GTCO CALCOMP
DrawingSlate I and II Commands

POWER UP DEFAULT

Format 23
Run mode
9600 8 none 1
1000 lines per inch 125 point per second

OPERATING MODES
RUN MODE - The digitizer outputs coordinate data continuously.

TRACK MODE -The digitizer outputs coordinate data when a button is down.

LINE MODE -The digitizer outputs coordinate data points when a button is down, plus one when the button is released.

POINT MODE-One point is sent when a button is pressed.

INCREMENT MODE FILTER-Puts a movement filters on the data in any mode. The transducer must move N counts before the data can be sent. Then both axis data is updated. If out of proximity data is enabled and in increment mode 2 data point may be sent on leaving proximity.

GRID UPDATE MODE FILTER - just like increment mode except only the axis that the inc occurred in is updated, the other axis is its old value.

PROMPT MODE MODIFIER- places the additional restriction on data transmission that the host must transmit a prompt character to the tablet for each data point output. All other rules of normal operation apply. The prompt character is "?". Prompting is a feature, which operates in conjunction with any of the above standard modes.

SEND DATA OUT OF PROXIMITY MODE MODIFIER- If this flag is set coordinate data will be sent when it meets the output conditions in or out of the active area. Cordless units may not respond to button information until cursor is close to table. NOTE this command should be sent after the mode commands.

SEND DATA IN MARGIN - If this flag is set coordinate data point will be sent when it meets the output conditions in the active area or when in margins. NOTE margins on some of the tablets are very small and are large leaving the table than coming in to the tablet.

DELTA MODE - (mm mode only) Send relative data.

OUTPUT FORMATS - this show only a sub set of formats for these products.
Note it is recommended to use format 20,23 or 7 for new drivers.

The following codes are used in describing the output formats:

C Cursor Status. In ASCII formats, indicates a single status character.
Cn Cursor Status Bit. In binary formats, a bit representing cursor status. The highest-numbered "Cn" is the MSB, "C0" the LSB.
CACB 2 CHARACTER CURSOR STATUS
, ASCII comma.
CR ASCII carriage return (HEX 0D). cr can be inhibited by cr menu bit
LF ascii line feed HEX 0A [LF] is selected by lf enable menu bit
T0 Tablet status bit 0 or 1 set by command
X Y Data Digit. In ASCII formats, a numeric character representing coordinate data. The number of X symbols represents the number of allowable digits.
Xn Yn Data Bit. In binary formats, a bit representing coordinate data. The highest-numbered "n" is the MSB.
pn pressure pen data 0-7
pp pressure pen data ascii
+ sign character "space" = pos "-"= neg
[-] IF NEG IT ADD A "-" CHARACTER

ASCII FORMATS
31090,31120 OR 31180 WITH RES <510 LPI

```
0        XXXX , YYYY ,C    CR  [LF]
3        XXXX , YYYY , C   CR  [LF]
3 DELTA     +XXXX , +YYYY , C  CR  [LF]
15          +XXXXX , +YYYYY ,CACB,T0 CR  [LF]
```

33120 OR 33180 WITH RES >508 LPI or 4x5

```
0        XXXXX , YYYYY ,C         CR  [LF]
3        XXXXX , YYYYY , C        CR  [LF]
3 DELTA     +XXXXX , +YYYYY , C      CR  [LF]
15          +XXXXX , +YYYYY ,CACB,T0     CR  [LF]
```

ANY SIZE WITH RES > 1279

```
4 9100 1     T M C XXXXXX YYYYYY   CR  [LF]
5 9100 2     XXXXXX , YYYYYY ,T M CCR  [LF]
6 9100 3     C P XXXXXX  YYYYYY            CR  [LF]
0  2A        XXXXXX ,Y YYYYY ,C       CR  [LF]
3  mA        XXXXXX ,Y YYYYY , C      CR  [LF]
3 DELTA     +XXXXXX , +YYYYYY , C  CR  [LF]
15          +XXXXX , +YYYYY ,CACB,T0     CR  [LF]
```

ANY SIZE

4 9100 1 T M C XXXXX YYYYY CR [LF]
5 9100 2 XXXXX , YYYYY ,T M C CR [LF]
6 9100 3 C P XXXXX YYYYY CR [LF]
7 9100 4 SP XX.XXX , SP YY.YYY , TMC CR [LF] 1000 LPI
SP XXXX.XX , SP YYYY.YY , TMC CR [LF] 100 LPmm
SP XXXX.X , SP YYYY.Y , TMC CR [LF] 10 LPmm
SP XXXXX. , SP YYYYY. , TMC CR [LF] OTHER
8 +XX.XXX , +YY.YYY , CACB , T0 CR [LF] 1000 LPI
+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
16 +XXXX.XXX , +YYYY.YYY ,CACB,T0 CR [LF]

added in mod 4 (firmware 70181)to support pressure pen in summa mode
3 X...X,Y...Y,PPPPP,C CR [LF] PRESSURE 0 TO 127
15 +X...X,Y...Y,PPPPP,CACB,TO ,CR,[LF] PRESSURE 0 TO 255
8 +X...X,+Y...Y,PPPPP,CA,CB,TO CR [LF] PRESSURE 0 TO 255

BINARY FORMATS

20 format ATF

	7 6 5 4 3 2 1 0	
1	1 C4 C3 C2 C1 C0 X15 X14	
2	0 X13 X12 X11 X10 X9 X8 X7	
3	0 X6 X5 X4 X3 X2 X1 X0	
4	0 0 PR (X17 X16 Y16)Y15 Y14	PR 0= IN PROX 1= OUT OF
5	0 Y13 Y12 Y11Y10 Y9 Y8 Y7	PROX
6	0 Y6 Y5 Y4 Y3 Y2 Y1 Y0	
7	0 XT6 XT5 XT4 XT3 XT2 XT1	
8	XT0	TILT 40 TO 3F HEX 00= VERT.
9	0 YT6 YT5 YT4 YT3 YT2 YT1	
10	YT0	PRESSURE 0 TO 127
	0 P6 P5 P4 P3 P2 P1 P0	HEIGHT 0 TO 127
	0 H6 H5 H4 H3 H2 H1 H0	

23 format (2G) also 24,27 (note cursor coding is differt bewteen 23,24,27

	7 6 5 4 3 2 1 0	
1	1 C4 C3 C2 C1 C0 X15 X14	
2	0 X13 X12 X11 X10 X9 X8 X7	
3	0 X6 X5 X4 X3 X2 X1 X0	
4	0 0 PR (X17 X16 Y16)Y15 Y14	PR 0= IN PROX 1= OUT OF
5	0 Y13 Y12 Y11Y10 Y9 Y8 Y7	PROX
6	0 Y6 Y5 Y4 Y3 Y2 Y1 Y0	

if tilt data is enabled then the format 23 will change to:

	7 6 5 4 3 2 1 0	
1	1 C4 C3 C2 C1 C0 X15 X14	
2	0 X13 X12 X11 X10 X9 X8 X7	
3	0 X6 X5 X4 X3 X2 X1 X0	
4	0 0 PR (X17 X16 Y16)Y15 Y14	PR 0= IN PROX 1= OUT OF
5	0 Y13 Y12 Y11Y10 Y9 Y8 Y7	PROX
6	0 Y6 Y5 Y4 Y3 Y2 Y1 Y0	
7	0 TX6 TX5 TX4 TX3 TX2 TX1 TX0	
8	0 TY6 TY5 TY4 TY3 TY2 TY1 TY0	x tilt +/- 64. 0 is vert.

23 format (2G) From 0 TO 1FH (0 TO 31)ONLY IF PRESSURE PEN DATA IS ENABLED

	7 6 5 4 3 2 1 0	
1	1 P4 P3 P2 P1 P0 X15 X14	PRESSURE 0 TO 31
2	0 X13 X12 X11 X10 X9 X8 X7	
3	0 X6 X5 X4 X3 X2 X1 X0	
4	0 0 PR (X17 X16 Y16)Y15 Y14	PR 0= IN PROX 1= OUT OF
5	0 Y13 Y12 Y11Y10 Y9 Y8 Y7	PROX
6	0 Y6 Y5 Y4 Y3 Y2 Y1 Y0	

28 format (2B) also 25 (cursor coding deferent between 28 and 25)

	7 6 5 4 3 2 1 0	
1	0 1 C3 C2 C1 C0 C4 PR	PR 0= IN PROX 1= OUT OF
2	0 0 X5 X4 X3 X2 X1 X0	PROX
3	0 0 X11 X10 X9 X8 X7 X6	on format 28 no c4 bit
4	0 0 Y5 Y4 Y3 Y2 Y1 Y0	
5	0 0 Y11 Y10 Y9 Y8 Y7 Y6	

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
2	0 X6 X5 X4 X3 X2 X1 X0	PROX
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	I 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
2	0 X6 X5 X4 X3 X2 X1 X0	PROX
3	0 Y6 Y5 Y4 Y3 Y2 Y1 Y0	

CAN ONLY GET TO DELTA FORMAT USING MM COMMANDS
NOTE X14* AND Y14* are set high(1) for + and low (0) for OR X14,Y14 NOT

31 format

	7 6 5 4 3 2 1 0	
1 2 3 4 5 6 7 8	0 1 0 0 T2 T1 T0 PR 0 0 0 C4 C3 C2 C1 C0 0 0 X5 X4 X3 X2 X1 X0 0 0 X11 X10 X9 X8 X7 X6 0 0 0 X16 X15 X14 X13 X12 0 0 Y5 Y4 Y3 Y2 Y1 Y0 0 0 Y11 Y10 Y9 Y8 Y7 Y6 0 0 0 Y16 Y15 Y14 Y13 Y12	PR 0= IN PROX 1= OUT OF PROX t2,1,0=100 or 000(lectra)
9 10 11	0 0 p5 p4 p3 p2 p1 p0 0 0 0 0 0 0 p7 p6 0 0 0 0 0 0 0 0	if pressure is enabled 0 to 255

CURSOR CODING

pen	0	20,,23, 24,27, 28	31	3, 29, 30	4, 5, 6, 7	8, 15, 16
up tip(0) sw1 sw2 0+1 0+2 1+2 0+1+2	0 1 2 4 3 5 6 7	00000 00001 00010 00100 00011 00101 00110 00111	00000 00001 00010 00011 00001 00101 00110 00001	0 1 2 3 3 3 3 3	U 0 1 2 0 4 5 0	00 01 02 03 01 05 06 01

4 BUTTON CURSOR	0	20,23,24,25,27,28	31	3, 29, 30	4, 5, 6, 7	8, 15, 16
up 0 1 2 3 0+1	0 1 2 4 8 3	00000 00001 00010 00100 01000 00011	00000 00001 00010 00011 00100 00001	0 1 2 3 4 3	U 0 1 2 3 0	00 01 02 03 04 01

0+2	5	00101	00101	3	4	05
1+2	6	00110	00110	3	5	06
0+1+2	7	00111	00001	3	0	01
0+3	9	01001	00001	5	0	01
1+3	:	01010	00010	6	1	02
0+1+3	;	01011	00001	7	0	01
2+3	<	01100	00011	7	2	03
0+2+3	=	01101	00001	7	0	01
1+2+3	>	01110	00010	7	1	02
0+1+2+3	?	01111	00001	7	0	01

16 BUTTON CURSOR	0	20,23	31,24, 27,28	3, 29 ,30	4,5,6, 7	8,15,16
up	0	00000	00000	0	U	00
0	1	10000	00001	1	0	01
1	2	10001	00010	2	1	02
2	4	10010	00011	3	2	03
3	3	10011	00100	4	3	04
4	5	10100	00101	5	4	05
5	6	10101	00110	6	5	06
6	7	10110	00111	7	6	07
7	8	10111	01000	0	7	08
8	9	11000	01001	1	8	09
9	:	11001	01010	2	9	10
A	;	11010	01011	3	A	11
B	<	11011	01100	4	B	12
C	=	11100	01101	5	C	13
D	>	11101	01110	6	D	14
E	?	11110	01111	7	E	15
F	@	11111	10000	0	F	16

COMMANDS (rs232)- subset of commands for DrawingSlate tablets
One byte command for all modes
NOTE this one byte commands can not be inhibited by the one byte command enable menu bit.

DC1 (X ON) start transmission after a x off.
DC3 (X OFF) stop transmission on the next character.
BEL (CNT G) BEEP OR BEL MAKE THE TABLET BEEP if beeper is installed.
? is the default prompt character.

tablet can respond to 2x00 commands in the 2000/9100 subsets.

2000 COMMANDS (2x00)
NOTE use these commands ONLY WHEN IN 2000 MODE/FORMATS. And can be inhibited by the one byte enable menu bit.

@ Track mode 1 pps	H run mode 1 pps	P point mode
A track mode 5 pps	I run mode 5 pps	Q point prompt mode
B track mode 10 pps	J run mode 10 pps	R run prompt mode
C track mode 20 pps	K run mode 20 pps	S halt or stop mode
D track mode 40 pps	L run mode 40 pps	T track prompt mode
E track mode 75 pps	M run mode 75 pps	
F track mode 100 pps	N run mode 100 pps	
G track mode 125 pps	O run mode 125 pps	

MM AND 2000 COMMANDS
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 use these commands can be inhibited by the one byte enable menu bit.

a send size
b set origin to upper left
c set origin to lower left note On 6x9 b set vertical and c set horizontal

d	100 lpi	i	20 lpmm	n	2 lpi
e	200 lpi	j	1000 lpi	o	50 lpmm (1270 lpi)
f	10 lpmm	k	1270lpi(2x00 mode	p	4 lpi
g	400 lpi	only)		q	40 lpmm
h	500 lpi	l	1 lpi		

MM commands

NOTE use these commands ONLY WHEN IN mm MODE/FORMATS. And can be inhibited by the one byte enable menu bit.

nul RESET (only in MM formats) note the Nul reconfigure the tablet a

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		

9100/2500 COMMANDS

ESC % A [0/1] cr disable/enable data out of port a
ESC % C n h n n [0|1]cr set communication parameters
| | | | - disable /enable cts handshaking (added to thin)
| | | +- stop bits 1
| | +---- data bits 7 or 8
| +------- parity N,E,O,M,S(none, even, odd, mark, space)
+--------- baud rate n=0 to 4
0=19200 1=9600 2=4800 3=2400 4=1200
ESC % H cr halt mode
ESC % I cr inc track mode
ESC % I R cr inc run mode
ESC % I T cr inc track mode
ESC % I U cr inc line mode
ESC % J R n,0 cr set resolution (n=1 TO 2540 LPI)
ESC % J M n,0 cr set res (n=1 to 100)
ESC % J L L cr set origin to lower left
ESC % J L R cr set origin to lower right
ESC % J U L cr set origin to upper left
ESC % J U R cr set origin to upper right
ESC % J C cr set origin to center
ESC % J O cr dpoint set origin to next point Digitized
ESC % J P [0|1|2|3|4|5|6|7] set portrait mode
ESC % L cr set/clear line feed on data
ESC % L 0 cr disable line feed on data
ESC % L 1 cr enable line feed on data

ESC % N [0/1] cr send data in margins
ESC % P cr point mode
ESC % Q cr clear prompt mode
ESC % Q h cr set prompt mode and prompt character= h
ESC % R cr run mode
ESC % T cr track mode
ESC % U cr line mode

ESC % V E cr set up default settings in all 4 RECALL BLOCKS

ESC % V F cr make current switch settings active Clear set up mode
ESC % V R cr reset tablet
ESC % V R n CR recall bank n and make setting active n= 1 to 3 and clear setup mode
ESC % V R 5 CR RECALLS CALCOMP SOFTWARE SETTING
ESC % V R 6 CR RECALLS format 20 aft on

ESC % V S cr send tablet size
ESC % V V n CR set EXTRA data modes. n= 00110xxxb
"1" * tilt correct
"2" * tilt data
"4" * height data

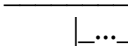
ESC % V A [0/1] PRESSURE PEN DATA 0=OFF 1=ON, ON FORMATS WITH OPTIONAL PRESSURE DATA FIELDS
ESC % V A [2/3] tilt to PRESSURE PEN DATA 2=OFF 3=ON
ESC % V A V n SET PRESSURE PEN LEVEL N = 0 TO 255

ESC % V 0 LED 2 OFF
ESC % V 1 LED 2 ON
ESC % V 8 DISABLE BEEPER
ESC % V 9 ENABLE BEEPER
ESC % V 4 DISABLE BEEPER CLICK ON PEN DOWN
ESC % V 5 ENABLE BEEPER CLICK ON PEN DOWN
ESC % V m [0|1] cr set/clear enable menu
ESC % V f [0|1] cr set/clear enable function blocks

ESC % W n cr set data rate (n=1 to 125)
ESC % X n cr set inc value (N=0 TO 64000)
ESC % Y n cr set inc value (n= 0 to 64000)
ESC % Z [0/1] cr # send data out of proximity
ESC % Z 2/3 CR 3= SET LOW PROXIMITY 2= SET HIGH PROXIMITY
ESC % ^ n cr set format number (n=0 to 31 or "m" or "M")
0= 2000 ASCII 3=mm ascii 4= 9100 #1 5= 9100 #2
6= 9100 #3 7= 9100 #4 20=cal bin with ATF
23= g bin 29 mm bin delta 30 mm bin
31=microgrid bin
ESC % _ _ V CR firmware part numbers ” 70xxxA 16XXX CR LF”

ESC % _ _ p CR prouduct id “CALCOMP 3100 or CalComp 3200 “

CTS.
CTS will stop next data byte out if bit in menu is enabled.
CTS toggled in software setup mode, will send a "T" at * .

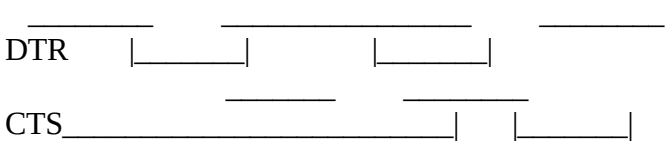


DTR

DTR toggled high low high 5 times in one sec. puts tablet in "software set up mode" where the output buffer is flushed data port is disabled and commutations is set to 9600 n 8 1. To exit this mode use a esc % VR n. command OR VF COMMAND and a A1 command. note min on/off time for toggle is 1/18 of a sec (IBM timer tic).

PLUG AND PLAY (WIN 95) 4x5 only

.2+/- .035 SEC



DTR go high then with in 150 msec to 250 msec cts go high then tablet send plug and play string at 1200 buad 7 data no parity 2 stop bits.
string could be "(01CAL0001\\TABLET\\CalComp DrawingSlate 4x5 xx) cr lf" or similar. see plug and play spec.

BINARY FORMATS

20 format AFT 4x5 only

	7 6 5 4 3 2 1 0	
1	1 C4 C3 C2 C1 C0 X15 X14	
2	0 X13 X12 X11 X10 X9 X8 X7	
3	0 X6 X5 X4 X3 X2 X1 X0	
4	0 plsb PR (X17 X16 Y16)Y15	PR 0= IN PROX 1= OUT OF PROX
5	Y14	plsb= pressure lsb added 70210 rev b
6	0 Y13 Y12 Y11Y10 Y9 Y8 Y7	
7	0 Y6 Y5 Y4 Y3 Y2 Y1 Y0	
8	0 XT6 XT5 XT4 XT3 XT2 XT1	
9	XT0	TILT 40 TO 3F HEX 00= VERT.
10	0 YT6 YT5 YT4 YT3 YT2 YT1	
	YT0	PRESSURE 0 TO 127
	0 P6 P5 P4 P3 P2 P1 P0	HEIGHT 0 TO 127
	0 H6 H5 H4 H3 H2 H1 H0	

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
2	0 0 0 C4 C3 C2 C1 C0	t2,1,0=100 or 000(lectra)
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 7 8	0 0 Y5 Y4 Y3 Y2 Y1 Y0 0 0 Y11 Y10 Y9 Y8 Y7 Y6 0 0 0 Y16 Y15 Y14 Y13 Y12	
9 10 11	0 0 p5 p4 p3 p2 p1 p0 0 0 0 0 0 0 p7 p6 0 0 0 0 0 0 0 0	if pressure is enabled 0 to 255