



toolkit 4

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including tk.1A

```
1-ARR - TOOLKIT 4
2-BAS - BOOTSTRAP SYSTEM-PROGRAM-UNIT
3-OBJ -SYSTEM-PROGRAM-UNIT a1p
4-BAS - SYSTEM-PROGRAM-UNIT BASIC start & go
5-OBJ -2F0 400 SCRN COPY EPSON 5 GREY SCALE 180-82-1
6-OBJ -2F0 400 SCRN COPY EPSON 5 GREY SCALE N182/100
7-ASS -SCREENCOPY MODE 1-8 5 BRIJSTINTEN
8-OBJ -300 40F SRCN COPY 9 GREY SCALE N180-82-100
9-OBJ -300 41F SCRN COPY 9 GREY SCALE N182/100
10-ASS -SOURCE SCRN COPY 9 GREY SCALE N182/100
11-ASS - ARRAYDATA
12-OBJ - ARRAYDATA 29B-41F
13-BAS - ARRAY-DATA DEMO 1
14-BAS - ARRAY-DATA DEMO 2
15-BAS - ARRAY-DATA DEMO 3
16-ASS - EDITDATA
17-OBJ - EDITDATA 29B-410
18-BAS - EDIT-DATA DEMO 1
19-BAS - EDIT-DATA DEMO 2
20-BAS - SCRN COPY SEIKOSHA 5/6 RS-232
21-BAS - SCRN COPY SEIKOSHA 7/8 RS-232
22-ARR -
```

(c) DAInamic

TOOLKIT 4

HOW TO USE THE PROGRAMS

1/ SYSTEM PROGRAM UNIT

a) for NEW programs

Position tape before file 2 , "BOOTSTRAP SYSTEM-PROGRAM-UNIT",
and type LOAD:RUN. SYSTEM-PROGRAM-UNIT is loaded, heap-
pointers are adapted and an introduction program is started.
Now you can start programming, and call the routines from
SPU with CALLM2000:..... , followed by operation command
codes.

b) for OLD programs

Adapt Heappointers :

```
POKE #29C,#11  
CLEAR 1000
```

Position tape before file 3 , "SYSTEM-PROGRAM-UNIT mlp",
type UT <return>
Z3 <return>
R <return>

start tape and Read SPU mlp-file
type B

Load your BASIC program and call SPU with CALLM2000:.....,
followed by operation commands.

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system- program- unit

SYSTEM - PROGRAM - UNIT contains in one machine language part following routines :

* <u>renumber</u>	- step - mode - add - mode - sub - mode
* <u>rename variables</u>	- global - with line-restrictions
* <u>variablen-atlas</u>	- V list - Q list (jump-table)
* <u>check</u>	- number of lines - BASIC : size - number of symbols - size of symbol table

The different routines are called with :

CALLM2000: : :

followed by normal BASIC-commands.

If a BASIC-command after CALLM2000 is not recognised by SPU, action is transferred to normal BASIC-execution.

SPU - commands :

LET OLD = NEW	rename variable
LET OLD = NEW : OUT 100,500	rename only in lines 100-500
RESTORE	CLEAR SYMBOL-TABLE
LIST	Q-list of total program
LIST 100	Q-list of line 100
LIST 100-500	Q-list from 100-500
MODE 0	variablen-atlas
MODE 1	variablen-atlas with line-numbers
WAIT start,end,new	renumber in STEP-mode
WAITMEM start,end,add	renumber in ADD-mode
DOT start,end,sub	renumber in SUB-mode
CHECK	programm-check-list

```

1  10  REM *****
11  11  REM * SYSTEM - PROGRAM - UNIT *
12  12  REM *
13  13  REM * DEMO *
14  14  REM *****
15  15  MODE 6A:COLORG 0 5 10 15
20  20  W=RND(5.0)
21  21  ON W GOSUB 100,101,102,103
23  23  PRINT A,B,C," SUM : ";A+B+C
25  25  DRAW 50,0 50,A 21
26  26  DRAW 100,0 100,B 22
27  27  DRAW 150,0 150,C 23
30  30  IF A>200 OR B>200 OR C>200 THEN 500
36  36  WAIT TIME 20:GOTO 20
100 100 A=A+0.5:RETURN
101 101 B=B+0.5:RETURN
102 102 C=C+0.5:RETURN
103 103 D=D+0.5:RETURN
500 500 FILL 0,0 XMAX,YMAX 20:A=0.0:B=0.0:C=0.0:GOTO 20

```

2 CALLM2000:WAIT 10,500,10

```

10  REM *****
20  REM * SYSTEM - PROGRAM - UNIT *
30  REM *
40  REM * DEMO *
50  REM *****
60  60  MODE 6A:COLORG 0 5 10 15
70  70  W=RND(5.0)
80  80  ON W GOSUB 150,160,170,180
90  90  PRINT A,B,C," SUM : ";A+B+C
100 100 DRAW 50,0 50,A 21
110 110 DRAW 100,0 100,B 22
120 120 DRAW 150,0 150,C 23
130 130 IF A>200 OR B>200 OR C>200 THEN 190
140 140 WAIT TIME 20:GOTO 70
150 150 A=A+0.5:RETURN
160 160 B=B+0.5:RETURN
170 170 C=C+0.5:RETURN
180 180 D=D+0.5:RETURN
190 190 FILL 0,0 XMAX,YMAX 20:A=0.0:B=0.0:C=0.0:GOTO 70

```

3 *CALLM2000:CHECK

Datum : Programm :

Lines : 17
 BASIC : 502 Bytes
 Symbols : 6
 Table : 43 Bytes

1 - the original dummy program
 2 - renumber in step mode
 3 - CHECK : programm information

**System -
 Program -
 Unit**

4 CALLM2000:WAITMEM 150,190,1000



```

10  REM *****
20  REM *  SYSTEM - PROGRAM - UNIT *
30  REM *
40  REM *          DEMO *
50  REM *****
60  MODE 6A:COLORG 0 5 10 15
70  W=RND(5.0)
80  ON W GOSUB 1150,1160,1170,1180
90  PRINT A,B,C," SUM : ";A+B+C
100 DRAW 50,0 50,A 21
110 DRAW 100,0 100,B 22
120 DRAW 150,0 150,C 23
130 IF A>200 OR B>200 OR C>200 THEN 1190
140 WAIT TIME 20:GOTO 70
1150 A=A+0.5:RETURN
1160 B=B+0.5:RETURN
1170 C=C+0.5:RETURN
1180 D=D+0.5:RETURN
1190 FILL 0,0 XMAX,YMAX 20:A=0.0:B=0.0:C=0.0:GOTO 70

```

5 *CALLM2000:MODE 0

Datum : Programm :

A ! -----

B ! -----

C ! -----

D ! -----

W ! -----

X % -----

6 *CALLM2000:MODE 1

Datum : Programm :

A ! -----

 90,100,130,1150,1190,

B ! -----

 90,110,130,1160,1190,

C ! -----

 90,120,130,1170,1190,

D ! -----

 1180,

W ! -----

 70,80,

X % -----

-
- 4 - renumber in ADD-mode
 - 5 - V-list : variables-atlas
 - 6 - Q-LIST : cross-reference
-

7 *CALLM2000:LIST

S.p.U.

Datum : Programm :

70: 140,1190,
1150: 80,
1160: 80,
1170: 80,
1180: 80,
1190: 130,

8 *CALLM2000:LIST1190

Datum : Programm :

1190: 130,

7 - JUMP-TABLE of entire programm
8 - where is a jump/call to 1190?
9 - rename 'W' to 'RANDOMVALUE'
10 - rename 'C' to 'THIRDBAR'

9 *CALLM2000:LET W = RANDOMVALUE

```
*LIST
10 REM *****
20 REM * SYSTEM - PROGRAM - UNIT *
30 REM *
40 REM * DEMO *
50 REM *****
60 MODE 6A:COLORG 0 5 10 15
70 RANDOMVALUE=RND(5.0)
80 ON RANDOMVALUE GOSUB 1150,1160,1170,1180
90 PRINT A,B,C," SUM : ";A+B+C
100 DRAW 50,0 50,A 21
110 DRAW 100,0 100,B 22
120 DRAW 150,0 150,C 23
130 IF A>200 OR B>200 OR C>200 THEN 1190
140 WAIT TIME 20:GOTO 70
1150 A=A+0.5:RETURN
1160 B=B+0.5:RETURN
1170 C=C+0.5:RETURN
1180 D=D+0.5:RETURN
1190 FILL 0,0 XMAX,YMAX 20:A=0.0:B=0.0:C=0.0:GOTO 70
```

*CALLM2000:LET C=THIRDBAR

10 *LIST
10 REM *****
20 REM * SYSTEM - PROGRAM - UNIT *
30 REM *
40 REM * DEMO *
50 REM *****
60 MODE 6A:COLORG 0 5 10 15
70 RANDOMVALUE=RND(5.0)
80 ON RANDOMVALUE GOSUB 1150,1160,1170,1180
90 PRINT A,B,THIRDBAR," SUM : ";A+B+THIRDBAR
100 DRAW 50,0 50,A 21
110 DRAW 100,0 100,B 22
120 DRAW 150,0 150,THIRDBAR 23
130 IF A>200 OR B>200 OR THIRDBAR>200 THEN 1190
140 WAIT TIME 20:GOTO 70
1150 A=A+0.5:RETURN
1160 B=B+0.5:RETURN
1170 THIRDBAR=THIRDBAR+0.5:RETURN
1180 D=D+0.5:RETURN
1190 FILL 0,0 XMAX,YMAX 20:A=0.0:B=0.0:THIRDBAR=0.0:GOTO 70

11 *CALLM2000:MODE 1

```
Datum :          Programm :

A ! -----
  90,100,130,1150,1190,
B ! -----
  90,110,130,1160,1190,
C ! -----
D ! -----
  1180,
RANDOMVALUE ! -----
  70,80,
THIRDBAR ! -----
  90,120,130,1170,1190,
W ! -----
X % -----
*
*
```

12 *CALLM2000:RESTORE

```
Datum :          Programm :

A ! -----
  90,100,130,1150,1190,
B ! -----
  90,110,130,1160,1190,
D ! -----
  1180,
RANDOMVALUE ! -----
  70,80,
THIRDBAR ! -----
  90,120,130,1170,1190,
*
```

13 *CALLM2000:WAIT10,1190,2000

```
RENUMBER RANGE : 10-1190
NEW LINE NUMBER : 2000-2180
*
*LIST
2000 REM *****
2010 REM * SYSTEM - PROGRAM - UNIT *
2020 REM *
2030 REM * DEMO *
2040 REM *****
2050 MODE 6A:COLDRG 0 5 10 15
2060 RANDOMVALUE=RND(5.0)
2070 ON RANDOMVALUE GOSUB 2140,2150,2160,2170
2080 PRINT A,B,THIRDBAR," SUM : ";A+B+THIRDBAR
2090 DRAW 50,0 50,A 21
2100 DRAW 100,0 100,B 22
2110 DRAW 150,0 150,THIRDBAR 23
2120 IF A>200 OR B>200 OR THIRDBAR>200 THEN 2180
2130 WAIT TIME 20:GOTO 2060
2140 A=A+0.5:RETURN
2150 B=B+0.5:RETURN
2160 THIRDBAR=THIRDBAR+0.5:RETURN
2170 D=D+0.5:RETURN
2180 FILL 0,0 XMAX,YMAX 20:A=0.0:B=0.0:THIRDBAR=0.0:GOTO 2060
```

11 - 'W' & 'RANDOMVALUE' are in the symbol table
 'C' & 'THIRDBAR' are in the symbol table
 12 - RESTORE : only actual symbols are preserved in the symbol table
 13 - again RENUMBER in step-mode

TOOLKIT 4

HOW TO USE THE PROGRAMS

2/ EPSON SCREEN COPIES (5 & 9 grey scales)

general information

For this Jumbo size screen copies, the video ram is scanned from right to left. This technique is used because the horizontal resolution of MODE 5/6, combined with the expression of brightness to represent colours, exceeds the maximum number of dots/line in bit image printing.

MX-80 : normal density : 480 dots/line
dual density : 960 dots/line

MX-82 : normal density : 576 dots/line
dual density : 1152 dots/line

MX-100: there is no need for restriction on MX-100,
but the same technique of MX-82 has been used.

restrictions for MX-80

- normal density bit graphics (5 grey scale)

5 grey scale copy takes 2*2 dots for each pixel, so the number of dots/line should be $256*2=512$. This is outside the range of MX-80, to solve this problem, 16 lines of the screen are not printed. (Y 0-15)

- dual density bit graphics (9 grey scale)

9 grey scale copy takes 4*2 dots for each pixel, so the number of dots/line should be $256*4=1024$. This is outside the range of MX-80, again 16 lines of the screen are not printed. (Y 241-256)

COLOUR/BRIGHTNESS TABLE

COLOUR Nr	5 grey scale	9 grey scale
0	0	0
1	1	1
2	1	1
3	1	2
4	2	2
5	2	3
6	2	3
7	2	4
8	3	4
9	3	5
10	3	5
11	3	6
12	4	6
13	4	7
14	4	7
15	4	8