



## SUMMAGRID IV™ USER'S GUIDE – PART 2

### Chapter 1 Summagrid IV Commands

This chapter provides a detailed summary of each Summagrid IV command, including command description, when to use and command syntax.

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## 1.1 Reset Commands

### 1.1.1 Description

The **Reset** command is used to reinitialize the Summagrid IV system. After receiving a **Reset** command, the Summagrid IV beeps and sets the communications protocol, report format and other features to match the DIP switch settings. A second command, **Change Reset Character**, allows the user to change the reset character.

### 1.1.2 When to Use

The tablet is reset every time it is turned on. Many applications also reset the tablet to meet their specific configuration requirements. Use **Reset** in the following situations:

**Reset:** Use to reset the Summagrid IV communications protocol, report format and other features to match the DIP switch settings. The tablet will default to these settings when powered up.

**Change Reset Character:** Command is used to prevent an application from resetting the tablet, thus deleting any special functions you may have enabled. Send the Change Reset Character prior to starting the application. Summagraphics recommends that the user uses non-letter characters (e.g. \$ or #).

### 1.1.3 Command Syntax

Reset	<ESC>Z
Change Reset Character	<ESC>r(x) X = new reset character

## 1.2 Change Emulation Command

### 1.2.1 Description

The Summagrid IV supports four different output formats: Microgrid UIOF, GTCO, CalComp and Summagraphics MM/SummaSketch. Use the Change Emulation Command to switch between these formats.



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### 1.2.2 Command Syntax

Change Emulation	<ESC>z(n)
Microgrid UIOF	n=0
MM/SummaSketch	n=1
CalComp	n=2
GTCO	n=3

## 1.3 Communication Protocol Commands

### 1.3.1 Description

These commands are used to change the Summagrid IV communication protocols from the host.

### 1.3.2 When to Use

The user needs to change the communication protocols when working with multiple applications that require different information, such as baud rate, parity and number of data bits.

### 1.3.3 Baud Rate

Baud rate refers to the number of bits transmitted each second between the host and Summagrid IV, or between the Summagrid IV and the host. The available Summagrid IV baud rates, along with their corresponding ASCII commands and DIP switch settings, are listed in the table below.

Command Name	ASCII Format	Switch Settings - DIP Switch A							
Baud Rate	<ESC>B (n)	1	2	3	4	5	6	7	8
19,200	n=0	OFF	OFF	OFF	-	-	-	-	-
9600	n=1	ON	OFF	OFF	-	-	-	-	-
4800	n=2	OFF	ON	OFF	-	-	-	-	-
2400	n=3	ON	ON	OFF	-	-	-	-	-
1200	n=4	OFF	OFF	ON	-	-	-	-	-
600	n=5	ON	OFF	ON	-	-	-	-	-
300	n=6	OFF	ON	ON	-	-	-	-	-
150	n=7	ON	ON	ON	-	-	-	-	-



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Please note for the tablet to correctly receive this command, the baud rate of the host and tablet must be the same; after receipt of the command at this baud rate, the new baud rate will be put into effect (and subsequent commands from the host must be sent at the new baud rate).

### 1.3.4 Parity, Data Bits and Stop Bits

#### Parity

Parity is an error detection system. When parity is enabled, a 1-bit is selectively added to a bit pattern, causing the pattern to have either an odd number of 1-bits (odd parity) or an even number of 1-bits (even parity). The receiving hardware (Summagrid IV tablet or host) checks the number of 1-bits in each pattern and indicates an error condition if a pattern with an even number of 1-bits is found in an odd parity system or an odd number in an even parity system.

#### Data Bits

Data bits are the number of bits per data transmission that contain data. The Summagraphics Summagrid supports either seven or eight data bits.

#### Stop Bits

Stop bits indicate that a data transmission is complete. They're transmitted with each byte of data. The Summagrid IV supports either 1 or 2 stop bits.

The Summagrid IV parity, data bit and stop bit combinations, along with their corresponding ASCII commands and DIP switch settings are listed in the table below.

Command Name	ASCII Format	Switch Settings - DIP Switch A									
		1	2	3	4	5	6	7	8		
<b>Parity and Data Bits</b>	<b>&lt;ESC&gt;p(n)</b>										
No Parity	n=0	-	-	-	-	OFF	-	-	-		
Odd Parity	n=1	-	-	-	OFF	ON	-	-	-		
Even Parity	n=2	-	-	-	ON	ON	-	-	-		
7 Data Bits	n=3	-	-	-	-	-	-	OFF	-		
8 Data Bits	n=4	-	-	-	-	-	-	ON	-		
2 Stop Bit	n=5	-	-	-	-	-	OFF	-	-		
1 Stop Bits	n=6	-	-	-	-	-	ON	-	-		



**NOTE:** Total number of parity, data and stop bits transmitted at one time cannot exceed ten.

## 1.4 Communication Protocol Commands

### 1.4.1 Description

Summagrid IV supports two main data formats: ASCII and Binary. Data formats may be selected by DIP switches or by software commands.

**ASCII Format:** The ASCII format sends one byte for each number and character required. Each character is defined by the International ASCII Standard (See Appendix C for the ASCII conversion table.)

**Binary Format:** There are several different binary formats, all of which have the ability to identify more than 64,000 different numbers with only 16 bits. These bits can be transmitted in 2 or 3 bytes, but the report must be decoded. Summagraphics uses an eight-byte format called Microgrid UIOF (Universal Input/Output Format).

### 1.4.2 When to Use

**Binary Command:** Use this command to change the report format to the eight-byte Microgrid UIOF Binary format. There is no <CR> or <LF> transmitted at the end of each report. This format cannot be modified.

**ASCII Command:** Use this command to change the report format to ASCII. The following commands are used to modify the ASCII format.

**Carriage Return and Line Feed:** The tablet normally sends a carriage return at the end of each report, and depending on the DIP switch setting, may also send a line feed. Commands are provided to toggle (turn on and off) the transmission of either the carriage return, line feed or both. These commands only apply when in the ASCII format.

**Change ASCII Delimiter:** The default delimiter between the X coordinate, the Y coordinate and the switch data is a comma ",". Use this command to adjust the delimiter from a comma to another character.



**Decimal Point:** The default ASCII report does not include the decimal point. To include the decimal point, enter <ESC>d1. To remove the decimal point, enter <ESC>d0. This command only works when the tablet is in the inches or millimeters format.

### 1.4.3 Command Syntax

Command Name	ASCII Format	Switch Settings - DIP Switch A							
		1	2	3	4	5	6	7	8
Binary	<ESC>MB	-	-	-	-	-	-	-	OFF
ASCII	<ESC>MA	-	-	-	-	-	-	-	ON
Binary to ASCII	<ESC>Q	-	-	-	-	-	-	-	-

		Switch Settings - DIP Switch B							
		1	2	3	4	5	6	7	8
Line Feed:									
Enable		-	-	ON	-	-	-	-	-
Disable		-	-	OFF	-	-	-	-	-
Carriage Return Toggle	<ESC>MR	-	-	-	-	-	-	-	-
Line Feed Toggle	<ESC>ML	-	-	-	-	-	-	-	-
Decimal Point (inches or mm format only)									
Include	<ESC>d1	-	ON	-	-	-	-	-	-
Exclude	<ESC>d0	-	OFF	-	-	-	-	-	-



## 1.5 Report Modes: Overview

### 1.5.1 Description

Report modes are used to control the manner and rate by which reports are sent to the host. Different applications have different requirements for accepting data (reports) from the tablet. There are four different report modes: Prompt, Point, Stream and Switch Stream.

### 1.5.2 When to Use

View the individual command descriptions for more detailed information on when to use.

### 1.5.3 Report Mode Command Syntax

Command Name	ASCII Format	Switch Settings - DIP Switch C							
		1	2	3	4	5	6	7	8
Stream Mode	<ESC>M0	ON	ON	-	-	-	-	-	-
Point Mode	<ESC>M1	ON	OFF	-	-	-	-	-	-
Switch Stream Mode	<ESC>M2	OFF	ON	-	-	-	-	-	-
Prompt Mode	<ESC>M3	OFF	OFF	-	-	-	-	-	-

## 1.6 Report Modes: Prompt

### 1.6.1 Description

Prompt mode allows the application to send a prompt to the tablet whenever it is ready to accept a new coordinate. This reduces the amount of unwanted data and allows the application to ignore the tablet when it wants to.

### 1.6.2 When to Use

Prompt mode can be used to communicate with the majority of applications.





### 1.6.3 **Command Syntax**

Prompt Mode <ESC>M3

Prompt Character: Send New Report <ESC>G

Prompt Character: Resend Last Report <ESC>g

## 1.7 **Report Modes: Point**

### 1.7.1 **Description**

Point mode allows the tablet to send one coordinate pair each time a cursor or stylus button is pressed.

### 1.7.2 **When to Use**

Point mode is best for mapping or other data collection applications; not recommended for cursor steering applications.

### 1.7.3 **Command Syntax**

Point Mode <ESC>M3

Send New Report <ESC>G

Resend Last Report <ESC>g

## 1.8 **Report Modes: Point**

### 1.8.1 **Description**

Stream mode allows the tablet to continually send reports to the host. Switch Stream Mode grants the tablet to send reports to the host whenever a cursor or stylus button is pressed. Both Stream and Switch Stream Mode send out reports at a specified number per second. At 9600 baud, the maximum report rate is about 90 reports per second. If this default report rate is too fast for certain applications, you may adjust the report rates using the Set Report Rate commands. The application will recommend a required report rate.







## 1.10 Report Modes: Increment

### 1.10.1 Description

Increment Mode is an increment filter. Used in combination with Stream or Switch Stream modes, it prevents duplicate reports from being transmitted to the host. When the tablet is in Increment Mode, it sends a report to the host only after the stylus or cursor has traveled a minimum distance, or increment, in the X or Y direction, or if a switch has changed status (been pressed or released). This increment is user-defined and it applies to both the X and Y axes. You may set the increment value to be anywhere between 0 (off) and 255 counts of resolution.

**NOTE:** If a cursor/stylus button is pushed or released while in increment mode, a report will be sent to the host even if the increment distance has not been met.

### 1.10.2 When to Use

Use in combination with Stream or Switch Stream modes to reduce the amount of data output sent to the host.

### 1.10.3 Command Syntax

Increment Filter

<ESC>I(nnn)

where (nnn) is a three digit value for the increment step, in thousandths of an inch, from 000 to 255 counts of resolution.

## 1.11 Proximity Transmission Command

### 1.11.1 Description

The Proximity Transmission command controls the transmission of reports based on the location of the stylus/cursor (in-prox or out-of-prox). When out-of-prox, the stylus/cursor transmits the last coordinates recorded while in-prox.

### 1.11.2 When to Use

With the Proximity Transmission Command, set up the Summagrid IV to:

- Always transmit reports, whether the cursor/stylus is in or out of proximity (always transmit)
- Transmit reports only when the cursor/stylus is in proximity (in-prox only)





### 1.13.3 Command Syntax

Activate the annunciator for approximately one quarter of a second; emits last tone chosen. <ESC>A

Selects one of four different tones for the annunciator and sounds that tone. <ESC>Y(n)  
 n=1 low tone  
 n=2 medium tone  
 n=3 high tone  
 n=4 highest tone

**NOTE:** If you want to hear a tone every time a switch is selected, be certain that DIP switch C5 is in the ON position and use the following command:

Enable Audible Feedback <ESC>MT1

Disable Audible Feedback <ESC>MT0

## 1.14 Relocate Origin Command

### 1.14.1 Description

This command allows the user to relocate the tablet origin (0,0). The default origin location is the lower left-hand corner of the tablet active area. The user may move the origin to either one of four pre-defined locations or to a user-defined position anywhere within the tablet active area. The pre-defined locations are listed as follows:

- Center of Tablet
- Lower Right Corner
- Lower Left Corner
- Upper Left Corner
- Upper Right Corner

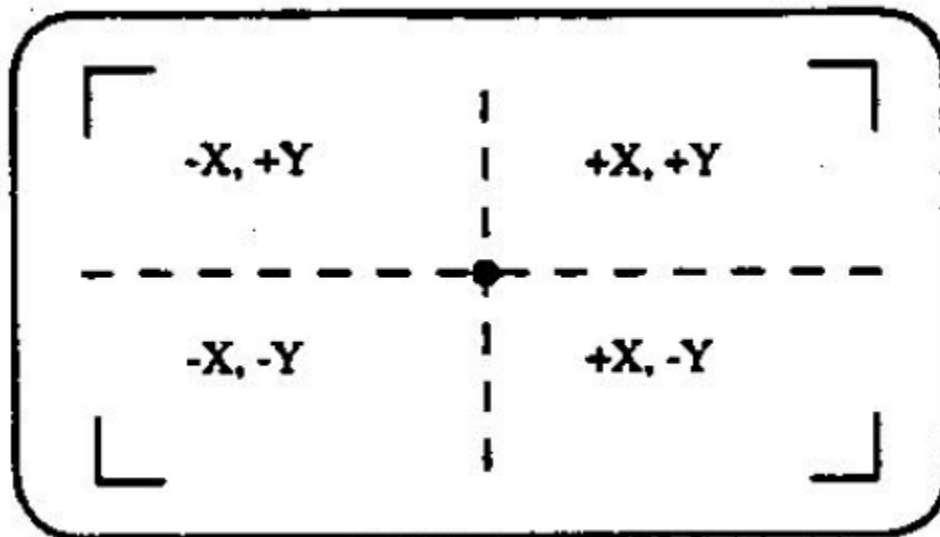


### 1.14.2 How to Relocate Origin

To relocate the origin to one of the pre-defined locations, send the appropriate command, listed below under **Command Syntax**. To change the origin to a specific user-defined location, follow these steps:

1. Send the command <ESC>F1 to let the tablet know you are redefining the origin.
2. Position the transducer over the desired origin location.
3. Press a button on the transducer to send the new origin location to the system.

Depending on the origin's location, coordinates can be positive or negative. For example, an origin centered on the tablet establishes four quadrants, where both negative and positive X,Y coordinates can be reported.



### 1.14.3 Command Syntax

Relocate Origin	<ESC>F [b]
lower left corner	b=0
user-defined	b=1
center	b=2
lower right	b=4
upper left	b=3
upper right	b=5



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## 1.15 Resolution Commands: Fixed Resolution

### 1.15.1 Description

Command enables the user to select the resolution of the Summagrid IV to meet various application needs. The Summagrid IV offers four different fixed resolution settings, in inches or millimeters, which apply to both axes:

Inches	Millimeters
100 lpi	4 lpmm
200 lpi	10 lpmm
1000 lpi	40 lpmm
2000 lpi	80 lpmm

### 1.15.2 Command Syntax

Command Name	ASCII Format	Switch Settings - DIP Switch B							
		1	2	3	4	5	6	7	8
<b>Resolution</b>									
<b>Millimeters</b>		-	-	-	ON	-	-	-	-
<b>Inches</b>		-	-	-	OFF	-	-	-	-
<b>Fixed Resolution</b>	<ESC>C[b]								
<b>Inches</b>									
100 lpi		-	-	-	-	OFF	OFF	-	-
200 lpi	b=0	-	-	-	-	ON	OFF	-	-
1000 lpi	b=2	-	-	-	-	OFF	ON	-	-
2000 lpi	<ESC>CS	-	-	-	-	ON	ON	-	-
<b>Millimeters</b>									
4 lpmm		-	-	-	-	OFF	OFF	-	-
10 lpmm	b=1	-	-	-	-	ON	OFF	-	-
40 lpmm	b=3	-	-	-	-	OFF	ON	-	-
80 lpmm	<ESC>CB	-	-	-	-	ON	ON	-	-



## 1.16 Resolution Commands: Variable Resolution

### 1.16.1 Description

The Variable Resolution command is used to define the resolution of each axis independently. It allows the user to set the resolution to any whole number from 0001 to 2540.

### 1.16.2 When to Use

Variable Resolution is used to match the tablet resolution to that of a graphics terminal. The resolution of a graphics terminal is measured in pixels, a unit of measurement similar to counts. Therefore, to match the measurement system of the graphics terminal (pixels) to that of the tablet (inches), the Summagrid IV automatically changes the report format of the tablet to counts.

### 1.16.3 Command Syntax

Variable Resolution	<ESC>P[a][bbbb]
X Axis	a=X
	bbbb=ASCII value from 0001 to 2540 lpi
Y Axis	a=Y
	bbbb=ASCII value from 0001 to 2540 lpi

## 1.17 Resolution Commands: Confirm Resolution

### 1.17.1 Description

The Confirm Resolution command is used to send a report to the host that specifies the maximum X and Y values at the current resolution setting. When the user sends a Confirm Resolution command, the tablet dimensions are multiplied by the resolution and the results are sent to the host in the data format previously selected.

### 1.17.2 When to Use

Use this command to verify a Variable Resolution setting.

### 1.17.3 Command Syntax

Confirm Resolution	<ESC>a
--------------------	--------





#### 1.17.4 Example

If you have a 36" x 48" tablet and you send the Confirm Resolution command, the following results are sent to the host (in the data format previously selected):

Resolution = 1000 lpi	48000, 36000
Resolution = 40 lpm	48768, 36576

## 1.18 Skew Correction Command

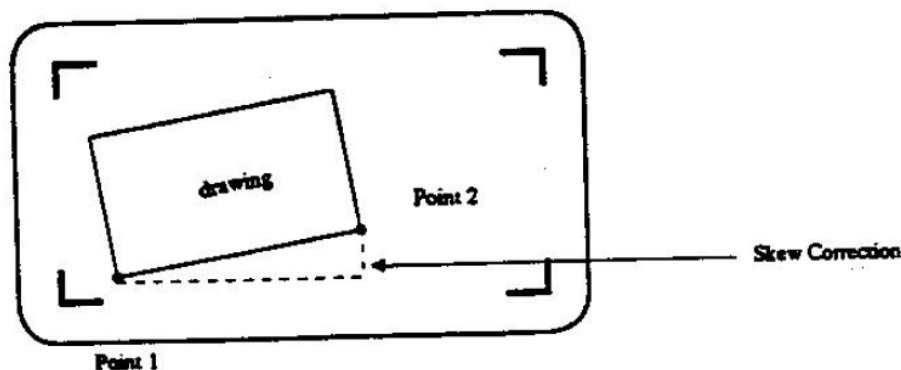
### 1.18.1 Description

The Skew command is used to align the tablet to a drawing placed upon it by using two points on the drawing as the reference "X-axis".

### 1.18.2 How to Use

After setting the drawing on the tablet, send the <ESC>x command. The tablet will stop transmitting reports and emit a tone to signify that it is ready for the first point. If possible, this first point should be the origin of the drawing. Place the cursor over this point and push any button. The tablet will emit a tone to signify that the tablet is ready for the second point. This point must be on a line parallel to the X-axis from the first point. Place the cursor over this point and push any button. The tablet will emit a third tone and resume transmitting data. All of the data will be adjusted so that the first point is the origin and the two points together define the X-axis.

If the first point selected is not the origin, use the <ESC>F1 "User Defined Origin" command after performing the skew correction.





## Chapter 2 Summagrid IV Output Formats

Summagrid IV supports four different output formats: Microgrid UIOF, GTCO, CalComp and Summagraphics MM/SummaSketch. This chapter provides technical information about the Microgrid UIOF output format.

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## 2.1 Summagraphics Microgrid UIOF Output Format

### 2.1.1 Overview

The Summagrid IV report formats conform to Summagraphics' Microgrid UIOF (Universal Input/Output Format) standards. To accommodate the special needs, choose the format to be in ASCII or packed binary.

### 2.1.2 ASCII BCD Report Format

Within the ASCII BCD report format the user can choose:

- The output to be in counts, inches or millimeters.

In units of measure (inches or millimeters), the user can also choose the format to include a decimal or not. This does not change the value of the coordinate. For example, 10.123 inches can be reported as either 10123 or 10.123.

- Each report to terminate with a <CR><LF> or just a <CR>.
- Delimiter to be any ASCII character. (The default is a comma.)

Refer to the key for definitions of each format character.

For reports, in counts, the format is:

```
SXXXXX,SYYYYY,FF,T<CR><LF>
```

For reports in U.S. measure and high resolution (1000 lpi = 39.37 lpmm) or low resolution (200 lpi = 7.874 lpmm), the format is:

```
SXX.XXX,SYY.YYY,FF,T<CR><LF>
```

For reports in metric measure and high resolution (1016 lpi = 40 lpmm), the format is:

```
SXXXX.XXX,SYYYY.YYY,FF,T<CR><LF>
```

For reports in metric measure and low resolution (254 lpi = 10 lpmm), the format is:

```
SXXXX.X,SYYYY.Y,FF,T<CR><LF>
```



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Character	Definition
S	Coordinate sign that can be the ASCII + (positive) or the ASCII - (negative)
X	A digit of the X coordinate, where each digit is an ASCII character, 0 through 9
,	The delimiter character. The default is an ASCII comma
Y	A digit of the Y coordinate, where each digit is an ASCII character, 0 through 9
FF	Flag character, identifying the transducer buttons being pressed. The possible combinations are listed in the table below.

3-button Stylus Buttons	4-button Cursor Buttons	16-button Cursor Buttons	ASCII Output
none	none	none	00
tip button	1	1	01
first barrel	2	2	02
second barrel	3	3	03
---	4	C	04
---	---	4	05
---	---	5	06
---	---	6	07
---	---	D	08
---	---	7	09
---	---	8	10
---	---	9	11
---	---	E	12
---	---	A	13
---	---	0	14
---	---	B	15
---	---	F	16
-----	out - of - prox-----		32



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**NOTE:** The cursors are designed for single, not multiple, button use. Pressing multiple buttons simultaneously yields unpredictable results.

T                      Tablet area identifier, set to 0  
 <CR>                ASCII carriage return  
 <LF>                ASCII line feed

### 2.1.3 Packed Binary Report Format

The packed binary report format is in counts, represented in binary notation. The format is the same for any resolution setting.

#### Seven Data Bits

Stop Bits	MSB	7	6	5	4	3	2	1	LSB	0	Start Bit	Transmission Sequence
SB	P	PH	0	0	0	0	T	PR	0	0	0	1st byte
SB	P	0	0	Fe	Fd	Fc	Fb	Fa	0	0	0	2nd byte
SB	P	0	X5	X4	X3	X2	X1	X0	0	0	0	3rd byte
SB	P	0	X11	X10	X9	X8	X7	X6	0	0	0	4th byte
SB	P	0	0	Sx	X15	X14	X13	X12	0	0	0	5th byte
SB	P	0	Y5	Y4	Y3	Y2	Y1	Y0	0	0	0	6th byte
SB	P	0	Y11	Y10	Y9	Y8	Y7	Y6	0	0	0	7th byte
SB	P	0	0	Sy	Y15	Y14	Y13	Y12	0	0	0	8th byte

#### Eight Data Bits

Stop Bits	MSB	7	6	5	4	3	2	1	LSB	0	Start Bit	Transmission Sequence
SB	P	0	PH	0	0	0	0	T	PR	0	0	1st byte
SB	P	0	0	0	Fe	Fd	Fc	Fb	Fa	0	0	2nd byte
SB	P	0	0	X5	X4	X3	X2	X1	X0	0	0	3rd byte
SB	P	0	0	X11	X10	X9	X8	X7	X6	0	0	4th byte
SB	P	0	0	0	Sx	X15	X14	X13	X12	0	0	5th byte
SB	P	0	0	Y5	Y4	Y3	Y2	Y1	Y0	0	0	6th byte
SB	P	0	0	Y11	Y10	Y9	Y8	Y7	Y6	0	0	7th byte
SB	P	0	0	0	Sy	Y15	Y14	Y13	Y12	0	0	8th byte



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Character	Definition
LSB	Least significant bit
MSB	Most significant bit
PR	Proximity 0 when in proximity and 1 when out-of-prox
T	Tablet area identifier, set to 0
PH	Phasing bit, set for 1
P	Parity bit
SB	One or two stop bits
F	Flag bit, identifying the transducer buttons being pressed. The possible combinations are listed in the table below.

3-button Stylus Buttons	4-button Cursor Buttons	16-button Cursor Buttons	Binary Output				
			Fe	Rd	Fc	Fb	Fa
none	none	none	0	0	0	0	0
tip button	1	1	0	0	0	0	1
first barrel	2	2	0	0	0	1	0
second barrel	3	3	0	0	0	1	1
---	4	C	0	0	1	0	0
---	---	4	0	0	1	0	1
---	---	5	0	0	1	1	0
---	---	6	0	0	1	1	1
---	---	D	0	1	0	0	0
---	---	7	0	1	0	0	1
---	---	8	0	1	0	1	0
---	---	9	0	1	0	1	1
---	---	E	0	1	1	0	0
---	---	A	0	1	1	0	1
---	---	0	0	1	1	1	0
---	---	B	0	1	1	1	1
---	---	F	1	0	0	0	0

**Note:** The cursors are designed for single, not multiple, button use. Pressing multiple buttons simultaneously yields unpredictable results.

X0 to X15	X coordinate bits
Y0 to Y15	Y coordinate bits
X0 to Y0	Least significant digits
X15 to Y15	Most significant digits
Sx and Sy	Sign bits for each coordinate where 0 is positive and 1 is negative





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**2.1.4 Summagraphics Microgrid UIOF Command Summary**

Command	ASCII	Command	ASCII
Reset	<ESC>Z	Sound Annunciator	
Reset and Change Emulation	<ESC>z(n)	Standard Tone	<ESC>A
MG/UIOF	n=0	Select Different Tone	<ESC>Y(n)
MM/SummaSketch	n=1	low tone	n=1
Calcomp	n=2	medium tone	n=2
GTCO	n=3	high tone	n=3
Change Reset Character	<ESC>x(x)	highest tone	n=4
	x=new character	Relocate Origin	<ESC>F[b]
Baud Rate	<ESC>B(n)	Lower Left	b=0
19.2K	n=0	Used-Defined	b=1
9600	n=1	Center	b=2
4800	n=2	Lower Right	b=4
2400	n=3	Upper Left	b=3
1200	n=4	Upper Right	b=5
600	n=5	Fixed Resolution	<ESC>C[b]
300	n=6	Inches	
150	n=7	200 lpi	b=0
110	n=8	1000 lpi	b=2
Parity	<ESC>p(n)	2000 lpi	<ESC>CS
Disabled	n=0	Millimeters	
Odd Parity	n=1	10 lpmmm	b=1
Even Parity	n=2	40 lpmmm	b=3
7 Data Bits	n=3	80 lpmmm	<ESC>CB
8 Data Bits	n=4	Variable Resolution	<ESC>P[a][bbbb]
Data Format		X Axis	a=x
Binary	<ESC>MB		bbbb=ASCII Value
ASCII	<ESC>MA		from 0001 to 2540
Binary to ASCII	<ESC>Q	Y Axis	awy
Carriage Return Toggle	<ESC>MR		bbbb=ASCII Value
Line Feed Toggle	<ESC>ML		from 0001 to 2540
Decimal Point		Confirm Resolution	<ESC>a
Exclude	<ESC>d0	Audible Feedback	
Include	<ESC>d1	Disable Beep	<ESC>MT0
Send Previous Report	<ESC>g	Enable Beep	<ESC>MT1
Report Modes			
Increment Mode	<ESC>I(nnn)		
Stream Mode	<ESC>M0		
Point Mode	<ESC>M1		
Switch Stream Mode	<ESC>M2		
Prompt Mode	<ESC>M3		
Skew Correction	<ESC>x		
Send New Report	<ESC>G		
Set Report Rate	<ESC>R(n)		
1 report per second	n=0		
2 rps	n=1		
5 rps	n=2		
10 rps	n=3		
30 rps	n=4		
60 rps	n=5		
85 rps	n=6		
150 rps (MAX)	n=7, 8, 9		
Transmit In-Prox Only	<ESC>W0		
Always Transmit	<ESC>W1		
Stop Transmission	<Ctrl>S		
Start Transmission	<Ctrl>Q		





## Chapter 3 Guidelines for Writing a Software Driver

If the Summagrid IV is connected to a computer, rather than to a terminal, the computer must have a driver for the tablet. The driver is a software subroutine that collects and decodes Summagrid IV reports for use by another (master) program. This chapter provides some guidelines, in the form of flowcharts, for writing a driver.

The flowcharts are for a Summagrid IV using the Summagraphics UIOF packed binary report format. The steps are general for any set of operating characteristics.

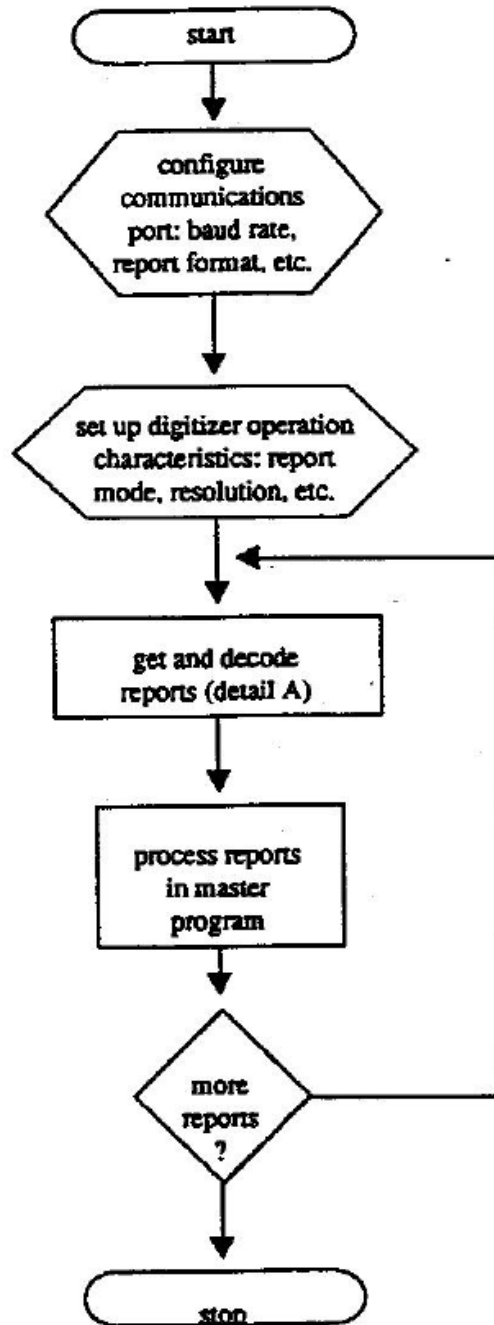
**NOTE:** In the context of these charts, *normalize* means to combine the coordinate bytes into the format required by the user's master program.

<b>3.1</b>	<b>Flowcharts for Writing Drivers</b>	<b>24</b>
3.1.1	General Flowchart for Master Program to Read and Process Digitizer Reports	24
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3.1.5	Detail D: Normalize Bytes into X and Y Coordinates, Switch and Proximity Information	28



### 3.1 Flowcharts for Writing Drivers

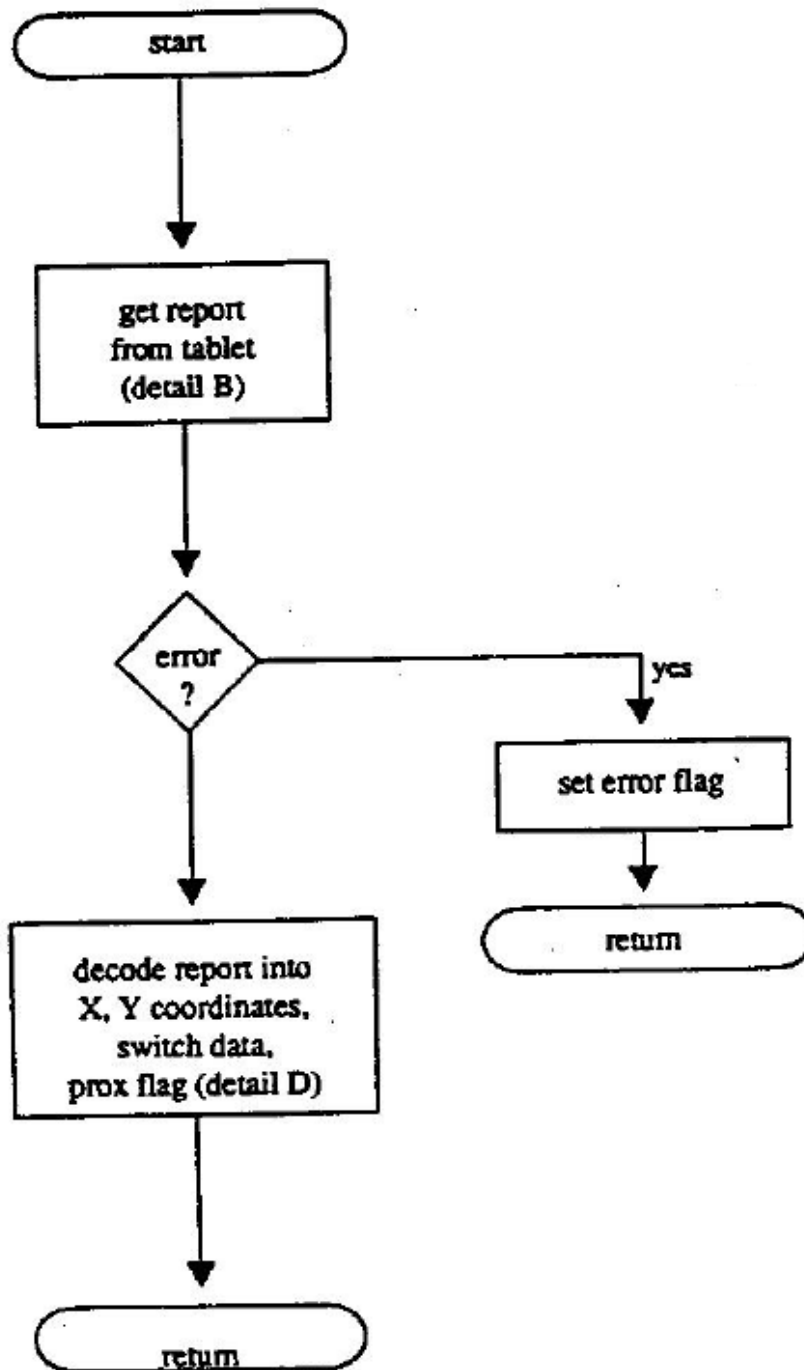
#### 3.1.1 General Flowchart for Master program to Read and Process Digitizer Reports





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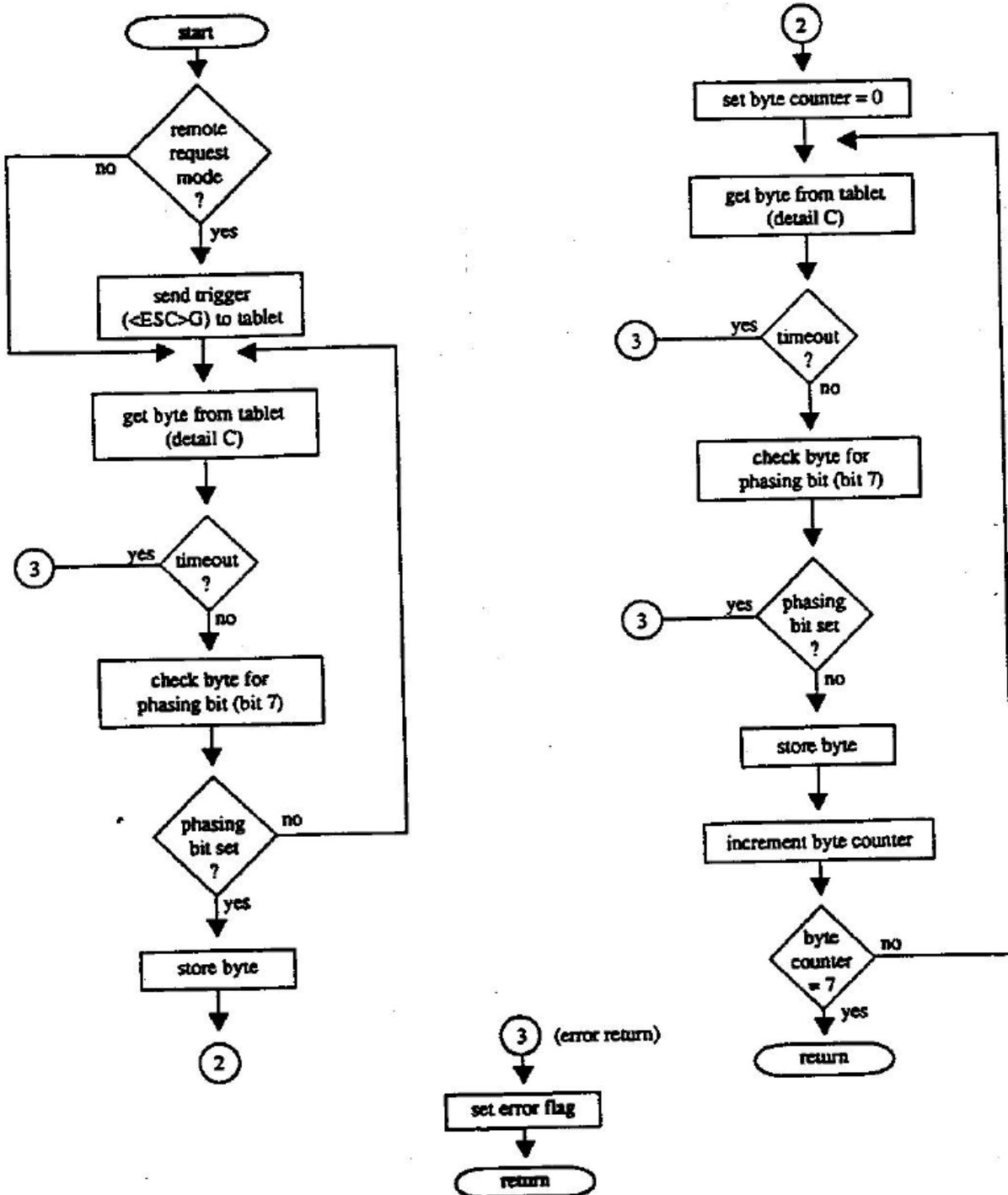
### 3.1.2 Detail A: Get Binary Format Report





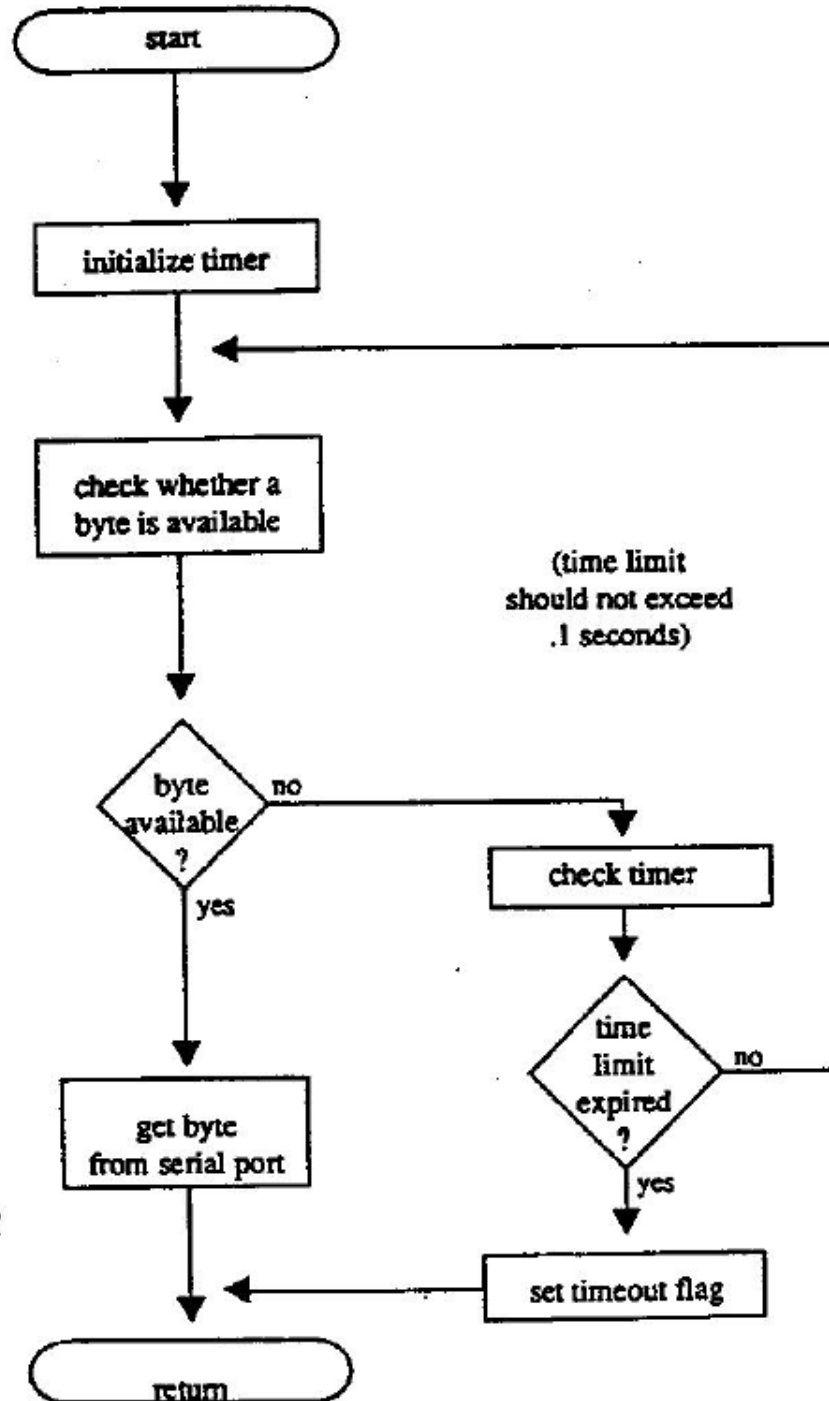
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**3.1.3 Detail B: Get Binary Format Report, Poll/Remote Mode or Stream Mode**





### 3.1.4 Detail C: Get Byte from Tablet





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### 3.1.5 Normalize Bytes into X and Y Coordinates, Switch and Proximity Information

