Untitled Hutchins Piece

Christopher Otto

The Contrabass's lowest string is to be tuned down to a D. All other strings are tuned normally, with pure fifths (3/2) and fourths (4/3).

Alto clef in the Soprano sounds once octave higher than written.

Harmonics are notated as follows: the roman numeral indicates the string number, and the arabic numberal immediately following it is the number of the harmonic on that string. Below these numbers is the deviation in cents from the nearest equal-tempered pitch. For example:

IV 19
+3

indicates the 19th harmonic on the fourth string, which is 3 cents higher than the notated pitch. Open strings are notated with the usual "o".

Double stops invariably involve at least one open string, and if there is a stopped note, its ratio to the open string is indicated, in addition to its deviation in cents from equal temperament. Single stopped notes are notated in relation to the fundamental of the chord (always related by octaves to the open C, G, D, or A strings) - ie, the 7th harmonic of (open) C.

Pairs of pitches, either between two instruments or as double stops, create beating (or, later on, difference tones) at speeds (or frequencies) which are uniform within each section (aside from any pitches hanging over from the previous section). This property can be used to help tune some of the double stops, especially the ones with more complex ratios in the earlier sections. For example, in m.5 the Contrabass can tune the 28/27 interval so that the speed of its beating is the same as the beating created between the Soprano and Small Bass. The rate of beating for each section is listed below:

Beginning to Letter A: 2 Hz
A to B: 4 Hz
B to C: 6 Hz
C to D: 8 Hz
D to E: 12 Hz
E to F: 16 Hz
F to G: 18 Hz
G to H: 24 Hz
H to I: 32 Hz
I to J: 36 Hz
J to K: 48 Hz
K to I: 64 Hz

Timing is free throughout. Each measure should last as long as is necessary to establish a stable, accurate pitch (probably between about 2 and 6 seconds).

Score

[Title]

A

Christopher Otto

Treble

Soprano

IV 4

Mezzo

Alto

IV 2

Tenor

80/81
E: -14
(unison w/ Bar.)

Baritone

IV 11
-49

49/48
G: +38

+38

IV 5
-14

Small Bass

IV 19
+3

35/36
D: -45

-45

25/24
Ab: -27

Contrabass

III 13
+44

28/27
Bb: -31

IV 7
-27

25/27
G#: -27

B

16

Treb.

Sop.

IV 19
-2

Mez.

Alto

49/48
G: +38

IV 11
-49

33/32
Ab: -45

Ten.

I 15
-4

25/24
Eb: -25

Bar.

35/36
D: -45

IV 13
+41

15/16
F#: -10

S.Bass

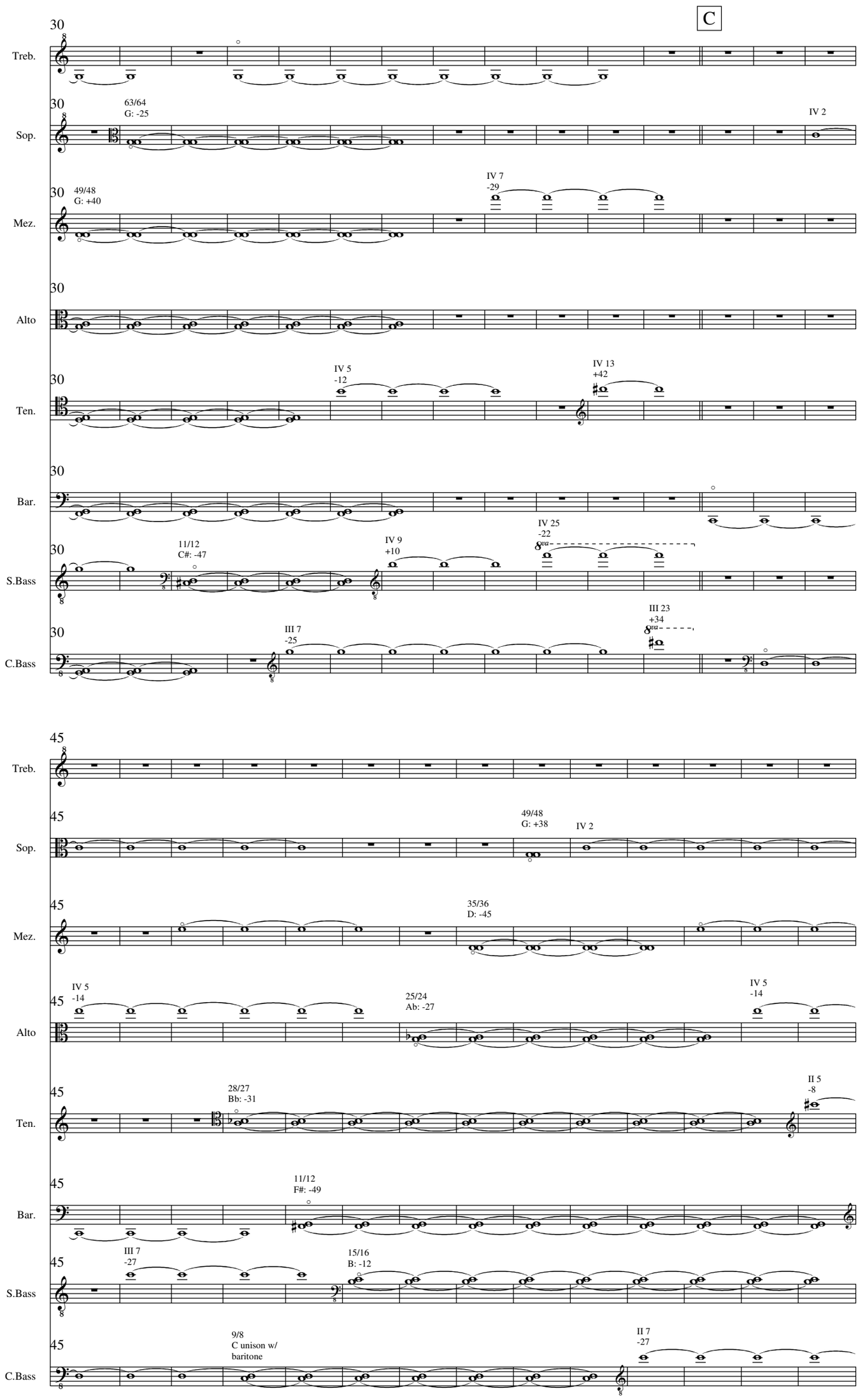
IV 26
+46

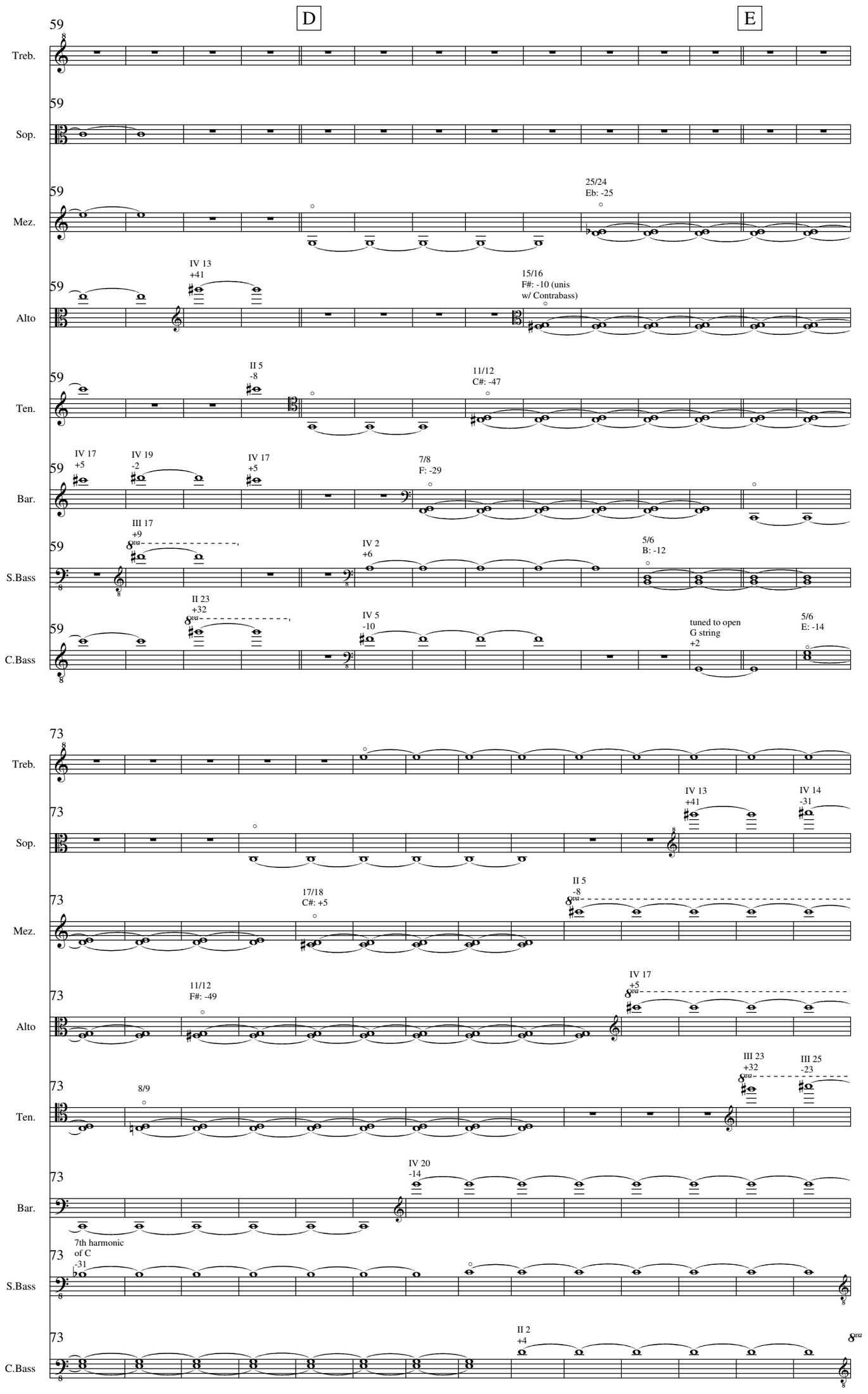
IV 7
-25

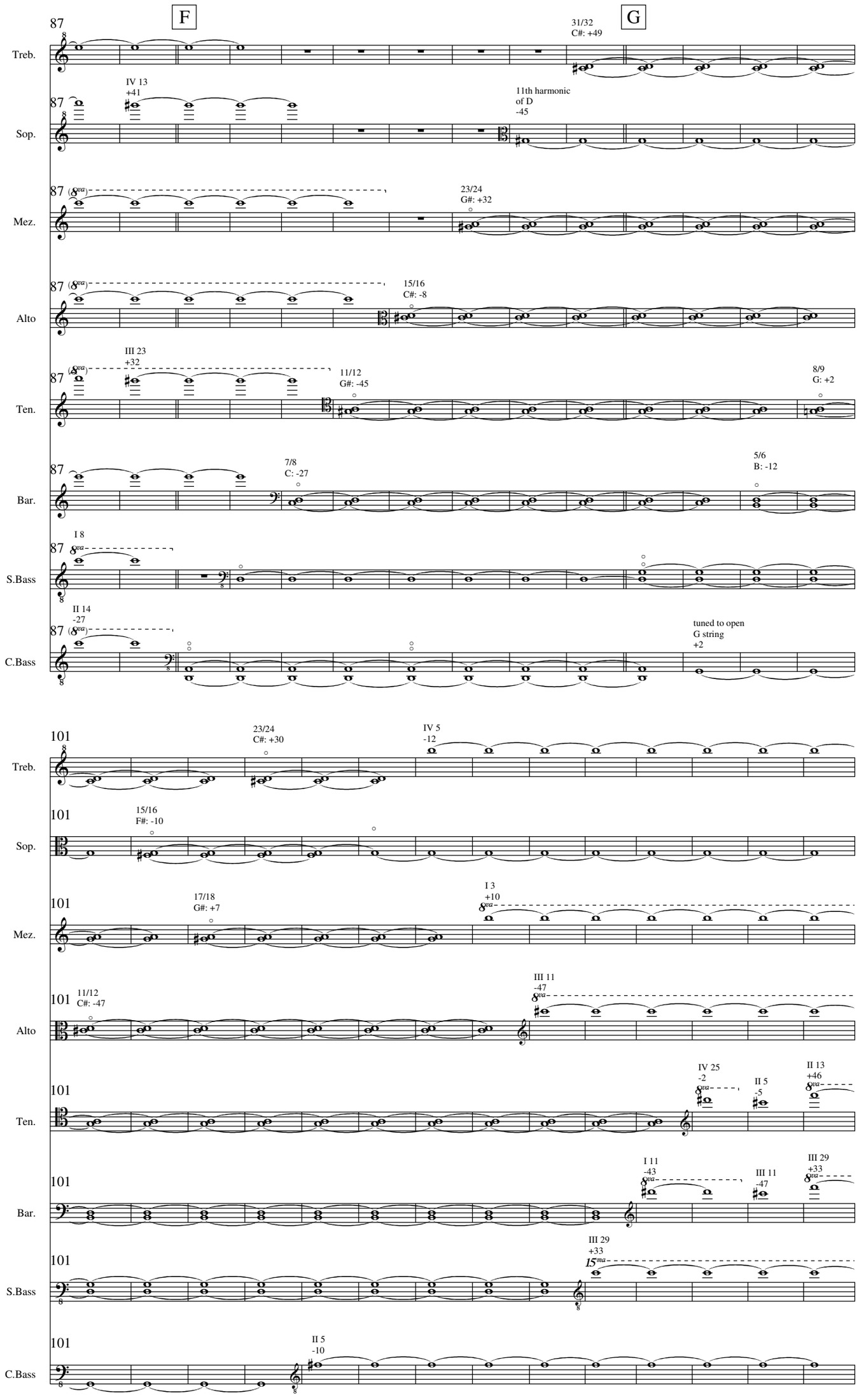
C.Bass

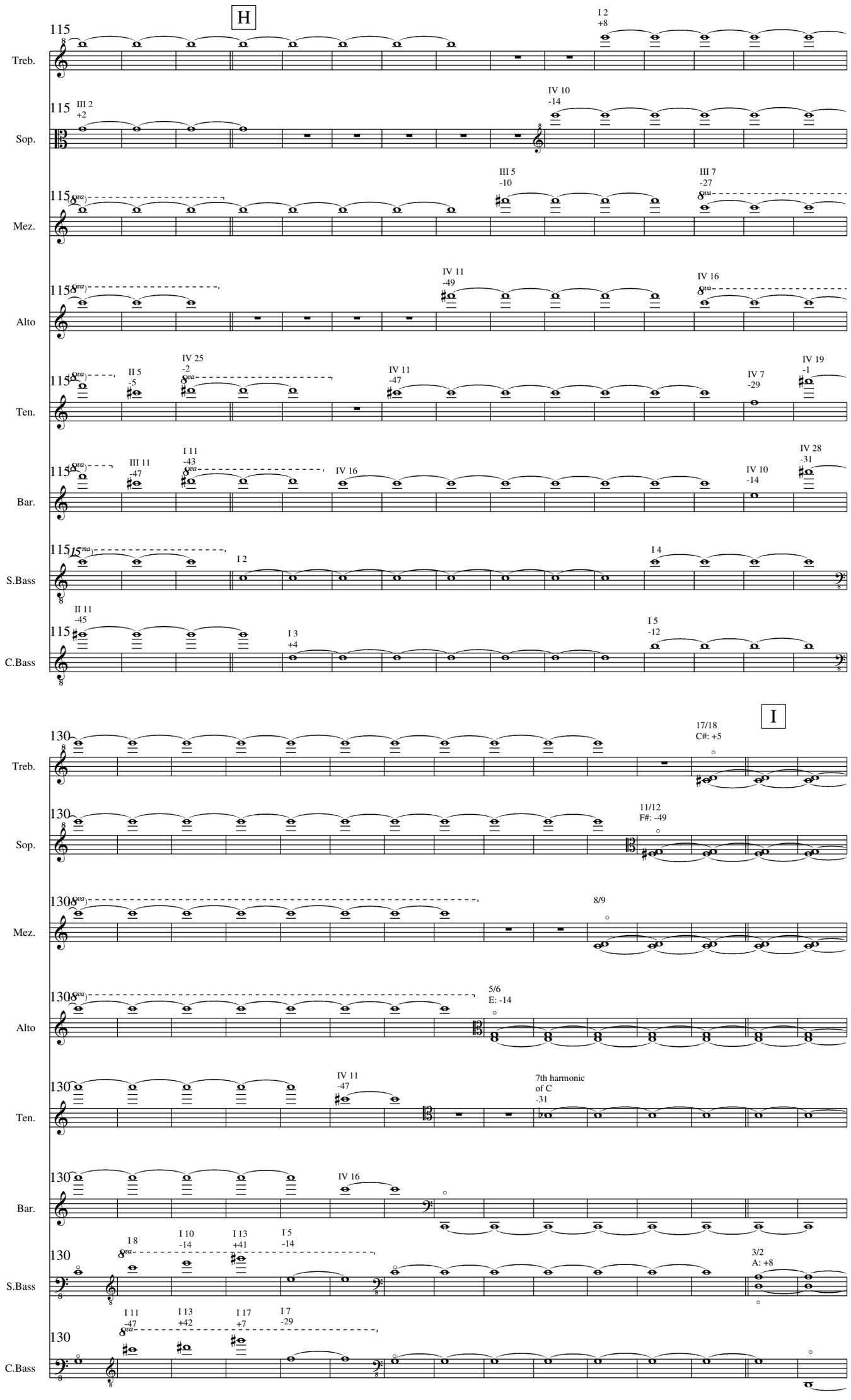
IV 23
+32

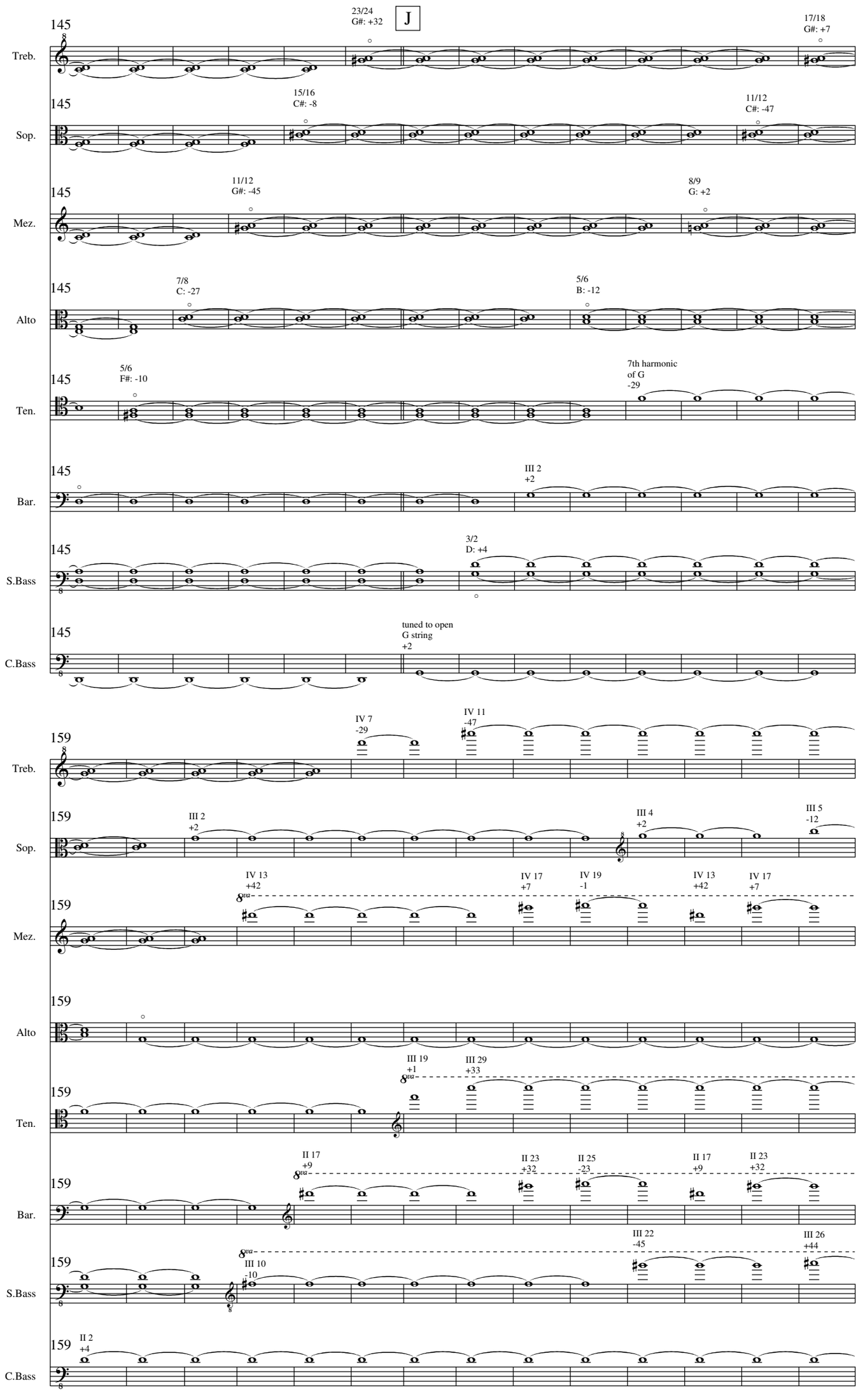
8/9
G: +2

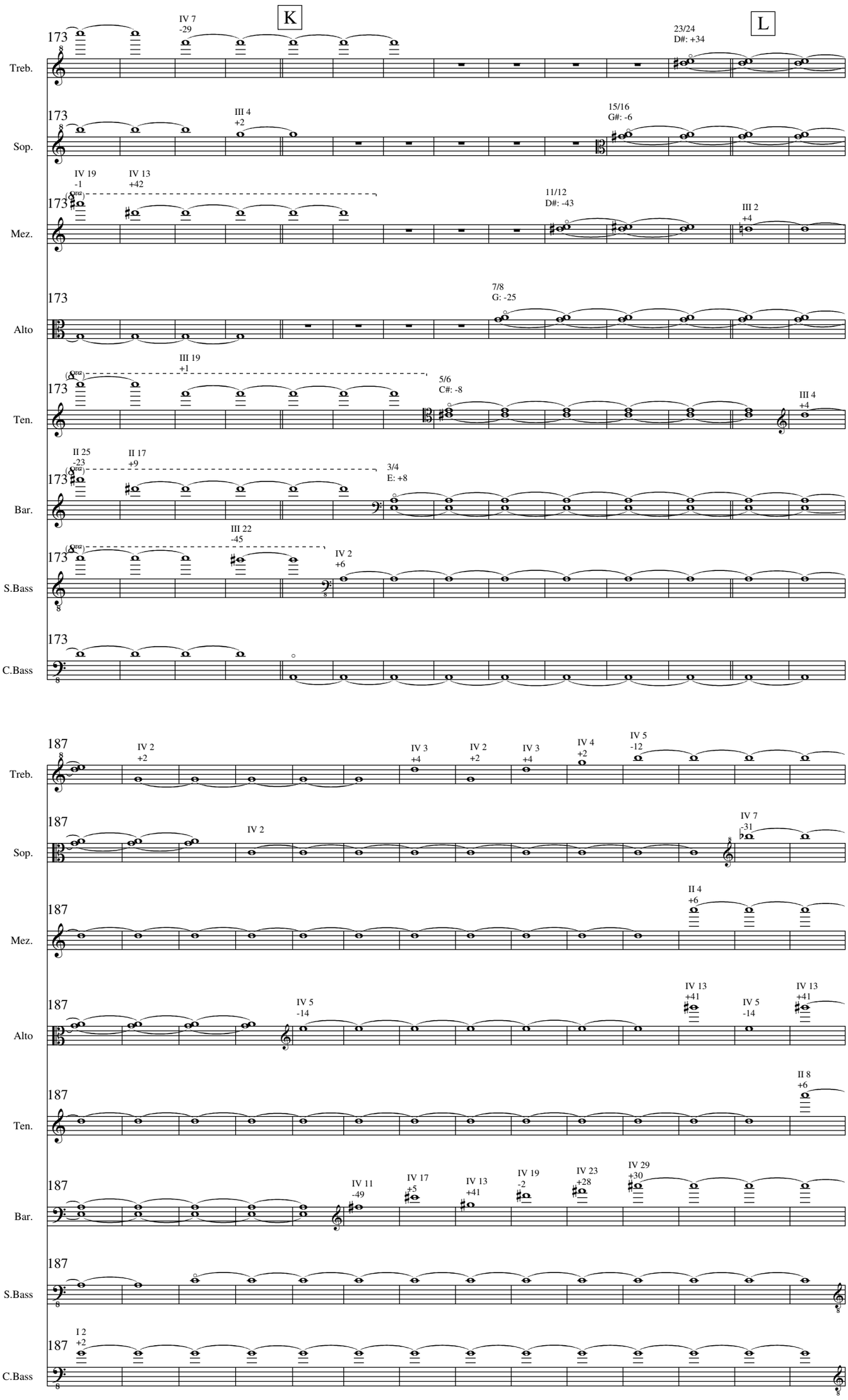

C
30
Treb.
Sop.
63/64
G: -25
IV 2
Mez.
49/48
G: +40
IV 7
-29
Alto
Ten.
IV 5
-12
IV 13
+42
Bar.
S.Bass
11/12
C#: -47
IV 9
+10
IV 25
-22
C.Bass
III 7
-25
III 23
+34
45
49/48
G: +38
IV 2
35/36
D: -45
IV 5
-14
25/24
Ab: -27
IV 5
-14
28/27
Bb: -31
II 5
-8
11/12
F#: -49
III 7
-27
15/16
B: -12
9/8
C unison w/
baritone
II 7
-27

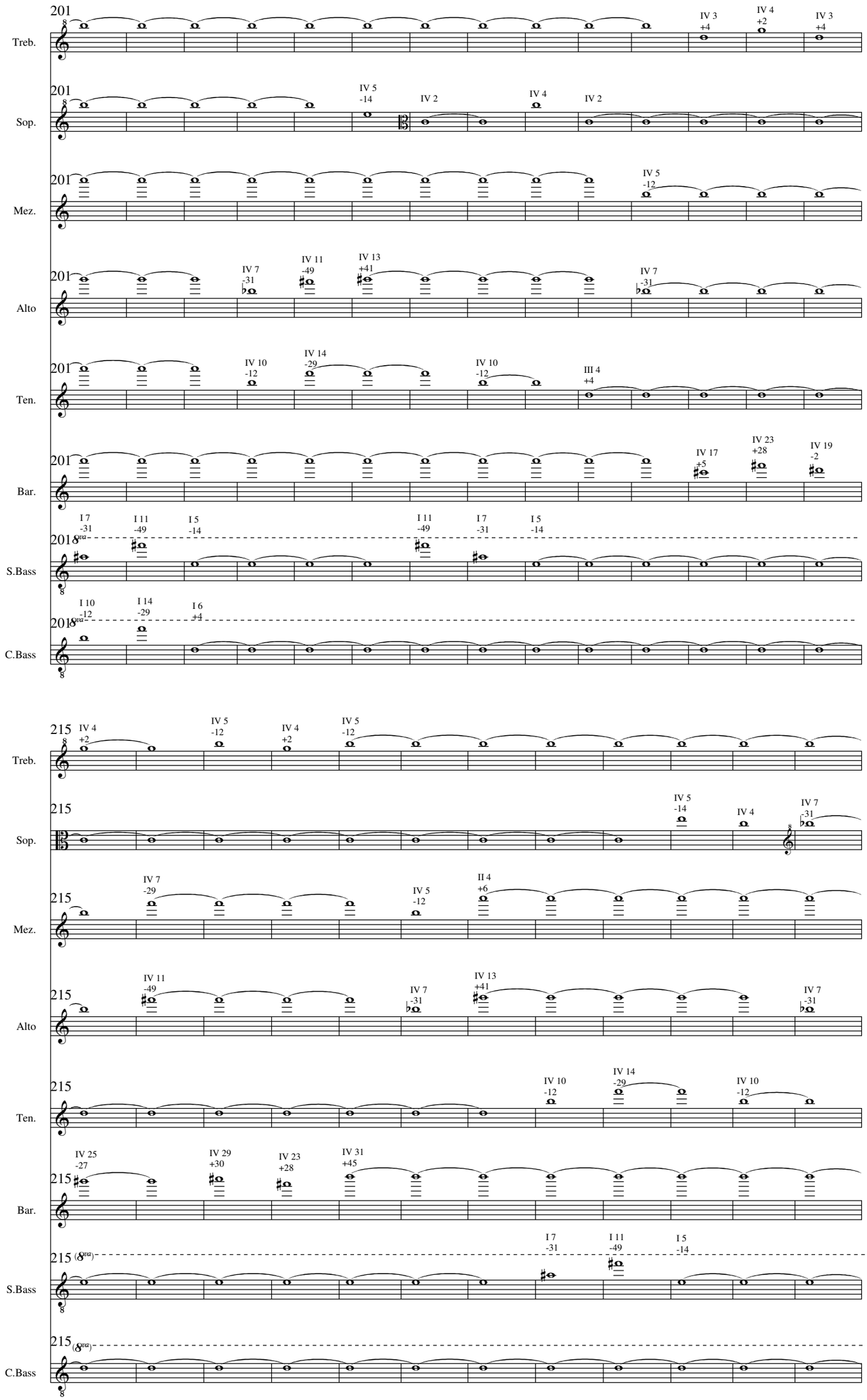

D
E
59
Treb.
Sop.
Mez.
Alto
Ten.
Bar.
S.Bass
C.Bass
25/24
Eb: -25
IV 13
+41
15/16
F#: -10 (unis
w/ Contrabass)
II 5
-8
11/12
C#: -47
IV 17
+5
IV 19
-2
IV 17
+5
7/8
F: -29
III 17
+9
IV 2
+6
5/6
B: -12
II 23
+32
IV 5
-10
tuned to open
G string
+2
5/6
E: -14
73
IV 13
+41
IV 14
-31
17/18
C#: +5
II 5
-8
11/12
F#: -49
IV 17
+5
III 23
+32
III 25
-23
8/9
IV 20
-14
7th harmonic
of C
-31
II 2
+4

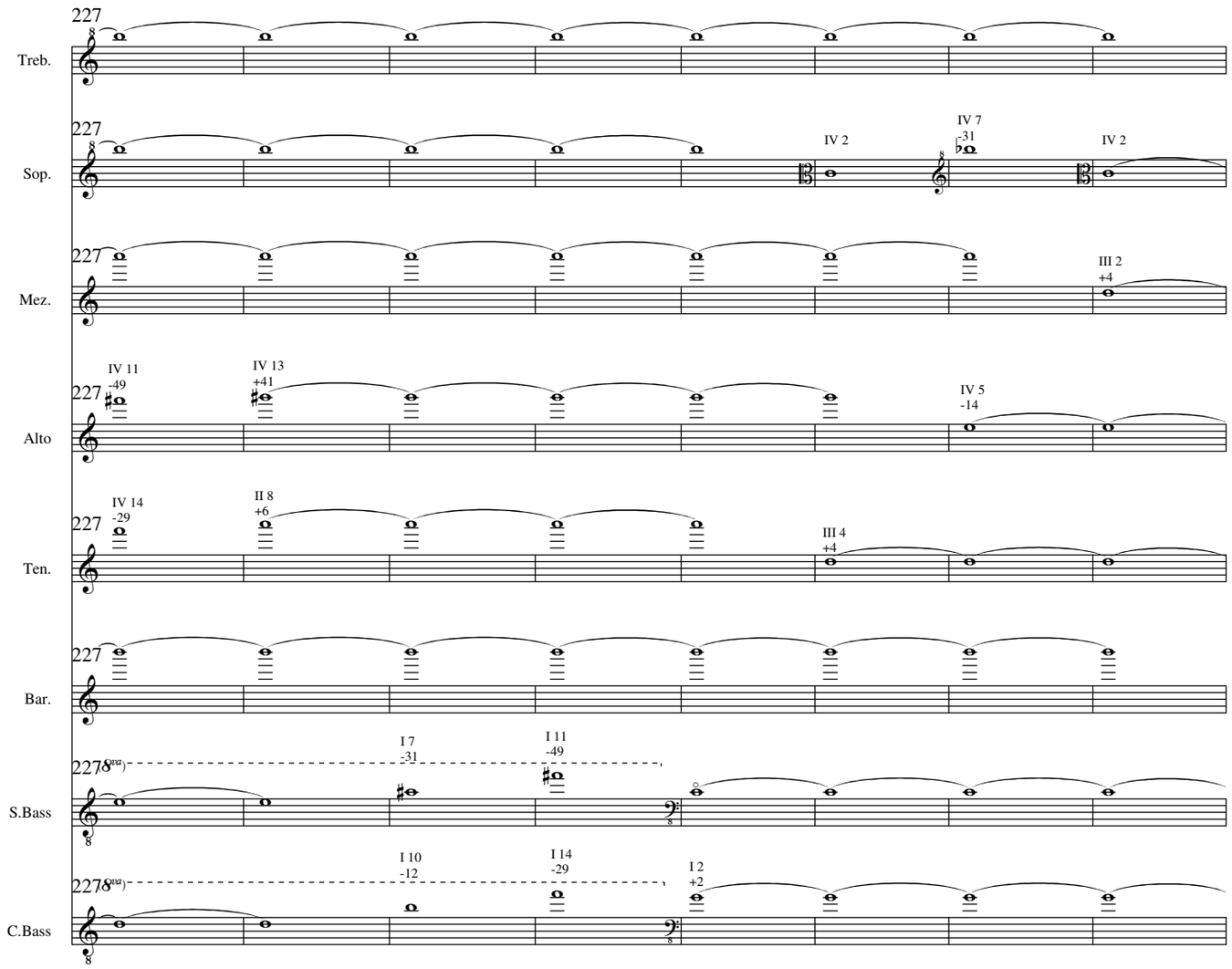

F
G
87
Treb.
Sop.
Mez.
Alto
Ten.
Bar.
S.Bass
C.Bass
31/32
C#: +49
IV 13
+41
11th harmonic
of D
-45
23/24
G#: +32
15/16
C#: -8
III 23
+32
11/12
G#: -45
8/9
G: +2
7/8
C: -27
5/6
B: -12
I 8
II 14
-27
tuned to open
G string
+2
101
23/24
C#: +30
IV 5
-12
15/16
F#: -10
17/18
G#: +7
I 3
+10
11/12
C#: -47
III 11
-47
IV 25
-2
II 5
-5
II 13
+46
I 11
-43
III 11
-47
III 29
+33
III 29
+33
15ma
II 5
-10

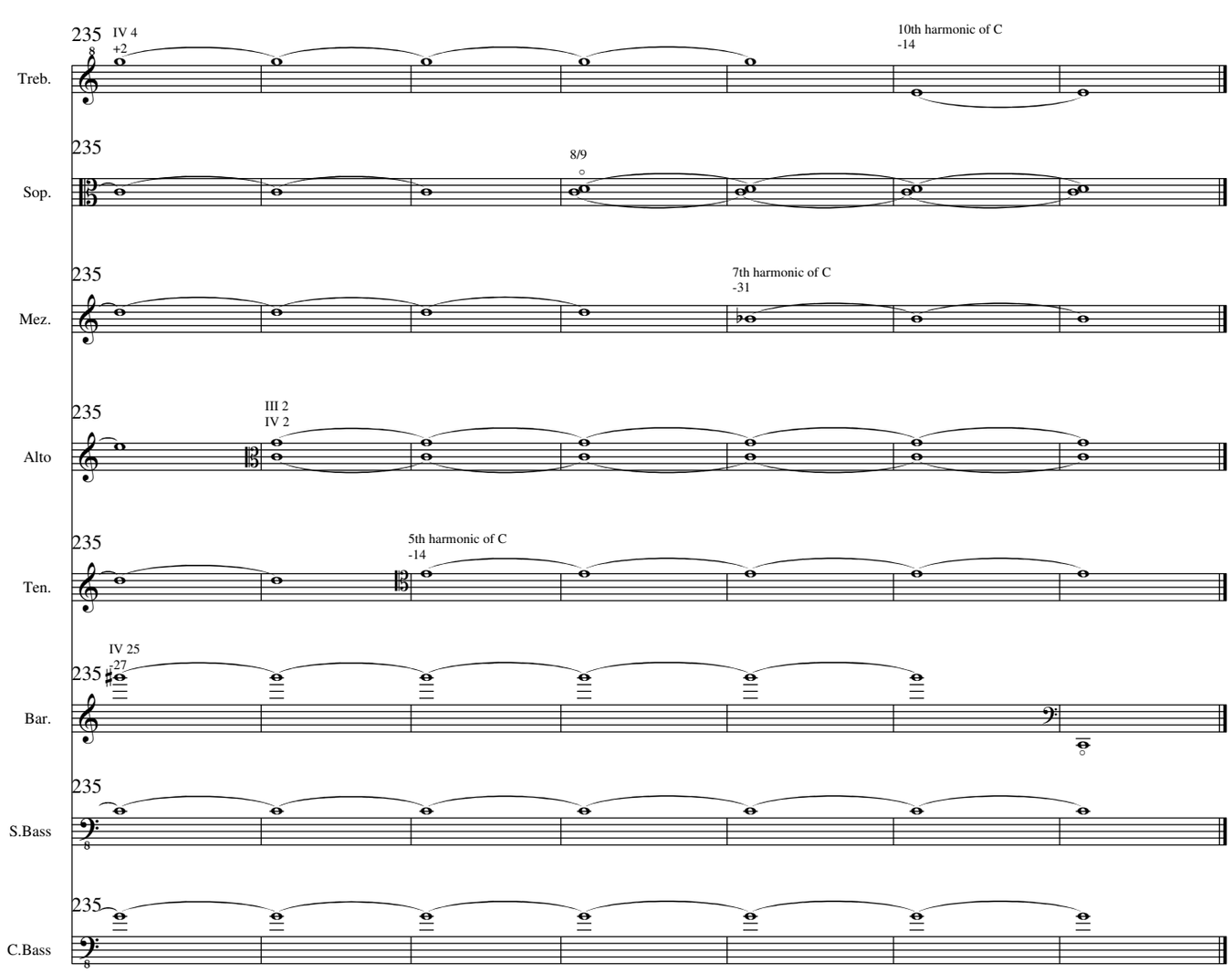

H
115
Treb.
I 2
+8
III 2
+2
Sop.
IV 10
-14
III 5
-10
III 7
-27
Mez.
IV 11
-49
IV 16
Alto
II 5
-5
IV 25
-2
IV 11
-47
IV 7
-29
IV 19
-1
Ten.
III 11
-47
I 11
-43
IV 16
IV 10
-14
IV 28
-31
Bar.
I 2
I 4
S.Bass
II 11
-45
I 3
+4
I 5
-12
C.Bass
I
130
17/18
C#: +5
11/12
F#: -49
8/9
5/6
E: -14
IV 11
-47
7th harmonic
of C
-31
IV 16
I 8
I 10
-14
I 13
+41
I 5
-14
3/2
A: +8
I 11
-47
I 13
+42
I 17
+7
I 7
-29


145
Treb.
23/24
G#: +32
J
17/18
G#: +7
145
Sop.
15/16
C#: -8
11/12
C#: -47
145
Mez.
11/12
G#: -45
8/9
G: +2
145
Alto
7/8
C: -27
5/6
B: -12
145
Ten.
5/6
F#: -10
7th harmonic
of G
-29
145
Bar.
III 2
+2
145
S.Bass
3/2
D: +4
145
C.Bass
tuned to open
G string
+2
159
Treb.
IV 7
-29
IV 11
-47
159
Sop.
III 2
+2
III 4
+2
III 5
-12
159
Mez.
IV 13
+42
IV 17
+7
IV 19
-1
IV 13
+42
IV 17
+7
159
Alto
159
Ten.
III 19
+1
III 29
+33
159
Bar.
II 17
+9
II 23
+32
II 25
-23
II 17
+9
II 23
+32
159
S.Bass
III 10
-10
III 22
-45
III 26
+44
159
C.Bass
II 2
+4


K
L
173
Treb.
Sop.
Mez.
Alto
Ten.
Bar.
S.Bass
C.Bass
IV 7
-29
III 4
+2
IV 19
-1
IV 13
+42
III 19
+1
II 25
-23
II 17
+9
III 22
-45
IV 2
+6
23/24
D#: +34
15/16
G#: -6
11/12
D#: -43
III 2
+4
7/8
G: -25
5/6
C#: -8
III 4
+4
3/4
E: +8
187
IV 2
+2
IV 3
+4
IV 2
+2
IV 3
+4
IV 4
+2
IV 5
-12
IV 7
-31
II 4
+6
IV 5
-14
IV 13
+41
IV 5
-14
IV 13
+41
II 8
+6
IV 11
-49
IV 17
+5
IV 13
+41
IV 19
-2
IV 23
+28
IV 29
+30
I 2
+2


201
Treb.
Sop.
Mez.
Alto
Ten.
Bar.
S.Bass
C.Bass
IV 3 +4
IV 4 +2
IV 3 +4
IV 5 -14
IV 2
IV 4
IV 2
IV 5 -12
IV 7 -31
IV 11 -49
IV 13 +41
IV 7 -31
IV 10 -12
IV 14 -29
IV 10 -12
III 4 +4
IV 17 +5
IV 23 +28
IV 19 -2
I 7 -31
I 11 -49
I 5 -14
I 11 -49
I 7 -31
I 5 -14
I 10 -12
I 14 -29
I 6 +4
215
IV 4 +2
IV 5 -12
IV 4 +2
IV 5 -12
IV 5 -14
IV 4
IV 7 -31
IV 7 -29
IV 5 -12
II 4 +6
IV 11 -49
IV 7 -31
IV 13 +41
IV 7 -31
IV 10 -12
IV 14 -29
IV 10 -12
IV 25 -27
IV 29 +30
IV 23 +28
IV 31 +45
I 7 -31
I 11 -49
I 5 -14


227
Treb.
Sop.
Mez.
Alto
Ten.
Bar.
S.Bass
C.Bass
IV 2
IV 7
-31
III 2
+4
IV 11
-49
IV 13
+41
IV 5
-14
IV 14
-29
II 8
+6
III 4
+4
I 7
-31
I 11
-49
I 10
-12
I 14
-29
I 2
+2


235
Treb.
Sop.
Mez.
Alto
Ten.
Bar.
S.Bass
C.Bass
IV 4
+2
10th harmonic of C
-14
8/9
7th harmonic of C
-31
III 2
IV 2
5th harmonic of C
-14
IV 25
-27