Andrew Nathaniel McIntosh

Imperfect Distance

thirteen voices in relative and accelerated motion
for two microtonal pianos

(2010 - 2012)

PLAINSOUND MUSIC EDITION

for Dante Boon and Samuel Vriezen

notes

Please keep the sustain pedal down for the duration of the work.

While most of this piece is constructed very strictly, there is a lot of freedom for phrasing and nuance in both the dynamics and the tempo. Within the broad tempo and dynamic glissandos please take liberties and bring out the melodic or harmonic interest as seems most fitting.

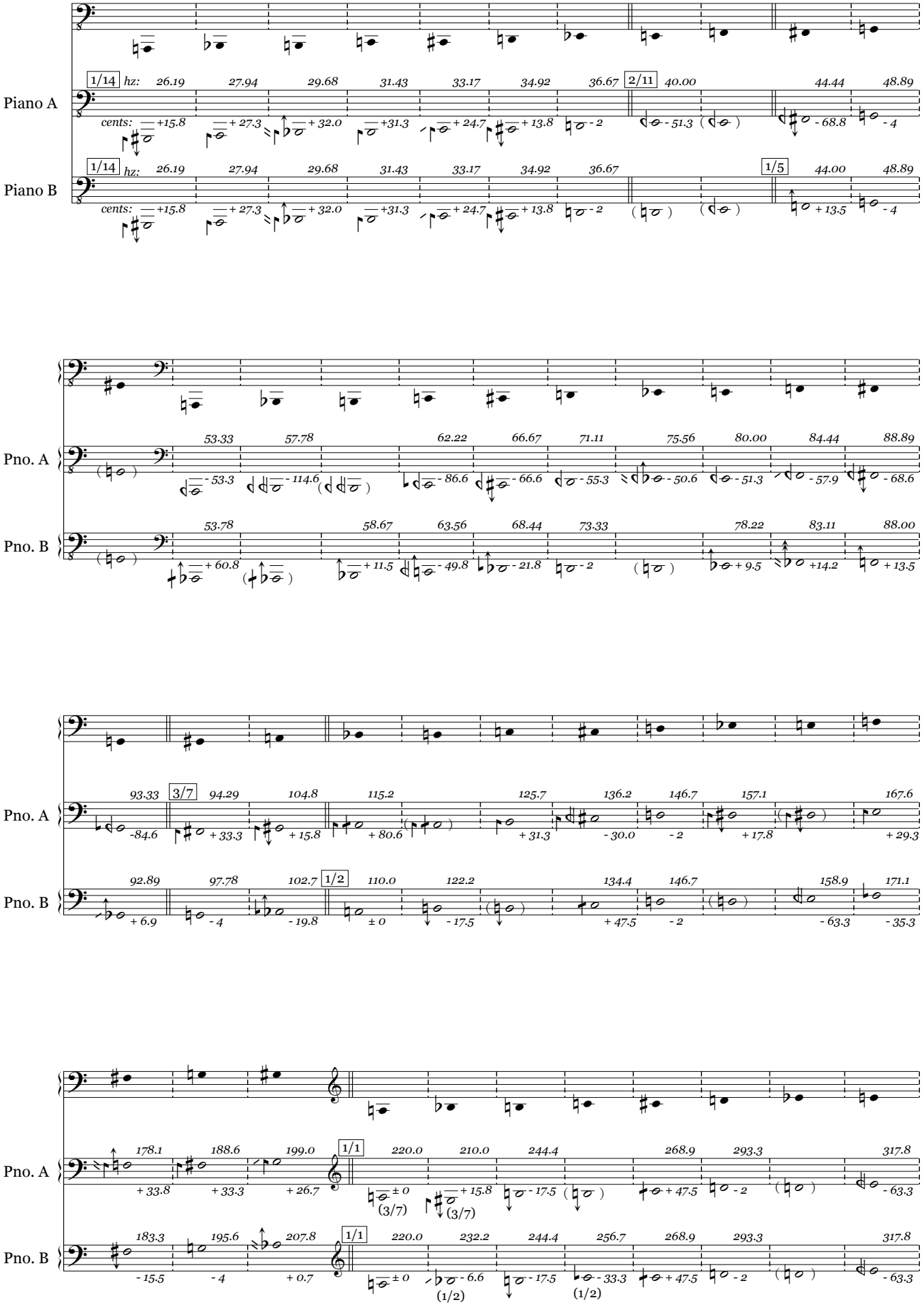
Also, the quantity of notes becomes somewhat absurd from about measure 911 or so to the end. This is not meant to be taken too literally, please leave out (or add) notes as desired. What is important in this section is the extreme velocity, the shifting melodic contours, and the more organic rhythms. The harmony is more or less non-functional by this point so slightly altering the chords will have very little musical consequence.

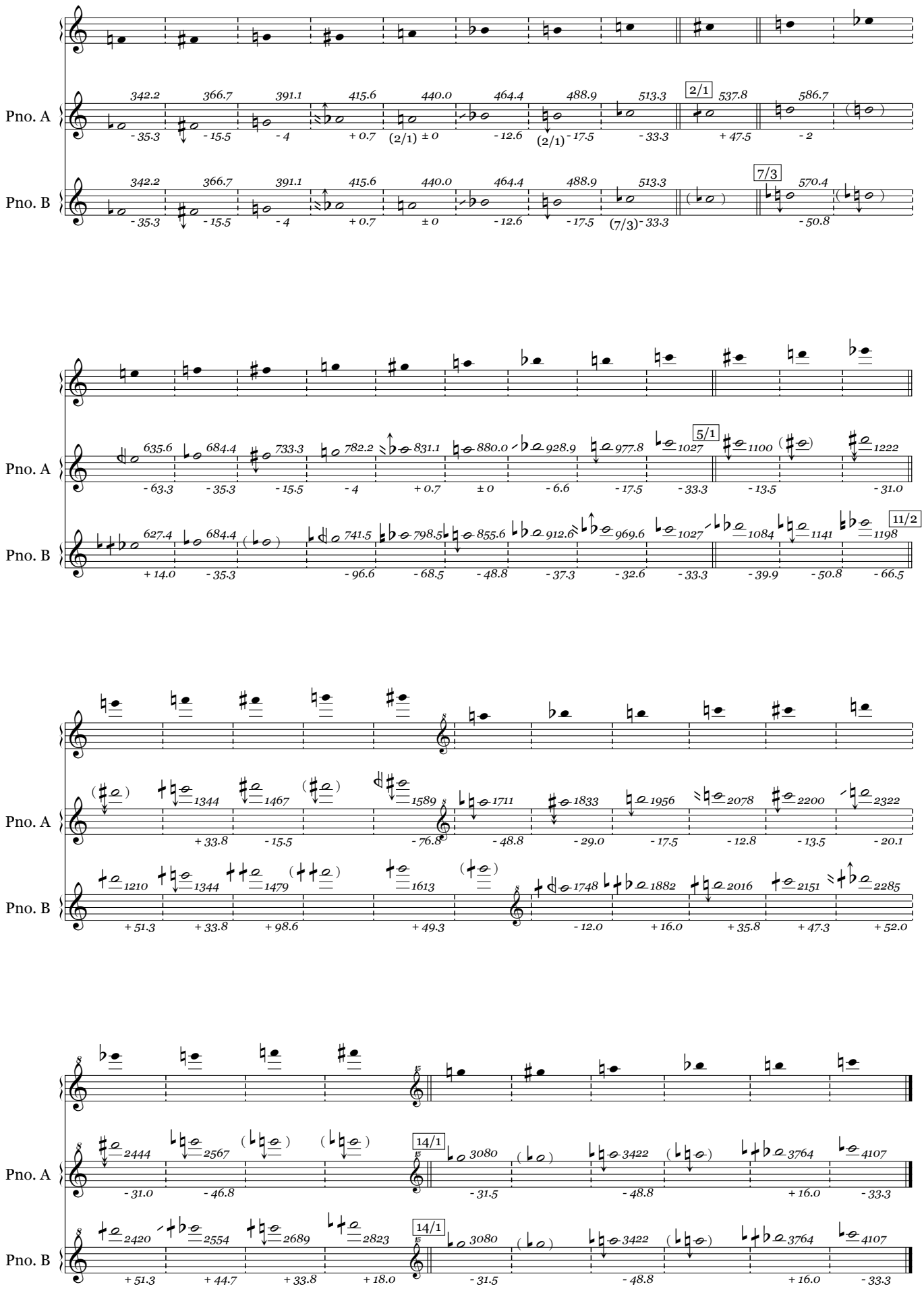
The tuning is meant to be tempered so that the intervals resonate best on each piano. The chart provided includes mathematically correct cent deviations and hertz values, but they should be stretched so that the enharmonic overtones of the piano are in tune. First tune the middle minor tenth (A to C marked 1/1) as shown (9^{th} to 21^{st} overtones), and then tune the other notes each to its corresponding note the middle register (octaves, then 7/3, 5/1, 11/2, etc.)

Duration: 48 minutes

For more information please contact the composer at
Plainsound Music Edition
552 S. Oakland Ave., Apt. 1
Pasadena, CA 91101
www.plainsound.org
mcintosh@plainsound.org

piano tuning for Imperfect Distance




Pno. A
Pno. B
342.2 366.7 391.1 415.6 440.0 464.4 488.9 513.3 2/1 537.8 586.7
- 35.3 - 15.5 - 4 + 0.7 (2/1) ± 0 - 12.6 (2/1) - 17.5 - 33.3 + 47.5 - 2
342.2 366.7 391.1 415.6 440.0 464.4 488.9 513.3 7/3 570.4
- 35.3 - 15.5 - 4 + 0.7 ± 0 - 12.6 - 17.5 (7/3) - 33.3 - 50.8
635.6 684.4 733.3 782.2 831.1 880.0 928.9 977.8 5/1 1027 1100 1222
- 63.3 - 35.3 - 15.5 - 4 + 0.7 ± 0 - 6.6 - 17.5 - 33.3 - 13.5 - 31.0
627.4 684.4 741.5 798.5 855.6 912.6 969.6 1027 1084 1141 11/2 1198
+ 14.0 - 35.3 - 96.6 - 68.5 - 48.8 - 37.3 - 32.6 - 33.3 - 39.9 - 50.8 - 66.5
1344 1467 1589 1711 1833 1956 2078 2200 2322
+ 33.8 - 15.5 - 76.8 - 48.8 - 29.0 - 17.5 - 12.8 - 13.5 - 20.1
1210 1344 1479 1613 1748 1882 2016 2151 2285
+ 51.3 + 33.8 + 98.6 + 49.3 - 12.0 + 16.0 + 35.8 + 47.3 + 52.0
2444 2567 14/1 3080 3422 3764 4107
- 31.0 - 46.8 - 31.5 - 48.8 + 16.0 - 33.3
2420 2554 2689 2823 14/1 3080 3422 3764 4107
+ 51.3 + 44.7 + 33.8 + 18.0 - 31.5 - 48.8 + 16.0 - 33.3

The Extended Helmholtz-Ellis JI Pitch Notation

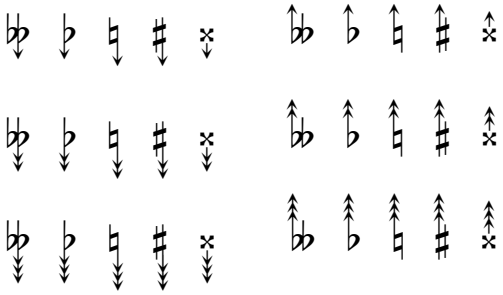
microtonal accidentals designed by Marc Sabat and Wolfgang von Schweinitz, 2004

3-LIMIT (PYTHAGOREAN) INTERVALS

FUNCTION OF THE ACCIDENTALS

notate 35 pitches from the series of untempered perfect fifths
(3/2) ≈ ± 702.0 cents;
perfect fifth (3/2); perfect fourth (4/3); major wholetone (9/8)

5-LIMIT (PTOLEMAIC) INTERVALS



notate an alteration by one syntonic comma (81/80) ≈ ± 21.5 cents;
major third (5/4); minor third (6/5); major sixth (5/3); minor sixth (8/5); minor wholetone (10/9)

notate an alteration by two syntonic commas
(81/80)·(81/80) ≈ ± 43.0 cents;
augmented fifth (25/16); diminished fourth (32/25)

notate an alteration by three syntonic commas
(81/80)·(81/80)·(81/80) ≈ ± 64.5 cents;
minor diesis (128/125)

7-LIMIT (SEPTIMAL) INTERVALS

notate an alteration by one septimal comma (64/63) ≈ ± 27.3 cents;
natural seventh (7/4); septimal wholetone (8/7);
septimal diminished fifth (7/5); septimal tritone (10/7);
septimal minor third (7/6); septimal quartertone (36/35)

notate an alteration by two septimal commas
(64/63)·(64/63) ≈ ± 54.5 cents;
septimal sixthtone (49/48)

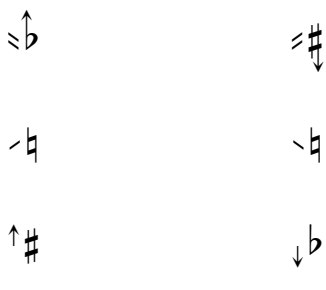
11-LIMIT (UNDECIMAL) INTERVALS

notate an alteration by one undecimal quartertone
(33/32) ≈ ± 53.3 cents;
undecimal augmented fourth (11/8); undecimal diminished fifth (16/11)

13-LIMIT (TRIDECIMAL) INTERVALS

notate an alteration by one tridecimal thirdtone (27/26) ≈ ± 65.3 cents;
tridecimal neutral sixth (13/8); tridecimal neutral third (16/13)

PRIMES IN THE HARMONIC SERIES OCTAVE 16 - 32 *(5-limit signs are given here relative to "A")*



notate an alteration of the 5-limit accidental by one 17-limit schisma
(16/17)·(16/15) = (256/255) ≈ ± 6.8 cents;
Galileo's "equal-tempered" semitone (18/17);
17-limit diminshed seventh chord 10:12:14:17

notate an alteration by one 19-limit schisma
(19/16)·(27/32) = (513/512) ≈ ± 3.4 cents;
19-limit minor third (19/16); 19-limit minor triad 16:19:24

notate an alteration by one 23-limit comma
(23/16)·(8/9)·(8/9)·(8/9) ≈ ± 16.5 cents;
raised leading tone (23/12)

notate an alteration of the 5-limit accidental by one 29-limit comma
(29/16)·(5/9) = (145/144) ≈ ± 12.0 cents

notate an alteration of the 11-limit accidental by one 31-limit schisma
(32/31)·(32/33) = (1024/1023) ≈ ± 1.7 cents

PRIMES IN THE HARMONIC SERIES OCTAVE 32 - 64 *(5-limit signs are given here relative to "A")*

notate an alteration of the 11-limit accidental by one 37-limit schisma
(36/37)·(33/32) = (297/296) ≈ ± 5.8 cents

notate an alteration of the 5-limit accidental by one 41-limit schisma
(32/41)·(81/64)·(81/80) = (6561/6560) ≈ ± 0.3 cents

notate an alteration by one 43-limit comma
(43/32)·(3/4) = (129/128) ≈ ± 13.5 cents

notate an alteration of the 7-limit accidental by one 47-limit schisma
(32/47)·(48/49)·(3/2) = (2304/2303) ≈ ± 0.8 cents

notate an alteration of the 5-limit accidental by one 53-limit comma
(32/53)·(5/3) = (160/159) ≈ ± 10.9 cents

notate an alteration of the 13-limit accidental by one 59-limit schisma
(32/59)·(24/13) = (768/767) ≈ ± 2.3 cents

notate an alteration of the 7-limit accidental by one 61-limit schisma
(61/32)·(21/40) = (1281/1280) ≈ ± 1.4 cents

IRRATIONAL AND TEMPERED INTERVALS

notate the respective Equal Tempered Semitone;
may be combined with a cents indication to notate any pitch

NOTE ABOUT CENTS INDICATIONS

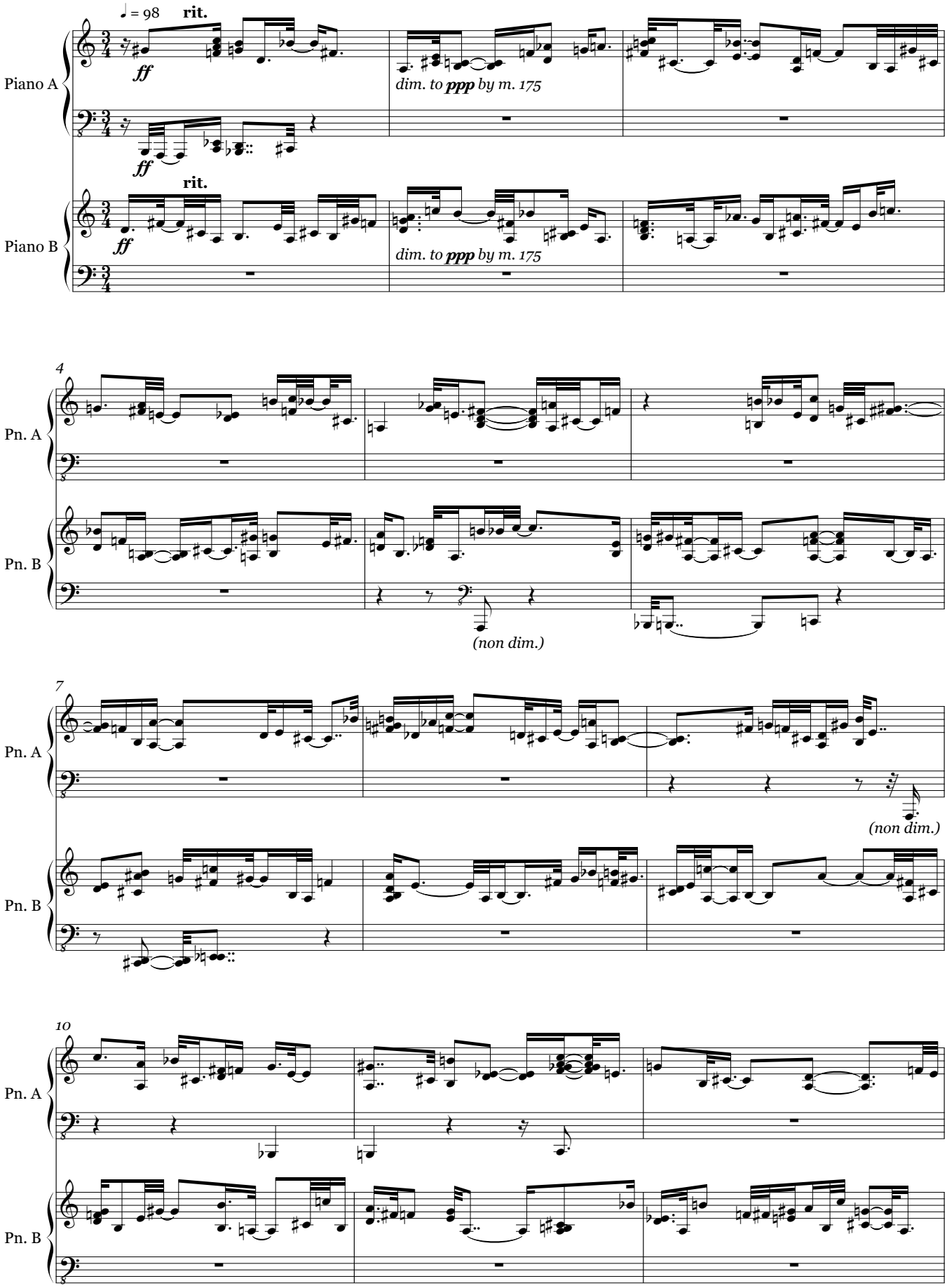
optional cents indications may be placed above or below the respective accidentals and are always understood in reference to Equal Tempered semitones, as implied by the Pythagorean accidentals

for Dante Boon and Samuel Vriezen

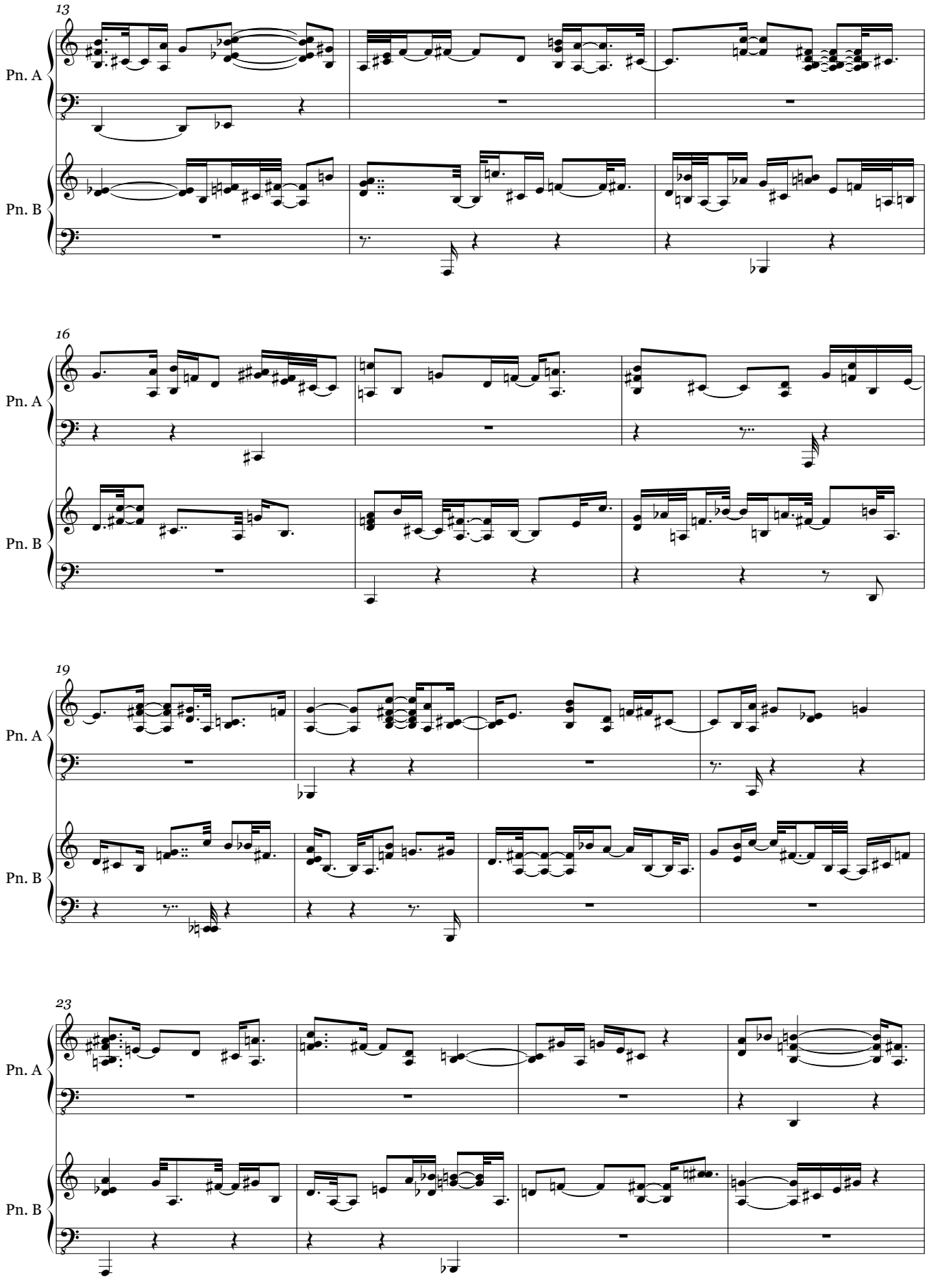
Imperfect Distance

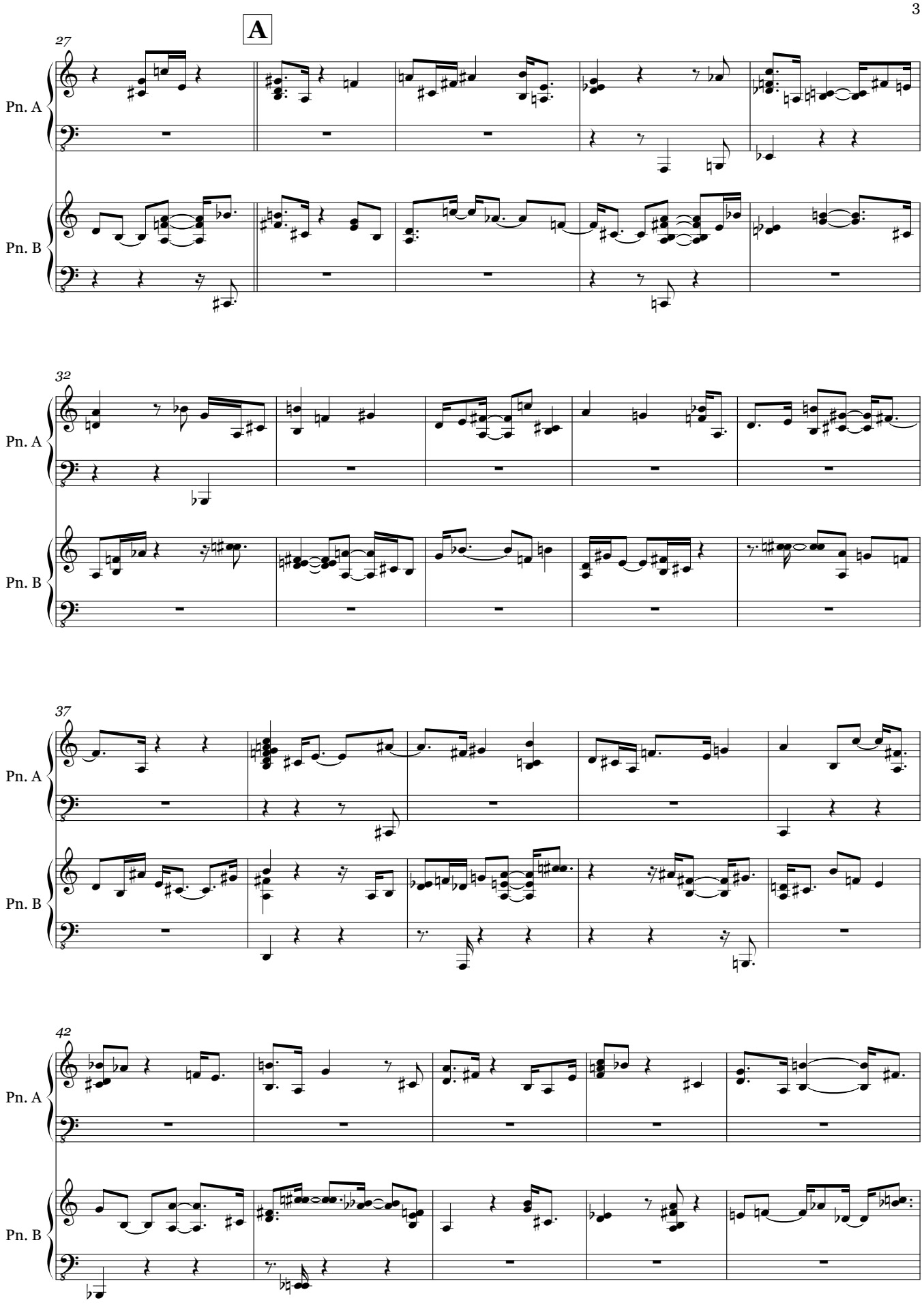
thirteen voices in relative and accelerated motion for two microtonal pianos

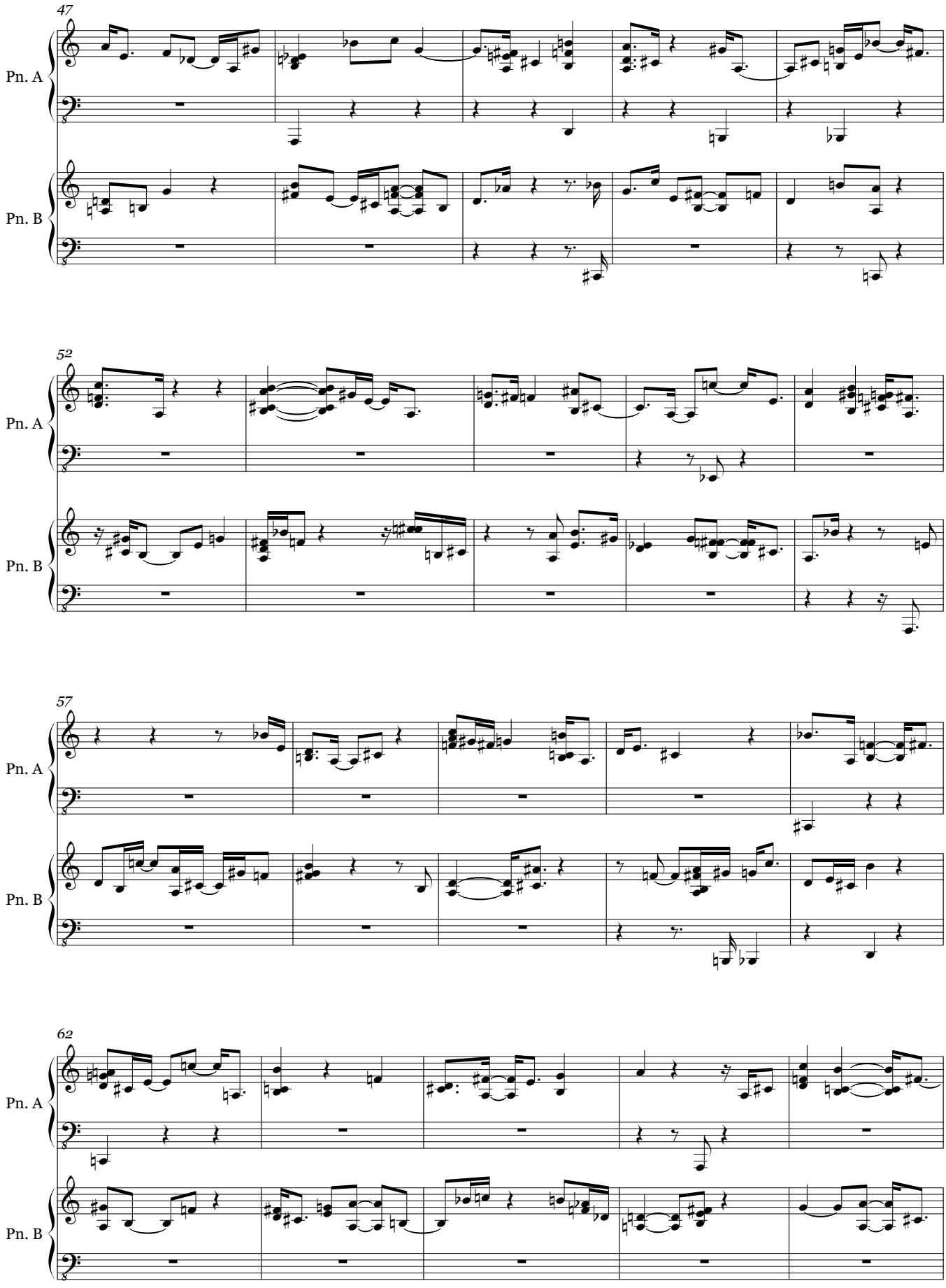
Andrew Nathaniel McIntosh

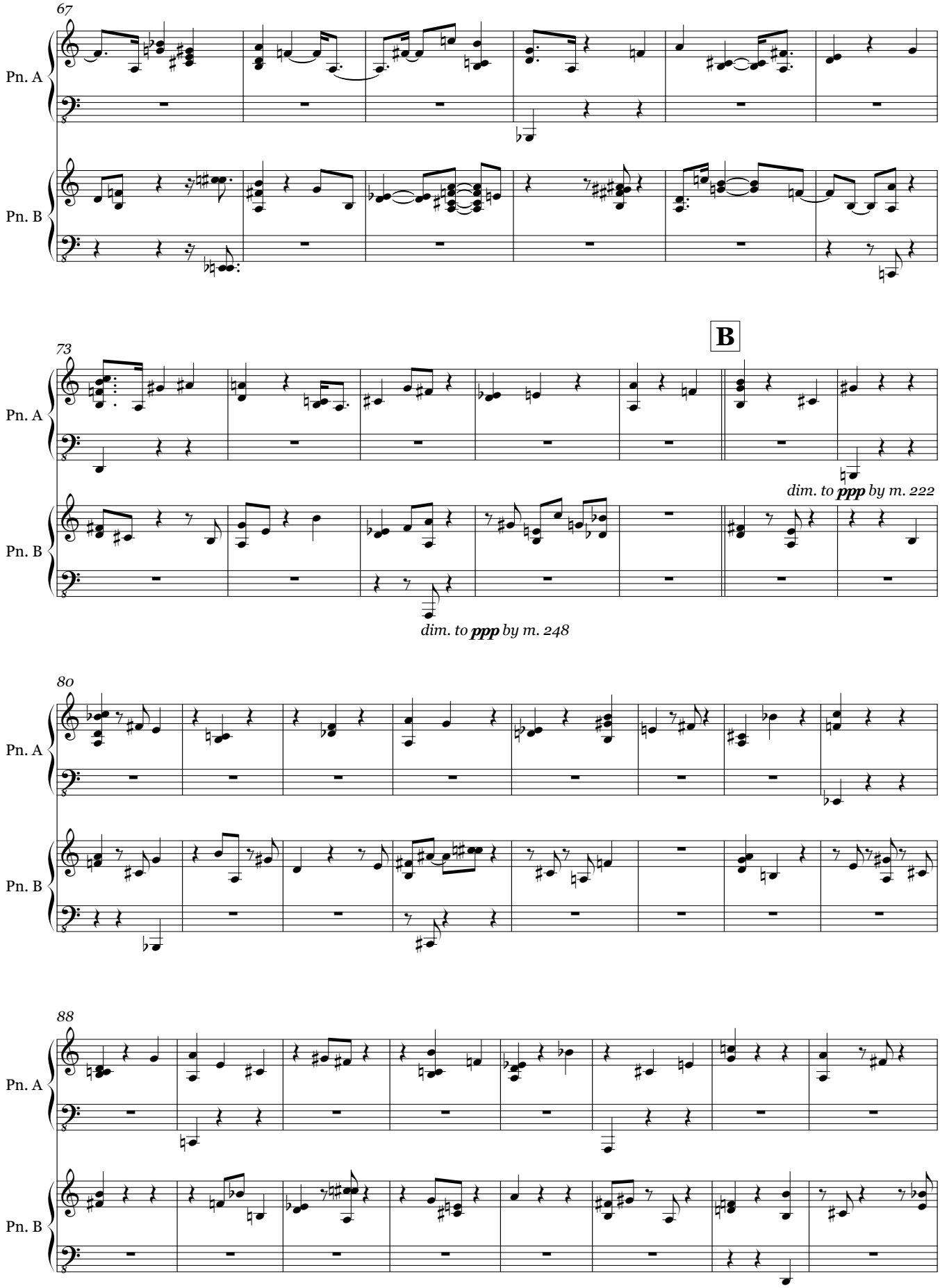


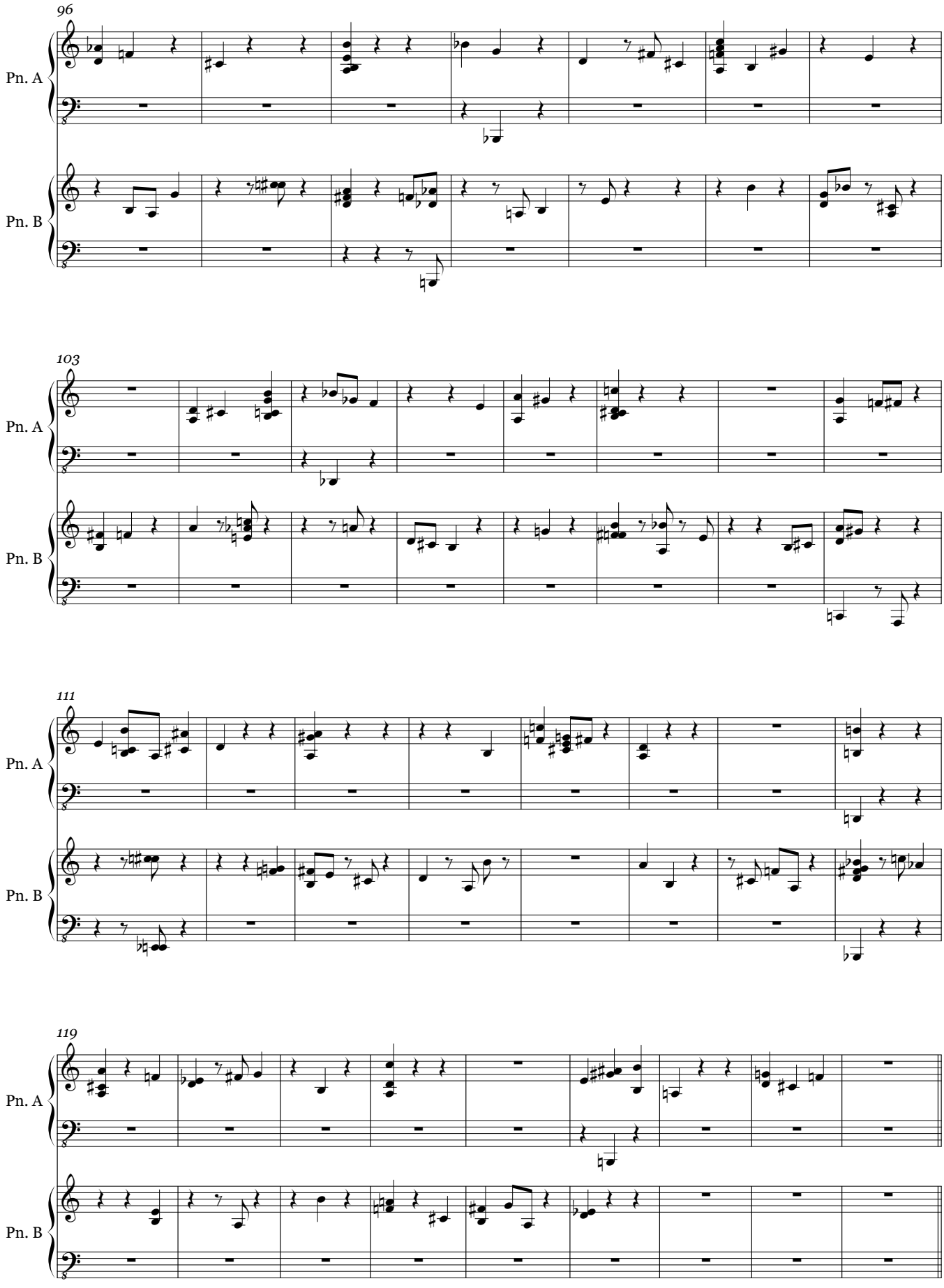
Copyright © 2012 A. N. McIntosh


13
Pn. A
Pn. B
16
Pn. A
Pn. B
19
Pn. A
Pn. B
23
Pn. A
Pn. B


A
27
Pn. A
Pn. B
32
Pn. A
Pn. B
37
Pn. A
Pn. B
42
Pn. A
Pn. B


47
Pn. A
Pn. B
52
Pn. A
Pn. B
57
Pn. A
Pn. B
62
Pn. A
Pn. B


67
Pn. A
Pn. B
73
B
dim. to ppp by m. 222
dim. to ppp by m. 248
80
88


96
Pn. A
Pn. B
103
Pn. A
Pn. B
111
Pn. A
Pn. B
119
Pn. A
Pn. B

C

128

Pn. A

Pn. B

138

Pn. A

Pn. B

148

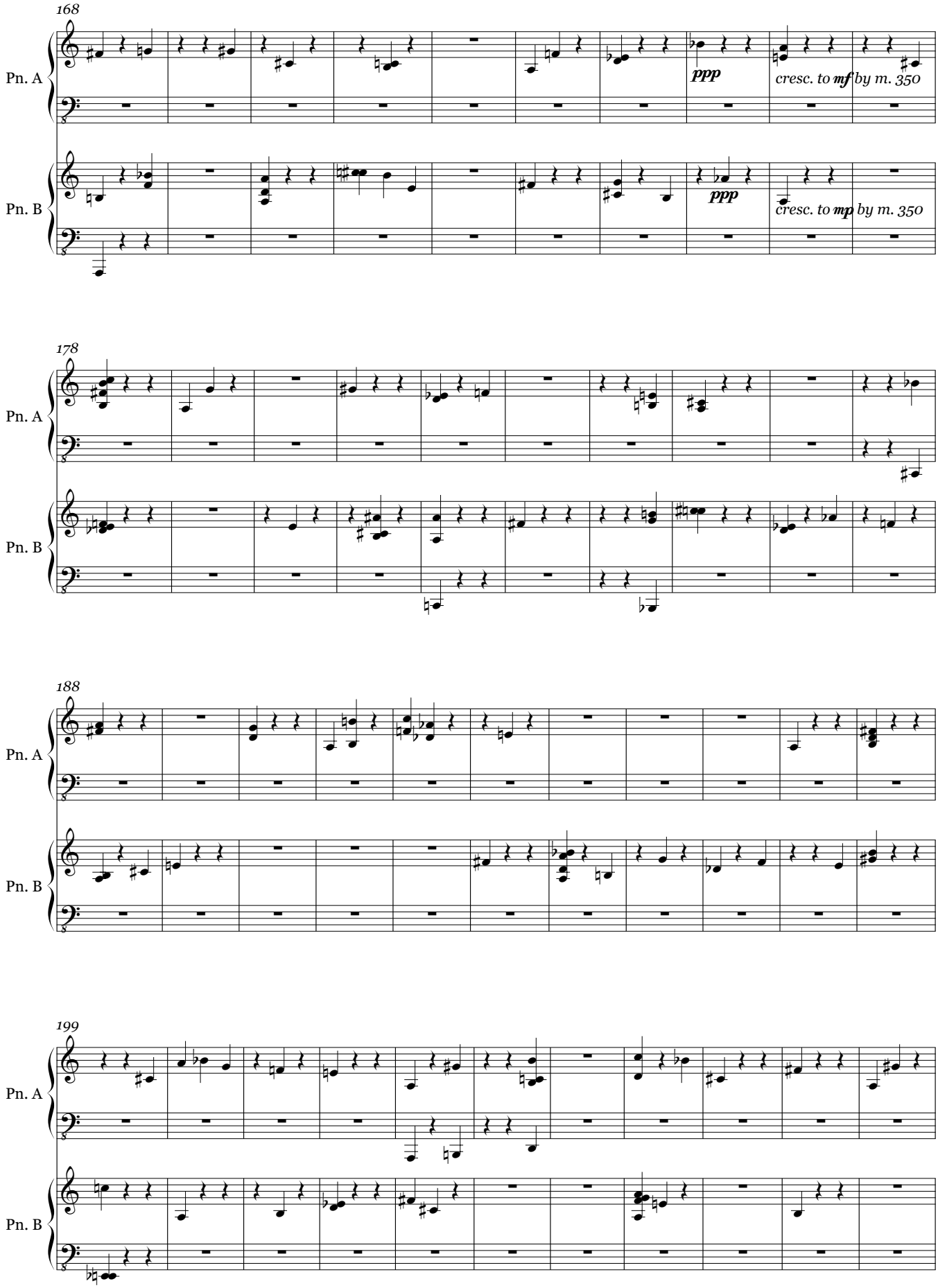
Pn. A

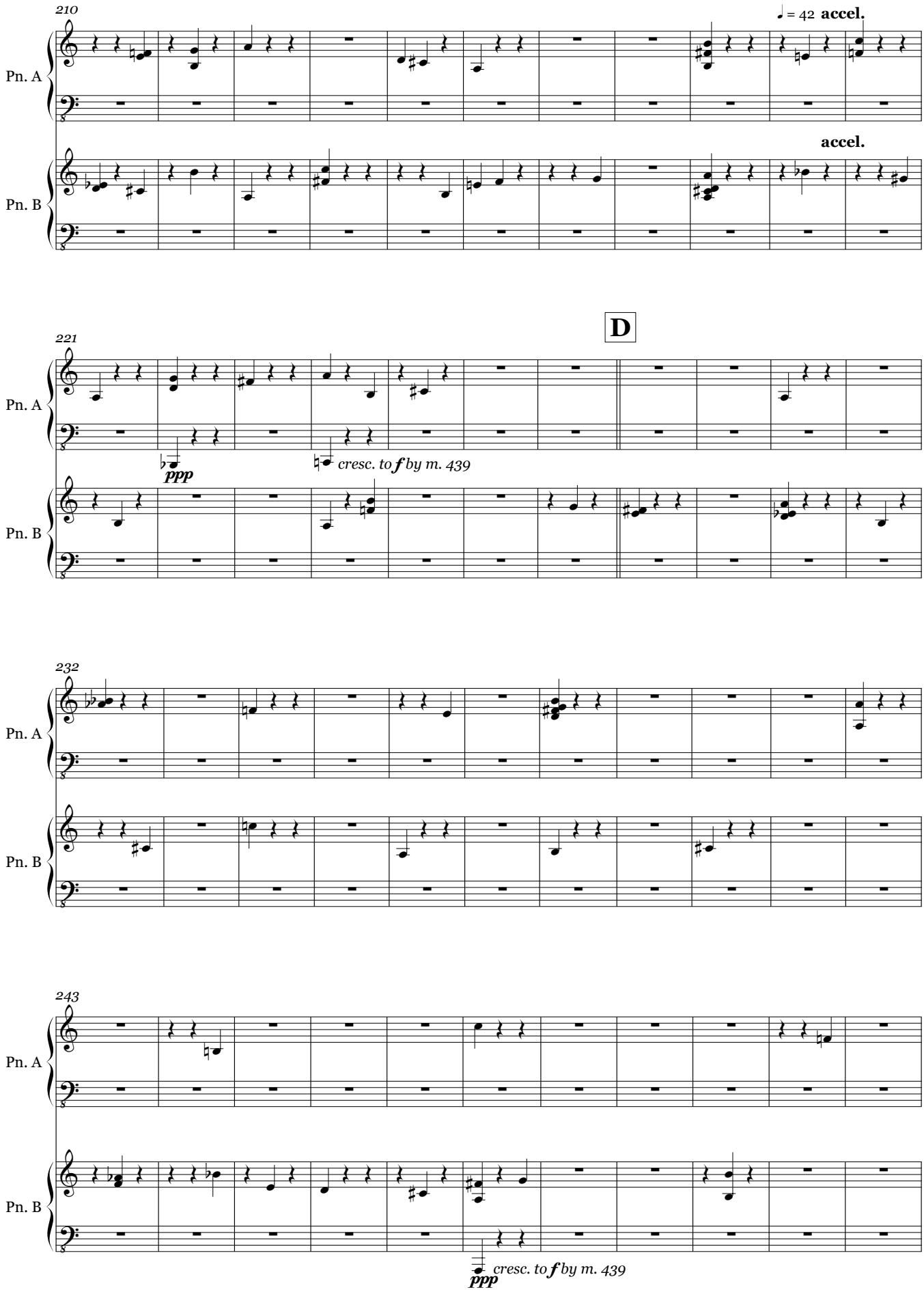
Pn. B

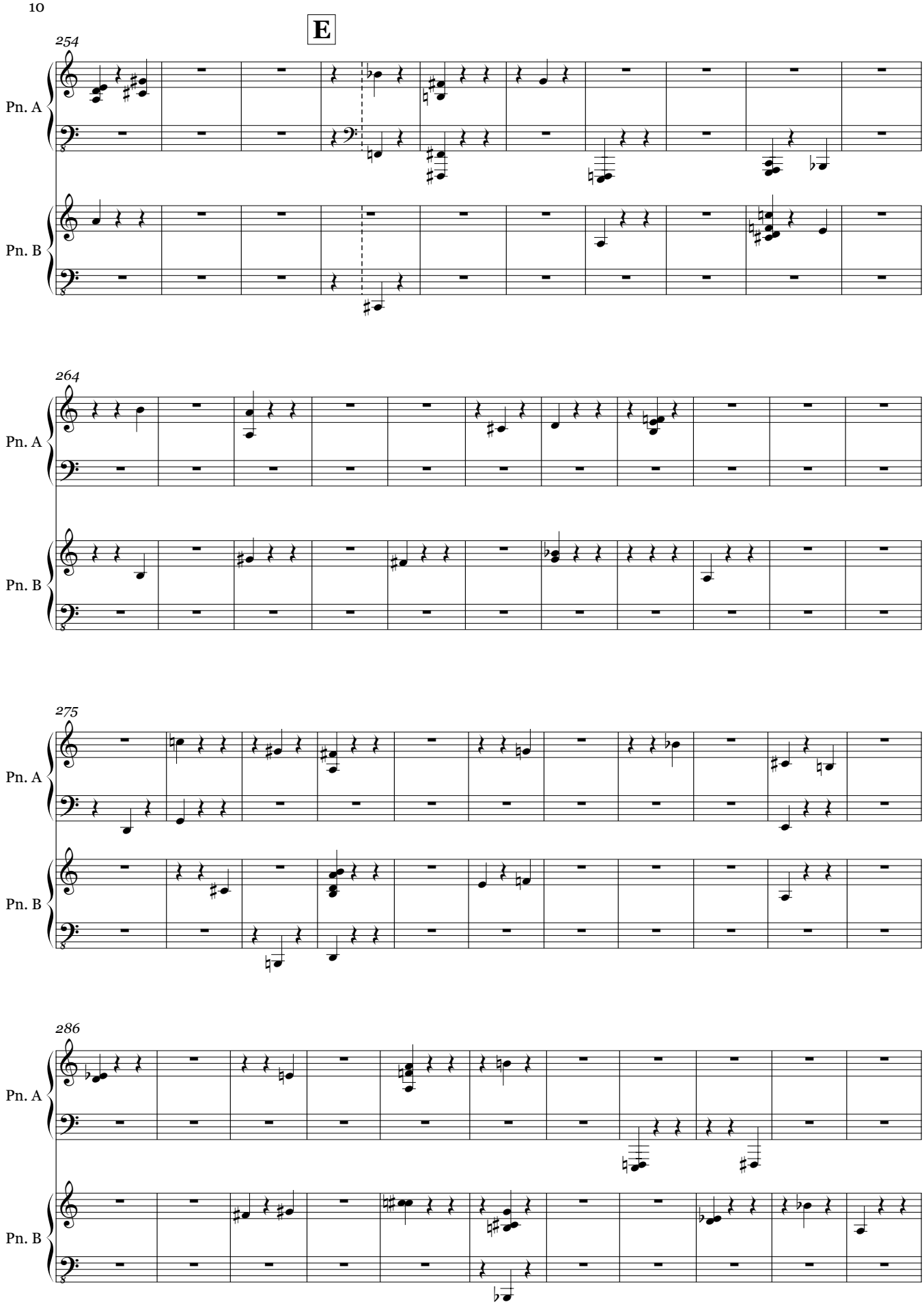
158

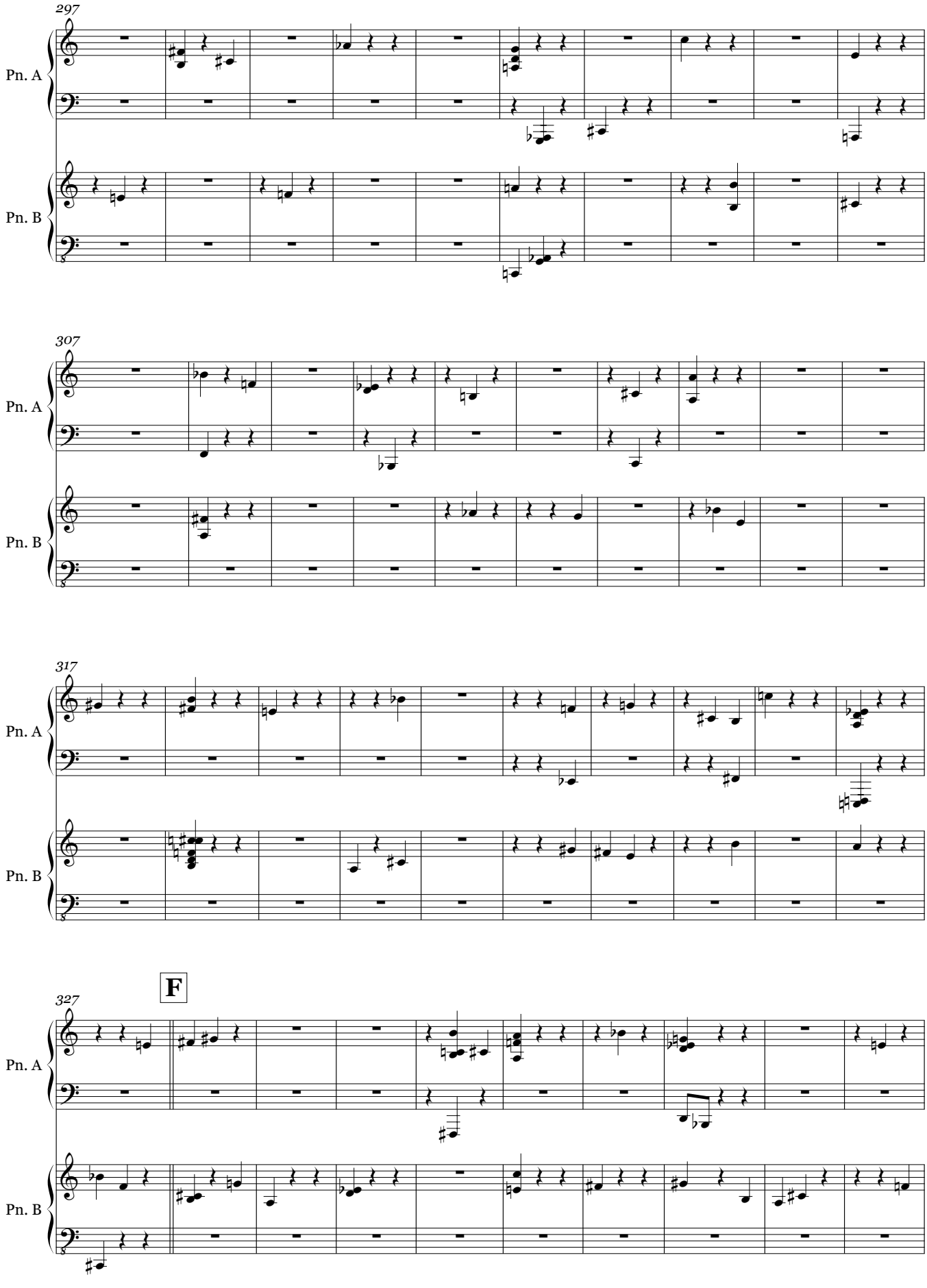
Pn. A

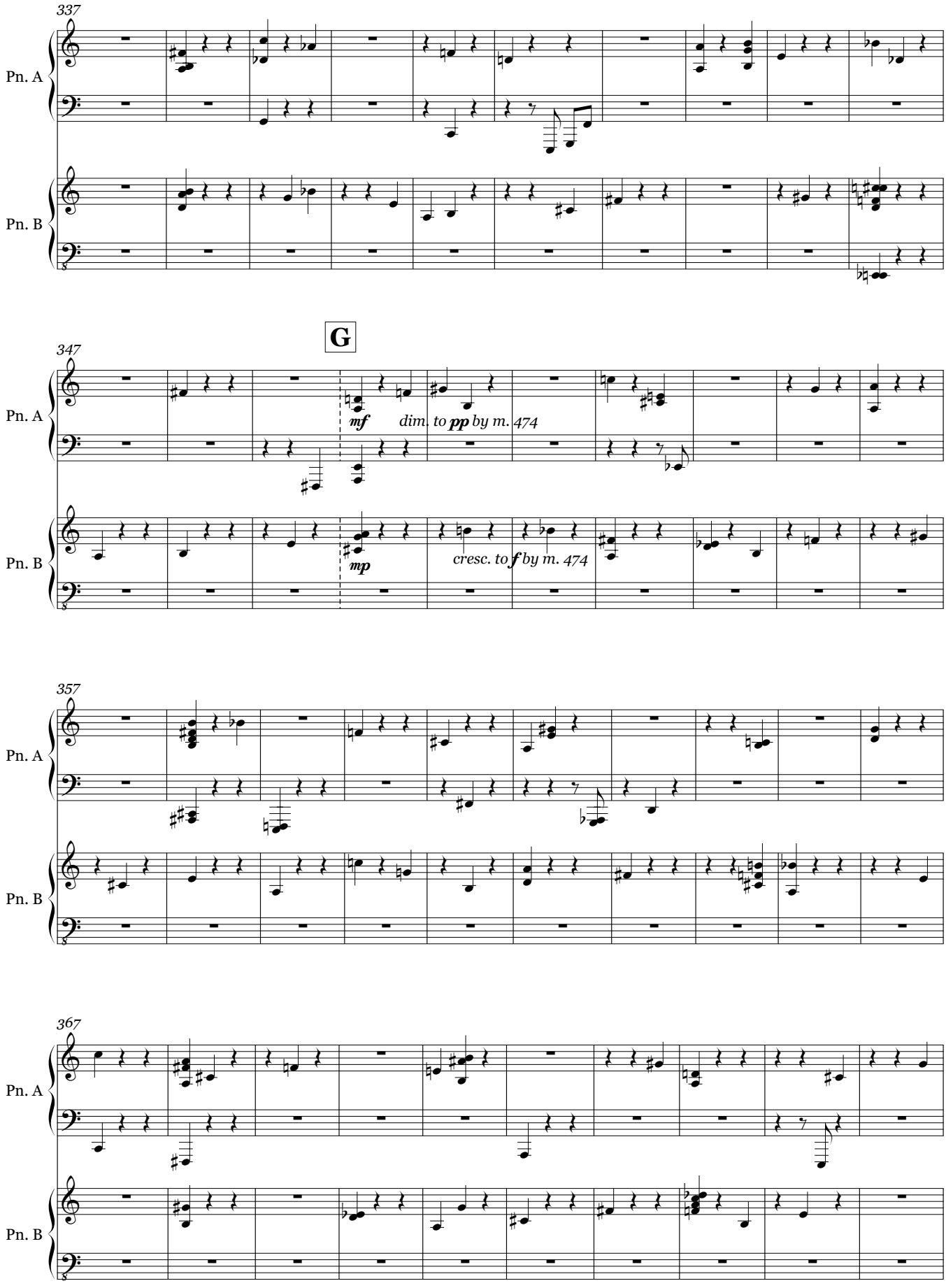
Pn. B

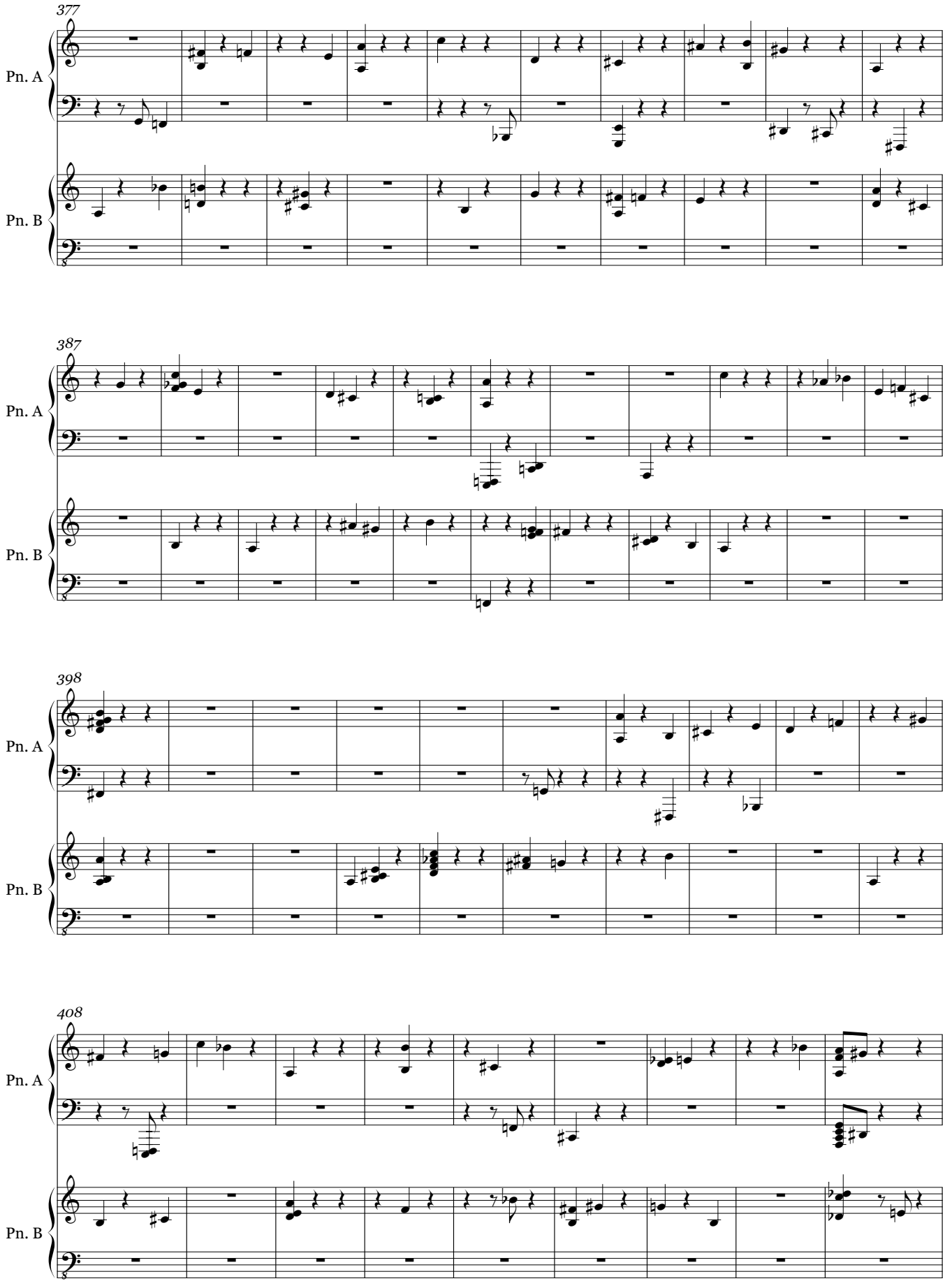

168
Pn. A
Pn. B
ppp
cresc. to mf by m. 350
ppp
cresc. to mp by m. 350
178
Pn. A
Pn. B
188
Pn. A
Pn. B
199
Pn. A
Pn. B

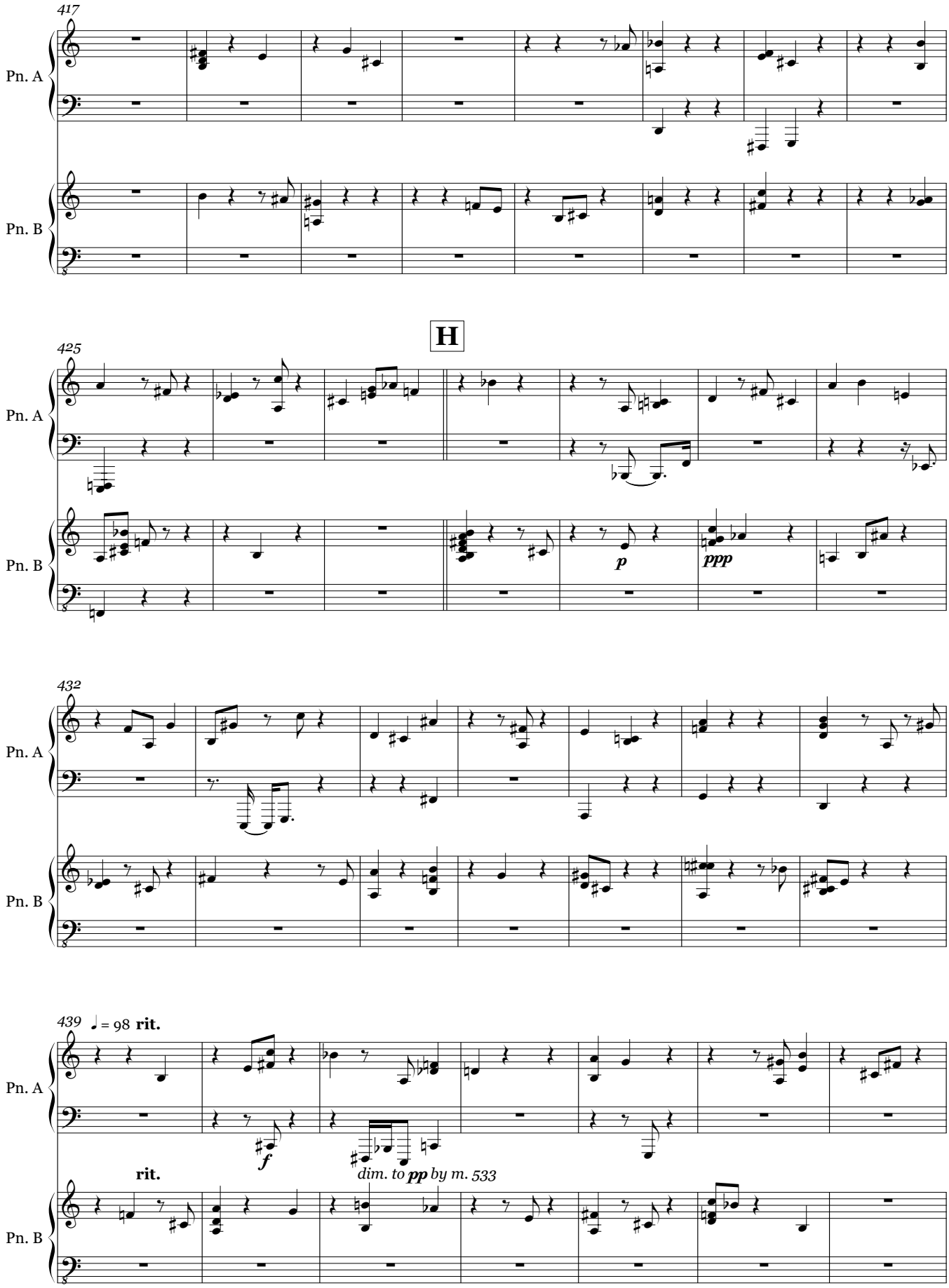

210
♩ = 42 accel.
Pn. A
accel.
Pn. B
221
D
Pn. A
ppp
cresc. to f by m. 439
Pn. B
232
Pn. A
Pn. B
243
Pn. A
Pn. B
ppp
cresc. to f by m. 439

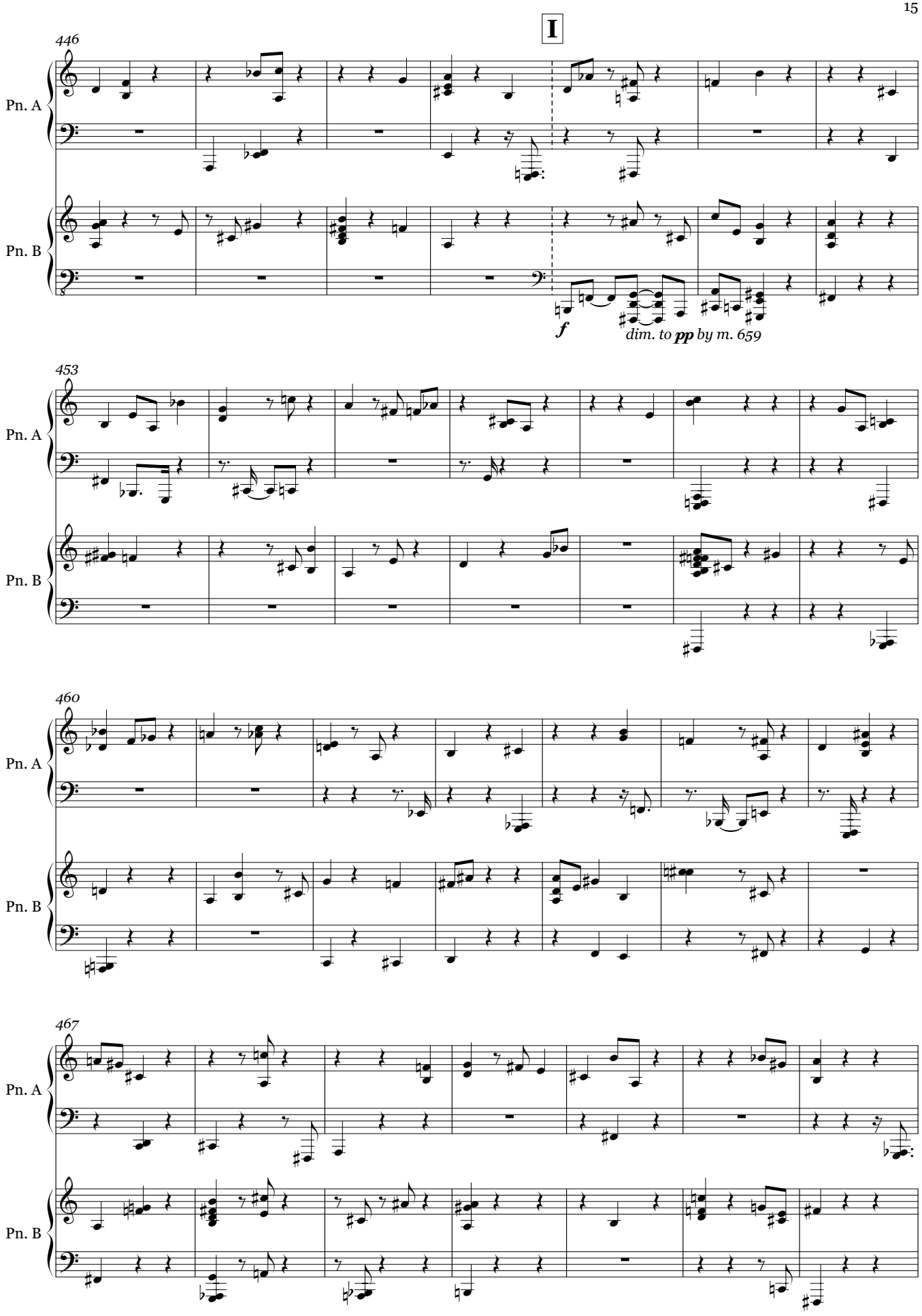

E
254
Pn. A
Pn. B
264
Pn. A
Pn. B
275
Pn. A
Pn. B
286
Pn. A
Pn. B

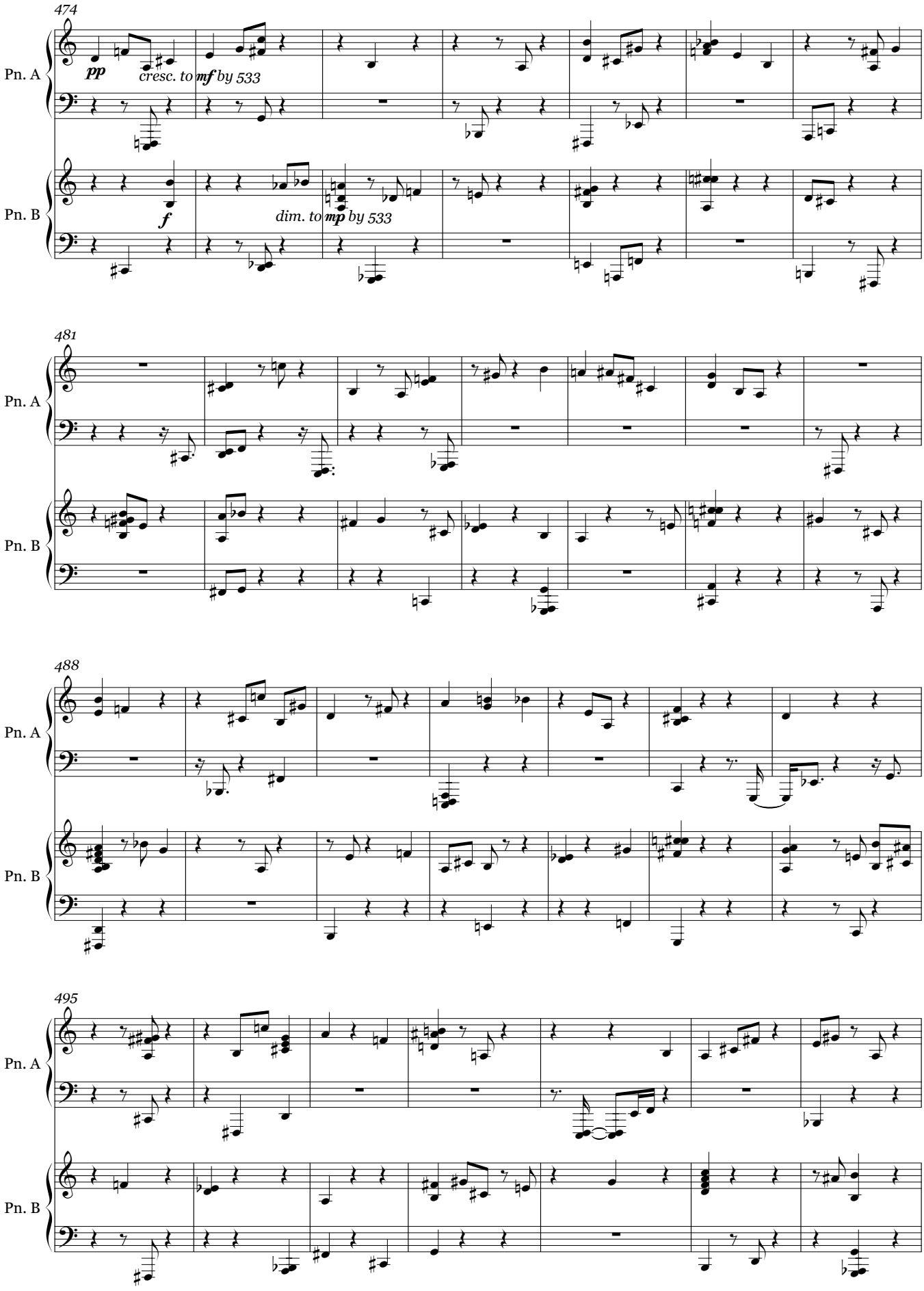

297
Pn. A
Pn. B
307
Pn. A
Pn. B
317
Pn. A
Pn. B
F
327
Pn. A
Pn. B

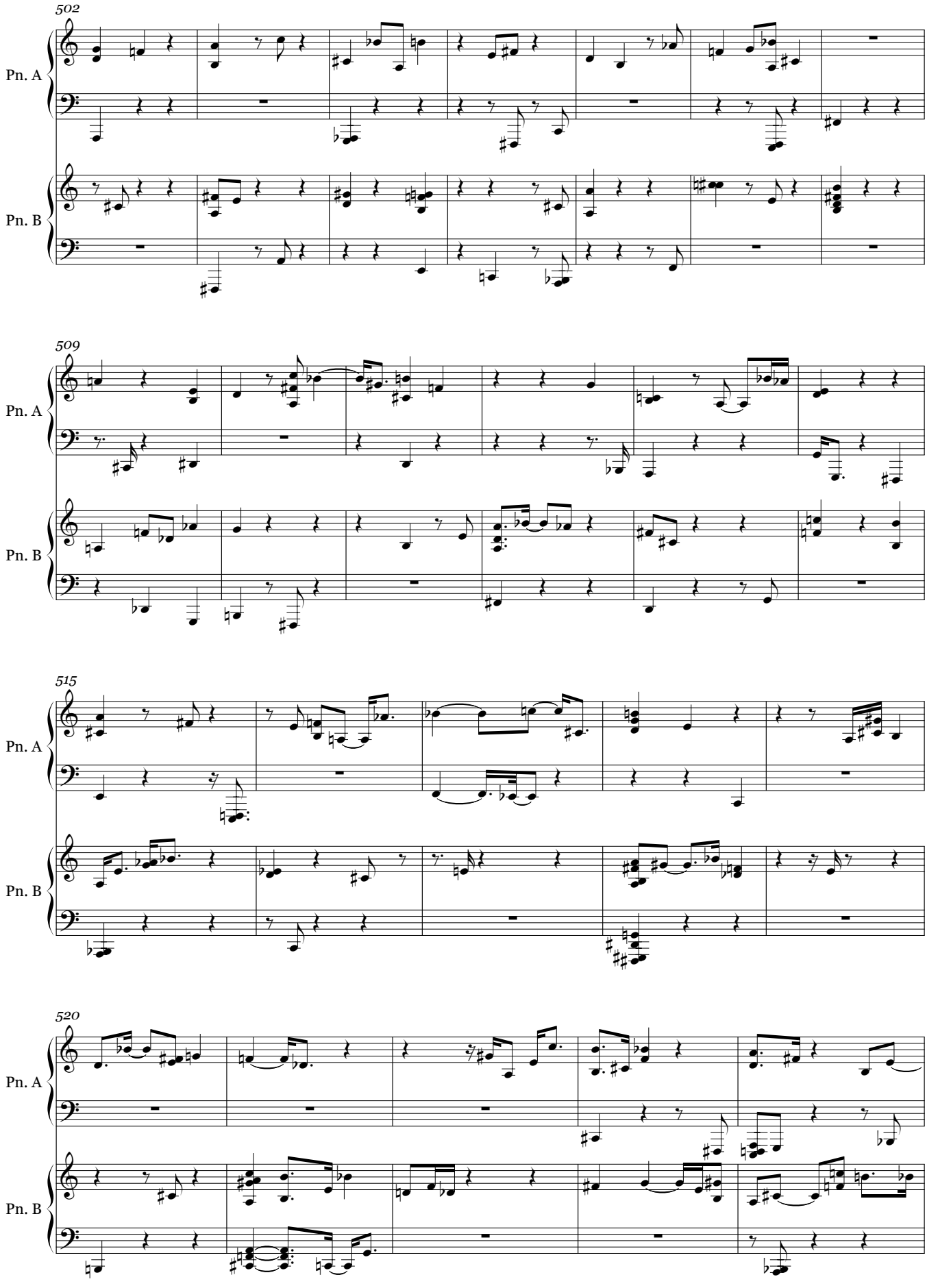

337
Pn. A
Pn. B
G
347
mf
dim. to pp by m. 474
mp
cresc. to f by m. 474
357
367

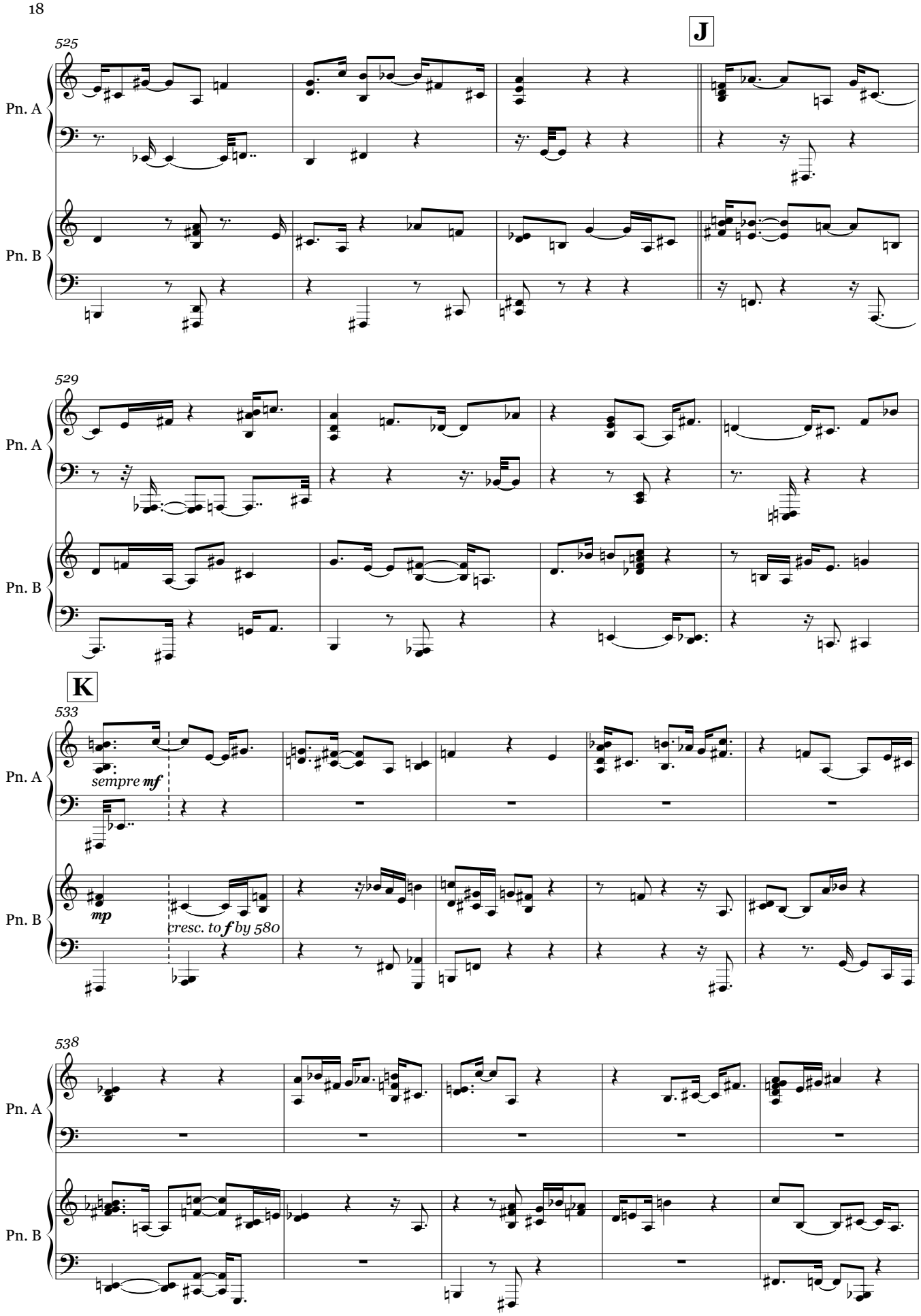

377
Pn. A
Pn. B
387
Pn. A
Pn. B
398
Pn. A
Pn. B
408
Pn. A
Pn. B

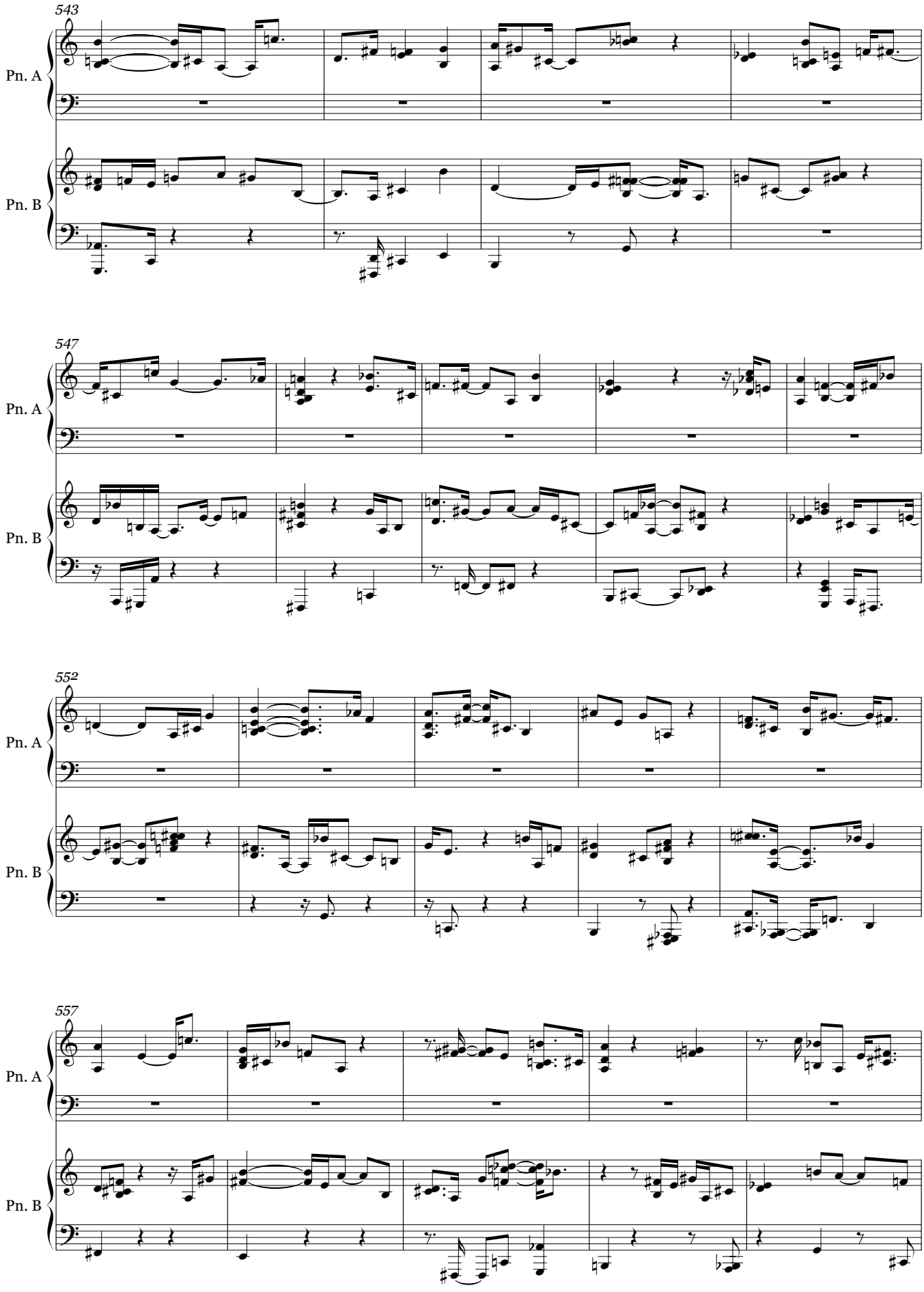

417
Pn. A
Pn. B
H
425
Pn. A
Pn. B
p
ppp
432
Pn. A
Pn. B
439
♩ = 98 rit.
Pn. A
f
dim. to pp by m. 533
rit.
Pn. B

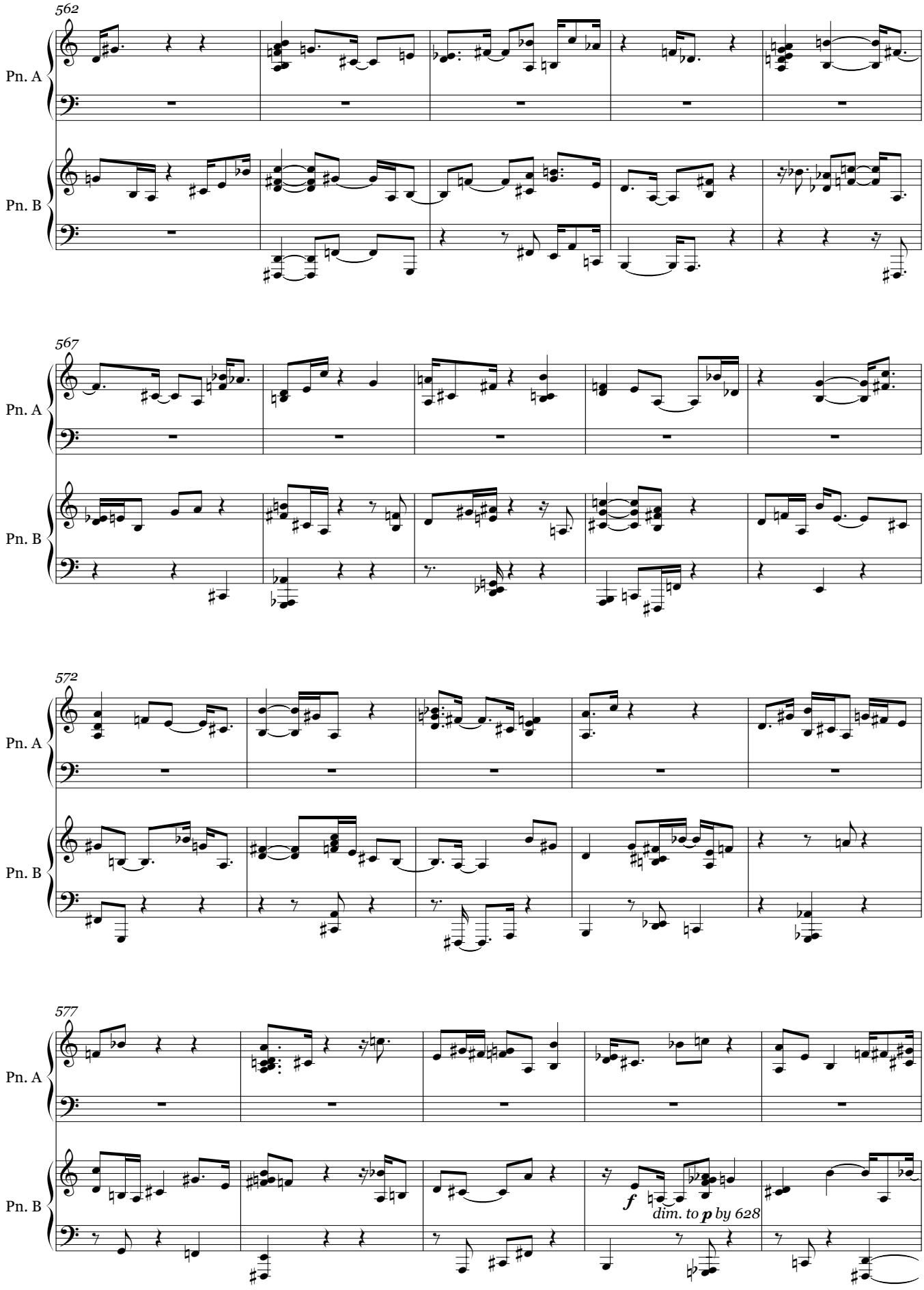

I
446
Pn. A
Pn. B
f
dim. to pp by m. 659
453
Pn. A
Pn. B
460
Pn. A
Pn. B
467
Pn. A
Pn. B

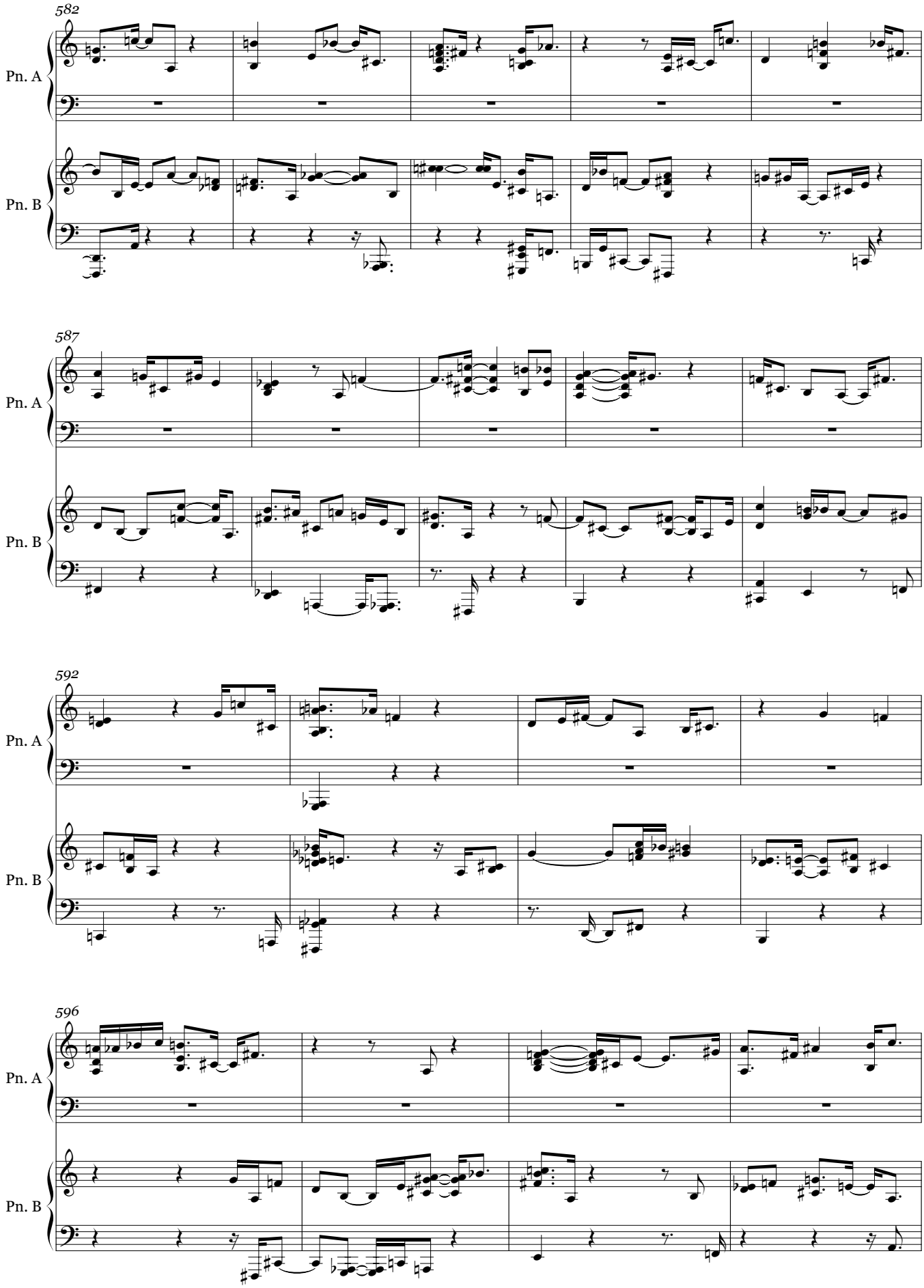

474
Pn. A
pp
cresc. to mf by 533
Pn. B
f
dim. to mp by 533
481
Pn. A
Pn. B
488
Pn. A
Pn. B
495
Pn. A
Pn. B

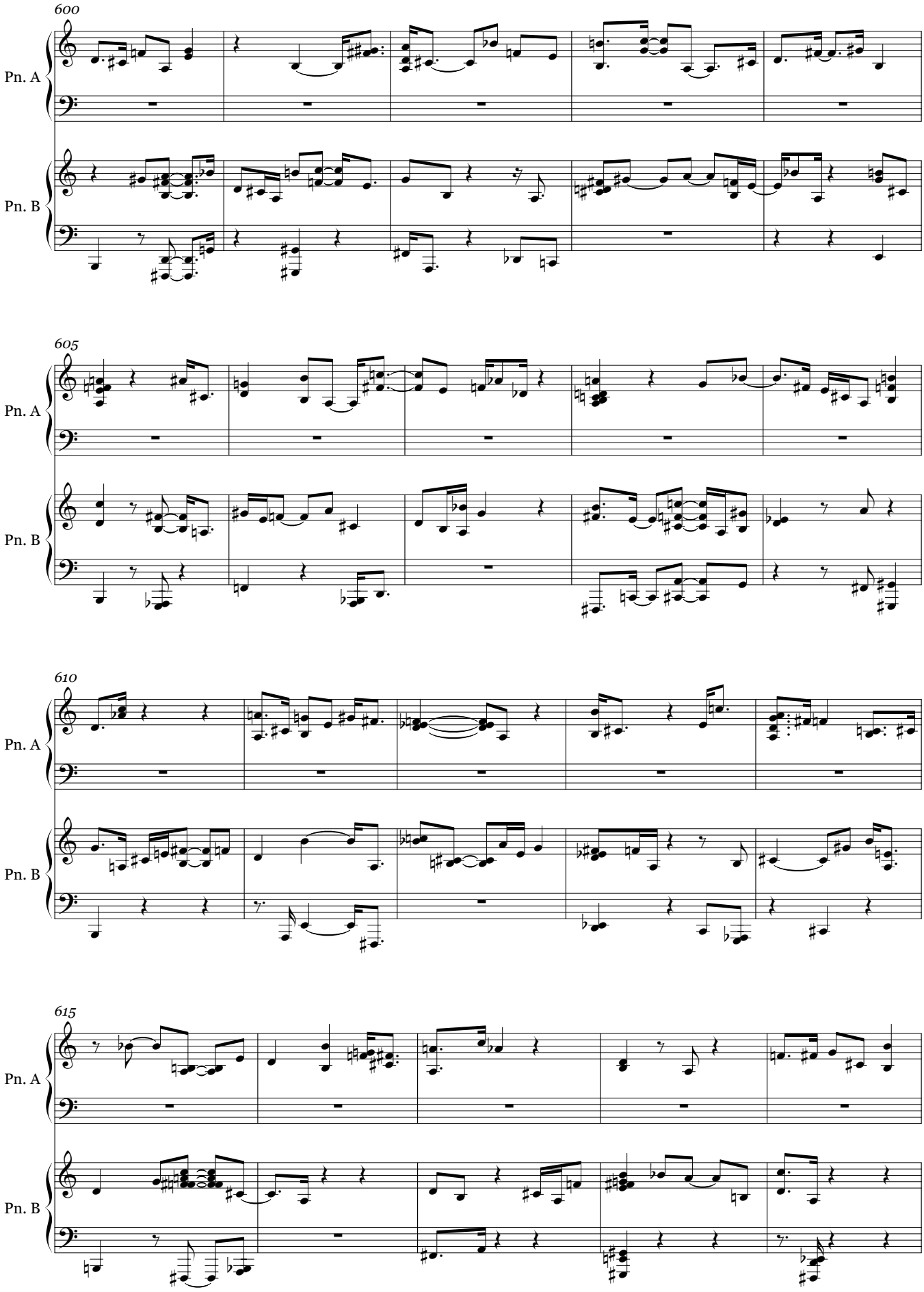

502
Pn. A
Pn. B
509
Pn. A
Pn. B
515
Pn. A
Pn. B
520
Pn. A
Pn. B

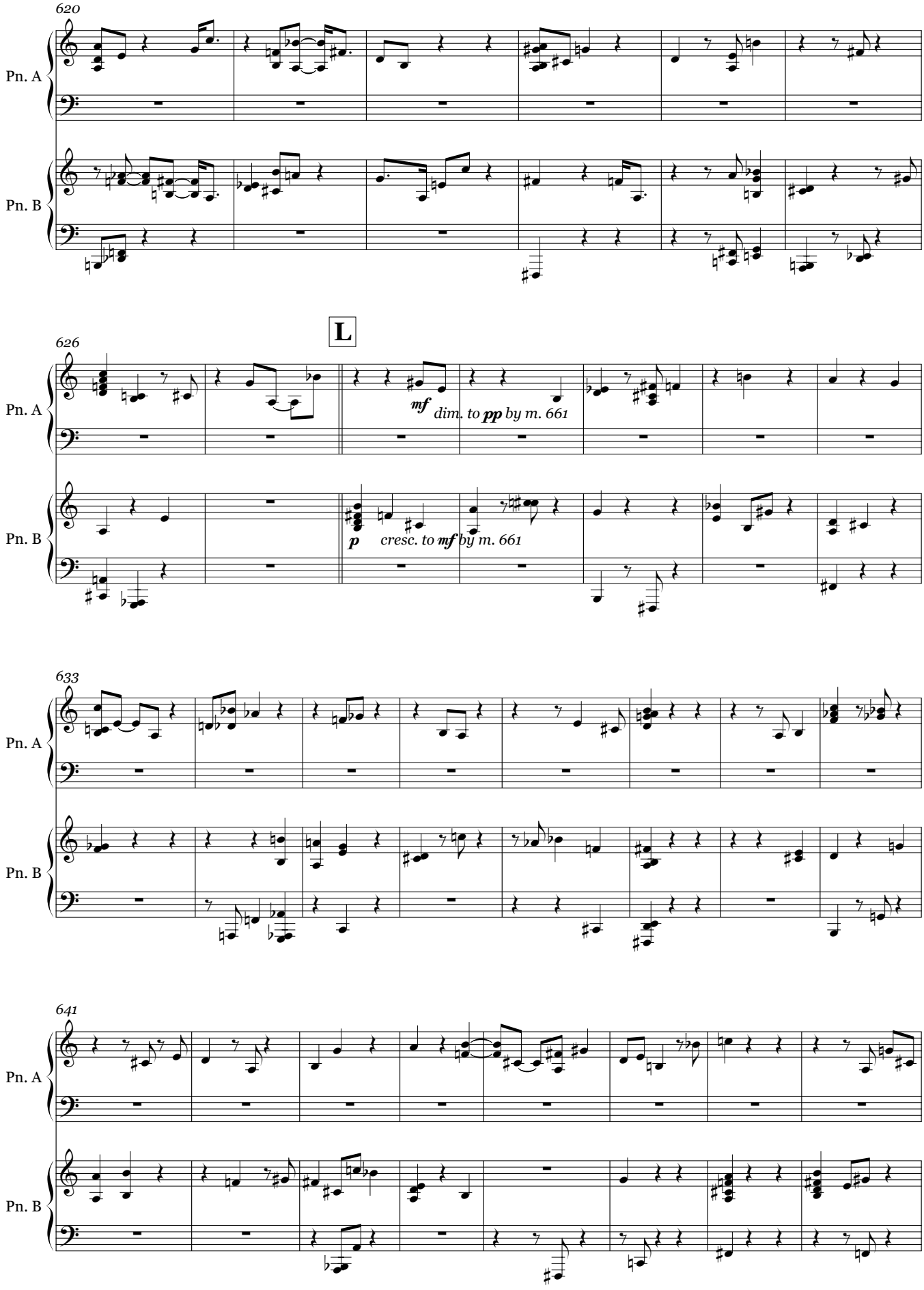

J
525
Pn. A
Pn. B
529
Pn. A
Pn. B
K
533
Pn. A
sempre mf
Pn. B
mp
cresc. to f by 580
538
Pn. A
Pn. B

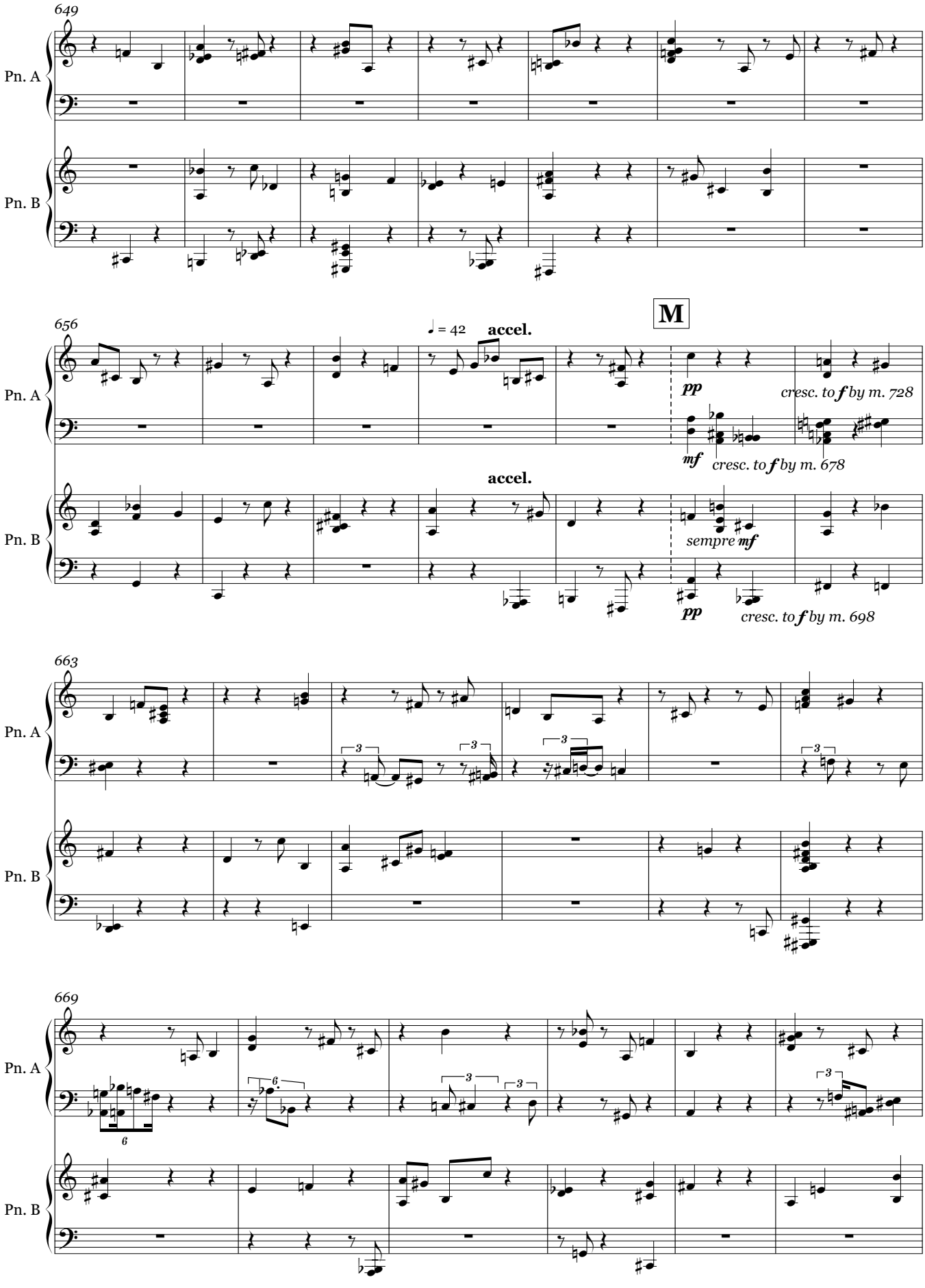

543
Pn. A
Pn. B
547
Pn. A
Pn. B
552
Pn. A
Pn. B
557
Pn. A
Pn. B

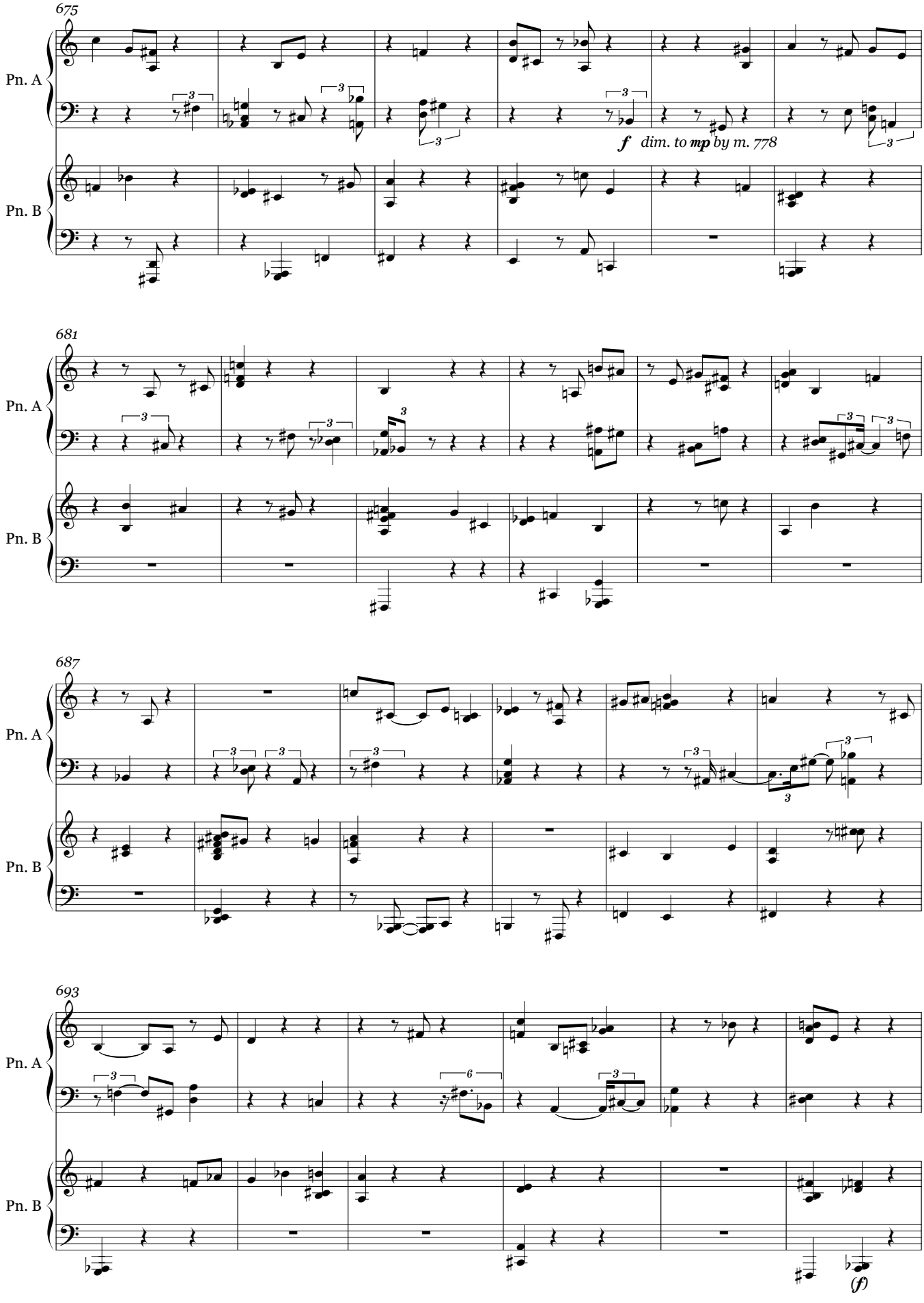

562
Pn. A
Pn. B
567
Pn. A
Pn. B
572
Pn. A
Pn. B
577
Pn. A
Pn. B
f
dim. to p by 628

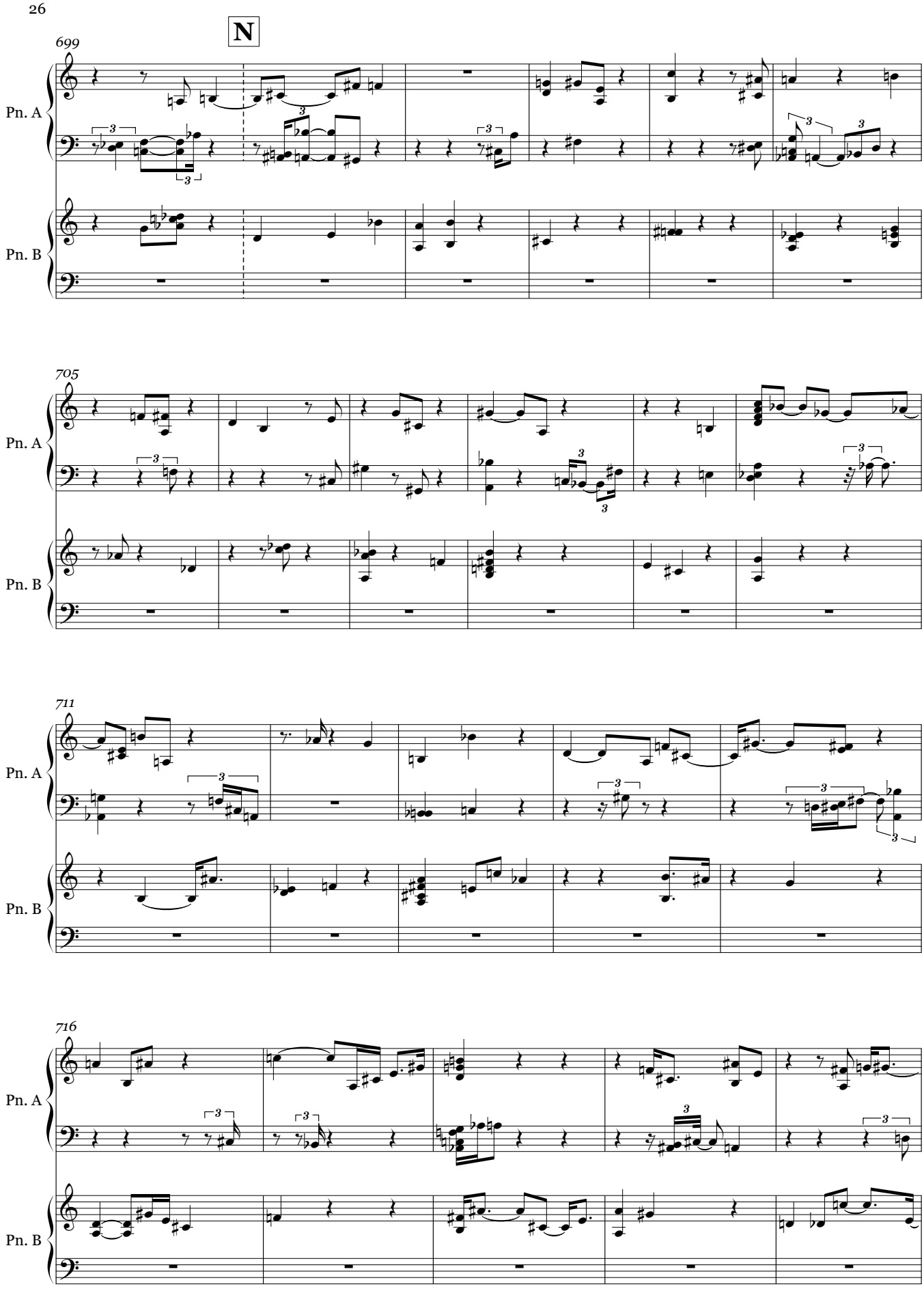

582
Pn. A
Pn. B
587
Pn. A
Pn. B
592
Pn. A
Pn. B
596
Pn. A
Pn. B

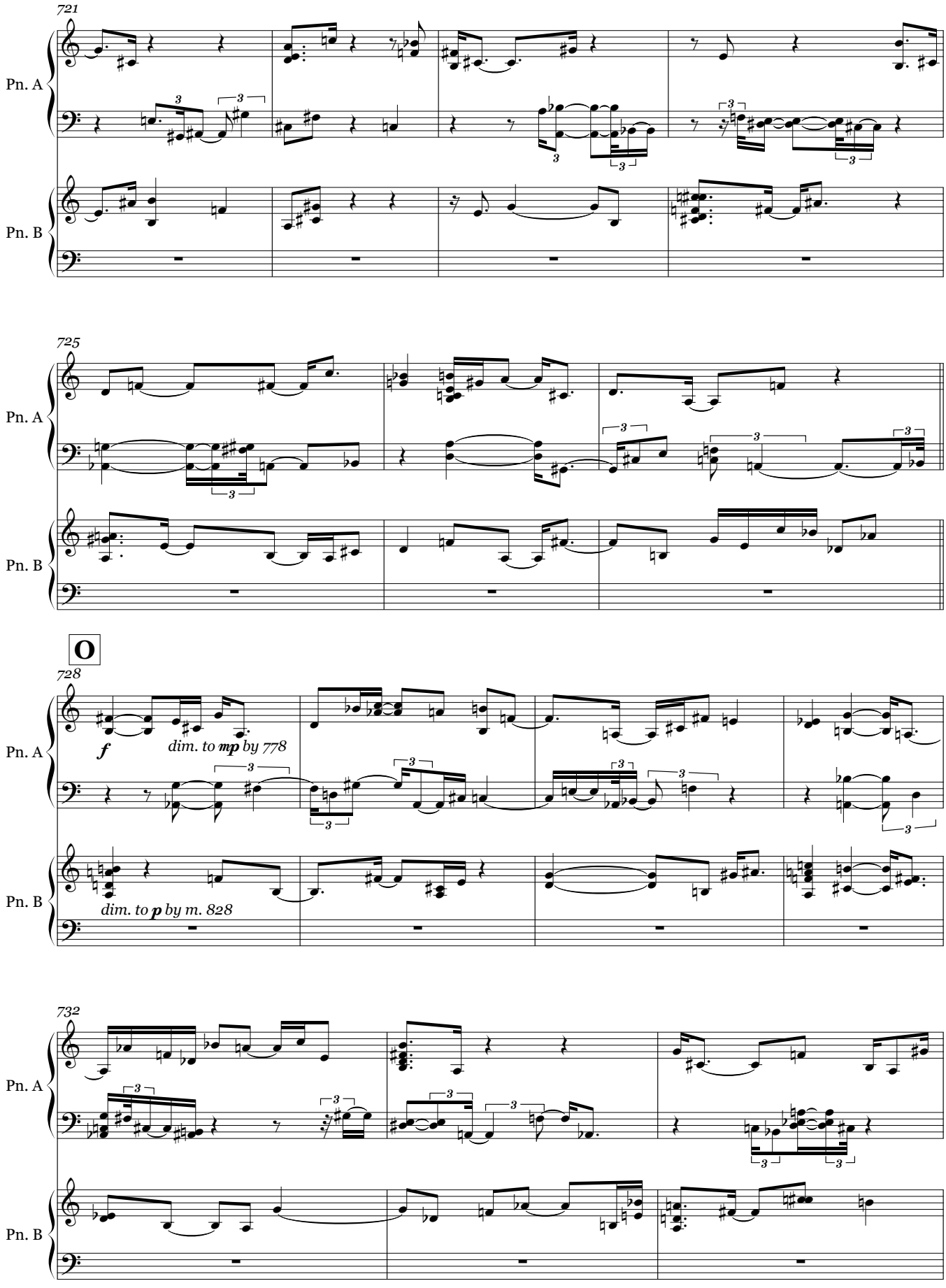

600
Pn. A
Pn. B
605
Pn. A
Pn. B
610
Pn. A
Pn. B
615
Pn. A
Pn. B

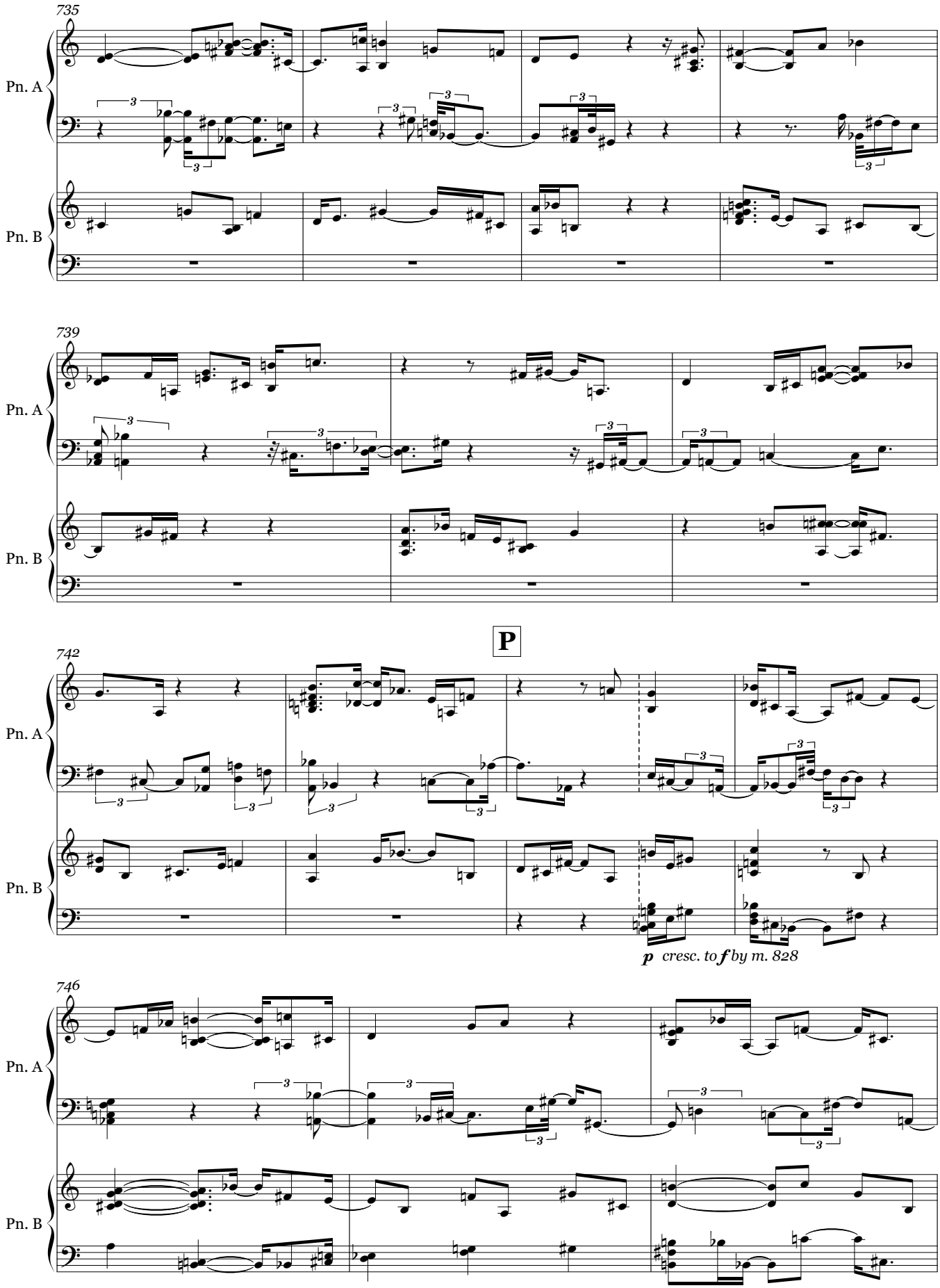

620
Pn. A
Pn. B
626
L
mf
dim. to pp by m. 661
p
cresc. to mf by m. 661
633
641

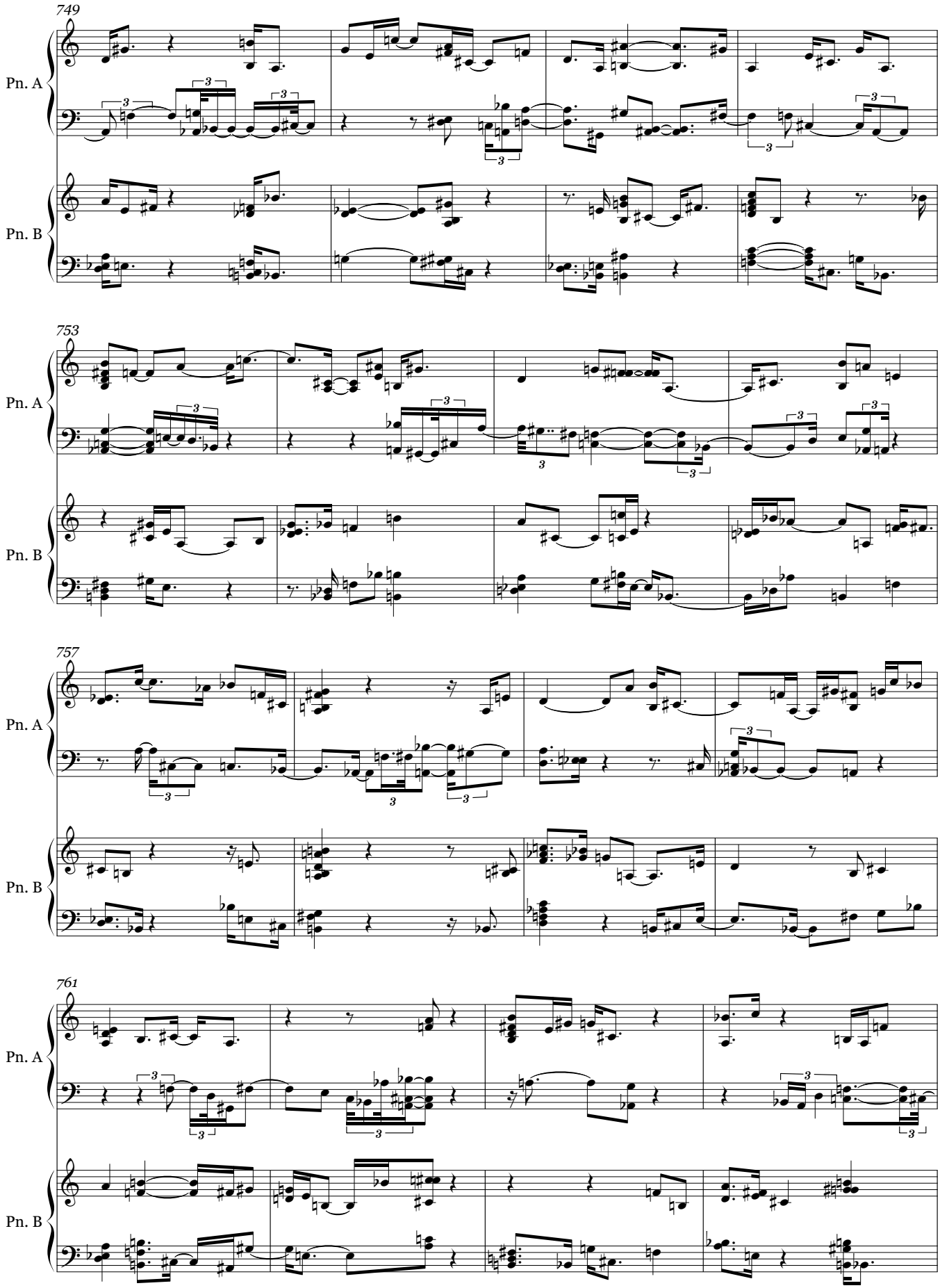

649
Pn. A
Pn. B
656
M
♩ = 42
accel.
pp
cresc. to f by m. 728
mf
cresc. to f by m. 678
accel.
sempre mf
pp
cresc. to f by m. 698
663
669


675
Pn. A
Pn. B
f dim. to mp by m. 778
681
Pn. A
Pn. B
687
Pn. A
Pn. B
693
Pn. A
Pn. B
(f)


N
699
Pn. A
Pn. B
705
Pn. A
Pn. B
711
Pn. A
Pn. B
716
Pn. A
Pn. B


721
Pn. A
Pn. B
725
Pn. A
Pn. B
O
728
Pn. A
f
dim. to mp by 778
Pn. B
dim. to p by m. 828
732
Pn. A
Pn. B


735
Pn. A
Pn. B
739
Pn. A
Pn. B
P
742
Pn. A
Pn. B
p cresc. to f by m. 828
746
Pn. A
Pn. B


749
Pn. A
Pn. B
753
Pn. A
Pn. B
757
Pn. A
Pn. B
761
Pn. A
Pn. B

765

Pn. A

Pn. B

769

Pn. A

Pn. B

773

Pn. A

Pn. B

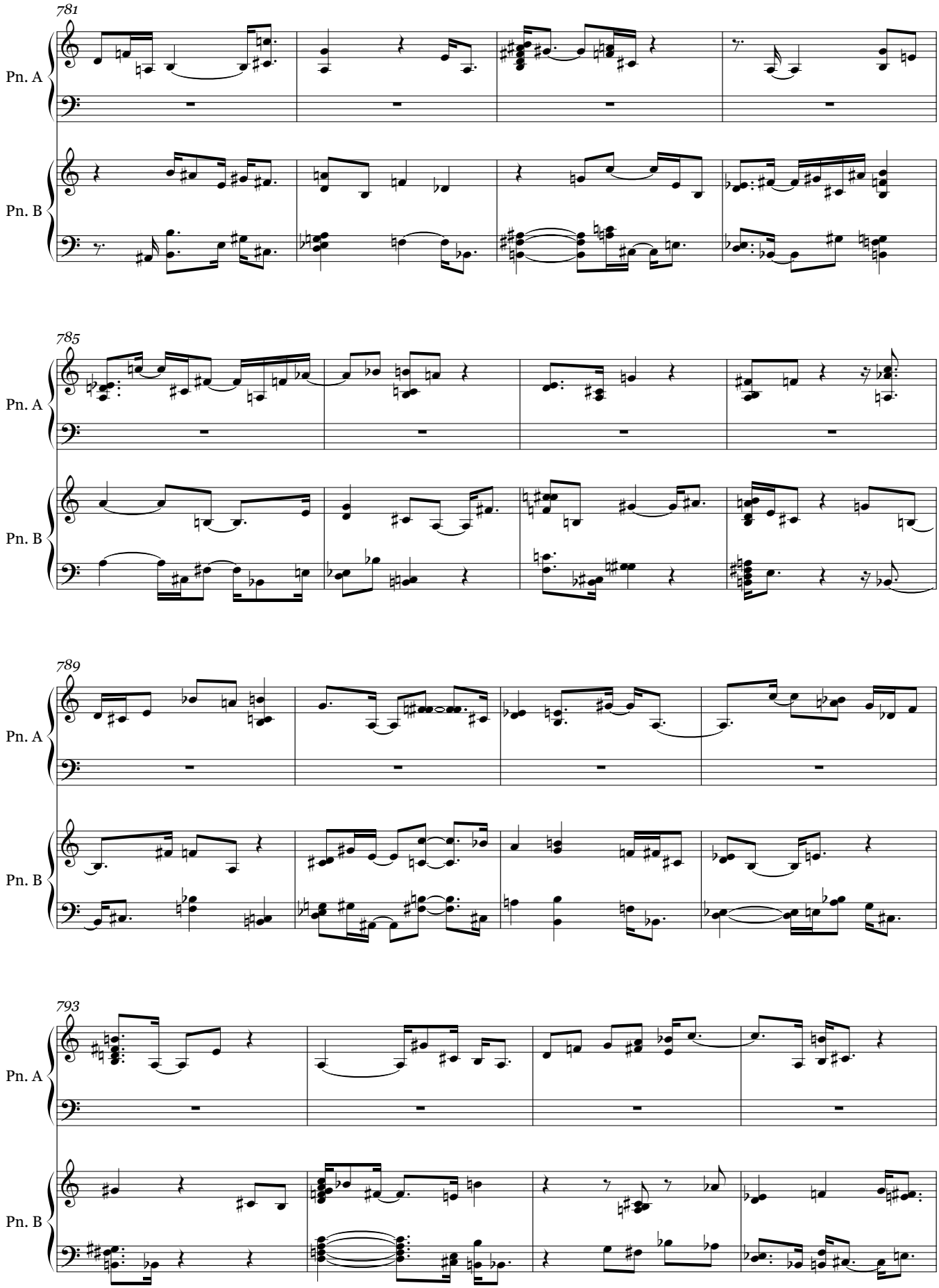
Q

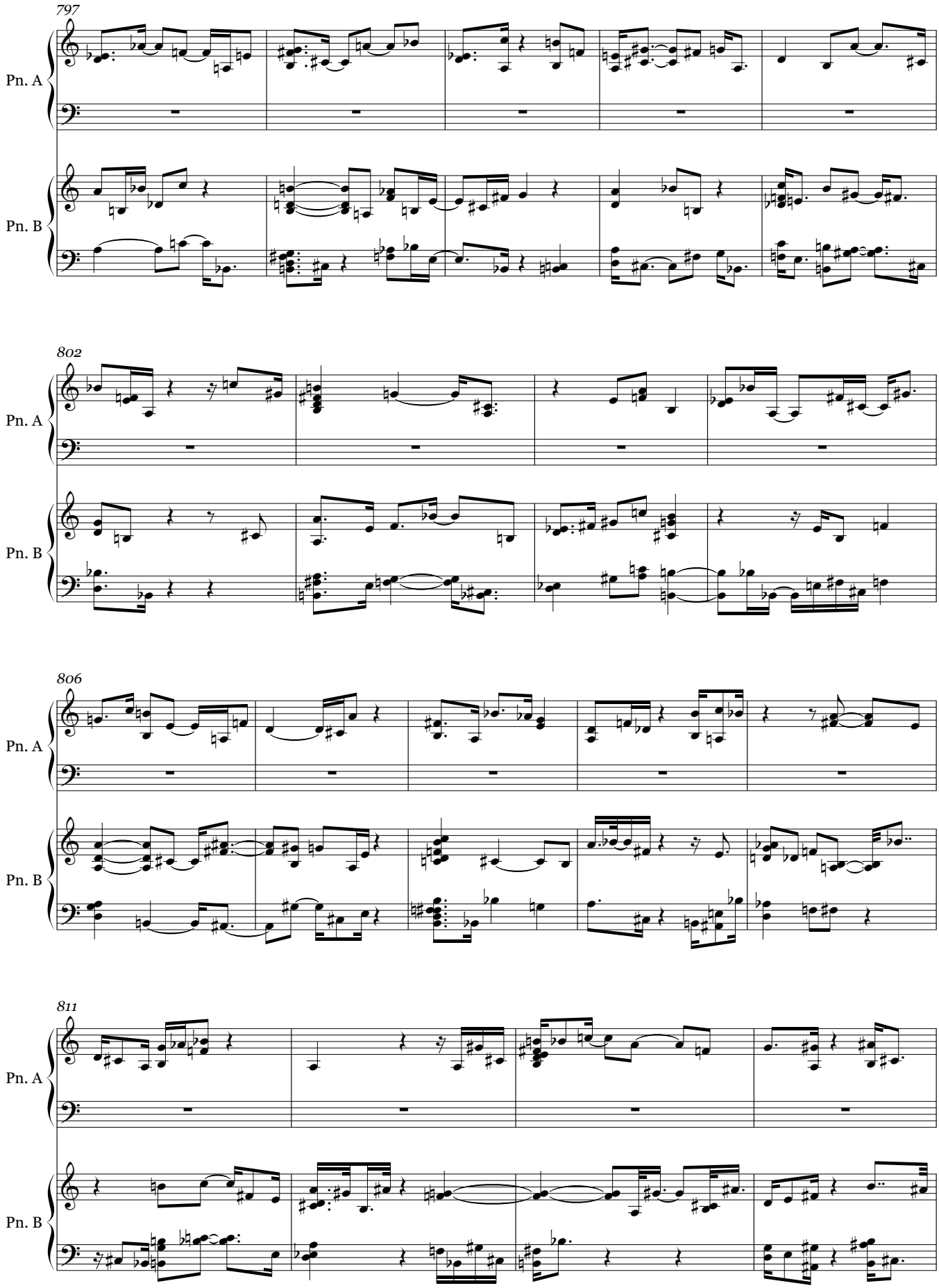
777

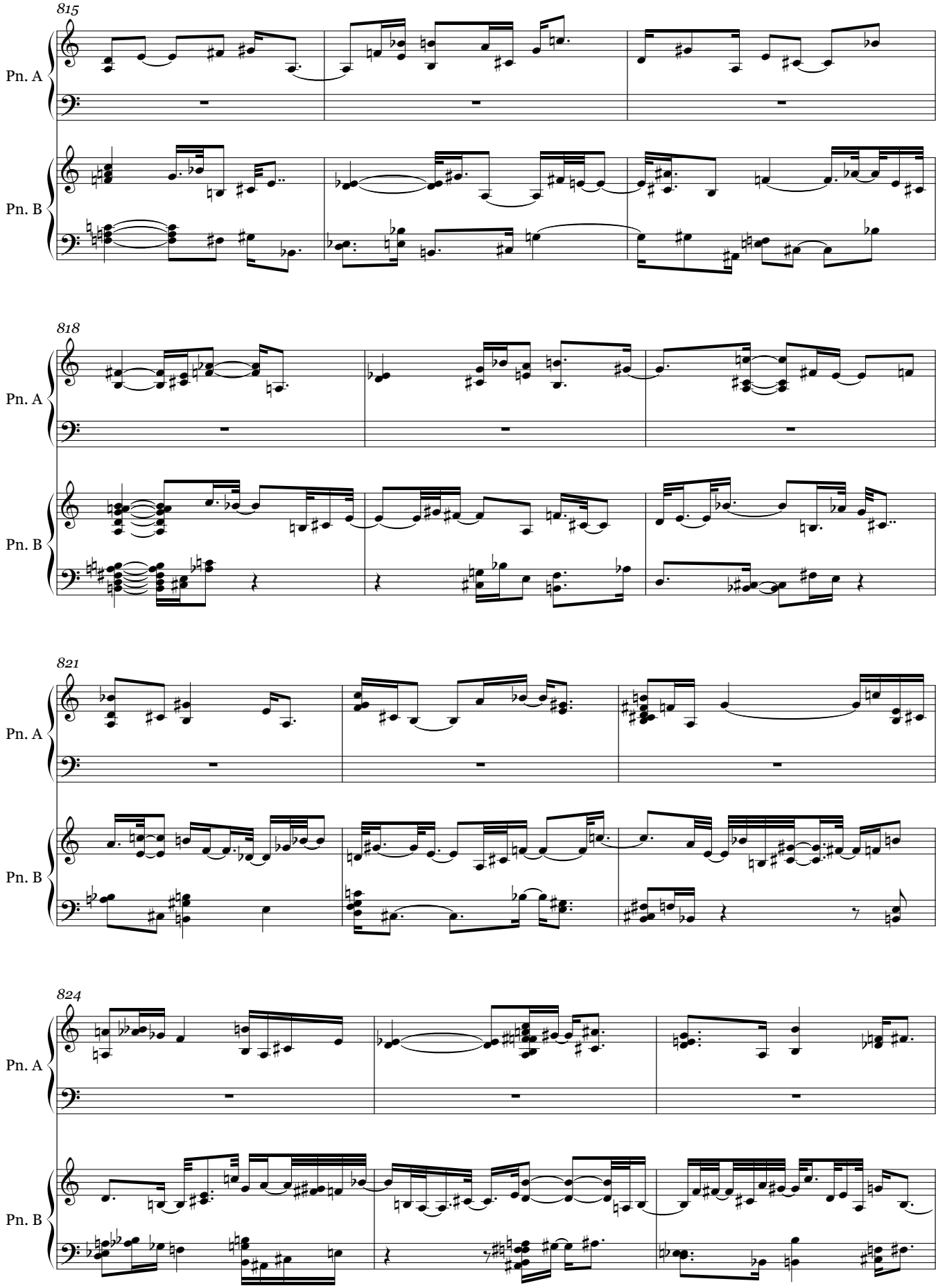
Pn. A

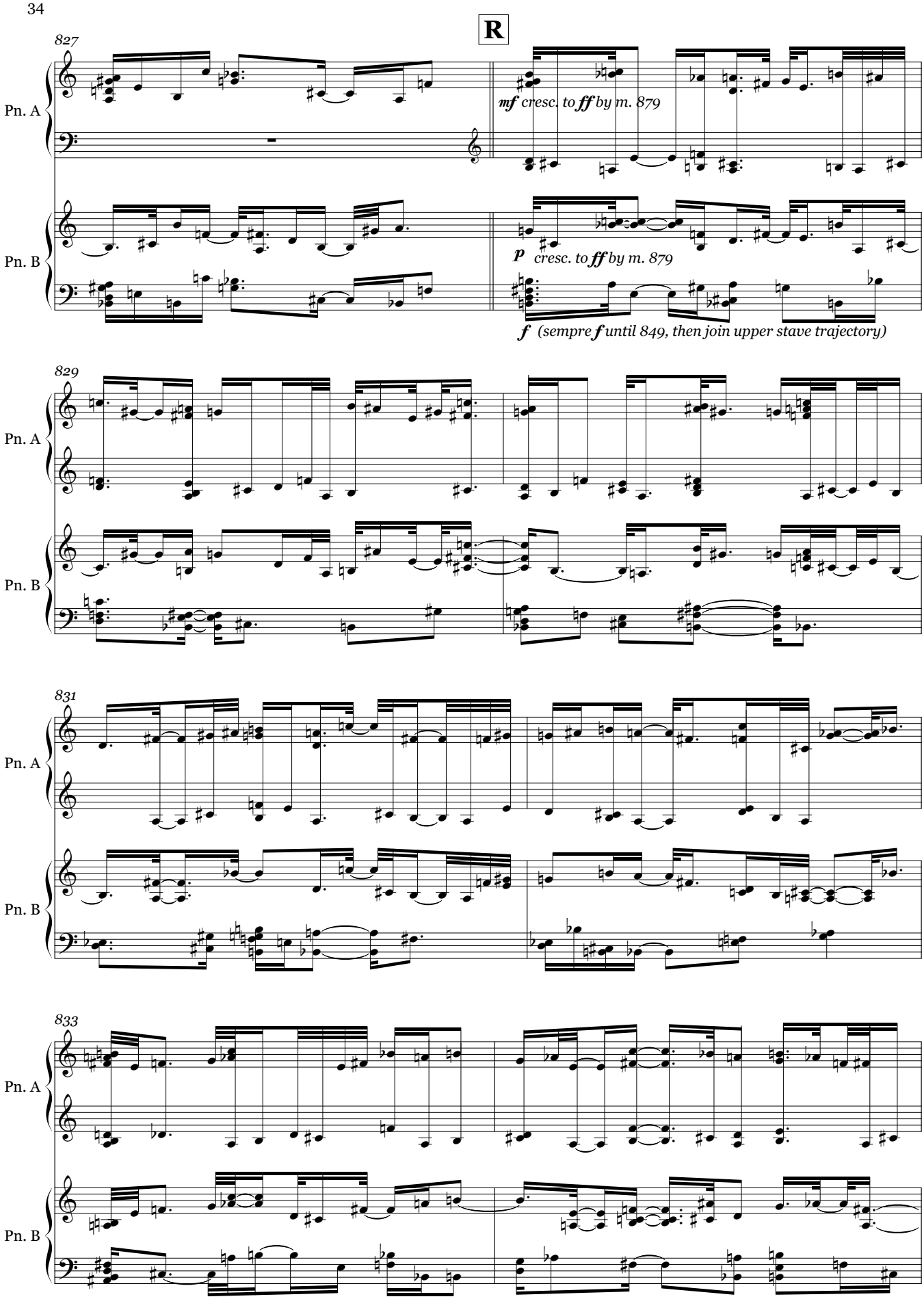
mp *cresc. to* ***mf*** *by 828*

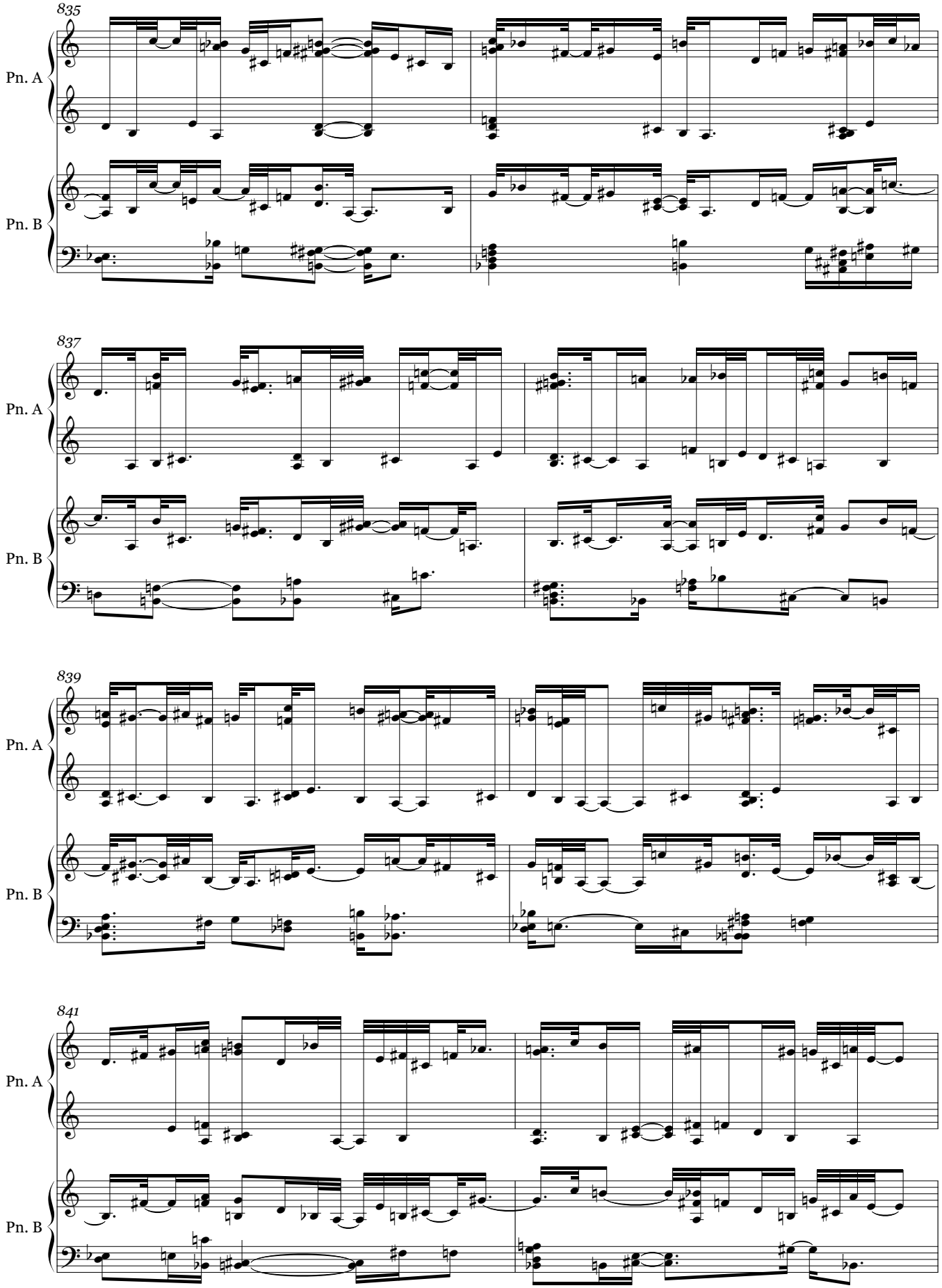
Pn. B

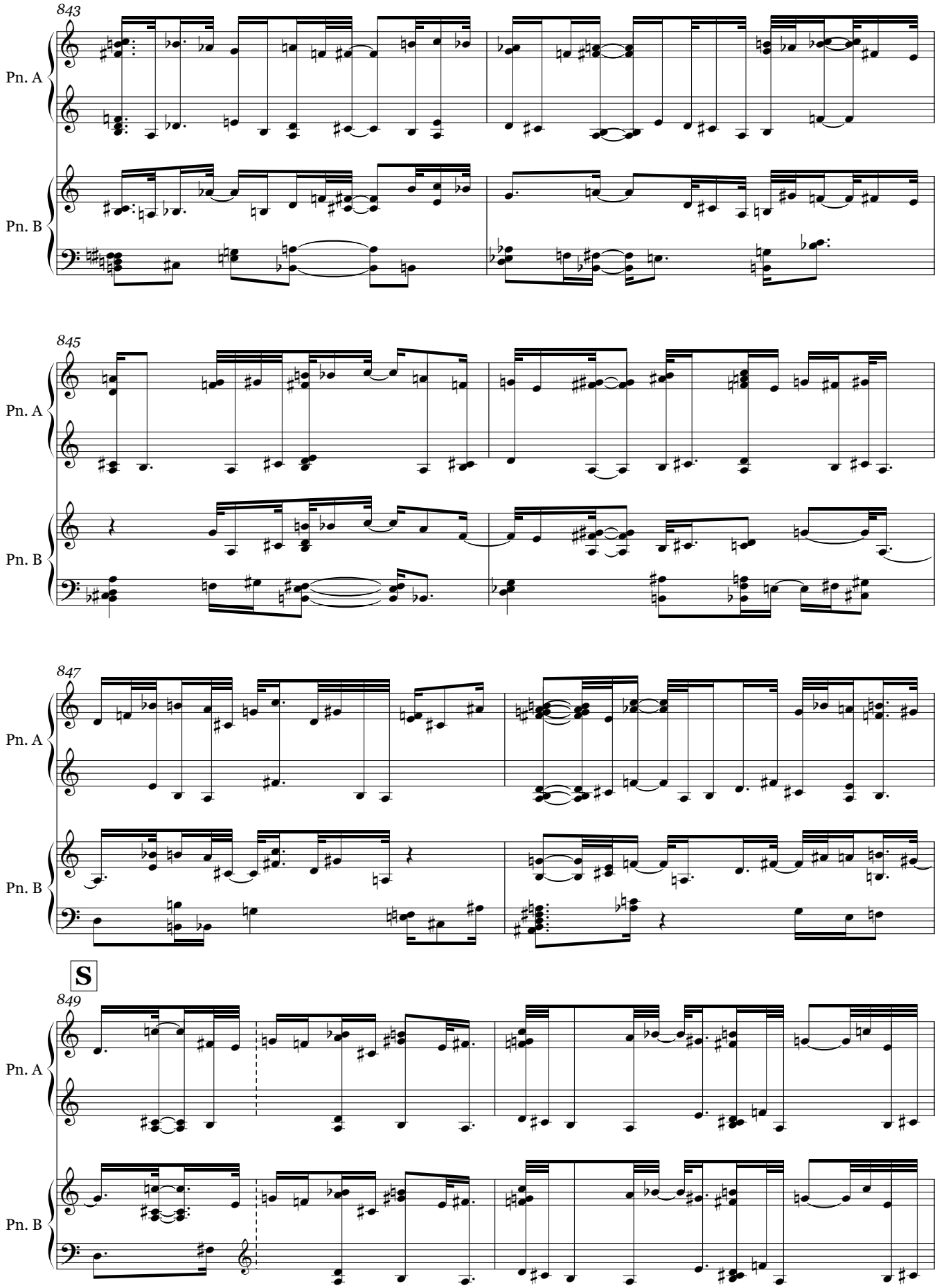

781
Pn. A
Pn. B
785
Pn. A
Pn. B
789
Pn. A
Pn. B
793
Pn. A
Pn. B

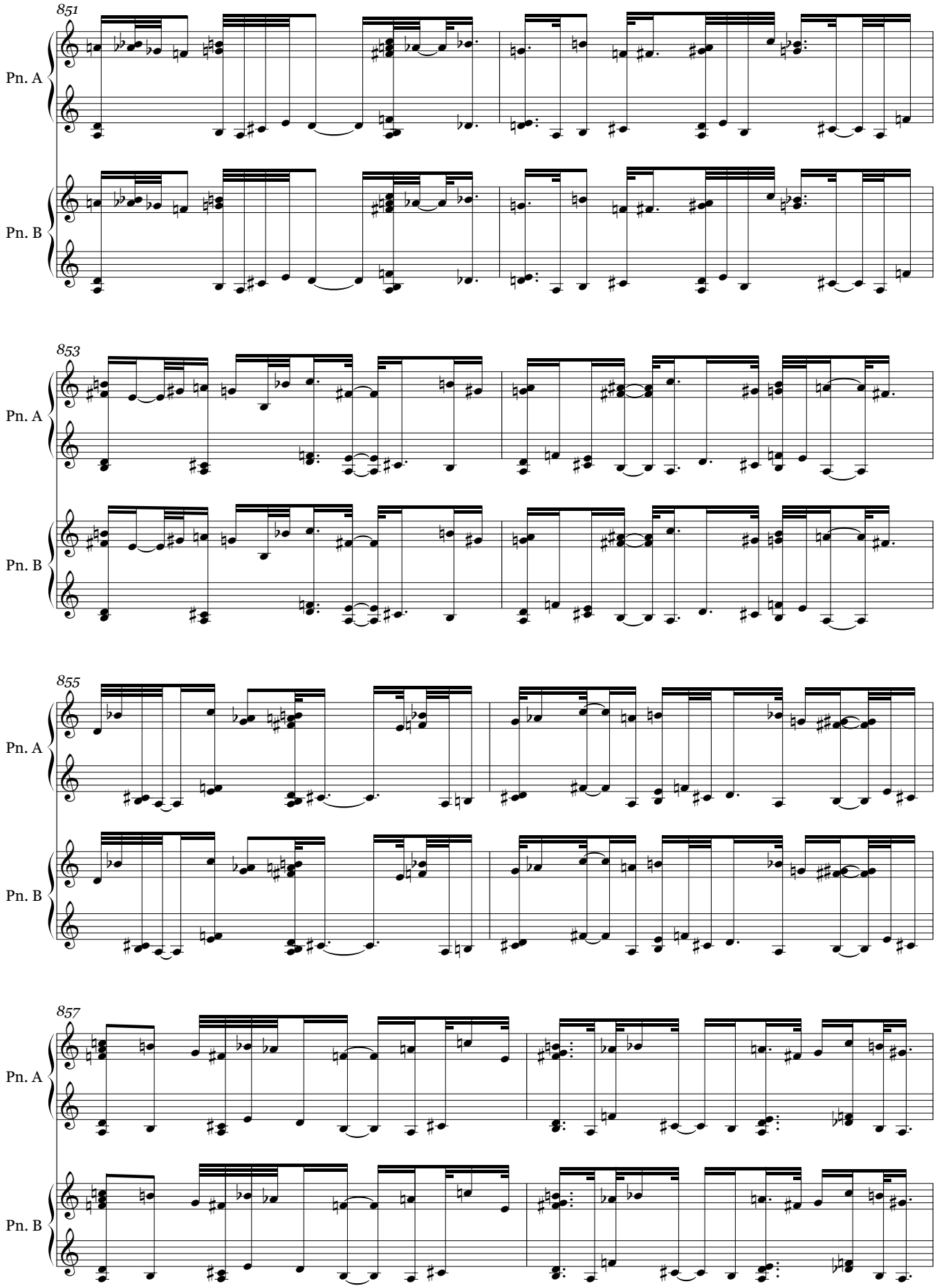

797
Pn. A
Pn. B
802
Pn. A
Pn. B
806
Pn. A
Pn. B
811
Pn. A
Pn. B

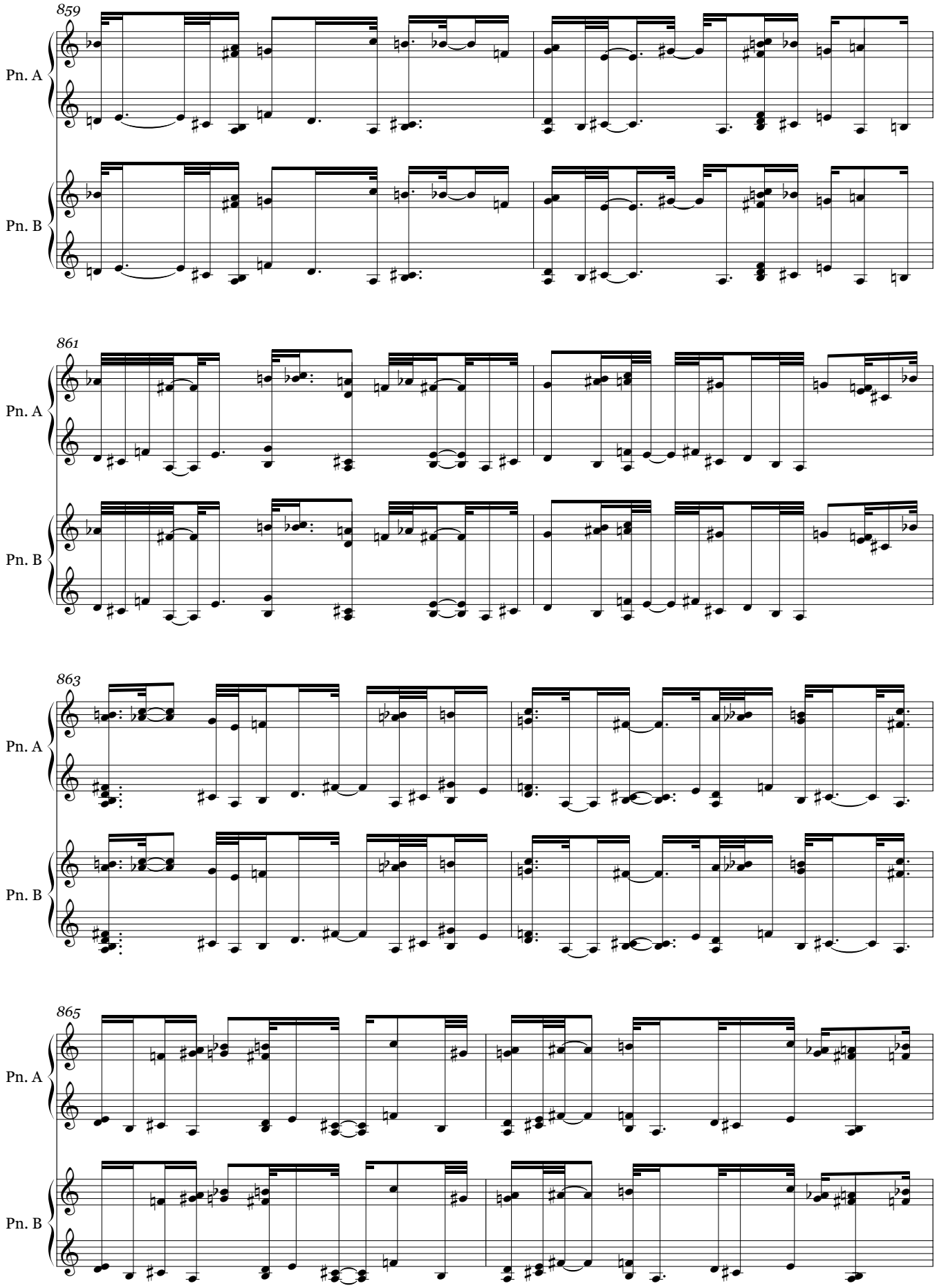

815
Pn. A
Pn. B
818
Pn. A
Pn. B
821
Pn. A
Pn. B
824
Pn. A
Pn. B

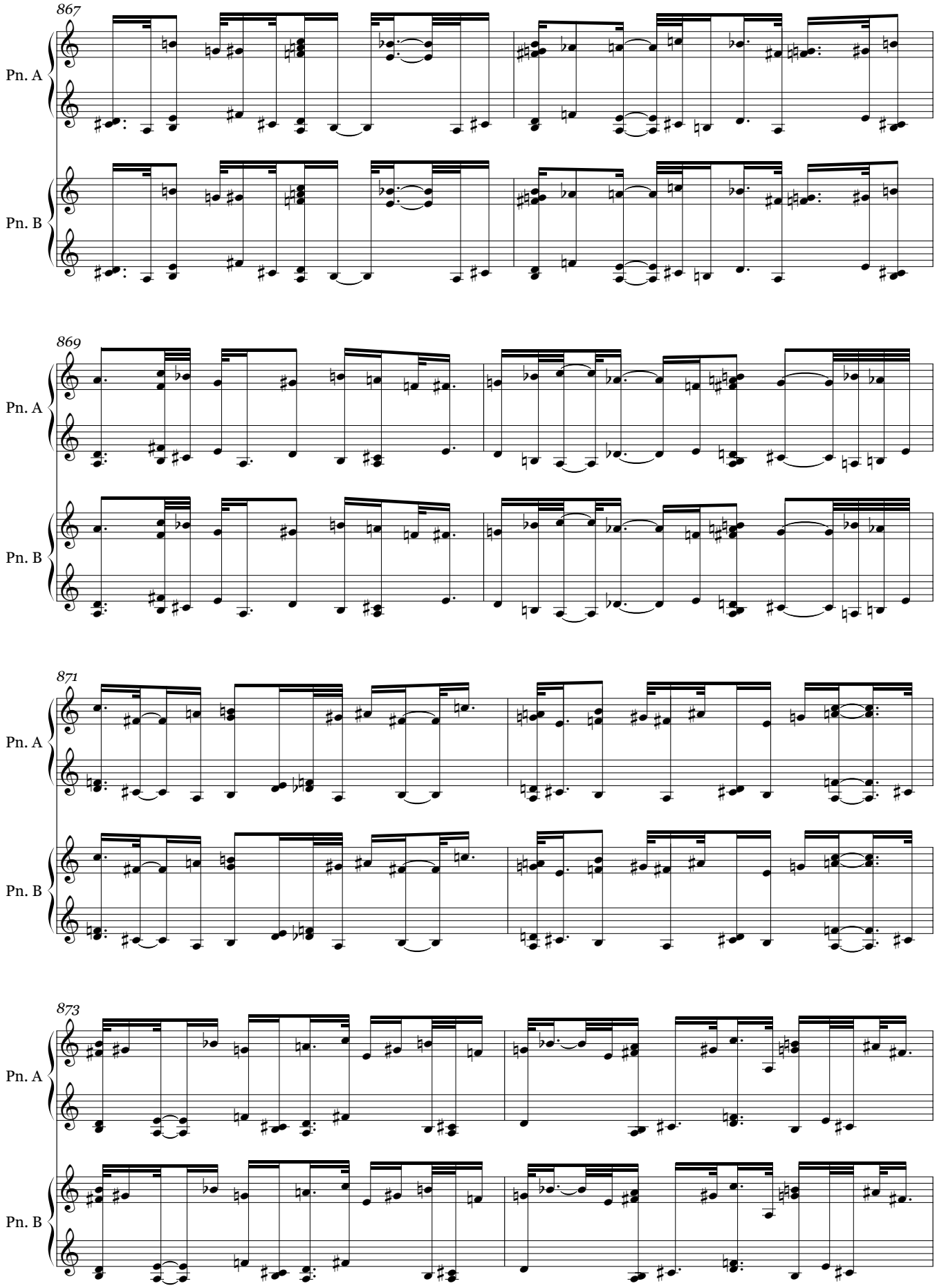

R
827
Pn. A
Pn. B
mf cresc. to ff by m. 879
p cresc. to ff by m. 879
f (sempre f until 849, then join upper stave trajectory)
829
831
833

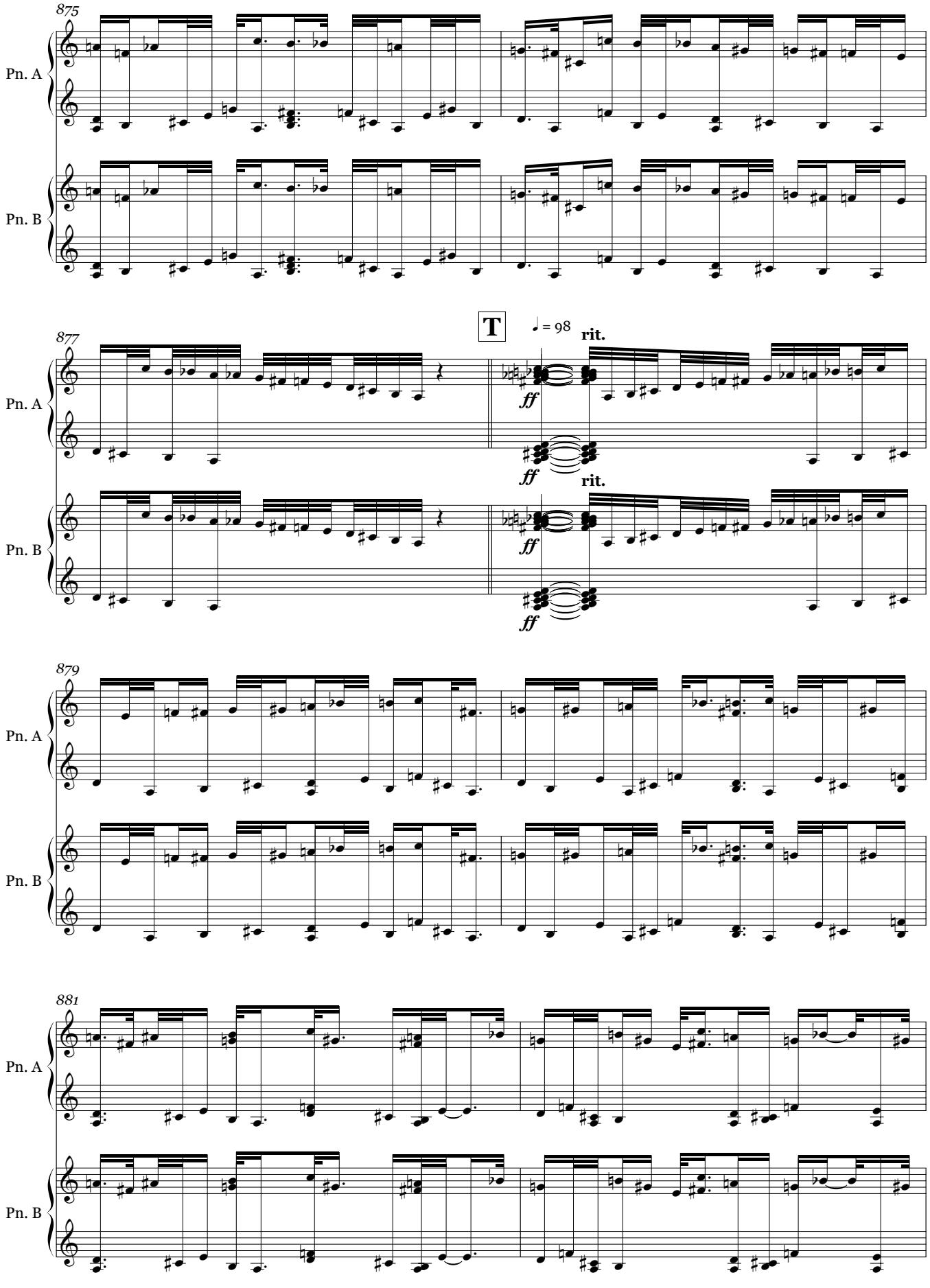

835
Pn. A
Pn. B
837
Pn. A
Pn. B
839
Pn. A
Pn. B
841
Pn. A
Pn. B

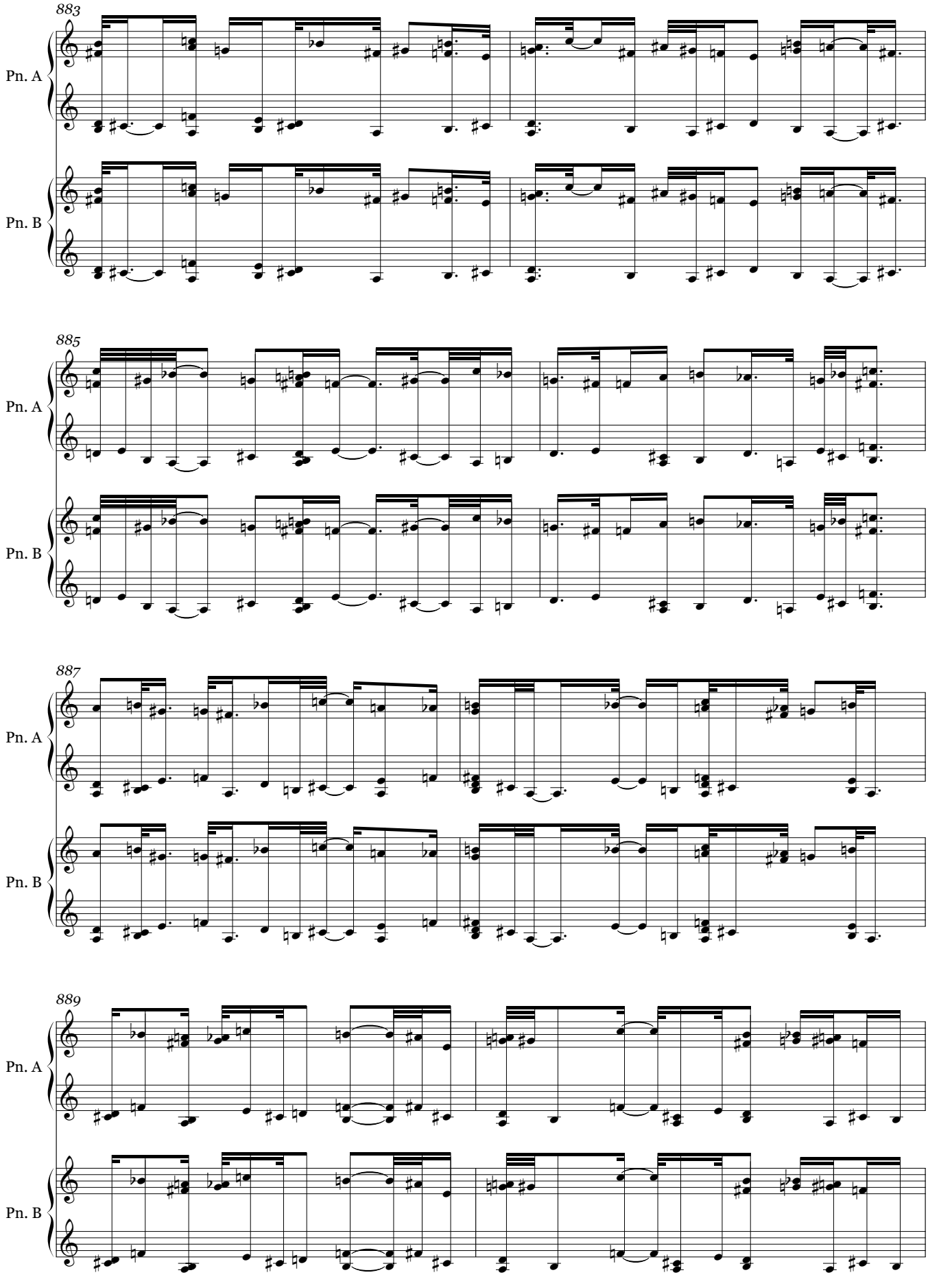

843
Pn. A
Pn. B
845
Pn. A
Pn. B
847
Pn. A
Pn. B
S
849
Pn. A
Pn. B

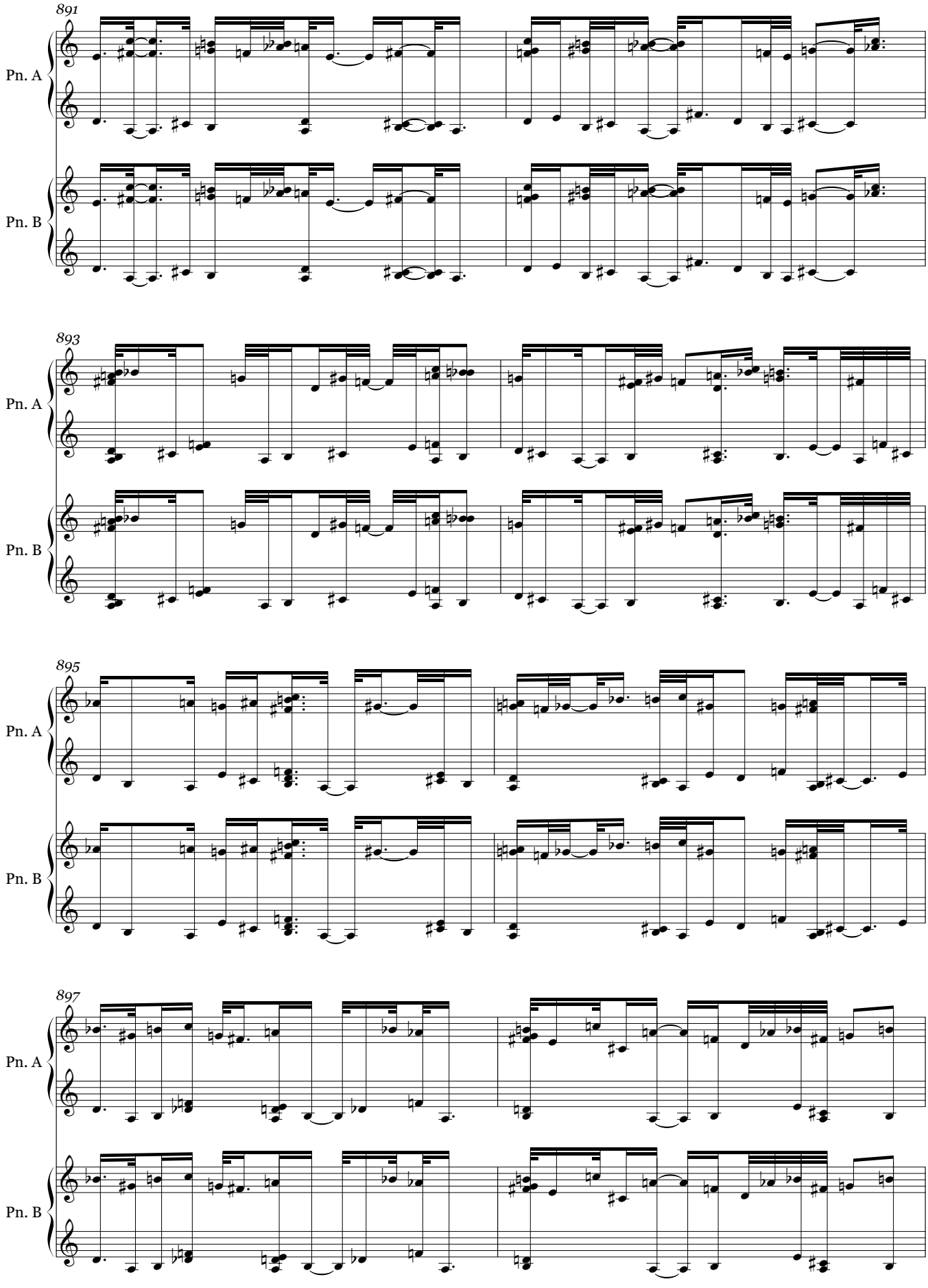

851
Pn. A
Pn. B
853
Pn. A
Pn. B
855
Pn. A
Pn. B
857
Pn. A
Pn. B

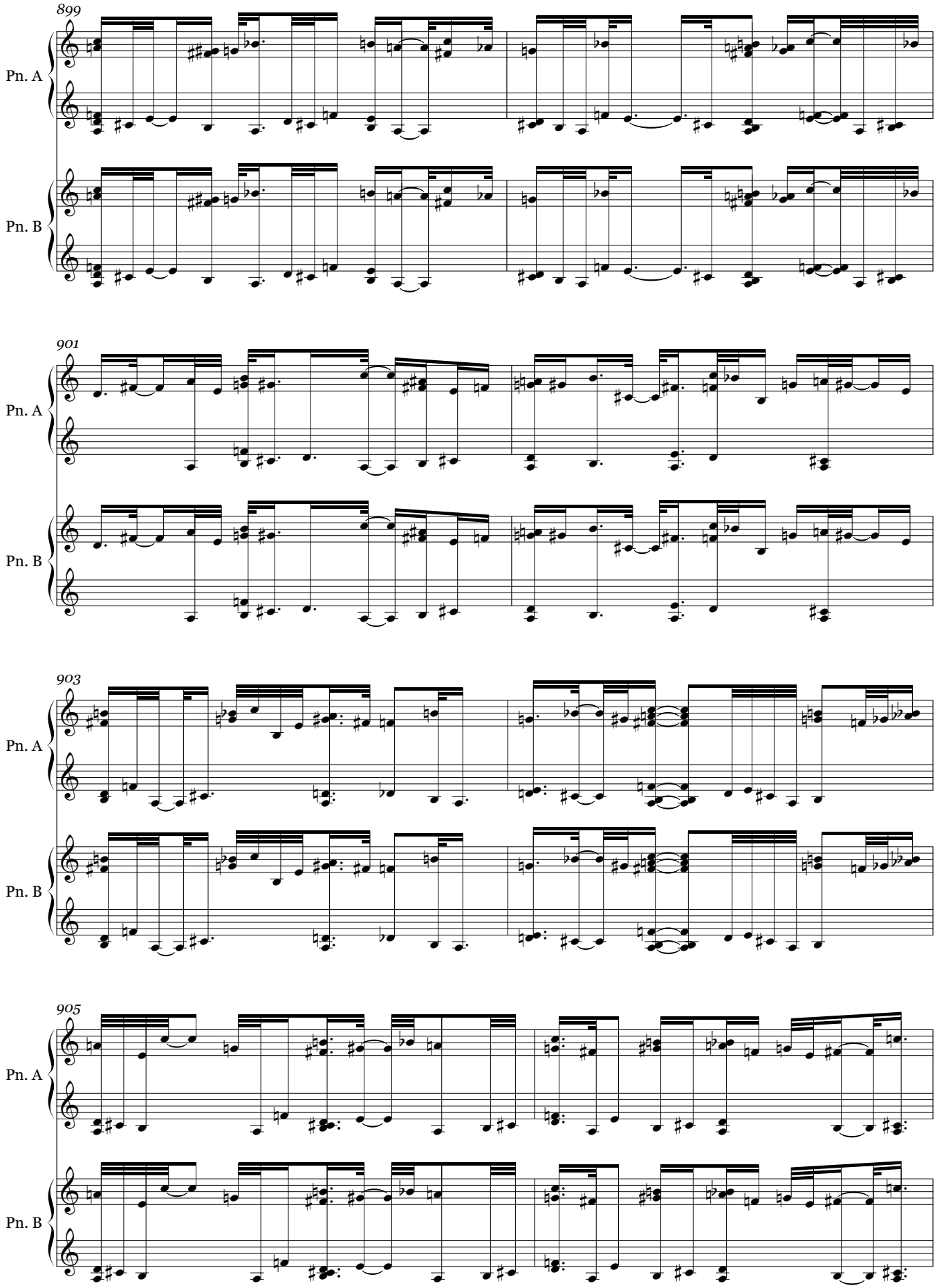

859
Pn. A
Pn. B
861
Pn. A
Pn. B
863
Pn. A
Pn. B
865
Pn. A
Pn. B


867
Pn. A
Pn. B
869
Pn. A
Pn. B
871
Pn. A
Pn. B
873
Pn. A
Pn. B


875
Pn. A
Pn. B
877
T
♩ = 98
rit.
ff
ff
rit.
ff
879
Pn. A
Pn. B
881
Pn. A
Pn. B


883
Pn. A
Pn. B
885
Pn. A
Pn. B
887
Pn. A
Pn. B
889
Pn. A
Pn. B


891
Pn. A
Pn. B
893
Pn. A
Pn. B
895
Pn. A
Pn. B
897
Pn. A
Pn. B


899
Pn. A
Pn. B
901
Pn. A
Pn. B
903
Pn. A
Pn. B
905
Pn. A
Pn. B

907

Pn. A

Pn. B

909

Pn. A

Pn. B

U

911

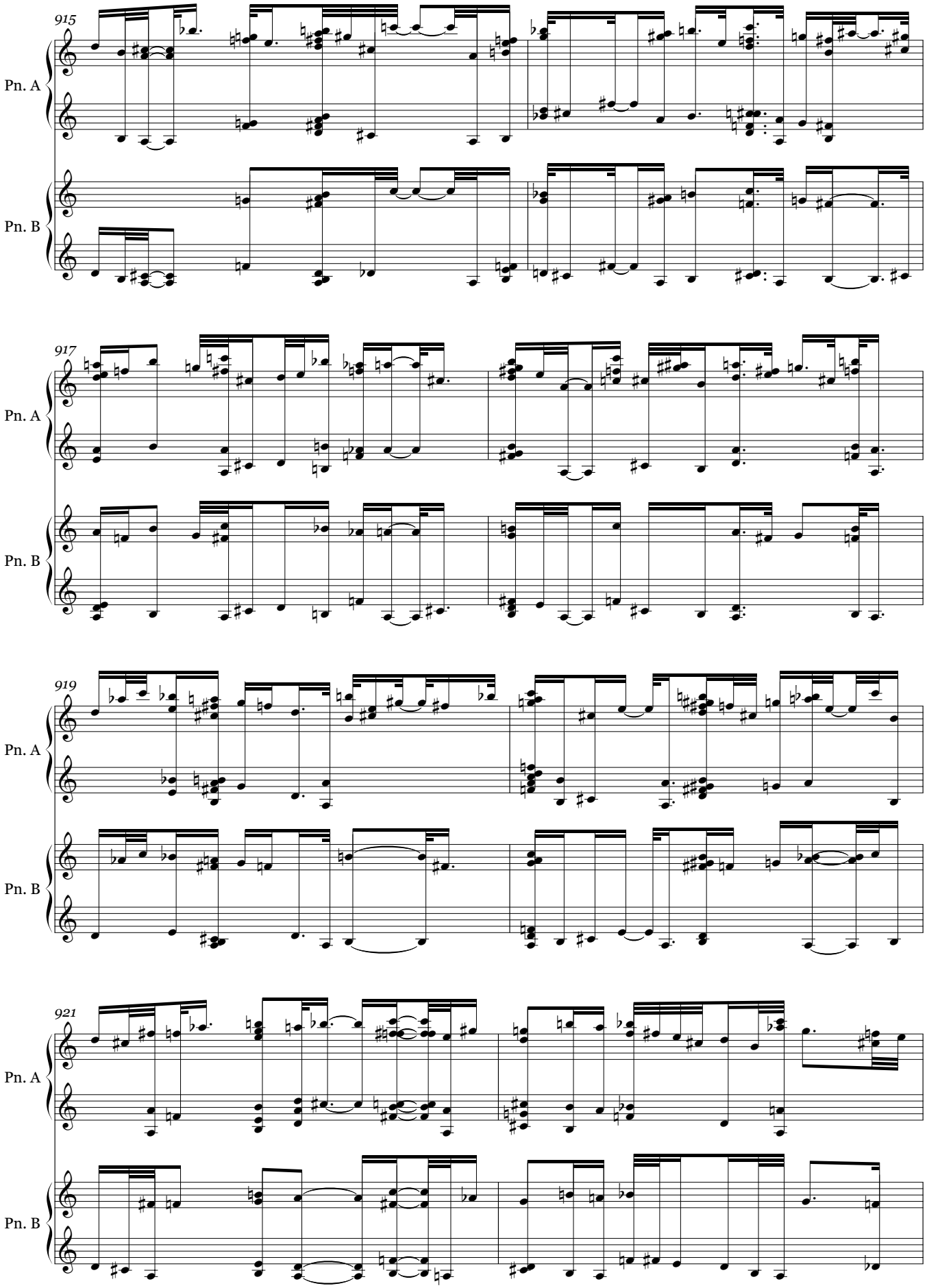
Pn. A

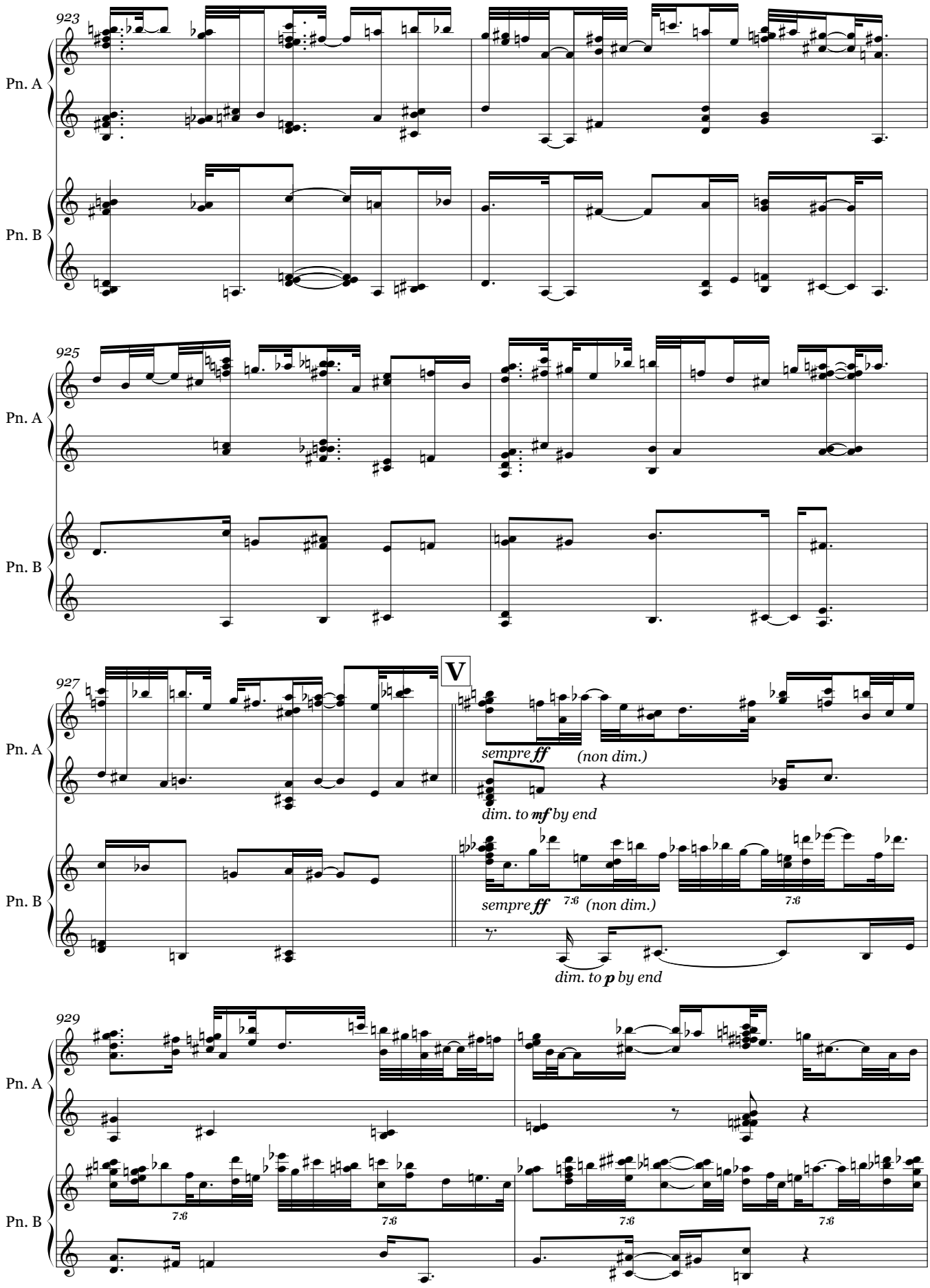
Pn. B

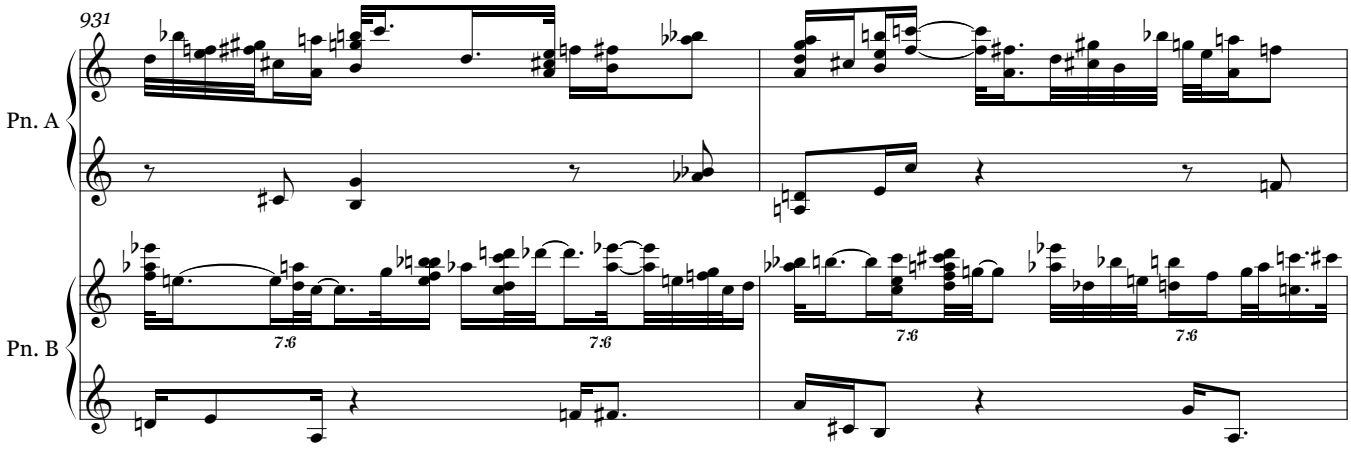
913

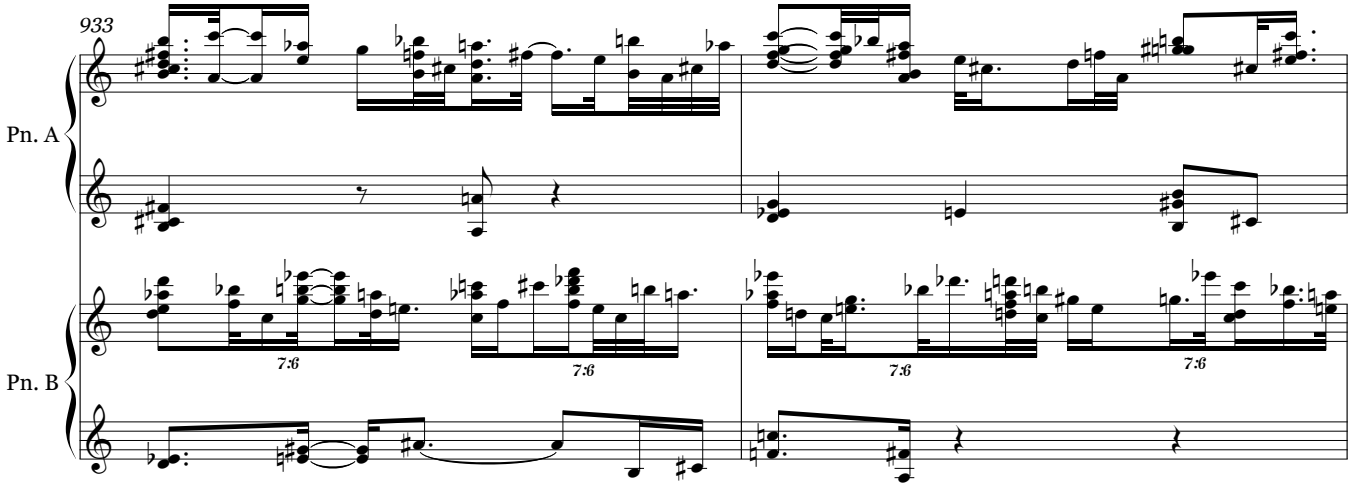
Pn. A

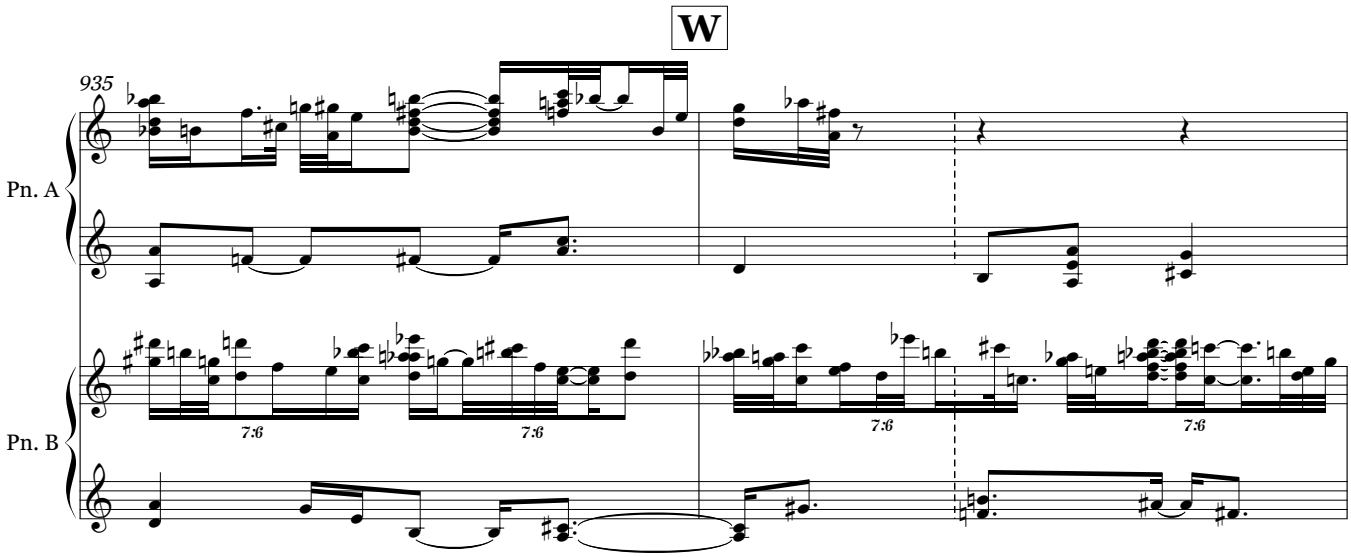
Pn. B

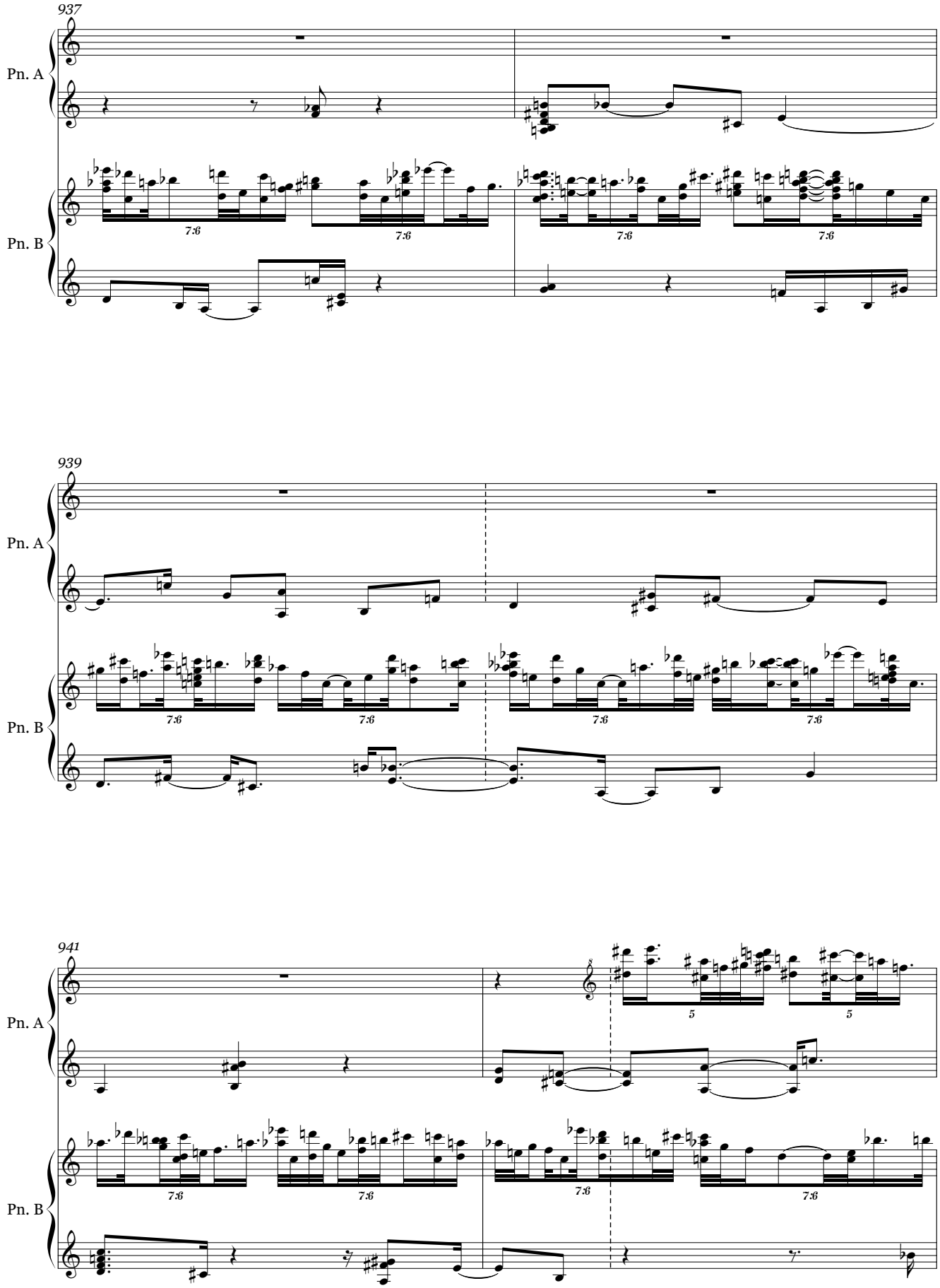

915
Pn. A
Pn. B
917
Pn. A
Pn. B
919
Pn. A
Pn. B
921
Pn. A
Pn. B

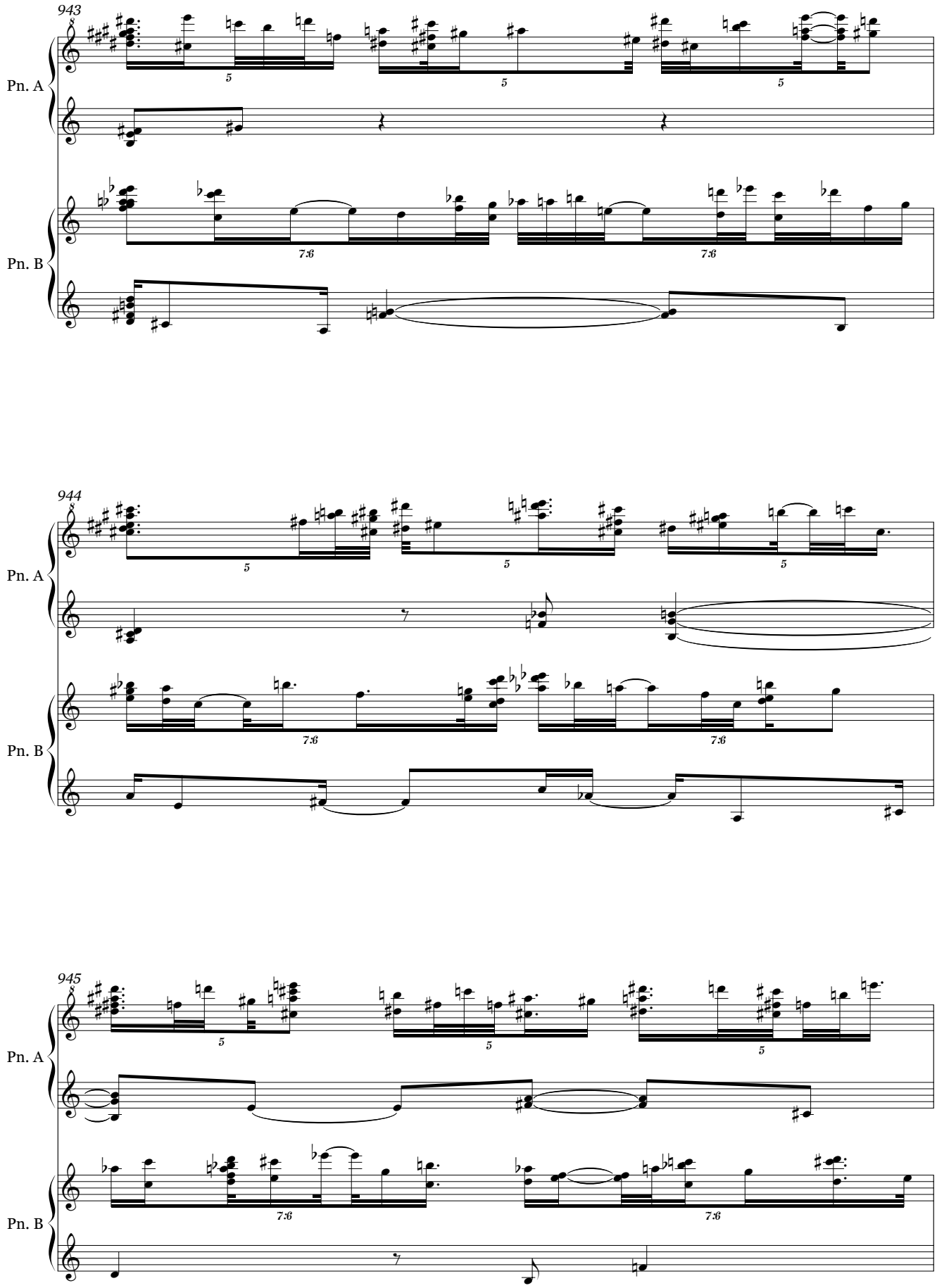

923
Pn. A
Pn. B
925
Pn. A
Pn. B
927
V
Pn. A
sempre ff
(non dim.)
dim. to mf by end
Pn. B
sempre ff
7:6
(non dim.)
7:6
dim. to p by end
929
Pn. A
Pn. B
7:6
7:6
7:6
7:6


931
Pn. A
Pn. B
7:6
7:6
7:6
7:6


933
Pn. A
Pn. B
7:6
7:6
7:6
7:6


W
935
Pn. A
Pn. B
7:6
7:6
7:6
7:6


937
Pn. A
Pn. B
7:6
939
941
5


943
Pn. A
Pn. B
944
Pn. A
Pn. B
945
Pn. A
Pn. B

946

Pn. A

Pn. B

947

Pn. A

Pn. B

948

Pn. A

Pn. B

X

949

Pn. A

Pn. B

950

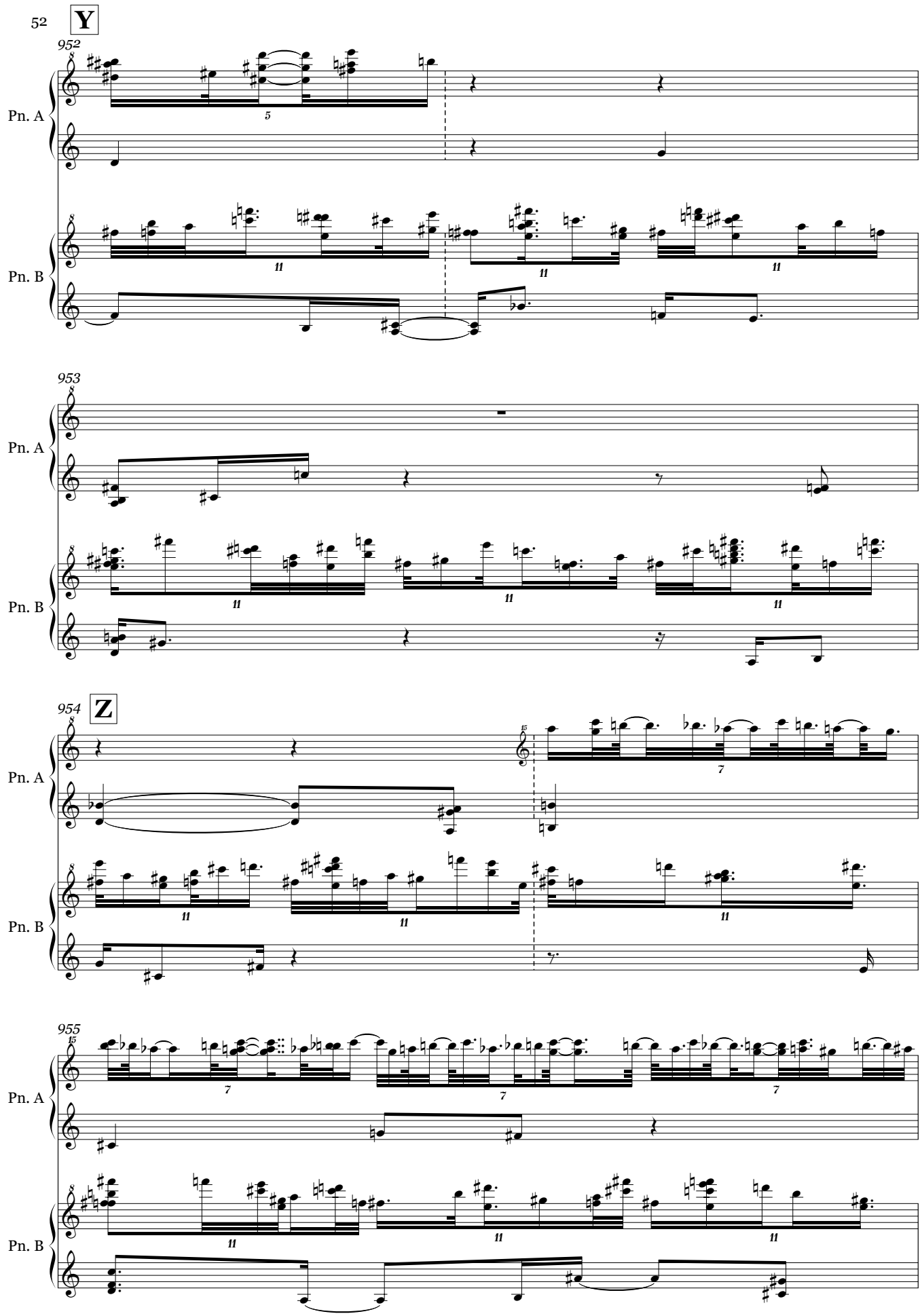
Pn. A

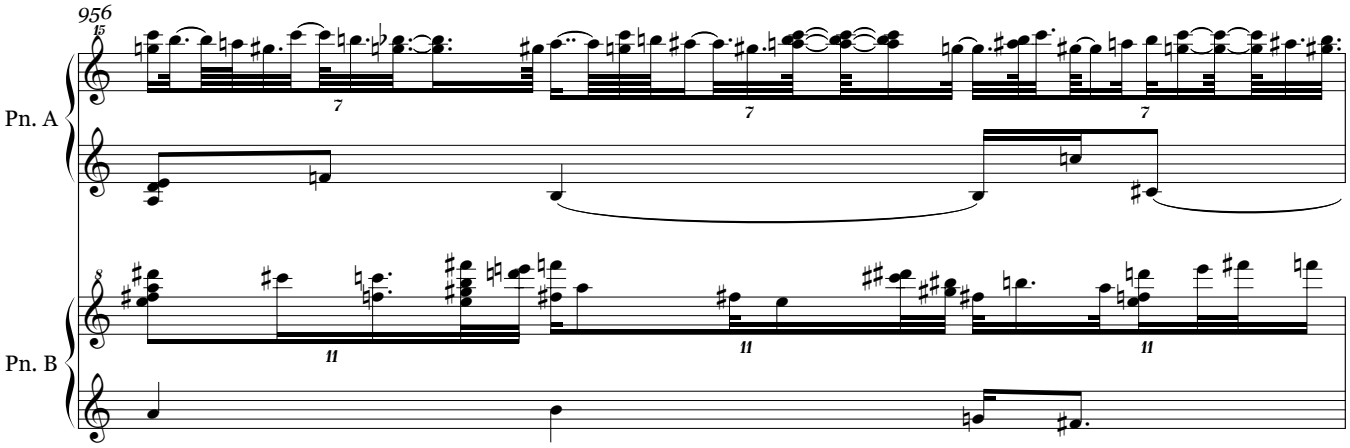
Pn. B

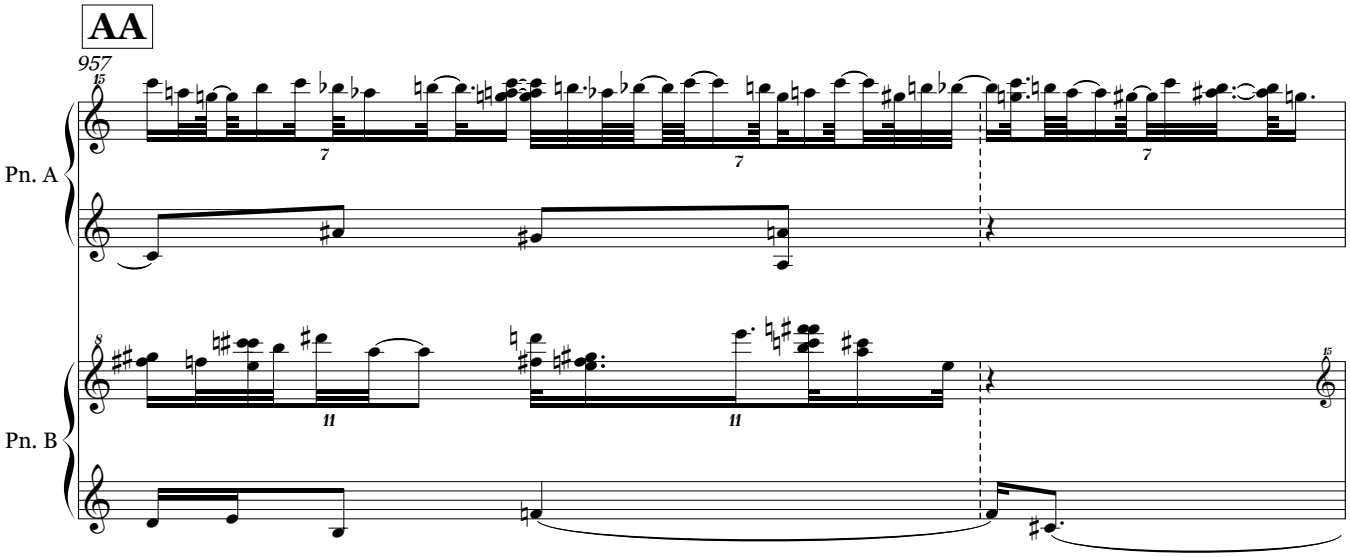
951

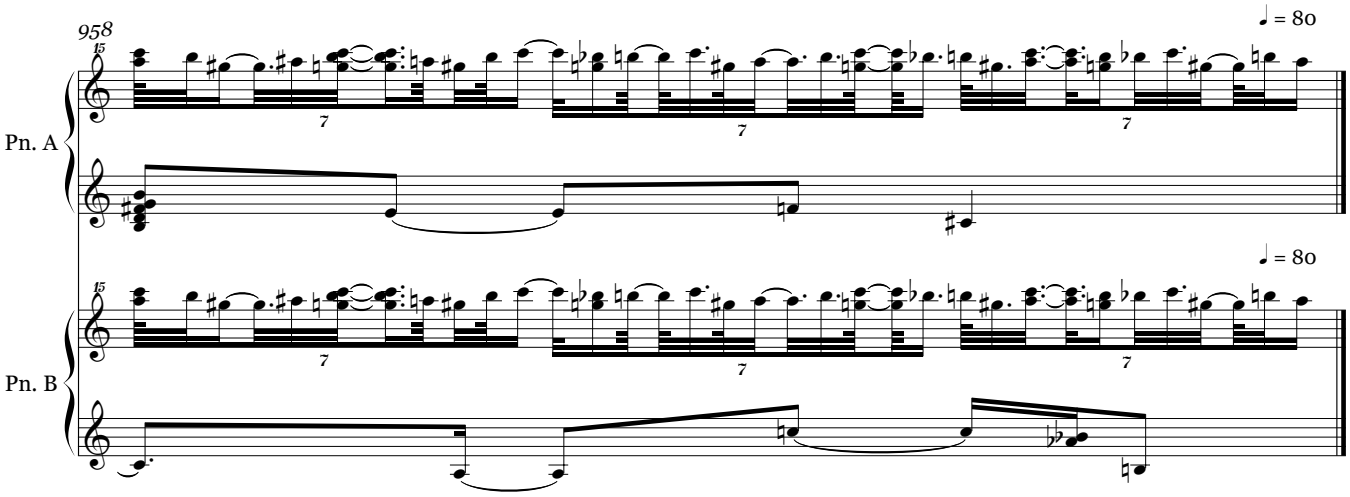
Pn. A

Pn. B


Y
952
Pn. A
Pn. B
953
Pn. A
Pn. B
Z
954
Pn. A
Pn. B
955
Pn. A
Pn. B


956
Pn. A
Pn. B


AA
957
Pn. A
Pn. B


958
♩ = 80
Pn. A
♩ = 80
Pn. B