

1954

1954

K & E
LEVEL BOOK

W 373 A

COUNTY

HOLMES
COLUMBIA
ALACHUA

9

LEVELING to DETERMINE ELEV. DIFF.
 Bonifay TEST #3 + Holmes Co. Courthouse

Jan 24, 1950 C/ondy + cool
 Level chittum

STA	B.S. +S	HI	F.S. -S	EL.	B.M.
TEST #3	10.61				D.F.
TP ₁	11.52		0.02		
TP ₂	10.79		0.36		
TP ₃	10.95		0.27		
	43.87		3.23		
	3.88		3.88		
	39.99				

B.M.	3.22	163.56		160.34
TP ₁	0.48	153.10	10.94	152.62
TP ₂	0.56	142.66	11.00	142.10
TP ₃	0.27	131.23	11.70	130.96
TEST #3	4.53		10.80	120.43
			44.44	39.91 ✓
			4.53	
			39.91	✓

Roll VERNON

'A' 2.78

'B' 1.78

1.00

B₁B 3.66

'A' 2.80

'B' 1.82

0.98

B₁B 3.75

4.73

'A' 2.47

'B' 1.47

1.00

B₁B 3.55

4.55

Read 454

Leveling to determine Elev. of Squares
at site near Darby Spgs, Alachua Co.
for Bill Edwards, Run from Bridge

Sta.	Backsight		Foresight	
	+ S	H.I.	- S	Elev.
B.M.,	3.36	49.36		46.0
	4.90	49.64	4.62	44.74
	2.99	51.42	1.21	48.43
SW ^c			8.47	42.95
DA-6			9.31	
SE ^c			8.71	43.11
DA-0				
SW ^c				
DA-4				
TP	1.72	50.6	2.98	48.44
	4.68	50.44	4.40	45.76
B.M.,			3.29	46.15
B.M.,			0.58	49.86
B.C-101				50.1

On N.E. abutment of Bridge at Columbia Spgs over
Santa Fe River on Columbia Co. Side

B.M. B.C-101 (U.S.C. & G.S. & State Survey) Alachua Co.

Leveling to determine elev. of squares
 at site near Darby Spgs. run from

U.S.G. & G.S. & St. Survey BM BC-101

Sta	+ S	H.I.	- S	Elev.
B.M. BC101	0.41	50.51		50.1
B SW ^c	3.06	51.83	1.74	48.77
DA-6			8.55	43.28
SW ^c			8.77	43.06
DA-4			9.42	42.41
SV SE ^c				
DA DA-0				
SE				
DA	5.16	48.44		
SV				
DA DA-401			6.21	42.23
- DA-101			2.34	46.10

B
 B
 B

Leveling to determine elev. of Squares
at site near Hornsby Spgs

Sta.	+S	H.I.	-S	Elev.
B.M.	1.70			
	4.08		6.11	
	2.94		3.43	
	4.80		7.56	
	4.52		11.89	
T.B.M. near Colleguan SEC	0.43		4.14	
HO-1 SWC			5.44	
HO-7 NWC			4.31	
HO-31			7.19	
HO-13			7.16	
HO-11			8.67	
T.B.M.	1.85		10.13	
	1.06		6.63	
			10.25	
NWC			4.52	
HO-41 NWC			8.18	
HO-31				

U.S.C. & G.S. 2^d St. Survey B.M. - CA 25

on ls. at edge of pothole filled with marl

On S. side of big cypress stump S.E. of Spgs.
water level of Hornsby Spgs. Dec 29, 1951

changed to #0-51

HI - FS = elev.

Elev + BS = HI

Elevations on a series
of test holes #1 through
#20 (- #17)

⌒ - James S. Cullison
Rod - Bill Wisner.

Holes located by Bud
Hendry & Bill Yon

Order of elevations

1. #19	8. #14	15. #5
2. #18	9. #13	16. #4
3. #16	10. #?	17. #3
4. #15	11. #9	18. #2
5. #10	12. #8	19. #1
6. #11	13. #7	20. #20
7. #12	14. #6	21. #17

June 4 1954
5:50 PM #19

Sta BS HI FS Elev

Red Tree 11.52 89.52 00 78.00

TP-1 11.39 100.91 00 89.52

TP-2 6.27 107.18 4.21 100.91

#19 1.32 104.29 10.54 102.97 Sta #19

TP-3 2.43 96.18 9.02 93.75

TP-4 1.84 89.00 11.97 87.16

Red Tree 78.03

(.03 ft. error)

77.03 checked

June 4 1954
7:00 PM #18

Sta	BS	HI	FS	Elev
BM	0.90	90.90	9.10	90.00 * 94.36
TP ₁	9.08	90.88	6.72	81.80
Sta #18	4.55	88.71	6.96	84.16 #18
TP ₂	9.33	91.08	1.10	81.75
BM				89.98

(.02 ft. error)

* BM Z201 (90.00 ft)
assumed elev (1952) 28.7589 Meters

BM (1929) el. 64.93 is
under water

BM F13-20 el. 85.41 was
either destroyed or
obscured beyond discovery

June 5, 1954
6:45 AM #16

Sta	BS	HI	FS	Elev
BM	2.54	102.54	8.11	100.00 *
TP ₁	11.28	105.71	1.90	94.43
TP ₂	5.40	109.21	.82	103.81
TP ₄	8.60	116.99	5.16	108.39
Sta #16	4.23	116.06	6.31	111.83 #16
TP ₅	2.73	112.48	2.47	109.75
				100.01 BM

(.01 ft. error)

* Corp of Engr Survey
Mark - A 265 - 262
1952 (assumed elevation
100.00 ft.)

June 5, 1954
9:00 AM

15 ✓

Sta. BS HI FS Elev.

Red Tree 3.24 81.24 5.42 78.00

Sta #15 5.65 81.47 3.46 75.82 #15

78.01 Red Tree

(.01 ft. error)

June 5 1954
9:50 AM

10 ✓

Sta BS HI FS Elev

BM 5.91 116.91 5.80 111.00

Sta #10 5.90 117.01 6.01 111.11 Sta #10

111.00 BM

(.00 error)

June 5, 1954
10:15 A.M. #11

Sta.	BS	HI	FS	Elev	
BM ^{Z200} ₁₉₅₂	2.53	121.53	6.18	119.00	* P=117'
TP ₁	2.51	117.86	8.10	115.35	
TP ₂	3.54	113.30	2.27	109.76	
TP ₃	4.89	115.92	6.88	111.03	
TP ₄	4.67	113.71	2.99	109.04	
TP ₅	7.89	118.61	1.26	110.72	
TP ₆	5.09	122.44	1.11	117.35	
TP ₇	0.34	121.67	8.68	121.33	
TP ₈	7.79	120.78	4.17	112.99	
#11	3.14	119.75	8.12	116.61	#11
TP ₉	7.48	119.11	5.13	111.63	
TP ₁₀	4.99	118.97	7.92	113.98	
TP ₁₁	8.77	119.82	3.20	111.05	
TP ₁₂	4.73	121.35	4.17	116.62	
TP ₁₃	2.11	119.29	3.15	117.18	
BM	5.68	121.82	2.78	116.14	
				119.04	

June 5 1954
12:30 P.M. #12

Sta.	BS	HI	FS	Elev	
Red Tree	.02	78.02	11.89	78.00	
Sta #12	11.97	78.10	00.06	66.13	#12
				78.04	Red Tree
					(.04 ft. error)

$$35.7520 \text{ M.} = 117.27'$$

* BM Z200 (1952) had no elevation marked on it, but one was present on the tree. Other cases were noticed where both BM and tree carried the same numbers. This may be checked by writing USGS. (.04 ft error)

June 5, 1954
1:30 PM # 14

Sta	+BS	HI	-FS	Elev
BM	5.21	90.21	7.29	85.00
Sta #14	7.35	90.27	5.27	82.92 #14
BM				85.00
.00 ft error.				

STA	+BS	HI	-FS	Elev
BM	5.21	90.21		85.00
	7.35	90.27	7.29	82.97
			5.27	85.00

June 5, 1954
2:30 PM # 13

Sta	BS	HI	FS	Elev
BM	1.72	91.72	4.13	90.00 * = 79'
TP ₁	7.66	95.25	4.75	87.59
TP ₂	5.35	95.85	5.27	90.50
Sta #13	5.21	95.79	7.23	90.58 #13
TP ₃	2.65	91.21	1.15	88.56
				90.06
.06 ft error.				

* ^{BM} V 201 1952 USCGS
90 ft assumed elevation
 $24.0385 = 78.846'$

June 5 1954

4:40 PM

#

5*

15A

Sta BS HI FS Elev

Red Tree 7.28 85.28 6.15 78.00

TP₁ 2.27 ^{81.40} 79.40 1.68 ^{79.13} 77.13TP₂ 4.68 ^{84.40} 82.40 1.03 ^{79.72} 77.725.31 ^{85.68} 86.68 8.69 81.37 ^{83.37}77.99 ^{10.99}

Red Tree

.01 ft. error

1.91

* We forgot to look at the number on the stake, however I think we duplicate a number some where.

This is the hole just above the dam between the Flint & Chatahoochee Rivers.

June 5 1954

7:10 PM

9

Mistake

Sta BS HI FS Elev

BM ^{W128} 1952 8.80 108.80 9.54 100.00 * 99.67TP₁ 3.03 102.29 7.15 99.26TP₂ 11.29 106.43 9.33 95.14TP₃ 3.53 100.63 8.84 97.10TP₄ 7.43 99.22 00.00 91.79TP₅ 11.12 110.34 1.16 99.52

Sta #9 1.53 109.71 11.73 109.18 # 9

TP₆ 5.56 103.54 6.14 97.98TP₇ 3.51 100.91 2.30 97.40TP₈ 1.42 ^{100.103} 97.19 8.13 98.61TP₉ 9.48 ^{101.38} 98.54 4.12 89.06 ^{91.90}BM 7.92 ^{103.18} 102.34 2.27 94.42 ^{97.26}100.07 BM ^{102.91}

(.07 ft error)

2.91

* BM W128 (1952) 100 ft assumed elevation.

30.3932 m.

June 6 1954

7:15 AM #8

Sta	BS	HI	FS	Elev
BM ^{C130} ₁₉₅₂	3.72	103.72	11.58	100.00 *100.00
Sta #8	11.44	103.58	3.57	92.14 #8
			100.01	BM

(.01 ft. error.)

*BM C130 (1952) Assumed
elevation - 100.00 ft.

$$30.3969 \text{ m} = 99.70$$

June 6 1954

9:00 AM #7

Sta	BS	HI	FS	Elev
BM	7.81	100.32	5.42	92.51
TP ₁	5.42	100.32	4.31	94.90
TP ₂	5.73	101.74	4.20	96.01

Sta #7 4.34 101.88 5.63 97.54 Sta #7

TP₂ 3.72 99.97 5.37 96.25

TP₄ 3.51 98.11 5.60 94.60

92.51 BM

.00 ft error

11:05 AM #6

Sta.	BS	HI	FS	Elev
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BM	4,5684.50	4,7379.94
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Sta #6 4.73 84.50 4.56 79.87 #6
79.94

(.005% error)

22

June 6 1954

12:00 Noon # 5

Sta	BS	HI	FS	Elev
1	1.12	4.50	3.38	3.38
2	1.12	4.50	3.38	3.38
3	1.12	4.50	3.38	3.38
4	1.12	4.50	3.38	3.38
5	1.12	4.50	3.38	3.38
6	1.12	4.50	3.38	3.38
7	1.12	4.50	3.38	3.38
8	1.12	4.50	3.38	3.38
9	1.12	4.50	3.38	3.38
10	1.12	4.50	3.38	3.38
11	1.12	4.50	3.38	3.38
12	1.12	4.50	3.38	3.38
13	1.12	4.50	3.38	3.38
14	1.12	4.50	3.38	3.38
15	1.12	4.50	3.38	3.38
16	1.12	4.50	3.38	3.38
17	1.12	4.50	3.38	3.38
18	1.12	4.50	3.38	3.38
19	1.12	4.50	3.38	3.38
20	1.12	4.50	3.38	3.38
21	1.12	4.50	3.38	3.38
22	1.12	4.50	3.38	3.38
23	1.12	4.50	3.38	3.38
24	1.12	4.50	3.38	3.38
25	1.12	4.50	3.38	3.38
26	1.12	4.50	3.38	3.38
27	1.12	4.50	3.38	3.38
28	1.12	4.50	3.38	3.38
29	1.12	4.50	3.38	3.38
30	1.12	4.50	3.38	3.38
31	1.12	4.50	3.38	3.38
32	1.12	4.50	3.38	3.38
33	1.12	4.50	3.38	3.38
34	1.12	4.50	3.38	3.38
35	1.12	4.50	3.38	3.38
36	1.12	4.50	3.38	3.38
37	1.12	4.50	3.38	3.38
38	1.12	4.50	3.38	3.38
39	1.12	4.50	3.38	3.38
40	1.12	4.50	3.38	3.38
41	1.12	4.50	3.38	3.38
42	1.12	4.50	3.38	3.38
43	1.12	4.50	3.38	3.38
44	1.12	4.50	3.38	3.38
45	1.12	4.50	3.38	3.38
46	1.12	4.50	3.38	3.38
47	1.12	4.50	3.38	3.38
48	1.12	4.50	3.38	3.38
49	1.12	4.50	3.38	3.38
50	1.12	4.50	3.38	3.38
51	1.12	4.50	3.38	3.38
52	1.12	4.50	3.38	3.38
53	1.12	4.50	3.38	3.38
54	1.12	4.50	3.38	3.38
55	1.12	4.50	3.38	3.38
56	1.12	4.50	3.38	3.38
57	1.12	4.50	3.38	3.38
58	1.12	4.50	3.38	3.38
59	1.12	4.50	3.38	3.38
60	1.12	4.50	3.38	3.38
61	1.12	4.50	3.38	3.38
62	1.12	4.50	3.38	3.38
63	1.12	4.50	3.38	3.38
64	1.12	4.50	3.38	3.38
65	1.12	4.50	3.38	3.38
66	1.12	4.50	3.38	3.38
67	1.12	4.50	3.38	3.38
68	1.12	4.50	3.38	3.38
69	1.12	4.50	3.38	3.38
70	1.12	4.50	3.38	3.38
71	1.12	4.50	3.38	3.38
72	1.12	4.50	3.38	3.38
73	1.12	4.50	3.38	3.38
74	1.12	4.50		

Red Tree 5.21 83.21 5.55 78.00

St ₂ #	5	5.55	83.2	5.2	<u>177.66</u>	#5
					78.06	Red Tree

(.00 ft error)

7.7.7

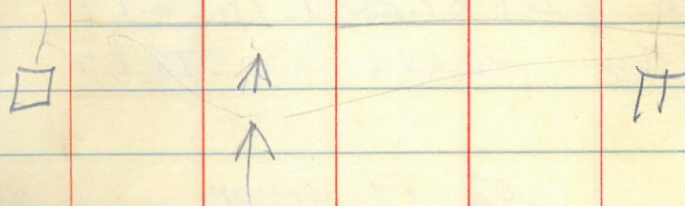
June 6 1954
1:15 PM #4

Sta	BS	HI	FS	Elev
Red Tree	4.42	82.42	5.31	78.00
Sta #4	5.31	82.42	4.42	<u>77.11</u> #4
				78.00 Red Tree
<u>.00 ft. error</u>				

June 6 1954
1:35 PM #3

Sta	BS	HI	FS	Elev
Red Tree	1.42	79.42	6.91	78.00
TP1	7.94	80.45	5.47	72.51
Sta #3	5.43	80.41	7.63	<u>74.98</u> #3
TP2	7.01	79.79	1.76	72.78
Red Tree				<u>78.03</u> Red Tree

.03 ft. error.



June 6 1954
2:00 PM # 2

mistake

Sta	BS	HI	FS	Elev
Red Tree	11.91	89.91	00.00	78.00
TP ₁	11.63	101.54	00.00	89.91
TP ₂	8.94	110.48	1.01	101.54
TP ₃	5.42	114.89	1.23	109.47
Sta #2	21.23	114.89	11.72	113.66
TP ₄	2.42	105.59	10.62	103.17
TP ₅	2.03	97.00	11.81	94.97
TP ₆	1.01	87.20	9.18	86.19
Red Tree				78.02

.02 ft error

.98

June 6 1954
4:05 PM # 1

Sta	BS	HI	FS	Elev
Sta #2	11.42	125.08	00.00	113.66
TP ₁	10.91	135.99	00.00	125.08
TP ₂	4.02	140.01	5.79	135.99
Sta #1	1.21	135.93	10.41	134.22
TP ₃	1.72	126.74	11.01	125.02
TP ₄	2.48	118.21	4.50	115.73
Sta #2				113.71

1

.05 ft error

June 6 1954
7:10 PM # 20

Sta	BS	HI	FS	Elev
Red Tree	10.01	88.01	00.00	78.00
TP ₁	11.76	99.88	00.00	88.01
TP ₂	11.42	111.30	2.03	99.88
TP ₃	10.42	119.69	4.71	109.27
Sta #20	4.71	119.69	11.41	114.98 #20
TP ₄	2.31	110.59	11.10	108.28
TP ₅	1.34	100.83	11.82	99.49
TP ₆	1.04	89.05	10.98	89.01
			78.07	Red tree

.07 ft error.

June 1954
#

Sta BS HI FS Elev

Void

Void

#	Elev	#	Elev
1	134	20	115
2	114		
3	75		
4	77		
5	78		
6	80		
7	98		
8	92		
9	109		
10	111.0		
11	115.0		
12	66.0		
13	80.0		
14	83		
15	76.0		
15A	78.0		
16	7		
17	78.0		
18	89.0		
19	103.0		

109
10
139

Hole drilled 5 above
this elev.

Right beside red
tree.

July 28, 1954

#9

Sta.	BS	HI	FS	Elev.
W# 9	0.46	109.64		109.18
TP ₁	1.73	100.11	11.26	98.38
TP ₂	8.66	100.56	8.21	91.90
TP ₃	9.82	106.05	4.33	96.23
TP ₄	1.11	97.33	9.83	96.22
TP ₅	9.60	103.36	3.57	93.76
TP ₆	7.35	108.69	2.02	101.34
BM ^{W128} 1952			8.42	100.27

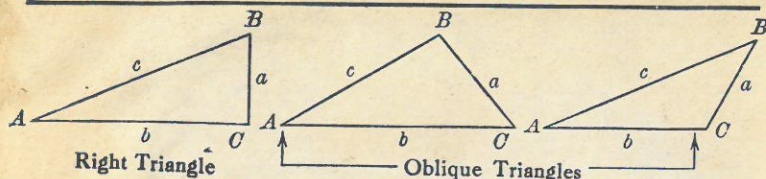
Correction of
#9 back check
line

#16

Sta	BS	HI	FS	Elev.
W# 16	5.75	117.58		111.83
TP ₁	1.59	108.26	10.91	106.67
TP ₂	0.05	99.22	9.09	99.17
TP ₃	4.51	101.90	6.83	97.39
BM ₁			2.40	99.50
A265- 262 (1952)				

Recheck of #16
back check
line

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

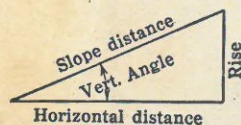
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{a}$, $\operatorname{cosec} = \frac{c}{b}$

Given	Required	
A, b	A, B, c	$\tan A = \frac{a}{b} = \cot B$, $c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B$, $b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90^\circ - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A$, $a = c \sin A$, $b = c \cos A$

Solution of Oblique Triangles

Given	Required	
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180^\circ - C$, $\tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$, $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a + b + c}{2}$, $\sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{bc}}$, $\sin \frac{1}{2}B = \sqrt{\frac{(s - a)(s - c)}{ac}}$, $C = 180^\circ - (A + B)$
a, b, c	Area	$s = \frac{a + b + c}{2}$, $\text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
A, b, c	Area	$\text{area} = \frac{b c \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = $5^\circ 10'$. From Table, Page IX. $\cos 5^\circ 10' = .9959$. Horizontal distance = $319.4 \times .9959 = 318.09$ ft.
Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle) With the same figures as in the preceding example, the following result is obtained. Cosine $5^\circ 10' = .9959$. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ ft.

When the rise is known, the horizontal distance is approximately:—the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.