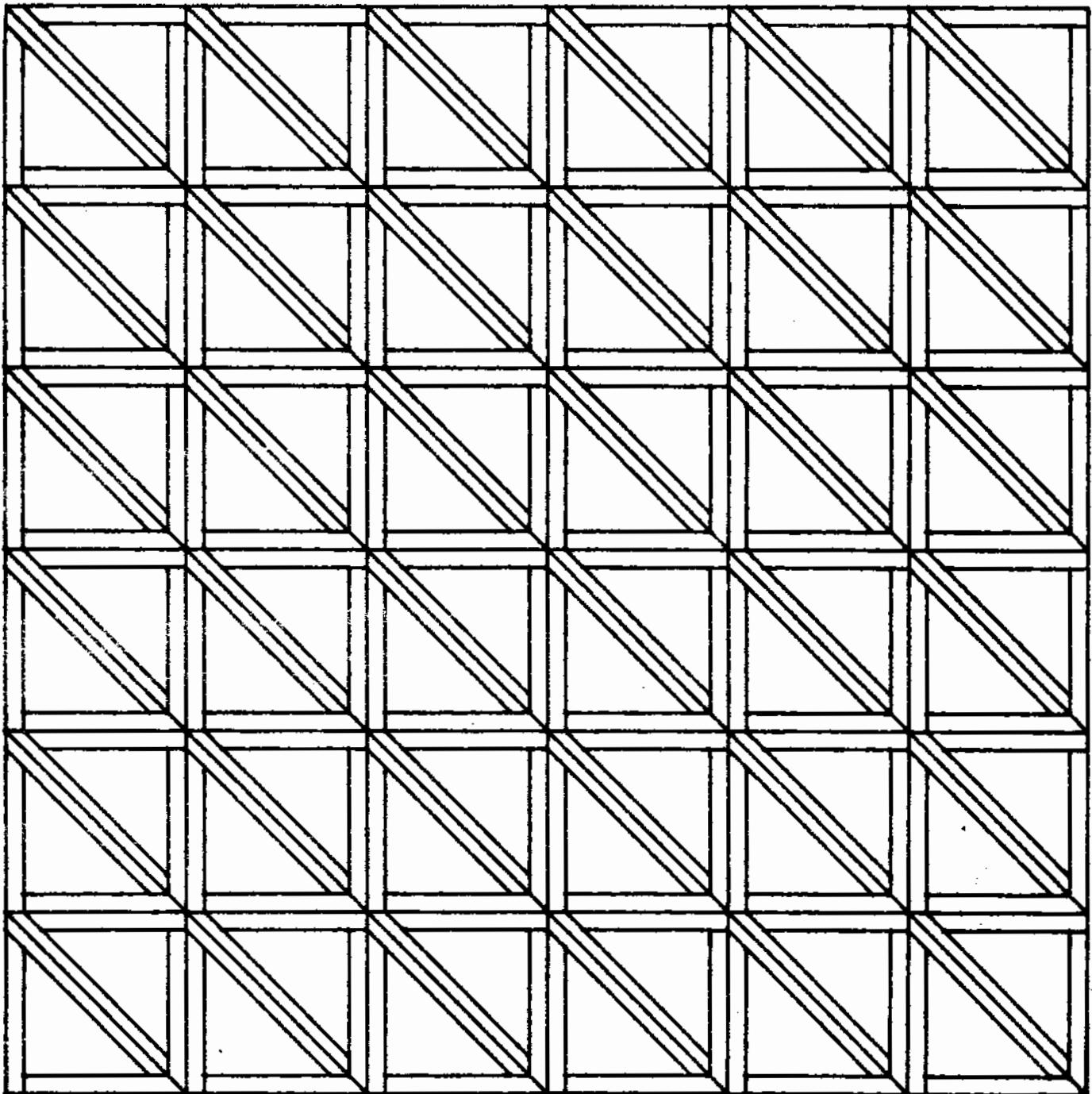
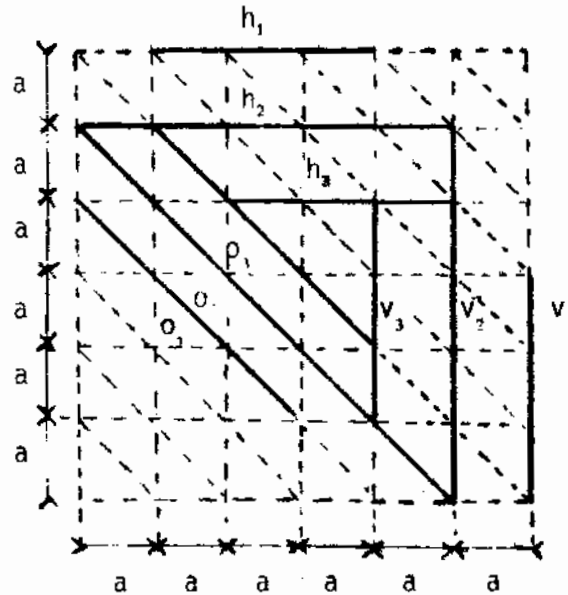


IMPOSSIBLE CRISTAL

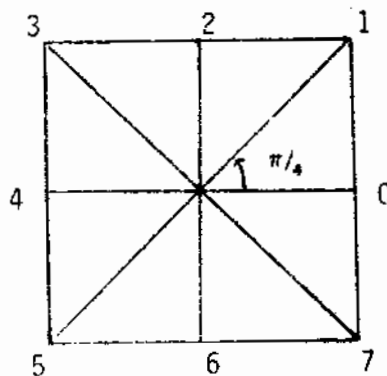
JEAN-ERIC SCHOETTL  
& HARALD WERTZ



Voici une version LSE du programme qui fait tracer le dessin illusoire bien connu inspiré par M.C. Escher.



Le motif de base : 3 traits horizontaux  $(h_1, h_2, h_3)$ , 3 traits verticaux  $(v_1, v_2, v_3)$ , 3 traits obliques  $(o_1, o_2, o_3)$ . a donne



Le pas élémentaire de la traçante et les 8 directions 0...7. 8 et 9 sont réservées aux lever et baisser de plume.

Un pas oblique : un pas droit  $\times \sqrt{2}$

```

1  <<*****
2  <<
3  <<          I M P O S S I B L E   C R I S T A L
4  <<
5  <<*****
6
7  MAIN PROCEDURE DESSIN
8
9  .COMMON SECTION COM
10  REF PROCEDURE PASELN;
11  WORD I,J,N,A,AP2-AP8,AP9,AP10,APN10;
12  WORD DIR,NPAS;
13  ARRAY 10 BYTE TQA=('8D','0A','QUEL AP? ');
14  LPFILE QA=(MODE:OUTPUT,EM;EU:TS;DATA:TQA;EDE:10;CONTROL);
15  ARRAY 10 BYTE TQN=('8D','0A','QUEL N? ');
16  LPFILE QN=(MODE:OUTPUT,EM;EU:TS;DATA:TQN;EDE:10;CONTROL);
17
18  .KSTORE SECTION FILE
19  RES 50;
20
21  .LOCAL SECTION LOC
22  RES 1;
23  <<
24  <<*****
25  <<
26
27  PROCEDURE LEC(DON)
28  .LOCAL SECTION CONTINUE LOC
29  POINTER WORD DON;
30  BYTE NA;
31  LPFILE LPNA=(MODE:INPUT,EM;EU:TK;DATA:NA;EDE:1;CONTROL);
32  .USING LOCAL IS LOC,COMMON IS COM;
33  READ LPNA;
34  &DON:= NA AND *F;
35  END; <<DE LEC.
36  <<
37  <<*****
38  <<
39  PROCEDURE PLUME
40
41  .USING LOCAL IS LOC,COMMON IS COM;
42  RX:= NPAS; RA:= DIR;
43  CALL PASELN;
44  END; <<DE PLUME
45  <<
46  <<*****
47  <<
48  PROCEDURE PENUP
49

```

```

50 .USING COMMON IS COM,LOCAL IS LOC;
51 RX:= 1 ; RA:= 3 ; CALL PASELN;
52 END; << DE FENUP
53 <<
54 << *****
55 <<
56 PROCEDURE PENDOWN
57
58 .USING COMMON IS COM,LOCAL IS LOC;
59 RX:= 1 ; RA:= 2 ; CALL PASELN;
60 END; << DE FENDOWN
61 <<
62 << *****
63 <<
64 PROCEDURE NOB (DIR1,DIR2,DIR3)
65
66 .LOCAL SECTION CONTINUE LOC
67 WORD DIR1,DIR2,DIR3;
68
69 .USING LOCAL IS LOC,COMMON IS COM;
70
71 DO FOR I:=1 STEP +1 UNTIL N;
72 <<
73 << LIGNE CONTINUE
74 <<
75 NPAS:= APN10;
76 DIR:=DIR1;
77 CALL PENDOWN;
78 CALL PLUME;
79 <<
80 << RETOUR
81 <<
82 CALL FENUP;
83 DIR:= DIR2;
84 CALL PLUME;
85 <<
86 << SE DECALER VERS LA DROITE
87 <<
88 DIR:= DIR3;
89 NPAS:= A;
90 CALL PLUME;
91 <<
92 << 1 EPE LIGNE BRISEE
93 <<
94 DIR:= DIR1;
95 DO FOR J:= 1 STEP +1 UNTIL N;
96 NPAS:= AP2;
97 CALL PLUME;
98 CALL FENDOWN;
99 NPAS:= AP3;
100 CALL PLUME;
101 CALL FENUP;
102 END;
103 <<
104 << RETOUR
105 <<
106 DIR:= DIR2;
107 NPAS:= APN10;
108 CALL PLUME;
109 <<
110 << SE DECALER VERS LA DROITE
111 <<

```

```

112     DIR:= DIR3;
113     NPAS:= AP3;
114     CALL PLUME;
115     <<
116     << 2 EME LIGNE BRISEE
117     <<
118     DIR:= DIR1;
119     DO FOR J:= 1 STEP +1 UNTIL N;
120     NPAS:= A;
121     CALL PLUME;
122     CALL PENDOWN;
123     NPAS:= AP3;
124     CALL PLUME;
125     CALL PENUP;
126     NPAS:= A;
127     CALL PLUME;
128     END;
129     <<
130     << RETOUR
131     <<
132     NPAS:= APN10;
133     DIR:= DIR2;
134     CALL PLUME;
135     <<
136     << DECALER VERS LA DROITE
137     <<
138     NPAS:= A;
139     DIR:= DIR3;
140     CALL PLUME;
141
142     END;
143
144     <<
145     << DERNIER GRAND TRAIT
146     <<
147     CALL PENDOWN;
148     NPAS:= APN10;
149     DIR:= DIR1;
150     CALL PLUME;
151
152     END; << DE NOB.
153     <<
154     << *****
155     <<
156     PROCEDURE OB(BINF,BSUP,PAS)
157
158     .LOCAL SECTION CONTINUE LOC
159     WORD BINF,BSUP,PAS;
160
161     .USING LOCAL IS LOC,COMMON IS COM;
162
163     I:= BINF-PAS;
164     DO! I:= I+PAS;
165     IF (PAS<0) THEN IF (I<BSUP) THEN EXIT OB; END; END;
166     IF (PAS>0) THEN IF (I>BSUP) THEN EXIT OB; END; END;
167
168     <<
169     << AVANCER SUR LE COTE
170     <<
171     CALL PENUP;
172     IF (PAS>0) THEN
173     DIR:= 2;

```

```

174      NPAS:= AP9;
175      CALL PLUME;
176      ELSE
177      DIR:= 0;
178      NPAS:= AP10;
179      CALL PLUME;
180      DIR:= 6;
181      NPAS:= A;
182      CALL PLUME;
183      END;
184
185      <<
186      << 1 ERE LIGNE BRISEE
187      <<
188      DIR:= 7;
189
190      DO FOR J:= 1 STEP +1 UNTIL I;
191      CALL PENDOWN;
192      NPAS:=AP8;
193      CALL PLUME;
194      CALL PENUP;
195      NPAS:= AP2;
196      CALL PLUME;
197      END;
198
199      <<
200      <<      RETOUR
201      <<
202      NPAS:=I*AP10;
203      DIR:= 3;
204      CALL PLUME;
205      <<
206      << SE DECALER D'UN CRAN
207      <<
208      DIR:= 2;
209      NPAS:=A;
210      CALL PLUME;
211      <<
212      << LIGNE CONTINUE
213      <<
214      CALL PENDOWN;
215      NPAS:=I*AP10;
216      DIR:= 7;
217      CALL PLUME;
218      <<
219      <<      RETOUR
220      <<
221      CALL PENUP;
222      DIR:= 3;
223      CALL PLUME;
224      <<
225      <<      DECALER
226      <<
227      DIR:= 2;
228      NPAS:=A;
229      CALL PLUME;
230      <<
231      << 3IEME LIGNE BRISEE
232      <<
233      DIR:= 7;
234
235      DO FOR J:=1 STEP +1 UNTIL I;

```

```

236     NPAS:= A;
237     CALL PLUME;
238     CALL PENDOWN;
239     NPAS:=AF3;
240     CALL PLUME;
241     CALL PENUP;
242     NPAS:= A;
243     CALL PLUME;
244     END;
245
246     <<
247     <<RETOUR
248     <<
249     DIR:= 3;
250     NPAS:=I*AF10;
251     CALL PLUME;
252     <<
253     << REDESCENDRE UN BRIN
254     <<
255     DIR:= 6;
256     NPAS:= A;
257     CALL PLUME;
258
259     END;
260
261     END;      <<DE OB
262     <<
263     <<      *****
264     <<
265
266
267     .USING KSTORE=PILE,LOCAL=LOC,COMMON=COM;
268
269     WRITE QA;
270     CALL LEC(QA);
271     WRITE QN;
272     CALL LEC(QN);
273
274     A:= 10*A;
275     AF2:= 2*A;
276     AF3:= 3*A;
277     AF9:= 9*A;
278     AF10:= 10*A;
279     APN10:= AF10*N;
280
281     <<
282     << LIGNES HORIZONTALES ET VERTICALES.
283     <<
284     CALL NOB (6,2,0);
285     CALL PENUP;
286     NPAS:= APN10;
287     DIR:=2;
288     CALL PLUME;
289     DIR:=4;
290     CALL PLUME;
291     CALL NOB(0,4,6);
292     CALL PENUP;
293     NPAS:= APN10;
294     DIR:=4;
295     CALL PLUME;
296
297     <<

```

298 // LIGNES OBLIQUES.  
299 //  
300 CALL OB(1;N;1) ;  
301 CALL OB(N-1;1;-1) ;  
302  
303 END.  
304 FIN



URGENT **T**  
NE PAS AFFRANCHIR