



## SUMMAGRID V COMMANDS

### Configuration

Use switch six to flag

### Determination

Summagrid (used for old board/software)

### Switch Settings

0 is on (closed)      1 is off (open)

SWITCH 6 5 4 3 2 1	SIZE X x Y
XXX000	reserved (12 x 12)
XXX001	reserved (12 x 18)
XXX010	reserved (18 x 24)
XXX011	reserved (tbd)
XXX100	36 x 24
XXX101	48 x 36
XXX110	60 x 44
XXX111	reserved (high accuracy only)
XX1XXX	high accuracy standard surface (default)
XX0XXX	back light
X1XXXX	SWITCH 5 MUST BE OFF (used for auto hi acc cursor detection)
1XXXXX	Summa
0XXXXX	CalComp

### ROM Defaults

TYPE	RECALL 1
FORMAT	#31
MODE	POINT
PARITY BAUD	7 EVEN 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				
M4.6 B[08] NO MM OR 2000		1	0	recall 1 43, DF, 89, 61, 00, 00, 27			
M4.5 B[09] MUST USE ESC 9X00		1	0	recall 2 84, 9E, C8, 00, 12, 00, 00			
M4.4 B[10] PROXIMITY		0	0				
M4.3 B[11] PPEN		0	0	<b>X is the last value, i.e. It does not</b>			
M4.2 B[12] HEIGHT		0	0	<b>change these bits.</b>			
M4.1 B[13] TILT_DATA		0	0				
M4.0 B[14] TILT_CORRECT		1	0				



## 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,yyyy,ppppp,c CR [LF] pressure 0 to 127  
 15 +xXXXXX , +yYYYYY , CACB , T0 CR [LF] OTHER >1270  
 15 +XXXXX , +YYYYY ,+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 Å 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	

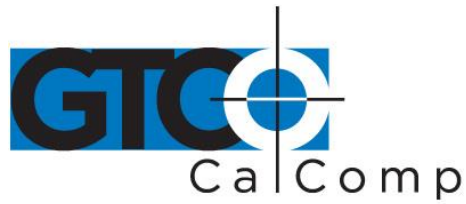
### 30 Format DELTA

	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 Å 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	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	



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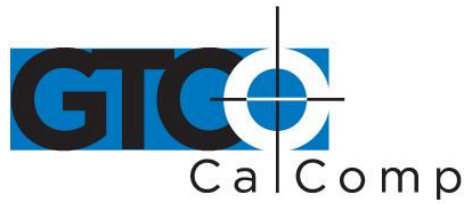
**31 Format**

	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 and 30	15 and 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



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4-Button Cursor	31	3, 29 and 30	15 and 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 and 30	15 and 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 (RS-232): 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. It 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=lpmm and yy/SIZE=lpmm (Use only on size <24 inch)

max res is 1000 lpmm  
 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 lpmm  
 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 and 31)

**NOTE:** "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 and 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 BASED 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 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 1000 LPI



ESC C 3 SET RESOLUTION TO 1016 LPI, 40 LPmm  
 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 character mg mode
ESC B n	n set baud rate
	n= 0 to 8 19200,9600,4800,2400,1200,600,300,150,110
	note B8 (110) may not be implemented
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 PXhhh	SET X RES TO 0001 TO 2540 LPI
ESC PYhhh	SET Y RES TO 0001 TO 2540 LPI
ESCx	SKEW CORRECTIONS ( <b>NOTE:</b> 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	SNE 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

zi SEND INC VALUE  
000 TO 255+1

z? send product id or firmware id

zt send transducer type  
CURSOR OR STYLUS

### ***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