

Herbert Bielawa

Piece of  $\pi$

(1989)

for Piano  
and MIDI Sequence

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# PIECE OF PI

For Piano and Orchestra (MIDI Version)

Herbert Bielawa  
January 1990

$\text{♩} = 150$

1 *pp* 2 *f* 3 *p* 4 **8va**

MIDI

(Only for analytical reference... not to be played!!)

PI

1 (Sequence number)  
3. (Actual PI number)

5 *mf* 6 7

M

50

PI

2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 (...and so on...)  
1 4 1 5 9 2 6 5 3 5 8 9 7 9 3 2

8 9 10 11 12 13 14 15 16 17 18 19

M

PI

11 12 13 14 15 16 17 18 19

M

PI

Musical score system 1, measures 13-15. The upper staff (M) contains a complex melodic line with many accidentals and slurs. The lower staff (PI) contains a few notes with a long slur.

Musical score system 2, measures 16-19. The upper staff (M) features a dense melodic texture with many accidentals and slurs. The lower staff (PI) contains a few notes with a long slur.

Musical score system 3, measures 20-22. The upper staff (M) contains a complex melodic line with many accidentals and slurs. The lower staff (PI) contains a few notes with a long slur.

Musical score system 4, measures 23-25. The upper staff (M) contains a complex melodic line with many accidentals and slurs. The lower staff (PI) contains a few notes with a long slur. A dynamic marking *8va* is present above measure 25.

Musical score system 5, measures 26-28. The upper staff (M) contains a complex melodic line with many accidentals and slurs. The lower staff (PI) contains a few notes with a long slur.

29 30 31

M

PI

32 33 34

M

PI

35 36 37

M

PI

8va

38 39 40

M

PI

8va

41 42 43

M

PI

8va

PIECE OF PI

8va

44 45 46 <sup>a</sup> tempo

M

Pno.

PI

47 48 49 50

M

Pno.

PI

PIECE OF PI

51 52 53 54 55

MIDI

Piano

PI

1  
3.  
1 2 3 4 5  
3. 1 4 1 5

56 57 58 59

M

Pno.

PI

6 9  
7 8  
2 6

*mf*

*mf*

*mf*

60 61 62 63 64

M

Pno.

PI

9 10  
5 3

*mp*

PIECE OF PI

65 66 67 68 69

M

Pno.

PI

70 71 72 73 74

M

Pno.

PI

75 76 77 78 79

M

Pno.

PI

PIECE OF PI

80 81 82 83 84

M

Pno.

PI

Musical score for measures 80-84. The score is arranged in three systems. The top system contains two staves for the Music (M) instrument. The middle system contains two staves for the Piano (Pno.) instrument, with dynamics *f* and *mp*, and accents. The bottom system contains one staff for the Percussion (PI) instrument, with a 'Sub' marking.

85 86 87 88 89

M

Pno.

PI

Musical score for measures 85-89. The score is arranged in three systems. The top system contains two staves for the Music (M) instrument. The middle system contains two staves for the Piano (Pno.) instrument, with dynamics *f*. The bottom system contains one staff for the Percussion (PI) instrument.

90 91 92 93 94

M

Pno.

PI

Musical score for measures 90-94. The score is arranged in three systems. The top system contains two staves for the Music (M) instrument. The middle system contains two staves for the Piano (Pno.) instrument, with dynamics *f* and *p*. The bottom system contains one staff for the Percussion (PI) instrument.



PIECE OF PI

95 96 97 98 99 100

M

Pno.

PI

12 8 13 14 9 7

101 102 103 104 105 106

M

Pno.

PI

15 16 9 3 17 18 19 2 3 8 20 21 22 23 24 4 6 2 6 4

107 108 109 110 111 112

M

Pno.

PI

PIECE OF PI

113 114 115 116 117

M

Pno.

PI

3

1 2 3 4 5 6  
3. 1 4 1 5 9

118 119 120 121 122

M

Pno.

PI

*pp* *ff*

7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

2 6 5 3 5 8 9 7 9 3 2 3 8 4 6 2 6 4 3 3 8 3 2

123 124 125 126 127

M

Pno.

PI

*p*

30 31

7 9

PIECE OF PI

128 129 130 131 132

M

Pno.

PI

133 134 135 136 137

M

Pno.

PI

(No pedal)

33 0

34 35 36 37 38 39  
2 8 8 4 1 9

138 139 140 141

M

Pno.

PI

cresc.

3

3

3

40 41 42 43 44  
7 1 6 9 3

45 46 47 48 49 50 51 52  
9 9 3 7 5 1 0 5

54 55  
8 2

53 56 57 58 59  
8 2 0 9 7

Piece of PI

142 143

M

Piano

DRIVING!

PI

60 61 62 63 64 65 66 67 68  
4 4 5 9 2 3 9 7 8

144 145

M

Pno.

PI

69 70  
1 6

146 147

M

Pno.

PI

71 72 73 74 75  
4 0 6 2 8

11

Piece of PI

148

149

M

Pno.

PI

76 77 78 79 80 81 82  
6 2 0 8 9 9 8

83 84 85 86 87 88 89 90 91 92  
6 2 8 0 3 4 8 2 5 3

150

151

M

Pno.

PI

93  
4

94 95  
2 1

152

153

M

Pno.

PI

96 97 98  
1 7 0

12 99 100 101  
6 7 9

Piece of PI

154 155

M

Pno.

PI

102 103 104 105 106 107

8 2 1 4 8 0

156 157

M

Pno.

PI

108 109 110 111 112 113 114 115 116 117

8 6 5 1 3 2 8 2 3 0

158 159

M

Pno.

PI

118 119 120 121 122 123 124 125 126 127 128 129

6 6 4 7 0 9 13 3 8 4 4 6 0

Piece of PI

160 161

M

Pno.

PI

8va sfz sfz 8va sfz sfz

130 131 132 133 134 135 136 137 138 139 140

9 5 5 0 5 8 2 2 3 1 7

162 163 164

M

Pno.

PI

8va dim. 8va

141 142 143 144 145 146 147 148 149 150

2 5 3 5 9 4 0 8 1 2

165 166 167

M

Pno.

PI

8va 8vb 15ma mp

151 152 153 154 155 156 157 158

8 4 8 1 1 1 1 7 4

♩ = 130

168

169

170-

Pno.

PI

159 160 162 163 164 165 166 167  
5 0 2 8 4 1 0 2 7

Pno.

PI

172

173

174

175

Pno.

PI

176

177

3

178

179-

168 169 170 171  
0 1 9 3

Pno.

PI

180

181

182

183

184

172 173 174  
8 5 2



185 *Red.* *Red.* 186 187 *pp*

Pno.

PI 175  
1

188 189 190 191

Pno.

PI

192 193 WITH SUSPENSE 194 195 *pp* *pp*

Pno.

PI 176 177 178 179 180 181 182 183  
1 0 5 5 5 9 6 4

196 197 198 199 *mf* *mf* *pp* *mf*

Pno.

PI 184 185 186 187 188 189 190  
4 6 2 2 9 4 8

16

Piano score for measures 191-200. The Pno. part features a melody in the right hand with dynamics *p*, *f*, and *p*. The PI part provides a bass line with fingerings: 9 5 4 9 (191-194), 3 0 3 (195-197), 8 (198), and 1 9 (199-200).

Piano score for measures 201-211. The Pno. part continues with dynamics *p* and *f*. The PI part includes fingerings: 6 4 4 2 (201-204), 8 8 1 (205-207), 0 9 7 5 (208-210), and 6 6 5 9 (211).

Piano score for measures 212-229. The Pno. part includes dynamics *f*, *mp*, and *p*. The PI part includes fingerings: 3 3 (212-217), 4 4 6 1 2 8 (218-223), 4 7 5 6 (224-227), and 4 8 (228-229).

Piano score for measures 230-233. The Pno. part includes dynamics *pp* and *f*. The PI part includes fingerings: 2 (230), 3 17 (231), 3 7 (232-233).

Piece of PI

215 216 217 218 219

M

Pno.

PI

234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249

8 6 7 8 3 1 6 5 2 7 1 2 0 1 9 0

220 221 222 223

M

Pno.

PI

Piece of PI

225 226 227 228 229

M

Pno.

Pno.

PI

8va

230 231 232 233 234

M

Pno.

Pno.

PI

8va

8va 1

Piece of PI

235 236 237 238 239

M

Pno.

Pno.

PI

8va

240 241 242 243 244

M

Pno.

Pno.

PI

8va

8va

8va

Piece of PI

245 246 247 248

M

Pno.

Pno.

PI

Vamp with these sixteenth notes until you hear entrance of MIDI .....then stop

249 250 251

M

Pno.

Pno.

PI

254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274

6 4 9 5 6 6 9 2 3 4 6 0 3 4 9 6 1 0 4 5 4

Piece of PI

252 *f* 253 254

M

PNO. *DRY* *p* *p*

PI

275 276 277 278 279 280 281 282

3 2 6 6 4 8 2 1

255 *p* 256 257 *p*

M

PNO. *f* *p*

PI

283 284 285 286 287 288 289 290 291 292 293 294 295 296 297

3 3 9 3 6 0 7 2 6 0 2 4 9 1 4

258 259 260

M

PNO.

PI

298 399 300 301 302 303

1 2 7 3 7 22

Piece of PI

261 262 263

M

Pno.

PI

264 265 266

M

Pno.

PI

307 308 309 310 311 312 313 314 315 316 317 318

7 0 0 6 6 0 6 3 1 5 5 8

267 268 269

M

Pno.

PI

319 320 321 322 323 324 325

8 1 7 4 2 3 8 8 1



Piece of PI

270 271 272

M

Pno.

PI

326 327 328 329 330

5 5 0 9 2

273 274 275

M

Pno.

PI

*mf* *ff*

331 332 333 334 335 336 337 338 339 340 341

0 9 6 2 8 2 9 2 5 4 0

276 277 278

M

Pno.

PI

*ff* *p*

342 343 344 345 346 347 348 349 350 351 352 353

9 1 7 1 5 3 6 4 32 4 6 7 8

Piece of PI

279 280 281

M

Pno. *f* *p* *ff* *mp*

PI

354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369

9 2 5 9 0 3 6 0 0 1 1 3 3 0 5 3

8ub

282 283 284

M

Pno. *mf* *Res.*

PI

370 371 372 373 374 375 376 377 378 379 380 381 382

0 5 4 8 8 2 0 4 6 6 5 2 1

285 286 287

M

Pno. *8va*

PI

383 384 385 386 387 388 389 390 391 392

3 8 1 1 4 2 5 9 5 1 9

Piece of PI

288 289 290

M

Pno.

PI

393 394 395 396

4 1 5 1

291 292

M

Pno.

PI

397 398 399 400 401 402 403 404 405 406 407 408 409 410

1 6 0 9 4 3 3 0 5 7 2 7 0 3

293 294 295 296

M

Pno.

PI

411 422

6 5

297

298

299

M

Pno.

PI

(From this measure to measure 250

the following PI numbers have

been used freely pitch resources)

412	413	414	415	416
7	5	9	5	9

417	418	419	420	421	422
9	1	9	5	3	0

423	424	425	426	427	428	429
9	2	1	8	6	1	1

300

301

302

303

M

Pno.

PI

430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445
7	3	8	1	9	3	2	6	1	1	7	9	3	1	0	5

8vb

304 305 306 307

M

Pno.

PI

308 309 310

M

Pno.

PI

310 312 313

M

Pno.

PI

314 315 316

M

Pno.

PI

*mp*

*mf*

8va

8va

8va

8vb

5

6

317 318 319

M

8va

Pno.

*f* *mp*

3 3 3 5

PI

320 321 322 323

M

8va

Pno.

*ff* *mp*

3 8vb

PI

324 325 326

M

Pno. *p*

8va 8va 8va 8va 8va 8va 8va 8va 8va 8va

8vb

PI

327 328 329

M

Pno.

8va 8va 8va 8va 8va 8va 8va 8va 8va 8va

3 3 3 3 3 3 3 3

8vb

PI



330

331

332

M

8va 8va 8va 8va 8va 8va 8va 8va 8va 8va 8va 8va

Pno.

3 3 3 3 3 3

8vb

PI

*p*

333

334

335

M

Pno.

crésc.

PI

336 337 338

M

Pno

PI

339 340

M

Pno

PI

Piece of PI

341 342 343 344

M

Pno.

PI

451 452 453 454 455 456 457 468 459 460 461

8 0 7 4 4 6 2 3 7 9 9

345 346 347

M

Pno.

462 463 464

6 2V 7

348 349 350

M

Pno.

465 466 467 468 469

7 9 5 6 7

Piece of PI

351 352 353

M

Pno.

(MIDI PI NUMBERS BEGIN ON #457 AND UNRAVEL UP TO #649 AT MEASURE 374)

470 471 472 473  
3 5 1 9

354 355 356

M

Pno.

(PIANO VAMPS ON NUMBERS 468 TO 473)

357 358 359

M

Pno.

(DIMINISH THE DYNAMICS OF 16TH NOTES GRADUALLY TO NOTHING BY MEASURE 375. KEEP ACCENTED NOTES AT FULL DYNAMIC.)

Piece of PI

M

Pno.

M

Pno.

M

Pno.

8va

8va

8va

8va

8ub

(MIDI AND PIANO CARRY ON)

FROM PI NUMBER 650 TO 758  
AT MEASURE 383)

Piece of PI

372 373 374 375 376 377

M

Pno.

(MIDI RUNS FROM  
PI # 759 TO 797)

378 379 380 381 382 383

M

Pno.

(MIDI "RAMPS" GO FOR  
FROM #805 TO #853 )

798 799 800 801 802 903 804 796 797 798 799 800

1 8 5 9 5 0 2 6 3 1 8S 5

384 385 386 387 388

M

Pno.

801 802 803 804 805 806 807

9 5 0 2 4 4 5

Piece of PI

389 390 391 392 393 394

M

Pno.

808 809 810 811 812 813  
9 4 5 5 3 4

395 396

M

Pno.

814  
6S

397 398 399 400 401 402

M

Pno.

818 819 820 821 822 823 824 825  
3 0 2 6 7 7 8 5

Piece of PI

403 404 405 406 407

M

Pno.

826 827 828 829 830 831

2 3 0 8 2 5

408 409 410 411 412

M

Pno.

(Stop ABRUPTLY wherever you want to from here on.

832 834 835

3 4 4

413 414 415 416 417

M

Pno.

You must keep a steady, mechanical tempo, however. When you stop, move your hands starkly upward, over the keys and ...

836 837 838 839 840 841 842 843

6 8 5 0 3 5 2 6



Piece of PI

418                      419                      420                      421                      422

M

...FREEZE!                      Hold it fr a long time                      before breaking off.

Eno. (There doesn't seem to be any other way to end a piece whose basic structure is an irrational number.)

844 845 846                      847 848 849 850 851                      852 853                      855 856 857 858 859 860                      861 862 863 864 865 866

1 9 3                      1 1 8 8 1                      7 1                      1 0 0 0 3 1                      3 7 8 3 8 7

# Piece of $\pi$

## Performance Notes

Managing the MIDI part for Piece of  $\pi$  can be done in two ways: Run the sequence in realtime with Macintosh, MIDI interface, synthesizer and sound system on stage or play a prerecorded version on cassette or DAT tape through a suitable sound system. Of these two options, the recorded one is the least problematic and cumbersome. In either case the sequence is a mono signal even though it is found on both channels. When I perform the work I prefer one speaker set close to the left leg of the piano with its back more or less flush with the piano's straight left side, which means the speaker sits generally under the piano near the pedal structure. If one chooses to use two high mounted speakers, a third monitor speaker should also be used and set close to the pianist (on the left).

Once the tape is started there should be no reason for stopping it for the duration of the performance. Interpolating the piano entrance around measure 215 is a simple matter of waiting for the cue from the tape. The sound level of the tape should be rather full giving the sensation of a surrounding flood of sound that almost engulfs the piano. It should NOT, however, engulf the piano. It should not be so high as to intimidate or swallow the piano part. An important step in the preparation of this piece for a performance, then, is finding the best sound balance. Of course, this has to be done before an audience is present. It is also possible for a sound monitoring person in the audience to adjust the gain, assuming he or she has that control at hand.

If it is desired to use the given *Piece of  $\pi$*  sequence (Mark of the Unicorn's Professional Performer) with other patches it is permissible to do so provided all envelope characteristics are kept. They must be the same as the ones in the prototype patch library. Long and slow rising and falling envelopes found at the beginning, the middle and the ending are crucial. "Ping" -shaped patches that dominate the work are also crucial. **Do not use any steady state patches in this work!** Needless to say, funky, sci-fi, cute, or other novelty patches are not appropriate for this piece.

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# PIECE OF PI FOR PIANO AND MIDI TAPE (1990)

## Notes

The number I always used in school for PI was 3.1416. It actually goes on forever (as far as we know). The idea to use it for composition came to me in several stages. First it happened to read Carl Sagan's novel *Contact* in which the scientist, Dr. Eleanor Arroway fusses over PI throughout the whole story hoping to find some direct meaning in it (...from God?..) Then I quite accidentally saw a poster on the wall of the engineering building at San Francisco State which posted nearly nine thousand positions of the number. (The circular "O" rings in the ill-fated Challenger also burned up around that time as well.) I, essentially, **had** to do it, or at least try. With only ten possible numerals in base ten math, my plan gave me only ten musical intervals since two of the musical twelve (minor and major sevenths are missing) the music has a strangely more consonant quality than my other music. Such a work could, furthermore, hardly escape the drive toward some sort of revolving order, cyclic ongoing rhythm like the endless outer surface of a turning wheel. In some instances the PI intervals are used up with incredible speed as in the introduction, where MIDI, in a sense states flat out the PI interval content that the piece will use when the piano enters. Listening to PI intervals unfold directly in their unique PI order is interesting for a while, but soon reveals numbing aimlessness; an impossible situation for musical purposes. I did discover many little pockets of musical potential, however. There are many "dead spots" as well (repeated notes, unbalanced triadic forms, classic diminished seventh chords and the like) I did NOT avoid the "dead spots", but they had to be put into a special perspective and gracefully dispatched as smoothly and as quickly as possible. The "good" intervals were then used as a kind of subset, a store of limited pitch classes whose notes are shaped into music, a process that gradually grew by the insertion of the ever-next intervals that PI presented. My approach was not dissimilar to that of serial composition, my row, of course, being infinitely longer than 12. How to end such a piece becomes a philosophical crisis. Does one fade out? cadence?, stop? slow up? speed up? Quitting the piece in **any** fashion necessitates a structural abortion at best. Besides being an infinite number, PI is also referred to by mathematicians as an irrational number. Indeed it is! For me it became a mysterious and haunting one. Altogether I used the first 866 numerals of PI for this work:

3.1415926535897932384626433832795028841971693993751058209749445923078164062862089986280348  
253421170679821480865132823066470938446095505822317253594081284811174502841027019385211055  
596446229489549303819644288109756659334461284756482337867831652712019091456485669234603486  
104543266482133936072602491412737245870066063155881748815209209628292540917153643678925903  
600113305305488204665213841469519415116094330572703657595919530921861173819326117931051185  
480744623799627495673518857527248912279381830119491298336733624021394946395224737190702179  
860943702770539217176293176752384674818467669405132000568127145263560827785771342757789609  
173644090122495343014654958537105079227968925892354201995611212344181598136297747713099605  
187072113499999983729780499510597317328160963185950244593455346908302642522308253344685035  
2619311881710100031378387.....