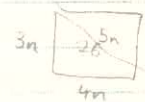
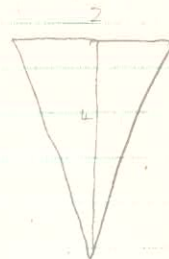


DIV. SYSTEM.

$$\begin{array}{r}
 00000110 \\
 1101 \overline{) 01010110} \\
 \underline{1101} \\
 10001 \\
 \underline{1101} \\
 1000 \\
 \hline
 3 \sqrt{x}
 \end{array}$$

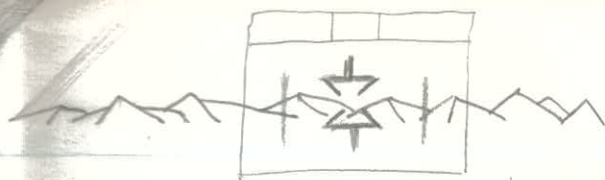


XLOC = HL'
 ZLOC = DE'
 CNT = B'
 X = A, A'
 Z = DE
 ANS. = A, A'
 XPERS = SP
 FLAGS. = C', C
 PDD = HL

$$5n = 26 \Rightarrow n = \frac{26}{5}$$

$$512x = X$$

PRB C
 RLA
~~ADC~~ HL, HL
 SBC HL, DE
 JR NC
 ADD HL, DE
 CCF
 DJNZ ←



$$\begin{aligned} X &= x \cos \theta + z \sin \theta \\ Y &= z \cos \theta - x \sin \theta \end{aligned}$$

$$\begin{aligned} \sin \theta &= 804 \\ &= 0000001100100100 \\ \cos \theta &= 32757 \\ &= 01111111110101 \end{aligned}$$

X , Z

LD (SP), SP
LD A, LD
LD (SP), SR
(DE = X
BC = Z
A = 0, #0)

EX AF, AF
PUSH DE, PUSH BC
LD A, D
LD B, 0
AND A

JP P
LD HL, 00
SBC HL, DE
EX DE, HL
LD B, 128
SLA E
LD A, D
RLA
RRA
RRA
RRA
RRA
RRA
LDE A
RRA
RRA
ADD A, E
SLA D
ADD A, D
LD L, A
RRA

DE = X BC = Z

```

1 PUSH DE
2 PUSH BC
3 LD C, B
4 LD A, B / AND A
5 SRL B / JRP
6 SRL A / CPL
7 SRL B / LDB, A
8 ADD B
9 SRL B
10 SRL B
11 ADD B
12 SRL B
13 LD L, A
14 LD H, 0
15 ADD HL, HL
16 ADD HL, HL
17 (ADD HL, HL)
18 BIT 7, C
19 JR (NZ)
20 ADD HL, DE
21 JP
22 AND A
23 EX DE, HL
24 SBC HL, DE
25 POP DE
26 POP BC
27 PUSH HL
28 LD C, B
29 LD A, B
30 AND A
31 JP P
32 CPL
33 LDA, B
34 SRL A
35 SRL B
36 SRL B

```

```

4 ADD B
5 SRL B
6 SRL B
7 SRL B
8 ADD B
9 LD L, A
10 LD H, 0
11 ADD HL, HL
12 ADD HL, HL
13 (ADD HL, HL)
14 BIT 7, C
15 JR (NZ)
16 ADD HL, DE
17 JP
18 AND A
19 EX DE, HL
20 SBC HL, DE
21 LD B, H
22 LD C, L
23 POP DE
24 POP HL
25 RET

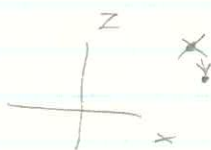
```

$C \propto X$
 $X \sin \theta$

If $X \sin \theta > 0$
 $C \neq 0$

then add

(13207, 9048)



$$x = x \cos + Z \sin$$

$$Z = x \cos + x \sin$$

01101010
00101010 = D

EXST1 :

- 7 Ord Tank
- 6 Super Tank
- 5 Saucer
- 4 Missile
- 3 Bullet (Mine)
- 2 Bullet (His)
- 1
- 0

EXST2 :

As above but
explosions.

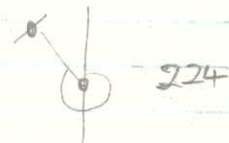
$$5 \leq S \leq 24$$

$$\begin{aligned} M &= \frac{1}{4} \\ M|M &= \frac{3}{4} \\ T &= \frac{3}{4} \\ T|M &= \frac{1}{4} \end{aligned}$$

128

$$S \geq 25$$

$$\begin{aligned} ST &= \frac{3}{8} \\ M &= \frac{3}{8} \\ T &= \frac{1}{4} \end{aligned}$$



25
20

EXISTANCES AT START OF WAVE

```

LD A, (EXST1)
LD C, A
LD A, R ← AND 127
LD B, A
LD HL, (SCORE)
LD DE, 5
AND A
SBC HL, DE
JP P
LD A, 36
OR 128
LD (EXST1), A
LD A, B
AND 31
OR 16
LD (TKZ+1), A ← LDD, A
RLCA ← LD A, B
LD H, 0
LD L, A
LD (TKX), HL
CALL POLCO
LD (TK-OR), HL
LD (TKDIR), HL
RET
N7 LD DE, 2032 ←
AND A
SBC HL, DE
JP P
LD A, C
AND 16
JP Z
LDA, B
CP 32
JP NC → MSET
LD A, 36
JP TSET
O7 LD A, B ←
CP 32

```

```

LDD, 128 JP C - MSET
JP TSET
P7 LD A, B
CP 48
JP NC
LDD, 64
JP TSET
Q7 CP 96 ←
JP C MSET
LDD, 128
(JP TSET)
V7 TSET LD A, 36
AND C
OR D
LD (EXST1), A
LD A, R
AND 127
LD B, A
AND 63
OR 16
LD D, A
LD A, B
AND A
JP P
NEG
R7 LD H, A ←
LD (TKX), HL
T
JP P
NEG
S7 LD D, A ←
LD (TKZ), DE
CALL POLCO
LD (TKOR), HL
LD (TKDIR), HL
RET
LD L, A
LD H, 0
ADD HL, HL

```

77 MSET

LD HL, 0 LD (MXLOC), HL
 LD (MISX), HL
 LD HL, 3600
 LD (MISY), HL
 LD HL, 25600 LD (MZLOC), HL
 LD (MISZ), HL
 LD HL, MISCT
 LD A, (HL)
 INC (HL)
 LD (ZIG), A
 LD A, 128
 LD (MSTRJ), A
 SUB A
 LD (MSMCT), A
~~LD HL, 0~~
~~LD (MSVCX), HL~~
~~LD HL, 65336~~
~~LD (MSVCY), HL~~
~~LD HL, 65024~~
~~LD (MSVCZ), HL~~
 LD HL, 128
 LD (MSOR), HL
 LD A, (EXST1)
 LD A, 16
 LD (EXST1), A
 RET

MSTRJ

7 = Init Drop 6 = Left
 5 = Right return 4 = Right
 3 = Left return 2 = Up (obst)
 1 = Cont (obst) 0 = Down (obst)

MSMCT = No frames per manoeuvre
 ZIG = No of Zigzags available
 MISCT = No of Missiles or far.

MAIN PROGRAM

LD HL, 0
 LD (FRAME), HL
 LD (EXST1), HL
 LD (EXST2), HL
 LD (SCORE), HL
 LD (MISCT), HL
 LD (PHASE), HL
 LD (TKMCT), HL
 LD (MSMCT), HL
 LD (TRIGA), HL
 LD (PRSTA), HL
 LD HL, 3
 LD (SHIP), HL
 LD HL, 16384
 LD (OB1Z), HL
 LD (OB2X), HL
 LD HL, 61440
 LD (OB2Z), HL
 LD (OB3X), HL
 LD HL, 49152
 LD (OB3Z), HL
 LD (OB4X), HL
 LD HL, 4096
 LD (OB4Z), HL
 LD (OB1X), HL
 CALL SCNTAB
 LD HL, 56320
 LD (DRTP1), HL
 LD (SPPL1), HL
 LD HL, 61440
 LD (DRTP2), HL
 LD (SPPL2), HL
 LD HL, 40960
 LD (EXSCN), HL
 LD HL, 64
 LD (OBOR), HL

LD B, 39
 LD C, 1
 LD HL, 63871
 LD D, (HL)
 DEC HL
 LD A, (HL)
 DEC HL
 ADD 12
 LD E, A
 LD A, C
 LD (DE), A
 DJNZ

LD B, 39
 LD C, 128
 LD HL, 63871
 LD D, (HL)
 DEC HL
 LD A, (HL)
 ADD 19
 DEC HL
 LD E, A
 LD A, C
 LD (DE), A
 DJNZ

LD B, 32
 LD A, 255
 LD HL, 18303
 INC L
 LD (HL), A
 DJNZ

LD B, 160
 LD HL, 22528
 LD DE, 22529
 LD (HL), 67

LDIR
 LD (HL), 68 (INC(HL))

LDBC, 607
 LDIR
 LD HL, [HIGHSCORE]
 CALL MESPR
 LD HL, [SCORE] *8
 CALL MESPR
 LD HL, 25
 LD (NMAN), HL

53428 144
53419 200

X = 1000
Z = 9000

53969 162

53971 164

53965 218

53967 220

0

37390 = 121

BC = |Z|

X > Z

37376 112
4884

38598 150
74516

38558

DL X = ~~1000~~ / X

A = flags

A' = 32 if X < Z

lar B / D small

128 | ∞

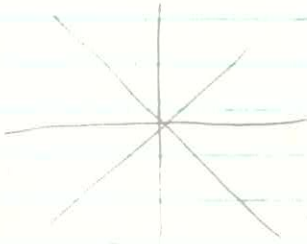
X Z

1

Z
X
Z

X

X



8
4) 32



Cif print

Objectives: Conduct sancer existance
Set up Bullets and missiles

DIR = 448
OR = 64

1111101
1111110

PRSTA

218
38

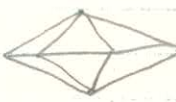
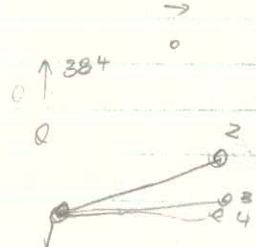
436
76

7 Tank 6 SupTank
5 Sancer 4 Missile
3 Bullet (Mine) 2 His Bullet
1 Object 0 —

D = 240
OR = 368
112

64
↓

0



-32 < x < 32
ADD 32
0 < x < 64

(TKSTR) = 7
6
4

KILL
FORWARD 5 Back
Left 3 Right

OB 1:



OB 2:



OB 3:



OB 4:



TEXST

LD HL, 768
LD (MBZLC+2), HL

LD HL, (FRAME)
INC HL
LD (FRAME), HL
LD DE, 512
SBC HL, DE

JP C
LD A, (PRSTA)
AND 224
JP NZ
CALL MSET
LD A, (EXST1) ←
AND 224 PRSTA

JP NZ
LD HL, (FRAME)
LD A, H
AND A

LDA, H
ANDA
JP M →

LD HL, (TKZ)
LD D, 128
ADD HL, DE
LD (SAUZ), HL
LD A, R
LD (SAUX+1), A
LD A, (EXST1)
OR 32

LD (EXST1), A
LD A, (EXST2)
AND 223
LD (EXST2), A
SUB A

LD (SAUOR), A
LD A, (TRIGA) ←
AND A

JP Z
LD A, (EXST1)
BIT 3, A

JP NZ →
OR 8
LD (EXST1), A
LD A, (PRSTA)
AND 2

JP Z →
LD A, (MAX2+1)
AND A
JP M →
LD A, (MIN2+1)
AND A

JP P →
LD A, (OBIX+1)
ADD 32

JP C →
SUB 64
JP NC →

LD A, (OBIZH)
AND A
JP M →

AND 253
RRA
RRA

JP →

LDA, 25

OBZ

27

X

A8 LD A, 25 ←

B8 DEC A

LD (MYBCT), A

LD HL, 0

LD (MBULX), HL

LD HL, 1024

LD (MBULZ), HL
LD HL, 384
LD (MBLOR), HL
LD A, (EXST1) ←

BIT 2, A
JP NZ →
AND 192

JP Z →
LD A, (TKSTR)
AND A

JP P →
LD HL, (TKOR)
LD DE, (TKDIR)
AND A

SBC HL, DE
LD A, L
ADD 128

JP NZ →
LD HL, (TKOR)
LD (HBLOR), HL

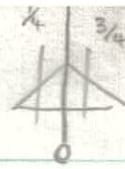
LD A, 28
LD (HBLCT), A
LD HL, (TXLOC+38)

LD (HBULX), HL
LD HL, (TZLOC+8)

LD (HBULZ), HL
LD A, (EXST1)
OR 4

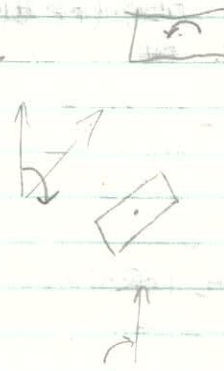
LD (EXST1), A
RET ←

LD HL, (TXLOC+10)
LD (HBXLC+2), HL
LD HL, (TZLOC+10)
LD (HBZLC+2), HL



For OB3 :

LD A, (OB3X+1)
ADD 32
JP C →
SUB 64
JP NC →
LD A, (OB3Z+1)
AND A
LD B, A
JP M →
LD HL, (MAX2)
LD DE, (MIN2)
SBC HL, DE
SRL H
RR L
SRL H
RR L
EX DE, HL
ADC HL, DE
JP P →
ADD HL, DE
ADC HL, DE
JP M →
LD A, B
AND 253.
RRA
RRA
JP →
LD A, 25 ←
←



{S} TKSTRAT

LD A, (PHASE)
RLA
RLA
NEG
ADD 100
LD (TKMCT)

LD A, (TKMCT)

AND A

JP Z

DEC A

LD (TKMCT), A

LD A, (TKSTR)

LD C, A

AND 24

JP Z

AND 16

JP Z

LD HL, (TKOR)

LD A, L

SUB 1 {2}

LD L, A

JP NC

LD A, 1

SUB H

LD H, A

LD (TKOR), HL

JP NZ > BIT 7, C

RET

H&LD HL, (TKOR)

INC HL {INCHL}

RES 1, H

LD (TKOR), HL

RET

LD HL, (TXLOC+2)

LD DE, (TXLOC+14)

ANDA

SBC HL, DE

LD DE, (TKX)

ADD HL, DE

LD (TKX), HL

TKSTR: 7: KILL

5: Back

3: Right

1: —

6: Forward

4: Left

2: —

0: —

LD HL, (TZLOC+2)

LD DE, (TZLOC+14)

SBC HL, DE

LD DE, (TKZ)

ADD HL, DE

LD (TKZ), HL

JP NZ > BIT 7, C

RET

LD A, C

AND 32

JP Z

LD HL, (TXLOC+14)

LD DE, (TXLOC+2)

SBC HL, DE

LD DE, (TKX)

ADD HL, DE

LD (TKX), HL

LD HL, (TZLOC+14)

LD DE, (TZLOC+2)

SBC HL, DE

LD DE, (TKZ)

ADD HL, DE

LD (TKZ), HL

JP NZ > BIT 7, C

RET

LD A, R

AND 127

LD C, A

LD HL, (FRAME)

SRL H

LD A, L

RRA

AND A

RRA

SUB 127

NEG

LD B, A

SUB C

JP C

LD A, C

AND 8

ADD 8

LD (TKSTR), A

RET

LD A, R

LD HL, (FRAME)

AND 127

LD C, A

SRL H

LD A, L

RRA

AND A

RRA

SUB 127

NEG

LD B, A

SUB C

JP C

LD A, 64

LD (TKSTR), A

LD A, (PHASE)

RLA

RLA

NEG

ADD 110

LD (TKMCT), A

RET

LD A, 128

LD (TKSTR), A

LD A, 255

LD (TKMCT), A

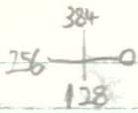
LD A, (TKMCT)

LD A, (TKMCT)

LD A, (TKMCT)

LD A, (TKMCT)

LD A, (TKMCT)

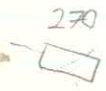


- 2 + 5

-8
248



-114
142



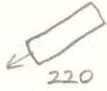
7



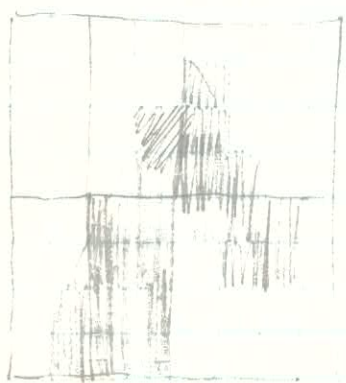
-14
242



60



16



0
12 LD HL, (TKOR) ← A

LD DE, (TKDIR)

AND A

SBC HL, DE

LD A, L

ADD 128

JP M

JP Z

LD A, (TKSTR)

AND 128
OR 16

LD (TKSTR), A

RET

08 LD A, (TKSTR) ←

AND 128
OR 8

LD (TKSTR), A

RET

18 LD A, (TKSTR) ←

AND 128

OR 64

LD (TKSTR), A

RET

- contd -

LD HL, (TKOR)
SLA H
FRL

LD HL, TYLOC

LD (YLOC), HL

LD A, 12

LD HL, TXPER+32

LD (XPER), HL

LD HL, TYPER+32

LD (YPER), HL

CALL PERSP

LD A, C

AND A

LD A, (PRSTA)

JP Z

AND 127

LD (PRSTA), A

LD A, 12

CALL DLAY1

LD HL, 34000

LD (MAXI), HL

LD (MINI), HL

JP SAUC

LD HL, (XMAX)

LD (MAXI), HL

LD HL, (XMIN)

LD (MINI), HL

LD A, H

AND A

JP P

LD A, D

AND A

JP M

LD A, 128

LD (SIGHT), A

LD DE, (TXPER+28)

LD A, (RBEEP)

AND A

JP NZ

CALL MATMLT

JP

CALL MATMLT

SUB A

LD (RBEEP), A

LD HL, (TXPER+30)

SBC HL, DE

JP P

LD HL, (TXPER+26)

SBC HL, DE

JP P

LD HL, VU-A

JP

LD HL, VU-B

JP

LD HL, (TXPER+26)

EX DE, HL

SBC HL, DE

JP M

LD HL, VU-E

JP

LD HL, (TXPER+24)

SBC HL, DE

JP P

LD HL, VU-C

JP

LD HL, VU-D

LD (LINED), HL

CALL LNPLT

LD HL, (SPPL)

LD (SPPLI), HL

JP SAUC

STNK

```

SAUX LD A, (EXSTI)
AND 32
JPZ MISS
LD A, (SAUOR)
INC A
AND 3
CALL SAUSTR
LD (SAUOR), A
LD HL, (SPPL1)
LD (SPPL), HL
RLA
RLA
LD E, A
RLA
ADD E
LDE A
LD B, 0
PUSH DE
LD HL, SXLOC
ADD HL, DE
LD (SPI), SP
LD SP, SXLC1+12
LD A, 6
LD DE, (SAUX)
LD B, H
LD C, L
EXX
LD B, A
EXX
LD HL, SXPER+12
LD (XPERS), HL
LD HL, SYPER+12
LD (YPERS), HL
LD A, 2
LD HL, SYLOC
LD (YLQ), HL
CALL PERSP
LD A, C
AND A
LD A, (PRSTA)

```

```

LD SP, (SPI)
POP DE
LD (SPI), SP
LD HL, SZLOC
ADD HL, DE
LD SP, SZLC1+12
LD A, 6
LD DE, (SAUZ)
LD B, H
LD C, L
EXX
LD B, A
EXX
DEC BC
LD A, (BC)
DEC BC
LD H, A
LD A, (BC)
LD L, A
ADD HL, DE
PUSH HL
EXX
LD B, A
EXX
LD HL, SXPER+12
LD (XPERS), HL
LD HL, SYPER+12
LD (YPERS), HL
LD A, 2
LD HL, SYLOC
LD (YLQ), HL
CALL PERSP
LD A, C
AND A
LD A, (PRSTA)

```

```

JP Z
AND 223
LD (PRSTA), A
AND 192
JP NZ
LD HL, 34000
LD (MAXI), HL
DEC HL
LD (MINI), HL
LD A, 2
CALL DAY1
JP BULLT
OR 32
LD (PRSTA), A
LD HL, (XMAX)
LD (MAXI), HL
LD HL, (XMIN)
LD (MINI), HL
LD HL, SAUVU
LD (LINC), HL
CALL LNPLT
LD HL, (SPPL)
LD (SPPL1), HL
JP BULLT

```


SAUSTRAT

LD A, (SAMCT)

AND A

JP Z

DEC A

LD (SAMCT), A

LD HL, (SAUX)

LD DE, (SAVCX)

ADD HL, DE

LD (SAUX), HL

LD HL, (TKZ)

LD DE, 32768

ADD HL, DE

LD (SAVZ), HL

RET

LD A, 80

LD (SAMCT), A

LD A, R

RLA

LD L, A

LD H, 0

LD A, L

AND A

JP P

EX DE, HL

LD HL, 00

SBC HL, DE

LD (SAVCX), HL

RET

MISSILES

```

LD A, (EXSTI)
AND 16
JP Z BULLT
CALL MISSTRAT
LD A, C
LD (MSTRJ), A
LD HL, (MISX)
LD DE, (MISZ)
CALL RADAR
LD A, (MISZ+1)
AND A
JP P →
ADD 100
JP NC (WAVE)
LD HL, (ENEMY IN RANGE)
CALL MESPR
LD HL, (ENEMY TO RIGHT)
CALL MESER
LD HL, (MISX)
LD DE, (MISZ)
CALL POLCO
LD C, A
LD A, (EXSCN)
SUB C
NEG
SUB 11
JP NC →
LD (RBEEP), A
LD HL, SPPL1
LD (SPPL), HL
LD A, 7
LD HL, MIXTAB
LD (XTAB), HL
LD HL, MZTAB
LD (ZTAB), HL

```

```

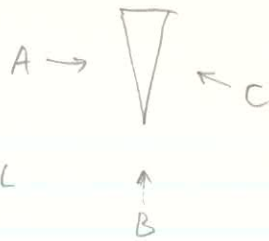
LD HL, (MXLOC)
LD (MISX), HL ← LD (XDIS), HL
LD HL, MXLOC+14
LD (XLOC), HL
LD HL, (MZLOC)
LD (MISZ), HL ← LD (ZDIS), HL
LD HL, MZLOC+14
LD (ZLOC), HL
LD HL, (MSOR)
SLA H
RR L
LD A, (RBEEP)
AND A
JP NZ →
CALL MATMLT
JP →
CALL MATMLTI
SUB A
LD (RBEEP), A
LD A, (MISZ)
CP 3
JP NC →
LD A, (MISX+1)
ADD 2
CP 4
JP C CRASH
LD HL, MXPER ← +14
LD (XPERS), HL
LD HL, MXPER+14
LD (XPERS), HL
LD DE, (MISY)
LD (SPI), SP

```

```

LD SB, MYLCI+14
LD BC, MYLOC+14
EXX
LD B, 7
→ EXX
DEC BC
LD A, (BC)
LD H, A
DEC BC
LD A, (BC)
LD L, A
ADD DE
PUSHHL
EXX
DJNZ →
LD HL, MYLCI
LD (YLOC), SP
LD A, 3
CALL PERSP
LD A, C
AND A
LD HL, MYLCI
JP Z →
SUB A
LD (PRSTA), A
LD A, 3
CALL DLAY1
LD HL, 34000
LD (MAXI), HL
DEC L
LD (MINI), HL
JP BULLT
LD HL, (XMAX) ←
LD (MAXI), HL
EXX DE, HL
LD HL, (XMIN),

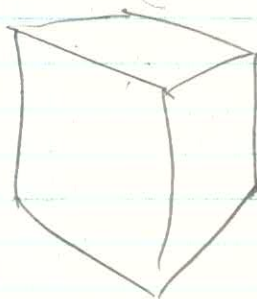
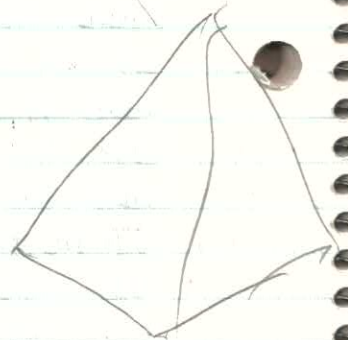
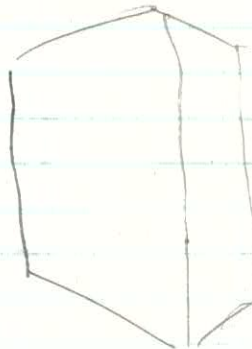
```



```

LD (MINI), HL
LD A, 16
LD (PRSTA), A
LD A, H
AND A
JP P
LD A, D
AND A
JP M
LD A, 128
LD (SIGHT), A
LD HL, (MXPER+12)
EX DE, HL
LD HL, (MXPER+10)
SBC HL, DE
JP P
LD HL, VU-A
JP
LD HL, (MXPER+8)
SBC HL, DE
JP P
LD HL, VU-B
JP
LD HL, VU-C
LD (LINCD), HL
CALL LNPLT
LD HL, (SPPL)
LD (SPPLI), HL
↓
BULLT

```



MSTRJ

64	7	Init. drop.
128	6	Left
64	5	Right (return)
128	4	Right
	3	Left (return)

2	Up	} obst.
1	Cont	
0	Down	

MISSTRAT

MIS

```
LD A, (MSTRJ)
LD C, A
AND A
JP P →
LD HL, (MISY)
LD A, H
AND A
JP P →
LD HL, 0
RES 7, C
JP →
LD DE, 65336 ←
ADD HL, DE
LD (MISY), HL
BIT 2, C
JP Z →
LD HL, (MISY)
LD A, H
CP 3
JP NC →
RES 2, C
SET 7, C
JP →
LD DE, 160 ←
ADD HL, DE
LD (MISY), HL
LD A, (MSMCT) ←
AND A
JP Z →
DEC A
JP →
```

```
BIT 6, C
JP Z →
RES 6, C
SET 5, C
LD HL, (MSOR)
LD DE, 65408
ADD HL, DE
LD (MSOR), HL
JP →
BIT 4, C
JP Z →
RES 4, C
SET 3, C
LD HL, (MSOR)
LD DE, 128
ADD HL, DE
LD (MSOR), HL
JP →
BIT 5, C
JP Z →
LD HL, (MSOR)
LD DE, 64
ADD HL, DE
LD (MSOR), HL
RES 5, C
JP →
BIT 3, C
JP Z →
LD HL, (MSOR)
LD DE, 65472
ADD HL, DE
LD (MSOR), HL
RES 3, C
LD A, R
CP 96
```

LD HL, 219
DEC(HL)
JP Z →

```
JP NC →
AND 16
JP Z →
LD HL, (MSOR)
SET 6, C
LD DE, 64
ADD HL, DE
LD (MSOR), HL
JP →
LD HL, (MSOR)
SET 4, C
LD DE, 65472
ADD HL, DE
LD (MSOR), HL
LD A, 4 ←
LD (MSMCT), A ←
LD A, (OBX+1)
LD B, A
LD A, (OBZ+1)
LD E, A
LD A, (MISX+1)
SUB B
ADD 2
SUB 4
RET NC
LD A, (MISZ+1)
SUB E
ADD 2
SUB 4
RET NC
SET 2, C
RET
```