```
c Código fantôma homem- modificado  c
Cell Cards
1 1 -1.87 -1      imp:p,e=1 $source
4  3 -1.04 ((-13 20 -5):(-213 20 -5)) #21 imp:p,e=1 $ legs
5  2 -0.00129 (((313 4 -5 413):-4):(11 5 -6):(21 6 -22): &
     (14 22 -12):(24 12 -15)) 1 2 7 -8 9 -10 #64 #15  imp:p,e=1 $outsides of phantom
6  3 -1.04 ((-23 6 -22 114) #44 #18 #118 ):(-21 22 -322 114):((322 -12 -18 116) &
     #41 #43 #17):((-524 12 116) #43 #42) imp:p,e=1 $ head and neck
7  3 -1.04 (-5 20 -313 13):(213 -413 -5 20):(4 -20 -313):(4 -20 -413): &
     (-11 16 5 -19):(-11 19 -6 21): &
     (-21 23 6 -22):(22 -322 21 -14):(-14 18 322 -12):(12 -24 524) imp:p,e=1 $skin
8  4 -0.296 (-27:28:-29:30) -25 31 imp:p,e=1 $right lung
9  4 -0.296 (33:34:32) -26 31  imp:p,e=1 $ left lung
10 3 -1.04 -35 36 -37 -38  imp:p,e=1 $liver
11 3 -1.04 -39 40 #47 imp:p,e=1 $stomach
12 3 -1.04 -40 imp:p,e=1 $ contents
13 3 -1.04 -41 42 imp:p,e=1 $ urinary bladder
14 3 -1.04 -42 imp:p,e=1 $ contents
15 3 -1.04 (-43):(-44) imp:p,e=1 $ testes
17 3 -1.04 -45  imp:p,e=1 $brain
18 3 -1.04 (-48 175 37 -19):(-176 177 -178) imp:p,e=1  $esophagus:thoracic+abdominal portion
118 0 -175 37 -19 imp:p,e=1 $ void in esophagus
19 3 -1.04 (-49 50 51 -52):(-53 54 -55 56):(-57 58 59 -52):(-61 62 -59 65): &
     (-63 64 -65 5)  imp:p,e=1 $colon:ascending, transverse, descending and sigmoid
20 3 -1.04 (-50 51 -52):(-54 -55 56):(-58 59 -52):(-62 -59 65): &
     (-64 -65 5) imp:p,e=1    $contents-colon
21 5 -1.4 (-66 20 -5):(20 -5 -67) imp:p,e=1 $ leg bones
24 5 -1.4 (-68 5 -70 -16):(-69 5 -70 -16)  imp:p,e=1 $ arm bones
25 5 -1.4 (-71 272 -72 -119):(-71 -73 -273 -119) imp:p,e=1 $clavicles
26 5 -1.4 (75 -74 78 -79 119 80 -81):(75 -74 78 -79 119 -76 77)   imp:p,e=1 $scapulae
28 5 -1.4 ((-83 82 -86 87 5 -85):(82 -83 87 85 -84))  imp:p,e=1  $pelvis
29 5 -1.4 ((-75 89 90 -91):(-75 89 92 -93):(-75 89 94 -95):(-75 89 31 -96): &
       (-75 89 97 -98):(-75 89 99 -100):(-75 89 101 -102):(-75 89 103 -104):  &
       (-75 89 105 -106):(-75 89 107 -108):(-75 89 109 -110):(-75 89 111 -79)) &
```

```
        #10 #24 #25 #26 imp:p,e=1 imp:p,e=1   $rib cage
41 5 -1.4 (-112 84 -90):(-112 90 -19):(19 -113 -114) imp:p,e=1 $spine c
41 5 -1.4 -112 84 -90 imp:p,e=1  $spine, lower portion
c 411 5 -1.4 -112 90 -19 imp:p,e=1 $ spine, middle portion c
412 5 -1.4 19 -113 -114 imp:p,e=1 $ spine, upper portion
42 5 -1.4 -116 45 -12 #18 imp:p,e=1 $skull-cranium
43 5 -1.4 (-116 45 12 #18):(118 -117 120 -121 -119 116) imp:p,e=1 $facial skeleton
44 3 -1.04 (((-125 134 -122 6 -133 123 127):(-126 128 -122 123 -134 6 -133)): &
     ((-129 131 134 -122 123 133 -47):(-130 132 -134 -122 123 133 -47))) ( &
     -122 123 -23 -124 6 -47)  imp:p,e=1   $thyroid
45 3 -1.04 (-135 65):(-136 -137)  imp:p,e=1 $ kidneys
47 3 -1.04 (-138 139 -65):(-138 65 140)  imp:p,e=1 $pancreas
48 3 -1.04 -141 imp:p,e=1 $spleen
49 3 -1.04 -142 imp:p,e=1 $thymus
50 3 -1.04 (-143 145):(-144 145)  imp:p,e=1 $ adrenals
52 3 -1.04 (-146 147 -148):(-149 150 148 -348)  imp:p,e=1 $gall bladder
53 3 -1.04 (-147 -148):(-150 148 -145)   imp:p,e=1 $gall bladder-contents
54 3 -1.04 -151 152 153  #56 #57 imp:p,e=1 $heart -left ventricle
55 3 -1.04 -152 153 #56 #57 imp:p,e=1 $ heart-left ventricle-contents
56 3 -1.04 -154 155 153 -156 151 imp:p,e=1 $right ventricle
57 3 -1.04 -155 153 -156 151  imp:p,e=1 $right ventricle-contents
58 3 -1.04 (-157 158 -153 156):(-159 160 -153 -156) imp:p,e=1 $left atrium-part 1 and 2
59 3 -1.04 (-158 -153 156):(-160 -153 -156) imp:p,e=1 $contents of the left atrium
60 3 -1.04 -161 162 -153 -156 159 imp:p,e=1  $right atrium
61 3 -1.04 -162 -153 -156 159 imp:p,e=1  $contents-right atrium
62 3 -1.04 ((-82 164 -165 52 -36):(-82 49 164 -165 166 -52)) #19 #20   imp:p,e=1 $small intestine
63 3 -1.04 ((-16 5 -19):(19 -6 -21 114)) #8 #9 #10 #11 #12 #13 #14  &
      #18 #19 #20 #24 #25 #26 #28 #29 &
      #41 #45 #47 #48 #49 #50 #52 #53 #54 #55 &
       #56 #57 #58 #59 #60 #61 #62 #118 imp:p,e=1 $trunk
64 3 -1.04 ((171 -5)(172 -170)(-119 169)(313 413)) 43 44  imp:p,e=1 $ male genitalia
65 0          -2:-7:8:-9:10:15 imp:p,e=0
66 3 -1.04  170 -171 -172  #35 #36 #37 #38 imp:p,e=1 $cilindro dentro fígado
67 6 -11.34       173 -174 -175 176 177 -178 imp:p,e=1 $colimador 1
```

```
68 6 -11.34       179 -180 -175 176 177 -178 imp:p,e=1 $colimador 2
69 6 -11.34       181 -182 -175 176 -183 184 imp:p,e=1 $c3
70 6 -11.34       181 -182 -175 176 185 -186 imp:p,e=1 $c4 c
end of cell Cards


c Surface Cards 1
s 0 -100 91.45 1
2 pz -300.0
4  pz -80.0
5  pz 0.0
6  pz 70.0
7  px -1000.0
8  px 1000.0
9  py -1000.0
10 py 1000.0
11 sq 100 400 0 0 0 0 -40000 0 0 0  $trunk-skin 12 pz 91.45
13 gq 1 1 0 0 0 -0.2 -20 0 0.04 3.96 $ left leg
213 gq 1 1 0 0 0 0.2 20 0 0.04 3.96 $ right leg
313 gq 1 1 0 0 0 -0.2 -20 0 0 0 $ left leg skin
413 gq 1 1 0 0 0 0.2 20 0 0 0 $ right leg skin 14
sq 100 64 0 0 0 0 -6400 0 0 0  $head1-skin
15 pz 200.0
16 sq 96.04 392.04 0 0 0 0 -37651.521 0 0 0   $trunk
18 sq 96.04 60.84 0 0 0 0 -5843.0736 0 0 0 $head1
19 pz 69.80
20 pz -79.8
21 cz 5.4
22 pz 78.40
322 pz 78.6
23 cz 5.20 $neck
24 sq 5112.25 3271.84 6400 0 0 0 -327184 0 0 91.45 $head2
524 sq 4638.172 2938.72 5843.074 0 0 0 -282235.1 0 0 91.45 $head2
25 sq 32400 14400 1406.25 0 0 0 -810000 -8.50 0 43.50  $right lung
```

```
26 sq 32400 14400 1406.25 0 0 0 -810000 8.50 0 43.5  $ left lung
27 pz 46
28 pz 54
29 px -5.4
30 py 1.5   $ end the section removed from the right lung
31 pz 43.5
32 pz 55
33 px 8.0
34 py 1.0  $end the section removed from the left lung
35 sq 64 272.25 0 0 0 0 -17424 0 0 0 $liver
36 pz 27
37 pz 43
38 p 0.028571 0.022222 -0.023256 -1   $end def the liver
39 sq 576 896 144 0 0 0 -9216 8 -4 35 $ stomach-wall
40 sq 310.914543 625.988841 65.363490 0 0 0 -3566.739812 8 -4 35 $ stomach-contents
41 sq 142.988120 293.942933 293.942933 0 0 0 -3514.900218 0 -4.50 8 $urinary bladder-wall 42 sq
   105.646247 227.630725 227.630725 0 0 0 -2339.687839 0 -4.50 8 $bladder-contents
43 sq 11.9025 8.9401 3.8025 0 0 0 -20.115225 -1.30 -8 -2.30  $testes-left
44 sq 11.9025 8.9401 3.8025 0 0 0 -20.115225 1.30 -8 -2.30  $testes-right
45 sq 2445.3025 1440.2025 3221.6976 0 0 0 -106517.3769 0 0 91.45 $brain c 37 pz 43.0
47 pz 75.0
48 sq 0.1764 1.3689 0 0 0 0 -0.24147396 0 2.575 0  $esophagus: thoracic+abdominal portion
175 sq 0.0144 0.7569 0 0 0 0 -0.01089936 0 2.575 0
176 5 cx 0.70
177 5 px 0.10
178 5 px 7.80
49 sq 6.25 6.25 0 0 0 0 -39.0625 -8.50 -2.36 0 $ULI- upper large intestine  1.ascending colon-
   wall
50 sq 3.20947225 3.20947225 0 0 0 0 -10.300712135 -8.5 -2.36 0 $ascending colon-contents 51 pz
   14.45
52 pz 24.0 $end ac. col.
53 sq 0 2.25 6.25 0 0 0 -14.0625 0 -2.36 25.50  $ ULI 2.transverse colon-wall
54 sq 0 0.946729 3.892729 0 0 0 -3.68539433441 0 -2.36 25.50  $ transverse colon-contents
55 px 10.50
```

```
56 px -10.50
57 gq 0.282933 0.220415 0.00663757 0 0.0721253 -0.0288859 -4.541008 -0.628932  &
      0.128904 17.669146  $LLI-lower large intestine 1. descending colon-wall 58
gq 0.556917 0.395554 0.0120398 0 0.129435 -0.056858 -8.938371 -1.128675 &
       0.271613 35.669768  $descending colon-contents
59 pz 8.72 c 52 pz 24.0
61 ty 3.0 0 8.72 5.72 1.57 1.57 $LLI 2. sigmoid colon -upper
62 ty 3.0 0 8.72 5.72 0.91 0.91
63 ty 3.0 0 0 3.0 1.57 1.57  $sigmoid colon -lower
64 ty 3.0 0 0 3.0 0.91 0.91  $sigmoid colon -lower
65 px 3.0
66 gq 1 1 0.00906872 0 0 -0.200501 -20 0 1.78571 87.75  $left leg bone
67 gq 1 1 0.00906872 0 0 0.200501 20 0 1.78571 87.75  $right leg bone
68 gq 0.510204 0.137174 0 0 0 0.010352 -19.4898 0 -0.204969 185.878  $left arm bone
69 gq 0.510204 0.137174 0 0 0 0.010352 18.0612 0 0.175983 159.592  $right arm bone
70 pz 69
71 tz 0 11.1 68.25 20 0.7883 0.7883 $clavicles
72 p 0.89415 1 0 11.1
73 p -0.89415 1 0 11.1
272 p 7.0342 1 0 11.1
273 p 7.0342 -1 0 -11.1
75 sq 94.09 289 0 0 0 0 -27192.01 0 0 0   $scapulae c 75 sq 96.04 361 0 0 0 0 -34670.44  0 0 0 74
   sq 95.8441 289 0 0 0 0 -27698.94 0 0 0
76 p 0.25 -1 0 0 $left
77 p 0.80 -1 0 0
78 pz 50.9
79 pz 67.3
80 p 0.25 1 0 0 $right
81 p 0.80 1 0 0
82 sq 127.69 127.69 0 0 0 0 -16304.7361 0 -3.8 0 $pelvis
83 sq 144 144 0 0 0 0 -20736 0 -3 0
84 pz 22
85 pz 14 86 py 5 87 py -3
c 75 88 sq 96.04 289 0 0 0 0 -27755.56 0 0 0     $rib cage
89 sq 86.49 272.25 0 0 0 0 -23546.9025 0 0 0
```

```
90 pz 35.1
91 pz 36.5
92 pz 37.9
93 pz 39.3
94 pz 40.7 95 pz 42.1 c 31 pz 43.5 96 pz 44.9
97  pz 46.3
98  pz 47.7
99  pz 49.1
100 pz 50.5
101 pz 51.9
102 pz 53.3
103 pz 54.7
104 pz 56.1
105 pz 57.5
106 pz 58.9
107 pz 60.3
108 pz 61.7
109 pz 63.1
110 pz 64.5
111 pz 65.9
c 79 pz 67.3
112 sq 6.25 4 0 0 0 0 -25 0 5.50 0 $ spine-mid, lower
113 pz 84.8
114 sq 6.25 4 0 0 0 0 -25 0 1.45 0 $ spine-upper
c 45 sq 2445.3025 1440.2025 3221.6976 0 0 0 -106517.3769 0 0 91.45  $skull -crnium 116
sq 3991.080625 2487.515625 5076.5625 0 0 0 -224498.28515625 0 0 91.45 $skull-cranium
117 sq 81 49 0 0 0 0 -3969 0 0 0 $ facial skeleton 118 sq
57.76 31.36 0 0 0 0 -1811.3536 0 0 0 $facial skeleton
c 80 sq 5112.25 3271.84 6400 0 0 0 -327184 0 0 91.45 $the statements defining the cranium
119 py 0.0
120 pz 82.4
121 pz 93.13
122 c/z 0 -4.0 2.2 $thyroid
123 c/z 0 -4.0 1.0
```

```
124 py -4
125 gq 1 1 -0.531464 -2 0 0 -8 8 78.9413 -2915.4 $thyroid (inside R)
126 gq 1 1 -0.531464 2 0 0 8 8 78.9413 -2915.4 $thyroid (inside R)
127 gq 1 1 -0.109807 -2 0 0 -8 8 16.3102 -589.661  $thyroi (outside r)
128 gq 1 1 -0.109807 2 0 0 8 8 16.3102 -589.661  $thyroid (outside r)
129 gq 1 1 -0.0590516 -2 0 0 -8 8 7.34563 -212.437   $thyroid (inside R)
130 gq 1 1 -0.0590516 2 0 0 -8 8 7.34563 212.437   $thyroid (inside R)
131 gq 1 1 -0.0122007 -2 0 0 -8 8 1.51769 -31.1977  $thyroid (outside r)
132 gq 1 1 -0.0122007 2 0 0 8 8 1.51769 -31.1977    $thyroid (outside r)
133 pz 71.25
134 px 0
135 sq 68.0625 612.5625 45.5625 0 0 0 -1378.265625 6.0 6.0 32.50 $left kidney
136 sq 68.0625 612.5625 45.5625 0 0 0 -1378.265625 -6.0 6.0 32.50 $right kidney c 65 px 3 137 px
    -3
138 sq 15.6816 2787.84 368.64 0 0 0 -4014.4896 -1.0 0 37 $pancreas
139 px -1
140 pz 37
141 sq 144 441 49 0 0 0 -1764 11 3 37  $spleen
142 sq 10.24 36 1.44 0 0 0 -23.04 0 -7.30 57.00 $thymus
143 1 sq 6.25 56.25 0.5625 0 0 0 -14.0625 0 0 0 $ left adrenal 144 2 sq 6.25 56.25 0.5625 0 0 0 -
    14.0625 0 0 0 $ right adrenal
145 1 pz 0
146 3 so 2.12 $ gall bladder
147 3 so 2.0   $ gall bladder
148 3 pz 0
348 3 pz 8
149 3 sq 1 1 -0.05175625 0 0 0.4823 -4.4944 0 0 0 $ gall bladder
150 3 sq 1 1 -0.05175625 0 0 0.455 -4 0 0 0 $ gall bladder
151 4 sq  240.25 710.7556 1849 0 0 0 -17768.89 0 0 0 $ HEART left ventricle
152 4 sq 44.3556 172.6596 729.5401 0 0 0 -2363.709924 0 0 0 $left ventricle (wall+contents) 153 4
    px 0
154 4 sq 1225 3624.08 1849 0 0 0 -90601 0 0 0 $ right ventricle (wall+contens) 155
4 sq 792.9856 2621.44 1239.04 0 0 0 -50751.0784 0 0 0  $ right ventricle
156 4 pz 0
157 4 sq 240.25 280.2276 729 0 0 0 -7005.69 0 0 0 $left atrium (wall+contents)-part 1
```

```
158 4 sq 173.1856 203.9184 574.5609 0 0 0 -4504.557456 0 0 0 $ left atrium (wall+contents)-part 1
159 4 sq 110.25 128.5956 729 0 0 0 -3214.89 0 0 0 $ left atrium (wall+contents)-part 2
160 4 sq 71.5716 84.2724 574.5609 0 0 0 -1861.577316 0 0 0  $ left atrium (wall+contents)part 2
161 4 sq 1225 1428.84 729 0 0 0 -35721 0 0 0 $ right atrium
162 4 sq 991.6201 1167.5889 574.5609 0 0 0 -25792.038801 0 0 0 $ right atrium (wall+contents) c
    82 163 sq 127.69 127.69 0 0 0 0 -16304.7361 0 -3.80 0  $small intestine
164 py -4.86
165 py 2.20 166 pz 17
c 36 pz 27   $end small intestine
171 pz -4.8  $male genitalia
172 p 1 0 0.1 -10 $xz plane
170 p 1 0 -0.1 10
169 p 0 1 0.1 -10 $yz plane
170 pz 34.75  $altura cilindro
171 pz 35.25  $altura cilindro
172 c/z -10 -5 0.798  $cilindro no fígado
173 PX -8          $colimador1(c1)
174 PX -3          $c1
175 PY -67.5       $c1 & c2 & c3 & c4
176 PY -72.5       $c1 & c2 & c3 & c4
177 PZ -3          $c1 & c2
178 PZ 3           $c1 & c2
179 PX 3           $c2
180 PX 8           $c2
181 PX -8          $c3 & c4
182 PX 8           $c3 & c4
183 PZ -3          $c3
184 PZ -8          $c3
185 PZ 3           $c4
186 PZ 8           $c4
c end surface cards

 vol j 20800 j 5250 2890 1810 1560 1830 152 250 45.7 203 37.6 1370 44.7 j
&
```

```
     372.5 360.9 2800 956 54.7 202 606 694 983 618 305 19.9 288 &
90.7 176 20.1 15.7 10.1 53.6 177 102 67.2 108 31.6 115 27.4 &      111
1060 43090 196 j
tr1  3.5 5.0 38 0.616 0.788 0 -0.788 0.616 0 0 0 1 tr2
-3.5 5 38 0.616 -0.788 0 0.788 0.616 0 0 0 1
tr3  -4.5 -3.2 30 0.9615 0 -0.2748 -0.0574 0.9779 -0.2008 0.2687 0.2090 0.9403
tr4 1 -1.8 50 0.6751 -0.4727 -0.5664 -0.4640 0.3249 -0.8241 0.5736 0.8191 0 tr5
0 2.575 42.30 0.736084 -0.604969 -0.303634 0.634945 0.772557 0 0.234575 &
     -0.192791  0.952789  c
Material  Cards  m1   55137
1.0  $source  m2  7000 0.8
8000  0.2  $air  m3    1000
10.454E-02 6000 22.663E-02
7000   2.490E-02   8000   &
63.525E-02 11000 0.112E-02
12000    0.013E-02    14000
0.030E-02 &
    15000 0.134E-02 16000 0.204E-02 17000 0.133E-02 19000 &
    0.208E-02 20000 0.024E-02 26000 0.005E-02 30000 0.003E-02 &
37000 0.001E-02 40000 0.001E-02  $soft tissue m4  1000 10.134E-02 6000
10.238E-02  7000 2.866E-02 8000 &     75.752E-02 11000 0.184E-02 12000
0.007E-02 14000 0.006E-02 15000 &
    0.080E-02 16000 0.225E-02 17000 0.266E-02 19000 &
    0.194E-02 20000 0.009E-02 26000 0.037E-02 30000 0.001E-02 &
37000 0.001E-02  $lung
m5  1000 7.337E-02 6000 25.475E-02 7000 3.057E-02 8000 &
    47.893E-02 9000 0.025E-02 11000 0.326E-02 12000 0.112E-02 14000 0.002E-02 &
    15000 5.095E-02 16000 0.173E-02 17000 0.143E-02 19000 &
    0.153E-02 20000 10.190E-02 26000 0.008E-02 30000 0.005E-02 &
37000 0.002E-02 38000 0.003E-02 82000 0.001E-02  $skeleton    m6
82207 1 $chumbo
mode p e
c source
SDEF PAR 2 POS 0 -107.5 0 VEC 0 1 0 DIR=d1 ERG=0.1 $E = 1keV
SI1 H -1 0.984 1 $theta=10 graus
```

```
SP1     0 0.9924 0.0076
SB1     0 0       1 c
tally F4:p 1
F14:e 1 F6:p
1
F16:e 1
*F8:p 1
*F18:e 1 nps
5e8 print
110
prdmp 0 1e4
```