

TMS
Thursday 3:30 PM April 12, 2012




Final Update!


Log Yard Inventory Measurements

2012

John Calkins,
Check Scaler/Quality Control
Simpson Lumber Company
Tacoma, Shelton, Longview
Washington



Original Goals

1. Improve the Physical Log Deck Measure for more Accurate Log Accounting.
 2. Take More Measurements using One Person.
 3. Devise a Procedure that is Easy to Understand and Replicate.
 4. Devise a Procedure that is Acceptable to Accountants and Auditors.
- 



Commencement
Bay Operations

The Challenge

Mountains to Measure



(I Have Found)

There are 3 Accepted Ways to Inventory Log Decks

- ▶ 1. Closed Deck: Knowing the exact volumes put into each deck.
- ▶ 2. Load Averages: Counting the Load Receipts in each deck.
- ▶ 3. Square Foot Deck Factors: Log Deck Volumes / Log Deck Square Foot Surface Area.

**This is
The Square Foot Deck Factor
Method**



Recognize the Geometric Shapes



Use the Simple Geometric Areas of Right Triangles and Rectangles to figure the Square Foot Surface Area of any Log Deck.

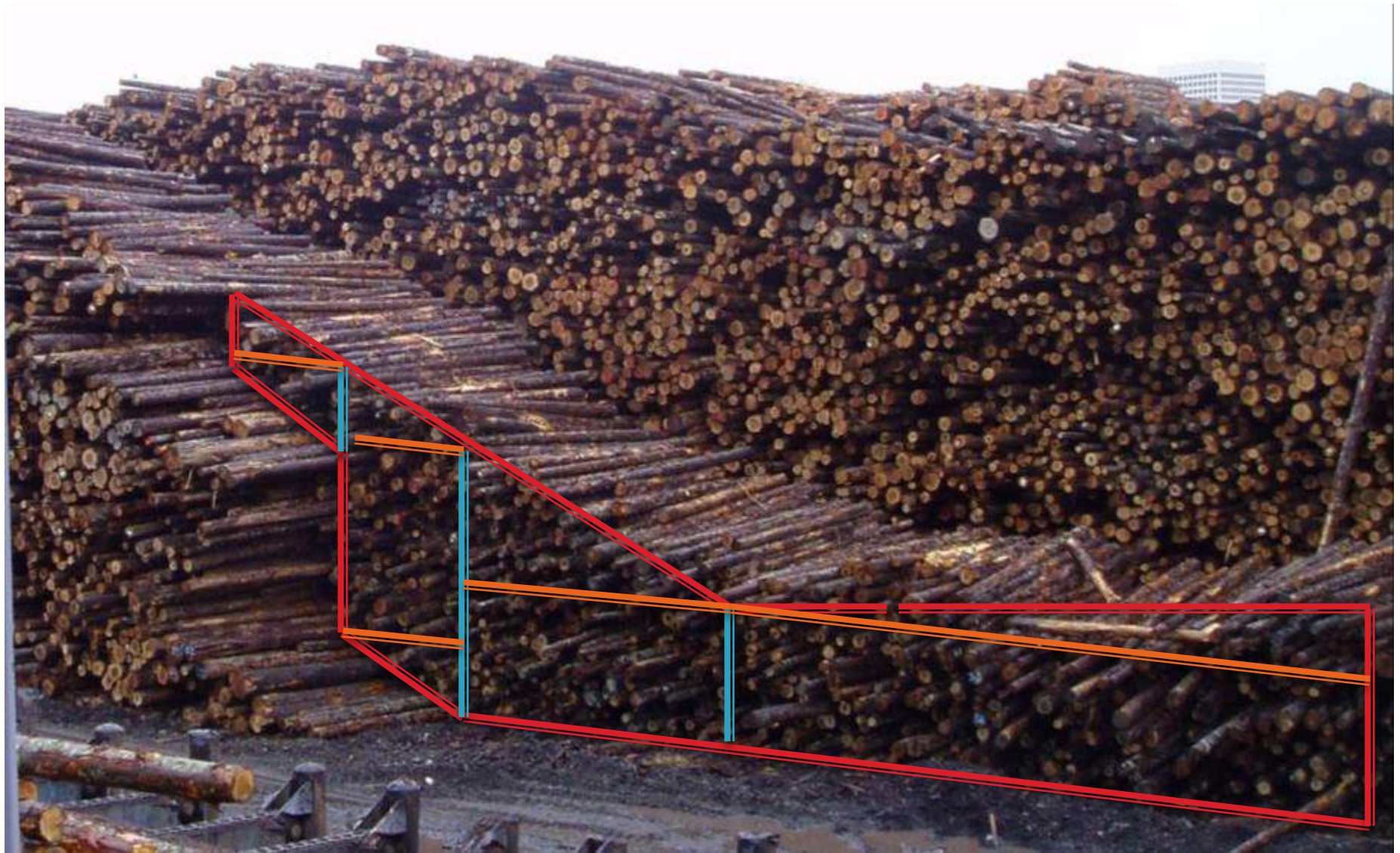


Vantage Points are Key



Learn Why Decks are Built the Way They Are. Spot the Geometric Shapes.





Find the Area of these Right Triangles and Rectangles for the SqFt. Measurement



This method is the easiest to understand even under complex shapes.

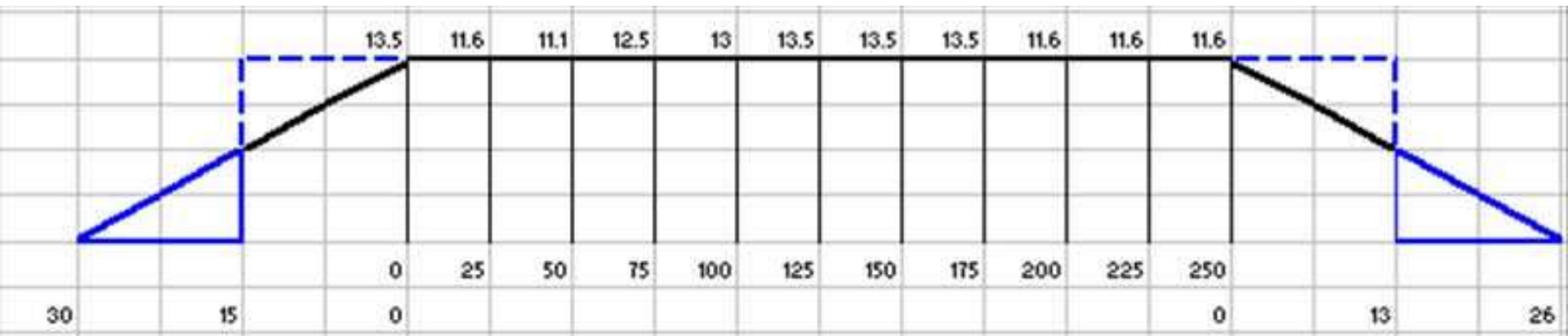
So at what point do we stop measuring the finer detail and use reasonable incremental measurements?



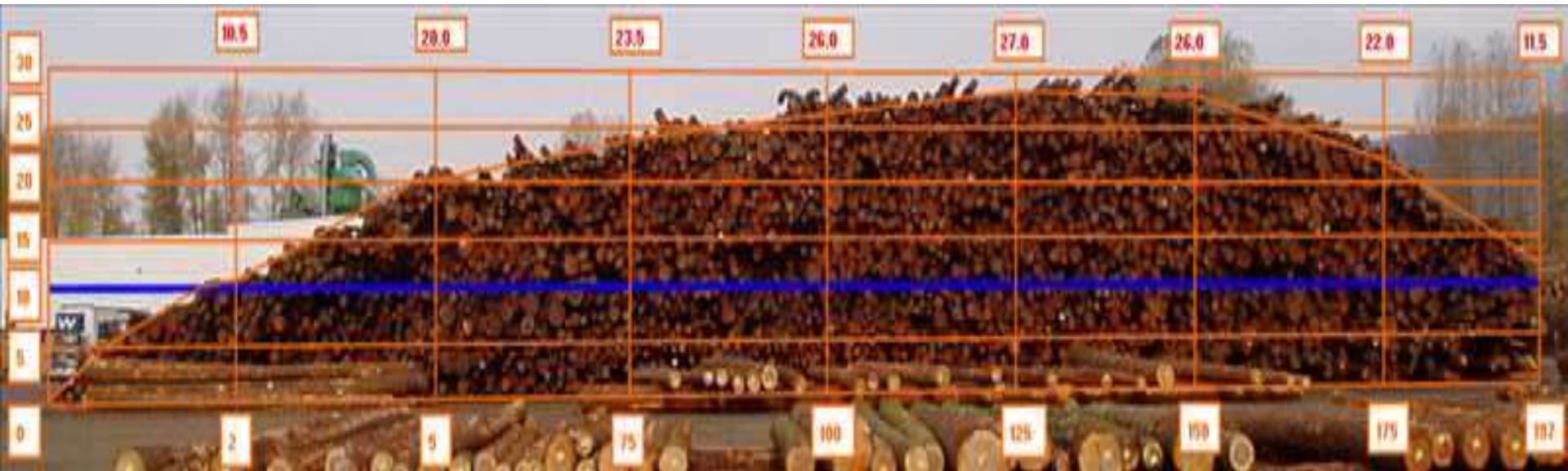
It Time To Use The New Technologies



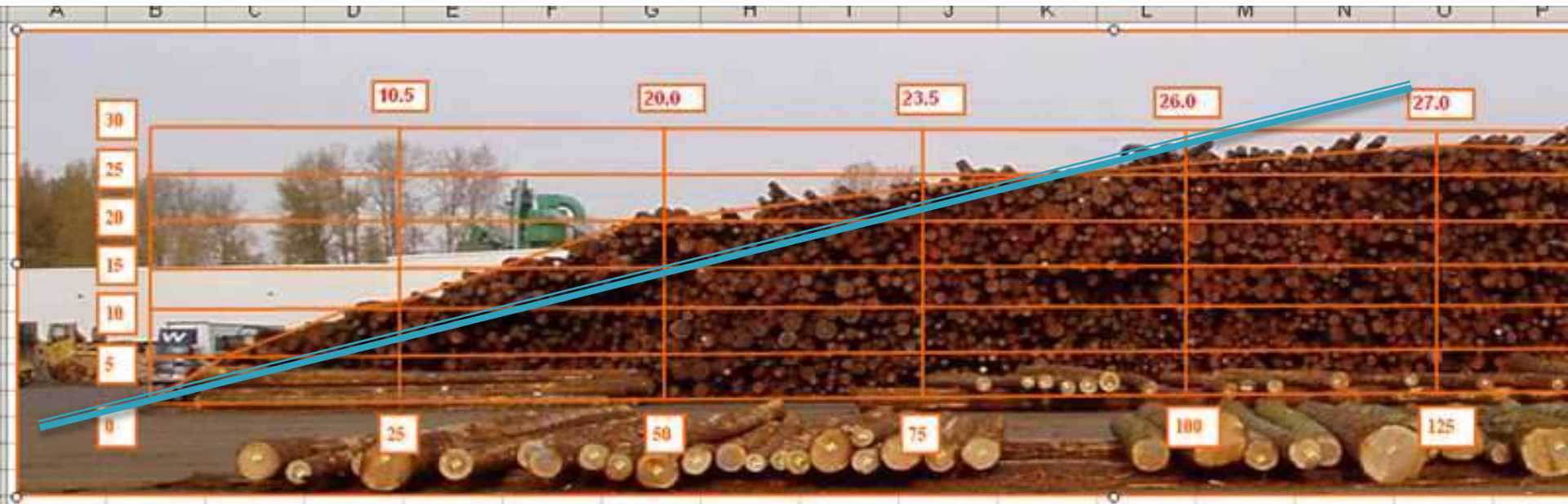
This is an accepted method used to visually fold the triangle ends up in the field then measure at regular intervals to average the top rectangle shape of the deck.



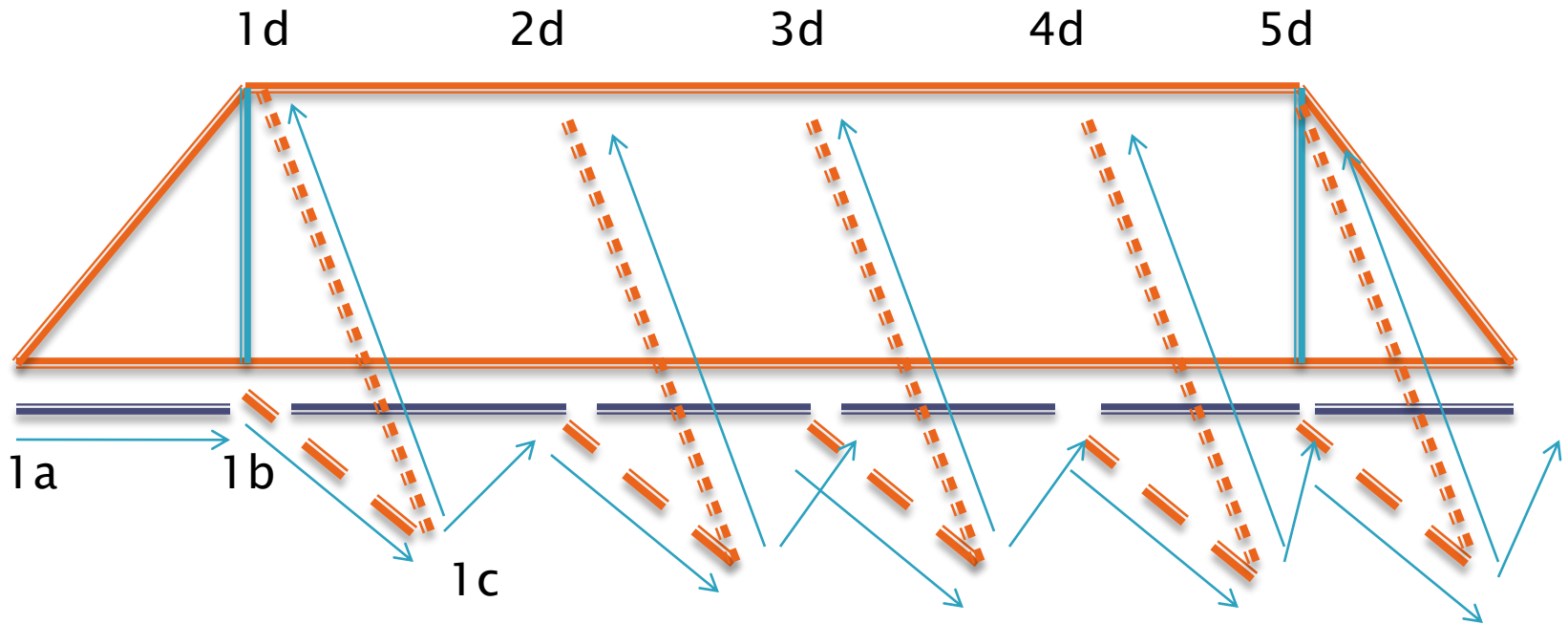
I used a camera and graphs to determine the size of decks by painting physical marks on the decks to line up with the graph.



I broke down the decks into smaller geometric shapes to see how much error there is in visually creating the larger Right Triangle and Rectangle shapes.



Clinometer Procedure

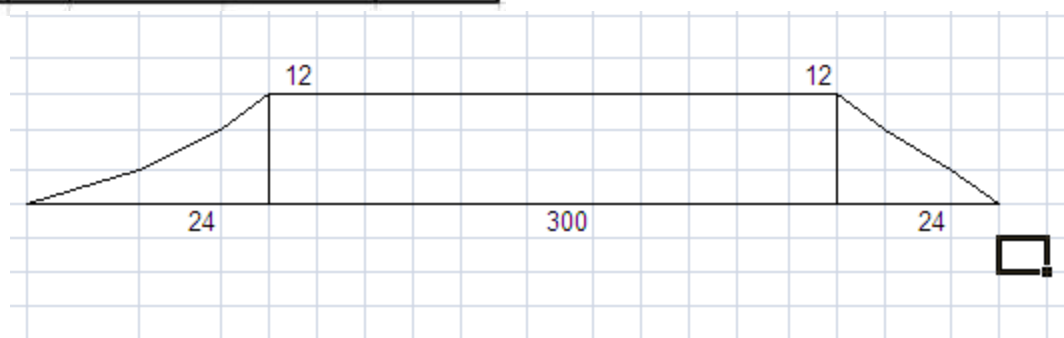


Clinometer and 50' Tape



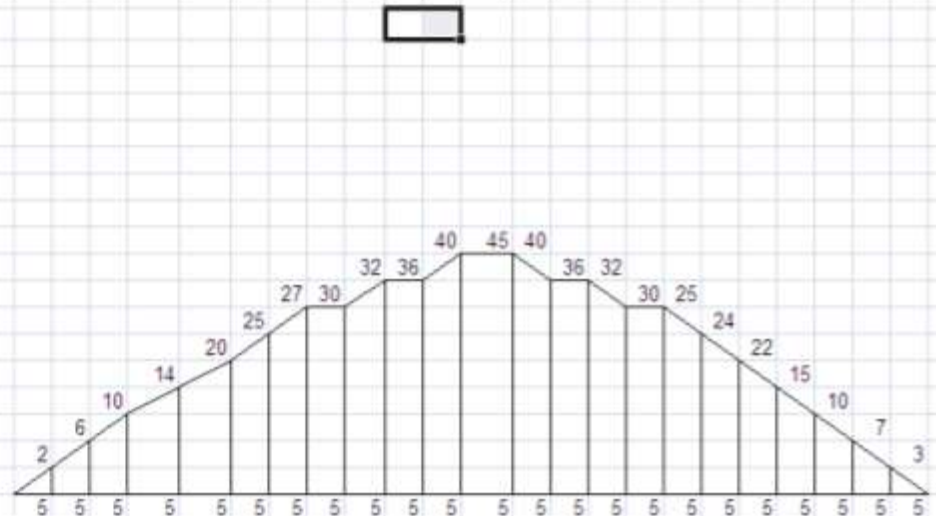
Clinometer Worksheet Method

	A	B	C	D	E	F	G
1	Method 1						
2	Deck Measurements		Clinometer Measurements				Height
3	Deck Parts	ClinDistToDeck	Down -	Up+	Below Eye	Above Eye	
4	Average Height	25	10	17	4.4	7.6	12.1
5		25	5	24	2.2	11.1	13.3
6		25	3	25	1.3	11.7	13.0
7		25	1	29	0.4	13.9	14.3
8		25	6	28	2.6	13.3	15.9
9		25	2	28	0.9	13.3	14.2
10		25	5	20	2.2	9.1	11.3
11		25	6	19	2.6	8.6	11.2
12		25	5	26	2.2	12.2	14.4
13							
14							
15	Average Deck Height						13.3
16	Big Rectangle Length	390					
17	Triangle 1 Length	34	17				
18	Triangle 2 Length	18	9				
19	Total Deck Length		416		<i>Total Deck Square Feet:</i>		5,529.1



Need More Measurements

44					Height	Width	Area
45	Clinometer Measurements						
46	Down -	Up+	Below Eye	Above Eye			
47	12	15	5.3	6.7	12.0		0
48	12		5.3	-	5.3		0
49	12		5.3	-	5.3		0
50	12		5.3	-	5.3		0
51	12		5.3	-	5.3		0
52	12		5.3	-	5.3		0
53	12		5.3	-	5.3		0
54	12		5.3	-	5.3		0
55	12		5.3	-	5.3		0
56	12		5.3	-	5.3		0
57	12		5.3	-	5.3		0
58	12		5.3	-	5.3		0
59	12		5.3	-	5.3		0
60	12		5.3	-	5.3		0
61	12		5.3	-	5.3		0
62	12		5.3	-	5.3		0
63	12		5.3	-	5.3		0
64	12		5.3	-	5.3		0
65	12		5.3	-	5.3		0
66	12		5.3	-	5.3		0
67	12		5.3	-	5.3		0
68	12		5.3	-	5.3		0
69							
70							0



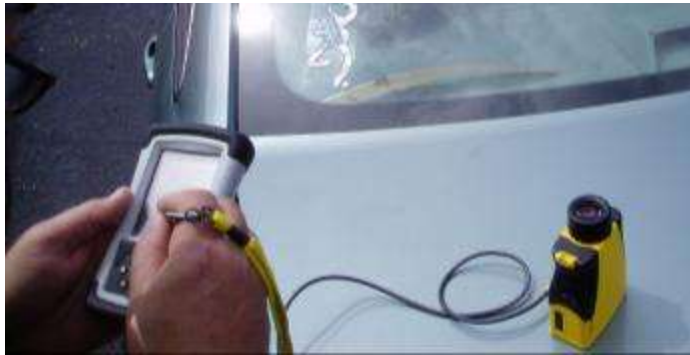
Constantly Changing



Inaccessible



TruePulse360 Rangefinder



TP 360 - Nomad - GPS



The TP360 appeared to be the ultimate device for my project

TruPulse® 360 for Stockpile Volumes

Traditional methods require your crew to build a prism pole and occupy areas of a large pile of loose material. Some crews wake this process, which causes lack of detail and poor results. This process can be time-consuming and dangerous.

Attempting for an aerial fly-over is not only expensive, but you'll usually wait days, even weeks for the results. Finally, there's a quick, safe and easy solution to measuring stockpile volumes! Take the TruPulse 360 in conjunction with LTI's MapSmart™ with volume software, and you'll be able to accurately measure the volume of aggregates, wood chips or anything else.

A single operator can quickly gather and record data from a safe distance, with results possible in less than an hour with the TruPulse 360. Having the combination of a hand-held computer and a compact data collector, it doesn't get any easier or more portable than this. With very little time, you can find a safe location and start collecting field data immediately.

Measurement Solutions:

- Distance (Horizontal, Vertical, Slope)
- Inclination (Degrees and Percent Slope)
- Height (Flexible three-shot routine)
- Azimuth (Compass bearing for single-shot positioning)
- Missing Line (Distance, Inclination and Azimuth between any two remote points)

Basic Specifications:

- Distance Accuracy: ±1 ft (30 cm) typical, ±1 yd (1 m) max.
- Inclination Accuracy: ±0.25 degrees
- Azimuth Accuracy: ±1 degree typical
- Data Communication: Serial, via wired RS232 (standard) or wireless Bluetooth® (optional)
- Max Range: ± 3,280ft (1,000 m) typical

Measured

Calculated

HD = Horizontal Distance
SD = Slope Distance
VD = Vertical Distance
RC = Rollmark
AZ = Azimuth
HT = Height

3-Shot Routine

8.5 F

18 F

18 F

2.0 F

22.5 F

23.5 F

26.5 F

24.0 F

24 F

24 F

17.0 F

16 F

14.5 F

14 F

15.0 F

24.0 F

18.5 F

28.5 F

19.0 F

18.5 F

18.5 F

18.0 F

16 F

5.5 F

2-Shot Missing Line

19 F*43

19 F*45

18.5 F*4B

12.01 F*7B

23 F*43

23.5 F*4D

26.5 F*49

24.01 F*4F

24 F*49

24.5 F*4E

17.01 F*7F

16 F*76

14.5 F*74

14 F*7D

15.01 F*70

24.01 F*7E

18.5 F*7C

28.5 F*4A

19.01 F*40

18.5 F*42

18.5 F*4C

18.01 F*42

16 F*49

5.5 F*4E

5 D

-14.8 D

1 D

-14.8 D

6 D

-14.7 D

2 D

-15.4 D

8 D

-9.5 D

7 D

-7.7 D

5 D

-2.3 D

4 D

-4.4 D

6 D

-4.9 D

4 D

-4.8 D

3 D

-4.5 D

2 D

-3.8 D

1 D

-4.6 D

1 D

-4.6 D

4 D

-3.8 D

9 D

-0.7 D

6 D

-3.8 D

6 D

-3.9 D

4 D

-4.1 D

1 D

-4.3 D

4 D

-5.2 D

9 D

-4 D

Measure a stockpile with LTI's Easy!

Here's how you can measure more of your stockpiles with less time and effort:

- 1) Open a new MapSmart file to start a new project.
- 2) Open a new MapSmart file to start a new project.
- 3) Aim and shoot at the first control point.
- 4) After collecting your last data point and then occupy that location.
- 5) Repeat steps 3 and 4 for each control point until the entire stockpile is measured.
- 6) Once you have closed your traverse, the software will calculate the stockpile volume, material density and press CALC to view results.

LAYER TECHNOLOGY
Authorized Dealer

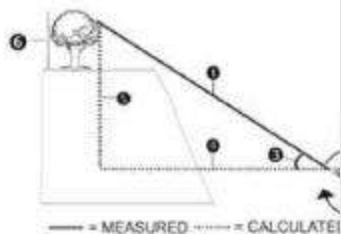
www.lasertech.com/360
info@lasertech.com
877-OWN-A-LTI

\$PLTIT	HV	8.5 F	5 D	-14.8 D	19 F*43
\$PLTIT	HV	18 F	1 D	-14.8 D	19 F*45
\$PLTIT	HV	18 F	6 D	-14.7 D	18.5 F*4B
\$PLTIT	HV	2.0 F	2 D	-15.4 D	12.01 F*7B
\$PLTIT	HV	22.5 F	8 D	-9.5 D	23 F*43
\$PLTIT	HV	23.5 F	7 D	-7.7 D	23.5 F*4D
\$PLTIT	HV	26.5 F	5 D	-2.3 D	26.5 F*49
\$PLTIT	HV	24.0 F	4 D	-4.4 D	24.01 F*4F
\$PLTIT	HV	24 F	6 D	-4.9 D	24 F*49
\$PLTIT	HV	24 F	4 D	-4.8 D	24.5 F*4E
\$PLTIT	HV	17.0 F	3 D	-4.5 D	17.01 F*7F
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\$PLTIT	HV	14 F	1 D	-5.7 D	14 F*7D
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\$PLTIT	HV	19.0 F	6 D	-3.8 D	19.01 F*40
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\$PLTIT	HV	18.0 F	1 D	-4.3 D	18.01 F*42
\$PLTIT	HV	16 F	4 D	-5.2 D	16 F*49
\$PLTIT	HV	5.5 F	9 D	-4 D	5.5 F*4E

Understand the Devices

Section 5 - Measurement Mode

When you power ON the TriPulse, the last used M to display the previous or next Measurement measurements that the TriPulse can take. For info see page 37.



Fig

Distance Measurements

The basic steps for taking any distance measurement

1. Look through the eyepiece and use the cross
2. Press-and-hold **[M]**. The LASER status indicator will remain active for a maximum of 10 seconds
 - o If the target is not acquired in the 10-sec
3. Once the measurement is displayed, release **[M]** indicating the measurement was downloaded, until you press any button or the unit powers

Firmware Version: A=3.05, b=3.35 [38]

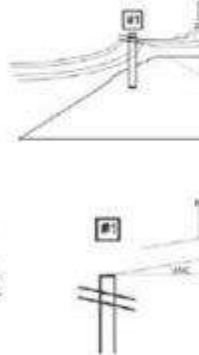
During the Height Routine:

- Press **[M]** to re-shoot the previous point.
- Press **[M]** to exit the Height Routine.
- The laser is not active while measuring the ANGI and A long as you hold **[M]**, the inclination reading is displayed your aiming point changes. The measured inclination is aiming point when you release **[M]**.
- When the height result is displayed, just press **[M]** to sta repeat the steps.

Missing Line Routine

The Missing Line Routine calculates distances and angles to describe the relationship between two points in three-dimensional space (connecting vector). This routine is ideal for span lengths, remote slope determinations, and changes in elevation from one location.

The simple routine prompts you to take two shots to targets: "Shot 1" and "Shot 2". The TriPulse uses the results to calculate five variables between the two points: slope distance, inclination, azimuth, horizontal distance, and vertical distance as shown in Figure #23.



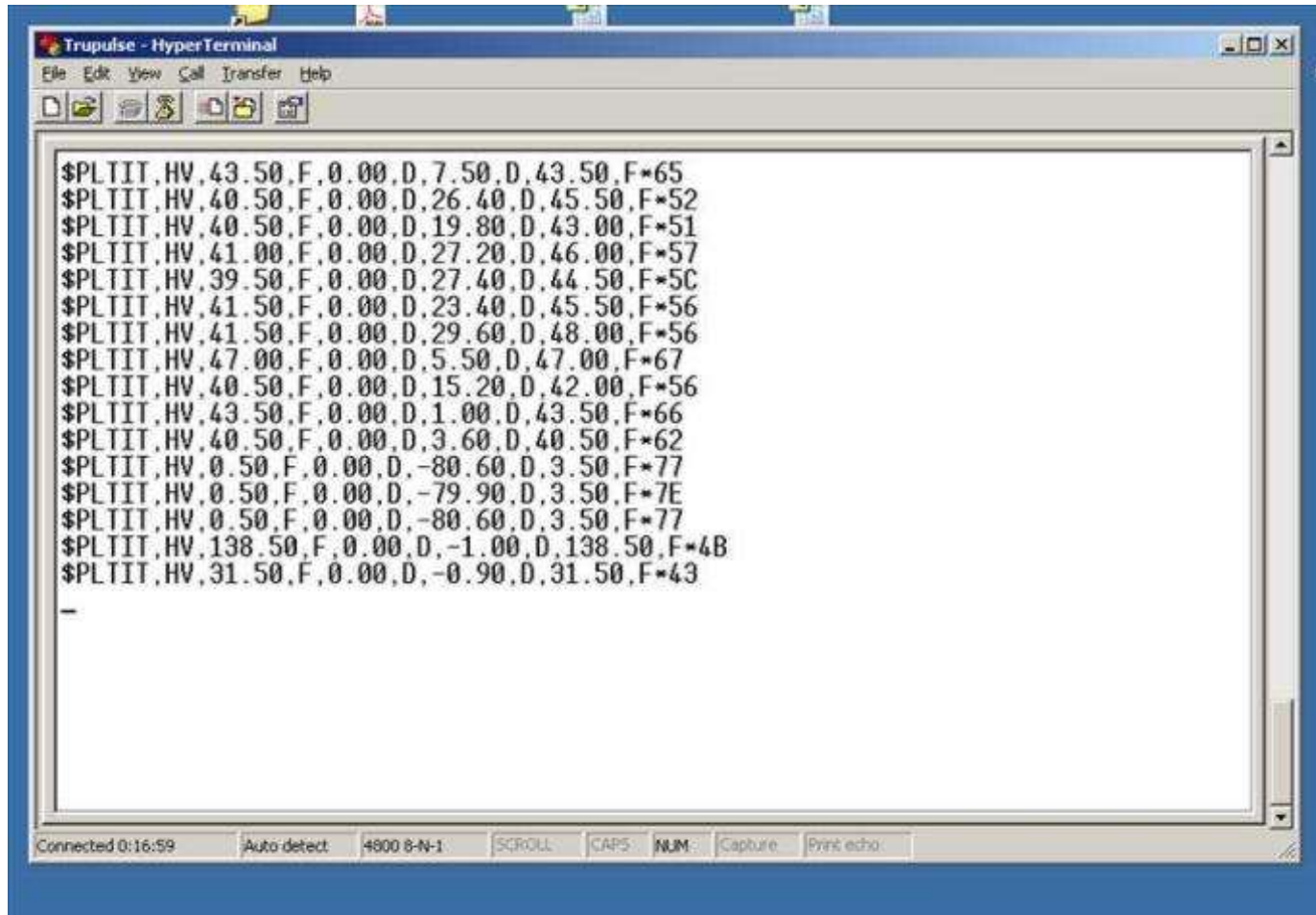
Fig

- o HD: Horizontal Distance: Horizontal component of the
- o VD: Vertical Distance: Change in elevation between p
- o SD: Slope Distance: Length of the missing line.
- o INC: Inclination between point #1 and point #2.
- o AZ: Relative Azimuth: Direction from the point #1 to

Firmware Version: A=3.05, b=3.35 (Manual DRAFT E: Upd

	A	B	C	D	E	F	G	H	I	J	K	L
1	SPLTIT	HV	18.5	F	14.5	D	-14.8	D	19	F	*43	
2	SPLTIT	HV	18	F	13.1	D	-14.8	D	19	F	*45	
3	SPLTIT	HV	18	F	11.6	D	-14.7	D	18.5	F	*48	
4	SPLTIT	HV	12.01	F	3.2	D	-15.4	D	12.01	F	*78	
5	SPLTIT	HV	22.5	F	9.8	D	-9.5	D	23	F	*43	
6	SPLTIT	HV	23.5	F	7	D	-7.7	D	23.5	F	*40	
7	SPLTIT	HV	26.5	F	7.5	D	-2.3	D	26.5	F	*49	
8	SPLTIT	HV	24.01	F	4.1	D	-4.4	D	24.01	F	*4F	
9	SPLTIT	HV	24	F	6.8	D	-4.9	D	24	F	*49	
10	SPLTIT	HV	24	F	9.4	D	-4.8	D	24.5	F	*4E	
11	SPLTIT	HV	17.01	F	13.6	D	-4.5	D	17.01	F	*7F	
12	SPLTIT	HV	16	F	14.2	D	-3.8	D	16	F	*76	
13	SPLTIT	HV	14.5	F	14.9	D	-4.6	D	14.5	F	*74	
14	SPLTIT	HV	14	F	15.1	D	-5.7	D	14	F	*7D	
15	SPLTIT	HV	15.01	F	15.2	D	-5.9	D	15.01	F	*70	
16	SPLTIT	HV	24.01	F	17	D	-4.6	D	24.01	F	*7E	
17	SPLTIT	HV	18.5	F	18.4	D	-3.8	D	18.5	F	*7C	
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20	SPLTIT	HV	18.5	F	352.6	D	-3.9	D	18.5	F	*42	
21	SPLTIT	HV	18.5	F	351.4	D	-4.1	D	18.5	F	*4C	
22	SPLTIT	HV	18.01	F	349.1	D	-4.3	D	18.01	F	*42	
23	SPLTIT	HV	16	F	347.4	D	-5.2	D	16	F	*49	
24	SPLTIT	HV	5.5	F	9.9	D	-4	D	5.5	F	*4E	
25	SPLTIT	HV	5.5	F	9.1	D	-4.2	D	5.5	F	*44	
26	SPLTIT	HV	5	F	6.9	D	-5.4	D	5	F	*4F	
27	SPLTIT	HV	5	F	4	D	-5.4	D	5	F	*4F	
28	SPLTIT	HV	5	F	2.2	D	-4.9	D	5	F	*47	
29	SPLTIT	HV	5	F	1.1	D	-4.9	D	5	F	*47	
30	SPLTIT	HV	23.01	F	5.1	D	-4.9	D	23.01	F	*43	
31	SPLTIT	HV	23.5	F	356.6	D	-2.6	D	23.5	F	*48	
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TP360 Data Collection

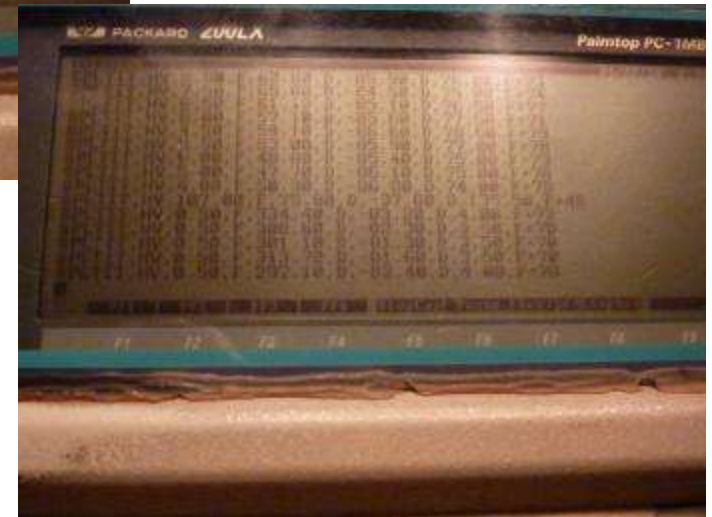
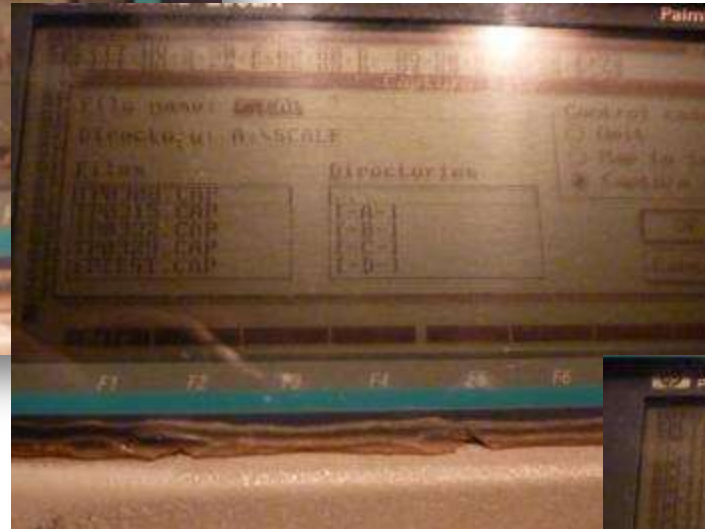
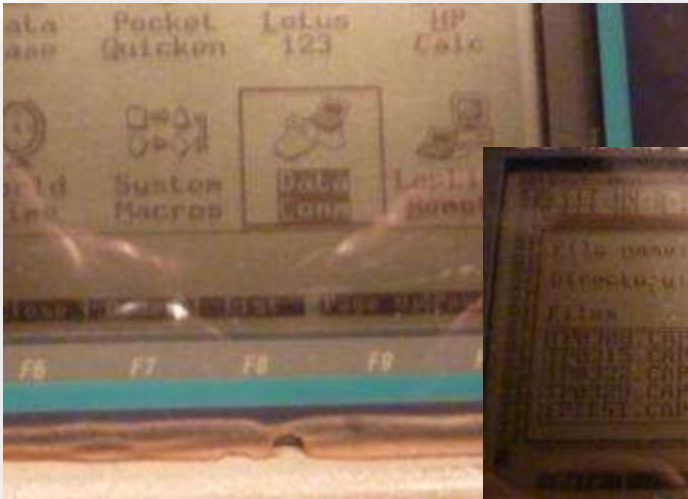


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Trupulse - HyperTerminal
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Deck Measurement Tools



HP200 DataComm



HP200 Data Collection

119.60,D,-81.10,D,4.00,F*7C

24. TRANSFILE WIN 200

186 File Disk Tree View HP Palmtop Options Help

186

18

18

177 [-C-] C:\HP200*

170

170

192

188

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MCI .DCF 628 06/01/93 12:56

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TP200910.CAP 1465 10/20/09 09:05

TERM .ENV 82 10/20/09 09:13

135 file(s). 1392462 Bytes

15 file(s). 46640 Bytes

Press F1 for Help.

NUM

TruPulse Datastring in an Excel Sheet

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3	\$PLTIT	HV	18	F	11.6	D	-14.7	D	18.5	F*48		
4	\$PLTIT	HV	12.01	F	3.2	D	-15.4	D	12.01	F*78		
5	\$PLTIT	HV	22.5	F	9.8	D	-9.5	D	23	F*43		
6	\$PLTIT	HV	23.5	F	7	D	-7.7	D	23.5	F*40		
7	\$PLTIT	HV	26.5	F	7.5	D	-2.3	D	26.5	F*49		
8	\$PLTIT	HV	24.01	F	4.1	D	-4.4	D	24.01	F*4F		
9	\$PLTIT	HV	24	F	6.8	D	-4.9	D	24	F*49		
10	\$PLTIT	HV	24	F	9.4	D	-4.8	D	24.5	F*4E		
11	\$PLTIT	HV	17.01	F	13.6	D	-4.5	D	17.01	F*7F		
12	\$PLTIT	HV	16	F	14.2	D	-3.8	D	16	F*76		
13	\$PLTIT	HV	14.5	F	14.9	D	-4.6	D	14.5	F*74		
14	\$PLTIT	HV	14	F	15.1	D	-5.7	D	14	F*7D		
15	\$PLTIT	HV	15.01	F	15.2	D	-5.9	D	15.01	F*70		
16	\$PLTIT	HV	24.01	F	17	D	-4.6	D	24.01	F*7E		
17	\$PLTIT	HV	18.5	F	18.4	D	-3.8	D	18.5	F*7C		
18	\$PLTIT	HV	28.5	F	349.9	D	-0.7	D	28.5	F*4A		
19	\$PLTIT	HV	19.01	F	351.6	D	-3.8	D	19.01	F*40		
20	\$PLTIT	HV	18.5	F	352.6	D	-3.9	D	18.5	F*42		
21	\$PLTIT	HV	18.5	F	351.4	D	-4.1	D	18.5	F*4C		
22	\$PLTIT	HV	18.01	F	349.1	D	-4.3	D	18.01	F*42		
23	\$PLTIT	HV	16	F	347.4	D	-5.2	D	16	F*49		
24	\$PLTIT	HV	5.5	F	9.9	D	-4	D	5.5	F*4E		
25	\$PLTIT	HV	5.5	F	9.1	D	-4.2	D	5.5	F*44		
26	\$PLTIT	HV	5	F	6.9	D	-5.4	D	5	F*44		
27	\$PLTIT	HV	5	F	4	D	-5.4	D	5	F*4F		
28	\$PLTIT	HV	5	F	2.2	D	-4.9	D	5	F*47		
29	\$PLTIT	HV	5	F	1.1	D	-4.9	D	5	F*47		
30	\$PLTIT	HV	23.01	F	5.1	D	-4.9	D	23.01	F*43		
31	\$PLTIT	HV	23.5	F	356.6	D	-2.6	D	23.5	F*48		
32	\$PLTIT	HV	23	F	352.5	D	-2.9	D	23	F*40		

TP360 Worksheet

S5				
LGTH	DOWN	UP	HEIGHT	SqFt
-	3.5	(3.5)	-	
14.0	3.5	6.0	9.5	67
8.0	3.5	5.5	9.0	74
23.0	3.5	(3.5)	-	104
TOTAL				244

S7				
LGTH	DOWN	UP	HEIGHT	SqFt
-	5.5	(5.5)	-	
27.0	5.5	4.5	10.0	135
23.4	5.5	5.0	10.5	240
23.4	6.0	3.5	9.5	234
23.4	6.0	4.0	10.0	228
23.4	5.5	6.0	11.5	251
23.4	4.5	5.5	10.0	251
23.4	5.0	5.0	10.0	234
23.4	6.0	7.0	13.0	269
23.4	6.0	7.5	13.5	310
42.0	6.0	(6.0)	-	221
TOTAL				2,372

Voice Data Collection and HP200 on the Crane

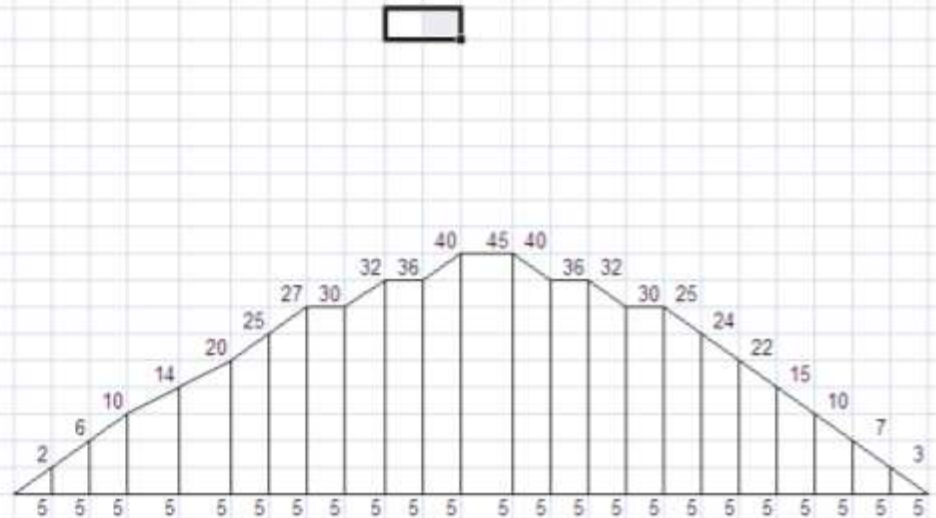
C1S NEW				
LGTH	DOWN	UP	HEIGHT	SqFt
-	4.0	(4.0)	-	
17.0	4.0	9.0	13.0	110.5
18.0	4.0	9.5	13.5	238.5
18.0	4.5	7.0	11.5	225.0
18.0	5.0	8.5	13.5	225.0
18.0	5.0	12.0	17.0	274.5
18.0	4.5	12.5	17.0	306.0
18.0	4.5	10.5	15.0	288.0
24.0	4.5	(4.5)	-	180.0
149.0				
TOTAL				1,847.5

**UNDER
CONSTRUCTION
in 2009**

C1S NEW			
73.0	8.0	8.3	66.2
71.5	9.5	8.3	78.6
68.0	13.0	8.3	107.6
69.5	11.5	8.3	95.2
67.0	14.0	8.3	115.9
69.5	11.5	8.3	95.2
70.0	11.0	8.3	91.1
68.0	13.0	8.3	107.6
68.0	13.0	8.3	107.6
65.5	15.5	8.3	128.3
65.5	15.5	8.3	128.3
68.5	12.5	8.3	103.5
66.0	15.0	8.3	124.2
64.0	17.0	8.3	140.7
66.5	14.5	8.3	120.0
65.5	15.5	8.3	128.3
70.0	11.0	8.3	91.1
73.5	7.5	8.3	62.1
COUNT	18.0		
Lgth	149.0		
Int	8.3		
SqFt			1,891.5

More is Better

44					Height	Width	Area
45	Clinometer Measurements						
46	Down -	Up+	Below Eye	Above Eye			
47	12	15	5.3	6.7	12.0		0
48	12		5.3	-	5.3		0
49	12		5.3	-	5.3		0
50	12		5.3	-	5.3		0
51	12		5.3	-	5.3		0
52	12		5.3	-	5.3		0
53	12		5.3	-	5.3		0
54	12		5.3	-	5.3		0
55	12		5.3	-	5.3		0
56	12		5.3	-	5.3		0
57	12		5.3	-	5.3		0
58	12		5.3	-	5.3		0
59	12		5.3	-	5.3		0
60	12		5.3	-	5.3		0
61	12		5.3	-	5.3		0
62	12		5.3	-	5.3		0
63	12		5.3	-	5.3		0
64	12		5.3	-	5.3		0
65	12		5.3	-	5.3		0
66	12		5.3	-	5.3		0
67	12		5.3	-	5.3		0
68	12		5.3	-	5.3		0
69							
70							0



Crane Operator Interface

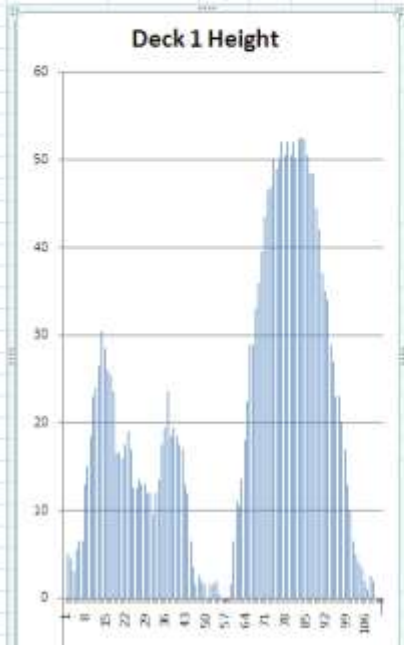


Mounted a TP200

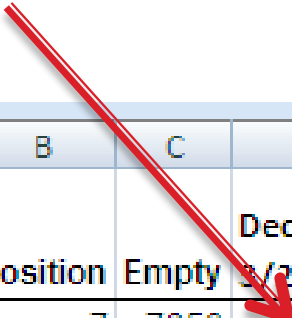


Crane Data

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	AB	AC	AD	AE	AF	AG
Deck	Position	Empty	Deck #1 3/28/2011	Deck 1 Height	Length	Length Running Total	Sqft	Sqft Running Total	Row Labels	Sum of Sqft	Row Labels	21-Feb	28-Feb	7-Mar	14-Mar	21-Mar	28-Mar			
C1N	7	7850	7201	6.48	6.3	37.6	40.9	195.2	C3N	8,341	C2S	10,671	10,659	10,877	4,391					
C1N	8	7850	6550	13	6.3	44.1	81.9	277.1	C3S	9,176	C3N	2,082		4,624	5,944	5,768	8,341			
C1N	9	7850	6350	15	6.3	50.4	94.5	371.6	C4N	7,869	C3S	11,362	10,682	10,455	10,723	9,163	9,176			
C1N	10	7850	6000	18.5	6.3	56.7	116.6	488.2	C4M	769	C4N	9,012	8,316	8,392	8,609	8,281	7,869			
C1N	11	7850	5550	23	6.3	63.0	144.9	633.1	C4S		C4M			298			769			
C1N	12	7850	5450	24	6.3	69.3	151.2	784.3	(blank)		C4S		2,054	2,463	3,988	3,988				
C1N	13	7850	5200	26.5	6.3	75.6	167.0	951.2	Grand Total	40,515	Grand Total	54,061	55,682	52,104	46,226	44,563	40,515			
C1N	14	7850	4800	30.5	6.3	81.9	192.2	1,143.4												
C1N	15	7850	5000	28.5	6.3	88.2	179.6	1,322.9												
C1N	16	7850	5250	26	6.3	94.5	163.8	1,486.7												
C1N	17	7850	5300	25.5	6.3	100.8	180.7	1,647.4												
C1N	18	7850	5500	23.5	6.3	107.1	148.1	1,795.4												
C1N	19	7850	6200	16.5	6.3	113.4	104.0	1,899.4												
C1N	20	7850	6200	16.5	6.3	119.7	104.0	2,003.3												
C1N	21	7850	6250	16	6.3	126.0	100.6	2,104.1												
C1N	22	7850	6100	17.5	6.3	132.3	110.3	2,214.4												
C1N	23	7850	5950	19	6.3	138.6	119.7	2,334.1												
C1N	24	7850	6150	17	6.3	144.9	107.1	2,441.2												
C1N	25	7850	6600	12.5	6.3	151.2	78.8	2,519.9												
C1N	26	7850	6600	12.5	6.3	157.5	78.8	2,598.7												
C1N	27	7850	6501	13.48	6.3	163.8	85.0	2,683.7												
C1N	28	7850	6550	13	6.3	170.1	81.9	2,765.6												
C1N	29	7850	6550	13	6.3	176.4	81.9	2,847.5												
C1N	30	7850	6650	12	6.3	182.7	75.6	2,923.1												
C1N	31	7850	6650	12	6.3	189.0	75.6	2,998.7												
C1N	32	7850	6901	9.48	6.3	195.3	69.8	3,058.5												
C1N	33	7850	6650	12	6.3	201.6	75.6	3,134.1												
C1N	34	7850	6500	13.5	6.3	207.9	85.1	3,219.1												
C1N	35	7850	6101	17.48	6.3	214.2	110.2	3,329.3												
C1N	36	7850	5900	19.5	6.3	220.5	122.9	3,452.1												
C1N	37	7850	5900	23.5	6.3	226.8	148.1	3,600.2												
C1N	38	7850	6000	18.5	6.3	233.1	116.6	3,716.7												
C1N	39	7850	5900	19.5	6.3	239.4	122.9	3,839.6												
C1N	40	7850	6000	18.5	6.3	245.7	116.6	3,956.1												
C1N	41	7850	6100	17.5	6.3	252.0	110.3	4,066.4												
C1N	42	7850	6150	17	6.3	258.3	107.1	4,173.5												
C1N	43	7850	6550	13	6.3	264.6	81.9	4,255.4												
C1N	44	7850	6650	12	6.3	270.9	75.6	4,331.0												
C1N	45	7850	7200	6.5	6.3	277.2	41.0	4,371.9												



Crane Data



A	B	C	D	E	F	G	H	I	J
Deck	Position	Empty	Deck #1 3/28/2011	Deck 1 Height	Length	Length Running Total	SqFt	SqFt Running Total	
C1N	7	7850	7201	6.49	6.3	37.8	40.9	195.2	
C1N	8	7850	6550	13	6.3	44.1	81.9	277.1	
C1N	9	7850	6050	15	6.3	50.4	122.5	374.0	

N	O	AB	AC	AD	AE	AF	AG
	Row Labels	21-Feb	28-Feb	7-Mar	14-Mar	21-Mar	28-Mar
	C2S	10,671	10,659	10,877	4,391		
	C3N	2,082		4,624	5,944	5,768	8,341
	C3S	14,000	10,000	10,455	10,700	0,400	0,470

Understanding the Rangefinder Datastring

Shot 1
Shot 2

\$PLTI T, HV, 38.01, F, 11.00, D, -8.60, D, 39.01, F#15
ML, 10.10, F, 158.0, D, 34.70, D, 12.20, F#41

AZ° INC° SD(MP)

HEIGHT

$= SD(MP) \times \sin(\text{RADANS}(INC^\circ))$

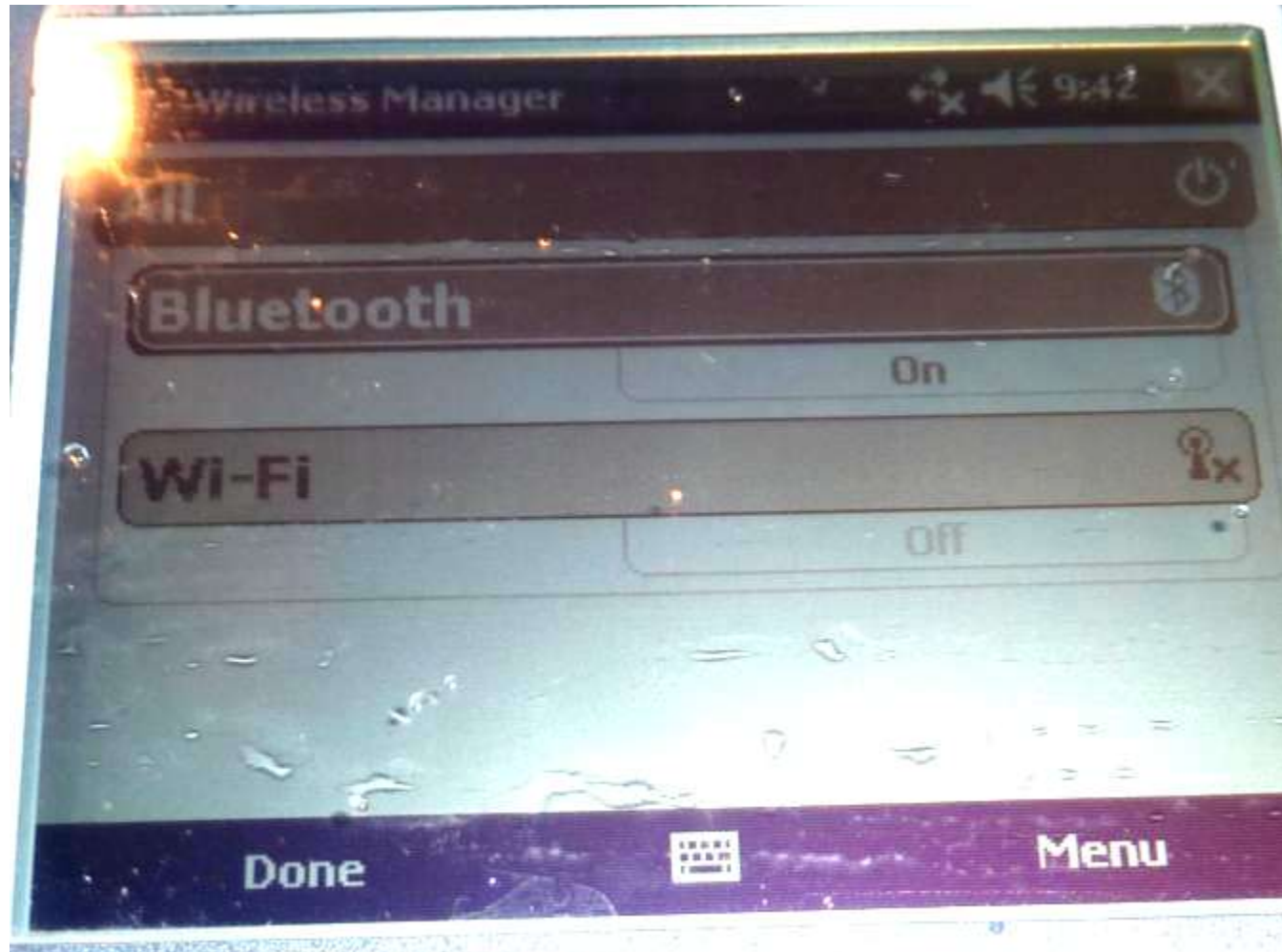
MISSING LINE

AZ1 0° (NORTH)
-AZ2 90° (EAST)
90°

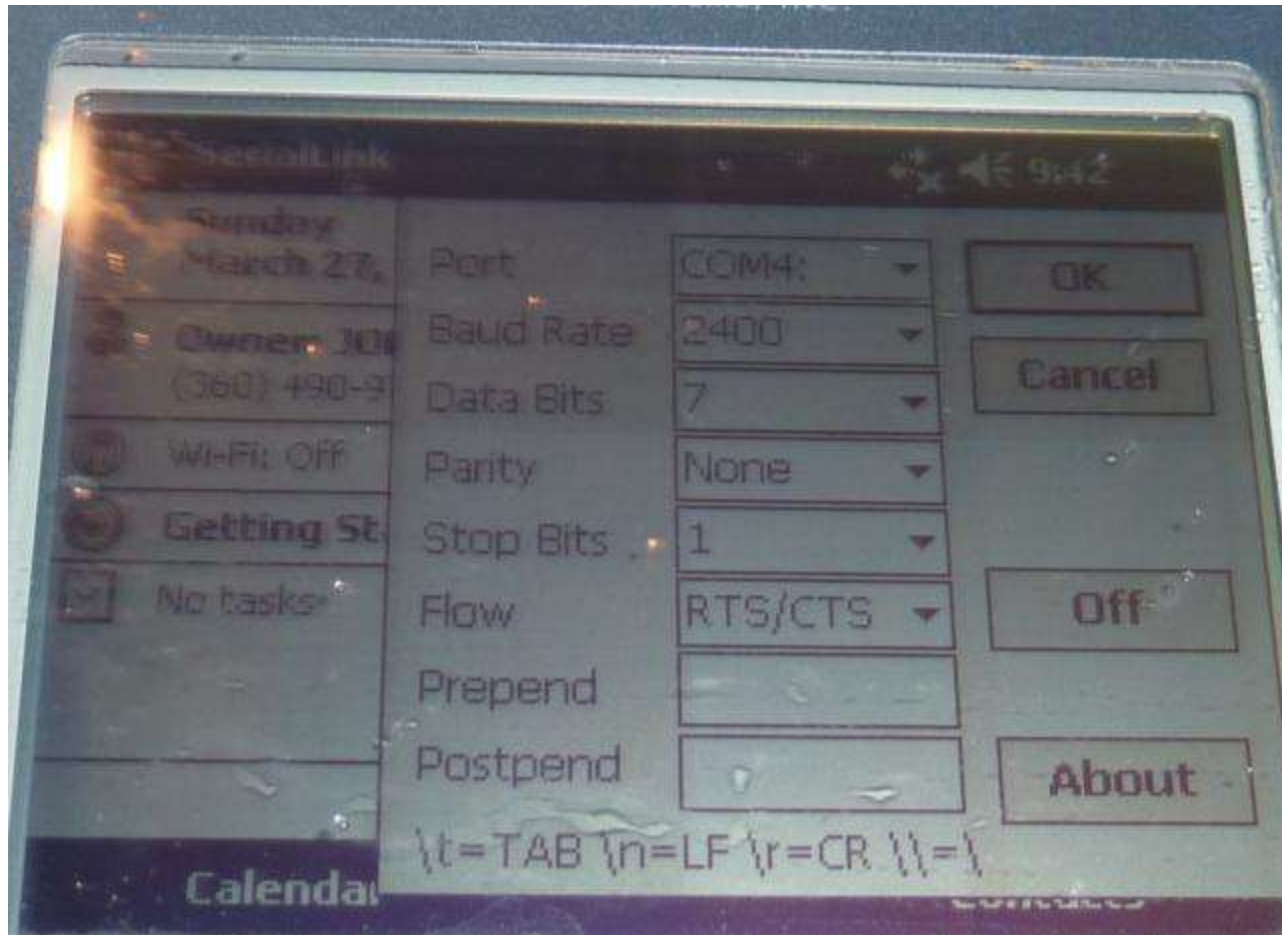
Allegro and TP360



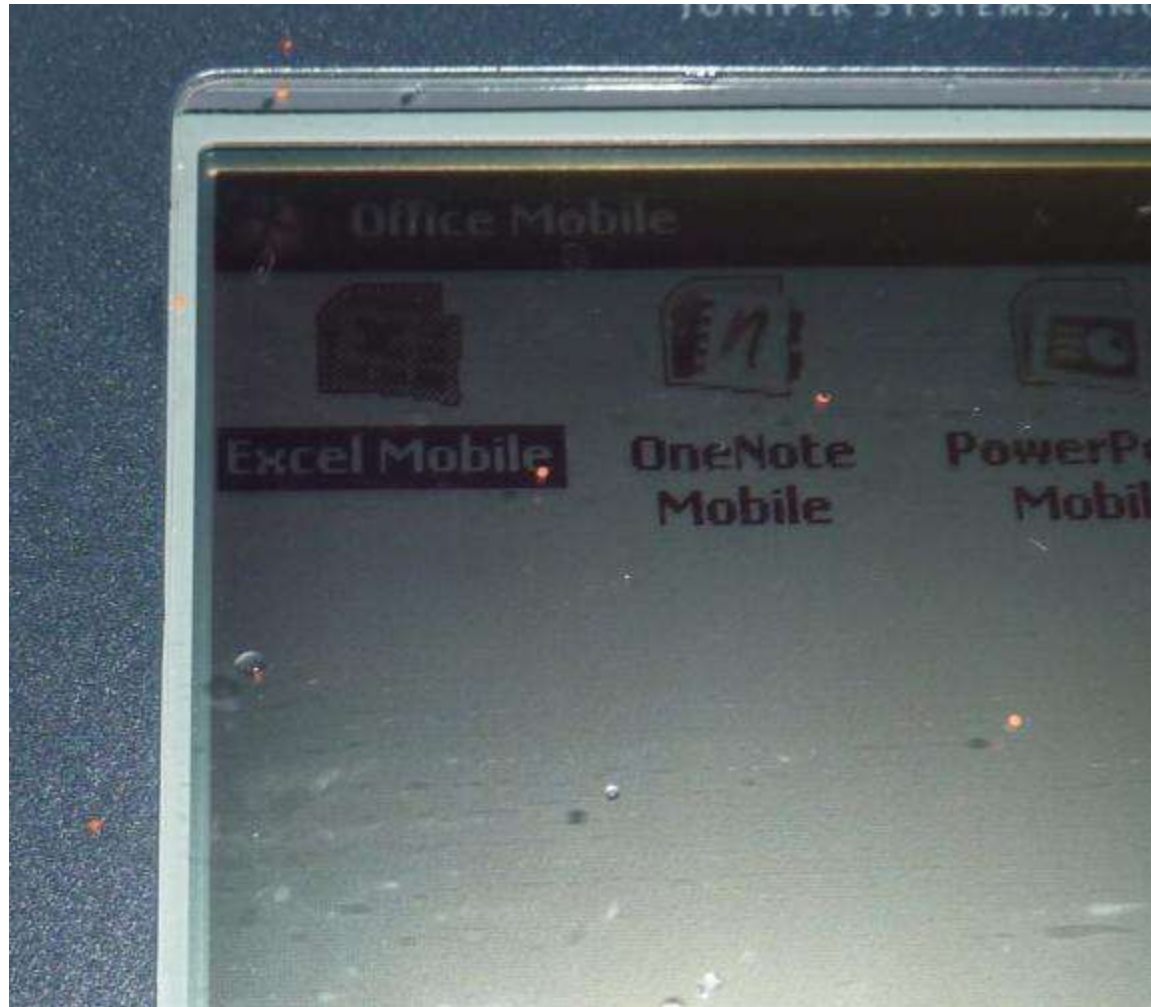
Allegro with Bluetooth



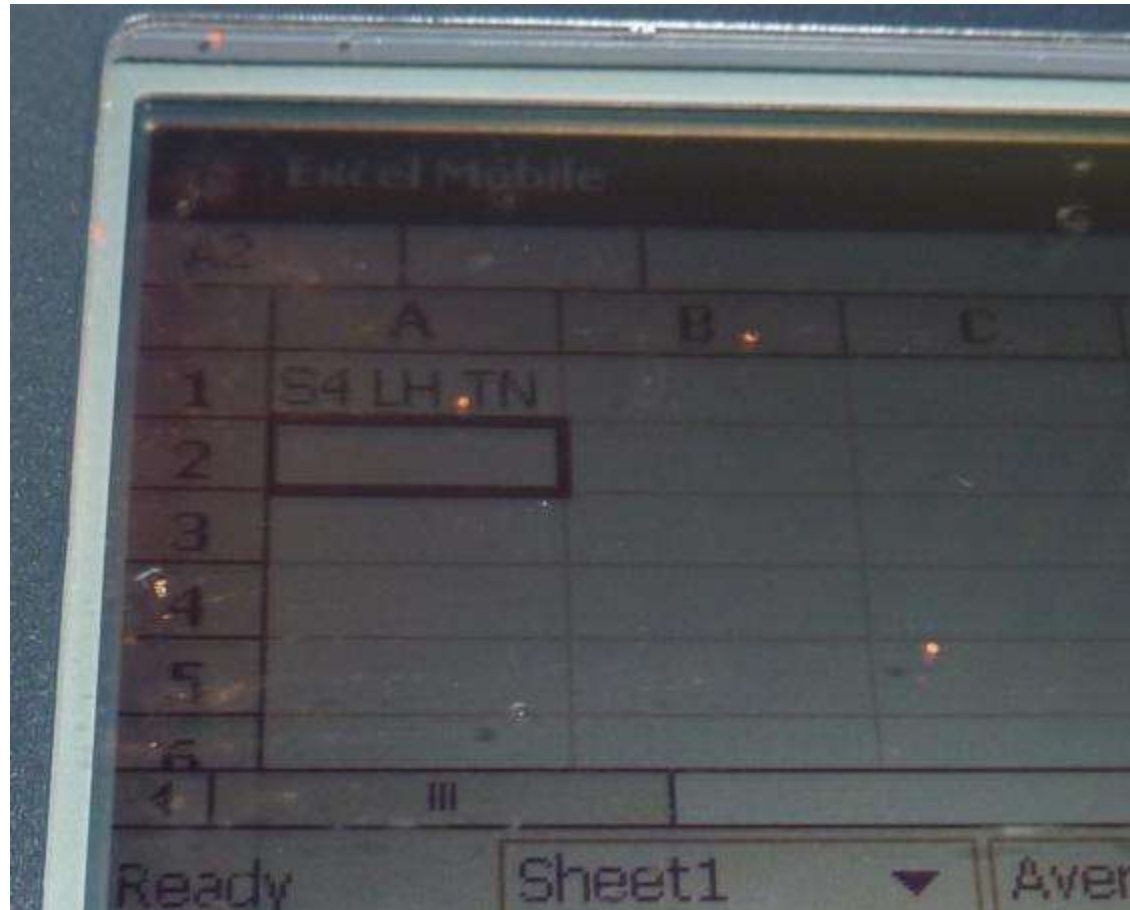
Key Logger to Accept Data



Excel Mobile



Setup Spreadsheet



Measure Triangle Lengths



Fire the Laser



Measure Rectangle Lengths



Measure Rectangle Heights



Excel Data String

B2 fx =TRIM(RIGHT(SUBSTITUTE(TRIM(LEFT(SUBSTITUTE("&A2&REPT(",",6)","",REPT(CHAR(32),LEN(A2)+6),COLUMN(B2))),LEN(A2)+6

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
S4 LH TN					AZ		INC		HYP			S4 LH TN				
\$plit,hv,25.00,f,244.50,d,17.30,d,26.00,f*56	\$plit	hv	25.00	f	244.50	d	17.30	d	26.00	f*56		LGTH	DOWN	UP	HEIGHT	SqFt
\$plit,hv,44.00,f,297.10,d,-5.80,d,44.00,f*4a	\$plit	hv	44.00	f	297.10	d	-5.80	d	44.00	f*4a						
\$plit,ml,34.80,f,298.40,d,-19.20,d,36.90,f*6b	\$plit	ml	34.80	f	298.40	d	-19.20	d	36.90	f*6b		-	(5.4)	5.4	-	
R1	R1											34.80	(5.4)	7.8	13.2	229.8
\$plit,hv,25.00,f,244.80,d,17.30,d,26.00,f*5b	\$plit	hv	25.00	f	244.80	d	17.30	d	26.00	f*5b		39.4	(4.9)	4.6	9.6	449.1
\$plit,hv,277.00,f,159.20,d,1.20,d,277.00,f*6b	\$plit	hv	277.00	f	159.20	d	1.20	d	277.00	f*6b		39.4	(5.4)	5.5	10.9	403.0
\$plit,ml,276.10,f,154.00,d,-0.40,d,276.10,f*51	\$plit	ml	276.10	f	154.00	d	-0.40	d	276.10	f*51		39.4	(5.8)	4.2	10.0	411.6
TS	TS											39.4	(5.6)	3.3	8.9	372.6
\$plit,hv,48.00,f,328.10,d,8.90,d,49.00,f*6f	\$plit	hv	48.00	f	328.10	d	8.90	d	49.00	f*6f		39.4	(6.5)	4.1	10.6	383.4
\$plit,hv,29.50,f,302.50,d,-2.40,d,29.50,f*48	\$plit	hv	29.50	f	302.50	d	-2.40	d	29.50	f*48		39.4	(4.1)	6.9	11.0	424.4
\$plit,ml,25.30,f,178.30,d,-19.10,d,26.80,f*69	\$plit	ml	25.30	f	178.30	d	-19.10	d	26.80	f*69		39.4	(4.5)	6.7	11.2	437.2
H0	H0											25.30	(4.5)	4.5	-	141.7
\$plit,hv,25.00,f,245.10,d,17.50,d,26.00,f*55	\$plit	hv	25.00	f	245.10	d	17.50	d	26.00	f*55						
\$plit,hv,28.00,f,242.10,d,-10.90,d,28.50,f*72	\$plit	hv	28.00	f	242.10	d	-10.90	d	28.50	f*72		TOTAL				3,252.9
\$plit,hv,26.00,f,250.20,d,10.10,d,26.50,f*57	\$plit	hv	26.00	f	250.20	d	10.10	d	26.50	f*57						
\$plit,hv,29.00,f,242.40,d,-9.60,d,29.50,f*40	\$plit	hv	29.00	f	242.40	d	-9.60	d	29.50	f*40						
\$plit,hv,34.50,f,254.40,d,9.00,d,35.00,f*6d	\$plit	hv	34.50	f	254.40	d	9.00	d	35.00	f*6d						
\$plit,hv,27.50,f,248.80,d,-11.10,d,28.00,f*77	\$plit	hv	27.50	f	248.80	d	-11.10	d	28.00	f*77						
\$plit,hv,30.00,f,249.60,d,8.00,d,30.00,f*66	\$plit	hv	30.00	f	249.60	d	8.00	d	30.00	f*66						
\$plit,hv,31.50,f,242.50,d,-10.50,d,32.00,f*79	\$plit	hv	31.50	f	242.50	d	-10.50	d	32.00	f*79						
\$plit,hv,34.00,f,249.50,d,5.60,d,34.00,f*6e	\$plit	hv	34.00	f	249.50	d	5.60	d	34.00	f*6e						
\$plit,hv,26.50,f,245.60,d,-11.90,d,27.00,f*72	\$plit	hv	26.50	f	245.60	d	-11.90	d	27.00	f*72						
\$plit,hv,42.50,f,194.80,d,5.50,d,42.50,f*63	\$plit	hv	42.50	f	194.80	d	5.50	d	42.50	f*63						
\$plit,hv,60.01,f,186.10,d,-6.10,d,61.01,f*42	\$plit	hv	60.01	f	186.10	d	-6.10	d	61.01	f*42						
\$plit,hv,127.50,f,169.70,d,3.10,d,127.50,f*6c	\$plit	hv	127.50	f	169.70	d	3.10	d	127.50	f*6c						
\$plit,hv,155.50,f,168.20,d,-1.50,d,155.50,f*43	\$plit	hv	155.50	f	168.20	d	-1.50	d	155.50	f*43						
\$plit,hv,175.50,f,166.30,d,2.20,d,175.50,f*65	\$plit	hv	175.50	f	166.30	d	2.20	d	175.50	f*65						
\$plit,hv,64.01,f,178.00,d,-4.00,d,64.01,f*40	\$plit	hv	64.01	f	178.00	d	-4.00	d	64.01	f*40						

The Ultimate Test


► Compare Crane Data to Handheld Data

C1N	30	7850	3100	47	6.3	182.7	290.1	5,973.2
C1N	31	7850	3100	47.5	6.3	189.0	299.3	5,972.4
C1N	32	7850	3250	46	6.3	195.3	289.8	6,262.2
C1N	33	7850	3450	44	6.3	201.6	277.2	6,539.4
C1N	34	7850	3500	43.5	6.3	207.9	274.1	6,813.5
C1N	35	7850	3701	41.49	6.3	214.2	261.4	7,074.8
C1N	36	7850	3850	40	6.3	220.5	252.0	7,326.8
C1N	37	7850	4150	37	6.3	226.8	233.1	7,559.9
C1N	38	7850	4650	32	6.3	233.1	201.6	7,761.5
C1N	39	7850	5050	28	6.3	239.4	176.4	7,937.9
C1N	40	7850	5200	26.5	6.3	245.7	167.0	8,104.9
C1N	41	7850	5750	21	6.3	252.0	132.3	8,237.2
C1N	42	7850	6201	16.49	6.3	258.3	103.9	8,341.1
C1N	43	7850	6450	14	6.3	264.6	88.2	8,429.3
C1N	44	7850	6750	11	6.3	270.9	69.3	8,498.6
C1N	45	7850	6950	9	6.3	277.2	56.7	8,555.3
C1N	46	7850	7350	5	6.3	283.5	31.5	8,586.8
C1N	47	7850	7150	7	6.3	289.8	44.1	8,630.9
C1N	48	7850	7100	7.5	6.3	296.1	47.3	8,678.1
C1N	49	7850	7150	4	6.3			

C1N MH TN				
LGTH	DOWN	UP	HEIGHT	SqFt
-	(6.0)	6.0	-	
103.30	(6.0)	40.5	46.5	2,400.8
20.0	(6.0)	40.6	46.6	932.6
20.0	(5.7)	41.5	47.2	939.9
20.0	(5.4)	41.8	47.1	945.2
20.0	(5.5)	36.4	41.9	892.2
20.0	(5.1)	37.7	42.7	848.2
78.30	(5.1)	5.1	-	1,673.3
TOTAL				8,632.1




Now What ?

- ▶ 1. I'm able to capture the data into my handheld device for my use.
 - ▶ 2. I'm able to hand the Laser for either voice or direct data collection to a Accountant that does not have any experience and get the same results.
 - ▶ 3. I'm able to recognize that I'm the only one willing to do all of this each week.
- 

Consistent Measurements



What Have I learned?

- ▶ 1. We can get very accurate Square Foot Log Deck Measurements with the New Technologies.
 - ▶ 2. We have to develop the procedures that are repeatable and acceptable.
 - ▶ 3. We need to be persistent and be able to explain what is needed for others to utilize what we have learned.
- 

TruePulse to the Rescue

UNDER
CONSTRUCTION
2011



**Laser Tech's
Log Deck
Measurement
Program
Finished**



Turn on Bluetooth or Tether with Serial Cable



The image shows a Windows Phone Start screen with the following elements:

- Start bar:** Contains the Windows logo, the word "Start", and icons for network, volume, and battery.
- System status:** Shows "Monday April 09, 2012" and "8:56 PM".
- Owner information:** "Owner: John Calkins" with a contact icon and the phone number "(360) 490-9739".
- Connectivity:** "Wi-Fi: Off" and "Bluetooth: On".
- Getting Started:** A green circular icon with a checkmark.
- Tasks:** "No tasks" with a checkmark icon.
- Bottom bar:** Contains "Calendar" and "Contacts" buttons.

Start the Laser Tech LogDeck Program



Create a Job Name



The screenshot shows a software interface titled "Log Deck" with a Windows logo icon. The main window is titled "New Job Settings" and contains the following fields and buttons:

- Job name:** A text input field containing "2012-04-12".
- Yard:** A text input field containing "CBOP".
- Species:** A dropdown menu with "F FIR" selected.
- Buttons:** "Cancel" and "Start" buttons are located at the bottom of the form.

The bottom of the application window features a black bar with the text "File Utilities Help" on the left and a keyboard icon on the right.

The Grade Sort and Species are Customizable

Log Deck 9:01 ok

New Deck

Yard:

Deck name:

Grade:

Sort:

Species:

File Utilities Help

Select Orientation

The screenshot shows a software interface titled "Log Deck" with a Windows logo on the left. The top right corner contains navigation icons, a speaker icon, the time "9:01", and an "ok" button. The main area is titled "C2N" and displays a triangular grid of points. A red dot at the bottom right of the grid is labeled "Origin". Below the grid are four selection options: "Backstop" (represented by a square icon), "Left Origin" (represented by a circle icon), "Backstop" (represented by a square icon), and "Right Origin" (represented by a circle icon with a black center). At the bottom of the main area are two buttons labeled "Previous" and "Next". The bottom of the screen features a black bar with "File Utilities Help" on the left and a keyboard icon on the right.

Select Survey Method

Log Deck 9:02 ok

Choose Survey Method

Survey Method:

Traverse w/ Azimuth

Inst. Ht: 5.50

Previous Next

File Utilities Help

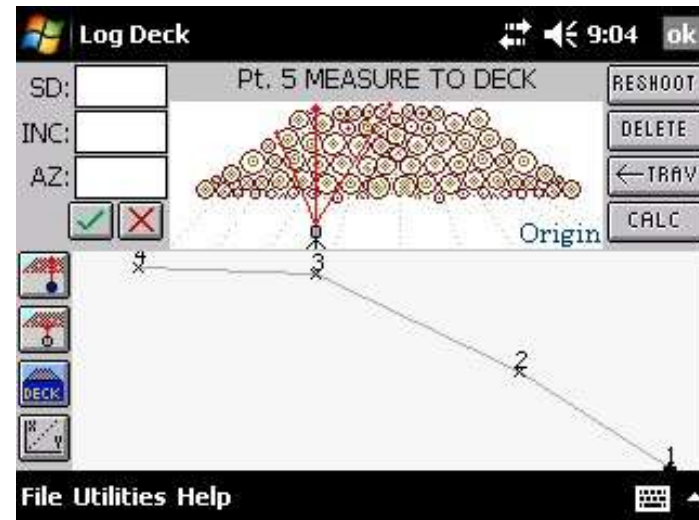
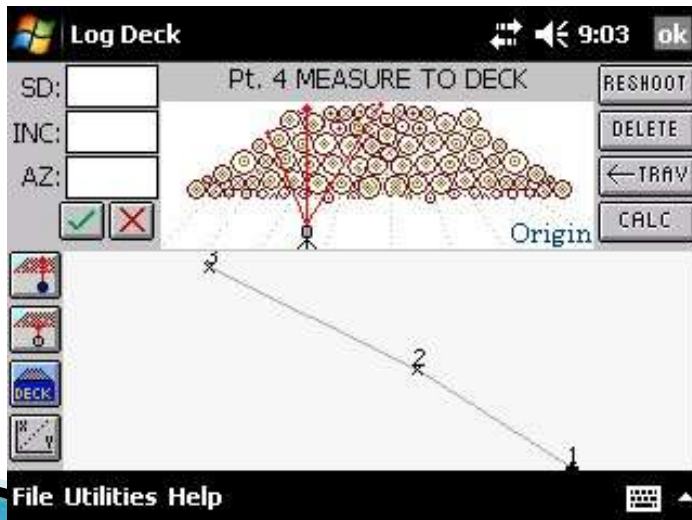
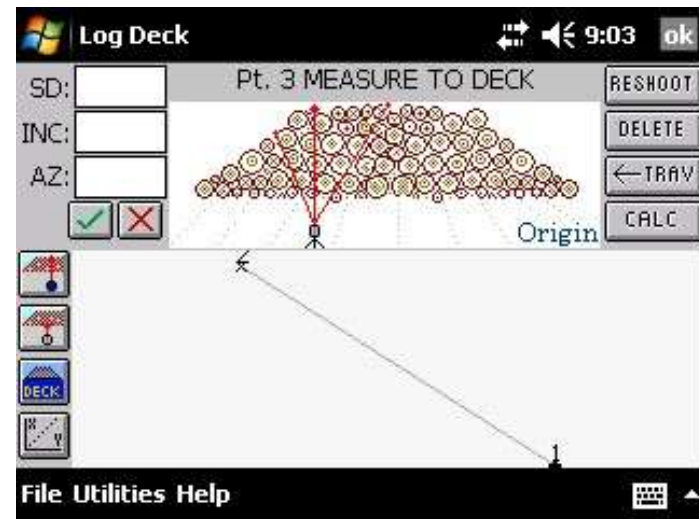
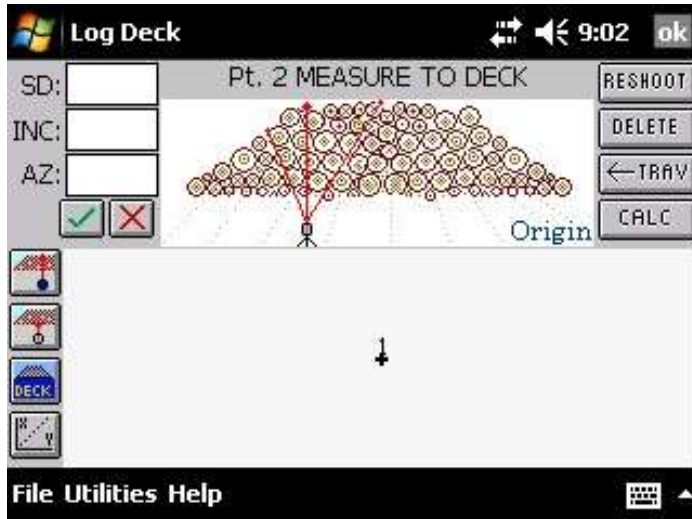
This is the selection for the TP360

Fire the Laser at the Origin

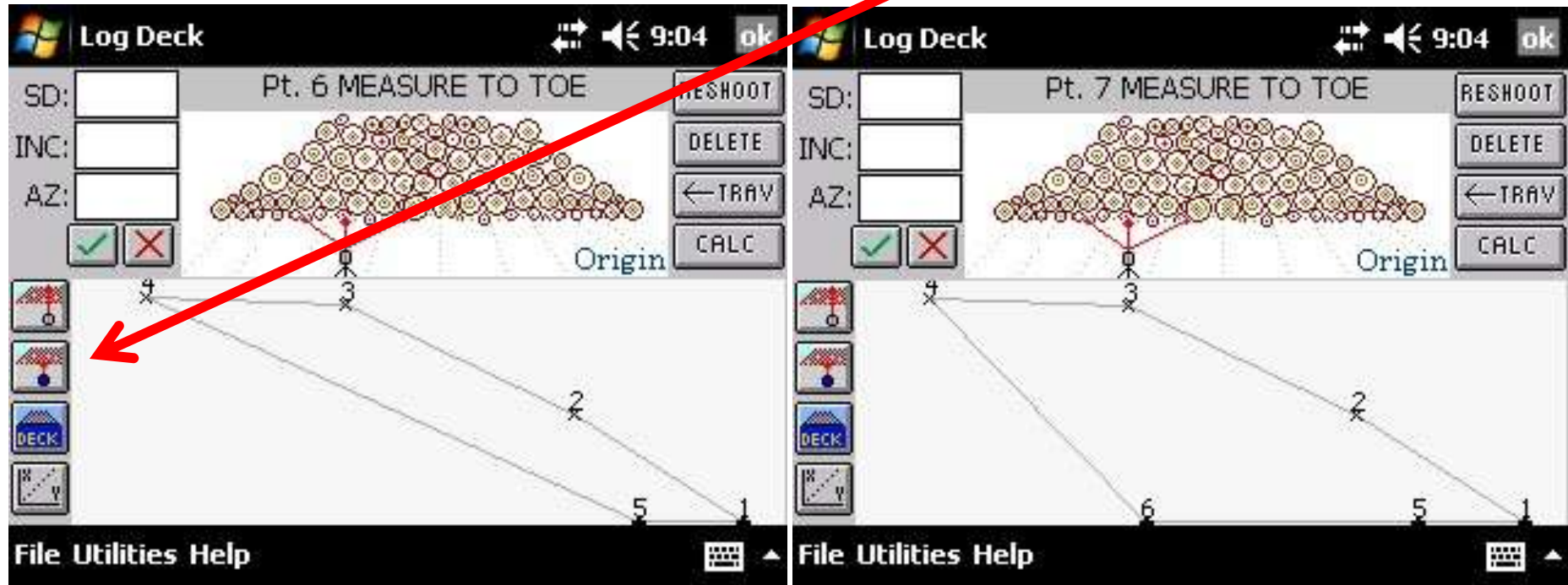


The Program tells you what to do

Continue with the Deck Top Shots

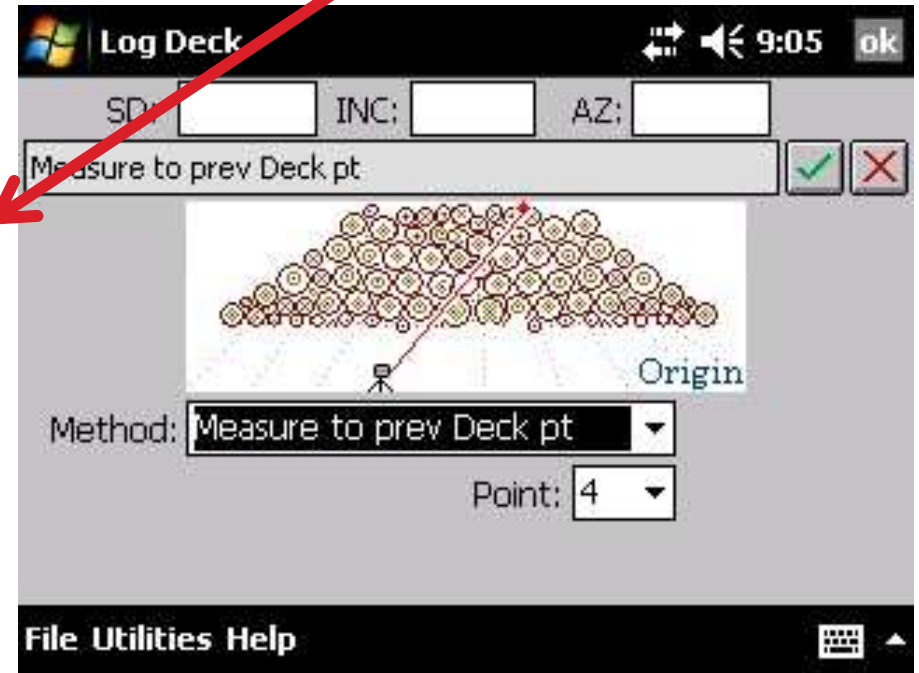
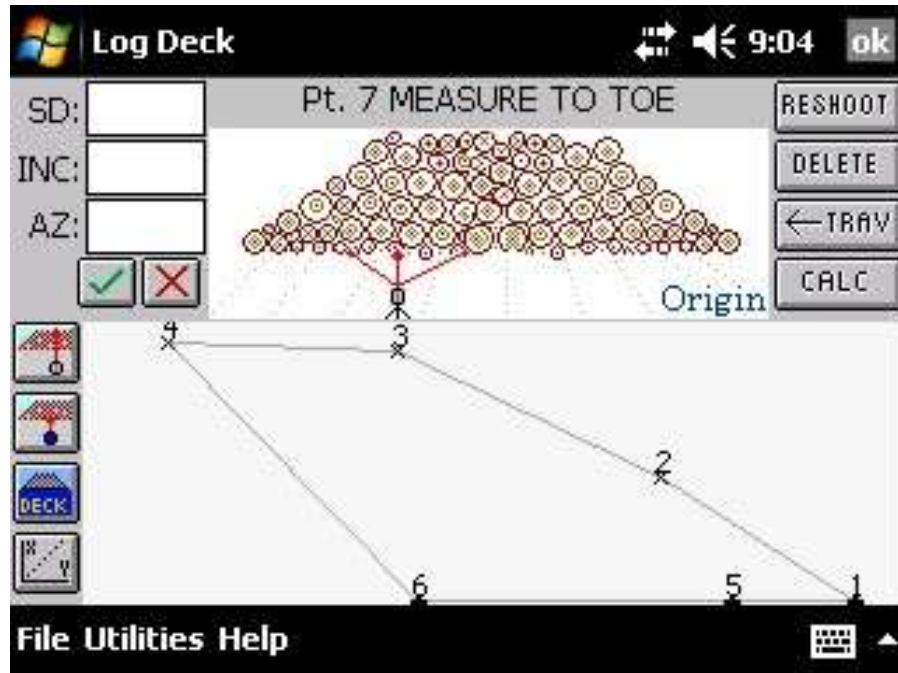


Select the Deck Toe Shots



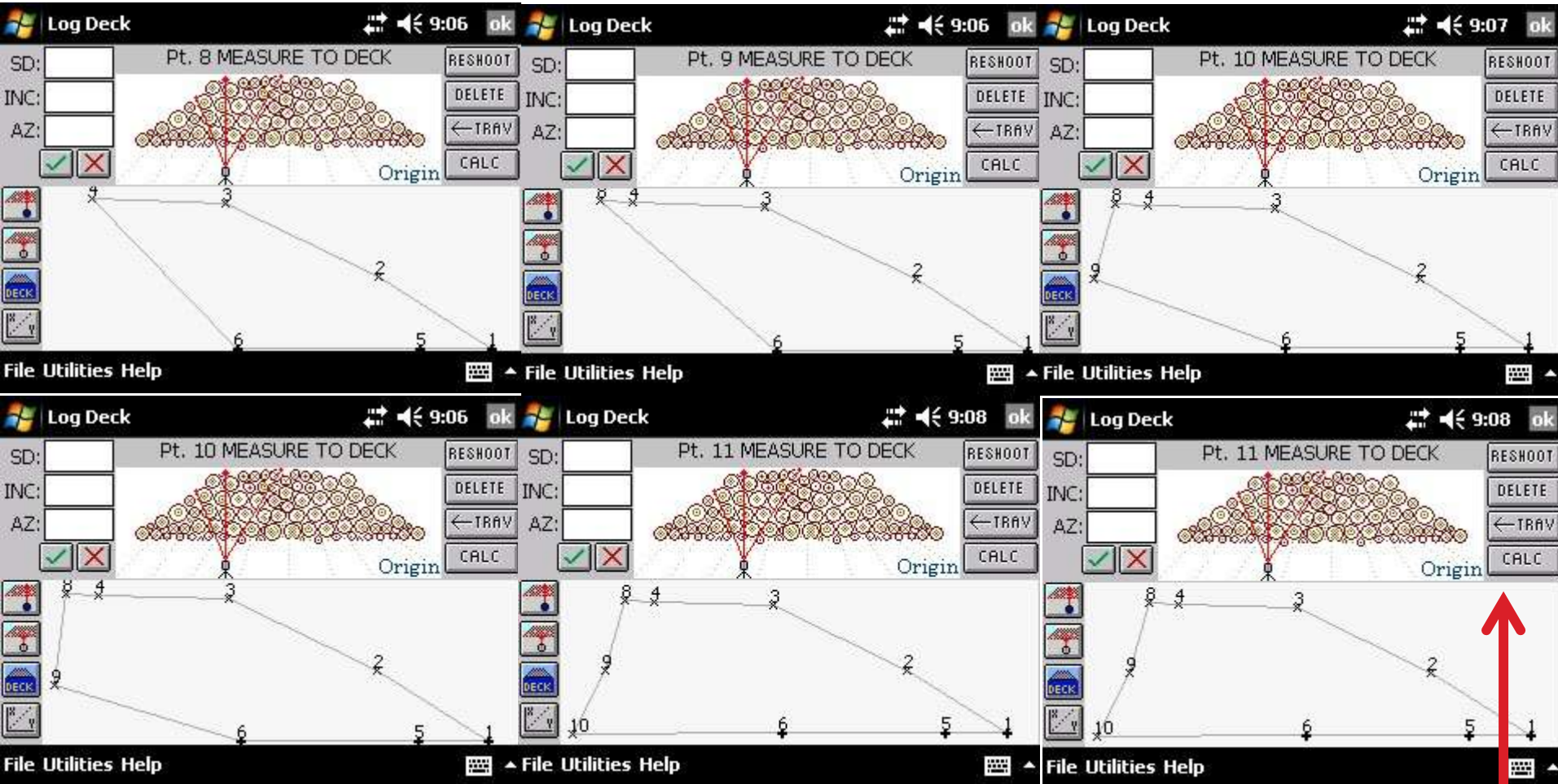
And fire away, the program tells you what do next

When you need to move, select the Traverse Function



Move to the new location and start with the log you left off on

Continue to the end of the deck



Switching to the toe measurements, then click "CALC"

The Deck Length and SqFt Measurements are Displayed

The image displays two side-by-side screenshots of a software application titled "Log Deck". Both screenshots show the "Calculations" section with the following data:

- Length = 21.72 ft, Area = 096 ft²
- Log length:
- Conversion constant:
-

The right screenshot shows the results of a calculation:

- for Log length
- for Conversion constant
-
- Volume = 3,071 ft³
- MBF Volume = 9,213 ft³

Both screenshots also feature a "Note:" field with a "Save" button, and "New Deck" and "Close" buttons at the bottom. The status bar at the bottom of each window reads "File Utilities Help".

Due your *Due Diligence* to establish factors you can use for a quick volume estimate.

Select Deck and Report Summary



Exported Reports

Job	Date	Length Units	Angle Units	Deck	Species	Grade	Sort	Survey Method	Backstops	Origin	Length	Area	Note
2012140	4/8/12 9 10:45 AM	Feet	Degrees	C4M	FIR	CTL SHORTS	MEDIUM FIR	Traverse w/ Azimuth	No Backstops	Origin at Right	147.52	1090.66	
2012140	4/8/12 9 10:45 AM	Feet	Degrees	C3S	FIR	MEDIUM FIR	MEDIUM FIR	Traverse w/ Azimuth	No Backstops	Origin at Right	360.9	10321.08	
2012140	4/8/12 9 10:45 AM	Feet	Degrees	CEW	FIR	MEDIUM FIR	MEDIUM FIR	Traverse w/ Azimuth	No Backstops	Origin at Right	105.68	766.88	
2012140	4/8/12 9 10:45 AM	Feet	Degrees	C2N	FIR	MEDIUM FIR	MEDIUM FIR	Traverse w/ Azimuth	No Backstops	Origin at Right	337.17	10846.86	
2012140	4/8/12 9 10:45 AM	Feet	Degrees	C2N2	FIR	MEDIUM FIR	MEDIUM FIR	Traverse w/ Azimuth	No Backstops	Origin at Right	326.37	10346.45	
2012140	4/8/12 9 10:45 AM	Feet	Degrees	C2N3	FIR	MEDIUM FIR	MEDIUM FIR	Traverse w/ Azimuth	No Backstops	Origin at Right	332.08	10384.28	
2012140	4/8/12 9 10:45 AM	Feet	Degrees	C1S	HEM	MEDIUM HEM	MEDIUM HEM	Traverse w/ Azimuth	No Backstops	Origin at Right	288.99	3433.31	

TP360b and Allegro Mx in Action



Shot 1



Shot 2



Shot 3



Shot 4



Shot 5



Shot 6



Shot 7



Shot 8



Shot 9



Shot 10



Shot 11



Shot 12



More TP360 Allegro Action



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IN THIS ISSUE

10. Laser Technology Inc. Ruggedizes Software Express Log Loader's Control System Laser Control Systems (LCS) Technology Inc. has announced its development of a new ruggedized control system for its Express Log Loader. The new system is designed to be used in the most demanding environments and is capable of operating in temperatures as low as -40 degrees Fahrenheit and as high as 140 degrees Fahrenheit. The system is also capable of operating in high humidity environments.

11. Raybitt Helps the Forestry World Company Get On the Ground The Forestry World Company, a division of Chippewa Paper, is using a Raybitt product to add value to its logs. The company is using the Raybitt product to add value to its logs by measuring the length, diameter, and volume of each log. The company is also using the Raybitt product to measure the volume of each log deck.

12. Strong Enough To Support 400 Tons of Heavy Equipment The new 400-ton bridge at the Port of Seattle is the largest bridge in the world. The bridge is made of steel and is 1,100 feet long. The bridge is supported by four concrete piers. The bridge is designed to support 400 tons of heavy equipment. The bridge is also designed to support 400 tons of heavy equipment.

13. New Timberline Storage Products Timberline Storage has introduced a new line of storage products. The new products are designed to be used in the most demanding environments. The new products are also designed to be used in the most demanding environments.

14. In Year One Kilo Working EVERYWHERE Kilo is a new laser-based surveying system. The system is designed to be used in the most demanding environments. The system is also designed to be used in the most demanding environments.

15. Shooting a Laser at a Round Corner The new laser-based surveying system is designed to be used in the most demanding environments. The system is also designed to be used in the most demanding environments.

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