DATA OUTPUT FORMATS

The output format is the manner in which ASCII or binary characters are transmitted from the tablet to represent the position of the cursor, the operating mode and other information.

There are 32 possible output formats. Four are standard CalComp 9100 series formats, three are standard CalComp 2000 or 2200 series formats and one is a standard Calcomp 4000 Wedge series format. These formats are used by many applications software packages. On power-up, the 2500 Tablet will default to the format specified in the soft switch settings.

NOTE

The 2500 Tablet will only respond to CalComp 9100, 2500 and 2000 series digitizer commands. Although it can emulate the data output formats of other manufacturer's tablets, it will not respond to other manufacturer's tablet function commands. A complete listing of the 9100, 2000 and 2500 commands begins on page 58.

FORMAT DEFINITIONS

@	"At" sign. In ASCII formats, it is a literal @ symbol (HEX 40) in the output.
C (or Ca, Cb)	Cursor Status Character. In ASCII formats, "C" represents a single character, multiple characters are "Ca", "Cb".
Cn	Cursor Status Bit. In Binary formats, the highest number "Cn" is the most significant bit, "C0" is the least significant bit.
Comma (,)	Comma. In ASCII formats it is a literal comma (HEX 2C) in the output.
Carriage Return (<CR>)> in output format	Carriage return. In ASCII formats, a literal carriage return (HEX 0D) in the output.
Decimal Point (.)	Decimal Point. In ASCII formats it represents a literal decimal point (HEX 2E) in the output.
Line feed (<LF>)	Line feed. In ASCII formats it represents a literal line feed command (HEX 0A) in the output.> in output format
LPmm, LPI	Lines per millimeter, lines per inch.
M	Mode Status Character. In ASCII formats, "M" is a single character representing the current operating mode.
MSB, LSB	Most significant bit, least significant bit.
N	Near Proximity. In Binary formats, this bit is set when the transducer is out of proximity.

P	Pen (Cursor) Status. In ASCII formats, a character reading "D" when the stylus tip or any cursor button is depressed and "U" when the stylus tip or all cursor buttons are up.
Space (<SP>)> in output data format	Space Character. In ASCII formats, <SP> represents a literal space character command (HEX 20) in the output. Any spaces in the following output format tables not indicated by <SP> are for clarity only and are not part of the tablet output data.
Sx and Sy	Sign Character or Bit. In ASCII formats, a "+" for positive and a "-" for negative. In binary formats, a "0" bit for positive and a "1" bit for negative **except** for Formats 29 and 30 which use "0" for negative and "1" for positive.
T	Tablet Status. In ASCII formats, a single character reading "A". Included for CalComp 9100 compatibility.
T0	Tablet Status. If the first character of the tablet status characters is set to anything but "A", T0 will be equal to the lower three bits of that ASCII character in formats 8, 15, 16 and 31. T0 will equal the lowest bit in formats 29 and 30.
X or Y	Data Digit. In ASCII formats, a numeric character representing coordinate data. The number of X or Y symbols represents the allowable number of digits in any output.
Xn or Yn	Data Bit. In binary formats, a bit representing coordinate data. The highest numbered "n" is the most significant bit.

MODEL TO FORMAT CONVERSION

MANUFACTURER	MODEL	FORMAT NAME	2500 FORMAT
CalComp	2000	ASCII	0
CalComp	2000	Binary	28
CalComp	2000	ASCII (Special)	2
CalComp	2200	Format 1	0
CalComp	2200	Format 2	1
CalComp	2200	Format 3	28
CalComp	4000	ASCII	1
CalComp	9100	Format 1	4
CalComp	9100	Format 2	5
CalComp	9100	Format 3	6
CalComp	9100	Format 4	7
GTCO	DP5	ASCII	9
GTCO	DP5	Binary Low resolution	25
GTCO	DP5	Binary High resolution	23
GTCO	MD7	ASCII	10,11
GTCO	MD7	Binary	28
Hitachi	HDG 1111	ASCII	12,14
Hitachi	HDG 1111	Binary Low resolution	28
Hitachi	HDG 1111	Binary High resolution	27

Manufacturer	Model	Format	Number
Hitachi	HDG 1515	ASCII	12,14
Hitachi	HDG 1515	Binary Low resolution	28
Hitachi	HDG 1515	Binary High resolution	27
Houston Instruments	HI Pad	ASCII	13
Kurta	Series 1	Format 1	28
Kurta	Series 1	Format 2	24
Kurta	Series 1	Format 3	26
Kurta	Series 1	Format 4 ASCII	10
Kurta	Series 2	ASCII	10
Kurta	Series 2	Binary	24
Numonics	2200		23
Summagraphics	BitPad 1	ASCII	0
Summagraphics	BitPad 1	Binary	28
Summagraphics	1103 (BitPad 2)	ASCII	0
Summagraphics	BitPad 2	Binary	28
Summagraphics	1105 (BitPad 2)	ASCII	8,15,16
Summagraphics	BitPad 2	Binary	31
Summagraphics	MM	ASCII	0
Summagraphics	MM	Binary (3-byte)	29
Summagraphics	MM	Binary (5-byte)	30

OUTPUT FORMATS

FORMAT	RESOLUTION	ASCII OUTPUT
0	<510 LPI, <21 LPM >509 LPI, >20 LPM	XXXX,YYYY,C CR XXXX,YYYY,C CR
1	<510 LPI, <21 LPM >509 LPI, >20 LPM	C XXXX YYYY CR C XXXX YYYY CR
2	ALL	@ C Sx XXXXX Sy YYYYY CR
3	RESERVED	RESERVED
4	<1280 LPI, <51 LPM >1279 LPI, >50 LPM	T M C XXXXX YYYYY CR T M C XXXXXX YYYYYY CR
5	<1280 LPI, <51 LPM >1279 LPI, >50 LPM	XXXXX, YYYYY , T M C CR XXXXXX, YYYYYY , T M C CR
6	<1280 LPI, <51 LPM >1279 LPI, >50 LPM	C P XXXXX YYYYY CR C P XXXXXX YYYYYY CR
7	1000 LPI 100 LPM 10 LPM OTHER	SP XX.XXX, SP YY.YYY,T M C CR SP XXXX.XX, SP YYYY.YY,T M C CR SP XXXX.X, SP YYYY.Y,T M C CR SP XXXXX., SP YYYYY.,T M C CR

8	1000 LPI	Sx XX.XXX, Sy YY.YYY, CbCa, T0 CR
	100 LPM	Sx XXXX.XX, Sy YYYY.YY, CbCa, T0 CR
	10 LPM	Sx XXXX.X, Sy YYYY.Y, CbCa, T0 CR
	OTHER	Sx XXXXX., Sy YYYYY., CbCa, T0 CR
9	<510 LPI, <21 LPM	C XXXX SP YYYY CR
	>509 LPI, >20 LPM	C XXXXX SP YYYYY CR
10	<510 LPI, <21 LPM	C XXXX YYYY CR
	>509 LPI, >20 LPM	C XXXXX YYYYY CR
11	<510 LPI, <21 LPM	XXXX YYYY C CR
	>509 LPI, >20 LPM	XXXXX YYYYY C CR
12	<510 LPI, <21 LPM	XXXX , YYYY , C CR
	>509 LPI, >20 LPM	XXXXX , YYYYY , C CR
13	ALL	C Sx XXXXX Sy YYYY CR
14	<510 LPI, <21 LPM	Sx XXXX Sy YYYY C CR
	>509 LPI, >20 LPM	Sx XXXXX Sy YYYYY C CR
15	ALL	Sx XXXXX, Sy YYYYY, CbCa, T0 CR
16	ALL	Sx XXXX.XXX, Sy YYYY.YYY, CbCa, T0 CR
17 to 22	RESERVED	

16-BUTTON CURSOR OUTPUT

		ASCII FORMATS		
	BUTTON PRESSED	0,2,9, 10and11	4,5,6 and7	12
PEN UP	NONE	0	U	SP
PEN DOWN	0	1	0	0
	1	2	1	1
	2	3	2	2
	3	4	3	3
	4	5	4	4
	5	6	5	5
	6	7	6	6
	7	8	7	7
	8	9	8	8
	9	:	9	9
	A	;	A	*
	B	<	B	#
	C	=	C	0
	D	>	D	1
	E	?	E	2
	F	@	F	3

	BUTTON PRESSED	8,15,16 IN PROX	8,15,16 OUT OF PROX	1 RUN MODE	1 OTHER MODES
PEN UP	NONE	00	32	9	8
PEN DOWN	0	01	33	1	0
	1	02	34	3	2
	2	03	35	5	4
	3	04	36	7	6
	4	05	37	1	0
	5	06	38	3	2
	6	07	39	5	4
	7	08	40	7	6
	8	09	41	1	0
	9	10	42	3	2
	A	11	43	5	4
	B	12	44	7	6
	C	13	45	1	0
	D	14	46	3	2
	E	15	47	5	4
	F	16	48	7	6

BUTTON DOWN	LINE TRACK (IST)	FORMAT 13 LINE TRACK	POINT	RUN
NONE	3	N/A	N/A	3
0,4,8, or C	0	1	2	4
1,5,9, or D	@	A	B	D
2,6,A, or E	'	a	b	d
3,7,B, or F	P	Q	R	T

4-BUTTON CURSOR OUTPUT

		ASCII FORMATS	
	BUTTON PRESSED	0,2,9, 10and11	12, 14
PEN UP	NONE	0	SP
PEN DOWN	0	1	1
	1	2	2
	2	4	3
	3	8	4

The following formats duplicate the first four buttons of the 16-button cursor output with the 4-button cursor:

1,4,5,6,7,8,13,15,and 16

BINARY FORMATS

FORMAT 23

BYTE	(MSB) 7	6	5	4	3	2	1	(LSB) 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	0	0	0	0	Y15	Y14
5	0	Y13	Y12	Y11	Y10	Y9	Y8	Y7
6	0	Y6	Y5	Y4	Y3	Y2	Y1	Y0

FORMAT 24

BYTE	(MSB) B7	B6	B5	B4	B3	B2	B1	(LSB) B0
1	1	M	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	0	0	0	0	Y15	Y14
5	0	Y13	Y12	Y11	Y10	Y9	Y8	Y7
6	0	Y6	Y5	Y4	Y3	Y2	Y1	Y0

FORMAT 25

BYTE	(MSB) B7	B6	B5	B4	B3	B2	B1	(LSB) B0
1	0	1	C3	C2	C1	C0	C4	0
2	0	0	X5	X4	X3	X2	X1	X0
3	0	0	X11	X10	X9	X8	X7	X6
4	0	0	Y5	Y4	Y3	Y2	Y1	Y0
5	0	0	Y11	Y10	Y9	Y8	Y7	Y6

FORMAT 26

	(MSB)							(LSB)
BYTE	B7	B6	B5	B4	B3	B2	B1	B0
1	1	N	0	M	C3	C2	C1	C0
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

FORMAT 27

	(MSB)							(LSB)
BYTE	B7	B6	B5	B4	B3	B2	B1	B0
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	0	0	0	0	Y15	Y14
5	0	Y13	Y12	Y11	Y10	Y9	Y8	Y7
6	0	Y6	Y5	Y4	Y3	Y2	Y1	Y0

FORMAT 28

	(MSB)							(LSB)
BYTE	B7	B6	B5	B4	B3	B2	B1	B0
1	0	1	C3	C2	C1	C0	M	N
2	0	0	X5	X4	X3	X2	X1	X0
3	0	0	X11	X10	X9	X8	X7	X6
4	0	0	Y5	Y4	Y3	Y2	Y1	Y0
5	0	0	Y11	Y10	Y9	Y8	Y7	Y6

FORMAT 29

BYTE	(MSB) B7	B6	B5	B4	B3	B2	B1	(LSB) B0
1	1	N	T0	Sx	Sy	C2	C1	C0
2	0	X6	X5	X4	X3	X2	X1	X0
3	0	Y6	Y5	Y4	Y3	Y2	Y1	Y0

Sx amd Sy are 0 for negative output and 1 for positive in this format.

FORMAT 30

BYTE	(MSB) B7	B6	B5	B4	B3	B2	B1	(LSB) B0
1	1	N	T0	Sx	Sy	C2	C1	C0
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

Sx and Sy are 0 for negative output and 1 for positive in this format.

FORMAT 31

BYTE	(MSB) B7	B6	B5	B4	B3	B2	B1	(LSB) B0
1	0	1	0	0	T2	T1	T0	N
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	Sx	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	Sy	Y15	Y14	Y13	Y12

BINARY FORMATS

16-BUTTON CURSOR OUTPUT

BUTTON PRESSED	FORMAT 24, 26, 28	FORMAT 27, 31	FORMAT 29, 30	FORMAT 23, 25
NONE	0 0 0 0	0 0 0 0 0	0 0 0	0 0 0 0 0
0	0 0 0 1	0 0 0 0 1	0 0 1	1 0 0 0 0
1	0 0 1 0	0 0 0 1 0	0 1 0	1 0 0 0 1
2	0 0 1 1	0 0 0 1 1	0 1 1	1 0 0 1 0
3	0 1 0 0	0 0 1 0 0	1 0 0	1 0 0 1 1
4	0 1 0 1	0 0 1 0 1	1 0 1	1 0 1 0 0
5	0 1 1 0	0 0 1 1 0	1 1 0	1 0 1 0 1
6	0 1 1 1	0 0 1 1 1	1 1 1	1 0 1 1 0
7	1 0 0 0	0 1 0 0 0	0 0 0	1 0 1 1 1
8	1 0 0 1	0 1 0 0 1	0 0 1	1 1 0 0 0
9	1 0 1 0	0 1 0 1 0	0 1 0	1 1 0 0 1
A	1 0 1 1	0 1 0 1 1	0 1 1	1 1 0 1 0
B	1 1 0 0	0 1 1 0 0	1 0 0	1 1 0 1 1
C	1 1 0 1	0 1 1 0 1	1 0 1	1 1 1 0 0
D	1 1 1 0	0 1 1 1 0	1 1 0	1 1 1 0 1
E	1 1 1 1	0 1 1 1 1	1 1 1	1 1 1 1 0
F	0 0 0 0	1 0 0 0 0	0 0 0	1 1 1 1 1

4-BUTTON CURSOR OUTPUT

BUTTON PRESSED	FORMAT 24, 26, 28	FORMAT 27, 31	FORMAT 29, 30	FORMAT 23, 25
NONE	0 0 0 0	0 0 0 0 0	0 0 0	0 0 0 0 0
0	0 0 0 1	0 0 0 0 1	0 0 1	0 0 0 0 1
1	0 0 1 0	0 0 0 1 0	0 1 0	0 0 0 1 0
2	0 1 0 0	0 0 1 0 0	1 0 0	0 0 1 0 0
3	1 0 0 0	0 1 0 0 0	0 0 0	0 1 0 0 0

OPERATING MODES

The operating mode sets the conditions that must be satisfied before the tablet will transmit position information to the host. One or more modes may be active concurrently.

PROMPT MODE:

The host must transmit a prompt character to the tablet before a data point will be output. The default prompt character is "?". Prompting can operate in conjunction with any other mode.

RELATIVE OUTPUT MODES

A relative mode does not have a direct relationship between the tablet cursor position and the screen cursor position. The movements of the screen cursor will duplicate the tablet cursor's movements right, left, up and down, but its exact position on the screen will depend only on where it was when the cursor was activated.

DELTA

The data output represents the change in the transducer's position since the last point was output rather than the absolute position of the transducer on the tablet. DELTA may be used in conjunction with "LINE", "RUN", "POINT" or "TRACK".

ABSOLUTE OUTPUT MODES

Absolute modes have a direct relationship between the tablet's active area and the screen display. If the cursor is moved from lower left to upper right on the tablet, the screen's cursor will move from the lower left of the screen to the upper right.

HALT   The tablet continues to accept commands, but no data will be output until a new mode is selected.

LINE   The tablet outputs position data continuously while the stylus tip or a cursor button is depressed. One additional point is output when the stylus or button is released.

POINT   The tablet outputs one data point each time the stylus tip or cursor button is depressed.

RUN   The tablet outputs data points continuously. This mode is called "STREAM" by some manufacturers.

TRACK   The tablet outputs data points continuously while the stylus tip or cursor button is depressed. Unlike LINE, there is no extra point transmitted when the button is released.

INCREMENT   Data points are only output if the transducer has been moved the required increment distance. The increment distance must first be set by the SET INCREMENT command. Increment may be used in conjunction with "LINE", "RUN", or "TRACK".

NOTE

Changing the tablet resolution will affect the increment distance. See the discussion of resolution on page 80.

TROUBLESHOOTING

DIAGNOSTIC TESTS

When the tablet is powered on, or upon reception of the software reset command, it runs diagnostic self-tests to ensure the tablet is functioning correctly. After these tests, the tablet sounds the utility tone and is ready for operation. If any test fails, the tablet sounds an error tone and the test indicator flashes. The corresponding indicator (#1-8) of the failed test will also light.

If the tablet fails the self-tests, note which indicator is lit, write it down and contact your local CalComp service representative or call 1-800-CALCOMP. A comprehensive description of the self-tests and other diagnostic tests for the use of trained electronics technicians is included in this section. You may be asked to perform the tests and report the results to the service department.

NO DATA

If no data is being received by the host, check the following:

1. Is the tablet plugged in to a live receptacle and is its power switch on?

2. Switch the power off, then on. Does the tablet pass the self-tests?

3. Check the fuses. See page 52 for details on removing the fuse block.

4. Are all connections between the tablet and host tight? See pages 4 and 5.

> Tablet to transducer?
>
> Tablet to RS232 connection?
>
> Host to RS232 connection?

5. Is the RS232 cable plugged into the correct communications port?

6. Is the host computer turned on and ready to receive data?

7. Is the tablet disabled? Indicators #7 and #8 will be lit if the tablet is disabled.

8. Is the transducer in proximity?

9. Are the soft switches set properly for the software you are using? Recheck the settings.

10. Are the transmit and receive data lines configured properly? Check the host and software user's manuals for the right configuration. They can be reversed by setting Bank 5, switch 2.

GARBLED DATA

If data is transmitted, but garbled:

1. Does the data output format of the tablet match the data format expected by the software? See pages 27 through 41, and check the software manual.

2. Are the baud rate, number of data bits, parity bits and stop bits set to match the host's requirements? Does it match the software's requirements? Check the operator's manuals for the host and software.

TABLET DIAGNOSTIC TESTS

AUTOMATIC SELF-TESTS

At power up or software reset, the tablet runs the ROM CHECKSUM, RAM READ/WRITE, NON-VOLATILE MEMORY CHECKSUM and RS-232 PINOUT tests. If these self-tests are passed, the tablet sounds the utility tone and is ready for operation. If any test fails, the tablet sounds an error tone, the numbered block corresponding to the failed test lights, and the TEST indicator light flashes. See Bank 1 of the Soft Switch Test Assignments, on page 46, to identify the failure indicator.

Picking either the BANK or TEST blocks will take the tablet out of the failure mode and stop the flashing indicator. The tablet will attempt to operate normally.

DIAGNOSTIC TESTS

The diagnostic tests designated as "Runtime" tests are basic tests which the untrained user can perform. They are the same as the automatic self-tests that the tablet runs on power up. The "Comprehensive" tests are more detailed diagnostic tests meant for the use of trained factory or field service engineers.

NOTE:

The specifications of the comprehensive tests are subject to change at anytime, and without notice.

Tests may be run from the soft switch banks or by sending ESC % _ _ (b) CR commands from the host. The output will only appear on the numbered indicator LEDs if the soft switches are used. The output will appear on both the LEDs and on the RS-232 port if the ESC % _ _ (b) CR commands are used. See page 60 for details on sending commands.

ENTERING TEST MODE

To enter the test mode from the normal operating mode, pick the BANK block to first enter BANK SELECT mode. Then pick the numbered block that corresponds with the number of the test you wish to run. Finally, pick the TEST block. The results of the test will be displayed on the numbered indicators.

To run another test, pick BANK again, then the numbered block which corresponds with the next test, then TEST.

To return to normal mode, pick the TEST block a second time, after you have seen the results of the selected test.

1. Select Bank

2. Select Test.

3. Digitize TEST Block

4. Display Results
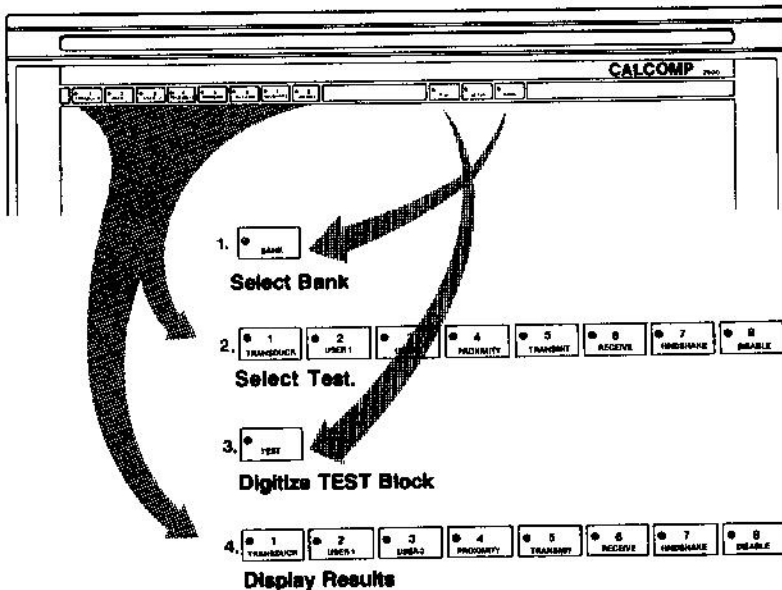
SOFT SWITCH ASSIGNMENTS IN TEST STATE

The tablet uses the following switch assignments for running the tests from the soft switches.

BANK 1: Self-tests and RS-232 pinout indicators

      Switch 1: Spare

      Switch 2: RS-232 Pinout (Pin 2 voltage indicator)

      Switch 3: RS-232 Pinout (Pin 3 voltage indicator)

      Switch 4: Non-Volatile Memory Failure

      Switch 5: ROM Checksum Failure

      Switch 6: RAM Read/Write Failure

      Switch 7: Spare

      Switch 8: Spare

BANK 2: Model ID

Bank 3: Software ID

Bank 4: Analog to Digital Converter

Bank 5: Input

Bank 6: Grid Test

Bank 7: Checksum

Bank 8: Transducer Data

TEST DESCRIPTIONS

RUNTIME OR SELF-TESTS

RS-232 PINOUT — This is NOT a failure indicator. Indicator lights #2 and #3 correspond to pins #2 and #3 of the RS-232 connector. The indicator lights if -12 V is present on the pin.

NON-VOLATILE MEMORY CHECKSUM — All bytes of the non-volatile memory are added and compared to a Checksum. If they are not equal, the test is failed. Each time the memory is altered, a new Checksum is calculated and stored.

ROM CHECKSUM — The bytes of the ROM are exclusive-ORed. The test fails if the ending value is non-zero.

RAM READ/WRITE — The RAM is written with a checkerboard pattern, read, and compared with write data. The test fails if the two don't match. Data needed by the system is moved so the entire RAM may be checked without destroying its contents.

COMPREHENSIVE TESTS

MODEL ID — The tablet model number (25120 or 25180) is output in consecutive ASCII characters on the numbered LEDs. To view the characters, press a cursor button or the stylus tip for each character. After the last character is displayed, the tablet returns to BANK/SELECT.

SOFTWARE ID — The software part number and current revision level are output in ASCII characters as in the MODEL ID test.

ANALOG TO DIGITAL TEST

Place the transducer on the active area during this test. The differential voltage between the Y axis wires located by the transducer is output continuously on the LEDs as a binary number between 00 and FF (0 volts to 10 volts).

INPUT TEST

When a character is received, the tablet beeps and the numbered indicator LEDs form a binary ASCII display of the character. They hold the display until a new character is received. Exit the test by pressing a cursor button or the stylus.

GRID TEST

The grid wires are tested as the transducer moves across the tablet. This test requires the user to move the transducer from left to right along the X axis, then from top to bottom along the Y axis. The number of the wire being tested is output as a binary number (Y is biased by 80H) on the indicator LEDs. If the test encounters a bad wire, it stops counting. The last number output is the number of the bad wire. If the tablet passes the test, it beeps and returns to normal.

CHECK SUM OUTPUT

The checksum output should be zero.

TRANSDUCER DATA

The output is an eight-bit binary number, followed by a CR and LF.

b0   Pen/Button Down

b1-b4   Button Code, a four-bit indication of which button is pressed (cursor line status)

b5   Cursor Present

b6   4 Button Cursor Present

b7   Reserved

TEST COMMANDS

The diagnostic tests can also be activated from the host keyboard or user menu overlay with the command:

ESC % _ _ (b) CR

where b is one to eight and corresponds to the soft switch test assignment. If a test is not self-terminating, send a character to the tablet to exit. The output is in ASCII or HEX on the display screen, and in binary on the tablet LEDs.

NOTE:

The tablet will not respond if "ESC % _ " is entered from the ASCII portion of the overlay. The blank box in the upper right corner of the menu activates the control sequence "ESC% _".

Select that box, then finish the command with _ (n)CR from the lower part of the overlay.

ESC %_ _1 CR SELF TESTS	The output is a 2-digit HEX number, corresponding to the binary output of the LEDs, followed by a carriage return and line feed. b0 0 b1 RS-232 pinout indicator (pin 2) b2 RS-232 pinout indicator (pin 3) b3 Non-volatile Memory failure b4 ROM Checksum failure b5 Ram Read/Write failure b6 0 b7 0
ESC % _ _ 2 CR MODEL ID	The tablet model number (25120 or 25180), followed by a carriage return and line feed, will be output to the host in ASCII characters.

ESC % _ _ 3 CR SOFTWARE ID	The software part number and current revision level are output in ASCII characters, followed by a carriage return and a line feed.
ESC % _ _ 4 CR ANALOG TO DIGITAL TEST	The test results are output as a 2-digit HEX number between 00 and FF (0 volts to 10 volts).
ESC % _ _ 5 CR INPUT TEST	This test can't be run from the host because the first character of the input simultaneously exits the test. The equivalent test can be run by enabling the ECHO with ESC % E 1 CR and checking that the characters on screen are the same as the ones entered. To exit the test, disable ECHO with ESC % E 0 CR.
ESC% _ _ 6 CR GRID TEST	The number of the wire being tested is output as a two-digit HEX number. The Y-axis is biased by 80H.
ESC % _ _ 7 CR CHECK SUM OUTPUT	Output is a two-digit HEX number followed by a carriage return and line feed.
ESC % _ _ 8 CR TRANSDUCER TEST	The data on the transducer port is output as a 2 digit HEX number followed by a carriage return and line feed. The test continues until a character is sent to the tablet.

MAINTENANCE

CLEANING THE TABLET SURFACE

Use a clean dry cloth to remove dust or dirt.

Never use an abrasive cleanser; it may scratch the surface. "Soft" cleansers may leave shiny spots on the tablet surface.

Use only the cleaning materials listed below to clean the tablet surface:

Denatured alcohol

Mild soap and water

Isopropyl alcohol (rubbing alcohol)
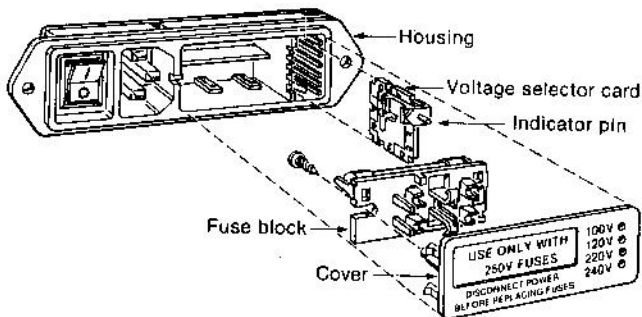
VM&P naphtha

Freon

PERIODIC MAINTENANCE

The 2500 tablet requires no periodic adjustments.

CHANGING THE OPERATING VOLTAGE

The tablet may be operated at 100-125 Volts AC, or at 200-250 Volts AC. If the operating voltage of the tablet is not the same as the operating voltage in your locale, follow the steps below to change it.

1. DISCONNECT THE TABLET FROM THE LINE CORD

2. Insert a small flat blade screwdriver into the notch at the left of the fuse block cover. Gently pry the left end of the fuse block cover up and remove the fuse holder.

Set aside cover/fuse block assembly for now.

3. Pull the voltage selector card straight out of its housing at the right, using the indicator pin as a handle. (Needlenose pliers are a help here.)

4. Orient the selector card so that the desired voltage label is right side up. Pull the indicator pin down to free it from the detent, turn it 1/4 turn to the right, then slide it up and to the right as far as possible.

Turn the pin another 1/4 turn so it points up, or away from the desired voltage label, then slide the pin down into the detent at the top of the card.

5. Reinstall the selector card. The printed side of the card must face the power cord connector, and the indicator pin must point out.
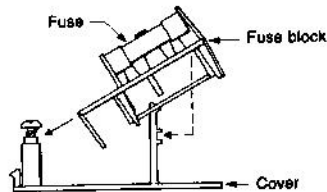
CHANGING THE FUSING

Tablets operating at 100-125 V require one slow blow fuse rated at .25 A.

Tablets operating at 200-250 V require two slow blow fuses rated at .125 A.
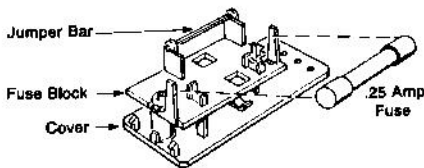
To change the fusing:

1. Loosen the Phillips screw on the fuse block one turn.

2. Remove the fuse block by lifting it free of the screw, sliding it away from the screw, then lifting up.

Fuse Block/Cover Assembly

Invert the fuse block and re-install it onto the pedestal. Insert the proper fuses into the holders. (Two fuses are required, although a dummy fuse may be used in the neutral (lower) holder.)

100-125 V Fusing Arrangement

200-250 V Fusing Arrangement
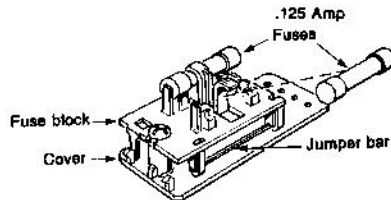
3. Reinstall the cover assembly. The indicator pin should now be visible in the 240V position.

CAUTION:

For protection against risk of fire or electric shock hazard, always replace fuses with the same type and rating of fuse.

COMMUNICATION INTERFACE

The 2500 tablet is designed for asynchronous serial RS-232C transmission using RS-232C/CCITT V.24 signals. This version supports an eight-wire data and handshaking subset of RS-232C. The tablet is configured to function as Data Terminal Equipment (DTE). DTE assumes transmit on pin 2 and receive on pin 3. The tablet can also emulate a DCE device, which transmits on pin 3 and receives on pin 2. If the host is configured as DTE and uses handshake signals, a null modem should be used between the tablet and host.

PIN NUMBER......................ASSIGNMENT

1 ....Chassis Ground

2(3) ....Transmitted Data

3(2) ....Received Data

4 ....Request To Send
....Output

5 ....Clear To Send
....Input, +12 V pullup

6 ....Data Set Ready
....Input, +12 V pullup

7 ....Signal Ground

8 ....Received Line Signal Detect
....Input, +12 V pullup

9-19 ....SPARE

20 ....Data Terminal Ready
....Output

21-23 ....SPARE

24 ....Optional Power Input
....when jumper W3 is installed.

25 ....Power Ground

ACCESSORIES

To order any of the items below, either contact your Calcomp distributor or call 1-800-CALCOMP and ask for order entry.

PART # ....DESCRIPTION

TABLETS

25120-01..................12" x 12" Tablet, RS232 DTE w/110V Power Supply

25120-02..................12" x 12" Tablet, RS232 DTE host powered

25120-03..................12" x 12" Tablet, RS232 DTE w/220V Power Supply

25180-01..................12" x 18" Tablet, RS232 DTE w/110V Power Supply

25180-02..................12" x 18" Tablet, RS232 DTE host powered

25180-03..................12" x 18" Tablet, RS232 DTE w/220V Power Supply

CURSOR

25034-01.................4-Button Cursor

25035-01.................4-Button Cursor, Diamond Shape

25036-01.................16-Button Cursor

I/o Cable
male to female kit 14809-1

STYLUS

25093-01.................Stylus w/o Ink

25094-01.................Stylus w/Blue Ink

25097-01.................Stylus w/Red Ink

MENU

14756-1...................Menu Overlay

USER'S MANUAL

50293-01.................2500 Series User's Manual

SPECIFICATIONS

PHYSICAL

Model 25120   12" x 12" (30 cm x 30 cm) active area
Height: minimum 0.545" (1.4 cm)
                         maximum 2.5" (6.4 cm)
Depth: 16" (41 cm)
Width: 15" (38 cm)
Weight: 6.2 lbs (2.8 kg)

Model 25180   12" x 18" (30 cm x 46 cm) active area
Height: minimum 0.545" (1.4 cm)
                         maximum 2.5" (6.4 cm)
Depth: 16" (41 cm)
Width: 21" (53 cm)
Weight: 9.4 lbs (4.3 kg)

FUNCTIONAL

Resolution   variable, user selectable up to
                         1280 LPI, 50 LPM.
Accuracy   +/- .015 inch (.254 mm) in the active area
Jitter   +/- .5 least significant digit
Proximity   0.75 inch (12.7 mm) +/- .25 inch
Speed   variable, user selectable up to 125
                         coordinate pairs per second.

ELECTRICAL

Input Power   Internal power supply or +12 to +15V
                         via RS232 connector
Power Consumption   10 watts
Input Voltage   90 - 110 VAC at 50 Hz
                         110 - 130 VAC at 60 Hz
                         190 - 210 VAC at 50 Hz
                         210 - 250 VAC at 60 Hz

REGULATORY

Safety: UL478 and IEC 380
Electromagnetic: FCC Class B, International VDE-B

ENVIRONMENTAL

Operating Temperature: 60 to 105 degrees F
                         15 to 40 degrees C
Storage Temperature: -131 to 167 degrees F
                         -55 to 75 degrees C
Humidity range: 0% to 95% non-condensing
Operating altitude: up to 15,000 Feet ASL
Storage altitude: up to 50,000 feet ASL

FACTORY SETTINGS

The 2500 tablet is shipped with the following parameters set in the soft switch banks. These settings will be invoked whenever the RESTORE FACTORY SETTINGS soft switch or menu block is selected.

BAUD RATE	9600
BEEPER	Enabled
COMMANDS	Enabled
CURSOR COMMANDS	Enabled
DATA BITS	7
DATA LINE ASSIGNMENT	DTE (Transmitting on pin 2)
DATA RATE	100 PPS
ECHO	Disabled
FORMAT	0
HANDSHAKE	Enabled
INDICATOR ASSIGNMENT	Tablet status
LINE FEED	Enabled
MARGIN DATA	Disabled
OPERATING MODE	HALT
OUT-OF-PROXIMITY DATA	Disabled
PARITY	Even
RESOLUTION	200 LPI
STOP BITS	1