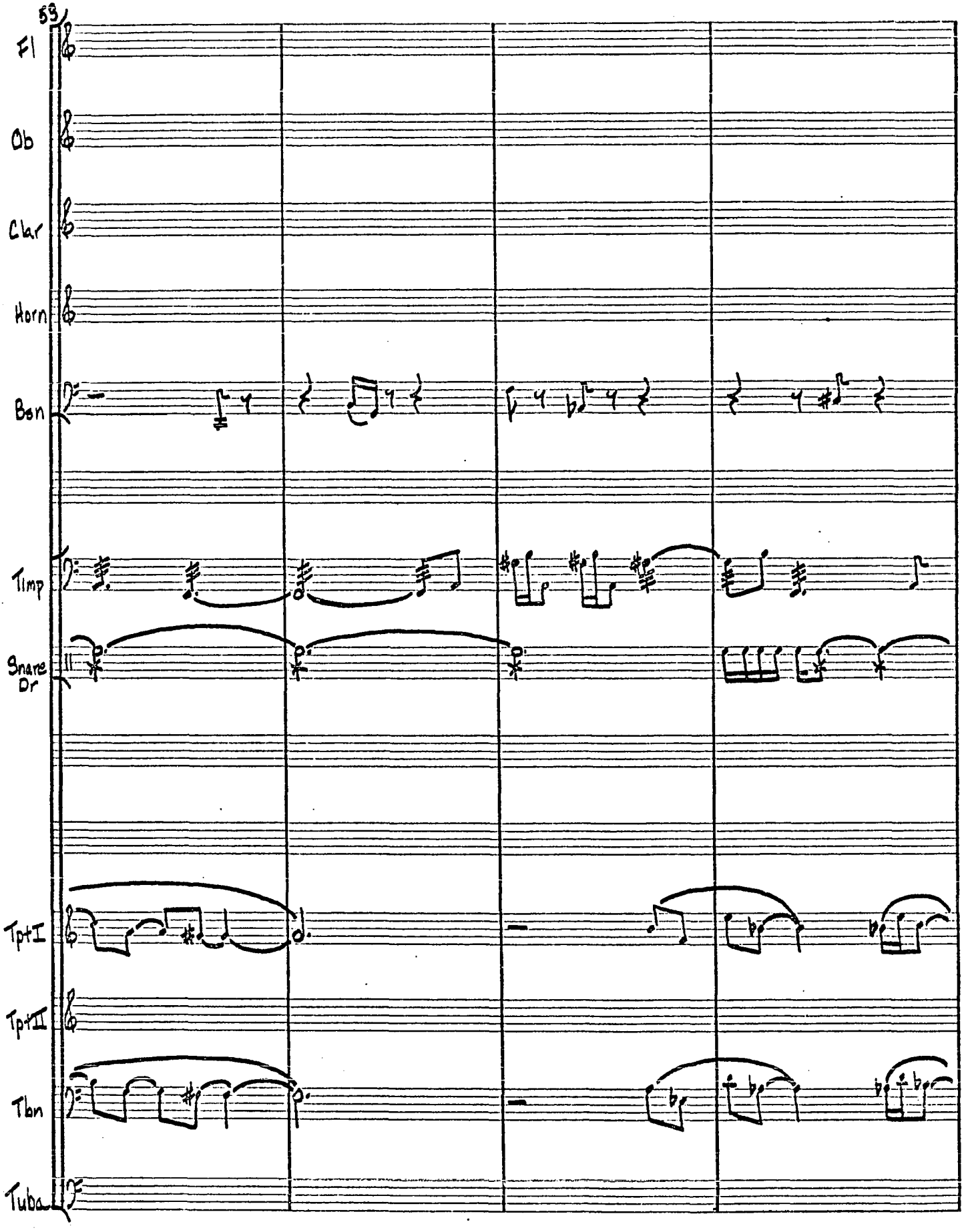


Alpheus Music Corp
Hollywood, Calif
V-44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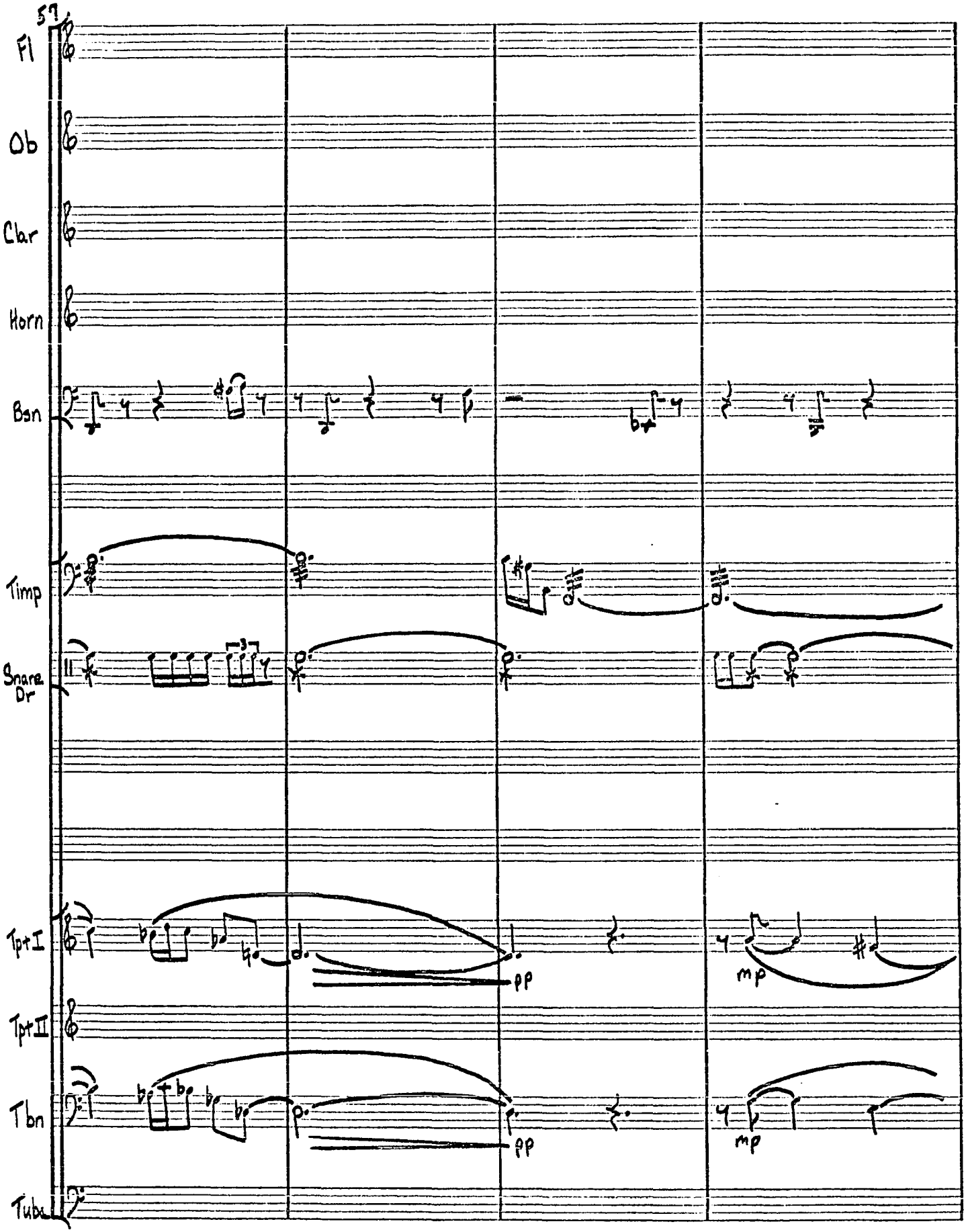

Alpheus Music Corp
Hollywood, Calif
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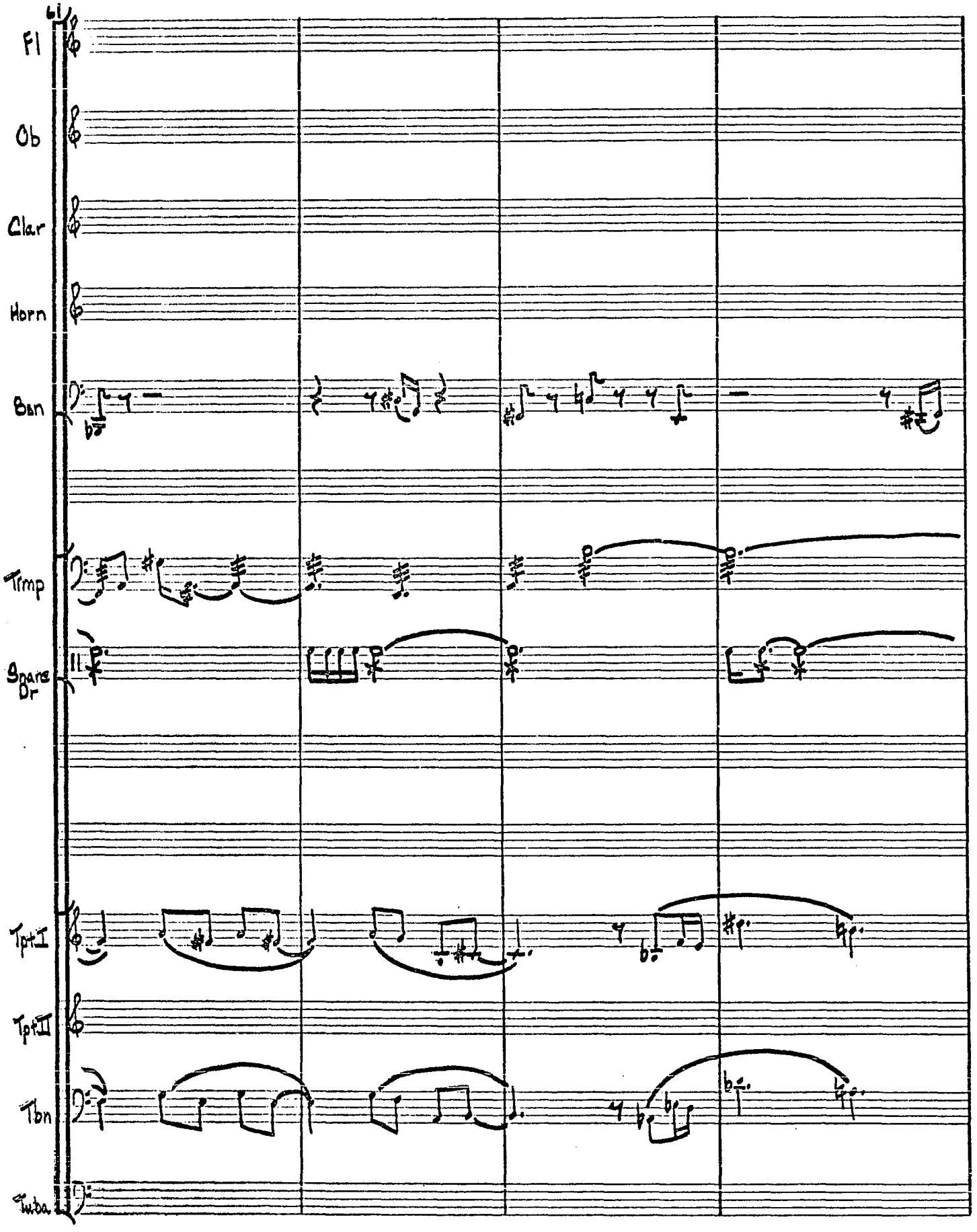

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Hollywood, Calif
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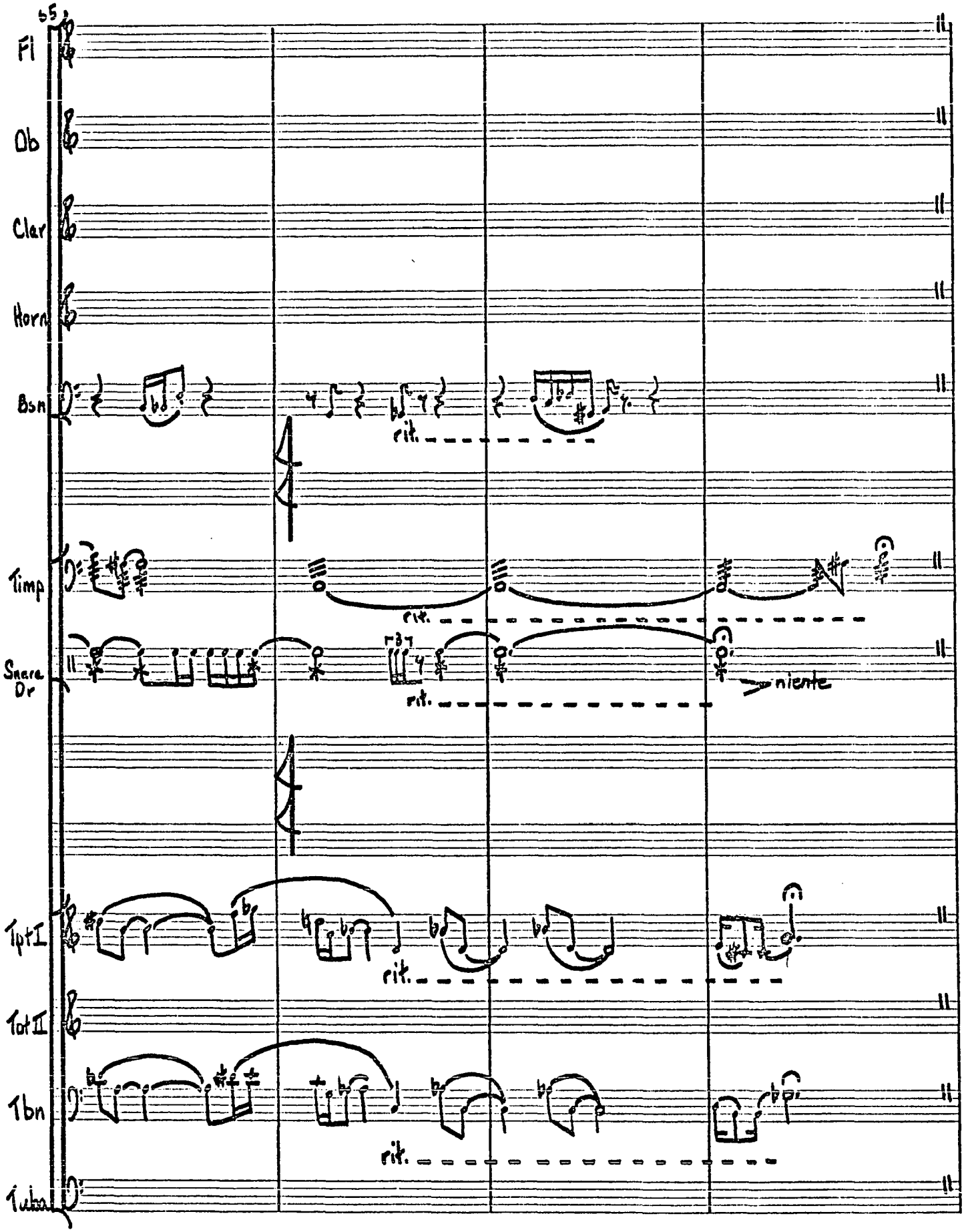

Alpheus Music Corp
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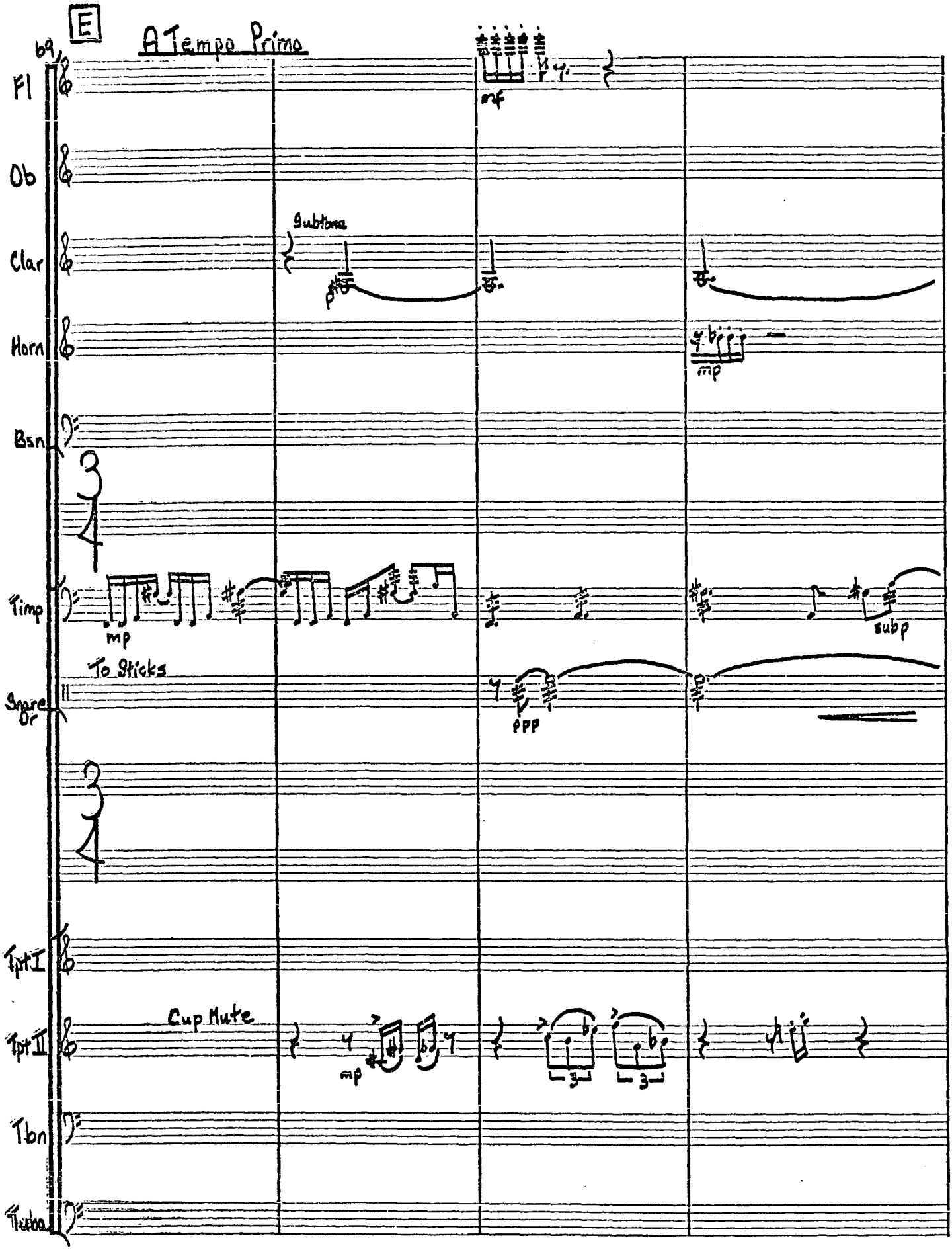
V 44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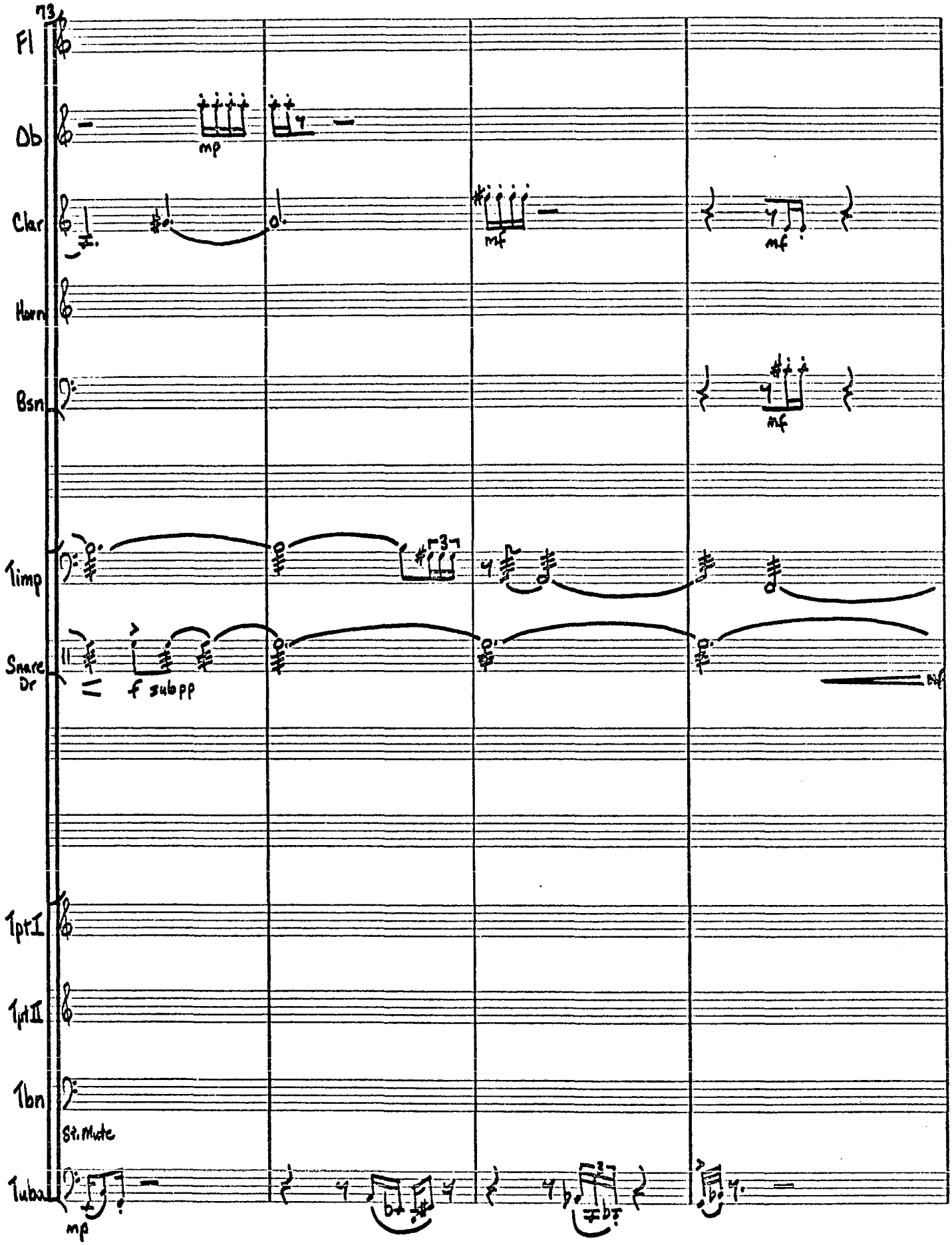
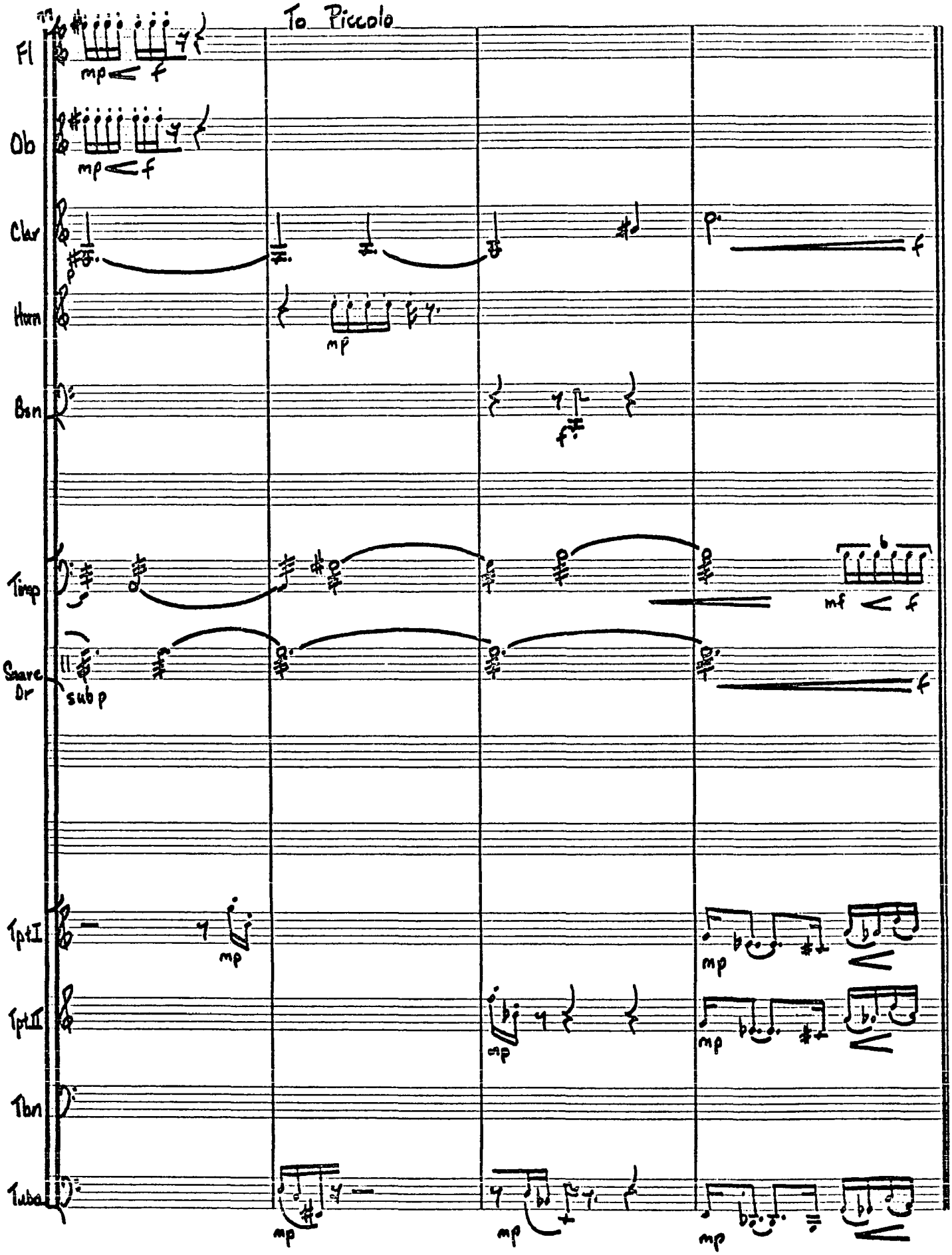
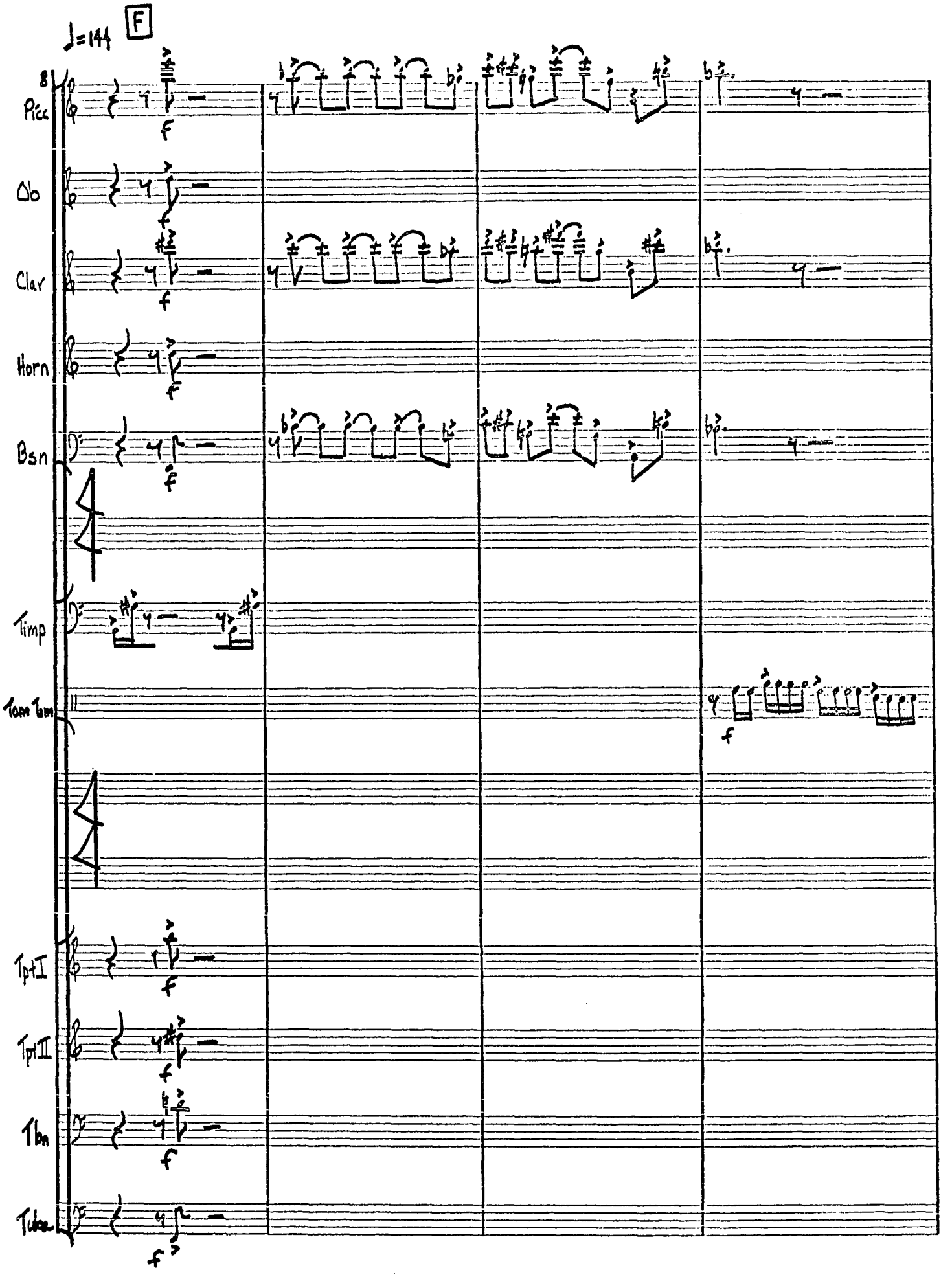


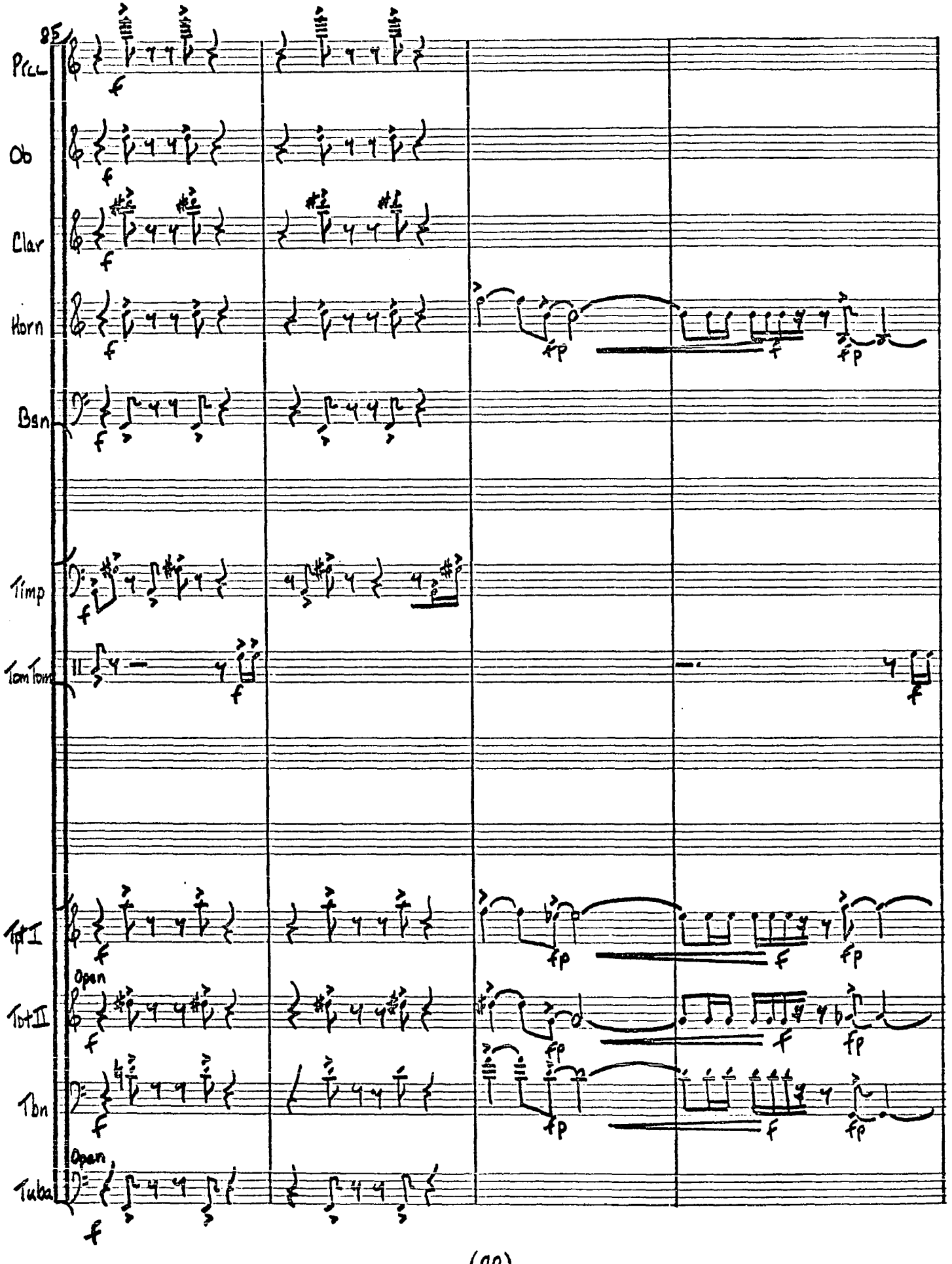
Alpheus Music Corp
Hollywood Calif V-44



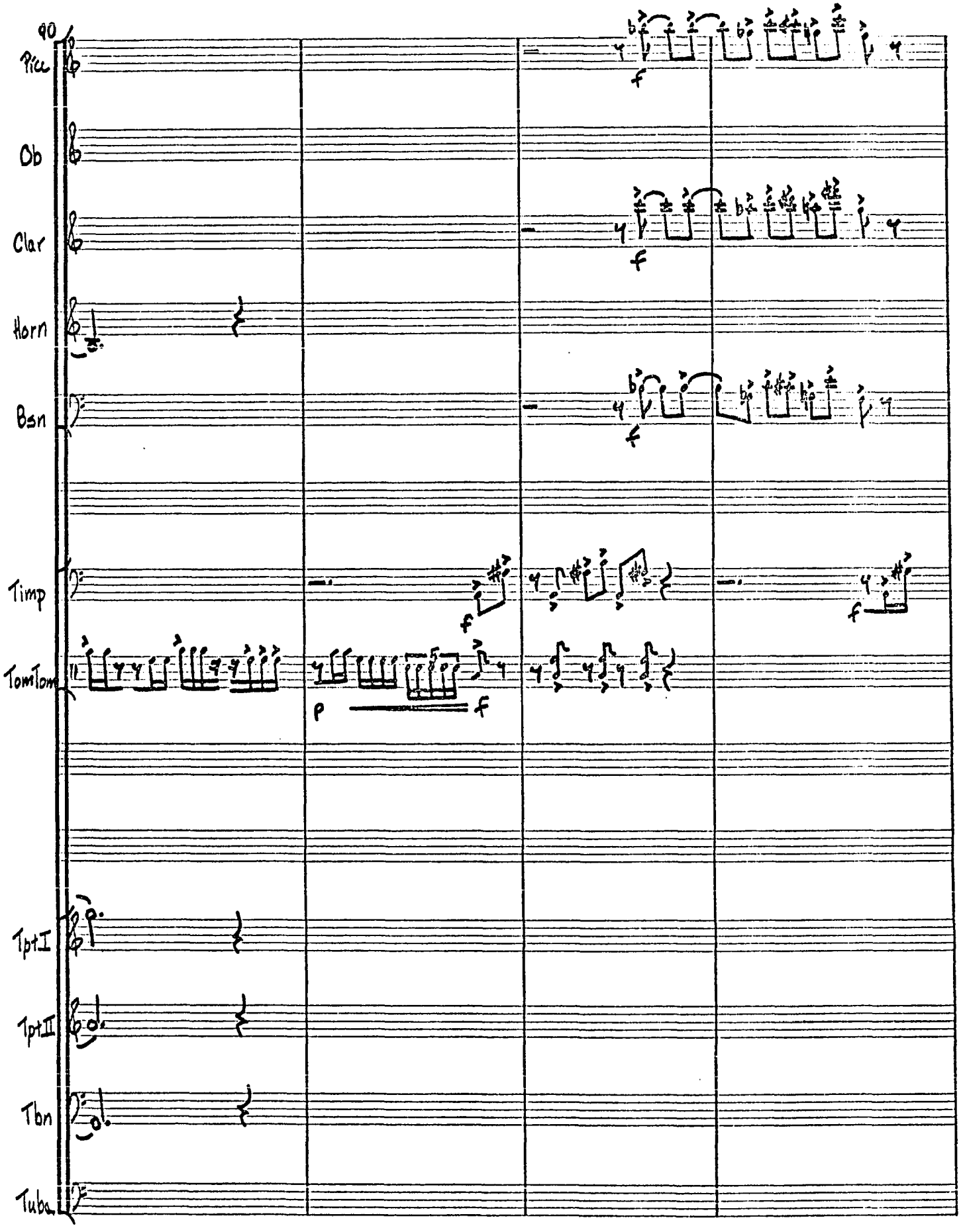
Alpheus Music Corp
Hollywood, Calif
V 44



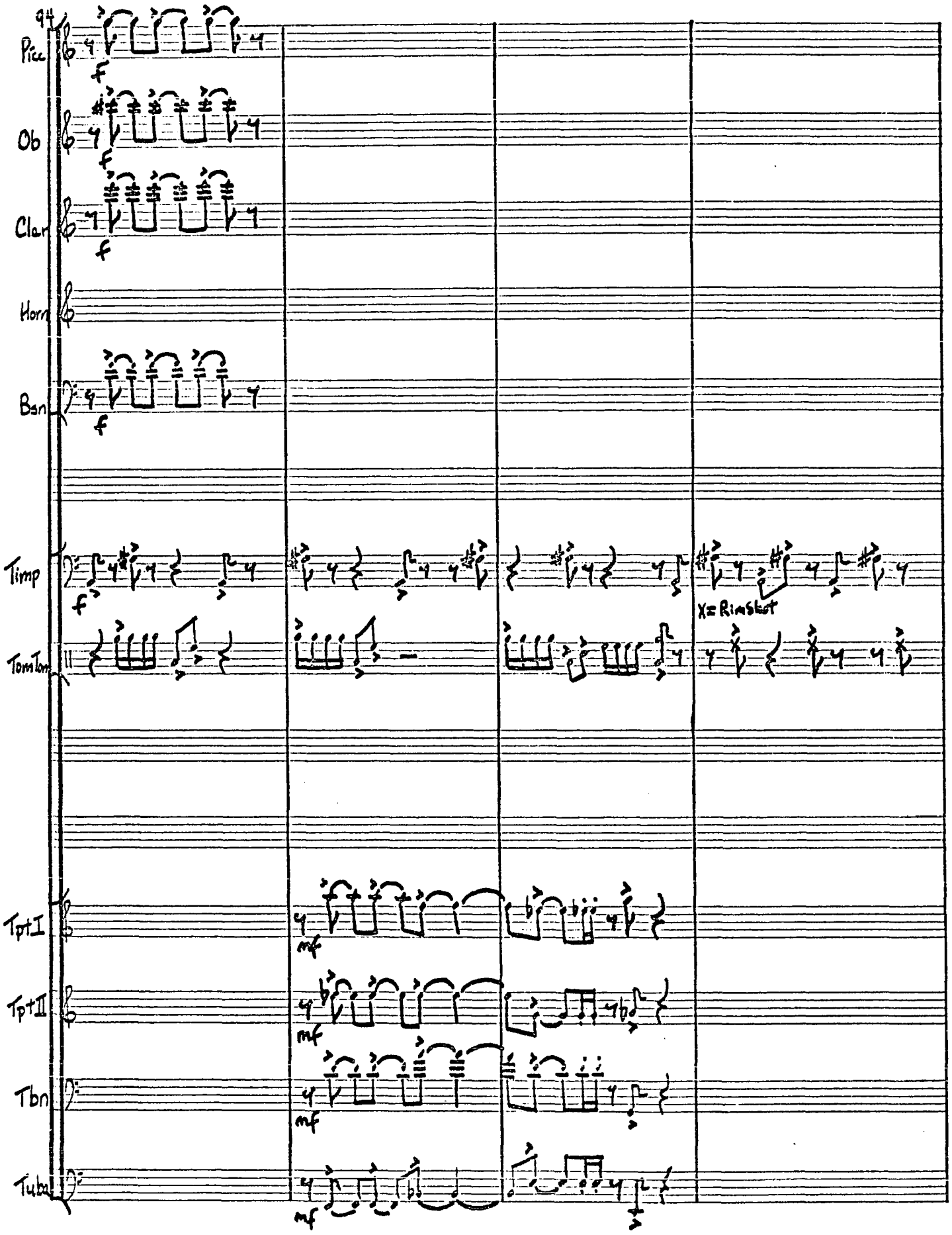
Alpheus Music Corp
Hollywood, Calif
V-44



Alpheus Music Corp
Hollywood, Calif
V 44



Alpheus Music Corp
Hollywood Calif
V 44



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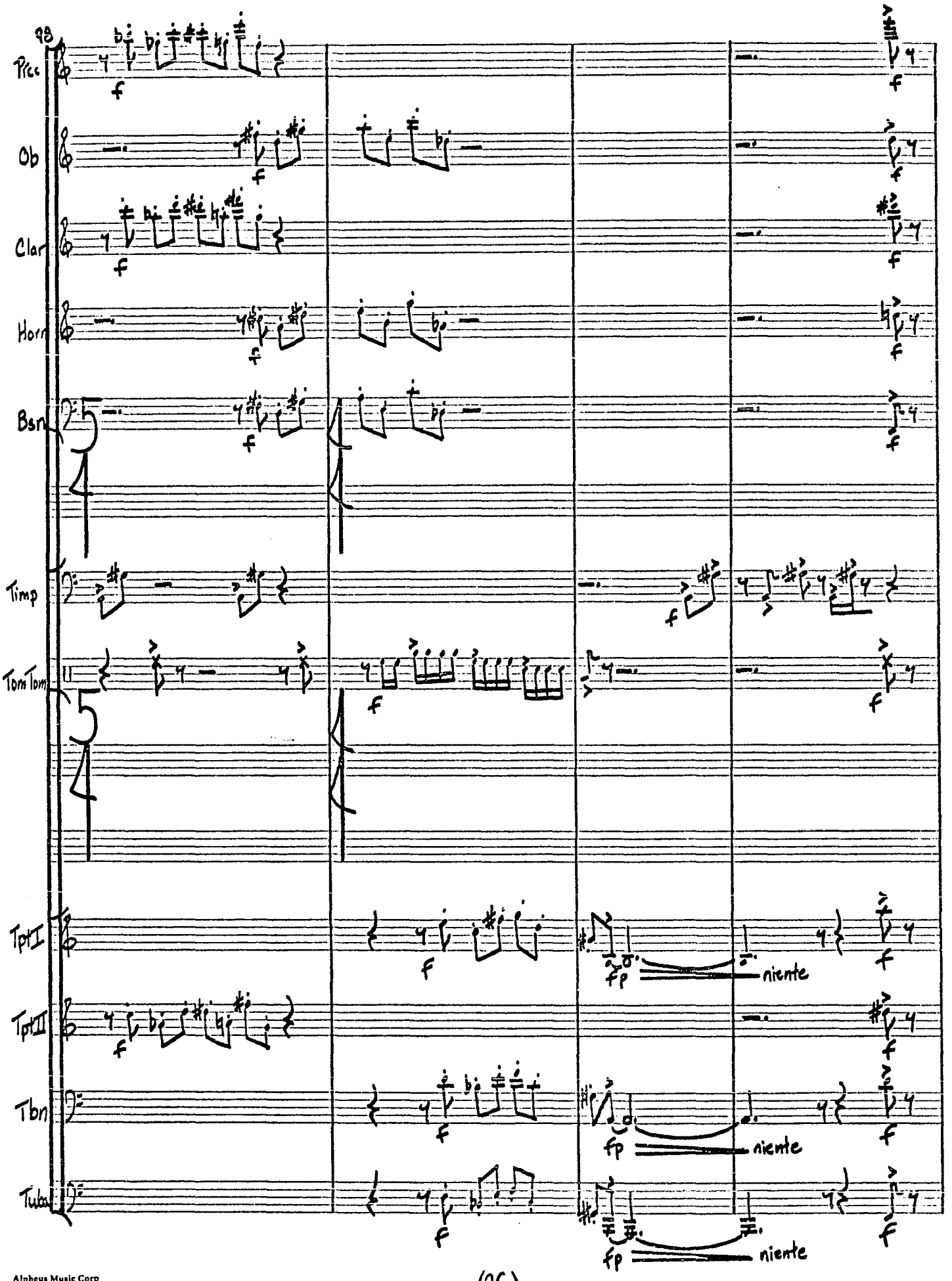

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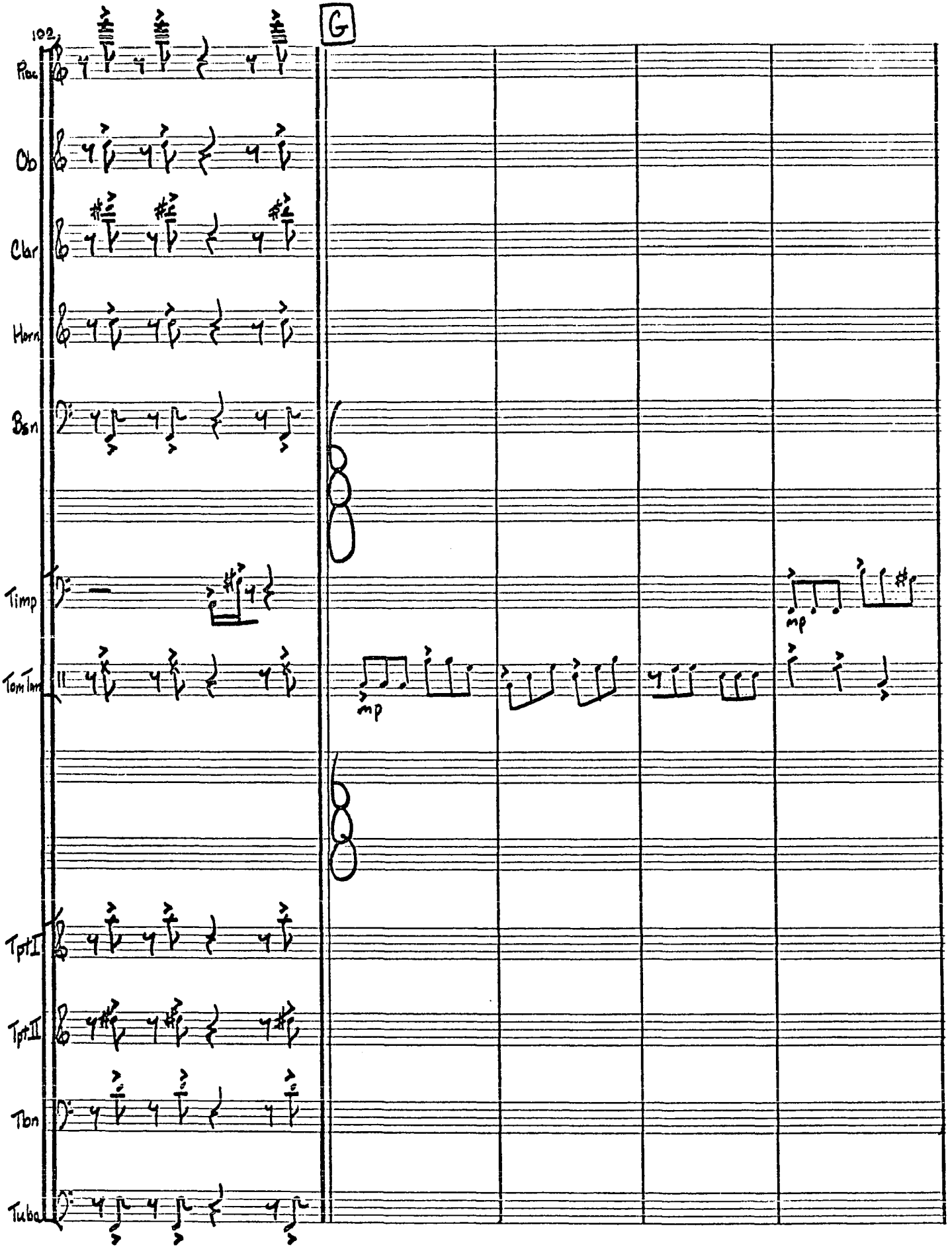
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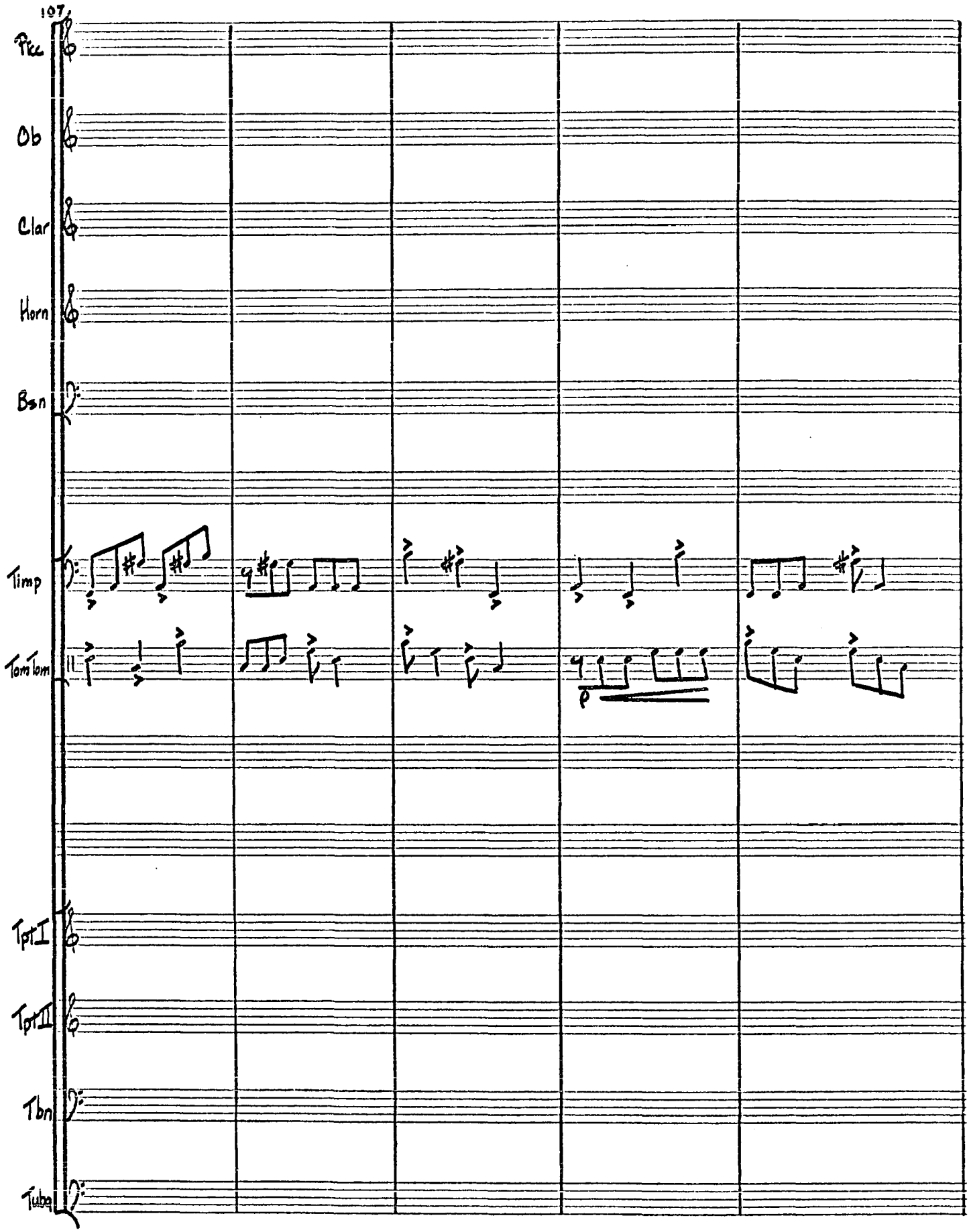
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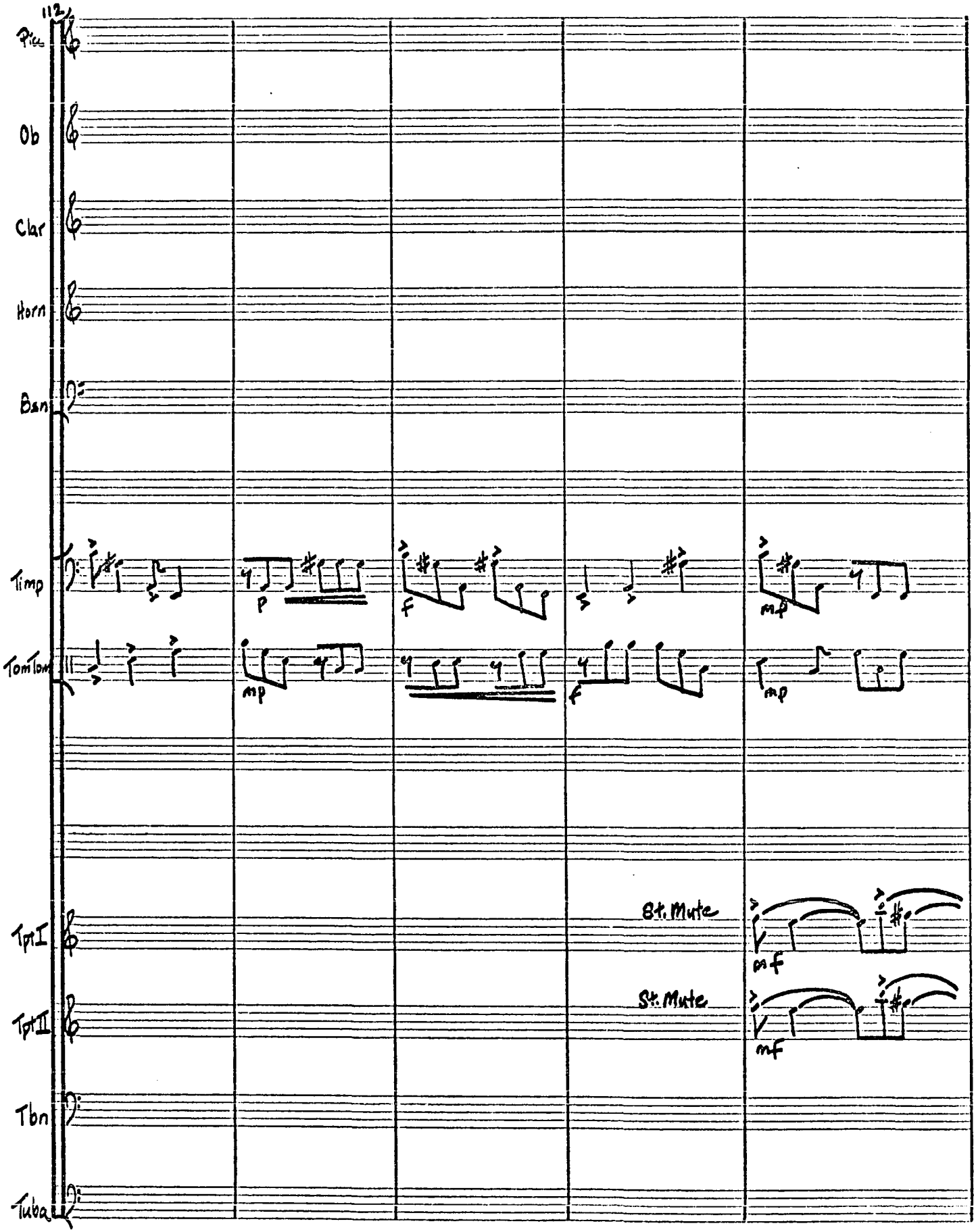
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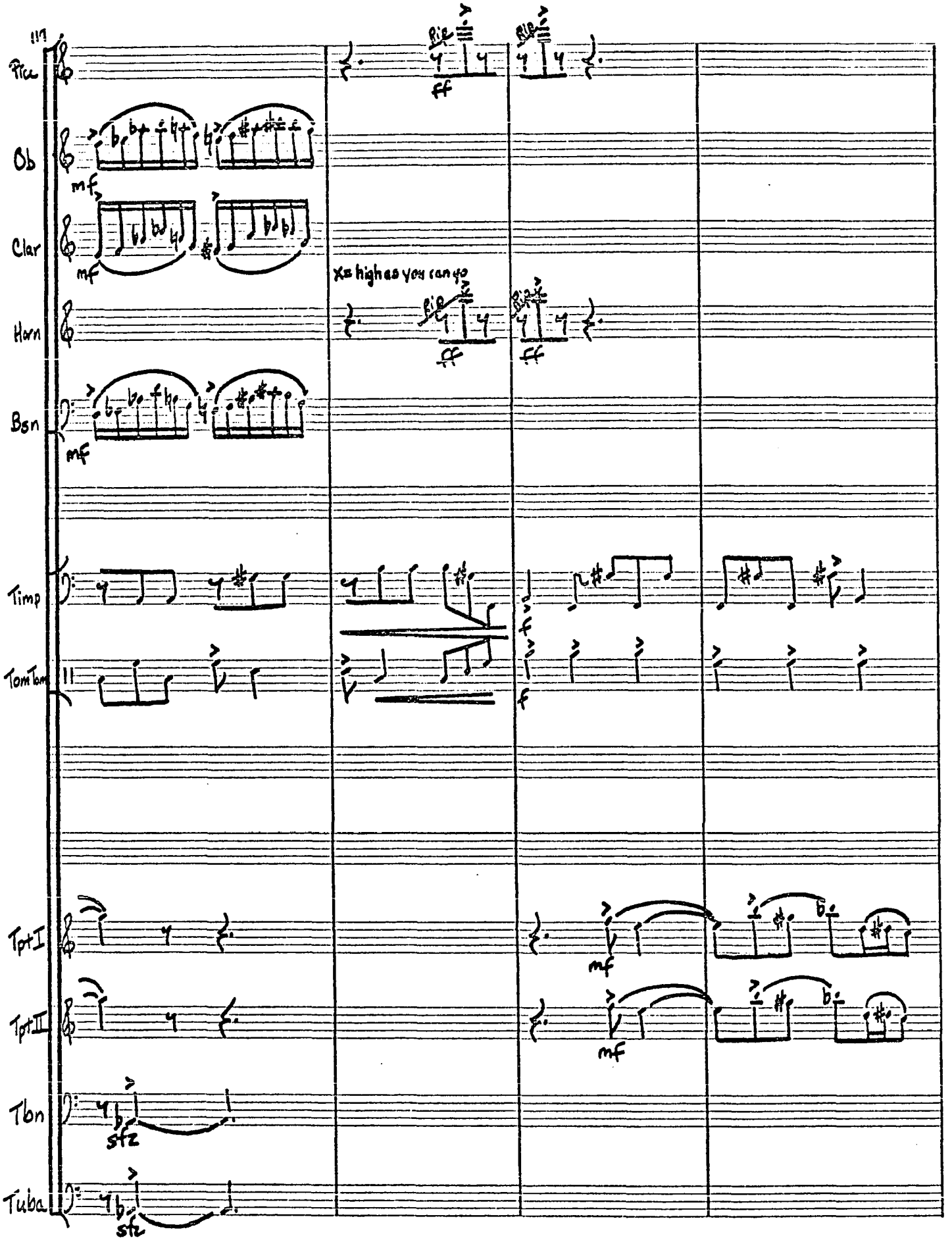

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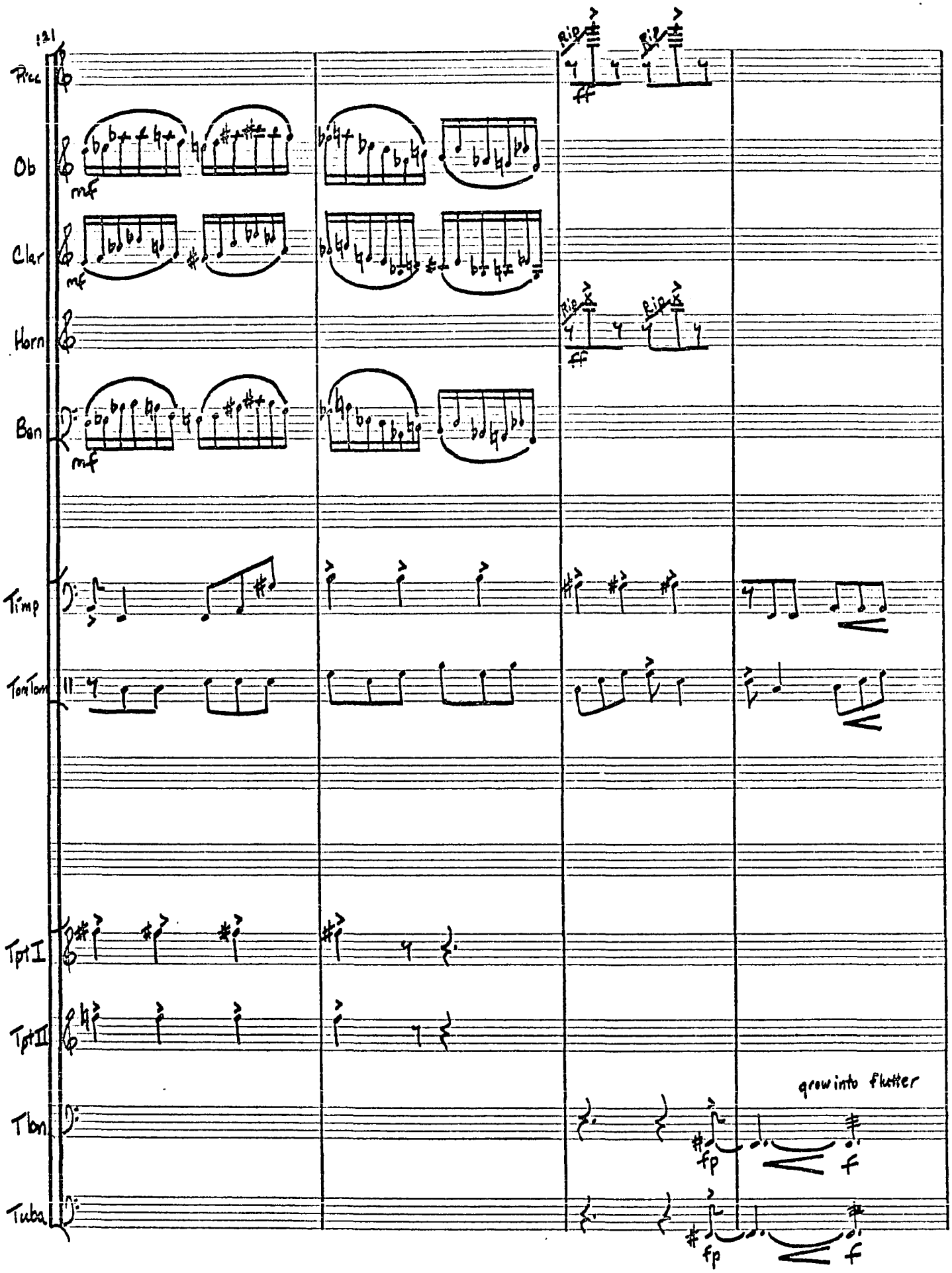

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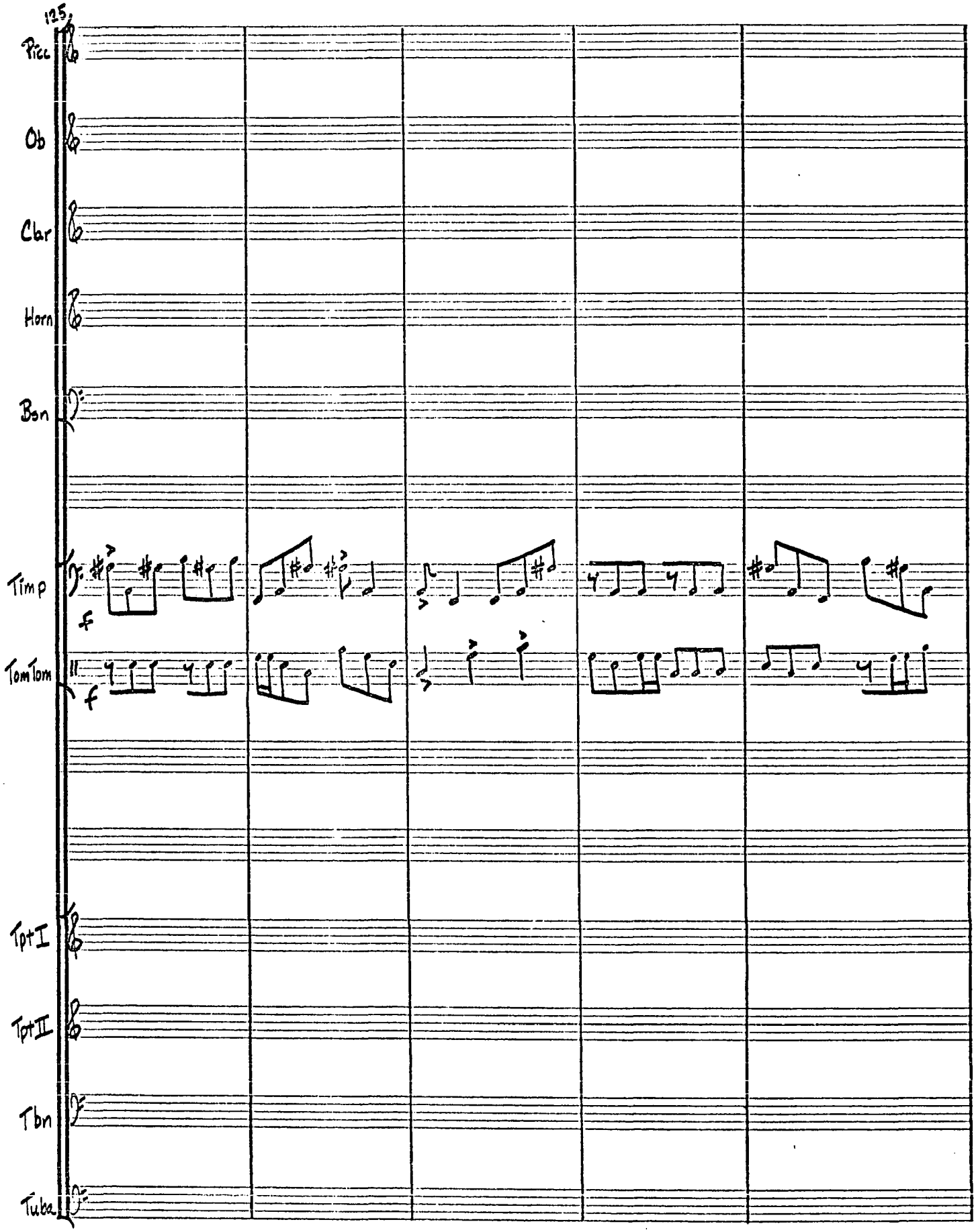
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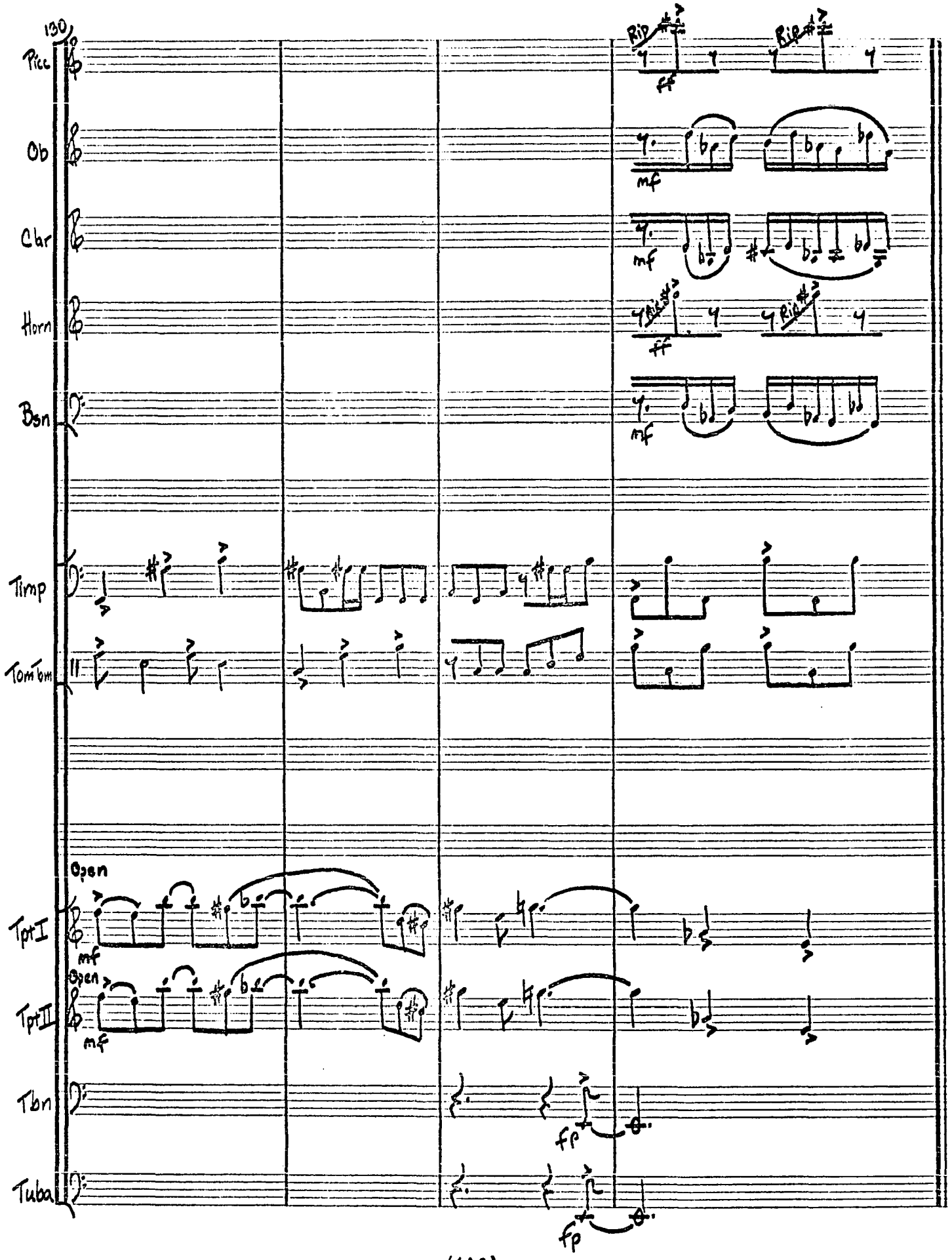

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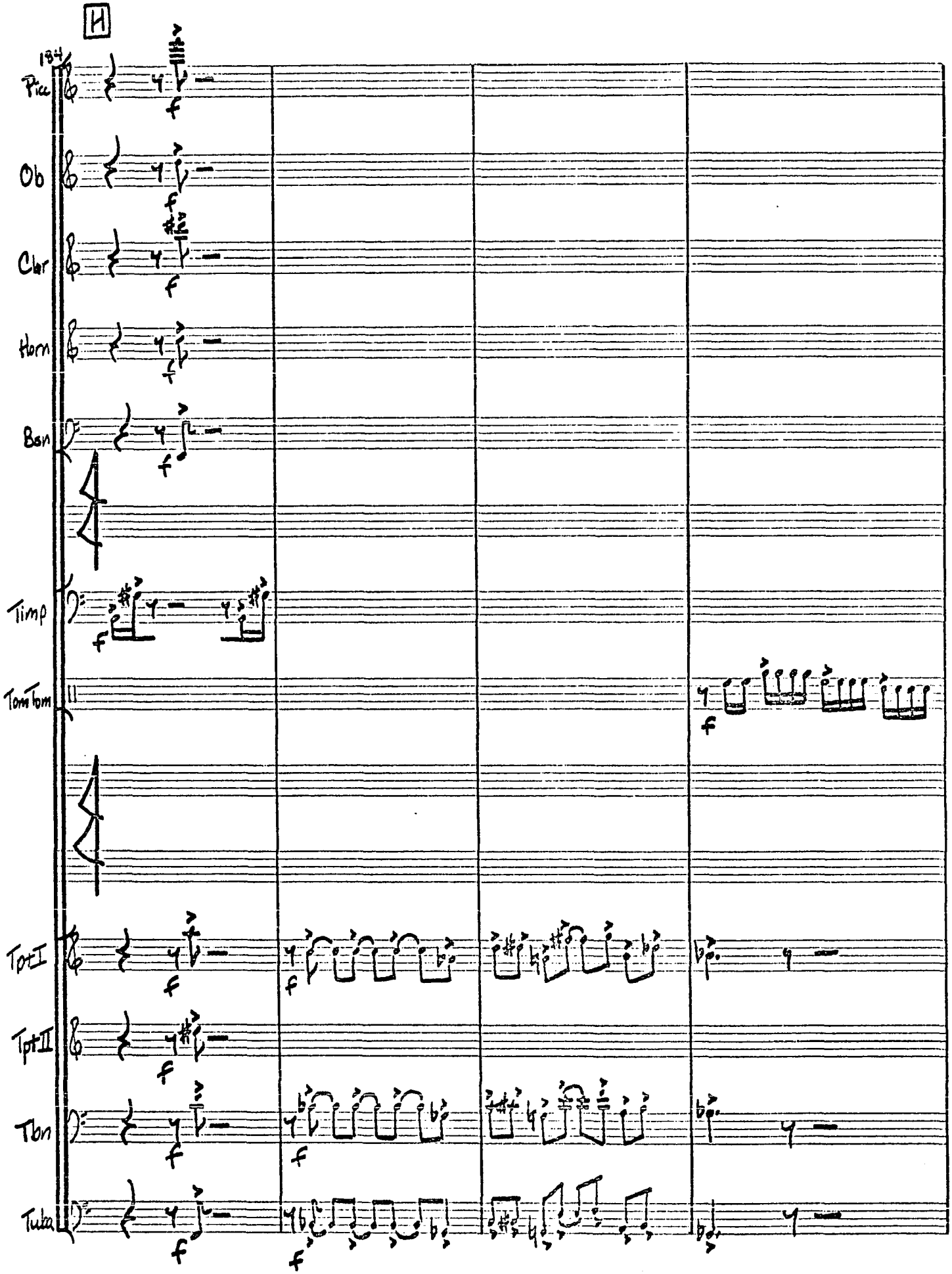

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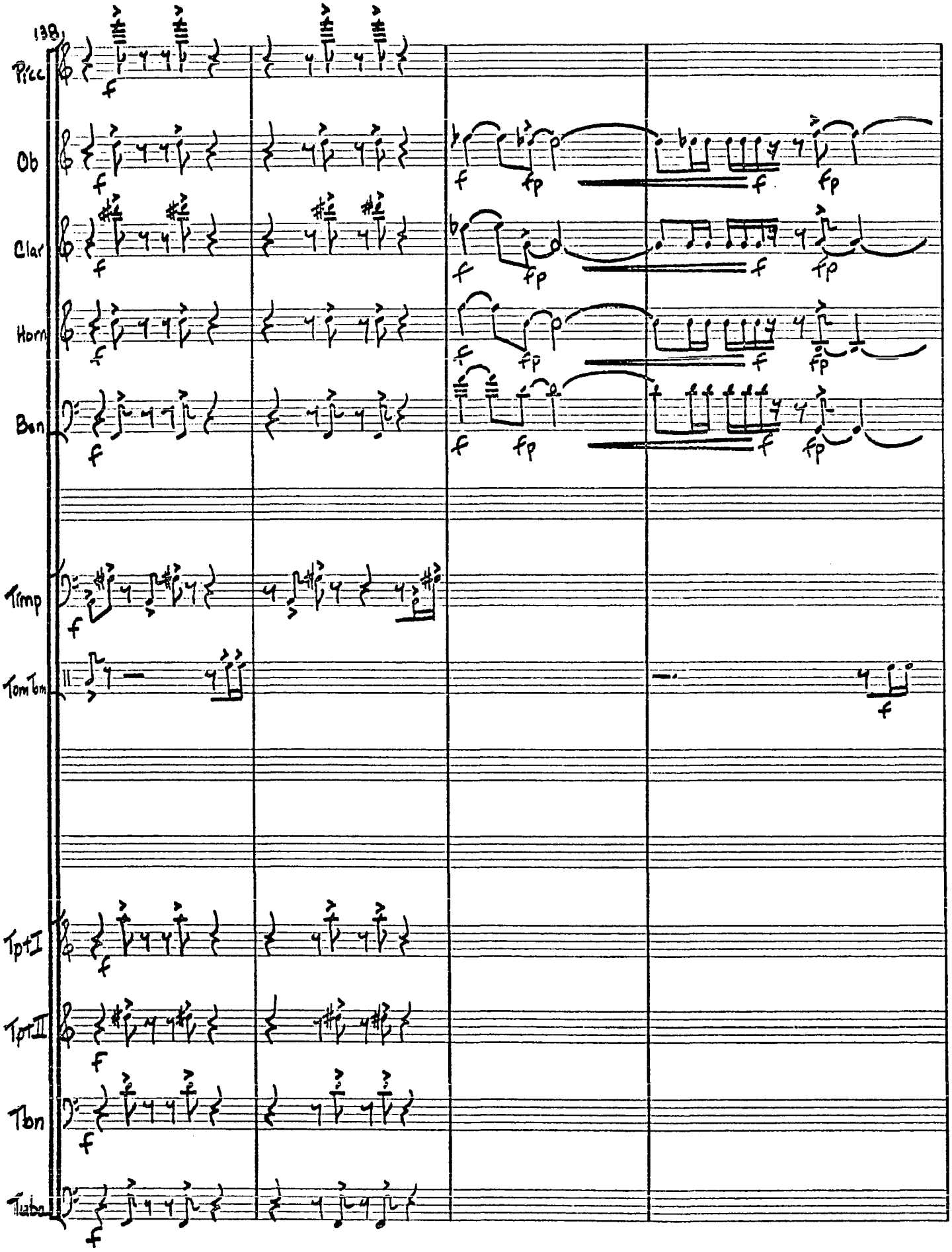

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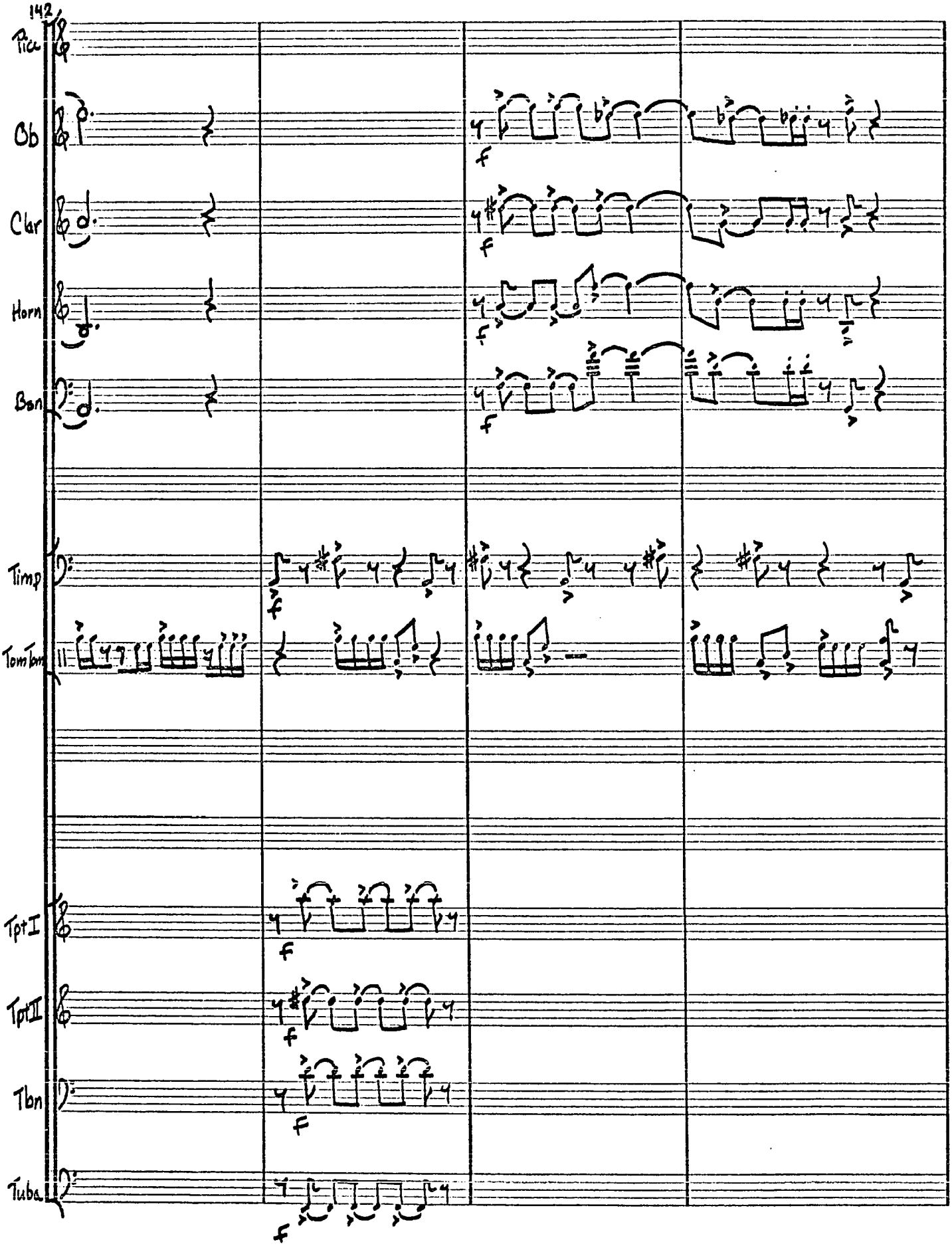
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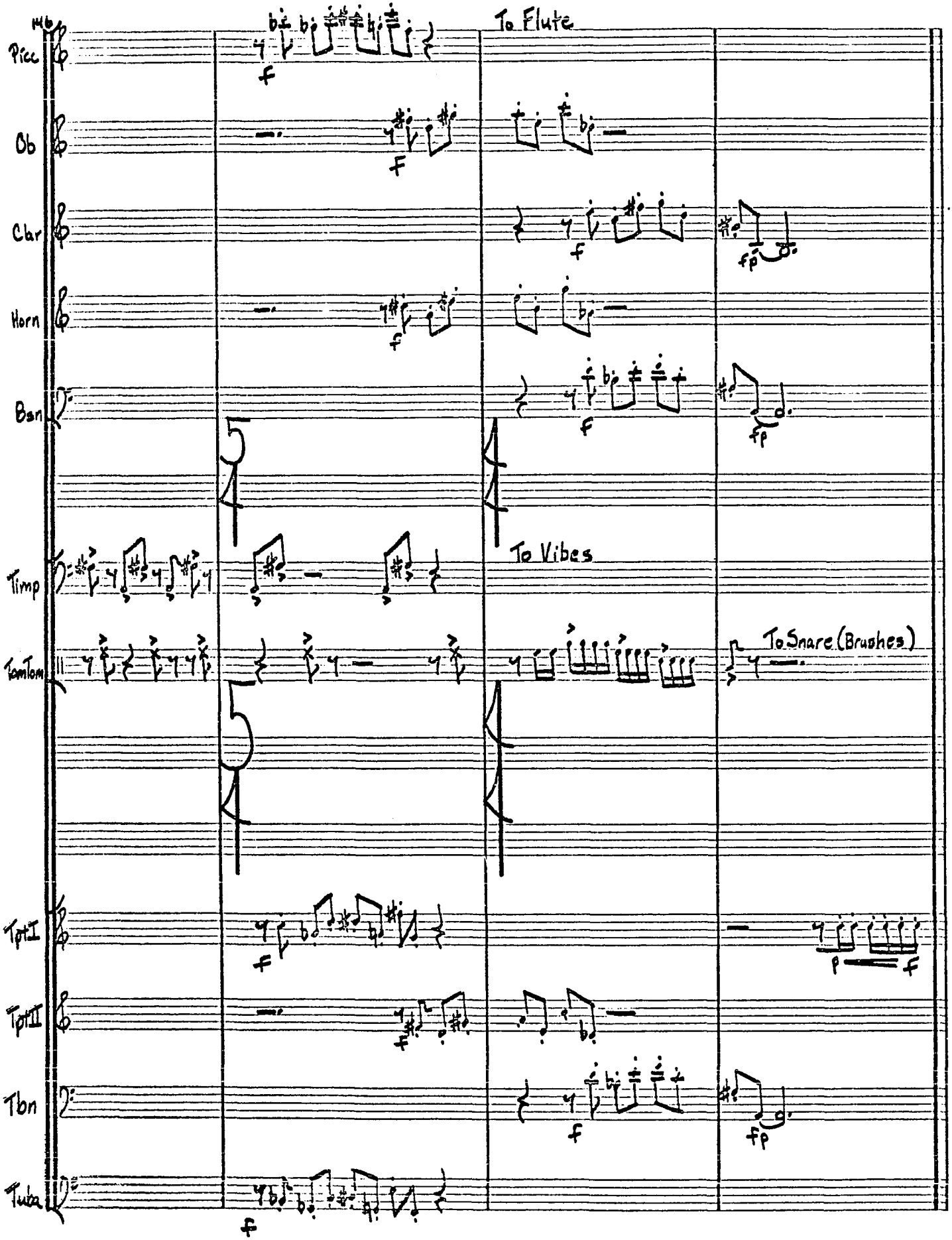

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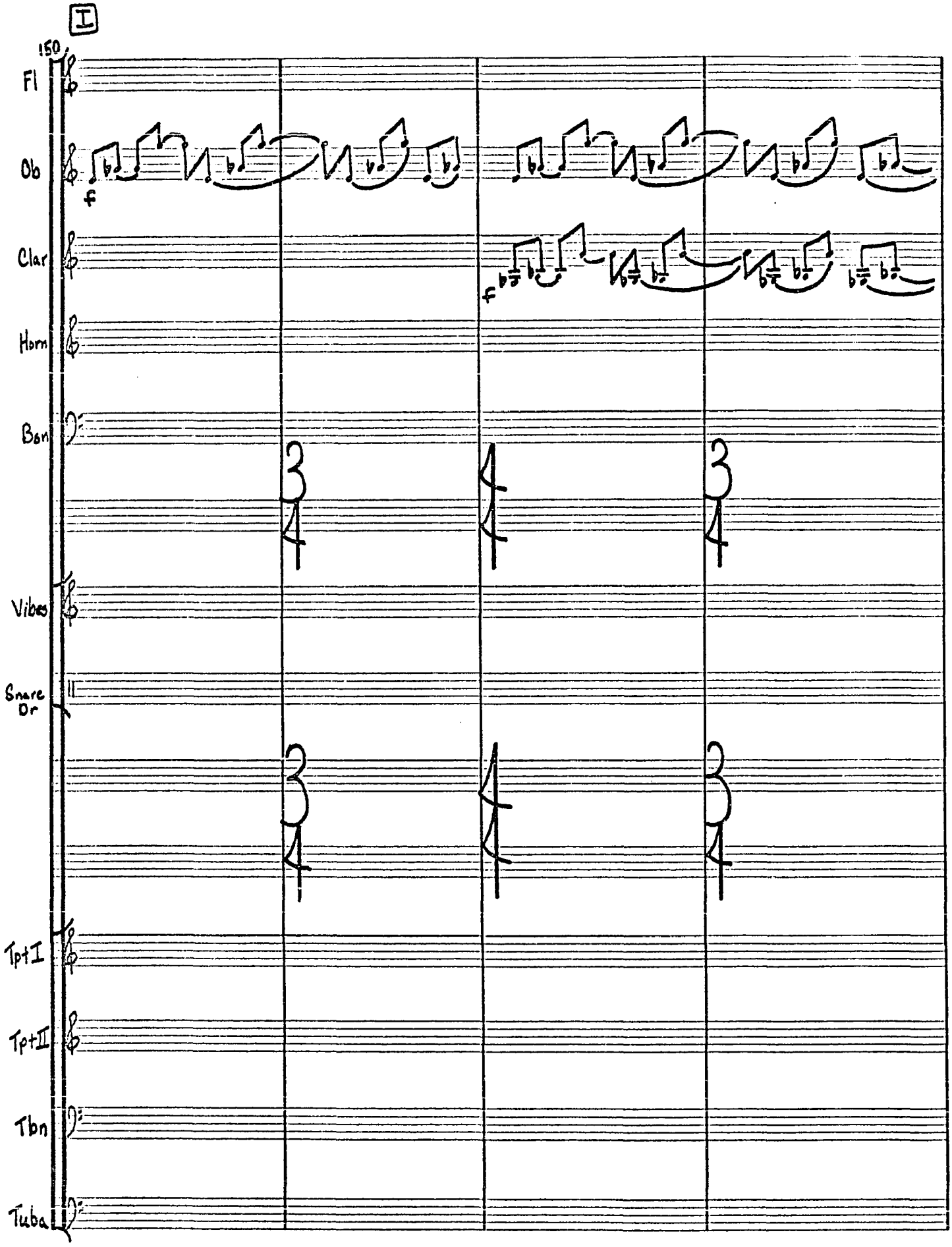
Hollywood, Calif
V 44



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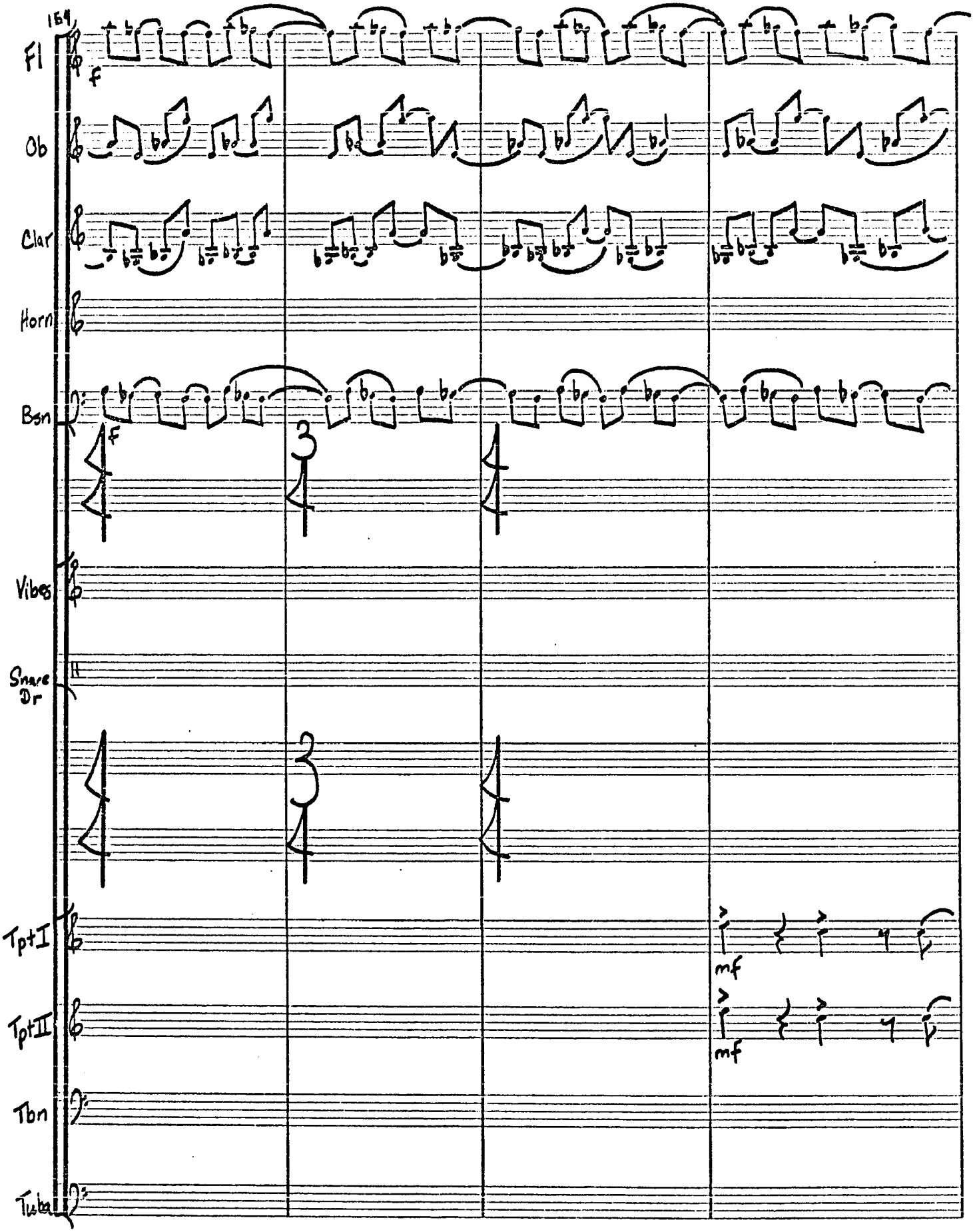
164
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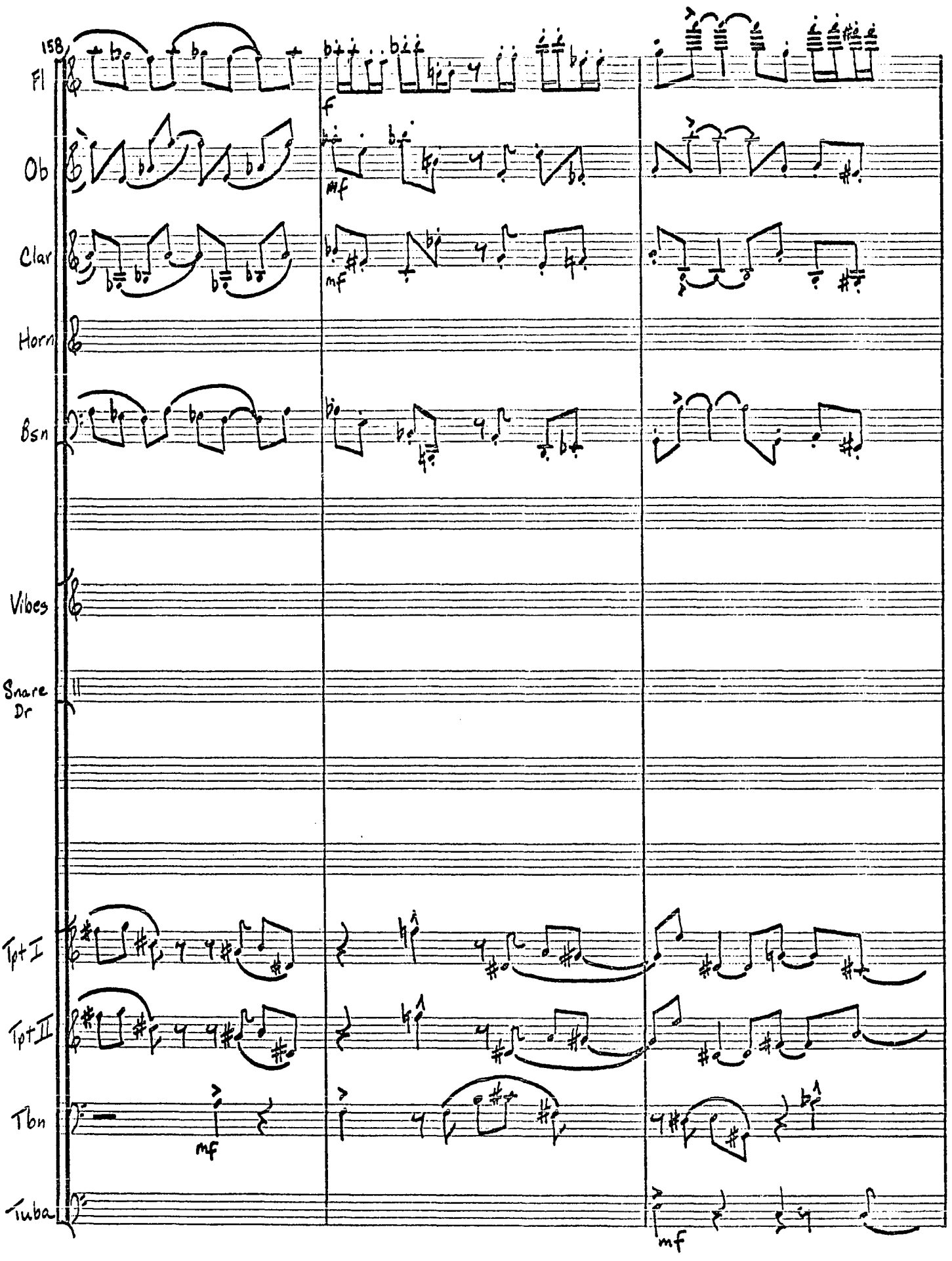
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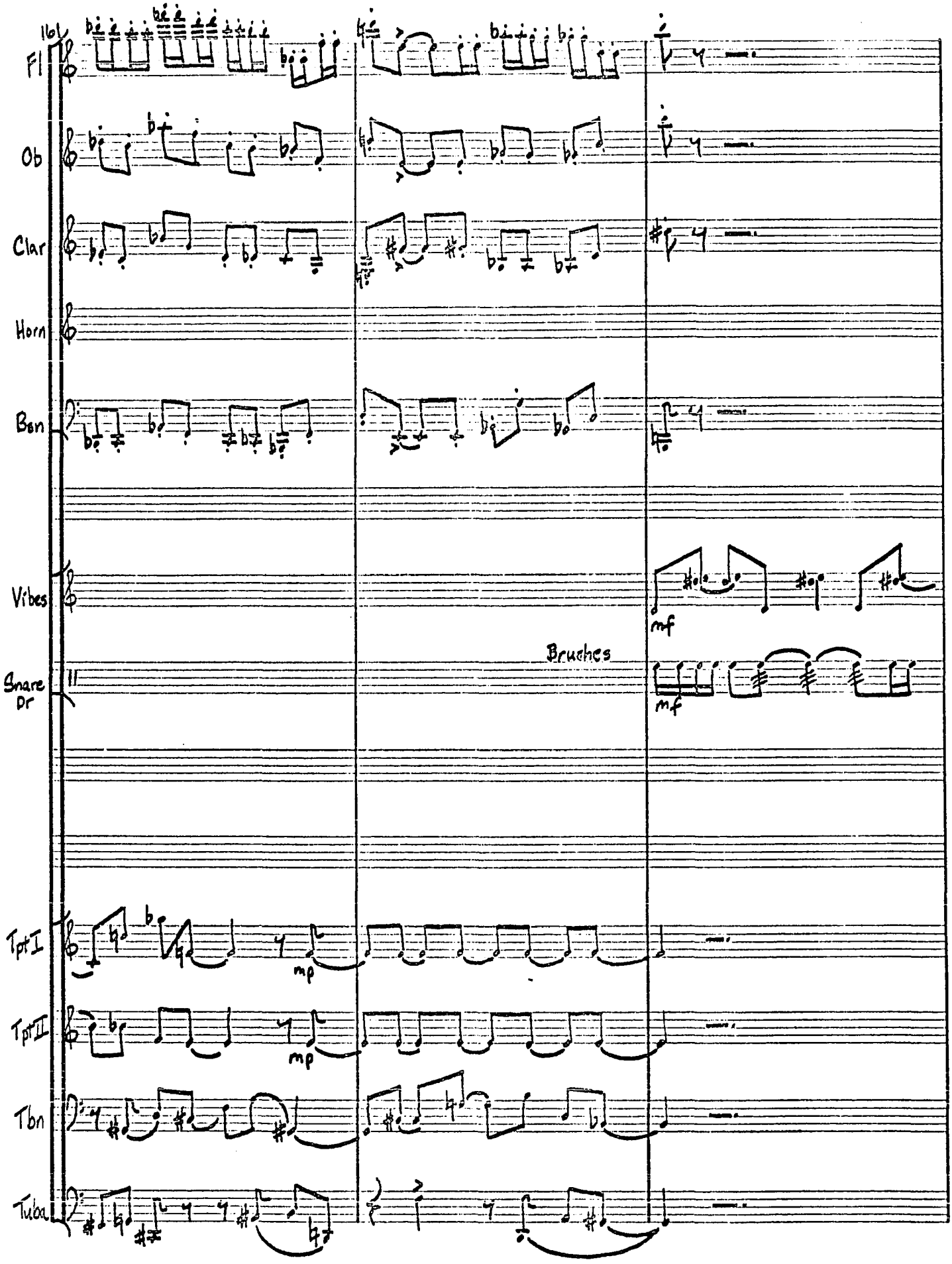
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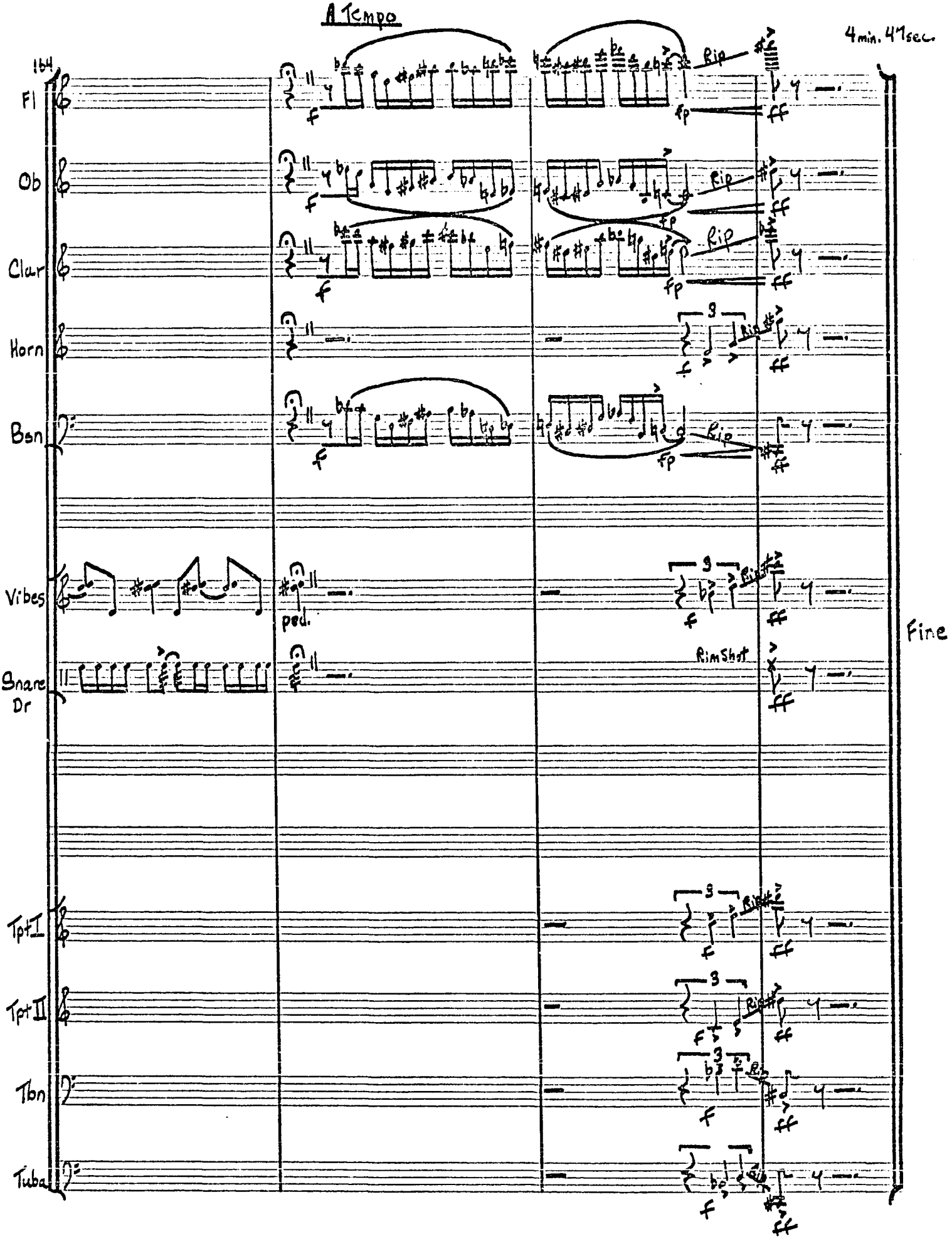

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