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# General Product Information

## About Cordless Roll-Up

Help File Number 53-00063, Revision D

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E-mail: [gtco.support@gtcocalcomp.com](mailto:gtco.support@gtcocalcomp.com)

## Limited Warranty for the Cordless Roll-Up

GTCO Corporation 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 tablet, controller, transducers and power supply. Any system components replaced under warranty will continue to be covered under the original system warranty for the duration of the warranty period. Replacement or spare components "purchased" for use with the original system will be warranted for two (2) years from the date of the original consumer purchase and will follow the same coverage guidelines as the original system. This warranty applies to the original consumer purchaser. Warranty is only valid if original consumer purchase or lease date is less than or equal to six months from the original GTCO sale date. This information will be captured by the system serial number and confirmed by the reseller's purchase order.

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.
  - 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's original sale date.

We will pay all labor and material expenses for covered items, but we will not pay for the following:

1. Removal or installation charges.
2. Costs for initial technical adjustments (set up), including adjustment of user controls.

Payment of shipping charges is discussed in the next section of this warranty.

### Warranty Service Procedures

1. To obtain service on your GTCO product, call Technical Support at (410) 312-9221 to obtain a Return Authorization (RA) number and shipping instructions. Ship the product to GTCO, to the attention of your RA number.
2. Although you must pay any shipping charges to ship the product to GTCO for warranty service, we will pay the return shipping charges for ground shipment (other shipping options extra), within the USA.
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, and a description of the problem.
5. If GTCO determines that the unit is not defective within the terms of the warranty, the buyer shall pay the cost of all freight charges.

### 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's sole liability whether in contract, tort, under any warranty, in negligence or otherwise shall be for the repair or replacement of the defective parts and under no circumstances shall GTCO be liable for special, indirect or consequential damages. The price stated and paid for the equipment is a consideration in limiting GTCO's 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 product, call our Technical Service Department at (410) 312-9221 or fax us at (410) 290-9065.**

**Important!** All products returned to GTCO for service must have prior approval in the form of a Return Authorization (RA) number, which can be obtained by calling the Technical Support Department.

# 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.

**Note:** 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
- Consult the dealer or an experienced Radio/TV technician for help

**Note:** This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to insure compliance.

The "CE" mark on this device indicates compliance under the EMC 89/336/EEC Directive.

European Contact: HCS Sysgraf of Computerhandel, Amalienstrabe 48/III Floor A-1130, Vienna.

## Transducers

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

# Bescheinigung des Herstellers/Importeurs

Heirmit wird bescheinigt, dass der/die/das

3036R

(Geraet, Typ, Bezeichnung)

im Uebereinstimmung mit den Bestimmungen der

Vfg 1046/1984

(Amtsblattverfuegung)

Funk-Entstort ist.

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

GTCO Corporation

(Name des Herstellers/Importeurs)

Dieses Geraet wurde einzeln sowohl als auch in einer Anlage, die einen normalen Anwendungsfall nachbildet, auf die Einhaltung der Funk-entstoerbestimmungen gepueft. Es ist jodoch moeglich, dass die Funk-entstoerbestimmungen unter unguenstigen Umstaenden bei anderen Geraetekombinationen nicht eingehalten werden. Fuer die Einhaltung der Funk-entstoerbestimmungen seiner gesamten Anlage, in der dieses Geraet betrieben wird, ist der Betreiber verantwortlich.

Einhaltung mit betreffenden Bestimmungen kommt darauf an, dass geschirmte Ausfuehrungen gebraucht werden. Fuer die beschaffung richtiger Ausfuehrungen ist der Betreiber verantwortlich.

# Standard Operating Information

## Parts Checklist

The digitizer system consists of:

- Cordless Roll-Up** digitizing tablet
- Transducer (stylus or 4-button cursor or 16-button cursor)
- Computer interface cable with 9-pin connector
- 9- to 25-pin adapter
- Power supply
- TabletWorks CD
- Accessory pouch
- Deluxe Travel Bag (optional)
- Cardboard tube, insert and end caps

**Important!** The Deluxe Travel Bag is intended to be used only in conjunction with the heavy gauge cardboard tube, insert and end caps supplied. **The Deluxe Travel Bag does not provide complete protection if used alone.** The product will be subject to damage, not covered by the warranty, if not protected by the tube, insert and end caps. If you have misplaced or disposed of these items, contact GTCO for replacements.

## What is the Cordless Roll-Up?

The **Cordless Roll-Up** belongs to a class of computer input devices called **graphic digitizers** or **graphic tablets**. A graphic digitizer consists of a transducer (usually a hand held cursor or stylus) and an electronic tablet work surface. The Cordless Roll-Up converts the position of the transducer into data for computer processing. Data output from the digitizer is in the form of an XY coordinate pair that pinpoints the location of the transducer on the tablet surface.

**The Cordless Roll-Up works with many graphic application software programs. It can be used to:**

- Move a pointer on a display screen
- Create and manipulate objects in a graphic composition
- Trace a drawing (or other source material) to create an image on the screen
- Select commands or functions from a menu of such items placed on the tablet surface
- Select items from a pull-down menu on the screen
- Determine dimensions of objects on drawings and blueprints

**Special features include:**

- Cordless transducers
- Flexible, portable tablet
- Dual tablet orientation
- GTCO, CalComp and Summagraphics emulations

For additional information, see Technical Specifications at the end of this section.

## What you need to use your Cordless Roll-Up

- A PC with an RS232C serial communication port. (Signal levels must conform to EIA RS2320 specifications.)
- Graphic application software that accepts digitizer input via the computer's RS232C serial port.

## Care and handling of your Cordless Roll-Up

The **Cordless Roll-Up** was designed to be both portable and durable. As with any product, it requires proper care and handling for reliable operation. By following these recommendations, your Cordless Roll-Up will provide you with many years of service:

- Always use the digitizer on a flat surface.
- Before moving the digitizer, disconnect the transducer and the interface cable.
- Before moving the digitizer, roll it up. The housing along the side of the tablet is designed as a rolling aid and it allows you to easily control rolling action. (See [Transporting your Cordless Roll-Up](#) for specific moving instructions.)
- Don't permanently attach anything to the tablet.
- Don't use sharp instruments on or near the tablet, to avoid scratching or cutting it. Cuts in the tablet will violate your warranty.
- Don't crease, dent or abuse the tablet. Creases can damage the tablet structure. Severe creases or abuse will violate your warranty.
- Clean the tablet with any mild, nonabrasive household cleaner. Rubbing alcohol is recommended. After cleaning, wipe the surface dry to avoid possible digitizing errors.

## Transporting your Cordless Roll-Up

You *must* transport your **Cordless Roll-Up** with the factory-supplied shipping materials (heavy gauge cardboard tube, insert and end caps). Failure to do so could result in serious damage to the unit and may violate your warranty.

1. Disconnect the transducer and interface cable from the Cordless Roll-Up and the computer. Remove all material from the tablet.
2. Grasp the housing firmly with both hands and roll it toward the opposite side of the tablet. The housing and the printing on the tablet must be on the inside of the roll. The roll diameter should be just smaller than the inside diameter of the factory-supplied shipping tube. When correctly rolled, only the tablet's black back will be exposed.
3. Insert the rolled digitizer into the shipping tube and allow it to fully unroll against the inside of the tube. Place the factory-supplied insert into the center of the rolled tablet for support.
4. Place the accessories in the accessory case. Place the accessory case in the cavity at the end of the insert. Place the factory-supplied end caps on the tube to seal it. Place the tube in the Deluxe Travel Bag (optional).

**Important!** The Deluxe Travel Bag is intended to be used only in conjunction with the heavy gauge cardboard tube, insert and end caps supplied. **The Deluxe Travel Bag does not provide complete protection if used alone.** The product will be subject to damage, not covered by the warranty, if not protected by the tube, insert and end caps. If you have misplaced or disposed of these items, contact GTCO for replacements.

# Installing your Cordless Roll-Up

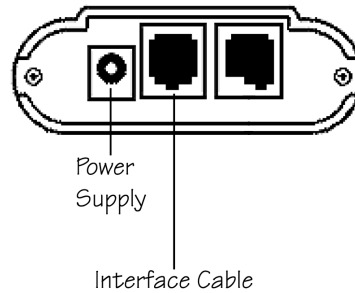
Follow the instructions below to set up your **Cordless Roll-Up**. Before you begin, please take a moment to fill out and mail the Warranty Registration Card.

1. Select a large, flat surface on which to place the Cordless Roll-Up. Clear all items from the surface.

**Caution!** Conductive materials on, under or near the Cordless Roll-Up may cause improper operation.

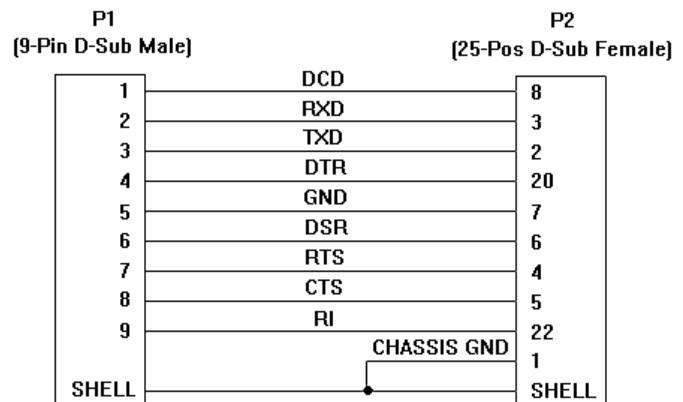
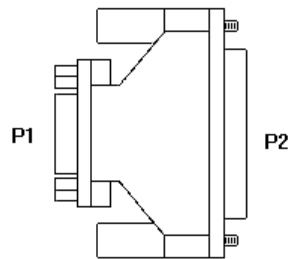
2. Remove the Cordless Roll-Up from its container and unroll it on the selected surface.

3. Plug the power supply into an AC outlet. Connect the power supply to the appropriate jack on the connector panel. The digitizer should produce four short tones.



4. Connect the interface cable to the appropriate jack on the connector panel. (The connector is keyed and will fit only the correct jack.)

5. Connect the 9-pin connector of the interface cable to the serial port on your computer. If necessary, use the 9- to 25-pin adapter to connect to a PC-compatible (DTE male) port.



6. Orient the tablet (see the [Using the SuperSet Menu](#) section) as desired.
7. Use the SuperSet Menu to select the two-digit SuperSet Code (shown in [Table 1](#)) for your application program.

- 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.
- If an appropriate SuperSet Code is not listed in Table 2, then use the [Custom Configuration Menu](#) to set up your Cordless Roll-Up.

8. Configure your computer for use with the Cordless Roll-Up:

- Configure your graphic application software to operate with the Cordless Roll-Up. Many application programs provide configuration information for specific digitizers. If Cordless Roll-Up digitizer is not listed, you can use the configuration for GTCO Digi-Pad Type 5 or Type 5A (T5/T5A), CalComp 9100/9500 or 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 necessary for the Cordless Roll-Up to work with your application software.

9. Begin digitizing.

# Using the transducers

Two types of transducers are available with the **Cordless Roll-Up**: a stylus and cursors. The transducers are cordless and are powered by a battery.

- The **cursor** is similar in appearance to a mouse, except that it has an attached lens with crosshairs for highly accurate digitizing. Cursors are available with 4 or 16 buttons.
- The **stylus** is similar in appearance to a ball-point pen. It has a tip-activated switch, plus two buttons on the barrel.

## Sleep mode

Each transducer goes into a battery-saving “sleep mode” when the buttons or tip switch haven’t been pressed for two minutes. To reactivate the transducer, press any of its buttons or the tip switch.

## Transducer battery replacement

The expected life of the transducer battery is approximately 350 hours of *continuous use*. Battery low tones indicate that the battery should be replaced. The system is designed to continue operating properly for a short time after the battery low alarm starts, however, the battery should be replaced promptly to avoid performance degradation.

The stylus uses AAA batteries. Contact [GTCO CalComp](#) for cursor batteries. (See [Technical specifications](#) for battery type.)

## Stylus battery replacement

The stylus uses a AAA battery.

1. Push in the clip on the battery cover to remove it.
2. Pull the used battery from its clip. Dispose of the battery promptly.
3. Insert the new AAA battery into the battery compartment, positioning it properly to ensure the correct polarity.
4. Replace the battery cover.



### Stylus Sleep Mode:

The stylus will enter *sleep mode* if there is no switch activity for approximately 20 seconds, or if any switch is held continuously active for approximately two minutes, to prolong battery life.

The stylus will exit sleep mode when the tip or either side switch is activated.

### Battery LED:

The LED will flash continuously when battery voltage has decayed to 0.9V nom. and the pen is awake.

The LED will flash four times when a new battery is installed to indicate the pen is ready to use.

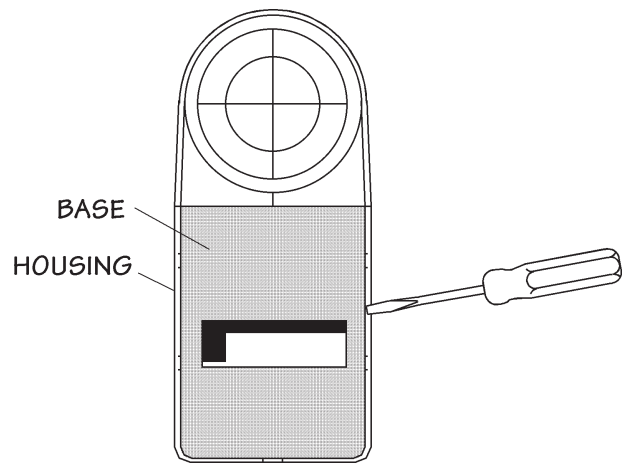
## Cursor battery replacement

**Important!** Read the following instructions thoroughly before attempting to replace the battery in your cursor. Failure to follow these instructions carefully could result in damage that would render the cursor unusable.

**Warning!** The lithium battery used in this device may present a fire, explosion and severe burn hazard if mis-treated.

**Do not recharge, disassemble, heat above 212°F (100°C), incinerate or expose to water.**

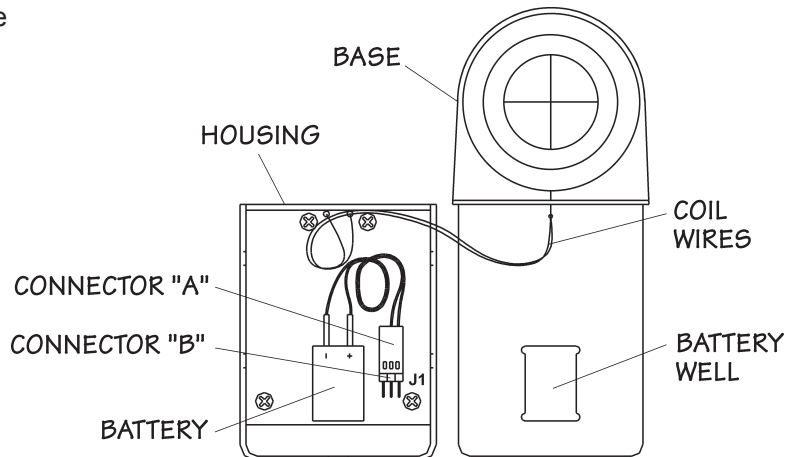
1. Place the cursor button-side-down on a table. Insert a small flat-blade screwdriver between the **housing** and the **base** in the area shown in the figure below. Gently pry the housing off the base, taking care that the screwdriver doesn't slip and damage internal components.



2. Carefully lift the base and place it next to the housing as shown in the figure below.

**Caution!** The housing and base are connected by two **coil wires**. Keep the housing and base close together to avoid putting any strain on these wires.

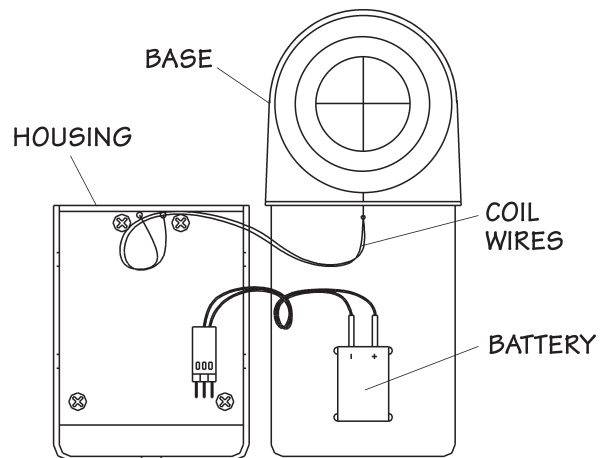
3. Slide **Connector "A"** off **Connector "B."** Dispose of the battery properly (see Warning).



4. Attach **Connector "A"** of new battery to **Connector "B"**.

5. Place the **battery** in the **well** of the base. Place the housing on the base, taking extreme care that the coil wires do not get pinched between the housing and base.

6. Snap the unit together, making sure that the battery stays in the well.



# Using the SuperSet Menu

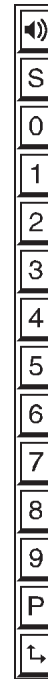
The **SuperSet Menu** is the column of blocks printed on the tablet.

Use the SuperSet Menu to:

- Change the tablet's orientation
- Configure the Cordless Roll-Up for specific application programs
- Use the Custom Configuration Menu
- Control the alarm
- Reset the Cordless Roll-Up

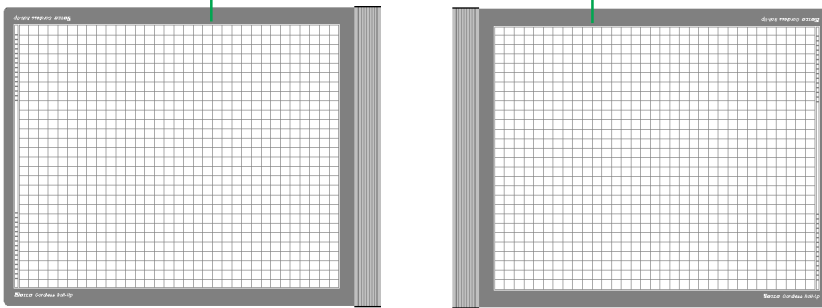
When using the SuperSet Menu, a **tone** will sound when you pick **S**, **P** or **Speaker**, indicating a successful selection.

The number blocks **0** through **9** are active only after selecting **S**.



## Changing the tablet's orientation

The **Cordless Roll-Up** lets you choose between two different tablet orientations: you can orient the tablet with the housing on your **right** (factory default) or on your **left**.



To change the orientation of the tablet:

1. Turn the tablet to the desired orientation.
2. Relocate the origin by selecting the **four-tone** block on the *lower* SuperSet Menu. You should hear four short **tones** when you do this.

## Configuring for specific application programs

To configure your Cordless Roll-Up for use with specific application programs:

1. In **Table 1**, find the application program you will be using with your Cordless Roll-Up. Note the corresponding **SuperSet code**.
  - 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.
  - If an appropriate SuperSet Code is not listed in Table 2, then use the **Custom Configuration Menu** to set up your Cordless Roll-Up.
2. Select **S** on the SuperSet Menu and then select the two digits of the SuperSet code for your application program.
3. You will hear four short **tones** after a successful menu configuration.

An **Example** of configuring for a specific application program follows.

**Table 1: SuperSet Menu Codes for selected application programs**

<b>Program</b>	<b>Company</b>	<b>SuperSet Code</b>
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
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	Paydirt Systems, Inc.	31
Cut & Fill/Precision	Paydirt/Timberline	42
<hr/>		
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
DrawPlus	Micrografix	02

<b>Program</b>	<b>Company</b>	<b>SuperSet Code</b>
Earthwork	Civilsoft	01
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.	Estimation, Inc.	89
Execucom	Execucom Systems Corp.	36
Expose	Roctek Corp.	64
<hr/>		
Fastcad	Evolution Computing	26
<hr/>		
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
<hr/>		
HALO products	Media Cybermetics	13
Hotdij	Geocomp, Ltd.	35
<hr/>		
IBM GFIS	IBM	55
Ice System, The	MC2	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
<hr/>		
JAVA	Jandel Scientific	24
Job Boss	Small Systems Design, Inc.	39
Job Power	Job Power	42
<hr/>		
Kolvin Pro	Damon, Inc.	01
<hr/>		
Landmarke	Cambridge Software, Inc.	23
Lasercad	The Software Machine	01
Logdigi, Planimeter	The Logic Group	12
Lumena	Time Arts, Inc.	10
<hr/>		
Mach Lite	Ziatek, Inc.	04
Mach 2	Ziatek, Inc.	04
Mach 4	Ziatek, Inc.	83
MapGrafix	Comgrafix, Inc.	02
Market America	CACI	11
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
Microstation PC	Intergraph Corp.	09
MIKE	Compute-Ability, Inc.	68
Mirage	Zenographics	36
Molitors & Zimmer	Molitors & Zimmer Estimating Syst.	67

<b>Program</b>	<b>Company</b>	<b>SuperSet Code</b>
NCE Estimator 2000	National Computer Est., Inc.	01
Pagemaker	Aldus Corp.	02
PAD	ModaCAD	50
Paydirt Cross-Section	Spectra-Physics Laserplan, Inc.	31
Paydirt Roadwork	Spectra-Physics Laserplan, Inc.	31
Paydirt Sitework	Spectra-Physics Laserplan, Inc.	31
Paydirt Sitework Basic	Spectra-Physics Laserplan, Inc.	31
Paydirt Sitework 3.1 for Windows	Spectra-Physics Laserplan, Inc.	05
Paydirt Sitework 3.2 for Windows	Spectra-Physics Laserplan, Inc.	01
P-CAD	Personal CAD Systems, Inc.	20
PC.BAT		46
PC Paintbrush	Z Soft	10
PC Paintbruch/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	Timberline Software	37
ProBid	Promation	06
Procad	Teksoft	13
Prodesign II	American Small Bus. Comp., Inc.	01
ProExcel	Excel	80
PTO	CDCI	58
QED	Roctek Corp.	64
QuickCalc	Constructive Computing	58
Quickdirt	Constructive Computing	23
Quickdirt II/QuickEst III	Constructive Computing	58
QuickEst	Constructive Computing	43
QuickPen CAD	QuickPen	09
QuickPen Estimating	QuickPen	59
Remodeling Estimator	National Computer Estimating, Inc.	01
Right Hand Man	Johnston & Associates, Inc.	04
Roadeng	Softree Technical Systems, Inc.	27
Roof Cad	True North Estimating	12
Roof Estimator 3000	Essential Technology	65
Robocad, Robosolid	RoboSystems International	21
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
Terra Model	Plus 3 Software	09
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

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
2D CAD	West Coast Consultants	33

**Table 2: Configuration details for SuperSet Menu Codes**

**Note:** Max  $\approx$  140 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	
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




Code	Commun.	Output Options	ASCII Options
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	
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,N,8,1	GTCO ASCII, 40 lpm, Point	Pb, CR, LF
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
87		<b>*Special:</b> Science Accessories Emulation; remote function disabled.	
88		<b>*Special:</b> Science Accessories Emulation; remote function enabled.	
89		<b>*Special:</b> Estimation, Inc.	
90-99	User configuration storage locations		

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**\*87-89 require special firmware to activate.**

## Example: Configuring for specific application programs

Suppose you wanted to configure your **Cordless Roll-Up** to operate with Autodesk's AutoCAD application program. You would:

1. Find the entry for AutoCAD in [Table 1](#). The SuperSet code is **01**.
2. Select  on the SuperSet Menu. This places the digitizer in **Select Mode**.
3. Select  on the SuperSet Menu. This enters the first digit of the SuperSet code for AutoCAD.
4. Select  on the SuperSet Menu. This enters the second digit of the SuperSet code for AutoCAD.
5. You will hear four short **tones**, indicating that the configuration is complete. The Cordless Roll-Up is now configured to operate with AutoCAD. Select Mode is no longer active.

**Note:** After you begin Select Mode, you must digitize only in the number blocks to properly enter a SuperSet code. If you digitize in the tablet's active area during Select Mode, the sequence will be terminated and the previous configuration will be retained (you will hear three medium-length tones after an aborted sequence). To cancel a sequence if the first digit is entered incorrectly, digitize in the tablet's active area.

## Introduction to the Custom Configuration Menu

The **Cordless Roll-Up** uses the [Custom Configuration Menu](#) to control baud rate, data format and other operating characteristics. The Custom Configuration Menu card is **stored** in one end of the digitizer's housing.

**Configuration parameters for the Cordless Roll-Up are divided into three categories:**


- [Communication Options](#)
- [Output Format Options](#)
- [Mode Options](#)

## Using the Custom Configuration Menu

If your application does not have a SuperSet Menu code, or if a different configuration is required, then you can use the [Custom Configuration Menu](#) card to configure the **Cordless Roll-Up**. The Custom Configuration Menu replaces the 24 switches that were associated with older GTCO digitizers.

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 Cordless Roll-Up to be easily switched between applications.

**To configure the Cordless Roll-Up using the Custom Configuration Menu:**

1. Remove the Custom Configuration Menu card from its [storage location](#) in one end of the housing. Place the card in the active area of the tablet (the entire menu must be in the active area). Hold or temporarily tape the card in place to keep it from moving during the configuration process.
2. Select  on the SuperSet Menu. The alarm will beep slowly, indicating that the Custom Configuration Menu mode is now ready to receive alignment Point 1.
3. You must now tell the Controller where the Custom Configuration Menu card is located on the tablet. Select alignment [Point 1](#) (small blue square) in the lower left corner of the menu area. The alarm will beep rapidly, indicating that the system is waiting to receive alignment Point 2.
4. Select alignment [Point 2](#) (small blue square) in the lower right corner of the card. After alignment Point 2 is selected, the alarm will sound only if the transducer passes over an active menu block on the card.



**Note:** If invalid alignment points are selected, or if the menu card is not entirely in the active area, the menu mode will be aborted. This is indicated by three medium **tones** from the alarm.

5. Configure the Cordless Roll-Up by selecting the [menu blocks](#) that correspond to the settings you want.
6. Review the configuration to ensure that the proper settings have been selected. Pass the transducer down each group of options; the alarm will sound when the transducer is over the active choice.

- After making your selections, you can save the configuration as a temporary configuration or save the configuration in a user-definable location for later recall.

**To save the configuration temporarily**, select **P** on the SuperSet Menu. You will hear four short tones when you successfully save a configuration. The configuration is saved in a temporary location, where it will be retained even if the unit is powered off or reset. However, if another SuperSet code is entered, this temporary configuration is lost and cannot be recalled without configuring the Cordless Roll-Up again.

**To save the configuration in a user-definable location**, select **S** and then select a two digit value ranging from 90 to 99 on the SuperSet Menu. You will hear four short tones when you successfully save a configuration. Saved configurations allow you to switch between applications quickly. Locations 90 through 99 retain configurations even if the Cordless Roll-Up is turned off or reset.

- The configuration setup is now complete. **Store** the Custom Configuration Menu card in the tablet housing.

## Custom Configuration Menu

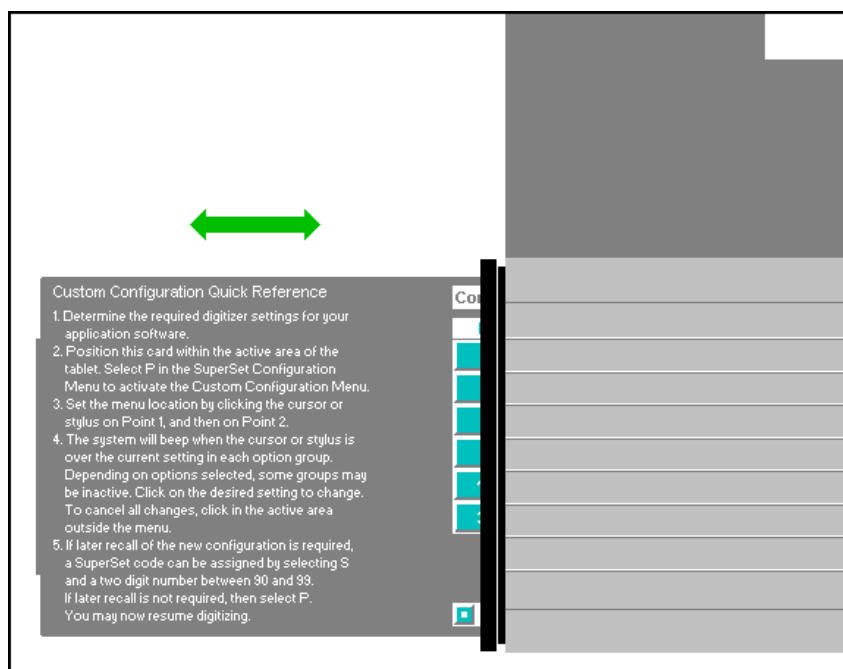
Click on menu blocks for description of each menu option group:

**Custom Configuration Quick Reference**

- Determine the required digitizer settings for your application software.
- Position this card within the active area of the tablet. Select P in the SuperSet Configuration Menu to activate the Custom Configuration Menu.
- Set the menu location by clicking the cursor or stylus on Point 1, and then on Point 2.
- The system will beep when the cursor or stylus is over the current setting in each option group. Depending on options selected, some groups may be inactive. Click on the desired setting to change. To cancel all changes, click in the active area outside the menu.
- If later recall of the new configuration is required, a SuperSet code can be assigned by selecting S and a two digit number between 90 and 99. If later recall is not required, then select P. You may now resume digitizing.

Communication Options		Output Format Options			Mode Options	
Baud	Data Bits	GTCO	CalComp	Summa	Mode	Resolution
1200	7	Binary	Binary	Binary	Point	100 Ipi
2400	8	ASCII	ASCII 1	ASCII 1	Line	200 Ipi
4800	Stop Bits	Button	ASCII 2	ASCII 2	Cont	1000 Ipi
9600		1	Include	ASCII 3	Line Incr	2000 Ipi
19200	2	Exclude	ASCII 4	Include	Cont Incr	10 Ipmm
38400	Parity	Space	Line Feed	Exclude	Rate	40 Ipmm
		Even	Include	Include	12	100 Ipmm
		Odd	Exclude	Exclude	50	
	None			Exclude	Max	

## Custom Configuration Menu Storage





## Communication Options

- **Baud** The rate, in bits/second, at which characters are transmitted across the RS232C serial interface. Choices are: 1200, 2400, 4800, 9600, 19200 and 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) and 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) and 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) and Odd (O).

## Output Format Options

- **GTCO** Selects GTCO-compatible formats. See Advanced programming information for greater detail on GTCO format structure. Choices are: Binary and 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 and ASCII 4.
- **Summa** Selects Summagraphics-compatible formats. See Advanced programming information for greater detail on Summagraphic format structure. Choices are: Binary and ASCII.

ASCII formats can be modified by including or excluding a button code, space, 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. 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. 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. 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. 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. 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 and Continuous Incremental.
- **Rate** Determines how fast output reports will be transmitted from the digitizer. Choices are: 12, 50 and 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 and 150 lpmm.

See the Advanced Programming information section for more details.

## Controlling the alarm

You can disable the alarm (for “transducer pressed”) if you don’t want to hear it while you are using the digitizer. When the alarm is off, you will still hear diagnostic tones and menu-related tones.

### To turn the alarm on and off:

- Select the  block on the SuperSet Menu.

## Resetting the Cordless Roll-Up

There are three ways to reset the Cordless Roll-Up:

- Enter SuperSet code 00,
- Unplug and replug the power supply, or
- Send [remote commands](#).

When one of these events occurs, the Cordless Roll-Up will revert to the configuration that was last defined. Any remote commands that were active before the reset will be lost.

## Cordless Roll-Up tones

The **Cordless Roll-Up** produces an “alarm” in the form of audio tones to inform you of various events. The table below describes the kinds of tones you might hear while operating the digitizer.

**Table 3: Cordless Roll-Up tones**

Length	Number of times	Meaning
Short	Four at power up	Diagnostics passed
Short	Four	Successful end of menu mode
Short	Once	Transducer switch pressed
Short	Ten (every ten minutes)	Battery low
Medium	Three	Menu mode aborted
Medium	Three at power up	Configuration error
Medium, once per second	Continuously	Configuration Menu mode; waiting for alignment Point 1
Short, twice per second	Continuously	Configuration Menu mode; waiting for alignment Point 2
Long, once per second	Continuously	Grid disconnected
Continuously on	At power up	Diagnostics failed

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

- **Configuration error** indicates that the Cordless Roll-Up may not be properly configured for your application. If you hear this tone, reselect the appropriate configuration from the [SuperSet Menu](#).
- **Diagnostics failed** and **Grid disconnected** indicate serious problems. If you hear either of these tones, call our [Technical Support Department](#).
- **Battery low** indicates that the battery in the transducer should be replaced. The system is designed to continue operating properly for a short time after the battery low alarm starts, however, [the battery should be replaced promptly](#) to avoid performance degradation.

**Note:** You might also hear tones produced by the Cordless Roll-Up which are sent by your application program. (Programs can send commands to the digitizer to turn the audio tone generator on and off.) If you hear tones during digitizing, and they don't correspond to tones listed in the table above, they are produced by the application program.

# Troubleshooting guide

As with any computer peripheral, **Cordless Roll-Up** problems sometimes do occur. Most of these problems are easy to find and correct. This troubleshooting guide provides clear instructions for finding and solving all common Cordless Roll-Up problems. In most cases, you will be able to quickly take care of the problem yourself by following these steps:

## 1. Install properly first.

This troubleshooting guide assumes you have already correctly installed your Cordless Roll-Up according to the detailed instructions in the **Installing your Cordless Roll-Up** section. If you have not followed the step-by-step instructions in that section, do so now.

## 2. Follow the **troubleshooting flowcharts** and **GTCOTEST** on the following pages in this troubleshooting guide.

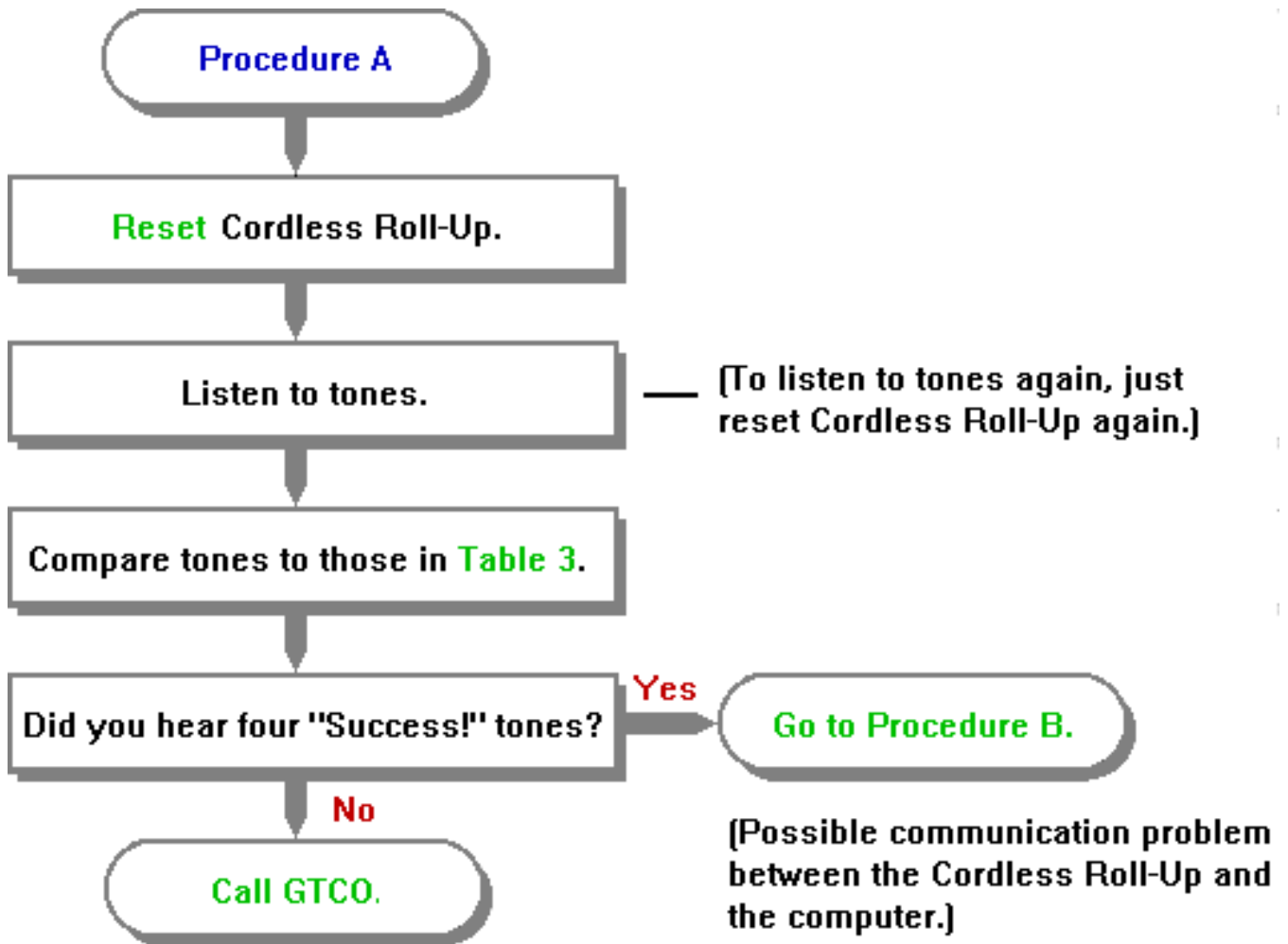
Record any unusual observations. Your notes will be useful if you need assistance from GTCO later.

## 3. If your system still doesn't work...

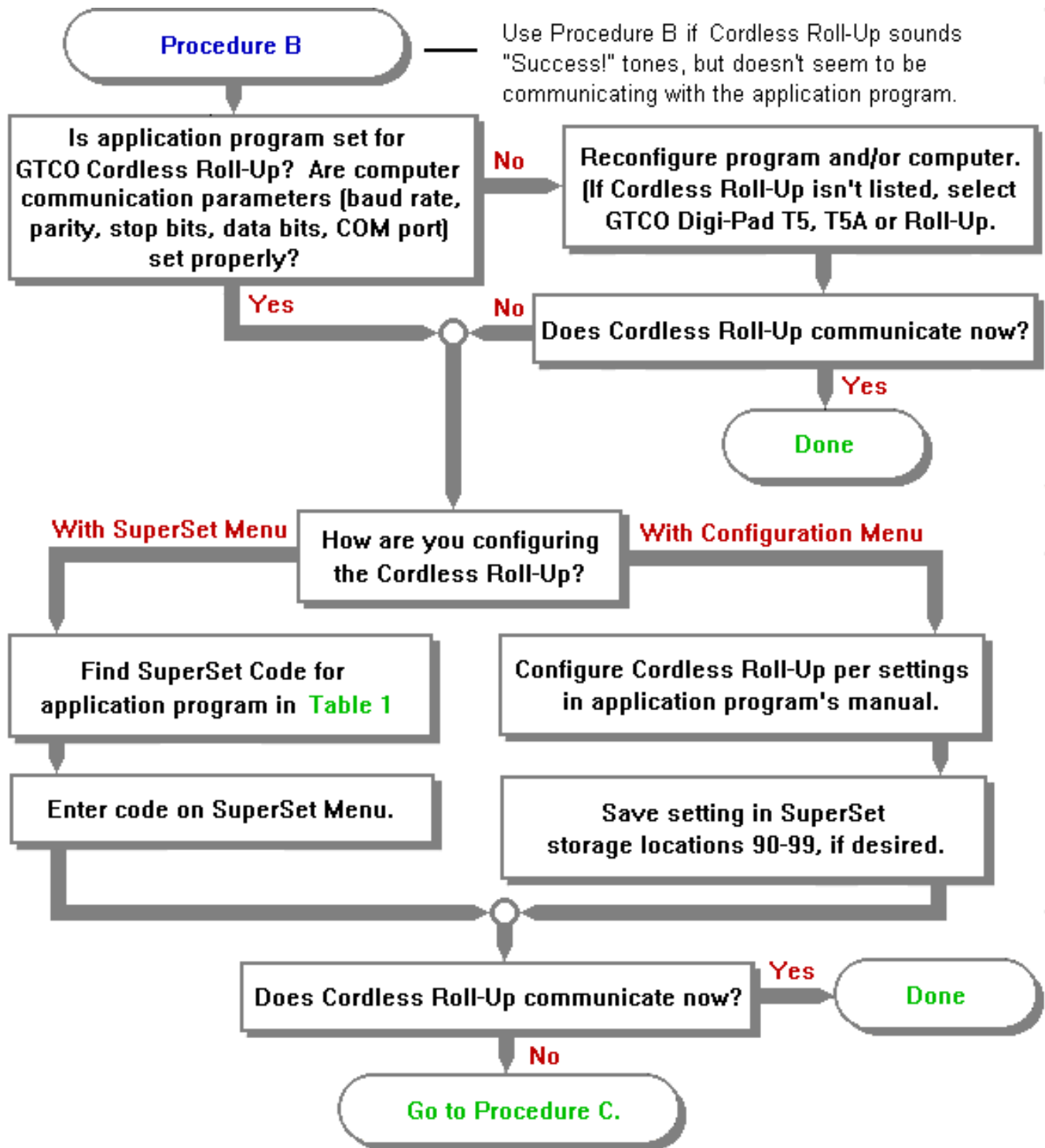
Call our **Technical Support Department**. Be prepared to discuss the observations you made while troubleshooting. A Technical Support Specialist will help you resolve the problem as quickly as possible.

**Note:** Refer to **Table 3:Cordless Roll-Up tones**, while using this troubleshooting guide.

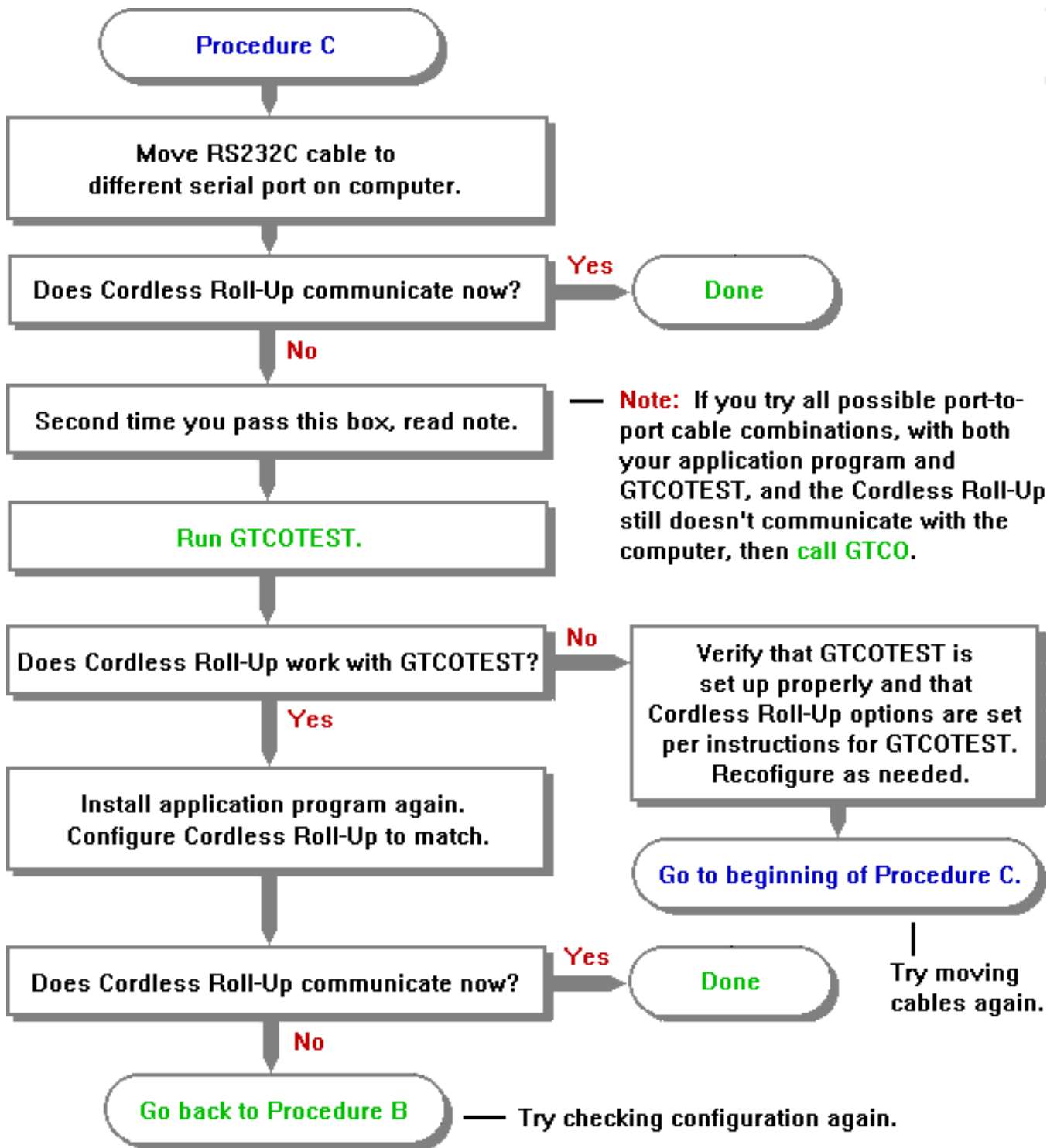
## Procedure A: Begin Troubleshooting



## Procedure B: Troubleshooting



## Procedure C: Troubleshooting



## Using GTCOTEST

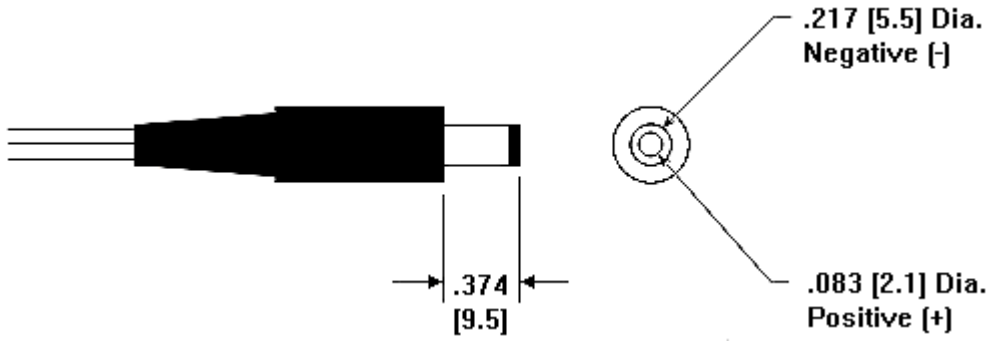
GTCOTEST is a program that runs on your PC. It can be used to perform communication and diagnostic tests on an installed **Cordless Roll-Up**. GTCOTEST is provided on the TabletWorks CD you received with your system.

1. Select SuperSet Code 01 on your Cordless Roll-Up (9600, N, 8, 1, GTCO Binary, 1000 lpi, Cont, 100).
2. To run GTCOTEST, insert the TabletWorks CD in the CD-ROM drive. 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 COM1 regardless of its physical address. GTCOTEST examines only the physical address.)
4. 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.
5. Select "Check Output," then select "High Res Binary."
6. Place the transducer in the active area on the tablet.
7. If everything is working properly, you should see data displayed on your computer screen in the following format: P XXXXXX YYYYYY
  - where P = pushbutton code;
  - XXXXXX = X coordinate data;
  - YYYYYY = Y coordinate data.
8. 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.
9. 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 help running GTCOTEST, call our Technical Support Department.

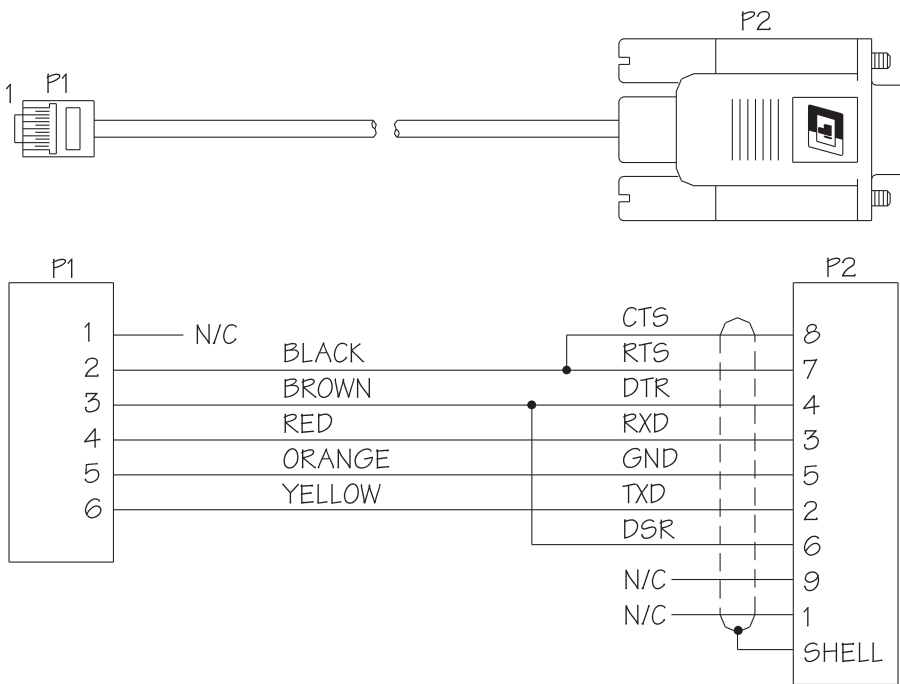
# Technical specifications

<b>Dimensions/Weight:</b>	<u>Active Area</u>	<u>Footprint</u>	<u>Weight</u>	<u>Avg. Ship Wt.</u>
	30" x 36"	35" x 44"	6 lbs.	17 lbs.
	36" x 48"	41" x 56"	7.25 lbs.	21 lbs.
<b>Technology:</b>	Electromagnetic			
<b>Resolution:</b>	Up to 2000 lpi (lines/inch) or 100 lpmm (lines/millimeter)			
<b>Lock height:</b>	0.5 inch (12.7 mm)			
<b>Coordinate origin:</b>	Selectable (Factory default: lower left corner)			
<b>Recommended roll diameter:</b>	8 inches (200 mm)			
<b>Operating environment temperature:</b>	41° to 115° F (5° to 46° C)			
<b>Storage environment temperature:</b>	-4° to 158° F (-20° to 70° C)			
<b>Storage environment humidity:</b>	0% to 100%, non-condensing			
<b>Operating modes:</b>	Point, Line, Continuous, Line Incremental, Continuous Incremental, Remote Request			
<b>Baud rates:</b>	1200, 2400, 4800, 9600, 19200 and 38400			
<b>Transducer switches:</b>	Rated life over 1 million actuations			
<b>Transducer battery life:</b>	Approximately 350 hours of continuous use			
<b>Stylus battery:</b>	AAA Battery			
<b>Cursor battery:</b>	3.5V 750mAH lithium (Eagle-Picher LTC-7PN-S4, or equivalent)			
<b>Emulations:</b>	GTCO T5A, CalComp 9100/9500, Summagraphics Microgrid and ID Series			
<b>Power supply:</b>	Output voltage +9VDC at 500mA, Center positive (See <a href="#">Figure 3</a> )			
<b>Interface:</b>	RS-232C (See <a href="#">Figure 4</a> )			
<b>Adapter:</b>	9- to 25-pin (See <a href="#">Figure 5</a> )			

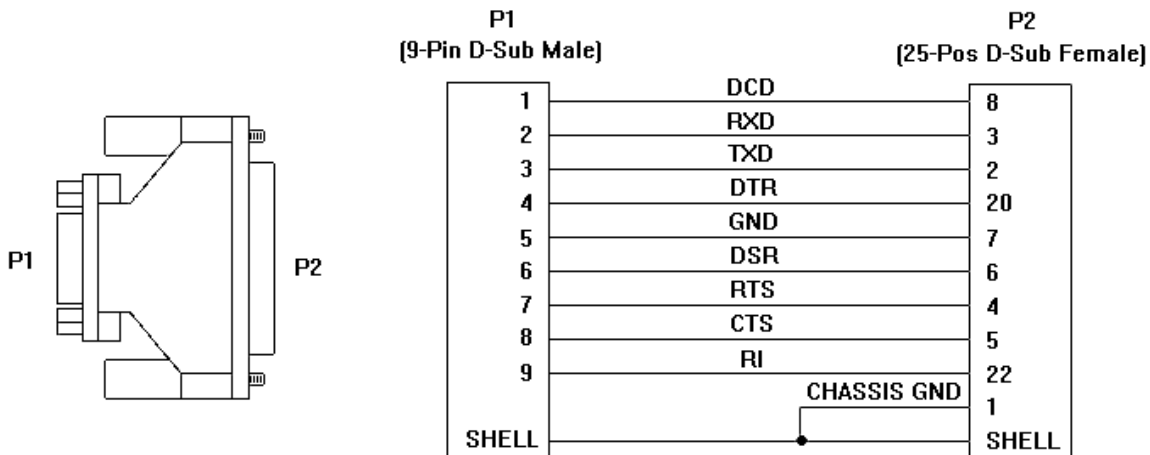
**Figure 3: Power supply connector**



**Figure 4: RS232C interface**



**Figure 5: 9- to 25-pin adapter**



# Advanced Operating Information

## Cordless Roll-Up interfacing

The following information is not required for normal Cordless Roll-Up operation.

Connecting the **Cordless Roll-Up** to a computer is usually a straight-forward process (see the **Installing your Cordless Roll-Up** section in this manual). If you don't have a typical interfacing situation, the information in this section will help you set up the Cordless Roll-Up and connect it to another device.

The Cordless Roll-Up is equipped to communicate via RS232C, a widely used serial interface between computers and peripherals. RS232C is a (more or less) standard interface, and cables and connectors are available from a variety of sources. Most computers and peripherals either have an RS232C interface or can be equipped with one.

### A mini-tutorial on RS232C interfacing

This section provides basic information about RS232C communications. There are three areas to consider when using RS232C:

- 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 the Cordless Roll-Up and the computer must have identical formats and rates. These are the parameters you must set for both devices:

- **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, usually 7 or 8. If they are not set the same, some or all of the data may be garbled.
- **Parity** is a simple error-detecting scheme. One bit may be allocated for parity. Both devices must be set for the same parity—either odd parity or even parity—or they must be set for no parity. Most digitizing application software does not check for parity.
- **Stop Bits** tell the receiving device that a character is complete. Each character has one or two stop bits. The number of stop bits usually doesn't matter. Setting for two stop bits instead of one may overcome a mismatch in parity or data bits.
- **Baud rate** is the speed of data transmission. Both devices must be set to communicate at the same baud rate. Commonly used rates are 2400, 4800, 9600 and 19200 baud (bits per second). The 9600 rate is popular for digitizing.

### Cabling

**Cabling** carries the data from one device to the other. The **interface cable**, shown in Figure 4 on the previous page, supplied with the **Cordless Roll-Up** is terminated in a 9-pin subminiature D connector. It attaches to a standard AT-compatible RS232C connector.

Your computer may have a 25-pin RS232C connector, rather than a 9-pin connector. If so, you can use the **9- to 25-pin adapter**, shown in Figure 5 on the previous page, supplied with the Cordless Roll-Up.

## Flow Control

Flow control is the process of regulating the traffic or flow of data between two RS232C 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:

- **Hardware flow control** (also called modem lead flow control) uses one or more lines in the RS232C cable to send status signals from one device to another. The Cordless Roll-Up is not equipped for hardware 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 Cordless Roll-Up is equipped for software flow control. It 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.

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

The following information is not required for normal Cordless Roll-Up operation. If you are programming for the Cordless Roll-Up product line, the details here will be helpful.

The Cordless Roll-Up can receive commands from other devices through its RS232C port. Commands cause the Cordless Roll-Up to change the way it operates, to use certain coordinate formats and to do other things as directed by you, or by an application program.

Commands offer another way to control Cordless Roll-Up operation besides the Custom Configuration Menu. Certain Cordless Roll-Up 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 Cordless Roll-Up or a Reset will cause it to discard any command changes it has received. This could leave your program confused about what the Cordless Roll-Up is doing. A full system reset would then be needed to get the Cordless Roll-Up and computer coordinated again. A prudent programmer will limit command control of a Cordless Roll-Up.

The Cordless Roll-Up responds to three kinds of commands:

- GTCO Cordless Roll-Up standard commands (with some omissions and additions)
- CalComp emulation commands
- Summagraphics emulation commands

## GTCO Cordless Roll-Up 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	<Ctrl-B> (hex 02)
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	<Ctrl-O> hex 0F

---

### 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**

See [Digitizing modes](#) for operating details.

---

### Read Current Coordinate

Code: hex **02**

The Read Current Coordinate causes the Cordless Roll-Up to output a coordinate while it is in Remote Request Mode. This command can be sent to the Cordless Roll-Up only when it is digitizing and only when Remote ReCordless Roll-Up is in Command Mode. Note that this command is not two ASCII characters. It is the one-byte-long STX character, CTRL-B (hex 02). The Cordless Roll-Up responds to the Read Current Coordinate command by transmitting one format.

### Set Increment Value

Code: **IV**

In Line Incremental and Continuous Incremental modes, the Cordless Roll-Up 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 Area

Code: **OP**

### No Output When Transducer Is Out Of Active Area

Code: **IP**

Certain situations require that the Cordless Roll-U 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 the Cordless Roll-U 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 the Cordless Roll-U at rates from 5 to approximately 140 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

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

---

Max ≈ 140 coordinates/second

### Change Mode Character

Code: **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 Cordless Roll-Up 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>. The Cordless Roll-Up 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 Scale**

Code: **IN**

**Select Metric Measurement Scale**

Code: **MT**

Invoking these commands causes the Cordless Roll-Up to scale coordinates in the desired measurement system. The Cordless Roll-Up measures in only one scale at a time. See [Measurement scales](#) for additional information on how scale selection affects coordinate data.

**Enable Echo Mode**

Code: **EM**

**Disable Echo Mode**

Code: hex **0F**

These commands control echoing by the Cordless Roll-Up. When enabled, echoing transmits each received character back to the sending device.

## Format selection commands

**ASCII Format Output**

Code: **AS**

This 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**

This 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**

This command modifies ASCII and binary formats. If ASCII formats have been selected, the Low Resolution command causes the least significant digit 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 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 0.001 inch or 0.025 millimeter, depending on whether English or metric scale has been selected.

---

**High Resolution**

Code: **HR**

This command modifies ASCII and binary formats. If ASCII formats have been selected, the High 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.

---

**Highest Resolution**

Code: **H1**

This command modifies ASCII and binary formats. If ASCII formats have been selected, the Highest Resolution command causes the least significant digits to represent 0.00025 inch or 0.0067 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 0.00025 inch or 0.0067 millimeter, depending on whether English or metric scale has been selected.

## Format selection commands, cont.

---

<b>Pushbutton Include</b>	Code: <b>PI</b>
<b>Pushbutton Exclude</b>	Code: <b>PE</b>
<b>Space Include</b>	Code: <b>SI</b>
<b>Space Exclude</b>	Code: <b>SE</b>
<b>Carriage Return Include</b>	Code: <b>CI</b>
<b>Carriage Return Exclude</b>	Code: <b>CE</b>
<b>Line Feed Include</b>	Code: <b>LI</b>
<b>Line Feed Exclude</b>	Code: <b>LE</b>

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

<b>Enable Alarm</b>	Code: <b>AE</b>
<b>Disable Alarm</b>	Code: <b>AD</b>

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.

---

<b>Sound Tone</b>	Code: <b>T1</b>
<b>Tone Pause</b>	Code: <b>T0</b>

The Sound Tone command allows a remote device to sound the Cordless Roll-Up'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

<b>Transmit Version Number</b>	Code: <b>VR</b>
--------------------------------	-----------------

This command causes the Cordless Roll-Up to determine and transmit the version number of the firmware currently installed.

---

<b>Display Tablet Active Area Size</b>	Code: <b>SZ</b>
--	-----------------

The Cordless Roll-Up 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 that 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" Cordless Roll-Up sends the digits "3648" in response to this command.

---

<b>Read Tablet Diodes</b>	Code: <b>RD</b>
---------------------------	-----------------

This diagnostic command causes the Cordless Roll-Up to examine the attached tablet and send the results to another device for display. A "1" means a diode is present and a "0" means a diode is missing.

---

## CalComp emulation commands

The **Cordless Roll-Up** recognizes a subset of the CalComp 9500 command set. Space does not permit a detailed description of CalComp commands. However, most of the commands in this subset have equivalent Cordless Roll-Up commands. For further information about the operation of those commands, please refer to the Cordless Roll-Up command or function description in the [GTCO Cordless Roll-Up 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.

---

### Disable/Enable Echo

Code: **ESC%En**

Where n = 0 to 3 (0 and 2 disable echo, 1 and 3 enable echo). If n is not included in the command, echo is toggled on or off from its previous state.

(Equivalent to Enable Echo Mode, EM, and Disable Echo Mode, hex 0F.)

---

### Set Increment Run Mode

Code: **ESC%IR**

(Similar to Select Continuous Incremental Mode, CL, except that one coordinate format is sent when the transducer button is pressed or released.)

---

### Set Incremental Track Mode

Code: **ESC%IT**

(Equivalent to Select Line Incremental Mode, IC.)

---

### Set Incremental Line Mode

Code: **ESC%IU**

(Similar to Select Line Incremental Mode, IC, except that one additional coordinate format is sent when the cursor pushbutton is released.)

---

### Set Resolution (English)

Code: **ESC%JRn1,n2**

### Set Resolution (Metric)

Code: **ESC%JMn1,n2**

Where n1 = 1 to 2540 lpi or 1 to 100 lpm; and n2 = 0 to 6, representing location of decimal point in format 4 (0 implies decimal point to right of least significant digit; 1 to 6 designate number of digits to right of decimal point). Not meaningful in other formats.

(Similar to Low Resolution, LR; High Resolution, HR; Highest Resolution, H1; Select English Measurement Scale, IN; Select Metric Measurement Scale, MT.)

---

### Set Origin

Code: **ESC%Jh**

Where h = location of origin selected from this list: LL = lower left; LR = lower right; UL = upper left; UR = upper right; C = center.

---

### Set Line Feed

Code: **ESC%Ln**

Where n = 0 to 3 (0 or 2 excludes Line Feed, 1 or 3 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.)

---

### Set Point Mode

Code: **ESC%P**

(Equivalent to Select Point Mode, PT.)

---

### Set Prompt

Code: **ESC%Qh1h2**

Where h1 = prompt character and h2 = optional resend character.

(Similar to Select Remote Request Mode, RM, and the Read Current Coordinate command, hex 02.)

<b>Cancel Prompt</b> Cancels prompt mode. (Same as selecting any digitizing mode except Remote Request.)	Code: <b>ESC%Q</b>
<b>Set Run Mode</b> (Equivalent to Select Continuous Mode, CN)	Code: <b>ESC%R</b>
<b>Set Track Mode</b> (Equivalent to Select Line Mode, LN.)	Code: <b>ESC%T</b>
<b>Set Line Mode</b> (Similar to Select Line Mode, LN, except that one additional coordinate format is sent when the cursor pushbutton is released.)	Code: <b>ESC%U</b>
<b>Set Cursor LED #2 and #3</b> Where n = 0 to 3 (0 and 1 turn green LED off and on respectively, 2 and 3 turn yellow LED off and on respectively; for Illuminated Cursor, 2 and 3 turn cursor lamps off and on respectively). (Similar to Turn Status Indicator On, ON, and Turn Status Indicator Off, OF.)	Code: <b>ESC%Vn</b>
<b>Reset</b> (Equivalent to Reset, RS.)	Code: <b>ESC%VR</b>
<b>Send Tablet Size</b> (Similar to Display Tablet Active Area Size, SZ; response is upper right corner coordinate based on current resolution and origin.)	Code: <b>ESC%VS</b>
<b>Set Data Rate</b> 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: <b>ESC%Wn</b>
<b>Set X Increment Value</b> <b>Set Y Increment Value</b> 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: <b>ESC%Xn</b> Code: <b>ESC%Yn</b>
<b>Set Data Proximity</b> 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: <b>ESC%Zn</b>
<b>Change Format</b> 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 Custom Configuration Menu.)	Code: <b>ESC%^n</b>
<b>Tone</b> (Equivalent to Sound Tone, T1.)	Code: <b>CTRL-G (hex 07)</b>

## Summagraphics emulation commands

The **Cordless Roll-Up** 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 Cordless Roll-Up commands. For further information about the operation of those commands, please refer to the Cordless Roll-Up command or function description in the [GTCO Cordless Roll-Up command summary](#).

**Note:** Summagraphics commands do not require a terminator.

---

<b>Reset</b> (Equivalent to Reset, RS.)	Code: <b>ESCZ</b>
<b>Binary Format</b> (Equivalent to Binary Format Output, BI.)	Code: <b>ESCMB</b>
<b>ASCII Format</b> (Equivalent to ASCII Format Output, AS.)	Code: <b>ESCMA</b>
<b>Line Feed Toggle</b> (Similar to Line Feed Include/Exclude, LI/LE.)	Code: <b>ESCML</b>
<b>Decimal Point Include</b> <b>Decimal Point Exclude</b>	Code: <b>ESCd1</b> Code: <b>ESCd0</b>
<b>Set Delimiter</b> Where n = new delimiter character for ASCII formats; default is “,”.	Code: <b>ESCDn</b>
<b>Stream Mode</b> (Equivalent to Select Continuous Mode, CN.)	Code: <b>ESCM0</b>
<b>Point Mode</b> (Equivalent to Select Point Mode, PT.)	Code: <b>ESCM1</b>
<b>Switch Stream Mode</b> (Equivalent to Select Line Mode, LN.)	Code: <b>ESCM2</b>
<b>Prompt Mode</b> (Equivalent to Select Remote Request Mode, RM.)	Code: <b>ESCM3</b>
<b>Send New Report</b> (Equivalent to Read Current Coordinate, hex 02.)	Code: <b>ESCG</b>
<b>Resend Last Report</b>	Code: <b>ESCg</b>
<b>Increment Mode</b> Where n = 000 to 255, representing increment size in counts. (Similar to Select Continuous Incremental Mode, CL, followed by Set Increment Value, IV.)	Code: <b>ESCInnn</b>

---

**Set Report Rate**Code: **ESCRn**

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.)

---

**Proximity Transmission**Code: **ESCW0**

(Equivalent to No Output When Transducer Is Out Of Active Area, OP.)

---

**Proximity Transmission**Code: **ESCW1**

(Similar to Send Coordinate 0,0 When Transducer Is Out Of Active Area, IP, except that the last valid coordinate is sent.)

---

**Sound Annunciator**Code: **ESCA****Sound Annunciator**Code: **ESCYn**

Where n = 1 to 4 (1 = low tone, 4 = highest tone, but AccuTab has only one tone).

(Equivalent to Sound Tone, T1.)

---

**Relocate Origin**Code: **ESCFn**

Where n = 0 to 5 (0 = lower left, 2 = center, 3 = upper left, 4 = lower right, 5 = upper right).

---

**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 Resolution**Code: **ESCPab**

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

---

**Confirm Resolution**Code: **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 Command Mode:

Send an ASCII CTRL-A (hex 01) character to the **Cordless Roll-Up**. When the Cordless Roll-Up 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.
- The Cordless Roll-Up sends a ">" (hex 3E) as a prompt to the commanding device. The Cordless Roll-Up 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 Cordless Roll-Up 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 Cordless Roll-Up 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 the Cordless Roll-Up 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 Cordless Roll-Up 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 the Cordless Roll-Up will send a "?" (question mark). If the delimiter following an invalid command was an <ESC> (indicating your desire to leave Command Mode), the Cordless Roll-Up 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 Cordless Roll-Up 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 Cordless Roll-Up's prompt. The Cordless Roll-Up 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 send an <ESC> 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.

The following [program example](#) shows this process.

## Programming example: To send version command and display results

This QBASIC program interacts with the **Cordless Roll-Up** in Command Mode. In this example, the program activates Command Mode, sends the VR command and displays the resulting firmware version transmitted by the **Cordless Roll-Up**.

1. Configure the Cordless Roll-Up for 9600, N, 8, 1, GTCO ASCII, 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$(1);                \SEND <CTRL A> WITHOUT <CR>
DO
    D$ = 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 AHX.X
```

## Advanced programming information

**The following information is not required for normal Cordless Roll-Up operation.**

If you are programming for the **Cordless Roll-Up** 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 the **Cordless Roll-Up** in a different operating state. The previous [Remote commands](#) section contains detailed information about remote commands—you should read that topic before attempting to send commands to the **Cordless Roll-Up**.

Command emulations for CalComp and Summagraphics digitizer SuperSet menu selection. Only **Cordless Roll-Up** commands, however, are referenced in this section.

## Coordinate formats

*Coordinate format* refers to the way the **Cordless Roll-Up** encodes XY coordinate information before it sends the data out through a communication interface. The **Cordless Roll-Up** 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 following topics 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.

The **Cordless Roll-Up** can produce two kinds of binary formats: one is compatible with GTCO Cordless Roll-Up 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

This six-byte format is compatible with the GTCO **Cordless Roll-Up** 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**

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

### To set up the GTCO/CalComp binary format:

#### *Custom Configuration Menu:*

1. Select GTCO Binary or CalComp Binary (under Output Format Options).
2. Select 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, command HR for 2000 lpi/100 lpmm.

## Summagraphics binary format

This eight-byte format is compatible with the Summagraphics 2000 lpi UIOF format. [Table 5](#) shows the structure of this format at the bit level.

### To set up the Summagraphics binary format:

#### *Custom Configuration Menu:*

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

**Table 5: Summagraphics binary format**

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

## Low resolution binary format

Low resolution binary format conforms to a defacto 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 lpmm. [Table 6](#) shows the structure of this format at the bit level.

**Table 6: GTCO low resolution binary format**

	Bit 7 <i>Parity</i>	Bit 6 <i>Sync</i>	Bit 5 <i>Button code</i>	Bit 4	Bit 3	Bit 2	Bit 1 <i>Not used</i>	Bit 0
<b>Byte 1</b>	1		C3	C2	C1	C0	C4	0
<i>X data low order bits</i>								
<b>Byte 2</b>	0		X5	X4	X3	X2	X1	X0
<i>X data high order bits</i>								
<b>Byte 3</b>	0		X11	X10	X9	X8	X7	X6
<i>Y data low order bits</i>								
<b>Byte 4</b>	0		Y5	Y4	Y3	Y2	Y1	Y0
<i>Y data high order bits</i>								
<b>Byte 5</b>	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	ASCII	ASCII2
None	00000	0	00000	U	00000	0 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 **Cordless Roll-Up**. 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:

#### Custom Configuration Menu:

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 1000 lpi/40 lpmm, command HR for 2000 lpi/100 lpmm, or command H1 for 4000 lpi/150 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 Custom Configuration Menu or by remote command. Check the tables under Cursor button codes in ASCII formats 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):

*Custom Configuration Menu:* 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 (when present):

*Custom Configuration Menu:* 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  
 lpi = lines per inch

**Table 10: CalComp ASCII formats**

---

ASCII1	<= 1016 lpi	T M C X X X X X Y Y Y Y Y <CR> <LF>
-	> 1016 lpi	T M C X X X X X X X Y Y Y Y Y Y <CR> <LF>
ASCII2	<= 1016 lpi	X X X X X , Y Y Y Y Y , T M C <CR> <LF>
-	> 1016 lpi	X X X X X X , Y Y Y Y Y Y , T M C <CR> <LF>
ASCII3	<= 1016 lpi	C P X X X X X X Y Y Y Y Y <CR> <LF>
-	> 1016 lpi	C P X X X X X X Y Y Y Y Y <CR> <LF>
ASCII4	1000 lpi	<SP> X X . X X X , <SP> Y Y . Y Y Y , T M C <CR> <LF>
-	100 lpmm	<SP> X X X X . X X , <SP> Y Y Y Y . Y Y , T M C <CR> <LF>
-	10 lpmm	<SP> X X X X . X , <SP> Y Y Y Y . Y , T M C <CR> <LF>
-	Other	<SP> X X X X X . , <SP> Y Y Y Y Y . , T M C <CR> <LF>

---

T = Tablet status (always "A")	<CR> = Carriage return
C = Cursor button character	<LF> = Optional line feed
X = X coordinate	<SP> = Space
Y = Y coordinate	lpi = lines per inch
P = Pen character ("U" = up, "D" = down)	lpmm = lines per millimeter
M = Mode status character ("I" = incremental, "U" = line, "R" = run-continuous, "T" = track, "P" = point)	

**Table 11: Summagraphics ASCII formats**

ASCII1	<= 1016 lpi	S X X X X X , S Y Y Y Y Y , C C , T <CR> <LF>
w/ decimal		
exclude	> 1016 lpi	S X X X X X X , S Y Y Y Y Y Y , C C , T <CR> <LF>
ASCII1	1000 lpi	S X X . X X X , S Y Y . Y Y Y , C C , T <CR> <LF>
w/ decimal		
include	40 lpmm	S X X X X . X X X , S Y Y Y Y . Y Y Y , C C , T <CR> <LF>
.. _	10 lpmm	S X X X X . X , S Y Y Y Y . Y Y , C C , T <CR> <LF>
.. _	Other	[defaults to Format 1]
ASCII2	All	@ C S X X X X X , S Y Y Y Y Y <CR> <LF>
	<=1016lpi	@ C S X X X X X , S Y Y Y Y Y Y <CR> <LF>
	> 1016 lpi	@ C S X X X X X X , S Y Y Y Y Y Y <CR> <LF>

S	= Sign	<CR>	=	Carriage return
X	= X coordinate	<LF>	=	Optional line feed
Y	= Y coordinate	C C	=	2-character cursor button code
T	= Tablet ID (always "0")	.	=	Optional period
C	= Cursor button character	lpi	=	lines per inch
		lpmm	=	lines per millimeter

**Cursor button codes in ASCII formats**

When the cursor button code is included in an ASCII format, the character transmitted in the format depends on the button pressed. Table 7 and Table 8 show which character will be sent. Instructions in the previous sections show how to include or exclude the cursor button character in certain of the ASCII formats.

**Measurement scales**

You can choose either English or metric scaling for the coordinates you digitize. The **Cordless Roll-Up** 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:**

*Custom Configuration Menu:* 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 above). Then, 2032 counts x 0.025 mm/count = 50.8 mm.

**Table 12: Measurement scales**

<b>English resolution</b>	<b>100 lpi</b>	<b>200 lpi</b>	<b>1000 lpi</b>	<b>2000 lpi</b>
Least significant digit equals	0.01 inch	0.005 inch	0.001 inch	0.0005 inch
<b>Metric resolution</b>	<b>10 lpmm</b>	<b>40 lpmm</b>	<b>100 lpmm</b>	
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 the **Cordless Roll-Up** 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**

The topics above describe the digitizing modes so you can select the one you want. See [Remote commands](#) for more information about commands.

[Table 14](#) will help you compare digitizing modes.

**Table 13: Rate commands**

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

Max  $\approx$  140 coordinates/second

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

## 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:

*Custom Configuration Menu:* Select the Point option under Mode.

*GTCO Commands:* Send command PT.

Table 14 will help you compare digitizing modes.

## 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:

*Custom Configuration Menu:* Select Line Mode.

*GTCO Commands:* Send command LN.

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

*Custom Configuration Menu:* Select 12, 50 or Max (approximately 140 coordinates/second) 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.

Table 14 will help you compare digitizing modes.

## 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:

*Custom Configuration Menu:* 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.

See Line Mode for comments about rate.

Table 14 will help you compare digitizing modes.

## 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:

*Custom Configuration Menu:* 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"

See Remote commands for more details on this operation.

Table 14 will help you compare digitizing modes.

## 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:

*Custom Configuration Menu:* 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"

See [Remote commands](#) for more details on this operation.

[Table 14](#) will help you compare digitizing modes.

## 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:

*Custom Configuration Menu:* Not available.

*GTCO Commands:* Send command RM.

[Table 14](#) will help you compare digitizing modes.

## Programming examples: Reading and displaying Cordless Roll-Up formats

The following example QBASIC programs will allow you to experiment with reading and displaying Cordless Roll-Up formats:

- [To read and display ASCII formats](#)
- [To read and display high resolution binary formats](#)
- [To send version command and display results](#)

### Programming example: To read ASCII formats

1. Configure the **Cordless Roll-Up** for 9600, N, 8, 1, GTCO ASCII, 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
```

## Programming example: To read high resolution binary formats

1. Configure the **Cordless Roll-Up** for 9600, N, 8, 1, GTCO Binary, 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 send version command and display results

This QBASIC program interacts with the **Cordless Roll-Up** in Command Mode. In this example, the program activates Command Mode, sends the VR command and displays the resulting firmware version transmitted by the **Cordless Roll-Up**.

1. Configure the **Cordless Roll-Up** for 9600, N, 8, 1, GTCO ASCII, 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$(1);                \SEND <CTRL A> WITHOUT <CR>
DO
  D$ = 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 AHX.X