

## SUMMAGRID V

### CONFIGURATION

USE SWITCH SIX TO FLAG

### DETERMINATION

SUMMAGRID. (WAS USED FOR  
OLD BOARD/SOFTWARE)

### SWITCH SETTINGS

note 0 is on (closed) 1 is off (open)

SWITCH 6 5 4 3 2 1	SIZE X x Y
X X X 0 0 0	reserved (12x12)
X X X 0 0 1	reserved (12x18)
X X X 0 1 0	reserved (18x24)
X X X 0 1 1	reserved(tbd)
X X X 1 0 0	36 x 24
X X X 1 0 1	48 x 36
X X X 1 1 0	60 x 44
X X X 1 1 1	reserved (high accuracy only)
X X 1 X X X	high accuracy standard surface (default)
X X 0 X X X	back light
X 1 X X X X	SWITCH 5 MUST BE OFF (used for auto hi acc cursor detection)
1 X X X X X	summa
0 X X X X X	CalComp

### ROM DEFAULTS

TYPE	RECALL1
FORMAT	#31
MODE	POINT
PARITY	7 EVEN
BAUD	9600
RESOLUTION	1000 LPI
DATA RATE	25

RECALL 1 43,DF,89,61,00,00,27

RECALL 2 84,9E,C8,00,12,00,00

## FACTORY DEFAULTS

Note - set up documents (80090) can and will override this list.

CURRENT SAME AS ROM DEFAULTS

MENU BITS	RECALL ->	1	2	MENU BITS	RECALL ->	1	2
M1.7 A[01] MODE 1	<i>bank a</i>	0	1	M5.7 B[15] MOUSE 1		0	0
M1.6 A[02] MODE 2		1	0	M5.6 B[16] MOUSE 2		0	0
M1.5 A[03] INC VALUE 1		0	0	M5.5 B[17] HIGH/LOW PROXIMITY		0	0
M1.4 A[04] INC VALUE 2		0	0	M5.4 B[18] CTS LINE ENABLE		0	1
M1.3 A[05] PROMPT		0	0	M5.3 C[01] PORTRAIT 0	<i>bank c</i>	0	0
M1.2 A[06] DATA RATE 1		0	1	M5.2 C[02] CR DISABLE		0	0
M1.1 A[07] DATA RATE 2		1	0	M5.1 C[03] BEEP ON PEN DOWN		0	1
M1.0 A[08] DATA RATE 3		1	0	M5.0 C[04] DISABLE BEEPER		0	0
M2.7 A[09] RESOLUTION 1		1	1	M6.7 C[05] TILT TO PRESSURE		0	0
M2.6 A[10] RESOLUTION 2		1	0	M6.6 C[06] PORTRAIT 1		0	0
M2.5 A[11] RESOLUTION 3		0	0	M6.5 C[07] TOP ORIGIN		0	0
M2.4 A[12] FORMAT 1		1	1	M6.4 C[08] 9500 style cursor		0	0
M2.3 A[13] FORMAT 2		1	1	M6.3 C[09] (RESERVED)		0	0
M2.2 A[14] FORMAT 3		1	1	M6.2 C[10] (RESERVED)		0	0
M2.1 A[15] FORMAT 4		1	1	M6.1 C[11] (RESERVED)		0	0
M2.0 A[16] FORMAT 5		1	0	M6.0 C[12] (RESERVED)		0	0
M3.7 A[17] LF ENABLED		1	1	M7.7 C[13] L_COMMANDS		0	0
M3.6 A[18] 7 OR 8 DATA		0	1	M7.6 C[14] McD spr		0	0
M3.5 B[01] BAUD RATE 1	<i>bank b</i>	0	0	M7.5 C[15] Auto/tek/lectra spr		1	0
M3.4 B[02] BAUD RATE 2		0	0	M7.4 C[16] jccs		0	0
M3.3 B[03] BAUD RATE 3		1	1	M7.3 C[17] otsuka		0	0
M3.2 B[04] PARITY 1		0	0	M7.2 C[18] lectra large format		1	0
M3.1 B[05] PARITY 2		0	0	M7.1 [??] DISABLE FUNCTION B		1	0
M3.0 B[06] PARITY 3		1	0	M7.0 [??] CMENU_ACTIVE		1	0
M4.7 B[07] FREQUENCY		0	0	recall 1 43,DF,89,61,00,00,27			
M4.6 B[08] NO MM OR 2000		1	0	recall 2 84,9E,C8,00,12,00,00			
M4.5 B[09] MUST USE ESC 9X00		1	0				
M4.4 B[10] PROXIMITY		0	0				
M4.3 B[11] P PEN		0	0				
M4.2 B[12] HEIGHT		0	0				
M4.1 B[13] TILT_DATA		0	0				
M4.0 B[14] TILT_CORRECT		1	0				

X is last value, i.e. It does not change these bits.

## FIRMWARE

### FIRMWARE OUTPUT FORMATS

#### ASIC FORMATS

```
15 +XXXXX , +YYYYY ,CACB,T0      CR [LF]
16 +XXXX.XXX , +YYYY.YYY ,CACB,T0  CR [LF]
3 DELTA +XXXXX , +YYYYY , C      CR [LF]
8 +XX.XXX , +YY.YYY , CACB , T0   CR [LF] 1000 LPI pressure 0 to 255
+XXXX.XX , +YYYY.YY , CACB , T0  CR [LF] 100 LPmm
+XXXX.X , +YYYY.Y , CACB , T0    CR [LF] 10 LPmm
+XXXXX. , +YYYYY. , CACB , T0    CR [LF] OTHER
```

#### <508 LPI

```
3 mA XXXX , YYYY , C      CR [LF]
```

#### >508 LPI

```
3 mA XXXXX , YYYYY , C CR [LF]
```

#### ANY SIZE >24 inches WITH RES > 1274

```
3 mA XXXXXX , YYYYYY , C      CR [LF]
```

```
3 DELTA +XXXXXX , +YYYYYY , C CR [LF]
```

```
15 +XXXXXX , +YYYYYY ,CACB,T0  CR [LF]
```

```
16 +XXXX.XXX , +YYYY.YYY ,CACB,T0  CR [LF]
```

#### Formats with pressure data (ppppp is pressure data)

```
3 xxxxx,yyyyy,ppppp,c CR [LF] pressure 0 to 127
```

```
15 +xxxxxx , +yyyyyy , CACB , T0 CR [LF] OTHER >1270
```

```
15 +xxxxxx , +yyyyyy ,+ppppp,CACB,T0 CR [LF] pressure 0 to 255
```

```
15 +xxxxxx , +yyyyyy ,+ppppp,CACB,T0 CR [LF] >1270 pressure 0 to 255
```

```
16 +xxxx.xxx , +yyyy.yyy ,+ppppp,CACB,T0 CR [LF] (40*25) pressure 0 to 255
```

```
8 +xx.xxx , +yy.yyy ,+ppppp, CACB , T0 CR [LF] 1000 LPI pressure 0 to 255
```

```
+xxxx.xx , +yyyy.yy ,+ppppp, CACB , T0 CR [LF] 100 LPmm
```

```
+xxxx.x , +yyyy.y ,+ppppp, CACB , T0 CR [LF] 10 LPmm
```

```
+xxxxx. , +yyyyy. ,+ppppp, CACB , T0 CR [LF] OTHER
```

## BINARY FORMATS

### 30 format

	7	6	5	4	3	2	1	0	
1	1	PR	T0	X14*	Y14*	C2	C1	C0	PR 0= IN PROX 1= OUT OF PROX X14* AND Y14* are set high(1) for + and low (0) for - OR X14,Y14 NOT
2	0	X6	X5	X4	X3	X2	X1	X0	
3	0	X13	X12	X11	X10	X9	X8	X7	
4	0	Y6	Y5	Y4	Y3	Y2	Y1	Y0	
5	0	Y13	Y12	Y11	Y10	Y9	Y8	Y7	

6	0	p6	p5	p4	p3	p2	p1	p0	pressure enabled 0 to 127

### 30 format DELTA

	7	6	5	4	3	2	1	0	
1	1	PR	T0	X14*	Y14*	C2	C1	C0	PR 0= IN PROX 1= OUT OF PROX X14* AND Y14* are set high(1) for + and low (0) for - OR X14,Y14 NOT
2	0	X6	X5	X4	X3	X2	X1	X0	
3	0	Y6	Y5	Y4	Y3	Y2	Y1	Y0	

CAN ONLY GET TO DELTA FORMAT USING MM COMMANDS

### 31 format

	7	6	5	4	3	2	1	0	
1	0	1	0	0	T2	T1	T0	PR	PR 0= IN PROX 1= OUT OF PROX t2,1,0=100 or 000(lectra)
2	0	0	0	C4	C3	C2	C1	C0	
3	0	0	X5	X4	X3	X2	X1	X0	
4	0	0	X11	X10	X9	X8	X7	X6	
5	0	0	X16	X15	X14	X13	X12		
6	0	0	Y5	Y4	Y3	Y2	Y1	Y0	
7	0	0	Y11	Y10	Y9	Y8	Y7	Y6	
8	0	0	Y16	Y15	Y14	Y13	Y12		

### 31 format

	7	6	5	4	3	2	1	0	
1	0	1	0	0	T2	T1	T0	PR	PR 0= IN PROX 1= OUT OF PROX t2,1,0=100 or 000(lectra)
tg2	0	0	0	C4	C3	C2	C1	C0	
3	0	0	X5	X4	X3	X2	X1	X0	
4	0	0	X11	X10	X9	X8	X7	X6	
5	0	0	0	X16	X15	X14	X13	X12	
6	0	0	Y5	Y4	Y3	Y2	Y1	Y0	
7	0	0	Y11	Y10	Y9	Y8	Y7	Y6	
8	0	0	0	Y16	Y15	Y14	Y13	Y12	

9	0	0	P5	P4	P3	P2	P1	P0	if PRESSURE ENABLED 0 to 255
10	0	0	P11	P10	P9	P8	P7	P6	
11	0	0	0	P16	P15	P14	P13	P12	

## CURSOR CODING

pen	LECTRA 31
up	00000
tip(0)	00001
sw1	00010
sw2	00100
0+1	00011
0+2	00101
1+2	00110
0+1+2	00111

pen	31	3, 29, 30	15, 16
up	00000	0	00
tip(0)	00001	1	01
sw1	00010	2	02
sw2	00011	3	03
0+1	00001	3	01
0+2	00101	3	05
1+2	00110	3	06
0+1+2	00001	3	01

4 BUTTON CURSOR	31	3, 29, 30	15, 16,
up	00000	0	00
0	00001	1	01
1	00010	2	02
2	00011	3	03
3	00100	4	04
0+1	00001	3	01
0+2	00101	3	05
1+2	00110	3	06
0+1+2	00001	3	01
0+3	00001	5	01
1+3	00010	6	02
0+1+3	00001	7	01
2+3	00011	7	03
0+2+3	00001	7	01
1+2+3	00010	7	02
0+1+2+3	00001	7	01

16 BUTTON CURSOR	31	3, 29, 30	15, 16,
Up	00000	0	00
0	00001	1	01
1	00010	2	02
2	00011	3	03
3	00100	4	04
4	00101	5	05
5	00110	6	06
6	00111	7	07
7	01000	0	08
8	01001	1	09
9	01010	2	10
A	01011	3	11
B	01100	4	12
C	01101	5	13
D	01110	6	14
E	01111	7	15
F	10000	0	16

## COMMANDS (RS232)

### One byte command for all modes

NOTE: These one byte commands cannot be inhibited by the one byte command enable menu bit.

### MM COMMANDS (must have one byte command enabled)

NOTE: These commands work in BOTH MM and 2000 mode/formats.

NOTE: Do not write drivers using these to be 2x00 and 9x00 compatible.

NOTE: These commands can be inhibited by the one byte enable menu bit.

NOTE: Use these commands ONLY WHEN IN MM mode/formats. Can be inhibited by the one byte enable menu bit.

a send configuration (size)

b set origin to upper left

c set origin to lower left

d 100 lpi

e 200 lpi

f 10 lpmm

g 400 lpi

h 500 lpi

i 20 lpmm

j 1000 lpi

k 1270 lpi(2x00 mode only)

l 1 lpi

n 2 lpi

o 50 lpmm (1270 lpi)

p 4 lpi

q 40 lpmm

s 2000 lpi

u 80 lpmm

v 100 lpmm

```

r x x y y    set new res
      xx/XSIZE=lpi  and yy/YSIZE=lpi    use only on size < 24 inch
max res is 1000 lpi
t do self test
w send self test results
      (t 0 0 0 pr d c a)
x send check sum  .#xxxx cr lf
nul RESET (ONLY IN MM FORMATS)
0 TABLET BIT TO 0
1 TABLET BIT TO 1
@ RUN MODE
A TRACK
B POINT MODE
D REMOTE MODE (PROMPT)
E SET DELTA MODE
F CLEAR DELTA MODE
G h AXIS UPDATE
I h INC MODE

```

```

      bin    ASCII
Q 140 100 DATA RATE
R 75 50
S 25 20
T 7 7
k data wrap(echo) characters till null is received.
s 2000 lpi
u 80 lpmm
v 100 lpmm
za ascii (#3)
zb bin (#30)
z8 8 none
z9 8 odd
zp0 no pressure data
zp1 pressure data
zu microgrid emulation
a -size + pressure set to max if enabled on summa formats (3,8,15,16,30,31)

```

**Note the Nul reconfigures the tablet and does not reset it. This was done for timing. Also the "x" only does the rom check on a rom error.**

## MICRO GRID COMMANDS

ESC Z RESET TABLET . RECONFIGURE BASE OF SWITCHES. FORMAT #31 , TABLE  
= 0 ,DELTA =0, INC VALUE = 0

ESC Q SET ASCII FORMAT #15

### MODE

ESC M 0 RUN (INC RUN)  
ESC M 1 POINT  
ESC M 2 (INC TRACK)  
ESC M 3 RUN PROMPT  
ESC M 4 DELTA MODE

### RATE

ESC R 0 1 PPS  
ESC R 1 2 PPS  
ESC R 2 5 PPS  
ESC R 3 10 PPS  
ESC R 4 20 PPS NOTE ON TEK WAS 30 AUTO WAS 20 PICKED SLOWER  
ESC R 5 60 PPS  
ESC R 6 90 PPS  
ESC R 7 45 PPS NOTE AUTO WAS 100 AND TEK 45 PICK SLOWER  
ESC R 8 130 PPS

ESC D h SET ASCII DELINEATER TO character h. NOTE this command may not  
be implanted base on ram usage.

ESC I nnn SET INC VALUE = nnn. nnn = 000 to 999  
ESC F 0 SET ORIGIN TO LOWER LEFT  
ESC F 1 SET ORIGIN TO NEXT POINT  
ESC F 2 SET ORIGIN TO TO CENTER  
ESC F 3 SET ORIGIN TO UPPER LEFT

ESC C 0 SET RESOLUTION TO 200 LPI  
ESC C 1 SET RESOLUTION TO 254 LPI 10 LPmm  
ESC C 2 SET RESOLUTION TO 1000LPI  
ESC C 3 SET RESOLUTION TO 1016LPI 40LPmm  
ESC C 4 SET RESOLUTION TO 500 LPI  
ESC C 5 SET RESOLUTION TO 508 LPI 20 LPmm  
ESC C 6 SET RESOLUTION TO 400 LPI  
ESC C 7 SET RESOLUTION TO 100 LPI  
ESC C 8 SET RESOLUTION TO 1 LPI  
ESC C 9 SET RESOLUTION TO 2 LPI  
ESC C A SET RESOLUTION TO 4 LPI  
ESC C B SET RESOLUTION TO 4096/LONG AXIS

ESC T 0 CLR TABLET ID  
ESC T 1 SET TABLET ID

```

ESC t DO SELF TEST
ESC a SEND SIZE
ESC G PROMPT COMMAND
ESC w SEND SELF TEST
      7 6 5 4 3 2 1 0LSB
      P X 0 1 X X 1 1
          |   | +----- DIGITAL TEST 0=ERROR
          |   +----- PROXIMITY (1= IN 0=OUT)
          +----- TOTAL ERROR FLAG
ESC x RETURN CHECK SUM

```

Lectra changes

first byte of format 31 is 40h rather than 48h

ording is allowed on the pen in format 31

data is sign magnitude on format 31

no cr on "w" test mode

after dpoint (locate origin command) do not clear pen down and convert flag so "request or mode will return a point

add Xn command that does nothing

force run prompt on bad M (mode)commands

```

ESC w SEND SELF TEST
      7 6 5 4 3 2 1 0 LSB
      P X 0 1 X X 1 1
          |   | +----- DIGITAL TEST 0=ERROR
          |   +----- PROX (1= IN 0=OUT)
          +----- TOTAL ERROR FLAG

```

```

ESC CS    2000LPI
ESC CB    80 LPMM (NOT 4096/AXIS)
ESC CD    100 LPMM
ESC MP1   PRESSURE DATA
ESC MP0   NO PRESSURE DATA
ESC MR    TOGGLE CR ON/OFF
ESC ML    TOGGLE LF ON/OFF
ESC MA    ASCII (#15)
ESC MB    BIN (#31)
ESC M5    ABSOLUTE
ESC F3    ORIGIN UPPER LEFT
ESC F4    ORIGIN LOWER RIGHT
ESC F5    ORIGIN UPPER RIGHT
ESC r h   change reset charactor mg mode
ESC B n   set baud rate
          n= 0 to 8 19200,9600,4800,2400,1200,600,300,150,110
          note B8 (110) may not be implamentd

```

ESC P0	NO PARITY
ESC P1	ODD PARITY
ESC P2	EVEN PARITY
ESC P3	7 DATA
ESC P4	8 DATA BITS
ESC P5	2 STOP BITS
ESC P6	1 STOP BIT
ESC L10	LED OFF
ESC L11	LED ON
ESC d0	NO DEC POINT IN ASCII
ESC d1	USE DEC POINT IN ASCII
ESC g	RESEND LAST DATA POINT
ESC W0	SEND IN PROX ONLY
ESC W1	SEND OUT OF PROX ONLY
ESC Y1	LOW TONE
ESC Y2	MED TONE
ESC Y3	HIGH TONE
ESC Y4	HIGHER TONE
ESC MT0	DISABLE BEEP
ESC MT1	ENABLE BEEP
ESC PXhhhh	SET X RES TO 0001 TO 2540 LPI
ESC PYhhhh	SET Y RES TO 0001 TO 2540 LPI
ESC x	SKEW CORRECTIONS - NOTE MAY BE ADDED AT A LATER TIME
ESC UC	SEND ID ID= SP 0 0 CR LF
ESC U2	SEND CHECK BYTE IN HEX
CNTL E	SEND PRODUCT ID SUMMAGRID 5
ESC U	
ESC z n	N=0 TO 4 EMULATION MODE (CHANGES FORMAT AND COMMANDS) N=0 UIOF (7 E) N=2 CALCOMP (8 ODD IF BIN) N=3 GTCO (8 ODD IF BIN) N=1 MM (8 ODD IF BIN )

## MM COMMANDS

z i    SEND INC VALUE  
      000 TO 255+1  
z?    send product id or firmware id  
zt    send transducer type  
      CURSOR OR STYLIS

MAY NEED TO ADD TEST COMMAND AT LATER DATE

ZS0   WIRE DUMP  
ZS4   RAM TEST

## FORMAT 15

### COUNTS

+XXXXX,+YYYYY,CA,T CR LF IN COUNTS  
+XXXXXX,+YYYYYY,CA,T CR LF IN COUNTS >1270 LPI

### INCHES AND DEC POINT NON METRIC

+XX.XXX,+YY.YYY,CA,T CR LF  
+XXX.XXX,+YYY.YYY,CA,T CR LF >1270 LPI

### INCHES AND NO DEC POINT NON METRIC

+XXXXX,+YYYYY,CA,T CR LF IN COUNTS  
+XXXXXX,+YYYYYY,CA,T CR LF IN COUNTS >1270 LPI

### INCHES AND DEC POINT METRIC

+XXXX.X,+YYYY.Y,CA,T CR LF 4/10LPMM DATA /4  
+XXXX.XXX,+YYYY.YYY,CA,T CR LF IN INCH WITH DEC POINT 40,80LMPP  
                                  ;DATA \*25

### INCHES AND NO DEC POINT METRIC

+XXXXX,+YYYYY,CA,T CR LF 4/10LPMM DATA /4  
+XXXXXXXX,+YYYYYYY,CA,T CR LF IN INCH WITH DEC POINT 40,80LMPP  
                                  ;DATA \*25