music chaine

unit canaux actifs bit=1 — bit 0 A, 1 B, 2 C

variables	défaut
unit	1
octave	3
[volume	10]
duree	25
x	1
y	1
z	1
par	)
env	0

defaut unit = 1 (canal A seul)

- (U) k∈[0,7] unit = k — bit 0 ~~unit = A~~, 1 ~~unit = B~~, 2 ~~unit = C~~ ~~7, unit~~
- (M) k ~~k∈[0,$3F]~~ 7, k ~~7, unit~~
- (O) k k∈[0,95] octave ~~k∈[0,7]~~ octave = k
- (A-L) q notes détermine $p = \frac{3822}{2^{n/12}}$ ~~.2^{octave}~~ puis $p_1 = \left[\frac{p}{256}\right]$, $p_2 = p \bmod 256$
  n = "A" ... "L" + octave, q∈[0,96]
  - si $unit_0 = 1$ → 0, p_2, 1, p_1
  - $unit_1 = 1$ → 2, p_2, 3, p_1
  - $unit_2 = 1$ → 4, p_2, 5, p_2
  - si) : 7, unit $FF, durée*(q+1), 7, $FF
  - si (rien
- (V) k k∈[0,15] volume = k
  - si $unit_0$ et $env_0 = 0$ → 8, vol
  - " 1 ... $env_1 = 0$ → 9, vol
  - " 2 $env_2 = 0$ → 10, vol
- (T) k ∈[1,255] duree = k
- (N) k∈[0,31] 6, k période du bruit
- (Q) k∈[0,7]
  - si bit_0 k=1 → 8, $10
  - si bit_1 k=1 → 9, $10
  - si bit_2 k=1 → 10, $10
- (P) k∈[1,256²[11, k mod 256, 12, k div 256
- (S) k∈[0,15] 13, k shape
- (W) k∈[1,255] $FF, k attend
- { R n 0 à 13 sauf 7 $80, x, $81, m, y, z
  X k
  Y l
  Z m
- (par = (
-) par =)
- (0) fin 7, $FF, $FF, 00

blancs ignorés

0 unit 1 octave 2 [volume] 3 durée 4 ⊠ 5 x 6 y 7 z 8 env 9 par

MUSM: DC.B 1, 36, 10, 2/8, $80, 1, 5/10, 255, 0, 0 "valeurs initiales"

MUSV: BLK.B 10

YMUS: MOVE.B #10, TBASE+1 ⊗

YMUS: BSR WCHAIN → décode chaine → A0

← CLR.B (A0,D3.L) met ⊗ terminal

LEA MUSM, A1
LEA MUSV, A2
MOVE.L (A1)+,(A2)+
MOVE.L (A1)+,(A2)+ variables en MUSV
MOVE (A1)+,(A2)+
MOVEM.L A0/A5/A6,-(SP)
MOVE.L A6,-(SP)
MOVE.L A0,A5

ADDQ #2,A6 (protège le ⊗ terminal)

MOVE.L (A2)+,(A6)+ } début
MOVE.L (A2)+,(A6)+

décodage en A5

MC77: NEXTAS
TST.B D0
BEQ MC79 → fin
LEA MUSA,A0
BSR RELAD
BNE ERRIS
JSR (A0) MC78: LEA MUSV,A2
BRA MC77

EXT D0
MOVE D0,D2
SUB #"A",D2 ← LEA MC88,A0
CMP #12,D2 ⊗ ⊗
BCS MC78 notes A-L

MC79: MOVE.L MUSF,(A6)+

MC79: LEA MUSF,A0
MOVE.L (A0)+,(A6)+
MOVE.L (A0)+,(A6)+
MOVE (A0)+,(A6)+

MC80: MOVE #32,-(SP)
TRAP #14
ADDQ #2,SP MC80: BSR ESCAPE
TST.L D0
BLE MC82
ST (SP)
BRA MC80

→ fin

ST (SP)
MC80: MOVE #32,-(SP)
TRAP #14 ← ADDQ #2,SP
TST.L D0
BNE MC80

MC82: MOVEM.L (SP)+,D0/A0/A5/A6 ⊗
MOVE.L A0,A6 ⊗
MOVE.B (SP)+,TBASE+1
RTS TBASET+3

BRA POPN ⊗

(5) Décode [-] [% / $] k ⟶ D3 = [-]k   k ∈ [-255, 255]
ϕ ⟹ D3 = 0

conserve D2/A6/A2
avance A5

```
DE
DECPS:BSR  DECCRM        (-)
      BNE  MC84
      BSR  MC84          (x)
      NEG  D3
      BEQ  ERRRE
      RTS
MC84: MOVEM.L D2/A2/A6,-(SP)
      BSR  DECP     <- MOVE #1,(A6)+ p  (x)
      BEQ  MC85     <- SUBQ #2,A2 -> (x) ϕ
      BSR  XTINDX
      BNE  ERRIS

      BRA  MC86
MC85: CLR  D3
MC86: MOVEM.L (SP)+,D2/A2/A6
      RTS

DECPER1: MOVEQ #8,D2          décode k   erreur si k >= D2
DECPER: BSR  MC84
        CMP  D2,D3
        BCC  ERRIS
        RTS
```

notes D2 ∈ [0-11]

```
MC88: BSR   ~~DECPS~~ MC84      D3 = k
      ~~ADD   D3,D2~~  ADD.B  1(A2),D2   octave
                                notes ∈ [0,95]
      CMP   #96,D2
      BCC   ERRIS
      MOVE  D2,D0
      EXT.L D0
      DIVU  #12,D0              | r | q |   n = 12q + r
      SWAP  D0
      ADD   D0,D0
X     LEA   MC96,A0
      MOVE  (A0,D0.W),D2
      SWAP  D0
      LSR   D0,D2               D2 = période = (D1, D2)
                                               k    bas
      MOVE  D2,D1
      LSR   #4,D1
      LSR   #4,D1
      AND   #$FF,D2

      MOVE.B (A2) D0
      MOVE  #2,D5               ⊗
MC90: BTST  D5,D0               ⊗
      BEQ   MC92
      MOVE  D5,D4               ⊗
      ADD   D4,D4
      MOVE.B D4,(A6)+
      MOVE.B D2,(A6)+
      ADDQ  #1,D4
      MOVE.B D4,(A6)+
      MOVE.B D1,(A6)+

MC92: DBRA  D5,MC90             ⊗
      NOT   D0
      MOVE.B #7,(A6)+
      MOVE.B D0,(A6)+
```

(5)

```
        CMP.B  #"(",3(A2)
*       BEQ    MC94
        MOVE.B #$FF,(A6)+
        MOVE.B 3(A2),(A6)+
               durée
        MOVE.B #7,(A6)+
        MOVE.B #$FF,(A6)+
```

⊗

```
        ADDQ #1,D3
        MOVE.B 3(A2),D0
        EXT D0
        MULU D0,D3
        CMP.L #256,D3
        BCC ERRIS
        MOVE.B D3,(A6)+
```

```
MC94:VERA6
     RTS

MC96:D.W  3822,3608,3405,3214,3034,2863
     D.W  2703,2551,2408,2273,2145,2025
```

```
(5) MUSV1:
    MUSV:                  volume
    MUSD:D.B      8,10 ,9,10,10,101            début
                       7,$FE
    MUSF:D.L      $7FFFFF00
    MUSF D.W      $800,$900,$A00

MUSA:D.W  $ 128

      D.W    MD10-*        (
      D.W    MD10-*        )
      D.W    $D4B
      D.W    MD12-*        M
      D.W    MD14-*        N
      D.W    MD16-*        O
      D.W    MD18-*        P
      D.W    MD20-*        Q
      D.W    MD24-*        R
      D.W    MD26-*        S
      D.W    MD28-*        T
      D.W    MD30-*        U
      D.W    MD32-*        V
      D.W    MD34-*        W
      D.W    MD36-*        X
      D.W    MD37-*        Y
      D.W    MD38-*        Z
      D.W    0
```

(5)

(C) MD10: MOVE.B D0,9(A2)
(J) RTS

(Mk) k∈[0,$3E] mot ~~k~~ 7, k

MD12: MOVE #$40,D2
BSR DECPER

~~MOVE.B D3,(A2)~~ ⊗
RTS

MD13: NOT D3
MOVE.B #7,(A6)+
BRA MD15 ⊗

(Nk) k∈[0,31] période du bruit

MD14: MOVE #32,D2
~~BSR DECPER~~
MOVE.B #6,(A6)+
MD15: MOVE.B D3,(A6)+
BRA MC94

(Ok) k∈[0,9] octave

MD16: MOVE #96,D2 } ⊗
BSR DECPER
MOVE.B D3,1(A2)
RTS

MULU ~~#12,D3~~ ⊗

(5)

(Pk) période de l'enveloppe = k.256 µs
$k \in [0, \frac{65536}{2}[$

```
MD18 :BSR  DECPSL MC84
      ADD  D3,D3
      BCS  ERRIS
      MOVE.B #11,(A6)+
      MOVE.B D3,(A6)+
      MOVE.B #12,(A6)+
      LSR  #4,D3
      LSR  #4,D3
      BRA  MD15
```

(Qk) $k \in [0,7]$ met l'enveloppe pour les canaux i unité $bit_i = 1$

```
MD20 :BSR  DECPER
      MOVE.B D3,8(A2)   enveloppe
MD200 :MOVE  #2,D1   ← MOVE #16,D0
                     ← MOVE.B (A2),D3 ⊗
                       AND.B
MD21 :BTST  D1,D3
      BEQ  MD22      ← BTST D1,D4 ⊗
      MOVE.B D1,(A6)    BEQ MD22
      ADDQ.B #8,(A6)+
      MOVE.B D0,(A6)+
MD22 :DBRA  D1,MD21
      BRA  MC94
```

(5) (Rm) m registre ∈[0,13] ≠7

```
MD24: MOVE  #14,D2
      BSR   DECPER
      CMP   #7,D3
      BEQ   ERRIS
      MOVE  4(A2),(A6)+      $80,x
      MOVE.B #$81,(A6)+
      MOVE.B D3,(A6)+        m
      MOVE  6(A2),(A6)+      y,z
      BRA   MC94
```

(Sk) k∈[0,15] shape 13,k

```
MD26: MOVE  #16,D2
      BSR   DECPER
      MOVE.B #13,(A6)+
      BRA   MD15
```

(Tk) k∈[1,255] durée = k

```
MD28: BSR   MC84
      MOVE.B D3,3(A2)
      BEQ   ERRIS
      RTS
```

(5)

(Uk) k∈[0,7] unit = 0 A, 1 B, 2 C

```
MD30 :MOVEQ #3,D2          ⊗
      BSR  DECPER1
      MOVEQ #1,D0          ⊗
      ASL  D3,D0
      MOVE.B D3,(A2)       ⊗ ← { MOVE D0,D3 ⊗
                               { BRA  MD13
      RTS
```

(Vk) k∈[0,15]

```
MD32 :MOVE  #16,D2
      BSR  DECPER
      MOVE  D3,D0
      MOVE.B 8(A2),D3   enveloppe
      NOT  D3
      BRA  MD200
```

(Wk) k∈[0,254] attend (k+1).20ms

```
MD34 :MOVEQ #-1,D2
      BSR  DECPER
      MOVE.B #$FF,(A6)+ ← MOVEQ #1,D3   ⊗
      BRA  MD15
```

(Xk) x

```
MD36 :BSR  MC84
      MOVE.B  D3,5(A2)
      RTS
```

(Yk)

```
MD37 :BSR  MC84
      MOVE.B  D3,6(A2) ← BEQ ERRIS
      RTS
```

(Zk)

```
MD38 :BSR  MC84
      MOVE.B  D3,7(A2)
      RTS
```