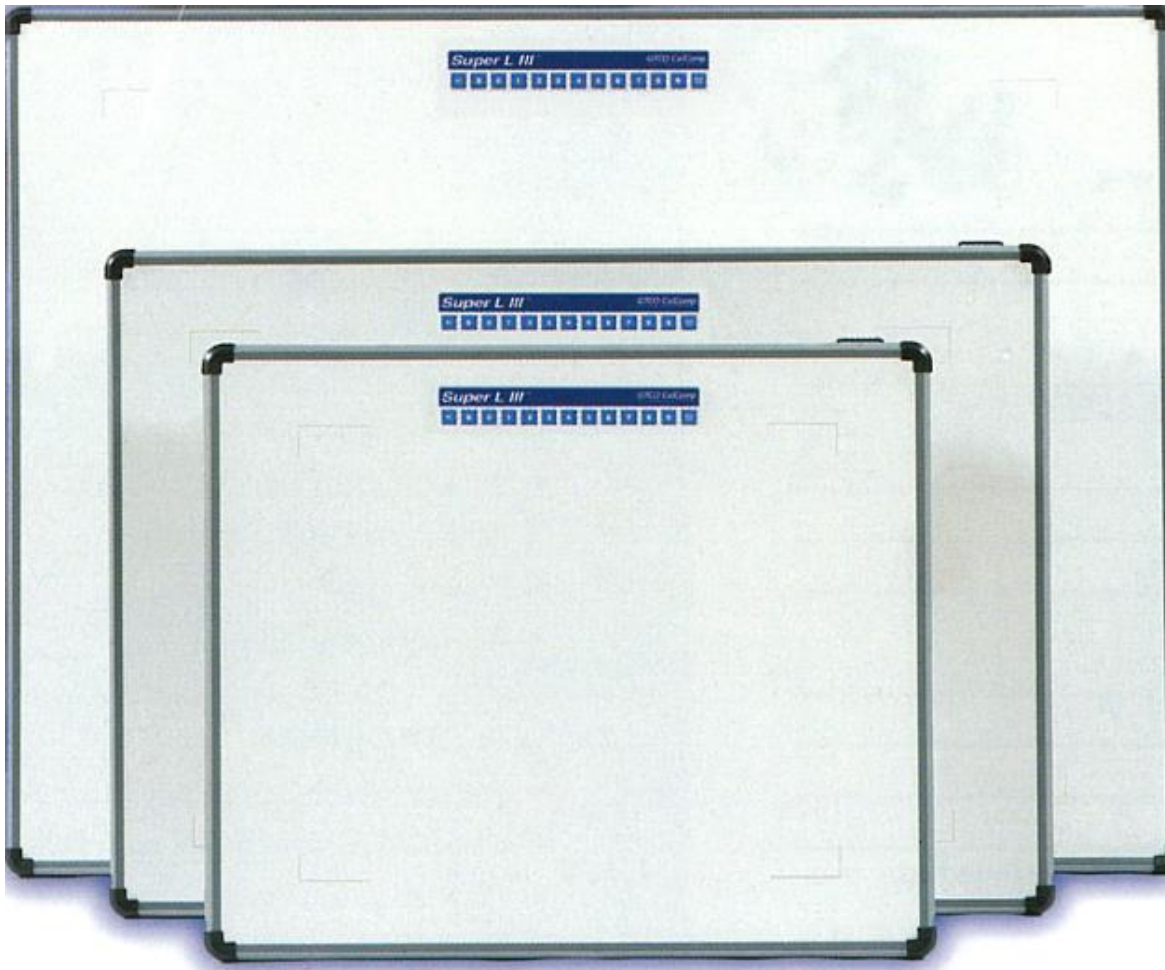




SUPER L III™ USER'S GUIDE



LARGE FORMAT DIGITIZERS



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Standard Operating Information

Parts Checklist

- ✓ Super L III Series digitizer with attached Controller
- ✓ Transducer (cursor or stylus)
- ✓ Power supply
- ✓ Computer interface cable with 9-pin connector and 9 to 25 adapter
- ✓ TabletWorks CD, which includes an electronic User's Manual

NOTE: Super L III Controller is the small enclosure attached to the back of the tablet. The Controller contains the electronics that drive the digitizer.

What You Need to Use Super L III

- Computer with an RS-232C communication port
- Graphic application software that accepts digitizer input

Caring for the Tablet and Transducer

Follow these precautions at all times to avoid damaging your Super L III:

- Avoid discharging static electricity to the tablet.
- Do not place heavy objects on the tablet surface.
- Do not use sharp objects; such as compasses or knives, on the tablet surface.
- Do not use the tablet surface for any purpose other than drawing, tracing or digitizing.
- Do not drill holes on any part of the digitizer or controller.

Cleaning the Tablet

To clean the tablet's surface, use a soft, non-abrasive cloth. Hardened dirt can be removed with a slightly dampened cloth. Do not clean pencil lines with a soft cleanser or pencil eraser. This could create an undesirable shiny spot on the tablet's surface that cannot be removed.



Do not use abrasive cleaners, acrylic, or lacquer paint thinners – or cleansers with an acetone or solvent base, such as MDC or EDC – on the tablet surface. They will damage the tablet.



Replacing the Pen Tip

To replace the pen tip, grasp the tip and pull straight out (see figure). Insert the new tip and press until it clicks into place.



Replacing the Cordless Pen Batteries

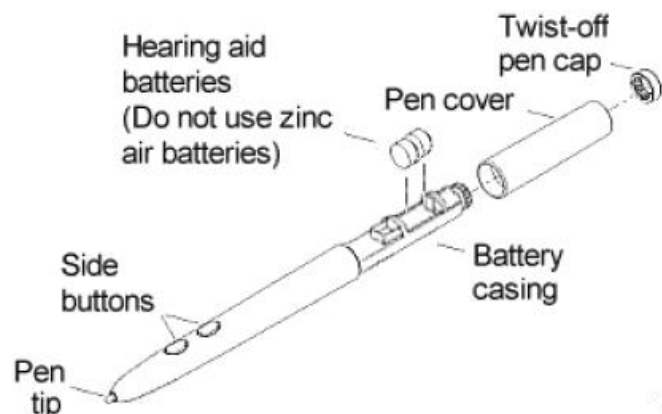
The pen requires two 393 silver oxide batteries. The average battery life is 200 hours.



Do not use ZINC AIR batteries as replacement batteries. They will corrode the electronics of the pen.

To replace the batteries:

1. Unscrew the pen cap. Hold the pen from the bottom and gently slide off the pen cover to expose the batteries.
2. Remove the old batteries by turning the pen over and gently tapping it, letting the batteries fall into your other hand.
3. Insert the new batteries as they are shown in the figure above (+ towards pen tip).
4. Replace the pen cover and screw the pen cap onto the pen.





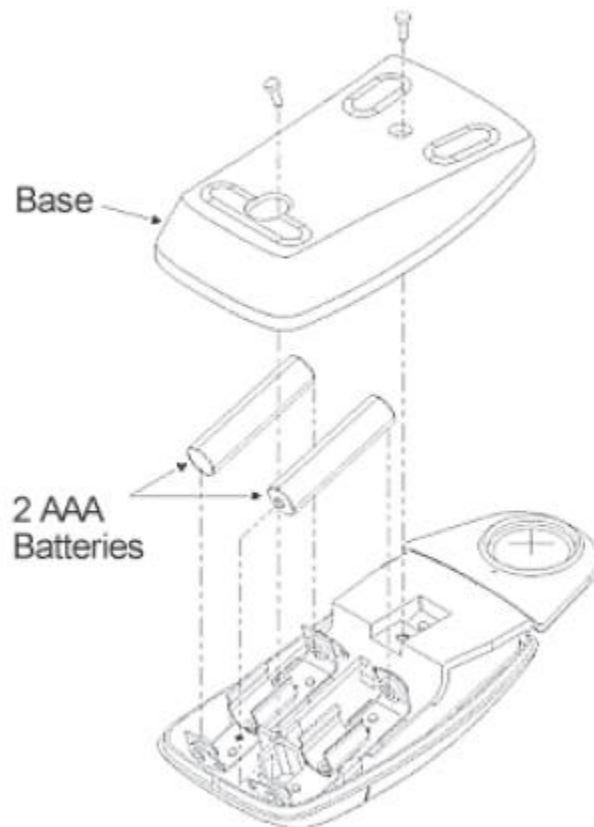
NOTE: When you replace the pen batteries, the pen will reset to the default frequency. If you changed the frequency of the pen before replacing the batteries, you will need to do so again after replacing the batteries (see the **Reducing Monitor Interference** section in **Troubleshooting**).

Replacing the Cordless Cursor Batteries

The cordless cursor requires two AAA batteries. The average battery life for the cursor batteries is 2,000 hours.

To replace the batteries:

1. Place the cursor face down in the palm of your hand. Use a Phillips screwdriver to remove the two screws located on the bottom of the cursor (see figure). Remove the cursor base.
2. Remove the old batteries from the battery casings.
3. Place the new batteries in the casings, matching the polarity of each battery with the markings on the connector strips (match + to +).
4. Reposition the cursor base. Replace the screws with the Phillips screwdriver.



NOTE: When you replace the cordless cursor batteries, the cursor will reset to the default frequency. If you changed the frequency of the cursor before replacing the batteries, you will need to do so again after replacing the batteries (see the **Reducing Monitor Interference** section in **Solving Problems**).



Installing Super L III

The following topics provide instructions for putting the Super L III system together and attaching it to your computer.

NOTE: Before you begin, please take a moment to fill out and mail the Warranty Registration Card or register your digitizer on our website at <http://www.gtccalcomp.com/warranty-information>.

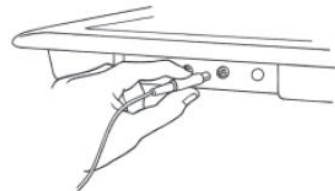
Mounting a Large Super L III Tablet

Super L III can be placed on a table, desk or drafting table. Alternatively, you can mount a tablet on a workstation stand available from a variety of manufacturers. Instructions will be packed with the stand. GTCO CalComp by Turning Technologies also provides Universal Mounting Brackets, as an option that allow the digitizer to be mounted to virtually any pedestal. Contact GTCO CalComp by Turning Technologies for price and availability.

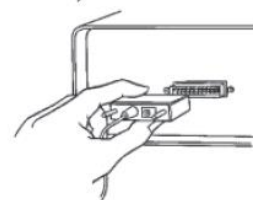
NOTE: Do not drill holes in any GTCO CalComp by Turning Technologies tablet. Drilling holes in any part of the tablet will void the warranty and may result in the purchase of a new tablet.

Connecting to Your Computer

Connect the round end of the serial cable to the jack labeled "I/O" on the Controller. The arrow on the connector should face up.

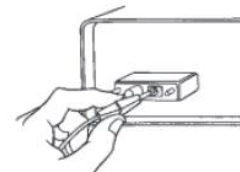


Attach the 9-pin or 9- to 25-pin connector to the serial port on back of your computer.



Connecting the Power Supply

Connect the power supply's cable to the jack on back of the serial cable's connector. Plug the power supply into a power outlet or power strip.





Connecting the Transducer

Six standard transducers are available for the Super L III.

- Cordless Stylus
- Cordless 4-button Cursor
- Cordless 16-button Cursor
- Corded Stylus
- Corded 4-button Cursor
- Corded 16-button Cursor

If you are using a corded transducer, attach the connector to the jack labeled **POINTER** on the tablet's Controller.

Applying Power to Super L III

With the wall mount power supplies, Super L III is powered when the unit is plugged into the outlet and the power switch is turned On. If you have a desktop supply, turn on the power supply switch. Super L III performs a self-test and responds with a series of tones when powered up.

When you apply power, you should instantly hear four short "Success!" tones and simultaneously see the green prox light in the upper right corner of the tablet flash four times. This response indicates that the Super L III is functioning properly.

If you hear any tones before the "Success!" tones or if you do not hear the four "Success!" tones or if the lights on the transducer do not flash four times, there is a problem. Carefully review the installation step-by-step and correct any errors. If there is still a problem, go to the **Troubleshooting** section of this manual.

Configuring Your Computer

Apply power to the computer. Configure your graphic application software to operate with Super L III. Many application programs provide configuration information for specific digitizers. If the GTCO CalComp by Turning Technologies Super L III digitizer is not listed, you can use the configuration for GTCO Digi-Pad Type 5 or Type 5A (T5/T5A), CalComp 3400, Summagraphics Microgrid III or ID Series.

If necessary, install the appropriate digitizer driver(s) from the TabletWorks CD supplied (AutoCAD, Windows and mouse drivers are included).

NOTE: Install only the drivers that are necessary for Super L III to work with your application software.



Mounting Transducer Holders

Each transducer comes with a holder. Remove the protective paper, exposing the adhesive layer on the bottom of the holder. Place the holder in a convenient location on the tablet, outside the marked active area.

Using the SuperSet Menu



Configuring for Specific Application Programs

To Configure Super L III for Use with Specific Application Programs:

1. In Table 1, select the application program you will be using with Super L III. Note the corresponding SuperSet Code.
 - a. If your application program is not listed in Table 1, find the configuration settings that apply to your application program in Table 2 and use that SuperSet Code.
 - b. If an appropriate SuperSet Code is not listed in Table 2, then use the **Tablet Configuration Utilities** to set up Super L III.
2. Select the **S** block on the SuperSet Menu. This lets the Super L III know you are about to set a new configuration. You will hear one short beep.

NOTE: The proximity light will turn on only when the transducer is over a SuperSet Menu block that is a valid selection (for example, the proximity light will not turn on over a digit block until the **S** block has been selected).

3. On the SuperSet Menu, select the two digits of the SuperSet code for your application program. You will hear one short beep after the first digit. Then, following the second digit, you will hear the four short "Success!" tones informing you that Super L III has reset itself to the new configuration. The proximity light on the tablet will also flash four times.



To cancel a menu selection before it is complete, digitize a point in the tablet's main active area. Three long beeps will indicate that the SuperSet selection process has been aborted. The proximity light on the tablet will also flash three times.

4. Run the corresponding application program on your computer.

NOTE: Hardware flow control is not supported by the Super L III Controller. If you have an application that requires this option, contact GTCO CalComp by Turning Technologies for alternatives.

Flow Control

Flow control is the process of regulating the traffic or flow of data between two RS-232C devices. Flow control prevents the transmission and subsequent loss of data if the receiver is not ready to accept it. Examples of devices that use flow control are: a printer to signal buffer full; a modem to indicate carrier detect; and a time-shared computer that services multiple users on a time-available basis.

There are two kinds of flow control:

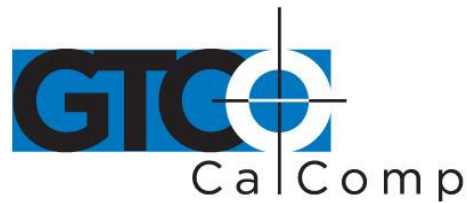
■ ***Software flow control*** is often used over communication links where only a 3-wire cable is used (Transmit Data, Receive Data, Ground) or over telephone lines. The sending device (such as the Super L III) will immediately stop sending data when it receives an ASCII XOFF character (CTRL-S, hex 13). Transmission will resume when it receives an ASCII XON character (CTRL-Q, hex 11). Character flow control will work with the straight through cable and the null modem cable.

■ ***Hardware flow control*** is not commonly used with digitizers and is therefore not supported by the Super L III Controller. Contact our Technical Support Department if you have hardware flow requirements. Flow control may not be needed when a terminal or digitizer is directly connected



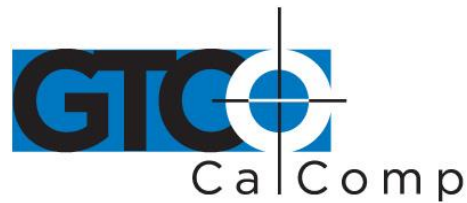
Table 1: SuperSet Menu Codes for Selected Application Programs

Program	Company	SuperSet Code
Access	Bautech	39
Advanced Construction Estim.	Software Shop Systems	28
A.G.E.	CEIA, Inc.	75
AGTEK Earthwork Engineering	AGTEK Development Co.	01
APS	Gunold & Stickma	52
ARC/CAD	ESRI	01
ARC/INFO	ESRI	12
ARCT, ACA		47
ATLAS*DRAW log res	Strategic Locations Planning	07
ATLAS*DRAW high res	Strategic Locations Planning	08
ATLAS GIS	Strategic Mapping	01
AutoCAD	Autodesk, Inc.	01
Autodesk 3D Studio	Autodesk, Inc.	01
AutoSketch	Autodesk, Inc.	01
Autoship	Coastdesign	01
Autoyacht	Coastdesign	01
Autumn	Zenographics	36
<hr/>		
Batisoft		46
Best Est II	Bird Construction Software	23
Bid Team	Construction Data Control, Inc.	58
Bidworx for DOS	Vertigraph, Inc.	31
Bidworx for Windows	Vertigraph, Inc.	01
BP-340	Barudan America, Inc.	77
Buildsoft	Buildsoft, Inc.	09
<hr/>		
Cadkey low res	Cadkey	18
Cadkey high res	Cadkey	25
Callidus	Oak Leaf Software	81
Carpet Estimating Systems	Ramco	54
Civilcad	Bloomfield Computer Services	03
CMS Estimating	Contractor Management Systems	29
CNG Survey	CNG Survey	05
Coastal	Oceanographics	42
Cogo-PC Plus	Civilsoft	01
COINS Estimating	Shaker Computer & Management	41
Composer Gold	Building Systems Design	42
Computer Methods Est.	Computer Methods	45
Comquest	Pinnacle Technology	38
Conception 3D	Serbi	22
Construction Link	The Construction Link	04
Contour Plus	Civilsoft	01
Cost Engineer, The	Cost Engineering Technologies	49
Counterpoint	Counterpoint	04
CPS/SP	Radian Corp.	34
Curve Digitizer	West Coast Consultants	33
Cut & Fill (DOS)	Paydirt Systems, Inc.	31
Cut & Fill/Precision (DOS)	Paydirt/Timberline	42



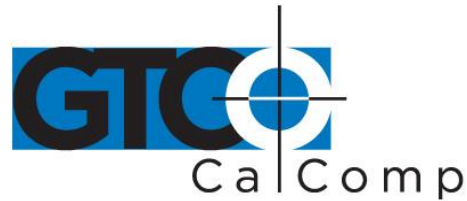
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Program	Company	SuperSet Code
Datacad	Microtecture	14
DATAMINE	Datamine International	82
Deed Mapping System	US Soft Tech	13
DEEM	Met-Coil, Ltd.	69
Design CAD	American Small Business Computers	01
Designer	Micrografix	02
DigiPlus	Civilsoft	01
DigiPro	Prosoft	66
Digtool	Rocktek Corp.	24
DMS Premiere	Tally Systems	57
DQ 2000	DQ Technologies, Inc.	85
DrawPlus	Micrografix	02
Earthwork	Civilsoft	01
Earthworks	Trakware	57
Easydij EJBIN#4	Geocomp, Ltd.	16
Easydij EJAF#2	Geocomp, Ltd.	35
Easydij EJBIN#30	Geocomp, Ltd.	19
Easy Cad	Easy Cad	01
Edge, The	Advanced Estimating	01
Equinox	Roctek Corp.	64
ESI 6000 Estimating System	McCormick Systems	09
Estimagic	Estimagic	63
Estimate Software	Estimate Software	04
Estimation, Inc. (700 Series)	Estimation, Inc.	89
Estimation, Inc (800 or Net Series)	Estimation, Inc.	88
Execucom	Execucom Systems Corp.	36
Expose (DOS)	Roctek Corp.	64
Fastcad	Evolution Computing	26
GAP 1	GTCO Corp.	39
Gemini	Excel	79
Generic CADD	Generic Software, Inc.	01
Geoquest	Softdesk	08
GM-SYS	NW Geophysics Association, Inc.	13
GraphPlus	Micrografix	02
GTCOTEST (default)	GTCO Corp.	44
GTCO WinTab Driver	GTCO Corp.	01
HALO products	Media Cybermetics	13
Hotdij	Geocomp, Ltd.	35



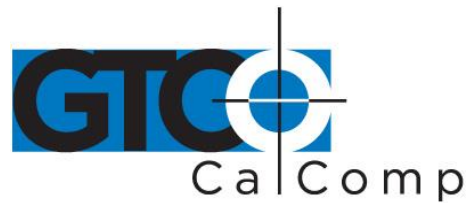
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Program	Company	SuperSet Code
IBM GFIS	IBM	55
Ice 2000	MC ²	01
Ice System, The (DOS)	MC ²	56
IDRISI	Clark University	74
IKE	Comput-Ability, Inc.	72
Imagine 8.X	ERDAS, Inc.	61
Insite Earthwork Estimating	Software Shop Systems	19
Insite 2	Software Shop Systems	28
JAVA	Jandel Scientific	24
Job Boss	Small Systems Design, Inc.	39
Job Power	Job Power	42
Kolvin Pro	Damon, Inc.	01
Landmarke	Cambridge Software, Inc.	23
Lasercad	The Software Machine	01
Logdigi, Planimeter	The Logic Group	12
Lumena	Time Arts, Inc.	10
Mach Lite	Ziatek, Inc.	04
Mach 2	Ziatek, Inc.	04
Mach 4	Ziatek, Inc.	83
MapGrafix	Comgrafix, Inc.	02
Marathon Systems Services	Marathon Systems Services	84
Market America	CACI	11
Master Builder, The	Omware	86
Master Touch	Integrated Measurement Systems	35
Measuremate/Measuring Calc.	Paladin Measuring Systems	64
Measure Master	Estimator's Corner	51
Mechanical Construction Manager	Mechanical Professional Services	73
Melco	Melco	78
Metricom	ADII Dynalog	71
Micro Lynx Plus	Lynx Geosystems	81
Micromine	Micromine Pty., Ltd.	27



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Program	Company	SuperSet Code
Microstation PC	Intergraph Corp.	09
MIKE	Compute-Ability, Inc.	68
Mirage	Zenographics	36
Molitors & Zimmer	Molitors & Zimmer Estimating Syst.	67
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NCE Estimator 2000	National Computer Est., Inc.	01
<hr/>		
Pagemaker	Aldus Corp.	02
PAD	ModaCAD	50
Paydirt Cross-Section (DOS)	Trimble/Spectra-Precision	31
Paydirt Roadwork (DOS)	Trimble/Spectra-Precision.	31
Paydirt Sitework (DOS)	Trimble/Spectra-Precision.	31
Paydirt Sitework Basic (DOS)	Trimble/Spectra-Precision	31
Paydirt Sitework 3.1 for Windows	Trimble/Spectra-Precision	05
Paydirt Sitework 3.2 & higher (Win)	Trimble/Spectra-Precision	01
P-CAD	Personal CAD Systems, Inc.	20
PC.BAT		46
PC Paintbrush	Z Soft	10
PC Paintbrush/Windows	Z Soft	02
PC3D	Jandel Scientific	24
PDS/SHADOW	Polygon Software & Technologies	53
PG1	Hirsch International	22
Phoenix Estimator	Phoenix Estimating	87 or 88
Picturemaker	Cubicomp Corp.	15
Piping/DWV Estimating	Esscomate	32
Polynest	Polygon Software	40
Precision Estimating (DOS)	Timberline Software	37
Precision Estimating (Windows)	Timberline Software	01
ProBid	Promation	06
Procad	Teksoft	13
Prodesign II	American Small Bus. Comp., Inc.	01
ProExcel	Excel	80
PTO	CDCI	58



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Program	Company	SuperSet Code
QED (DOS)	Roctek Corp.	64
Quest	Quest Solutions	01
QuickBid	On-Center Software	01
QuickCalc	Constructive Computing	58
Quickdirt	Constructive Computing	23
Quickdirt II/QuickEst III	Constructive Computing	58
QuickEst	Constructive Computing	43
QuickMeasure	Tally	57
QuickPen CAD (DOS)	QuickPen	09
QuickPen Estimating (DOS)	QuickPen	59
QuickPen Estimating (Windows)	QuickPen	04
QPI-ALT	QuickPen	02
<hr/>		
Remodeling Estimator	National Computer Estimating, Inc.	01
Right Hand Man	Johnston & Associates, Inc.	04
Roadeng	Softree Technical Systems, Inc.	27
Roof Estimator 3000	Essential Technology	65
Robocad, Robosolid	RoboSystems International	21
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SDP	Civilsoft	01
Sheetmetal/Ductwork	Esscomate	32
SigmaPlot	Jandel Scientific	24
SigmaScan	Jandel Scientific	24
SiteCalc	Eagle Point	01
Smartcam	Point Control Co.	17
Softplan	Softdesk	08
Sonnet CAD	Interworld Electronics	03
Sonnet Gap	Interworld Electronics	20
Subway	Roctek Corp.	64
Super-Duct, Super-Pipe	Wendes Mechanical Consulting	48
Surpac	Surpac Mining Systems	27
<hr/>		
TabletWorks Drivers	GTCO CalComp	01
Terra Model (DOS)	Trimble-Spectra-Precision	09
Terra Model (Windows)	Trimble-Spectra-Precision	01
Terrasoft	Digital Resource Systems	01
Topographics IIID	CEIA, Inc.	75
Tops II Digitizer	Software Shop Systems	28
TOSCA	Clark University	74
Turbo Map CAD	U.S. Softtech	01



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Program	Company	SuperSet Code
Versacad	Versacad Corp.	01
Vision	Bidtek	70
Wall to Wall Estimator	Safeharbor Software, Inc.	11
Wilcom Ltd.	Wilcom Ltd.	76
Windows	Microsoft	01
Winestimator	Winestimator	11
WinTab Driver (any version)	Roctek	01
WinScale	Roctek	01
Winxpro	Roctek	01
Ziatek	Ziatek	04
2D CAD	West Coast Consultants	33



Table 2: Configuration Details for SuperSet Menu Codes

NOTE: Max = 100 coordinates/second

lpi = lines per inch lpmm = lines per millimeter

Code	Commun.	Output Options	ASCII Options
01	9600,N,8,1	GTCO Binary, 1000 lpi, Cont Max	
02	9600,N,8,1	GTCO Binary, 1000 lpi, Cont Incr	
03	9600,N,8,1	GTCO Binary, 1000 lpi, Cont Max	
04	9600,N,8,1	GTCO Binary, 1000 lpi, Point	
05	9600,N,8,2	GTCO Binary, 1000 lpi, Cont 100	
06	9600,N,8,1	GTCO Binary, 1000 lpi, Point	
07	9600,N,8,1	GTCO Binary, 200 lpi, Cont 100	
08	9600,N,8,1	GTCO Binary, 1000 lpi, Cont 100	
09	9600,N,8,1	GTCO Binary, 1000 lpi, Cont 12	
10	9600,N,8,1	GTCO Binary, 200 lpi, Cont Max	
11	9600,N,8,1	GTCO Binary, 1000 lpi, Cont Max, Alarm	
12	9600,N,8,1	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR, LF
13	9600,N,8,1	GTCO Binary, 1000 lpi, Cont 12	
14	9600,N,8,1	GTCO Binary, 200 lpi, Cont 100	
15	9600,N,8,2	GTCO Binary, 200 lpi, Cont 100	
16	9600,E,7,1	GTCO Binary, 200 lpi, Point	
17	9600,E,7,2	GTCO Binary, 200 lpi, Cont Max	
18	9600,E,7,2	GTCO Binary, 200 lpi, Cont Max	
19	9600,N,8,1	GTCO Binary, 1000 lpi, Point	
20	1200,N,8,1	GTCO Binary, 1000 lpi, Cont 100	
21	4800,N,8,1	GTCO Binary, 40 lpmm, Cont 12	
22	4800,N,8,1	GTCO Binary, 1000 lpi, Cont Max	
23	2400,N,8,1	GTCO Binary, 1000 lpi, Cont 12	
24	9600,N,8,2	GTCO Binary, 1000 lpi, Cont Max	
25	9600,N,8,2	GTCO Binary, 1000 lpi, Cont Max	
26	9600,N,8,2	GTCO Binary, 200 lpi, Point	
27	9600,N,8,1	GTCO ASCII, 40 lpmm, Point	Pb, Sp, LF
28	4800,O,7,2	GTCO ASCII, 100 lpi, Point	Sp, CR, LF
29	1200,O,7,2	GTCO ASCII, 1000 lpi, Point	Pb, CR, LF
30	1200,N,8,1	GTCO Binary, 40 lpmm, Cont 12	



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Code	Commun.	Output Options	ASCII Options
31	9600,O,7,2	GTCO ASCII, 1000 lpi, Point	Pb, CR, LF
32	9600,E,7,2	GTCO ASCII, 1000 lpi, Point	Sp, CR
33	2400,E,7,1	GTCO ASCII, 100 lpi, Cont 12	Pb, Sp, CR, LF
34	9600,E,7,1	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR, LF
35	9600,E,7,1	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR, LF
36	9600,E,7,1	GTCO ASCII, 1000 lpi, Cont 12	Sp, CR, LF
37	2400,N,8,1	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR, LF
38	2400,E,7,2	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR, LF
39	1200,O,7,1	GTCO ASCII, 1000 lpi, Cont 12	Pb, CR
40	1200,N,8,1	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR, LF
41	9600,E,7,1	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR
42	9600,N,8,1	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR, LF
43	1200,E,7,1	GTCO ASCII, 1000 lpi, Point, Alarm	Pb, Sp, CR
44	9600,N,8,1	GTCO ASCII, 1000 lpi, Cont 12, Alarm	Pb, Sp, CR, LF
45	9600,N,8,2	GTCO ASCII, 100 lpi, Point, Alarm	Pb, CR, LF
46	9600,E,7,2	GTCO Binary, 1000 lpi, Cont 100	
47	9600,O,7,2	GTCO ASCII, 1000 lpi, Cont 100	Pb, CR
48	9600,E,7,1	GTCO ASCII, 1000 lpi, Point	CR, LF
49	1200,E,7,1	GTCO ASCII, 1000 lpi, Cont 12	Pb, CR
50	9600,E,8,1	GTCO ASCII, 40 lpm, Point, Alarm	Pb, Sp, CR, LF
51	1200,N,7,2	GTCO ASCII, 1000 lpi, Point	Pb, CR, LF
52	9600,E,8,1	GTCO Binary, 1000 lpi, Cont 100, Alarm	
53	9600,N,8,1	GTCO ASCII, 1000 lpi, Cont Max	Pb, CR
54	9600,N,8,1	GTCO ASCII, 1000 lpi, Cont 12	Pb, CR
55	9600,O,7,2	GTCO ASCII, 1000 lpi, Cont Max, Alarm	Pb, CR
56	9600,E,7,2	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR, LF
57	9600,O,7,1	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR, LF
58	9600,N,8,1	GTCO ASCII, 1000 lpi, Cont 12	Pb, CR, LF
59	1200,E,7,1	GTCO ASCII, 1000 lpi, Point, Alarm	Pb, Sp, CR
60	9600,O,7,1	GTCO ASCII, 1000 lpi, Point, Alarm	Pb
61	4800,N,8,1	GTCO ASCII, 1000 lpi, Point	Pb, CR, LF
62	2400,N,8,1	GTCO ASCII, 1000 lpi, Cont 12	Pb, CR, LF
63	1200,O,7,1	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR, LF
64	9600,N,8,1	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR, LF
65	2400,N,8,1	GTCO Binary, 1000 lpi, Cont 100	



Code	Commun.	Output Options	ASCII Options
66	9600,O,7,2	GTCO ASCII, 1000 lpi, Point	Pb, Sp, CR, LF
67	9600,N,8,1	GTCO ASCII, 1000 lpi, Cont 12, Alarm	Pb, CR
68	9600,O,7,2	GTCO ASCII, 100 lpi, Point	Pb, Sp, CR, LF
69	9600,E,7,1	GTCO ASCII, 40 lpm, Point	CR, LF
70	1200,N,8,1	GTCO ASCII, 100 lpi, Point, Max, Alarm	SP, CR
71	9600,N,8,1	GTCO Binary, 40 lpm, Cont	Pb
72	1200,O,7,2	GTCO ASCII, 100 lpi, Point	Pb, Sp, CR, LF
73	9600,N,8,1	GTCO ASCII, 1000 lpi, Point	CR, LF
74	9600,N,8,1	GTCO ASCII, 1000 lpi, Cont 100, Alarm	Pb, Sp, CR, LF
75	9600,N,8,1	Calcomp ASCII 3, 1000 lpi, Point	CR
76	9600,N,8,1	Summa ASCII 2, 10 lpm, Point	CR
77	9600,N,8,1	Summa ASCII 2, 10 lpm, Cont 100	CR
78	2400,N,8,1	Summa Binary, 10 lpm, Point	
79	9600,O,7,2	Summa ASCII 1, 10 lpm, Cont 100	LF
80	9600,O,8,1	Summa Binary, 10 lpm, Point, Alarm	
81	9600,E,7,2	Summa ASCII UIOF, 40 lpm, Point	CR, LF, Decimal
82	9600,N,8,1	GTCO ASCII, 1000 lpi, Point, Max, Alarm	Pb, Sp, CR, LF
83	9600,N,8,1	GTCO ASCII, 1000 lpi, Cont Incr	Pb, Sp, CR
84	Special: Reserved		
85	9600,N,8,1	Summa ASCII UIOF, 1000 lpi, Point	Pb, LF
86	9600,N,8,1	GTCO ASCII, 1000 lpi, Point	Pb, Sp
87	Special: Reserved		
88	Special: Reserved, Estimation		
89	Special: Reserved Estimation, Inc.		
90-99	User configuration storage locations		



Introduction to the Tablet Configuration Utilities

The Super L III with its Controller uses the Tablet Configuration Utilities to control baud rate, data format and other operating characteristics.

Communication Options

- **Baud:** The rate, in bits/second, at which characters are transmitted across the RS-232C serial interface. Choices are: 1200, 2400, 4800, 9600, 19200 or 38400.
- **Data Bits:** Data bits represent the actual data being sent from one device to another. Both devices must be set for the same number of data bits. Choices are: Seven (7) or Eight (8).
- **Stop Bits:** Each character has one or two stop bits, which tell the receiving device that a character is complete. The number of stop bits usually does not matter. Setting for two stop bits instead of one may overcome a mismatch in parity or data bits. Choices are: One (1) or Two (2).
- **Parity:** One bit can be allocated for parity (parity is a simple error-detecting scheme). Both devices (sending and receiving) must be set for the same parity – either odd parity or even parity – or they must be set for no parity. Choices are: None (N), Even (E) or Odd (O).

Output Format Options

- **GTCO:** Selects GTCO-compatible formats. See *Advanced Programming Information* for greater detail on GTCO format structure. Choices are: Binary or ASCII.
- **CalComp:** Selects CalComp-compatible formats. See *Advanced Programming Information* for greater detail on CalComp format structure. Choices are: Binary, ASCII 1, ASCII 2, ASCII 3 or ASCII 4.
- **Summa:** Selects Summagraphics-compatible formats. See *Advanced Programming Information* for greater detail on Summagraphic format structure. Choices are: Binary or ASCII.



ASCII formats can be modified by including or excluding a button code, decimal point, carriage return or line feed, depending on whether GTCO, CalComp or Summa formats have been selected.

- **Button:** Defines whether the Pushbutton (Pb) value is included in the ASCII output report. This option is available only with GTCO formats. Choices are: Include or Exclude.
- **Space:** Defines whether the Space (Sp) character (hex 20) is included in the ASCII output report as a delimiter between the X and Y coordinate values. This option is available only in GTCO formats. Choices are: Include or Exclude.
- **Decimal:** Defines whether the period character (hex 2E) is included in the ASCII output report between the units and tenths digits. This option is available only in Summagraphics formats. Choices are: Include or Exclude.
- **Return:** Defines whether the Carriage Return (CR) character (hex 0D) is included in the ASCII output report as a terminator. This option is available in GTCO and Summagraphics formats. Choices are: Include or Exclude.
- **Line Feed:** Defines whether the Line Feed (LF) character (hex 0A) is included in the ASCII output report as a terminator. This option is available in GTCO, CalComp and Summagraphics formats. Choices are: Include or Exclude.

Mode Options

- **Mode:** Defines how output reports are sent from the digitizer. Choices are: Point, Line, Continuous, Line Incremental or Continuous Incremental.
- **Rate:** Determines how fast output reports will be transmitted from the digitizer. Choices are: 12, 50 or 100 reports per second.
- **Resolution:** The smallest reported value returned by the digitizer. Choices are: 1000 lpi, 2000 lpi, 4000 lpi, 40 lpmm, 100 lpmm or 150 lpmm.

See the *Advanced Programming Information* section for more details.



Using the Tablet Configuration Utilities

If your application is not represented in the SuperSet Menu and does not have a SuperSet Code or if a different configuration is required, you can use the Tablet Configuration Utilities to structure the Super L III. The Tablet Configuration Utilities replace the 24 switches that were associated with older Type 5A Controller and the Custom Configuration Menu Card used with the Super L II Plus.

Configurations you set up can be stored in any of ten user-definable SuperSet locations (codes 90 through 99) for recall at a later time. This allows the Super L III to be easily switched between applications.

To Configure the Super L III with the Tablet Configuration Utilities:

1. Make sure Super L III is plugged into a Serial Port, powered on and all the tablet drivers have been uninstalled or disabled.
2. Install the Tablet Configuration Utilities from TabletWorks CD, or download them from www.gtcocalcomp.com.
3. After installation is complete, run the *Tablet Configuration Utilities* from the **Programs** list under GTCO CalComp by Turning Technologies TCU.
4. The Tablet Configuration Utilities will begin searching the Serial Ports for a supported tablet.
 - a. If the tablet is found, information about the tablet will display under **Device Info** near the bottom of the screen.
 - b. If the tablet is not found, a message will appear under **Device Info** near the bottom of the screen.
 - i. If Wintab files were found, it is possible that the TabletWorks driver has the Serial Port open.
 - ii. If the Serial Port is open by another application, it will not be displayed under **System Info**. Close any application or uninstall any driver that is using the Serial Port and select *Refresh System Info* from the **File** dropdown list at the top of the screen. Click on the Serial Port icon under **System Info** to search that Serial Port.
5. Once the Super L III has been found on a Serial Port, select *Advanced Configuration* from the **Options** dropdown list at the top of the screen.
 - a. If Advanced Configuration is not an option, make sure *Wintab Compatible Driver* is not listed under **Device Info**.



6. Select a predefined (01-89) SuperSet Codes or select one of the User Defined (90-99) SuperSet Codes to customize.
 - a. User Defined (01-89) SuperSet Codes are initially read from the tablet when the Advanced Configuration screen opens. This is to prevent loss of custom settings. Selecting **Read Current Settings** from the Options menu will:
 - i. Read the Power-Up settings and User Defined SuperSet Codes from the tablet.
 - ii. Overwrite all Custom Settings not yet saved to the tablet.
 - b. **Restore Factory Settings** from the Options menu will prompt for:
 - i. Power-Up settings reset to factory default and set current.
 - ii. User Defined SuperSet Codes cleared and reset to factory default.
7. After making your selections, choose one of the following from the **File** menu at the top of the screen.
 - a. **Save Temporary Settings** will configure the tablet as shown until the tablet is powered off, reset or another SuperSet Code is selected.
 - i. After saving temporary settings, select **File/Exit** to test with other applications. This will leave the tablet configured to the temporary settings selected and close the Serial Port, enabling other applications to communicate with the tablet.
 - b. **Save Power-Up Settings** will configure the tablet as shown. Every time the tablet is powered off and back on or reset, it will restore these settings.
 - c. **Save Custom Settings** will reconfigure all nine of the tablet's User Defined SuperSet Codes to the settings specified in the corresponding SuperSet Code dropdown list.
 - i. You can use the SuperSet Menu on the tablet with the tablet's transducer to activate these configurations (S + 90-99).
8. When you have finished, select *Exit* or *Close* from the **File** menu.
 - a. Exit will close the Tablet Configuration Utilities.
 - b. Close will exit the Advanced Configuration Screen and return to the Tablet Configuration Utilities window.



Controlling the Alarm

There are five ways to toggle the alarm on or off and set the tone:

Off-> Tone 1 -> Tone 2 -> Tone 3 -> Tone 4 -> Off

- Select the SuperSet Menu Alarm block (which toggles the alarm tone on and off).
- Use the following remote commands.

Controlling the Alarm Using Remote Commands

An alarm (audio tone) is provided so Super L III can inform you of certain conditions. The alarm can be enabled or disabled by the SuperSet Menu or commands.

To hear only critical tones, turn the alarm off:

SuperSet Menu: Select the Alarm menu block – the fat left block showing a speaker. Three medium length tones will be heard when digitized.

GTCO Commands: Send command AD.

To hear all tones, turn the alarm on:

SuperSet Menu: Select the Alarm menu block. Three medium length tones will be heard when digitized. Then, a tone will be heard each time a transducer button is pressed.

GTCO Commands: Send command AE.

When you move the cursor over the Alarm block on the SuperSet Menu, the Proximity indicator (**green**) will light if the alarm is currently enabled.



Resetting Super L III

There are four ways to reset Super L III:

- Enter SuperSet code 00 on the SuperSet Menu
- Turn the power switch off and back on
- Unplug and re-plug power supply
- Send remote commands described in the Advanced Operating Information section

When one of these events occurs, the Super L III will revert to the configuration that was last defined. Any remote commands that were active before the reset will be lost.

Tablet Power/Proximity LED

The tablet led will be on when the tablet is on and transducer is awake and in the active area.

Super L III Tones

Super L III produces an “alarm” in the form of audio tones to notify users of various events. The table below describes the kinds of tones you may hear while operating the digitizer.

Length	Number of times	Meaning
Short	Four at power up	Diagnostics passed
Short	Three	Successful end of menu mode
Medium	Three	Alarm tone toggled ON/OFF
Short	Once	Transducer switch pressed
Long	Three	SuperSet Code aborted
Continuously on	At power up	Diagnostics failed

Short = 1/16 second Medium = 1/4 second Long = 1/2 second



Troubleshooting Guide

As with any computer peripheral, Super L III problems sometimes do occur. This troubleshooting guide provides clear instructions for finding and solving all common Super L III issues. In a majority of cases, you will be able to quickly resolve the problem yourself by following the below steps.

1. Install properly first.

This troubleshooting guide assumes you have already correctly installed Super L III according to the detailed instructions in the *Installing Your Super L III* section. If you have not followed the step-by-step instructions in that section, do so now.

2. Work through the troubleshooting flowcharts on the following pages in this troubleshooting guide.

3. If your system still does not work.

Call GTCO CalComp by Turning Technologies Technical Support Department at 1.866.746.3015. Be prepared to discuss the observations you made while troubleshooting. A Technical Support Specialist will help you resolve the problem as quickly as possible.

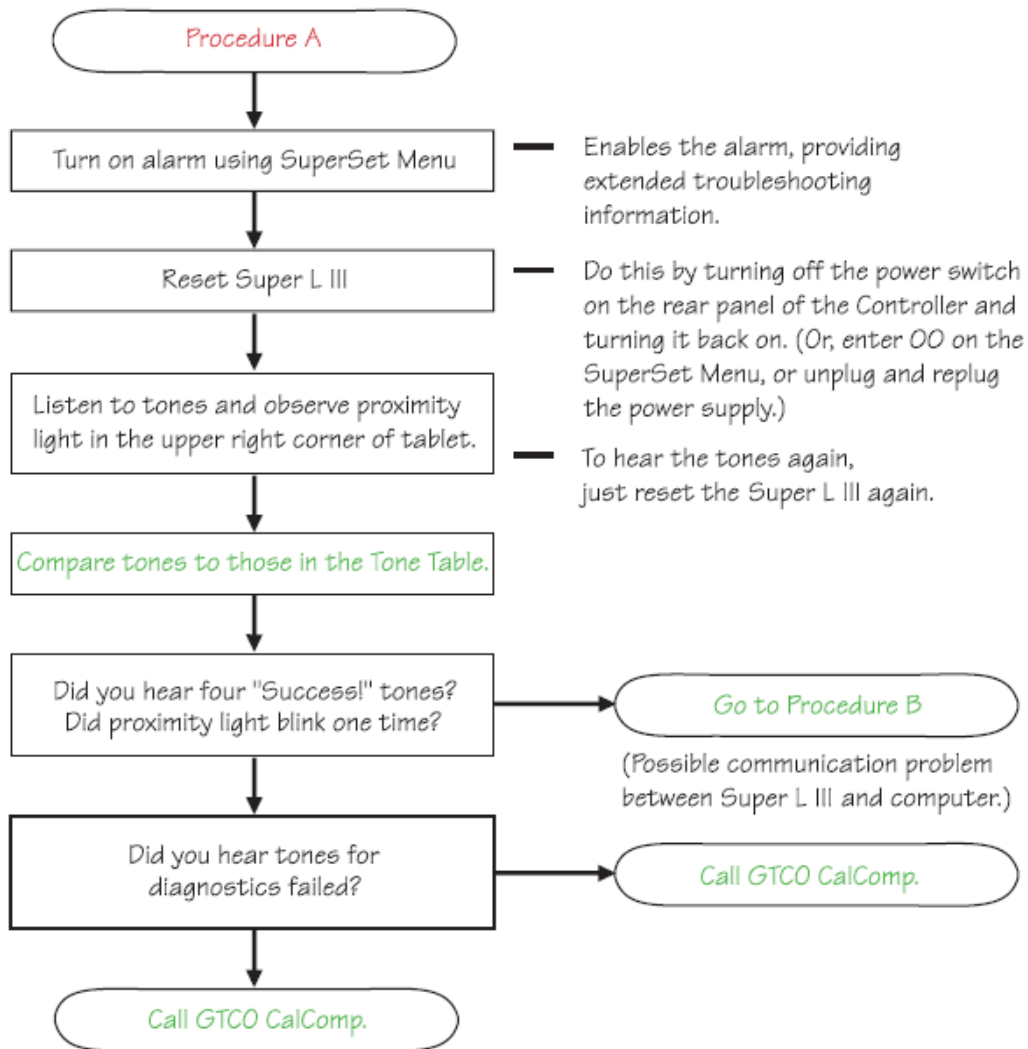
NOTE: Refer to the Super L III Tones table on the previous page while using this guide.

The following troubleshooting tools are included in this section:

- Troubleshooting Flowcharts
- Using GTCOTEST

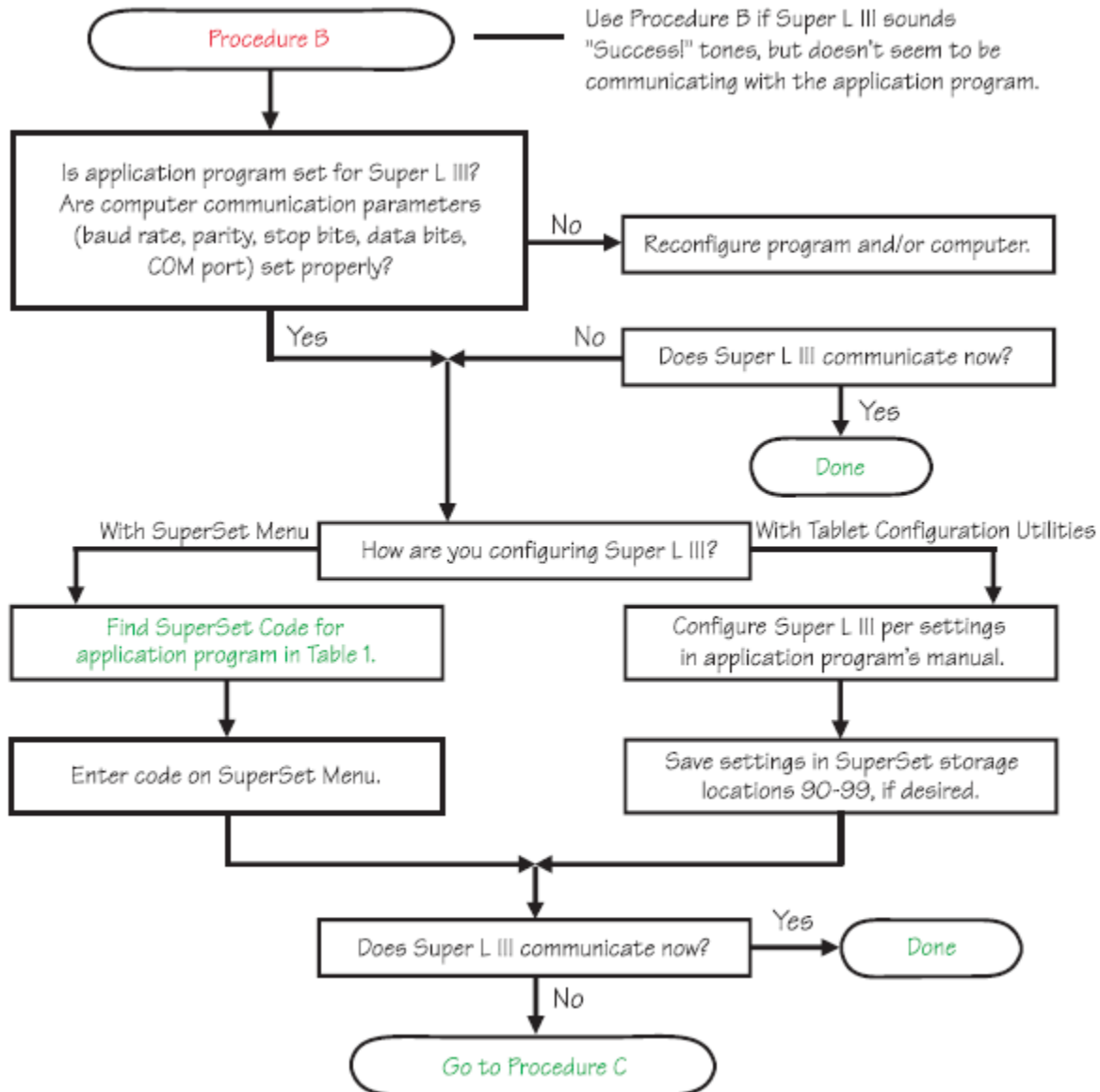


Procedure A: Begin Troubleshooting





Procedure B: Troubleshooting





Procedure C: Troubleshooting





Using GTCOTEST

GTCOTEST is a program that runs on the PC. It can be used to perform communication and diagnostic tests on an installed Super L III. GTCOTEST is provided on the TabletWorks CD with your system.

1. Select SuperSet Code 01 on Super L III (9600, N, 8, 1, GTCO Binary, 1000 lpi, Cont, 100).
2. To run GTCOTEST, insert the TabletWorks CD in the CD-ROM drive. GTCOTEST will work only if no Wintab drivers are installed. From the directory listing of the CD, switch to the folder that contains the gtcotest.exe files. Type **gtcotest** and follow the on-screen instructions.
3. Once GTCOTEST's third screen has been reached, the pull-down menu headings will read: **Communications, Diagnostics, Setup** and **Check Output**. Select **Read Switches** in the diagnostics window. Communication has been established if 0's and 1's appear in the display box.
 - If GTCOTEST displays the *Serial input timeout* error message, try selecting another COM port in the Communications window.
 - If GTCOTEST displays the *Cannot open COM port* error message, try selecting another COM port in the Communications window. (Each PC serial port has a physical address that corresponds to a specific COM port. If there is only one serial port installed in the computer, it will be assigned as COM 1 regardless of its physical address. GTCOTEST examines only the physical address.)

Once communication is established, select the *Read Tablet Size* and *Read Version* options, making a note of the responses. This can easily be done with your print screen key if a printer is connected to your computer.

Select *Check Output* and then choose **High Res Binary**. Place the transducer in the active area on the tablet.

If everything is working properly, you should see data displayed on the computer screen in the following format:

P = pushbutton code XXXXXX = X coordinate data YYYYYY = Y coordinate data



When you move the transducer around the active area, the X and Y coordinate data should change. When you press different cursor buttons, the pushbutton code should change.

If GTCOTEST indicates that the digitizer is functioning properly, check your software application setup and SuperSet code for accuracy. If you have any questions about your results or need assistance running GTCOTEST, contact our Technical Support Department.

Reducing Monitor Interference

If you are experiencing monitor interference with your tablet, reduce the interference by changing the frequency the transducer uses. Transducers with the following FCC ID numbers support two frequencies: ECPPPP ECPPP2, ECPPLTP, ECPPCURSOR4, ECPPCURSOR16 and ESPPCURSORII. Transducers with FCC ID numbers other than those listed must have frequencies changes at GTCO CalComp by Turning Technologies.

Changing the Frequency of the Cordless Cursor

1. Place the cursor on the tablet surface.
2. Press Buttons 1 and 2 simultaneously and hold for approximately three seconds.
3. The cursor turns itself off. You will know the cursor is off when the power light on the tablet is off.
4. The cursor turns on again at the new frequency. You will know the cursor is on when the power light glows steadily.

To return to the default frequency, repeat the above process. When you replace the cursor batteries, the cursor automatically resets to the default frequency.

Changing the Frequency of the Cordless Pen

Press both side buttons and the tip simultaneously and hold for approximately three seconds. To return to the default frequency, repeat the above process. When you replace the pen batteries, the pen resets to the default frequency.

Tablet Checklist

- Is the tablet power supply plugged into the serial connector and into a live outlet?
- Is the tablet power switch on?
- Does the power light glow steadily when the transducer is inside the drawing area?
Does it blink when the transducer is outside the drawing area?



- The power light will blink if the transducer has gone into sleep mode. Press any button on the transducer to activate it. If the power light continues to blink and the transducer is in the drawing area, change the battery.
- Are all cable connections tight?
- Power cable to serial connector?
- Pointer cable to tablet?
- Serial cable to tablet?
- Serial cable to computer? Check that the cable is connected to the serial port specified in your software package.
- Is the tablet set up according to the software recommendations?
- Are any of the connector cables or receptacles damaged? Check for bent pins, cut insulation and loose wires.

Computer Checklist

- Is the computer plugged into a live outlet? Did you turn on the computer?
- Does the computer work with any software? Try one of your other programs. If the computer has a diagnostic diskette, use it.
- Is your software package installed correctly?
- Does the serial port work? The only way to test the port without special equipment is to reinstall something that has worked in the past and test if it still works.
- Have there been any recent electrical storms in your area that may have damaged your equipment?

Software Checklist

Does the tablet work with some software?

- If your tablet currently works with some software packages, you know that the tablet, serial port and computer work.
- Even if the software package you are trying to install and the software that is working both support the same devices, it does not always mean that you can use the same tablet settings. The output format may be the same, but the communications protocol, resolution, operating mode and data rate may be different. Check your software's requirements.
- Call the software manufacturer. The software package may have an error with another component of your system.



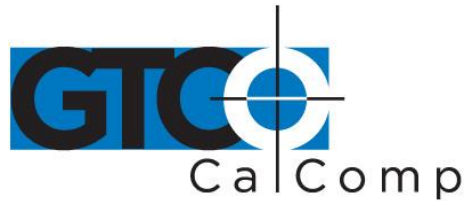
Did the software work in the past?

- If the software package worked with the tablet in the past, then the problem lies with the new setup.
- Check all the connectors. Is the tablet still plugged into the same port? If yes, reset the tablet by turning the power switch OFF and ON. Also, you may want to restart the software.
- Did you reset or power down the computer?
- During reset and power on, the computer can send meaningless characters out the serial port and this can disable the tablet. Reset the tablet again.
- Have you installed any new software or hardware? Remove it from your system and see if the problem goes away.
- Did you move any cables?
- Have you updated the software or its drivers?
- Did you reinstall the software, perhaps after a problem with your hard drive? Double check your installation procedure and the driver you selected.
- Reinstall the software from its master diskettes or CDs. The program files may have been corrupted.

Troubleshooting Chart

The following table lists common Super L III problems, their causes and their solutions.

Problem	Cause	Solution
Frozen screen pointer	Pointing tool is in sleep mode.	Press any button on the tool.
	Tablet plugged into the wrong serial port on the computer.	Check that the serial port used is correctly identified in your software application.
	Tablet not powered correctly.	Check that the power cable is installed correctly.
	Batteries low in pointing tool.	Replace the batteries in the pointing tool.



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	<p>Software application set up incorrectly.</p>	<p>Check that the tablet is identified in your software application.</p>
	<p>Another device is connected to a COM port that shares the same IRQ as the tablet COM port (<i>i.e.</i>, tablet is connected to COM1 IRQ4 and the modem is connected to COM3 IRQ4).</p>	<p>Move one of the devices to another COM port. Contact your system manufacturer for assistance in relocating the device.</p>
<p>Screen pointer appears to shake or jitter</p>	<p>Tablet is set too close to the screen monitor.</p>	<p>Move the tablet farther away from the screen.</p>
	<p>Tablet's frequency setting may conflict with the display.</p>	<p>Alternate the pointing tool's frequency. (See Reducing Monitor Frequency.)</p>
<p>Unable to use the entire tablet surface</p>	<p>Incorrect format selected.</p>	<p>Check your selections using the Tablet Configurations Utilities.</p>
	<p>Software application set up incorrectly.</p>	<p>Check that the tablet is identified in your software application.</p>



Super L III Technical Specifications

Technology	Patented electromagnetic
Resolution	Up to 2540 lpi or 100 lpmm real resolution
Absolute Accuracy	± 0.010 inch
Repeatability	1 least significant bit
Proximity	1.0 inch (25.4 mm) on corded transducers and .400" on cordless transducers
Self-Diagnostics	Automatic testing of tablet, drive electronics and microprocessor
Operating Modes	Point, line, continuous, line incremental, continuous incremental and remote request
Baud Rates	1200, 2400, 4800, 9600, 19200 and 38400
Power Supply	100/120/220/240 VAC, 50/60 Hz 12 to 17 VDC 200 ma. 2.1 mm monoplug with positive outside diameter
Operating Temperature	5° to 46° C (41° to 115° F)
Humidity Range	10% to 90%, non-condensing
Storage Temperature	-18° to 68° C (0° to 150° F)
Altitude Range	0 to 10,000 feet (0 to 3077 meters)
Certifications	UL, CSA, FCC-B, VDE-B
Cursor Switches	Elastomeric keypad, rated life over 1 million actuations
Emulations	GTCO T5A, CalComp 3400, Summagraphics Microgrid



Advanced Operating Information

Super L III Interfacing

NOTE: The following information is not required for normal Super L III operation.

Connecting Super L III to a computer is a simple operation (see the ***Installing Super L III*** section in this manual). If you do not have a typical interfacing situation, the information in this section will help you set up the Super L III and connect it to another device.

Super L III is equipped to communicate via RS-232C, a widely used serial interface between computers and peripherals. RS-232C is a standard interface, and cables and connectors are available from a variety of sources. Most computers and peripherals either have an RS-232C interface or can be equipped with one.

A mini-tutorial on RS-232C interfacing

This section provides basic information about RS-232C communications. There are three areas to consider when using RS-232C:

- Character Format and Baud Rate
- Cabling
- Flow Control

Character Format and Baud Rate

Character format and baud rate govern how bits are assembled to form characters and the speed of transmission. Both Super L III and the computer must have identical formats and rates. These parameters are discussed in ***the Introduction to the Tablet Configuration Utilities*** section.

Cabling

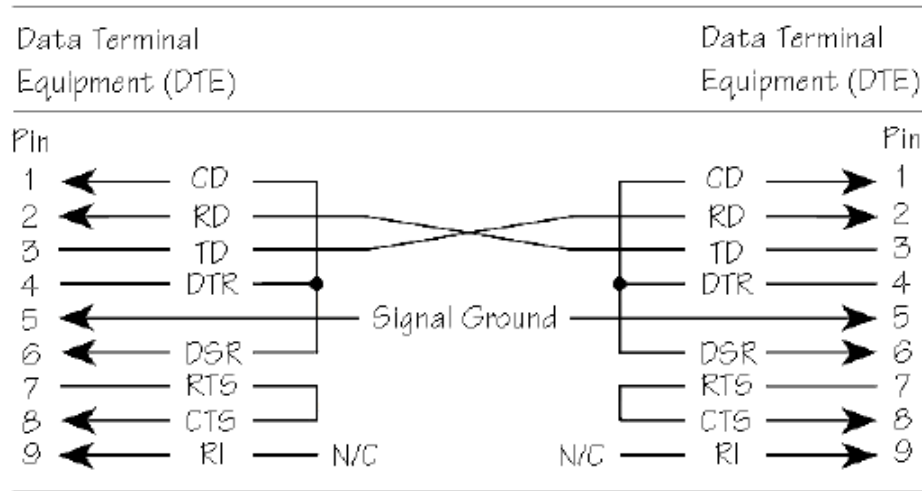
Cabling carries the data from one device to the other. A majority of RS-232C cables have either male 9-pin or 25-pin subminiature D connectors on their ends to match female connectors on the equipment. Super L III is supplied with an 8-pin-mini-din-to-9-pin-D serial cable and a 9-pin-to-25-pin adapter.



Data Terminal Equipment (DTE), such as printers, digitizers and computers, usually (but not always) transmit data on Pin 2 and receive data on Pin 3. Data Communications Equipment (DCE), such as modems, generally transmits data on Pin 3 and receives data on Pin 2. Thus, connecting a terminal (DTE) to a modem (DCE) may be as simple as connecting them with a straight-through cable that is wired pin-to-pin (*i.e.*, 1 to 1, 2 to 2, etc.). The figure below shows such a cable. The Super L III Controller is typically connected in this manner using the cable supplied by GTCO CalComp by Turning Technologies.

Data Terminal Equipment (DTE)		Data Communication Equipment (DCE)	
Pin			Pin
1	← Carrier Detect	←	1
2	← Receive Data	←	2
3	→ Transmit Data	→	3
4	→ Data Terminal Ready	→	4
5	— Signal Ground	—	5
6	← Data Set Ready	←	6
7	→ Request to Send	→	7
8	← Clear to Send	←	8
9	← Ring Indicator	←	9

Connecting DTE to DTE or DCE to DCE may require a different strategy to get the data on the correct wires. The figure below shows a cable that can work in this situation. It is called a *null modem* cable and it fools both devices into thinking they are talking with the right kind of receiver. This cable routes Pin 2 to Pin 3 and Pin 3 to Pin 2.



Your computer may have a 25-pin RS-232C connector, rather than a 9-pin connector. If so, use the 9- to 25-pin adapter supplied with Super L III. This figure shows how this adapter is wired internally.

9-pin DTE	25-pin DCE
1	
2	3
3	2
4	20
5	7
6	6
7	4
8	5
9	22

Flow Control

Flow control is the process of regulating the traffic or flow of data between two RS-232C devices. Flow control prevents the transmission and subsequent loss of data if the receiver is not ready to accept it. Examples of devices that use flow control are: a printer to signal buffer full; a modem to indicate carrier detect and a time-shared computer that services multiple users on a time-available basis.



There are two kinds of flow control:

- **Software flow control** is often used over communication links where only a 3-wire cable is used (Transmit Data, Receive Data, Ground), or over telephone lines. The sending device (such as Super L III) will immediately stop sending data when it receives an ASCII XOFF character (CTRL-S, hex 13). Transmission will resume when it receives an ASCII XON character (CTRL-Q, hex 11). Character flow control will work with the *straight through cable* and the *null modem cable* above.
- **Hardware flow control** is not commonly used with digitizers and is therefore not supported by the Super L III Controller. Contact our Technical Support Department if you have hardware flow requirements.

Flow control may not be needed when a terminal or digitizer is directly connected to a single-user computer. Most digitizing application software does not use flow control of either kind.

Remote Commands

NOTE: The following information is not required for normal Super L III operation.

Super L III can receive commands from other devices through its RS-232C port. Commands cause the Super L III to change the way it operates, to use certain coordinate formats and to do other things directed by you or by an application program.

Commands offer another way to control Super L III operation besides the Tablet Configuration Utilities. Certain Super L III functions can be carried out only through commands.

If you are developing your own application software, be cautious about using commands in your program. An interruption in power to the Super L III or a Reset will cause it to discard any command changes it has received. This could leave the program confused about what the Super L III is doing. A full system reset would then be needed to get the digitizer and computer coordinated again.



Super L III responds to three kinds of commands:

- GTCO CalComp by Turning Technologies Super L III standard commands (with some omissions and additions)
- CalComp emulation commands
- Summagraphics emulation commands

The topics listed below describe each kind of command.

- GTCO CalComp by Turning Technologies Super L III commands
- CalComp emulation commands
- Summagraphics emulation commands
- Command Mode basics

GTCO CalComp by Turning Technologies Super L III Command Summary

Functional control commands

Reset	RS
Select Point Mode	PT
Select Line Mode	LN
Select Continuous Mode	CN
Select Line Incremental Mode	IC
Select Continuous Incremental Mode	CL
Select Remote Request Mode	RM
Read Current Coordinate	hex 02 (Ctrl-B)
Set Increment Value	IV
Send Coordinates 0,0 When Transducer Is Out of Active Area	OP
No Output When Transducer Is Out of Active Area	IP
Set Digitizing Rate	Rx
Change Mode Character	MC
Enable Echo Mode	EM
Disable Echo Mode	hex 0F (Ctrl-O)

Alarm commands

Enable Alarm	AE
Disable Alarm	AD
Tone Pause	T0
Sound Tone	T1
Sound Tone	T2
Sound Tone	T3
Sound Tone	T4



Format selection commands

ASCII Format Output	AS
Binary Format Output	BI
Select English Measurement Scale	IN
Select Metric Measurement Scale	MT
Low Resolution	LR
High Resolution	HR
Highest Resolution	H1
Pushbutton Include	PI
Pushbutton Exclude	PE
Space Include	SI
Space Exclude	SE
Carriage Return Include	CI
Carriage Return Exclude	CE
Line Feed Include	LI
Line Feed Exclude	LE

Diagnostic commands

Transmit Version Number	VR
Display Tablet Active Area Size	SZ
Read Tablet Diodes	RD

Functional Control Commands

Reset Code: **RS**

The Reset command will reset the Controller to the last known configuration, clearing all previous commands sent to the Controller. If a SuperSet Menu configuration has been selected, the Reset command will reset the Controller to the SuperSet Menu value.

Select Point Mode	Code: PT
Select Line Mode	Code: LN
Select Continuous Mode	Code: CN
Select Line Incremental Mode	Code: IC
Select Continuous Incremental Mode	Code: CL
Select Remote Request Mode	Code: RM

**Read Current Coordinate**Code: hex 02 (**Ctrl-B**)

The Read Current Coordinate causes Super L III to output a coordinate while it is in Remote Request Mode. This command can be sent to the Super L III only when it is digitizing and only when Remote Request Mode has been selected by command RM. The Read Current Coordinate command will be ignored if the Super L III is in Command Mode. Please note that this command is not two ASCII characters. It is the one-byte-long STX character, CTRL-B (hex 02). Super L III responds to the Read Current Coordinate command by transmitting one format.

Set Increment ValueCode: **IV**

In Line Incremental and Continuous Incremental modes, the Super L III outputs a coordinate when the transducer is moved beyond a certain incremental distance in either the X or Y direction. The default increment is 0.01". The Set Increment Value command allows the user to select the distance which the transducer must move to initiate coordinate output. It works as follows:

1. Enter Command Mode by sending a CTRL-A.
2. After receiving the > prompt, send IV and a <CR> (hex 0D).
3. The Controller will respond with a <.
4. After receiving the <, send a three-digit string ranging from 000 to 999. This string represents an increment value of 0.000 to 0.999 inch.
5. When the Controller receives the last character it will respond with a > prompt and await the next command.

Send Coordinates 0,0 When Transducer is Out of Active AreaCode: **OP****No Output When Transducer is Out of Active Area**Code: **IP**

Certain situations require that the Super L III be able to send a coordinate when the transducer is out of the active area. Command OP permits coordinates to be sent under this condition. Since valid coordinates are not available when the transducer is out of the active area, coordinates 0,0 are substituted in the format. When this command has been executed, digitizing modes operate normally, whether the transducer is in the active area or not. Command IP returns Super L III to the default condition, in which coordinates are sent only when the transducer is in the active area.

**Set Digitizing Rate**Code: **Rx**

Coordinates can be sent from Super L III at rates from 5 to 100 coordinates per second. The second character in this command sets the rate, as shown in the table below. Actual rates are limited by the communication baud rate and coordinate type you have selected. The rates shown here are, therefore, maximum rates.

Rate Commands

Digitizing rate, formats/second	12	100	100	5	10	50
Digitizing rate command	R1	R2	R3	R4	R5	R6

Change Mode CharacterCode: **MC**

Some applications may have a predefined meaning for the SOH (CTRL-A) character used to invoke Command Mode. If so, invoking Command Mode may cause your system to do something else. You can set the Super L III so that a character other than SOH is used to begin Command Mode. Here is how to make the substitution:

1. Enter Command Mode.
2. Send MC, followed by a <CR>. Super L III responds with the prompt message:
ENTER NEW COMMAND MODE CHARACTER:
3. Enter the desired mode change character. The new mode character can be any character except ESC (CTRL-[, hex 1B), <CR> (CTRL-M, hex 0D), CAN (CTRL-X, hex 18), VT (CTRL-K, hex 0B), XON (CTRL-Q, hex 11) or XOFF (CTRL-S, hex 13).

Now, when you want to enter the Command Mode, send the new character. All other command operations remain unchanged.

Select English Measurement ScaleCode: **IN****Select Metric Measurement Scale**Code: **MT**

Invoking these commands causes Super L III to scale coordinates in the desired measurement system. The digitizer measures in only one scale at a time. See **Measurement Scales** for additional information on how scale selection affects coordinate data.

Enable Echo ModeCode: **EM****Disable Echo Mode**Code: hex 0F (**Ctrl-O**)

These commands control echoing by the Super L III. When enabled, echoing transmits each received character back to the sending device.



Format Selection Commands

ASCII Format Output

Code: **AS**

Command causes coordinates to be transmitted in ASCII. ASCII coordinates can be modified by the Low/High/Highest Resolution, Pushbutton, Space, Carriage Return and Line Feed commands and by menu settings.

Binary Format Output

Code: **BI**

Command causes coordinates to be transmitted in binary format. Binary coordinates can be modified by the Low/High/Highest Resolution commands and by menu settings.

Low Resolution

Code: **LR**

Command modifies ASCII and binary formats. If ASCII formats have been selected, the Low Resolution command causes the least significant digit to represent 0.01 inch or 0.1 millimeter, depending on whether English or metric scale has been selected. Both X and Y portions of each ASCII format will be four digits long if in English scale or five digits long if in metric scale.

If the binary format is selected, the least significant bits represent 0.005 inch or 0.1 millimeter, depending on whether English or metric scale has been selected.

High Resolution

Code: **HR**

Command modifies ASCII and binary formats. If ASCII formats have been selected, the High Resolution command causes the least significant digits to represent 0.001 inch or 0.025 millimeter, depending on whether English or metric scale has been selected. Both X and Y portions of each ASCII format will be six digits long.

If binary formats have been selected, the least significant bits represent 0.001 inch or 0.025 millimeter, depending on whether English or metric scale has been selected.

**Highest Resolution**Code: **H1**

Command modifies ASCII and binary formats. If ASCII formats have been selected, the Highest Resolution command causes the least significant digits to represent 0.0005 inch or 0.01 millimeter, depending on whether English or metric scale has been selected. Both X and Y portions of each ASCII format will be six digits long.

If binary formats have been selected, the least significant bits represent 0.0005 inch or 0.01 millimeter, depending on whether English or metric scale has been selected.

Pushbutton IncludeCode: **PI****Pushbutton Exclude**Code: **PE****Space Include**Code: **SI****Space Exclude**Code: **SE****Carriage Return Include**Code: **CI****Carriage Return Exclude**Code: **CE****Line Feed Include**Code: **LI****Line Feed Exclude**Code: **LE**

These commands control the presence of the corresponding characters in ASCII formats. Pushbutton codes and where they appear in coordinates are described in the **Advanced Programming Information** section. When included, the space is an additional character separating the X and Y components of the coordinate data. When included, the LINE FEED is an additional character following the <CR>.

Alarm Commands**Enable Alarm**Code: **AE****Disable Alarm**Code: **AD**

These commands enable or disable the audible alarm. When enabled, a short tone will sound when a transducer switch is pressed. When disabled, the alarm will not sound in response to transducer switch presses, but it may be sounded by remote commands and will be active during diagnostics and in the menu modes.

**Sound Tone**Code: **T1****Tone Pause**Code: **T0**

The Sound Tone command allows a remote device to sound the Super L III's audible alarm. Tone Pause provides a pause between tones. Tones and pauses are in 0.25 second intervals. Tone commands are not affected by the Disable Alarm command.

Diagnostic Commands**Transmit Version Number**Code: **VR**

Command causes Super L III to determine and transmit the version number of the firmware currently installed.

Display Tablet Active Area SizeCode: **SZ**

Super L III automatically determines the size of the attached tablet's active area when it is turned on or reset. This command can be used to send the information to another device. The size is encoded as four digits: two digits representing vertical size in inches followed by two digits representing horizontal size in inches. For example, the 36" x 48" Super L III sends the digits 3648 in response to this command.



Programming Example: To Send Version Command and Display Results

This QBASIC program interacts with Super L III in Command Mode. In this example, the program activates Command Mode, sends the VR command and displays the resulting firmware version transmitted by the Super L III.

1. Configure Super L III for 9600, N, 8, 1, GTCO ASCII and Point (SuperSet 42).
2. Enter and run this QBASIC program:

```

\*****
\*           SEND VERSION COMMAND (VR) AND DISPLAY RESULTS           *
\*           BY GTCO CORPORATION                                     *
\*****
CLS                               'CLEAR SCREEN
OPEN "COM1:9600,N,8,1" FOR RANDOM AS #1 'CONFIGURE & OPEN COM1
PRINT #1, CHR$(1);                CablingCabling SEND <CTRL A> WITHOUT <CR>
DO
  D$ = INPUT$(1, #1)              'GET CHARACTER FROM COMPORT
  LOOP UNTIL D$ = ">"            'WAIT FOR ">" PROMPT
  PRINT #1, "V";                  'SEND "V" WITHOUT <CR>
  D$ = INPUT$(1, #1)              'WAIT FOR "V" TO BE ECHOED
  PRINT #1, "R";                  'SEND "R" WITH <CR>
  D$ = INPUT$(2, #1)              'WAIT FOR "R" AND <CR> TO BE ECHOED
  LINE INPUT #1, VR$              'GET STRING FROM COMPORT
  PRINT VR$                        'PRINT STRING
  PRINT #1, CHR$(27);             'SEND <ESC> WITHOUT <CR>
END

```

This program will produce a line on the screen similar to this:

```
GTCO STANDARD FIRMWARE VERSION ABX.X
```

CalComp Emulation Commands

Super L III recognizes a subset of the CalComp 3400 command set. Space does not permit a detailed description of CalComp commands. However, most of the commands in this subset have equivalent Super L III commands. For further information about the operation of those commands, please refer to the Super L III command or function description in the **GTCO CalComp by Turning Technologies Super L III Command Summary**.

NOTE: CalComp commands must be terminated with a <CR>, which is not shown in the codes listed here. Commands can be strung together by substituting an @ character for the <ESC>% sequence after the first command and postponing the <CR> until the end of the multiple command string.



Set Increment Run Mode (Similar to Select Continuous Incremental Mode, CL, except that one coordinate format is sent when the cursor pushbutton is released.)	Code: ESC%IR
Set Incremental Track Mode (Equivalent to Select Line Incremental Mode, IC.)	Code: ESC%IT
Set Incremental Line Mode (Similar to Select Line Incremental Mode, IC, except that one additional coordinate format is sent when the cursor pushbutton is released.)	Code: ESC%IU
Set Resolution (English) Set Resolution (Metric) Where n1 = 1 to 2540 lpi, or 1 to 100 lppm; and n2 = 0. (Similar to Low Resolution, LR; High Resolution, HR; Highest Resolution, H1; Select English Measurement Scale, IN; Select Metric Measurement Scale, MT.)	Code: ESC%JRn1,n2 Code: ESC%JMn1,n2
Set Origin Where h = location of origin selected from this list: LL = lower left; LR = lower right; UL = upper left; UR = upper right; C = center.	Code: ESC%Jh
Set Line Feed Where n = 0 to 1 (0 excludes Line Feed, 1 includes Line Feed). If n is not included in command, Line Feed is toggled on or off from its previous status. (Equivalent to Line Feed Include, LI; Line Feed Exclude, LE.)	Code: ESC%Ln
Set Point Mode (Equivalent to Select Point Mode, PT.)	Code: ESC%P
Set Prompt Where h1 = prompt character. (Similar to Select Remote Request Mode, RM, and the Read Current Coordinate command, hex 02.)	Code: ESC%Qh1
Cancel Prompt Cancels prompt mode. (Same as selecting any digitizing mode except Remote Request.)	Code: ESC%Q
Set Run Mode (Equivalent to Select Continuous Mode, CN)	Code: ESC%R
Set Track Mode (Equivalent to Select Line Mode, LN.)	Code: ESC%T
Set Line Mode (Similar to Select Line Mode, LN, except that one additional coordinate format is sent when the cursor pushbutton is released.)	Code: ESC%U

**Reset**

(Equivalent to Reset, RS.)

Code: **ESC%VR****Send Tablet Size**

(Similar to Display Tablet Active Area Size, SZ; response is upper right corner coordinate based on current resolution and origin.)

Code: **ESC%VS****Set Data Rate**Where n = 1 to 100, representing number of coordinates per second, subject to baud rate limitations.
(Equivalent to Set Digitizing Rate commands R1 through R6.)Code: **ESC%Wn****Set X Increment Value****Set Y Increment Value**Where n = 0 to 65,535, the increment expressed in terms of the number of counts at the current resolution.
(Similar to Set Increment Value, IV, which expresses the increment in 0.001 inches.)Code: **ESC%Xn**Code: **ESC%Yn****Set Data Proximity**

Where n = 0 for output when out of proximity and 1 for no output when out of proximity.

(Similar to Send Coordinate 0,0 When Transducer Is Out Of Active Area, OP, and No Output When Transducer Is Out Of Active Area, IP, except that the last valid coordinate is sent.)

Code: **ESC%Zn****Change Format**

Where n = 4, 5, 6, 7, or 23:

n = 4, 5, 6, 7 for CalComp ASCII formats 1, 2, 3, 4, respectively

n = 23 for CalComp binary format

(Equivalent to selection of CalComp format options on the Tablet Configuration Utilities.)

Code: **ESC%^n****Tone**

(Equivalent to Sound Tone, T1.)

Code: **CTRL-G (hex 07)**



Summagraphics Emulation Commands

Super L III recognizes a subset of the Summagraphics UIOF command set. Space does not permit a detailed description of Summagraphics commands. However, most of the commands in this subset have equivalent Super L III commands. For further information about the operation of those commands, please refer to the Super L III command or function description in the ***GTCO CalComp by Turning Technologies Super L III Command Summary***.

Reset (Equivalent to Reset, RS.)	Code: ESCZ
Binary Format (Equivalent to Binary Format Output, BI.)	Code: ESCMB
ASCII Format (Equivalent to ASCII Format Output, AS.)	Code: ESMA
Line Feed Toggle (Similar to Line Feed Include/Exclude, LI/LE.)	Code: ESCML
Decimal Point Include Decimal Point Exclude	Code: ESCd1 Code: ESCd0
Set Delimiter Where n = new delimiter character for ASCII formats; default is “.”.	Code: ESCDn
Stream Mode (Equivalent to Select Continuous Mode, CN.)	Code: ESCM0
Point Mode (Equivalent to Select Point Mode, PT.)	Code: ESCM1



Switch Stream Mode (Equivalent to Select Line Mode, LN.)	Code: ESCM2
Prompt Mode (Equivalent to Select Remote Request Mode, RM.)	Code: ESCM3
Send New Report (Equivalent to Read Current Coordinate, hex 02.)	Code: ESCG
Resend Last Report	Code: ESCG
Increment Mode Where n = 000 to 255, representing increment size in counts. (Similar to Select Continuous Incremental Mode, CL, followed by Set Increment Value, IV.)	Code: ESCIⁿⁿⁿ
Set Report Rate Where n = 0 to 9 (0 = 1, 1 = 2, 2 = 5, 3 = 10, 4 = 30, 5 = 60, 6 = 85, 7 = 100, 8 = 100, 9 = 100 coordinates per second, subject to baud rate limitations). (Equivalent to Set Digitizing Rate, R1 to R6.)	Code: ESCRⁿ
Proximity Transmission (Equivalent to No Output When Transducer Is Out Of Active Area, OP.)	Code: ESCW0
Proximity Transmission (Similar to Send Coordinate 0,0 When Transducer Is Out Of Active Area, IP, except that the last valid coordinate is sent.)	Code: ESCW1
Sound Annunciator Sound Annunciator Where n = 1 to 4 (1 = low tone, 4 = highest tone, but Super L III has only one tone). (Equivalent to Sound Tone, T1.)	Code: ESCA Code: ESCYⁿ
Relocate Origin Where n = 0 to 5 (0 = lower left, 2 = center, 3 = upper left, 4 = lower right, 5 = upper right).	Code: ESCFⁿ

**Resolution**Code: **ESCCn**

Where n = 0 to 6 (0 = 200 lpi, 2 = 1000 lpi, 4 = 2000 lpi, 1 = 10 lpmm, 3 = 40 lpmm, 5 = 80 lpmm, 6 = double set resolution).

(Similar to combinations of Low Resolution, LR; High Resolution, HR; Highest Resolution, H1; English, IN; Metric, MT.)

Variable ResolutionCode: **ESCPab**

Where a = X or Y (axis) and b = 0001 to 1016 (resolution in lpi).

Confirm ResolutionCode: **ESCa**

(Similar to Display Tablet Active Area Size, SZ; response is upper right corner coordinate based on current resolution in current format.)

Command Mode Basics**To enter GTCO CalComp by Turning Technologies Command Mode:**

Send an ASCII CTRL-A (hex 01) character to Super L III. When Super L III receives the CTRL-A, two things happen:

- Digitizing stops and new coordinates are not generated. If Command Mode is invoked during transmission of a coordinate, that coordinate transmission will be completed.
- Super L III sends a ">" (hex 3E) as a prompt to the commanding device. Super L III is now ready to accept commands.

A **command** consists of two *upper case* ASCII letters or numbers followed by a delimiter. The delimiter lets the Super L III know the command is complete. There are two kinds of delimiters:

- <CR> (carriage return, hex 0D): indicates end of current command and more commands will follow. If the command just sent is valid, it will be carried out. The Super L III then sends another > prompt and awaits the next command.
- <ESC> (escape, hex 1B): indicates end of current command and no more commands will follow. If the command is valid, it will be carried out. Then Super L III will exit Command Mode and return to Digitizing Mode.

If you are entering several commands, end each one with a carriage return delimiter. After each <CR>, the Super L III carries out the command and sends a new command prompt.



After the last command or if you are entering only one command, use an <ESC>. The Escape delimiter takes you directly back to Digitizing Mode.

If the command entered is not recognized as a valid command, it will be ignored and Super L III will send a "?" (question mark). If the delimiter following an invalid command was an <ESC> (indicating your desire to leave Command Mode), Super L III stays in the Command Mode, awaiting a valid command.

A command may be aborted before entering a delimiter by sending a CTRL-X (hex 18). The Super L III then ignores the preceding one or two characters and responds with a new prompt.

To Leave Command Mode:

Send an <ESC> (hex 1B). The <ESC> may follow a command code or it can be sent in response to the Super L III's prompt. Super L III returns to digitizing, now operating according to the commands sent to it.

A Hint for Programmers

Here is the most efficient method for sending commands:

1. Send the CTRL-A and wait until the Controller responds with the prompt >. A loop that retrieves one byte at a time from the serial port and checks for the > is best.
2. Send the command one character at a time. The Controller will respond by echoing each character. Waiting for the character to be echoed will ensure that the Controller has received the character and is waiting for the next one.
3. Once the command is complete, send a <CR> or <ESC> (hex 1B) to exit command mode.
4. If you send a <CR>, go into a loop and grab one byte at a time until a > prompt is received. Then continue sending commands as described in step 2.



Advanced Programming Information

NOTE: The following information is not required for normal Super L III operation.

If you are programming for the Super L III product line, the topics listed below will be useful:

- Coordinate Formats
- Measurement Scales
- Digitizing Modes
- Controlling the Alarm Using Remote Commands
- Programming Examples

These topics refer to commands that put Super L III in a different operating state. The **Remote Commands** section contains detailed information about remote commands.

Command emulations for CalComp and Summagraphics digitizers are invoked automatically when a particular format is selected via the Custom Configuration Card or the SuperSet Menu selection. However, only Super L III commands are referenced in this section.

Coordinate Formats

Coordinate format refers to the way Super L III encodes XY coordinate information before it sends the data out through a communication interface. The Super L III and your application program must speak the same coordinate “language” for information to be properly transferred.

You have three basic format choices to make:

- GTCO versus CalComp or Summagraphics emulation
- Binary versus ASCII coordinates
- Coordinate resolution

The topics below describe the formats available and show you how to select them. If you are developing your own software, these sections will also help you choose a format that suits your needs.



Binary Formats

Binary formats encode coordinate information compactly. Binary coordinate formats are shorter than ASCII formats, transmit faster and take up less space if stored. On the other hand, binary formats cannot be directly displayed on a terminal or printed—they must be converted first into displayable characters.

Binary formats use the high order bit in each byte as a synchronization bit. The first byte in each format has its high order bit set to 1. The remaining bytes have their high order bits set to 0. The application program must examine the high order bit of each byte to determine when a format begins.

Super L III can produce two kinds of binary formats: one is compatible with GTCO Super L III and CalComp digitizers, and the other is compatible with Summagraphics digitizers. They are quite different and are described separately in the following topics.

- GTCO/CalComp Binary Format
- Summagraphics Binary Format
- Low Resolution Binary Format
- Cursor Button Codes in Binary Format

GTCO/CalComp Binary Format

This six-byte format is compatible with the GTCO Super L III high resolution binary format. It also emulates the CalComp binary format. Table 4 shows the structure of this format at the bit level.



Table 4: GTCO/CalComp High Resolution Binary Format

	Bit 7 <i>Sync</i>	Bit 6 <i>Cursor</i>	Bit 5 <i>button code</i>	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0 <i>X data high order bits</i>
Byte 1	1	C4	C3	C2	C1	C0	X15	X14
		<i>X data mid order bits</i>						
Byte 2	0	X13	X12	X11	X10	X9	X8	X7
		<i>X data low order bits</i>						
Byte 3	0	X6	X5	X4	X3	X2	X1	X0
		<i>Proximity X and Y highest order bits Y data high order bits</i>						
Byte 4	0	X17	0=in	Y17	X16	Y16	Y15	Y14
		<i>Y data mid order bits</i>						
Byte 5	0	Y13	Y12	Y11	Y10	Y9	Y8	Y7
		<i>Y data low order bits</i>						
Byte 6	0	Y6	Y5	Y4	Y3	Y2	Y1	Y0

To set up the GTCO/CalComp Binary Format:

Tablet Configuration Utilities:

1. Select GTCO Binary or CalComp Binary (under Output Format Options).
2. Choose the desired resolution (under Mode Options).

GTCO Commands:

1. Send command **BI** for Binary format.
2. Send command **IN** for English or command **MT** for metric measurements.
3. Send command **HR** for 1000 lpi/40 lpmm or command **H1** for 2000 lpi/100 lpmm resolution.



Summagraphics Binary Format

This eight-byte format is compatible with the Summagraphics 2000 Ipi UIOF format. Table 5 shows the structure of this format at the bit level.

To set up the Summagraphics Binary Format:

Tablet Configuration Utilities:

1. Select Summa Binary (under Output Format Options).
2. Choose the desired resolution (under Mode Options).

Table 5: Summagraphics Binary Format

	Bit 7 <i>Parity</i>	Bit 6 <i>Sync</i>	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1 <i>(Tablet ID)</i>	Bit 0 <i>Proximity</i> 0 = in
Byte 1		1	0	0	0	0	0	
<i>Cursor button code</i>								
Byte 2		0	0	C4	C3	C2	C1	C0
<i>X data low order bits</i>								
Byte 3		0	X5	X4	X3	X2	X1	X0
<i>X data mid order bits</i>								
Byte 4		0	X11	X10	X9	X8	X7	X6
<i>Sign X X data high order bits</i>								
Byte 5		0	Sx	X16	X15	X14	X13	X12
<i>Y data low order bits</i>								
Byte 6		0	Y5	Y4	Y3	Y2	Y1	Y0
<i>Y data mid order bits</i>								
Byte 7		0	Y11	Y10	Y9	Y8	Y7	Y6
<i>Sign Y Y data high order bits</i>								
Byte 8		0	Sy	Y16	Y15	Y14	Y13	Y12



Low Resolution Binary Format

Low resolution binary format conforms to an existing industry standard method of encoding small digitizer coordinate data. It is a fast, efficient and commonly used format. Low resolution binary formats are appropriate for applications needing low precision and using tablets up to 20" x 20". This format is five bytes long and is frequently transmitted at 9600 baud. It is used whenever the system resolution is set to 100 lpi, 200 lpi or 10 lpm. Table 6 shows the structure of this format at the bit level.

Table 6: GTCO Low Resolution Binary Format

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	<i>Parity</i>	<i>Sync</i>	<i>Button code</i>				<i>Not used</i>	
Byte 1		1	C3	C2	C1	C0	C40	
	<i>X data low order bits</i>							
Byte 2		0	X5	X4	X3	X2	X1	X0
	<i>X data high order bits</i>							
Byte 3		0	X11	X10	X9	X8	X7	X6
	<i>Y data low order bits</i>							
Byte 4		0	Y5	Y4	Y3	Y2	Y1	Y0
	<i>Y data high order bits</i>							
Byte 5		0	Y11	Y10	Y9	Y8	Y7	Y6

Cursor Button Codes in Binary Formats

Cursor button codes are always included in binary formats. You can define certain pushbuttons on your transducer to represent information that is relevant to your task. For example, the buttons on a 4-button cursor could represent four line widths or four colors.



By examining the button code in the format, the application program can use this information appropriately.

Binary formats include five bits which encode the button. The bits transmitted in the format depend on the button pressed. Table 7 and Table 8 show which bits will be sent.

Table 7: Cursor Button Codes for 4-Button Cursor

Button pressed	GTCO		CalComp		Summagraphics		
	Binary	ASCII	Binary	ASCII	Binary	ASCII1	ASCII2
None	00000	0	00000	U	000000	00	0
Yellow	00001	1	00001	0	000001	01	1
White	00010	2	00010	1	000010	02	8
Green	00100	4	00100	2	000100	04	2
Blue	01000	8	01000	3	000011	03	4

Table 8: Cursor Button Codes for 16-Button Cursors

Button pressed	GTCO		CalComp		Summagraphics	
	Binary	ASCII	Binary	ASCII	Binary	ASCII
None	00000	0	00000	U	00000	00
0	10000	0	10000	0	01110	14
1	10001	1	10001	1	00001	01
2	10010	2	10010	2	00010	02
3	10011	3	10011	3	00011	03
4	10100	4	10100	4	00101	05
5	10101	5	10101	5	00110	06
6	10110	6	10110	6	00111	07
7	10111	7	10111	7	01001	09
8	11000	8	11000	8	01010	10
9	11001	9	11001	9	01011	11
A	11010	:	11010	A	01101	13
B	11011	;	11011	B	01111	15
C	11100	<	11100	C	00100	04
D	11101	=	11101	D	01000	08
E	11110	>	11110	E	01100	12
F	11111	?	11111	F	10000	16



ASCII Formats

ASCII is a commonly used method for encoding text. ASCII coordinate formats can be directly displayed on most printers and terminals, and can be easily handled by QBASIC programs. On the other hand, ASCII coordinate formats are longer than binary ones, so they take longer to transmit and they occupy more space when stored in memory.

Table 9, Table 10 and Table 11 show the range of ASCII formats available on the Super L III. Besides the GTCO formats, emulations are provided for CalComp (in four variations) and Summagraphics ASCII formats. All the formats are influenced by the resolution currently in effect (higher resolutions require an additional digit of X and an additional digit of Y). Depending on the format, you can also choose to include or exclude certain optional characters (cursor button code, space, decimal point, carriage return and line feed).

To set up basic ASCII Formats:

Tablet Configuration Utilities:

1. Select GTCO ASCII, CalComp ASCII 1-4 or Summagraphics ASCII (under Output Format Options).
2. Select an English or metric resolution (under Mode Options).

GTCO Commands:

1. Send command **AS** for ASCII format.
2. Send command **IN** for English or command **MT** for metric measurements.
3. Send command **LR** for 100 lpi/10 lpmm, command **HR** for 1000 lpi/40 lpmm or command **H1** for 2000 lpi/100 lpmm resolution.

Then, you still have more decisions to make regarding the optional characters. Each of the optional characters can be selected by using the **Tablet Configuration Utilities** or by **Remote Command**. Check Tables 9, 10 and 11 to determine which optional characters can be included in the format you have selected.

To include a Cursor Button Code, Space, Decimal Point or Line Feed in an ASCII Format (where permitted):



Tablet Configuration Utilities: Select the “Include” option for the corresponding character.

GTCO Commands:

- Send command **PI** to include the Cursor Button Code character.
- Send command **SI** to include the Space character.
- Send command **CI** to include the Carriage Return character.
- Send command **LI** to include the Line Feed character.

To remove a Cursor Button Code, Space, Decimal Point or Line Feed in an ASCII Format (where present):

Tablet Configuration Utilities: Select the “Exclude” option for the corresponding character.

GTCO Commands:

- Send command **PE** to exclude the Cursor Button Code character.
- Send command **SE** to exclude the Space character.
- Send command **CE** to exclude the Carriage Return character.
- Send command **LE** to exclude the Line Feed character.

Table 9: GTCO ASCII Formats

100 LPI	C	X	X	X	X	<SP>	Y	Y	Y	Y	<CR>	<LF>				
<= 1016 lpi	C	X	X	X	X	X	<SP>	Y	Y	Y	Y	Y	<CR>	<LF>		
> 1016 lpi	C	X	X	X	X	X	X	<SP>	Y	Y	Y	Y	Y	Y	<CR>	<LF>

C = Optional cursor button code <SP> = Optional space
 X = X coordinate <CR> = Optional carriage return
 Y = Y coordinate <LF> = Optional line feed



Measurement Scales

You can choose either English or metric scaling for the coordinates you digitize. Super L III applies the required conversion factor before constructing a coordinate format for output.

The numbers appearing in coordinate formats depend on resolution. Table 12 shows how the resolution settings affect the data in coordinate formats.

To set the measurement scale:

Tablet Configuration Utilities: Select a resolution in the “Resolution” column of Mode Options.

GTCO Commands:

1. Send command **IN** for English or command **MT** for metric measurements.
2. Send command **LR** for 100 lpi/200 LPI/10 lpmm, command **HR** for 1000 lpi/40 lpmm or command **H1** for 2000 lpi/100 lpmm resolution.

Metric example: The distance between two points is 2032 counts in the 40 lpmm binary format. Each count represents 0.025 mm (from Table 12). Then, 2032 counts x 0.025 mm/count = 50.8 mm.

Table 12: Measurement Scales

English resolution	100 lpi	200 lpi	1000 lpi	2000 lpi
Least significant digit equals	0.01 inch	0.005 inch	0.001 inch	0.0005 inch
Metric resolution		10 lpmm	40 lpmm	100 lpmm
Least significant digit equals		0.1 mm	0.025 mm	0.01 mm

lpi = lines/inch lpmm = lines/millimeter



Digitizing Modes

Digitizing mode refers to the method Super L III uses to determine when to output a coordinate format. Six digitizing modes are available, but only one can be used at a time:

- Point Mode
- Line Mode (sometimes called Switched Stream Mode)
- Continuous Mode (sometimes called Stream Mode)
- Line Incremental Mode
- Continuous Incremental Mode
- Remote Request Mode

Table 14 will help you compare digitizing modes.

Table 14: Results of Active Area and Pushbutton Changes in Digitizing Modes

Digitizing mode	Action caused by entering active area	In active area: Action caused by pushbutton		caused by leaving active area	Other action	Command
		Off to on	On to off			
Point	No action	Send one format	No action	No action		PT
Line	No action	Send many formats	Stop sending formats	No action		LN
Continuous	Send many formats	Causes no change: send many formats		Stop sending formats		CN
Line incremental	No action	Send one format	No action	No action	Send one format at increment if button pressed	IC
Continuous incremental	Send one format	Send one format	No action	No action	Send one format at increment	CL
Remote request	No action	No action	No action	No action	Send one format on request	RM

**Table 13: Rate Commands**

Digitizing rate, formats/second	12	100	100	5	10	50
Digitizing rate command	R1	R2	R3	R4	R5	R6

Point Mode

In Point Mode, one coordinate is sent when a transducer button is pressed. Output occurs only when the transducer is in the active area.

To select Point Mode:

Tablet Configuration Utilities: Select the Point option under Mode.

GTCO Commands: Send command **PT**.

Line Mode

In Line Mode, coordinates are sent as long as a transducer button is pressed. Output occurs only when the transducer is in the active area.

To select Line Mode:

Tablet Configuration Utilities: Select Line Mode.

GTCO Commands: Send command **LN**.

To set the rate at which coordinates are sent in Line Mode:

Tablet Configuration Utilities: Select 12, 50 or 100 under Rate.

GTCO Commands: Send command **Rx** (where x = 1-6), as shown in Table 13.



Note that digitizing rate is also dependent on the communication baud rate and format type you have selected. The rates shown in Table 13 are therefore maximum rates.

Surprisingly, if your system seems to respond slowly to digitizer input, it may be because the digitizer coordinate output rate is set too high. This may occur when a program buffers excess coordinate data, thus causing a time delay.

Continuous Mode

In Continuous Mode, coordinates are sent continuously, at the specified output rate. Output occurs only when the transducer is in the active area. Output occurs continuously, whether or not a transducer button is pressed.

To select Continuous Mode:

Tablet Configuration Utilities:

Select the "Cont" option under Mode; select 12, 50 or 100 under Rate.

GTCO Commands:

Send command **CN**; to select a rate, send command **Rx** (where x = 1-6), as shown in Table 13.

Line Incremental Mode

In Line Incremental Mode, one coordinate is sent when the transducer is moved farther than a preset increment and a transducer button is pressed. Default increment is 0.01". Output occurs only when the transducer is in the active area.

To select Line Incremental Mode:

Tablet Configuration Utilities:

Select the "Line Incr" option under Mode.

GTCO Commands:

Send command **IC**; to set a new increment value, send command **IV** and at the prompt, send three digits representing the new increment in units of 0.001".



Continuous Incremental Mode

In Continuous Incremental Mode, one coordinate is sent when the transducer is moved farther than a preset increment or a transducer button is pressed or released. Default increment is 0.01". Output occurs only when the transducer is in the active area.

To select Continuous Incremental Mode:

Tablet Configuration Utilities: Select the "Cont Incr" option under Mode.

GTCO Commands: Send command CL; to set a new increment value, send command IV and at the prompt, send three digits representing the new increment in units of 0.001".

Remote Request Mode

In Remote Request Mode, one coordinate is sent when the Controller receives a Read Current Coordinate command (CTRL-B).

To select Remote Request Mode:

Tablet Configuration Utilities: Not available.

GTCO Commands: Send command **RM**.

Controlling the Alarm Using Remote Commands

An alarm (audio tone) is provided so the Super L III can inform you of certain conditions. The alarm can be enabled or disabled by the SuperSet Menu or commands.

To hear only critical tones, turn the alarm off:

SuperSet Menu: Select the Alarm menu block

GTCO Commands: Send command **AD**.



To hear all tones, turn the alarm on:

SuperSet Menu:

Select the Alarm menu block.

GTCO Commands:

Send command **AE**.

When you move the cursor over the Alarm block on the SuperSet Menu, the Proximity indicator (**green**) will light if the alarm is currently enabled.

Programming Examples: Reading and Displaying Super L III Formats

The following example QBASIC programs will allow you to experiment with reading and displaying Super L III formats:

- To read high resolution binary formats
- To read ASCII formats

Programming Example: To Read High Resolution Binary Formats

1. Configure Super L III for 9600, N, 8, 1, GTCO Binary and Continuous (SuperSet 01).
2. Enter and run this QBASIC program:

```

\*****
\*          READ AND DISPLAY HIGH RESOLUTION BINARY FORMAT          *
\*          BY GTCO CORPORATION                                     *
\*****
CLS                                                                    'CLEAR SCREEN
OPEN "COM1:9600,N,8,1" FOR RANDOM AS #1                                'CONFIGURE & OPEN COM1
DO
  D$ = INPUT$(1, #1)                                                  'GET ONE BYTE
  IF ((ASC(D$) AND 128) >= 128) THEN                                  'WAIT FOR SYNC BIT
    PB = (ASC(D$) AND 60) / 4                                         'EXTRACT PUSHBUTTON CODE
    XHIGH1 = (ASC(D$) AND 3) * 16384                                  'EXTRACT X HIGH ORDER BITS
    XHIGH = (ASC(INPUT$(1, #1)) AND 127) * 128                       'EXTRACT X MID ORDER BITS
    XLOW = (ASC(INPUT$(1, #1)) AND 127)                              'EXTRACT X LOW ORDER BITS
    XDATA = XHIGH1 + XHIGH + XLOW                                     'FINAL DECIMAL X DATA
    YHIGH1 = (ASC(INPUT$(1, #1)) AND 3) * 16384                     'EXTRACT Y HIGH ORDER BITS
    YHIGH = (ASC(INPUT$(1, #1)) AND 127) * 128                       'EXTRACT Y MID ORDER BITS
    YLOW = (ASC(INPUT$(1, #1)) AND 127)                              'EXTRACT Y LOW ORDER BITS
    YDATA = YHIGH1 + YHIGH + YLOW                                    'FINAL DECIMAL Y DATA
    PRINT PB, XDATA / 1000, YDATA / 1000                             'PRINT RESULTS
  END IF
LOOP

```



Programming Example: To Read ASCII Formats

1. Configure the Super L III for 9600, N, 8, 1, GTCO ASCII and Continuous (SuperSet 74).
2. Enter and run this QBASIC program:

```

\*****
\*          READ AND DISPLAY ASCII FORMAT          *
\*          BY GTCO CORPORATION                    *
\*****
CLS          'CLEAR SCREEN
OPEN "COM1:9600,N,8,1" FOR RANDOM AS #1 'CONFIGURE & OPEN COM1
DO
  LINE INPUT #1, D$          'GET FORMAT
  PRINT D$;                  'PRINT FORMAT
LOOP

```



General Product Information

Radio and Television Interference

The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Reorient or coil cables.
- Consult the dealer or an experienced Radio/TV technician for help.

NOTE: Any cables the user adds to the device must be shielded to be in compliance with the FCC standards. Any unauthorized modification to this device could result in the revocation of the end user's authority to operate this device.



Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, dass der/die/das

Super L III

(Gerät, Typ, Bezeichnung)

im Übereinstimmung mit den Bestimmungen der

Vfg 1046/1984

(Amtsblattverfügung)

Funk-Entstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

GTCO CalComp by Turning Technologies, Inc.

(Name des Herstellers/Importeurs)

Dieses Gerät wurde einzeln sowohl als auch in einer Anlage, die einen normalen Anwendungsfall nachbildet, auf die Einhaltung der Funkentstörbestimmungen geprüft. Es ist jedoch möglich, dass die Funkentstörbestimmungen unter ungunstigen Umständen bei anderen Gerätekombinationen nicht eingehalten werden. Für die Einhaltung der Funk-entstörbestimmungen seiner gesamten Anlage, in der dieses Gerät betrieben wird, ist der Betreiber verantwortlich. Einhaltung mit betreffenden Bestimmungen kommt darauf an, dass geschirmte Ausführungen gebraucht werden. Für die beschaffung richtiger Ausführungen ist der Betreiber verantwortlich.



Limited Warranty for Super L III

GTCO CalComp by Turning Technologies, Inc. warrants these products to be free from defects in material and workmanship under the following terms. Complete and return the enclosed warranty registration card to ensure that your products are covered with this warranty.

Coverage

Parts and labor are warranted for two (2) years from the date of the first consumer purchase for the digitizer tablet, controller, transducers and tablet accessories. Power supply and cables are also warranted for two (2) years. This warranty applies to the **original consumer purchaser only**.

Within the European Union, the warranty period is two (2) years, as mandated by the EU. Contact your local dealer or distributor for additional warranty information.

Warranty is only valid if original consumer's purchase or lease date is less than or equal to six months from the original GTCO CalComp by Turning Technologies sale date. This information will be captured by the system serial number and confirmed by the reseller's purchase order.

A nominal Warranty Handling Fee will be charged after the first 90 days of use and calculated from the date of original consumer purchase. This payment may be made by Visa, MasterCard or American Express. A copy of the sales receipt or invoice will be required for warranty verification.

Conditions

Except as specified below, this warranty covers all defects in material or workmanship in the products. The following are not covered by the warranty:

1. Any product on which the serial number has been defaced, modified or removed (if applicable).
2. Damage, deterioration or malfunction resulting from:
 - a. Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature, unauthorized modification for any purpose, unauthorized product modification, or failure to follow instructions supplied with the product.
 - b. Repair or attempted repair by anyone not authorized by GTCO CalComp by Turning Technologies.
 - c. Any damage in shipment of the product (claims must be presented to the carrier).
 - d. Any other cause which does not relate to a manufacturing defect.
3. Any product not sold or leased to a consumer within six months of GTCO CALCOMP BY TURNING TECHNOLOGIES original sale date.



GTCO CalComp by Turning Technologies will pay all labor and material expenses for covered items, but will not pay for the following:

1. Removal or installation charges.
2. Costs for initial technical adjustments (setup), including adjustment of user controls.
3. Certain shipping charges. (Payment of shipping charges is discussed in the next section of this warranty.)
4. Packaging costs. (Customers should keep their boxes.)

Warranty Service Procedures

1. To obtain service on your GTCO CalComp by Turning Technologies product, contact the Technical Support Department to receive a Return Material Authorization Number (RMA#) and shipping instructions by calling: 1-866-746-3015.
2. Ship the product to GTCO CalComp by Turning Technologies with the RMA# marked clearly on the outside of the box. Without a clearly marked RMA# on the shipping box, GTCO CalComp by Turning Technologies reserves the right to refuse the shipment.
3. Although you must pay any shipping charges to ship the product to GTCO CalComp by Turning Technologies for warranty service, GTCO CalComp by Turning Technologies will pay the return shipping charges for ground shipment. Other shipping options are available at an additional fee.
4. Whenever warranty service is required, the original dated sales invoice (or a copy) must be presented as proof of warranty coverage and should be included in shipment of the product. Please also include your name, address, telephone number, fax number, email address and a description of the problem.
5. If GTCO CalComp by Turning Technologies determines that the unit is not defective within the terms of the warranty, the consumer shall pay the cost of all freight charges, as well as any repair charges.

Technical Support

Web-based Technical Support is available free of charge at: www.gtcocalcomp.com, where current driver releases, as well as comprehensive technical support, troubleshooting, Technical Bulletins and FAQs can be found.

Telephone Technical Support is available free of charge to the original consumer for a period of 90 days from the date of purchase of the product. Please contact our Technical Support Department at: 1-866-746-3015 or fax your request to: 480.998.1751.

Disclaimer of Unstated Warranties

The warranty printed above is the only warranty applicable to this purchase. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. Assuming the



warranty above stated is otherwise applicable, it is expressly understood and agreed that GTCO CalComp by Turning Technologies sole liability whether in contract, tort, under any warranty, in negligence or other shall be for the repair or replacement of the defective parts and under no circumstances shall GTCO CalComp by Turning Technologies be liable for special, indirect or consequential damages. The price stated and paid for the equipment is a consideration in limiting GTCO CalComp by Turning Technologies liability.

Notice

Some states and provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you. This warranty gives you specific legal rights, and you may have other rights, which vary from state to state, or province to province.

To obtain service on your GTCO CalComp by Turning Technologies product, call our Technical Support Department at: 1-866-746-3015 or fax us at (480) 998-1751. We can also be contacted through our website at www.gtccalcomp.com (in US); at EUOffice@gtccalcomp.com (in Germany); at infos@calcomp.fr (in France).

Important!

All products returned to GTCO CalComp by Turning Technologies for service must have prior approval in the form of a Return Merchandise Authorization Number (RMA#), which can be obtained by calling the Technical Support Department.



Corporate Headquarters

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