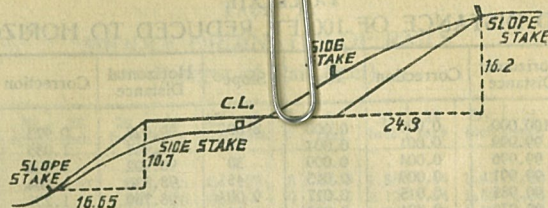


Goodly's Tower Survey's Ties

CCC # 82



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE 1 1/2 TO 1 ROADWAY OF ANY WIDTH

0	.35	0
1	.85	1
2	.35	2
3	.85	3
4	.35	4
5	.85	5
6	.35	6
7	.85	7
8	.35	8
9	.85	9
10	.35	10
11	.85	11
12	.35	12
13	.85	13
14	.35	14
15	.85	15
16	.35	16
17	.85	17
18	.35	18
19	.85	19
20	.35	20
21	.85	21
22	.35	22
23	.85	23
24	.35	24
25	.85	25
26	.35	26
27	.85	27
28	.35	28
29	.85	29
30	.35	30
31	.85	31
32	.35	32
33	.85	33
34	.35	34
35	.85	35
36	.35	36
37	.85	37
38	.35	38
39	.85	39
40	.35	40
41	.85	41
42	.35	42
43	.85	43
44	.35	44
45	.85	45
46	.35	46
47	.85	47
48	.35	48
49	.85	49
50	.35	50

TRIANGULATION  
and  
GEODETIC SURVEY TIES

CHIPPEWA NATIONAL  
FOREST  
(TIES TO CORNERS)

LOOK OUT TOWER  
SURVEYS

Field Book of J.A. Gjelhaug

Jan. 1935 - Dec. 1936

Covers areas in Beltrami, Cass,  
Hubard, Itasca, Koochiching and  
Aitkin Counties

THIS BOOK WILL BE FILED IN  
THE USFS FILES AS "CCC Field  
BOOK #82" met a/20/85

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TWO PAGES OF SCRATCH NOTES		

S.A. Gjølhang

Knudson Dam.

(2 of these.)

Jan 15-35

(2 of this)  
1/15' emb.

1877

10"  
Room for  
only 1 log.

55 Foot. of water going over Weir this date  
One sluice open

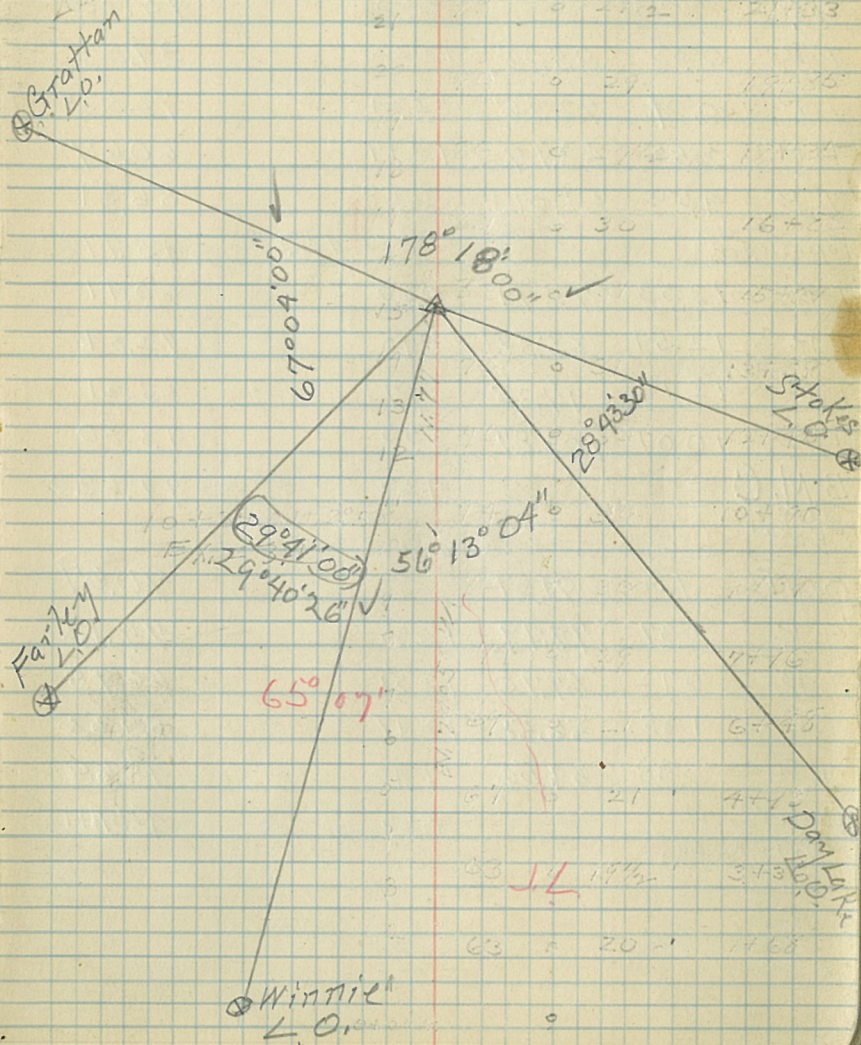
T. 141 N. R. 25 W

T. 141 N. R. 26 W

See Page

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Angles read with Transit  
 Oct. 14 - 1935  
 from Bass Lake L.O.  
 J.A. Gjelhaug



Point	+	H. L.	-	Elev.
A	2.07	102.07		100.00
T.P.	8.10	98.62	11.53	90.52
T.P.	7.70	94.47	11.85	86.77
	4.11	97.05	1.53	92.94
B			2.03	95.02
T.P.	0.23	85.06	12.22	84.83
T.P.	0.04	72.86	12.24	72.82
B.M.	2.52	63.19	12.19	60.67
T.P.	4.50	61.01	6.68	56.51
Top of water			15.70	45.91
T.P.	12.53	72.94	0.60	60.41
T.P.	12.54	85.38	0.10	72.84
T.P.	12.14	97.35	0.17	85.21
T.P.	10.07	103.87	3.55	93.80
B.M. C			4.25	99.62
<hr/>				
Old T.L.	1.00	91.67		90.67
T.P.	0.37	79.99	12.55	79.12
T.P.	0.72	67.70	12.57	66.98
T.P.	1.35	56.58	12.47	55.23
T.P.	5.88	54.56	7.90	48.68
Water Level Dixon Lake			8.65	45.91

3

100.00 Levels for Dixon Lake  
L.O. 10/15/35  
J.A. Guelhaney

A → 95.02  
B Magness  
H.H.B. © 99.62

Cut Tower 13 Div. down from Platform = 99.00

→ Water in Dixon Lake  
90.67 Old Tower  
D. = 37.00

New Tower Location:

Old Dixon Lake Tower Location  
45.91  
45.91  
90.67

Water Level Dixon Lake

Sta.	Course	Solar. Va. 6°55'		Lat.		Dep	
		Log Cos	Log Sin	N.	S	E	W
Bass Lake L.O.		9.999999	7.241877	✓			
		0.965672	0.965672	✓			
	N. 0°06'E.	0.965671	8.207549	9.24		0.01	✓
Pt. # 1		8.417919	9.999851	✓	8.4		✓
		1.514681	1.514681	✓		0.86	
	S. 88°30'W.	9.932600	1.514532	✓			32.70
Pt. # 2	Sec. Cor.						
	N. 75°37'W.	(33.75)	(8.38)				(32.69)
Pt. # 2	Sec. Cor.	8.417919	9.999851				
		1.514598	1.514598				
	N. 88°30'E.	9.932467	1.514399	0.85			32.69
Pt. # 1		9.999999	7.241877				
		0.966142	0.966142				
	S. 0°06'W.	0.966141	8.208019		9.25		0.01

S 75°35'E (33.74) (8.40) (32.68)  
 Mean Tie (S. 75°36'E) (33.74.5)

	10.09	10.11	32.70	32.71
	10.11		32.70	
Sum of Tot. Dist Run	83.90	Er. 0.2	Errm .01	

$$\text{Error of closure} = \frac{\sqrt{2^2 + 1^2}}{8390} = \frac{1}{3814}$$

Tie on Bass Lake L.O.  
 J.A. Bjorhang.

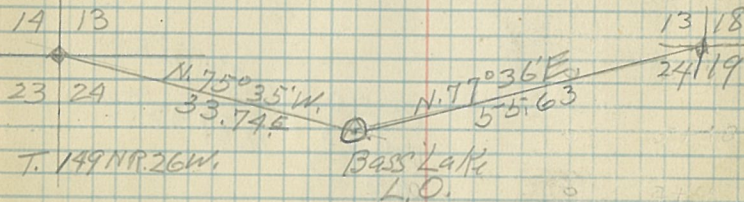
10/16/35

4

Copied

"Tower"  
 Bass Lake L.O.

Lat. 47°42'52.67"  
 Long. 93°55'04.84"



Va. 6°53'

Sta.	Course	Log. Cos.	Log Sin	N	S	E	W
Towed Bass Lake							
PT #1	N 0° 06' E			9.24		0.01	
Triang. pt. 1	N 88° 30' E	8417919 0.828015	9999851 0.828015	0.18		6.73	
Triang. pt. 2		-1245934	0.827866				
PT #2	North			0.55			
Triang. pt. 3	N 87° 45' E	8593948 1.677881	9999665 1.677881	1.87		47.59	
PT #A		0.271829	1.677546				
PT #B	North			0.10			
See Cor. 13118 24149	N 97° 36' E (55.63)			11.94		54.33	

32702 } N. 88° 30' E  
 673 }  
 4763 } N. 87° 45' E  
 87.06

2nd Tie on Bass Lake L.O.

5

Copied

164168							
163102							
161763							
160111							
158766							
157216							
156400							
154173							
152116							
149771							
147229							
144463							
142111							
140770							
138212							
135712							
133212							
130712							
128212							
125712							
123212							
120712							
118212							
115712							
113212							
110712							
108212							
105712							
103212							
100712							
98212							
95712							
93212							
90712							
88212							
85712							
83212							
80712							
78212							
75712							
73212							
70712							
68212							
65712							
63212							
60712							
58212							
55712							
53212							
50712							
48212							
45712							
43212							
40712							
38212							
35712							
33212							
30712							
28212							
25712							
23212							
20712							
18212							
15712							
13212							
10712							
8212							
5712							
3212							
712							

Sta.	Course	Compass. Va. 7°00'		Lat.		Dep.	
		Log Cos.	Log Sin	N	S	E	W.
Sec. Cor.		8.963665	9.999816			034	11.70
		0.068557	1.068557				
	S. 88° 20' E	7.532222	1.068373				
Pt. #1		9.972529	9.537507				
		0.409933	0.409933	2.41		0.89	
	N. 20° 10' E	0.382457	4.947440				
Pt. #2		9.899951	9.783623				
		0.736397	0.736397	4.33		3.31	
	N. 37° 25' E	0.636348	0.520020				
Pt. #3		9.912922	9.759492				
		1.288299	1.288299	5.89		11.16	
	N. 35° 05' E	1.201171	1.047741				
△ Grattan							
Tie-	S. 50° 31' W	(35.06)	(22.29)	(29.06)			

Tie on Grattan L.O.  
 J.A. Gjelhaug 10/17/35 - Copied

6

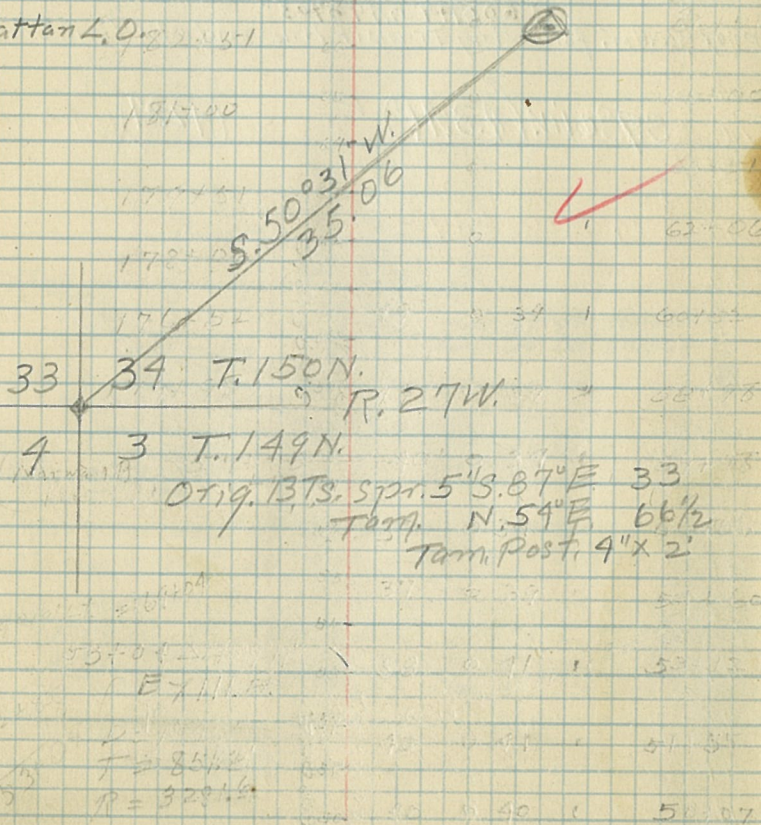
See Corner of S. 3-4 T. 149 N. R. 27 and S. 33-34 T. 150 N. R. 27  
 Orig. Corner,

CCC # 82

on Sec. Line East.

Grattan L.O.

Grattan L.O.



Orig. B.T.S. Spr. 5" 3.87° E 33  
 Tam. N. 59° E 66 1/2  
 Tam. Post. 4" x 2"

EXHIBIT

T = 854.2  
 R = 328.6



Sta	Course	Log Cos	Log Sin	Lat		Dep	
				N	S	E	W
Grattan	west				0		10.18
1/4 cor.	S. 4° 30' E	9.998659 0.477121 0.475980	8.894643 10.477121 7.371764			2.99	0.24
1/4 cor.	S. 9° 30' E	9.998659 1.602060 1.600719	8.894643 1.602060 0.496703			39.88	3.14

Approx Sec. Cor. following Transit line and old line blazes.

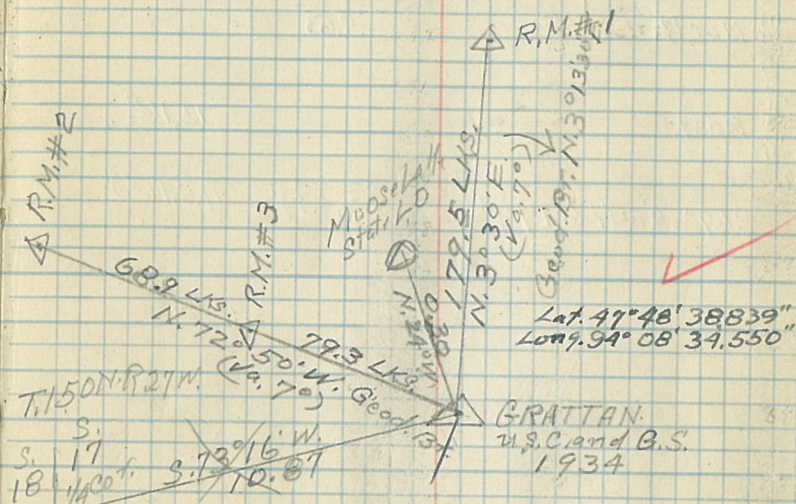
Tie S. 9° 01' W (43.41) (42.87) (6.80)

Tie on  $\Delta$  Grattan at Moose Lake L.O.  
J.A. Gjelthaug 10/18/35

7

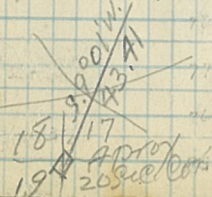
Copied

1/4 cor. betw. Secs. 17-18 - T. 150N. R. 27W.  
Mapk Post. 3" x 3"  
Aspen 12" S. 20° W. 25 0119, BT  
W. Pine 10" N. 77° W. 23 Poster in place.



Station and R.M.s. Brass plates in Cement Monuments 10" dia. and 6" above Ground.

$\Delta$  Station GRATAN located S. 24° 00' E. 30 LKS From Moose Lake State L.O. (Center) and 7 C.S. North, up steep hill from Road. Truck Trail No.



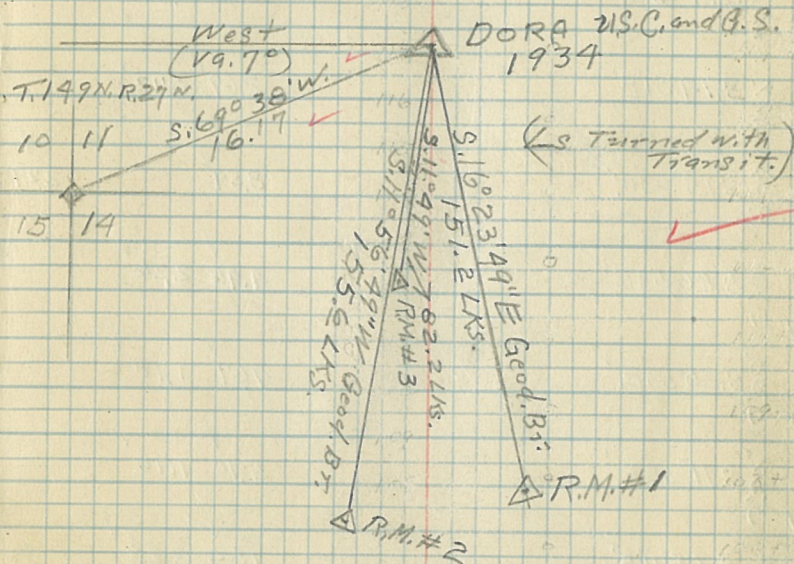
Sta. CHS. DIST.	Geodetic Az. $147^\circ$		Lat.		Dep.		
	Course	Log. Cos.	Log. Sin.	N	S	E	W.
DORA $\Delta$	west				0		18.25
Pt. #1		9.999977	8.007787				15.19
	$S. 0^\circ 35' W.$	0.745075	0.745075		5.56		0.06
Pt. #2		8.338723	9.999893				
	$S. 88^\circ 45' E.$	0.998311	0.998311	0.97	3.15		
Sec. Cor.				(5.63)			(15.16)
Sec. Cor.	North			5.63			
Pt. #3	East					15.165	
DORA $\Delta$ STQ. 157.66							
Tie	$S 69^\circ 38' W.$	(16.17)	(5.63)			(15.165)	
Tie							

Tie on  $\Delta$  Dora U.S.C. + G.S. Copied  
 JAG 10/17/35  
 10/18/35  
 10/19/35

8

Lat.  $47^\circ 43' 52.833''$   
 Long.  $94^\circ 04' 19.139''$

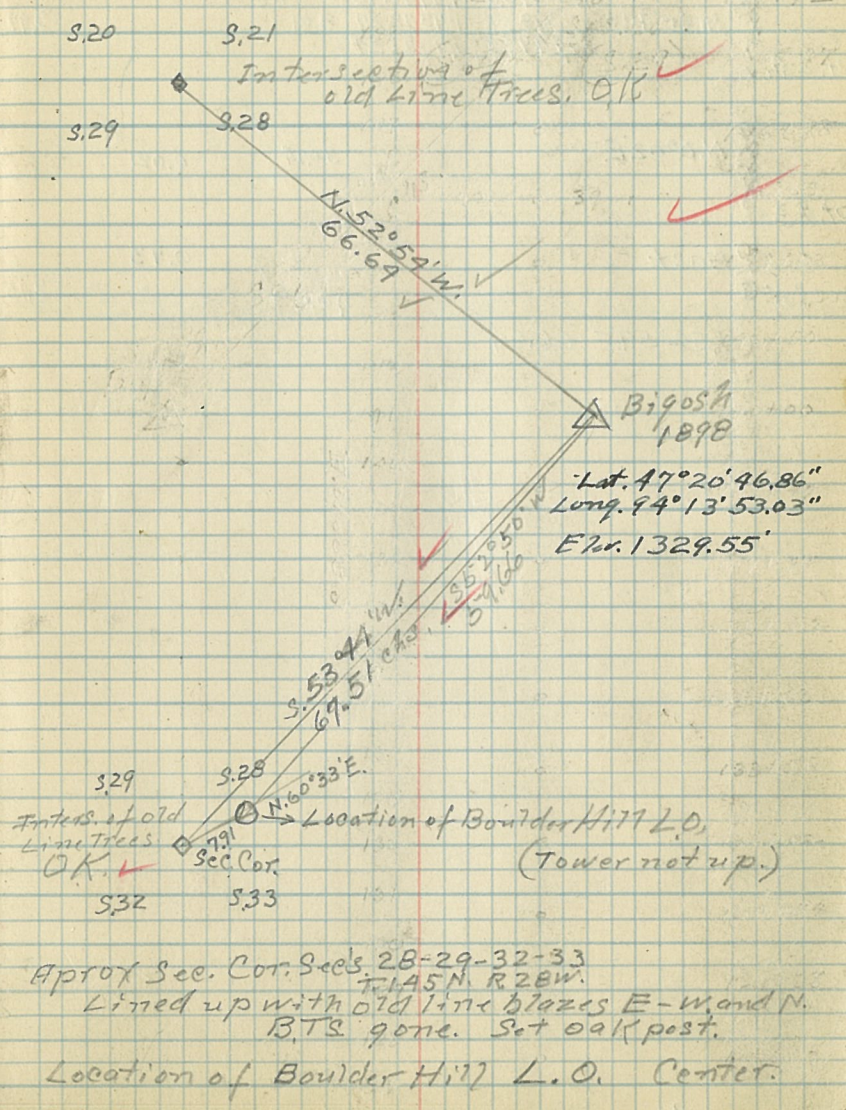
Sec. Cor. of 10-11-14-15-T. 149N. R. 27W.  
 Birch.  $8^\circ S 60^\circ E$  8 1/2 S. Orig. BT.  
 "  $10^\circ N. 85^\circ E.$  13. " Poster in Place.  
 4" X 3" Post Good condition.



$\Delta$  Station DORA Located about 1/4 mile  
 S and SE. of Wagner Lake CCC Camp.  
 go thru Camp site to left of oil station  
 S.E. down hill, end of truck trail. Cross  
 long draw follow blazed trail along west  
 side of hill side about 1/4 mile thence  
 East and S.E. to top of hill and Station.

Sta. <sup>0.45</sup> Dist.	Course	Log. Cos.	Log. Sine	Lat. N. S	Dep. E W
Sta. 0.45 Dist. B: 905h 1898	N 90° 16' E	9.994295 -1.653213 -1.647508	9.206906 -1.653213	0.44	0.07
Pt #1 So. Rail. RR	N 80° 44' W	9.206906 1.815445 1.022351	9.994295 1.815445 1.809740	10.53	64.53
Pt #2	S 3° 52' W			9.18	0.62
Pt #3	S 10° 25' E			11.00	2.02
Pt #4	S 14° 51' E			2.69	0.72
Pt #5	S 15° 03' W			8.54	2.29
Pt #6	S 26° 53' E			4.46	2.26
Pt #7	S 20° 53' E			7.67	1.78
Pt #8	S 11° 30' E			5.90	1.10
Pt #9	S 65° 11' E			1.52	3.28
Pt #10	S 27° 19' E	9.948650 0.587711 0.536361	9.661726 0.587711	3.74	1.78
Approx Sec. Cor.				39.93	(54.43)
B. Hill L.O.	N 60° 33' E			(3.89)	(6.89)

J.A. Gjelthang  
10/22/23/35  
Bigosh. Copied  
Mississippi River Commission. 1898  
Good condition  
Located about 1/4 mile west of Beng. P.S. 45 1/2 mi. So. of South of G.M. Ry. 4-T. & B. Bronze Cup.



Sta.	COURSE	Log. Cos.	Log. Sin	N.	S	E.	W.
Sta. <sup>0.45</sup> DIST B. 9051 A 1898	N. 9° 16' E.			0.44 ✓		0.07 ✓	
Pt. #1	N. 80° 44' W.	9.206906 ✓ 1.737829 ✓ 0.944735 ✓	9.994295 ✓ 1.737829 ✓ 1.732124 ✓				0.81 ✓ 53.91 ✓
Pt. 2. A.	N. 0° 02' E.			30.95 ✓		0.02 ✓	
Pt. #3	East					0.73 ✓	
Sec. Cor. 0.73	(S. 52° 54' E 66.64) ✓			40.20 ✓			53.15 ✓

Coppied 10

Sec. Cor. Secs 28-29-20-21 Intersection of old  
T. 145 N. R. 28 W. <sup>0.73</sup> <sub>OK</sub>

Solar Transit.

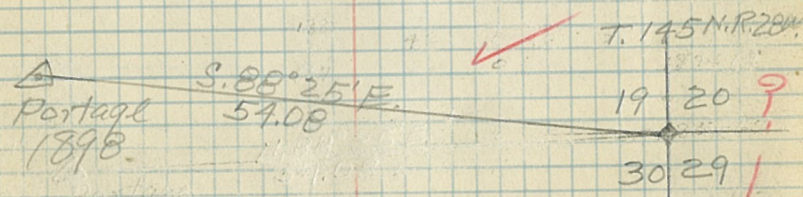
Sta.	Course	Log Cos.	Log Sin	N	S	E	W.
Sec. Cor. ↓		9.999927	8.263042				
	S. 1° 03' W.	0.832509	0.832509		6.80		0.12
		0.832436	-1.095551				
Pt. #1 S. 1898		9.204577	9.994357				
	N. 80° 47' W.	1.737590	1.737590	8.75			53.94
		0.942167	1.731947				
Pt. #2 S. 1898	South.				0.45		
△ PORTAGE 1898				(1.50)			(54.06)
△ PORTAGE 1898	North.				0.45		
Pt. #2 S. 1898		9.204577	9.994357				
	S. 80° 47' E.	1.737590	1.737590	8.75		53.94	
		0.942167	1.731947				
Pt. #1		9.999927	8.263042				
	N. 1° 03' E.	0.832509	0.832509	6.80			0.12
		0.832436	-1.095551				
Sec. Cor.							
Tier	S. 88° 25' E.	(54.08)		(1.50)			(54.06)

J.A. Gjelhaug △ Portage. Copied 11  
10/24/35

Sec. Cor. Sec's 19-20-30-29 T. 145 N. R. 28 W.  
Poster on Aspen 3" S. N. 2 LK3.

Portage about 3 1/2 miles west  
of Bone R. S  
△ 1898

Sec. Cor. 19-20-30-29 4" X 2" Stake  
T. 145 N. R. 28 W. 0719 Cor. BK  
PS, poster Aspen 3" S E 2 LK3.



Lat. 47° 21' 06.70"  
Long. 94° 16' 52.85"

Look up  
more notes  
on T. 145 Cor.

Sta. <sup>0.51</sup> <sub>1.97</sub> Course Log. Cos Log. Sin N. S E. W.  
 △ Schley <sub>1.97</sub> N58°33'E 9.717466 9.930998 1.03 1.68  
 Val 6°55' 0.01 1932 0.225464

1/4 Cor.

△ Schley  
 North 0.76 0.46  
 S. Rail. 0.76  
 N. 80°51' W. 9.201451 9.994438 79.24  
 1.05950 1.898937  
 Pt. 2. 0.26  
 N. 10°11' W. 9.999998 7.505118 0.09  
 1.453777 1.453777 28.93  
 1.453775 2.958895  
 Pt. 3. 0.56  
 West

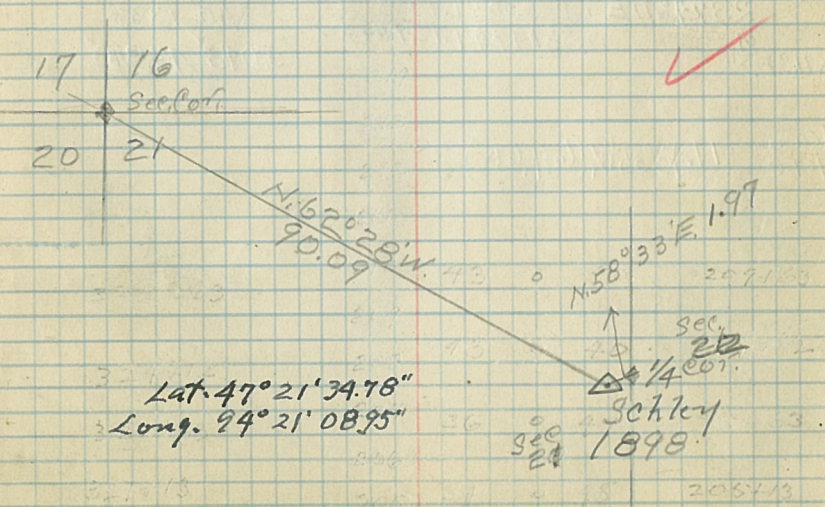
Sec. Cor. 0.56  
 Tie. N. 62°28' W. (90.09) ✓ (41.65) ✓ (79.89) ✓

J.A. G. Jethang 10/25/36 - Copied

1898  
 △ Schley Miss. River Commission  
 About 200 East of Switch block at Schley  
 Siding 46 LKS S. of S. Rail. on  
 High bank. Good condition.

1/4 Cor. between Sec's 21-22 T. 145 N. R. 29 W.

Sec. Cor. of Sec's 16-17-20-21  
 T. 145 N. R. 29 W.  
 Poster on J. Pine 10" N. 63° E. 62 1/2



Lat. 47° 21' 34.78"  
 Long. 94° 21' 08.95"

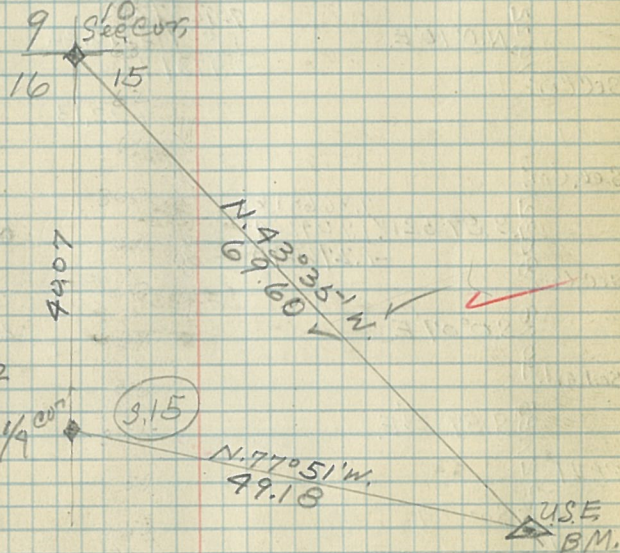
Sta.	Course	Log Cos	Log Sin	N	S	E	W
USE B.M. Δ		9.999959	8.135810				
		1.007748	1.007748				
	N. 0° 49' E	1.007709	-1.143559	10.18		0.14	
Pt. #1		7.542906	9.999997				
		1.663227	1.663227				
	N. 89° 48' W	1.226133	1.683224	0.17			48.22
1/4 Cor.		9.999998	7.463726				
		1.602819	1.602819				
	N. 0° 10' E	1.602819	1.066545	40.07		0.12	
Sec. Cor.				(50.42)			(47.96)
Sec. Cor.		9.999998	7.463726				
		1.602819	1.602819				
	S. 0° 10' W	1.602819	1.066545		40.07		0.12
1/4 Cor.		7.542906	9.999998				
		1.530968	1.530968				
	S. 89° 48' E	1.073874	1.530968			0.12	33.96
Pt. #2		9.996704	9.088970				
		0.838219	0.838219				
	S. 7° 03' E	0.834923	1.927189			6.84	0.85
Pt. #3		9.393197	9.986299				
		1.138303	1.138303				
	S. 75° 41' E	0.531494	1.24602			3.40	13.32
Δ USE				(50.43)		(48.01)	
Mean Tie	N. 43° 35' W	(69.66)					

J.A.G.  
10/21/35  
Copied. 13  
U.S.E. B.M. 347 (Cap gone) on the East end  
of high ridge, Cass Lake Nursery  
N.W. shore of Pike Bay U. of Minn. Eng.  
using it as triangulation station.  
Elev. 1340.18  
Lat. 47° 22' 16.35"  
Long. 94° 35' 39.36"

1/4 Cor. from pipe in Road 1/4 Cor. betw. Secs 15-16  
T. 145 N. R. 31 W.

Sec. Cor. of Secs 9-10-15-16 T. 145 N. R. 31 W.

Sec. Cor. Secs 9-10-15-16 T. 145 N. R. 31 W.



USE B.M. 392

Sta. <sup>Cass Dist.</sup>	Course	Log Cos.	Log sin	N.	S	E.	W.
Wye <sup>1898</sup> $\Delta$	North			0.68			
Pt. #1		8.031919				0.25	22.92
	S. 89° 23' E	1.360215					
		-1.392139					
Pt. #2	North			11.56			
Cass Lake L.O.							
	S. 89° 40' E			0.08		27.49	
Sec. Line							
	N. 0° 10' E	7.463726				0.22	0.03
		1.009451					
		-2.973177					
Sec. Cor.				(22.13)		(50.44)	
Sec. Cor.							
	S. 89° 52' W	7.366816				0.19	80.32
		1.904824					
		-1.276640					
Sec. Cor.							
	S. 0° 07' E			20.78		0.04	
So. Rail.							
	S. 89° 23' E			0.33		29.83	
Pt. #1	South			0.68			
Wye <sup>1898</sup> $\Delta$							
				(21.98)		(50.45)	
Mean Tie	N. 66° 23' E	(55.05)		(22.05 1/2)		(50.44)	

J. A. Gjelvang  
10/30/35

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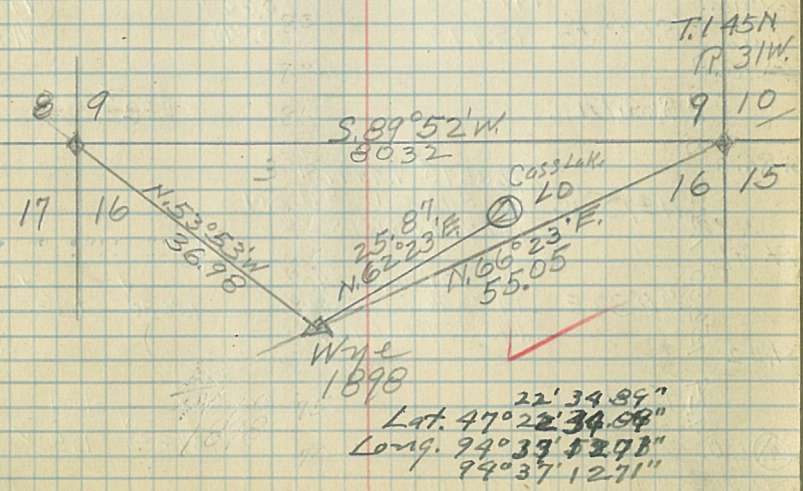
$\Delta$  Wye 1898 Miss. River Commission.  
in good condition  
about 1/2 mile west of G.N. Ry. Station  
in Cass Lake 68 Lts. South of South part  
of Main Line

$\odot$  Cass Lake L.O. ✓

Sec. Cor. Center of Month.  
Secs 9-10-15-16  
T. 145 N. R. 31 W.

Sec. Cor. above.

Sec. Cor. of Secs 8-9-16-17  
T. 145 N. R. 31 W.

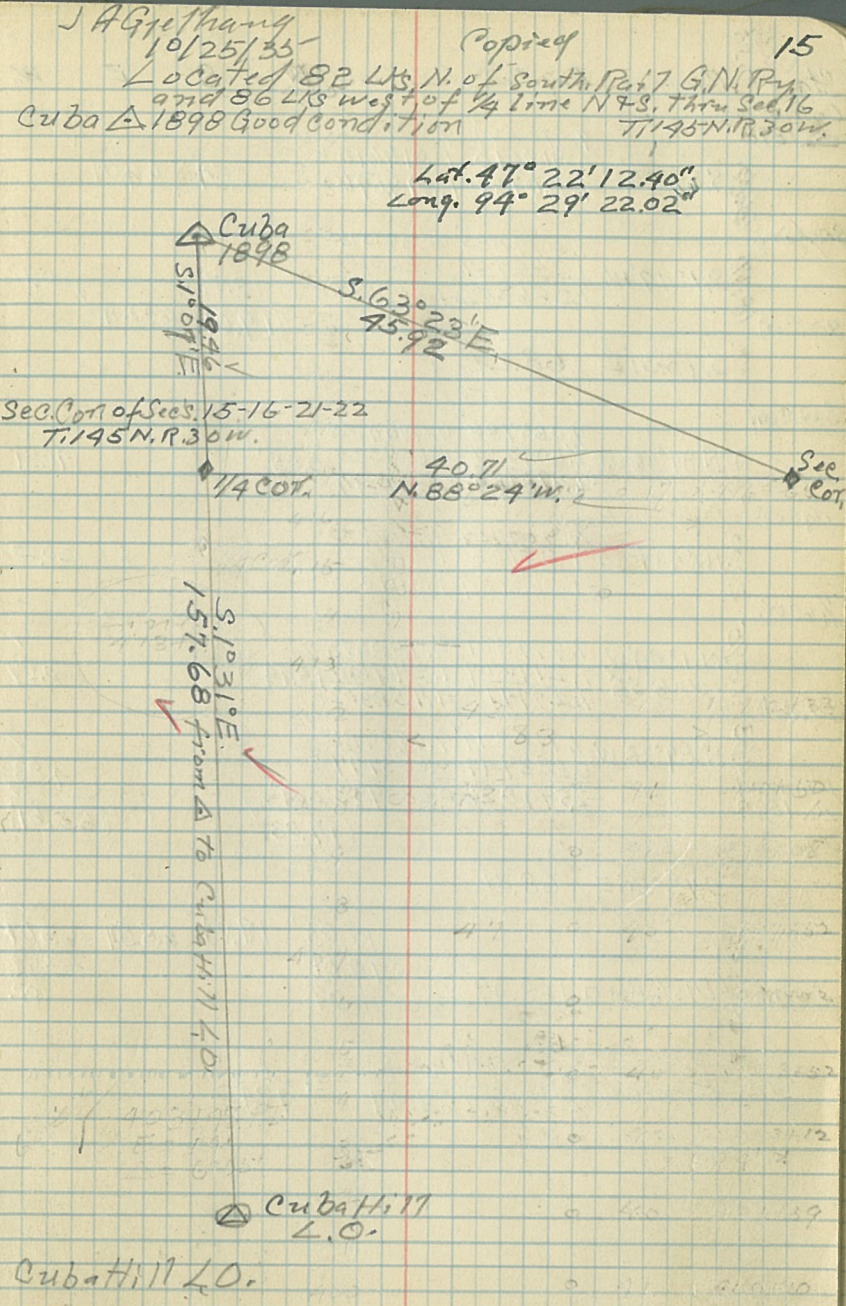


22' 34.85"  
Lat. 47° 22' 34.85"  
Long. 94° 39' 52.98"  
94° 37' 12.71"



Solar Transit  
va. 6°55'

Sta. Cms Dist	Course	Log. Cos.	Log. Sin	N	S	E	W.
Cuba △ 1898							
0.82	South.				0.82		
S. Rai. 1099	S. 89°28'E	7.968870 1.612678 -1.581598	9.999981 1.612678 1.612659		0.38	40.99	
Sec. Line 1934	S. 0°06'E	9.999999 1.286956 1.286455	7.241877 1.286456 -2.528333		19.34	0.03	
Sec. Cor.				(20.54)	(41.02)		
Sec. Cor.	N. 88°24'W	8.445941 1.609701 0.055642	9.999831 1.609701 1.609582		40.70		
1/4 cor.	West.				1.74		
Pt. #1. 1864	N. 0°32'W	9.999981 1.270946 1.270927	7.968870 1.270946 1.239316		10.64	0.17	
So. Rai.	N. 61°53'E	9.673268 0.238096 -1.911314	9.945469 0.238096 0.183510		0.82	1.53	
△ Cuba. Cuba. △ 1898	(S. 63°25'E 45.97)			(20.60) (20.54)	(41.08) (41.02)		
0.82	South				0.82		
S. Rai. 152	N 89°28'W	7.968870 0.181844 -2.150714	9.999981 0.181844 0.181825		0.01	1.52	
Pt. #1	S 0°32'E	9.999981 2.195346 2.195327	7.968870 2.195346 0.164216		156.80	1.46	
Pt. #2	East.				4.24		
① L.O. The	S. 1°31'E (157.68)			(157.62)	(4.18)		



Sta.	Course	Log. Cos.	Log Sin	N	S	E	W.
Lomond △ 1898		9.910879	9.999986	✓			✓
		1.819610	1.819610	✓			✓
	S. 89° 32' E	1.730489	1.819596	✓	0.54	66.01	✓
Sec. Line		9.999885	8.361315	✓			✓
		1.266967	1.266967	✓			✓
	S. 1° 19' W.	1.266352	1.627782	✓	18.47		0.92
Sec. Cor.					(19.01)	(65.59)	
	S. 73° 51' E.					68.29	
Sec. Cor.		7.065786	8.000000	✓			✓
		1.604339	1.604339	✓			✓
	S. 89° 56' W.	2.670120	1.604339	✓	0.05		40.21
1/4 Cor.	West						20.00
1/6 Cor.							
	N. 1° 44' W.	9.999801	8.480693	✓			✓
	va 6° 55'	1.277609	1.277609	✓			✓
		1.277416	1.758302	✓	18.94		0.57
Pt. # 2							
	N. 89° 32' W.	7.910879	9.999986	✓			✓
		0.683947	0.683947	✓			✓
		2.594826	0.683933	✓	0.94		4.83
Lomond △ 1898					(19.03)	(65.61)	
	S. 73° 56' E.					68.31	
Sum of Dist. Run.					19.03	19.01	65.59
					0.02		65.59
							0.02
Error of Closure							$\frac{\sqrt{2^2 + 2^2}}{168.47} = \frac{1}{42.12}$

J. A. G. L. Hany  
10/28/35

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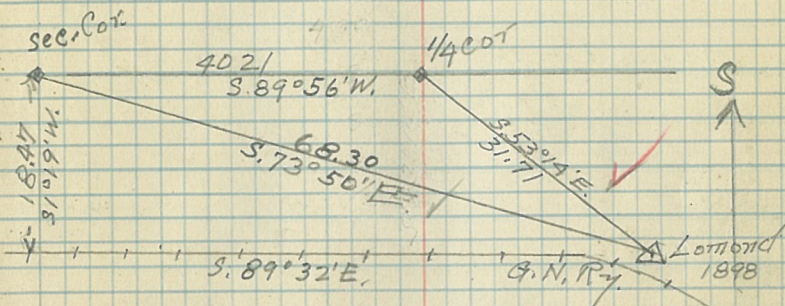
16

△ Lomond 1898 on line with South Part  
on tangent produced 3 Chs. West of Pike Bay  
Loop Road T.R. Crossing. In good condition.

Sec. Line N. & S. betw. Secs. 17-18 T. 145 N. R. 30 W.

Sec. Cor. of Secs. 17-18-19-20.

1/4 Cor. betw. Secs. 18-19



Sec. 18  
T. 145 N. R. 30 W.

Lat. 47° 22' 13.22"  
Long. 99° 32' 18.20"

(Used Solar for Bearing)

Sta. Dist.	Course	Log. Cos	Log. Sin	N	S	E	W.
5.19	West					5.19	
22.73	South				22.73		
39.22	N. 89° 39' E	7.785943	9.999992			39.22	
		1.593508	1.593508	0.24			
		-1.379451	1.593500				
				(22.49)	(34.03)		

Sec. Cor. (N. 56° 33' W) (40.79) to Cuba H. 11 ✓  
 1/4 Cor. (N. 12° 52' E) (23.31) " " ✓

J. A. G. 1/28/35

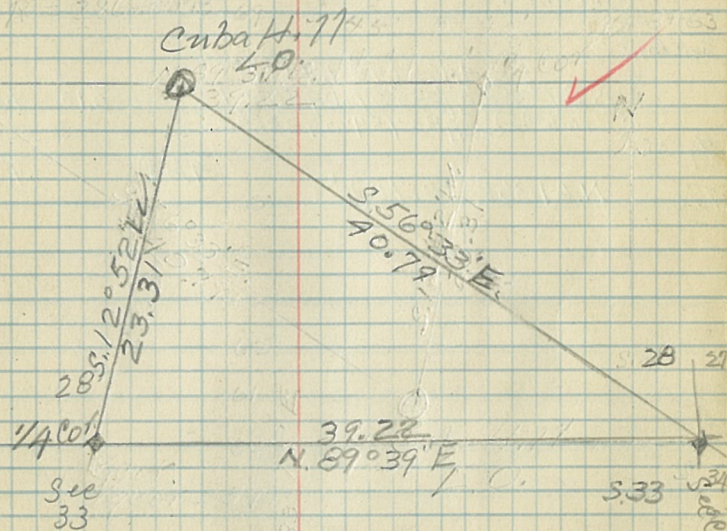
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17

Cuba H. 11 L.O. Ties to Sec. and 1/4 corners.

1/4 Cor. between Secs. 28-33 T. 145 N. R. 30 W.  
 Brass Caped Iron pipe G.L.O.

Sec. Cor. of Secs. 27-28-33-34 T. 145 N. R. 30 W.  
 Brass Cap. G.L.O.



Bearings taken with Solar  
and checked with Mag. Bearing.

Sta. <sup>Chs.</sup> <sup>D. 82</sup>  
Birch Hill  
40

Course	Log. Cos	Log. Sin	N.	S	E	W
North Va. 6.50			4.73			
Sec. Line	7.995198	9.999979				30.90
Sec. Cor. (Va. 6.50)	1.482874	1.482874	9.30			
Tie	N. 80° 36' W	(30.81)	✓	(5.03)		(30.40)

B.H.  
L.O.

North  
4.73

Sec. Line

1/4 Cor.	7.995198	9.999979				
(Va. 6.45)	0.988559	0.988559	0.10		9.74	
Tie	N. 61° 35' E	(10.78)	✓	(4.63)		(9.74)

J.A. Grelhang  
10/29/35

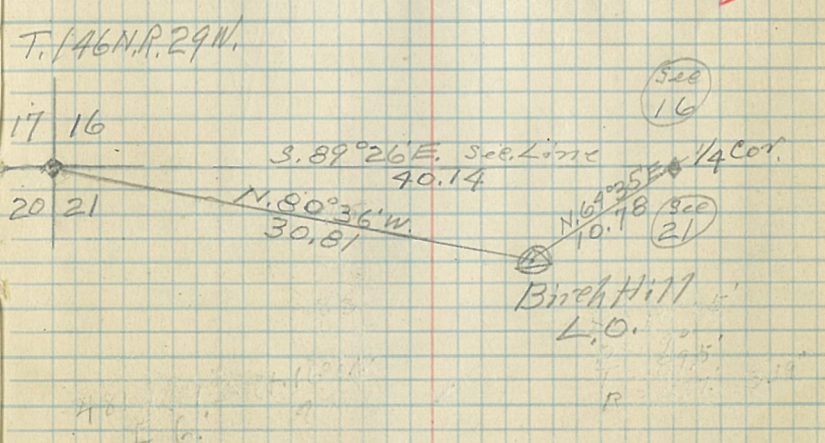
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Birch Hill L.O.

Sec. Cor. of Secs. 16-17-20-21 T. 46 N. R. 29 W.  
Brass Plate in Corner 6" dia. 2" above Cr. New G.L.P.

Birch Hill L.O.

1/4 Cor. bet. w. Secs 16-21  
pipe with Brass cap.



Solar. Va. 700'

Sta. Chk. Dist.	Course	Log. Cos	Log. Sin	N.	S	E	W.
Sta. Pimush L.O.	North			506			
Sec. Line	N. 89° 50' E	7.463726 3.93014		.06		22.03	
Sec. Cor.		-2.806740					
Tie	N. 76° 55' E (22.62)			(5.72)		(22.03)	
Sta. Pimush L.O.	North			506			
Sec. Line	S 89° 50' W	7.463726 6.252853			0.05	17.90	
1/4 Cor.		-2.116519					
Tie	N. 74° 22' W (18.59)						

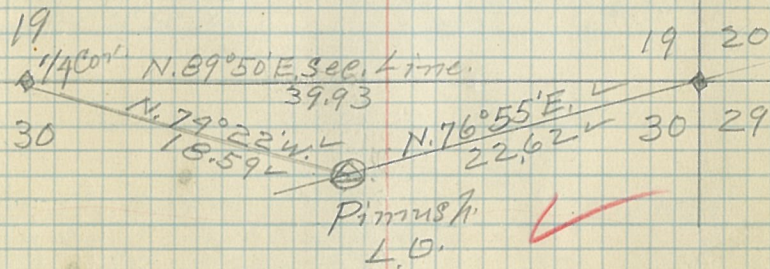
J.A. Gething  
10/29/36  
Pimush L.O.

Coppied

Sec. Cor. of Secs 19-20-30-29  
T. 147 N. R. 30 W.  
Orig. Cor.

1/4 cor. betw. 19-30  
orig. cor.

T. 147 N. R. 30 W.



used Geodetic Az. Compass

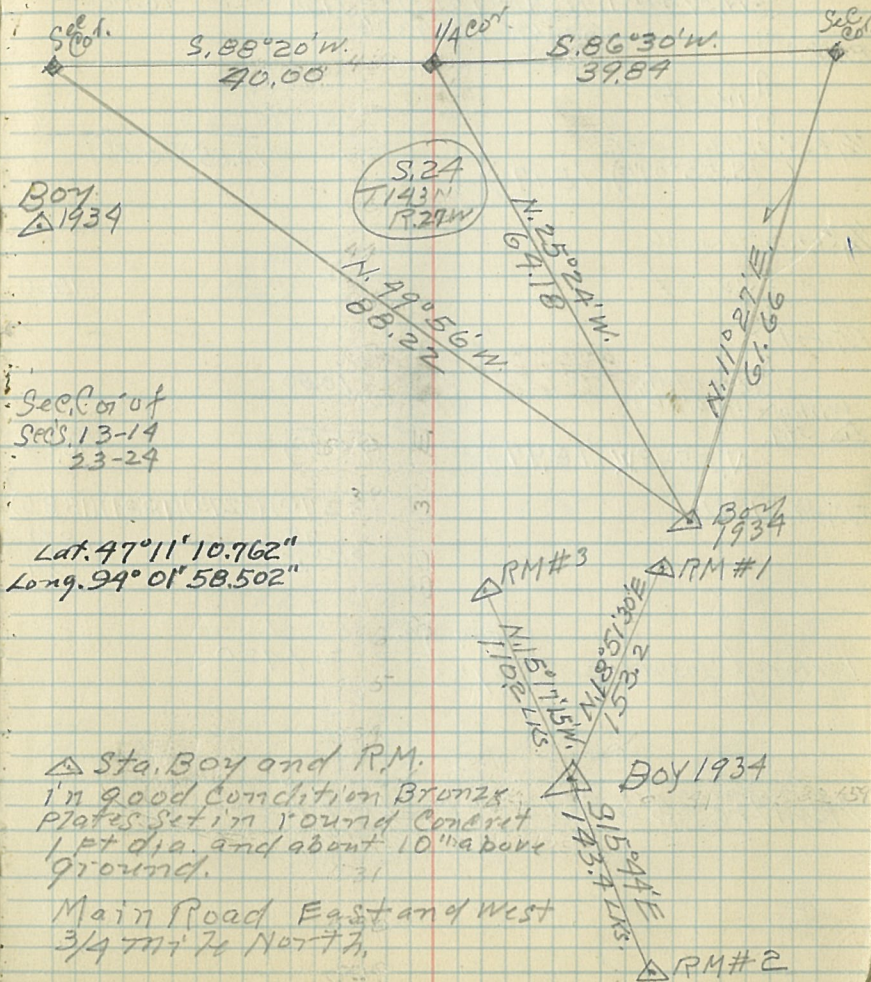
Sta. D	Course	Log Cos.	Log Sin	N	S	E	W
Sec Cor.		8.785675	9.999189				
	S 86° 30' W	1.600319	1.600319		2.43		39.77
		0.385994	1.599508				
1/4 Cor.		8.785675	9.999189				
	S 86° 30' W	0.193125	0.193125		0.09		1.56
		2.978800	0.192314				
Tr. Pt #1		9.999735	8.542819				
	S 2° 00' E	1.779813	1.779813		60.20	2.10	
		1.779548	0.322632				
Pt #2		8.639680	9.999586				
	N 87° 30' E	1.431525	1.431525	1.18		26.99	
		0.071205	1.431111				
Pt #3							
	North (Var. 7° 00')			1.13			
Boy Tie	N 11° 21' E (61.66)				60.71		12.79
Tr. Pt #1		8.463665	9.999816				
	S 88° 20' W	1.584783	1.584783		1.12		38.42
		0.048448	1.584599				
Sec Cor.							

J. A. Gethung  
11/5-6/35

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20

Sec. Cor. of Secs. 13-24 T. 143 N. R. 27 W.  
and 18-19 T. 143 N. R. 26 W.  
Corner in Road Cedar St. 10° 35' E 307.15  
1/4 Cor. in Center of Road Orig. Cor



Run with Compass  
and Geolite Az. Va. 6°20'

Sta.	Course	Log Cos.	Log Sin	N.	S	E	W.
Willow 1934	South (Va. 6°20')				3200		
Pt. #1							
	S 68°00'E	9.573575	9.967166			075	1.85
		0.301030	0.301030				
		-1.874606	0.268196				
Pt. #2							
	N, 37°45'E	9.898006	9.786906				16.96
		1.442480	1.442480	21.90			
		1.340486	1.229386				
Pt. #3							
	west					3.25	
1/4 Cor. S. side Sec 36	(S. 55°07'E)			(10.85)	(15.56)		
1/4 Cor. S. side Sec 36	west					15.60	
Pt. #4							
Willow Sta.	North (Va. 6°10')			10.80			
	N, 55°18'W	(16.97)	(10.80)			(15.60)	
T. Dist. (91.35)		(3270)	(3275)	(1881)	(1885)		
		32.75			1881		
		5			4		

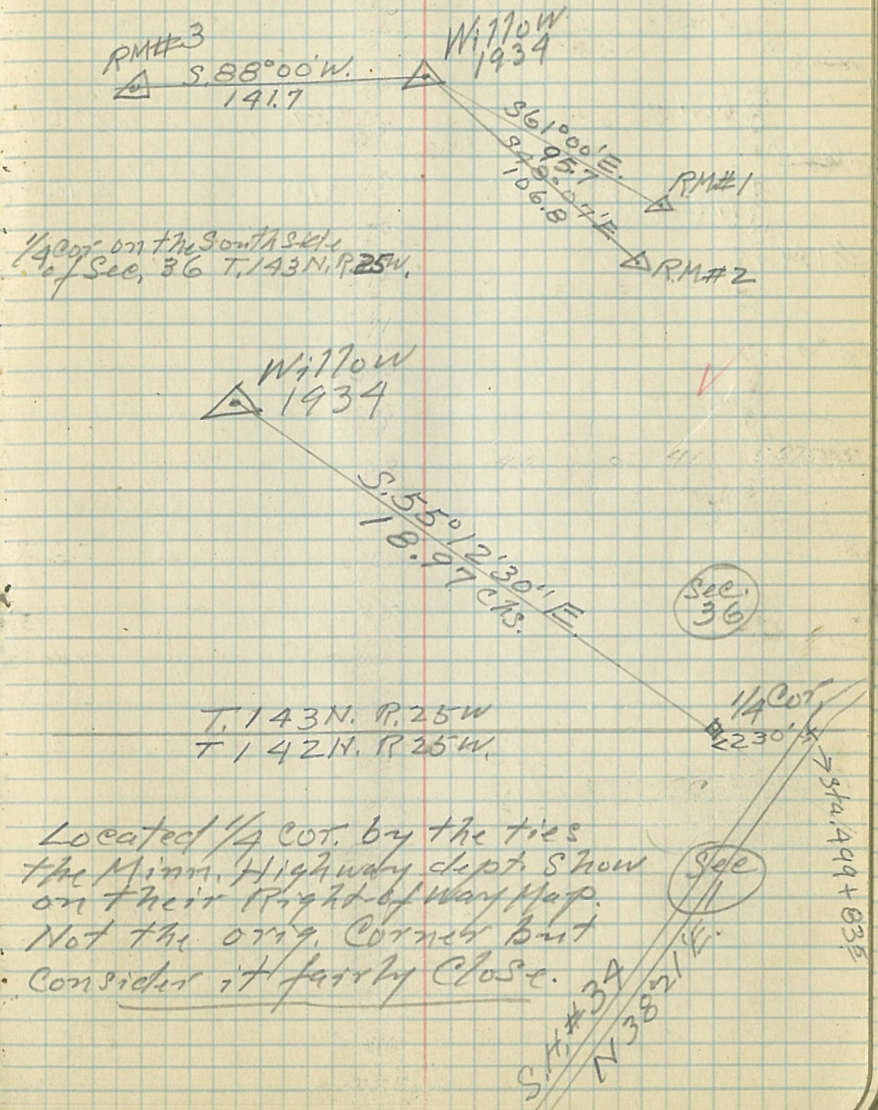
Error of closure =  $\frac{\sqrt{5^2 + 4^2}}{91.35} = \frac{1}{2.1420}$

Mean Tie - S 55°12'30"E. 18.97

J. A. Gehring  
11/7/35

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Willow 1934 Sta. Located on high hill  
about 3/4 mile NW of Willow Lake  
on the NW side of Highway #34 about 1/4 mile



T. 143N. R. 25W  
T. 142N. R. 25W.

Located 1/4 Cor. by the ties  
the Minn. Highway dept. show  
on their Right-of-Way Map.  
Not the orig. corner but  
consider it fairly close.

See  
11  
S. 38°30'W  
N 38°51'W

Sta.	Course	N.	S	E	W.
Remer Sta. 542	N. 63°50' W.	9.644428	0.733999	9.953042	0.733999
1/4 Cor. 8-9		0.378422		0.687041	2.39
					4.87
△ Sta 089	N. 71°00' W.		0.29		0.84
⊙ L.O.					4.03
1/4 Cor. 454	N. 62°30' W.		2.10		

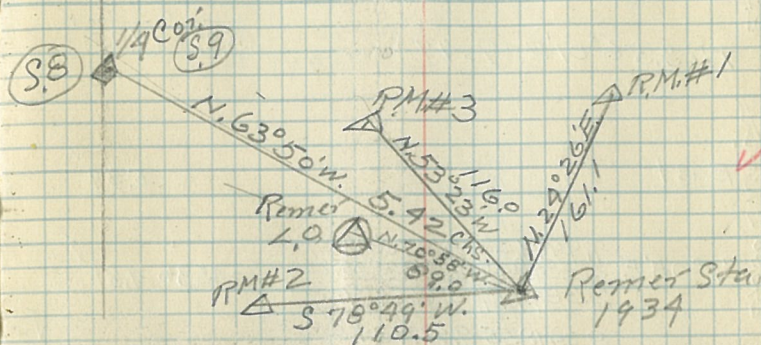
J.A. G. 1/1 hour  
8/35

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22

1/4 Cor. betw. Secs. 8-9  
T. 141 N. R. 26 W.  
Iron pipe 2" x 3' above ground of Orig. Corner.

T. 141 N. R. 26 W.



Lat. 47° 02' 30.93"  
Long. 93° 59' 09.11"

Used Geodetic Azimuth  
Va. 5° 55' Local Alt. from tower  
Setup close to 1/4 Cor. on  
same time Va. 6° 20'

Lat. 47° 02' 30.737"  
Long. 93° 59' 08.312"



(Courses Run twice to check)  
 Solar Transit V. 70°05'

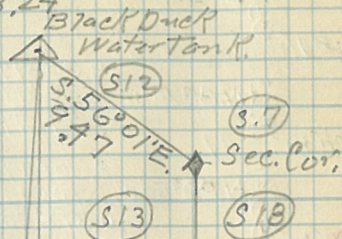
Sta. Obs. Dist.	Course	Log. Cos.	Log. Sin	N	S	E	W
Black Duck Tank	East					5.34	
Pt #1	5.34						
Pt #2	5.29	South				5.29	
Sec. Cor.	2.51	East				2.51	
		Tie S. 56°01'E. (9.47)				(5.29)	(7.85)
Black Duck Tank	East					5.34	
Pt #1	5.34						
Sec. Cor.	2.4540	S. 1°05'E.	9.999922	8.276614		24536	4.61
			2.389875	2.389875			
			2.389797	0.666489			
		S 89°00'W.	8.241855	9.999934			
			1.122216	1.122216		0.23	13.25
			1.364071	1.122150			
Pt #3	1.325	(South) (to old tower)				(0.99)	
		S 89°00'W.	8.241855	9.999934			
			1.064083	1.064083		0.20	11.59
			1.305938	1.064017			
Pt #4	11.59	North				1.66	
		↖ 3.20 to New Location					
		New Location S 3°29'W. (244.62)				(244.13)	(4.86)
		Tie to New Location					
		Tie to old B.D.L.O. S. 0°45'W. (246.58)				246.58	3.27
		25/30					
		36/31					
Pt #1	2.829	S 88°52'W				0.49	24.77
		North.				3.20	
		Tie = N. 83°46'W. 2494				2.71	24.17

J.A. Gjelthang  
 11/12/35

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23

Black Duck Water Tank  
 Lat. 47°43'50.27" Geod. S. 1934  
 Long. 94°32'58.24"



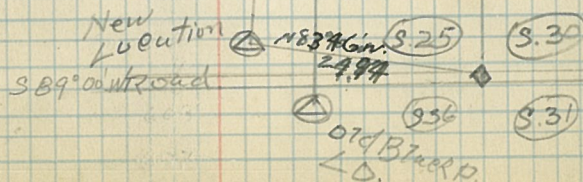
Sec. Cor 12-13 T. 149 N. R. 31  
 7-18 T. 149 N. R. 30

T. 149 N.  
 Sec. Cor Sec's. 25 + 30  
 Intersection of Roads 36 + 31  
 R. 31 | R. 30  
 (99 Lks. North of Center Pt. # 2. Black Duck L.D.)

S. 3°29'W. 244.62 Cts.  
 S. 0°45'W. 246.63

240.11 Cts.  
 N. 0°32'12"

New Tower Location Center



Sta.	Course	Log. Cos.	Log. Sin	N.	S	E	W.
Wagner Sta. 1934	South				0.54		
Pt #1 (Center of Road)	N. 88° 50' W.	8.308794 1.283979 -1.592713	9.999910 1.283979 1.283889		0.39		19.23
Sec. Cor. #1	N. 88° 50' W.	8.308794 1.906712 0.215506	9.999910 1.906712 1.906622		1.64		80.66
Sec. Cor. #2					(1.99)		(99.89)
Sec. Cor. #2	S. 88° 50' E.	8.308794 1.906712 0.215506	9.999910 1.906712 1.906622		1.64	80.66	
Sec. Cor. #1	N. 89° 35' E.	7.861662 1.283979 -1.145644	9.999988 1.283979 1.283979		0.14		19.23
Wagner Sta.					(1.50)		(99.89)
Mean Tie.	N. 89° 09' W.						(99.90)

J.A. G. J. H. H. H.  
11/14/35

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24

Wagner Sta. Located 54 Lbs. North of C.L. of E 4th Road on high bank. Cut starts 6' South of Sta. R.M. #1 on South side of Road R.M. #2 also on South side of Road Very Close to Cut bank but OK if protected. At Mark 1/2 mile West on South side of Road Was taken out by Road crew in Cutting down bank.

Sec. Cor. Inters. of Road East & West and North.

Cor. of Secs. 11-12-13-14  
T. 149 N. R. 28 W. ✓

Sec. Cor. of 10-11-14-15  
T. 149 N. R. 28 W.

T. 149 N. R. 28 ✓

Sec. 10 Sec 11  
S 11 S 12  
N. 89° 09' W. 99.90

Sec 15 Sec 14

1923  
S. 89° 35' E. 3.17  
S 14 S 13  
R.M. #2

Wagner 1934  
S 13 00' E  
108  
R.M. #1

Lat. 47° 43' 49.077"  
Long. 99° 10' 33.527"

Used Geodetic Az. Dec.  $7^{\circ}10'$   
Courses Run twice & checked.

Sta.	Course	Log. Cos.	Log. Sin	N.	S	E	W.
Sta. Northome 1934	N. $9^{\circ}59'11''$	9.993374 0.3292820	9.238953 0.329282	2.08			0.37
RM #2	N. $52^{\circ}E$	9.789342 1.093422	9.896532 1.093422	7.63		9.77	
Pt #1	N. $70^{\circ}45'E$	9.518107 1.853029	9.975013 1.853029	23.50		67.31	
Pt #2	N. $60^{\circ}30'E$	9.692339 1.302764	9.939697 1.302764	9.89		17.40	
Sec Line	Range Line	0.995103	0.242461				
North				6.78			
Sec Cor.				(49.88)		(94.19)	
Tie	N $62^{\circ}06'E$			(106.58)			

Northome L.O.  
Sta. 047 S.  $41^{\circ}05'E$ . 035 E 031

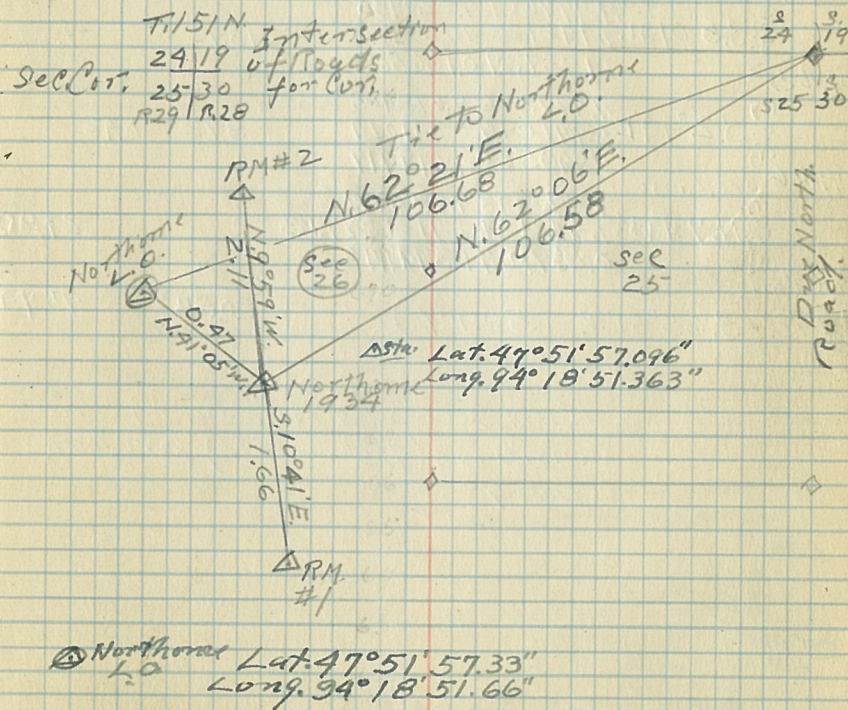
Tie N  $62^{\circ}21'E$  106.68 49.52 94.50

J. A. Gjothberg  
11/14/35

Copied

25

Northome Located S.  $41^{\circ}05'E$ , 47.416 from  
Center of Northome L.O. Tower.



Used Geodetic Bearing  
Turned Angles with Transit

Sta	Course	Log Cos	Log Sin	N	S	E	W
Farley 1934	N. 76° 09' W	9.379089	9.987186				6.57
		0.830589	0.830589	1.62			
		0.209678	0.817775				
Pt #1	S. 70° 29' W	9.523852	9.974302		2.34		6.59
		0.894477	0.844477				
		0.368329	0.818779				
Pt #2	N. 87° 30' W	8.639680	9.999586				4.91
		0.691081	0.691081	0.21			
		-1.330761	0.690667				
Pt #3	S. 21° 59' W	9.967217	9.573263		9.61		1.86
		0.696356	0.696356				
		0.663573	0.269619				
Pt #4	S. 6° 01' W	9.997601	9.020435		13.92		1.47
		1.146128	1.146128				
		1.143729	0.166563				
Pt #5	S. 2° 44' E	9.999506	8.678405		8.72	0.42	
		0.941014	0.941014				
		0.940520	-1.619419				
Pt #6	N. 73° 45' W	9.446893	9.982294				24.80
		1.412124	1.412124	7.23			
		0.859017	1.394418				
Sec. Cor.							
Tie.	S. 65° 51' W. (50.17)			20.53			45.78

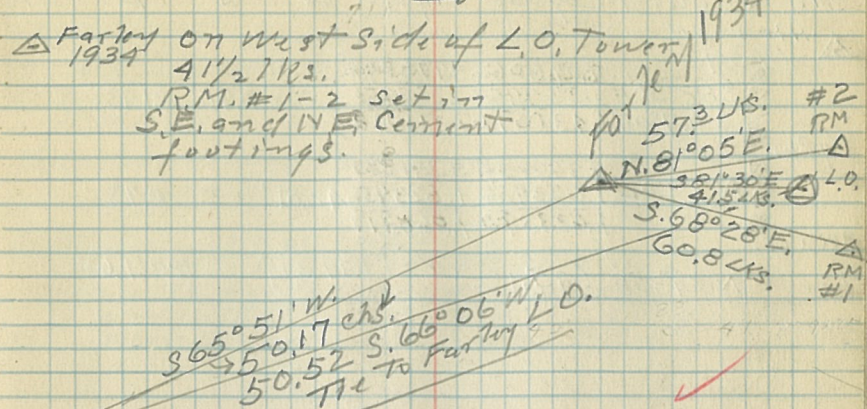
Run second time with  
Compass (4 1/2" needle) for check  
Dec. 7

Sta. S. 81° 30' E. 0.06 0.41

Farley L.O.

Tie. F.L.O. to Sec. Cor. S. 66° 06' W. 50.52

J.A. Gjelvang  
11/15/35  
Copper  
1934 26



Lat. 47° 34' 23.437"  
Long. 94° 07' 50.418"

S.W. Cor. of Sec. 5

South Sec. Line Sec. 5  
S 73° 45' E

Sec. Cor. Secs. 5-6-7-8  
T. 197 N. R. 27 W.  
BTS Orig.  
N. Pine 18" S. 59° W. 11 LKS  
W. " 18" S. 26° E. 15 "

Farley Lat. 47° 34' 23.39"  
L.O. Long. 94° 07' 50.04"

Used Geodetic Bearing Dec. 7°05'  
Run twice to check.

Sta.	Course	Log Cos	Log Sin	N	S	E	W.
△ ALV Wood 1934		9.096062	9.996594				
	S 82°50'E	1.337459	1.334454			2.70	21.43
	Va. 7°00'	0.930516	1.331048				
1/4 Cor.		9.999934	9.241855				
	N. 1°00'E	1.623456	1.623456	42.01		0.73	
		1.623390	1.865311				
Sec. Cor.							
Tie	N. 29°25'E	(45.12)	(39.31)			(22.16)	

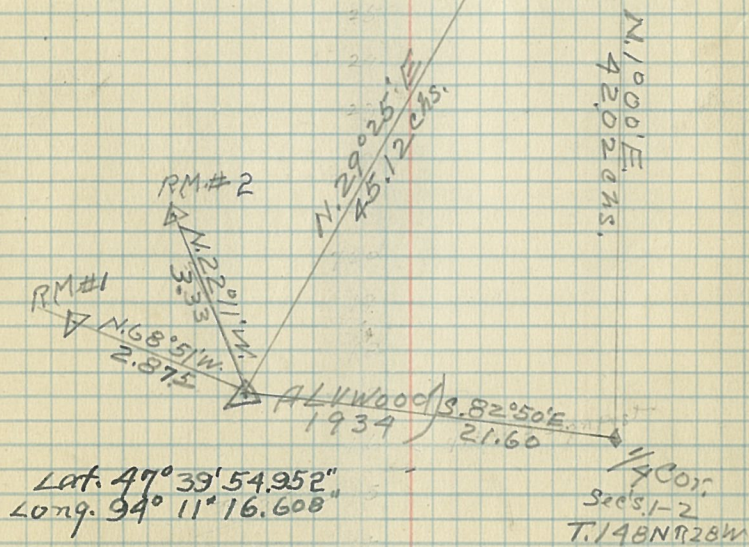
J.A. Gethaug  
11/16/30

Coppied

27

△ ALV Wood Located on highest knoll  
1934 about 4 1/2 chs. S.E. of Mr. Roosdett's  
house, under ground 16"  
R. Marls #1 and #2 flush with ground.  
1/4 Cor. in center of Road Running North  
Poster and Post on East Side of Road.

Sec. Cor. C.C. Cor. on Twp. Line  
for Secs. 1-2 T. 148 N. R. 28 W.  
New P.T. by Co. Surveyor. Twp. Line  
Aspen 16" 19.37°30'E 58 LK  
Pbst scribed for C. Corners 3"x4"



Lat. 49°39'54.952"  
Long. 94°11'16.608"

Used Geodetic Bearing  
Run twice to check.  
Sta. <sup>029</sup> <sub>027</sub> Course Log Co S Log Sta N S E W

△ Cedar

East

0:24 ✓

PT #1

C. L. of Road

9999.40 8.609734 ✓

S 2° 20' E

1.552060 1.552060 ✓

3562 1.45 ✓

Sec. <sup>029</sup> <sub>027</sub>

va. 6° 48'

1.551700 0.161799 ✓

Tr

S 2° 43' E

(35.66) ✓

(35.62)

(1.69) ✓

J.A. Gjerthang

11/18/35

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28

△ CEDAR Located 29 LKS. west of C.L. of N and So. Road. and 35.65' E of Sec. Cor. RM. #1 N. 16° 52' E 160.3 LKS on East side of Road.

RM. # 2 Could not find.

Used Geodetic Bearing

Sec. Cor. of Secs 10 | 11

T. 148 N. R. 26 W.

Intersection of Roads

RM. #1

E and W, N. and S.

Lat. 47° 39' 01.605"

Long. 93° 56' 43.232"

△ CEDAR

1934

S 2° 43' E

35.66

S 2° 43' E

35.66

Sec. 10

11

T. 148 N. R. 26 W.

15

14

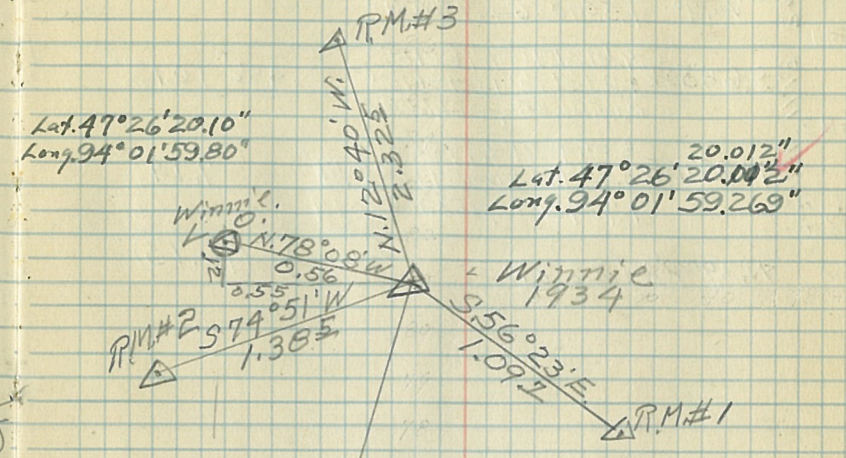
used Geodetic Bearing,

Sta	Course	Log Cos.	Log Sin	N	S	E	W
Winnie 1934	S. 55° 25' W	9.754046	9.915559				
	Var. 7°	0.787460	0.787460		3.48		5.05
PT# 1		0.541506	0.703019				
	S. 4° 58' E	9.998366	8.937398			6.52	0.57
PT# 2		0.815578	0.815578				
		0.813944	1.752976				
	S. 35° 20' E	9.911584	9.762177			1.53	1.09
PT# 3		0.274158	0.274158				
		0.185742	0.036335				
	S. 1° 00' E	9.999934	8.241855			16.00	0.28
1/4 Cor. Btm. Secs 25+30 R. 27   R. 26 T. 146 N.		1.204120	1.204120				
		1.204054	1.745975				
Tie	S 6° 27' W	(27.70)	(27.53)				(3.11)

J.A. Gehring  
11/18/35

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Winnie 1934 Located 56 Lks S. 78° 08' E. of Center of Winnie L.O. Tower.



(Tie to L.O.)  
S. 6° 27' W  
27.77  
27.70

Iron pipe 2 1/2" x 2'  
Sec. 25  
1/4 Cor. Sec 30  
R. 27 W. R. 26 W.  
T. 146 N.

Sta. <sup>Obs.</sup> <sup>Dist.</sup> Course Log Cos Log sin N. S E W

Sec. Cor. 24.22

N. 1° 20' W. 9.999882 8.366777 ✓  
 1.384174 1.384174 29.22 ✓  
 Va. 7° 1.384056 1.750951 ✓

Pt. #1 24.22

S. 65° 50' E. 9.612140 9.960165 ✓  
 1.046495 1.046495 ✓  
 0.658635 1.006660 ✓

Pt. #2 7.16 11.13

N. 85° 54' E. 8.854291 9.998887 ✓  
 0.854913 0.854913 0.51 ✓  
 7.14 ✓  
 -1.709204 0.853800 ✓

Mud Lake L.O.

Tie N. 39° 40' E (26.21) (20.17) (16.73) ✓

J.A. Gye / Hand  
 11/19/35

Sec. Cor. on Range Line

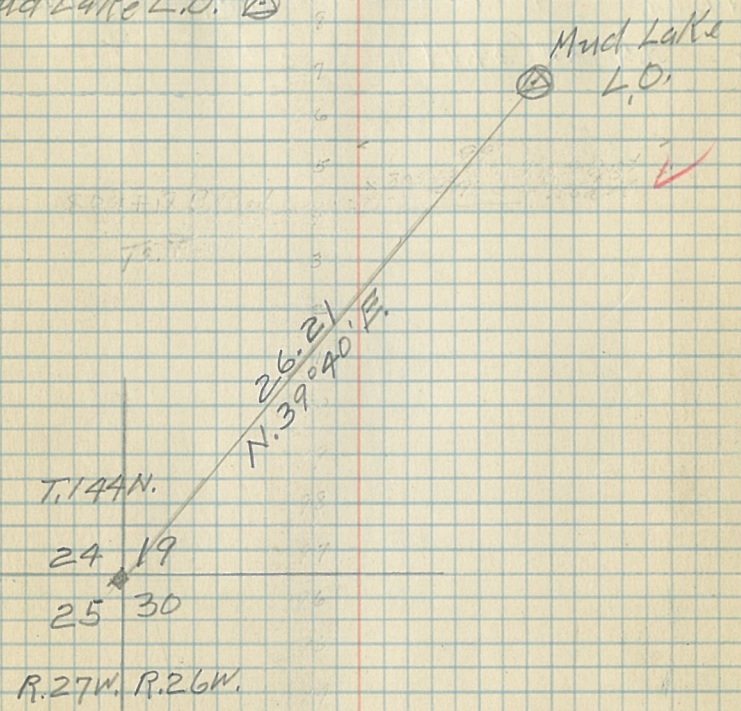
Orig. B.T.S.  
 W. Pt. to 16" S. 26° E. 16  
 Aspen 18" N. 89° E. 11  
 " 18" N. 45° W. 34  
 " 16" S. 80° W. 20

T 144 N  
 24 19  
 25 30  
 R 27 R. 26

All OK. Post set 7 LKs N.  
 and 4 LKs W. fm proper  
 place.

Copied

Mud Lake L.O. ⊙





Sta. <sup>1942</sup> Course Log<sub>cos</sub> Log<sub>sin</sub> N S E W

See Cor. West 0.86

Pt #1 N. 0° 30' W. 7.940842  
 Va. 7° 1.288249 19.42 ✓ 0.17 ✓

Pt #2 N. 17° 22' E. 9.979737 9.474923  
 1.309630 1.309630 19.97 ✓ 6.09 ✓

⊙ Nushka 1.289367 0.784553 38.89 ✓ 5.06 ✓

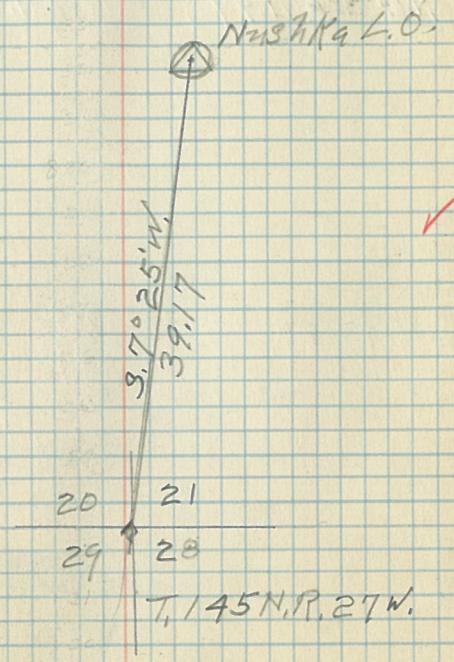
Tie - S. 7° 25' W. (39.17) ✓

JAG Gjelhang  
 11/19/35

Copper 31  
 with Henry Cor. E.

Sec. Cor. old post in place about 15 years.  
 Post on Aspen 10" North, 10 Lks. old blaze  
 + cut face  
 Probable Cor. 20 | 21 T. 145 N. R. 27 W.  
 29 | 28

⊗ Nushka L.O.



used Geodetic Bearings

Sta.	Course	Log Cos.	Log Sin	N	S	E	W
Ball 1934	S. 14° 37' E	9985742	9.402005			2.87	0.75
	Va. 6° 50'	0.458468	1.874761				
RM No. 2	N. 81° 42' E	9.169435	9.995427			9.95	
		1.002598	1.002598	1.45			
T.T. Pt. #1	N. 1° 42' E	0.162033	0.998025			0.19	
		9.999809	8.472263				
1/4 Cor.	N. 65° 32' E	0.804821	0.804821	16.37			
		0.804690	1.277684				
Tic.	N. 65° 32' E	(11.97)	(4.95)			(10.895)	

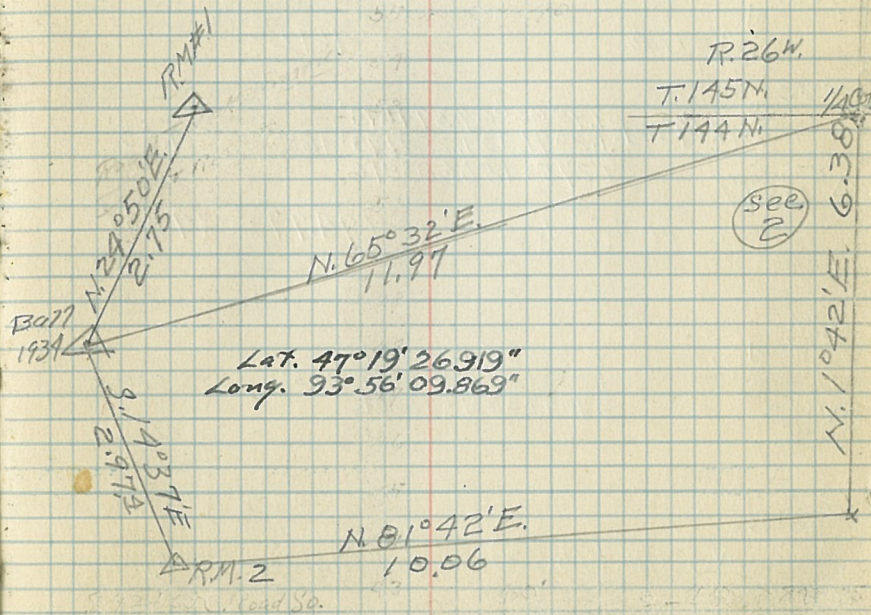
J. A. Byerhang  
11/20/35

Coppied

32

Ball 1934 Located at Ball Club,  
South of Post Office about 2 rods.

1/4 Cor. on N. Side of Sec. 2  
T. 144 N. R. 26 W.  
Original Site  
N. 16° S. 51° W. 32  
J. " 10° S. 45° E. 52



Used Conv. Bearing  $V.6^\circ$

Sta	Course	Log Cos.	Log Sin.	N.	S	E	W.
$\Delta$ Blumberg 1939	$S. 62^\circ W$	9.671609	9.945935			3.32	6.25
	$V.6^\circ$	0.850033	0.850033				
		0.521642	0.795968				
Pt #1	$S. 15^\circ 00' E$	9.984944	9.912996			13.93	3.60
		1.143015	1.143015				
		1.127959	0.556011				
Pt #2	$S. 47^\circ 30' W$	9.829683	9.867621			2.12	2.31
		0.495544	0.495544				
		0.325227	0.363175				
$\frac{1}{4}$ Cor.	$S. 0^\circ 30' W$	7.940842				76.12	0.66
		1.881499					
		-1.822391					
Tie	$S. 3^\circ 23' W$	(95.10)	(94.99)			(5.62)	
$\frac{1}{4}$ Cor.	North			76.12			
Pt #3	$N. 14^\circ 22' E$	9.986202	9.394673			1.885	4.83
		1.289143	1.289143				
		1.275345	0.683816				
$\Delta$ Blumberg 1939				(check)		(94.97)	(4.83)
$\Delta$ Sta.	$N. 80^\circ E$	9.239670	9.993351			0.055	0.315
		-1.505150	-1.505150				
		-2.744820	-1.498501				
$\frac{1}{4}$ Cor.	$N. 3^\circ 34' E$	(95.23)	(95.05)			(5.93)	
$\Delta$ P.L.O.							

J.A. Gjelthang  
11/20/35

Coppin

33

$\Delta$  Blumberg Located on high hill 322 AS  
1939 west of Blumberg L.O. in the  
SW  $\frac{1}{4}$  of the SE  $\frac{1}{4}$  Sec. 3 T. 56 N. R. 27 W

R.M. #2 could not find  
8" Snow on Ground Blumberg L.O.  
N. 80° E  
S. 81° 23' E  
1.272

Deep River Tank  
Water  
S. 46° 25' W  
V. 6° 30'

$\frac{1}{4}$  Cor. betw. Secs 10-15  
T. 56 N. R. 27 W  
Intersection of Roads  
East W-N and South

$\Delta$  Lat.  $47^\circ 21' 28.042''$   
Long.  $93^\circ 45' 13.597''$

$\Delta$  L.O. Lat.  $47^\circ 21' 28.08''$   
Long.  $93^\circ 45' 13.27''$

$S. 3^\circ 23' W$   
95.10  
 $N. 3^\circ 34' E$  95.23  
Sec. 10  
 $\frac{1}{4}$  Cor  
Sec. 15  
T. 56 N. R. 27 W

No. Geodetic Bearing in Notes  
used Va. 6<sup>30</sup>

Sta. <sup>Chs.</sup>	Dist	Course	Log Cos.	Log Sin	N.	S	E	W.
△ Bow 1934	1.52	N. 67° 15' E	9.587386 0.181844 -1.769230	9.964826 0.181844 0.146670	0.59		1.40	
RM # 1	5.23	N. 42° 30' E	9.867631 0.718502 0.586133	9.829683 0.718502 0.548185	3.856		3.533	
PT # 1	8.90	N. 86° 36' E	8.785675 0.949390 -1.735065	9.999189 0.949390 0.948579	0.543		8.889	
Sec. Cor.					(4.99)		(13.82)	
Tie		N. 70° 09' E			(14.69)			

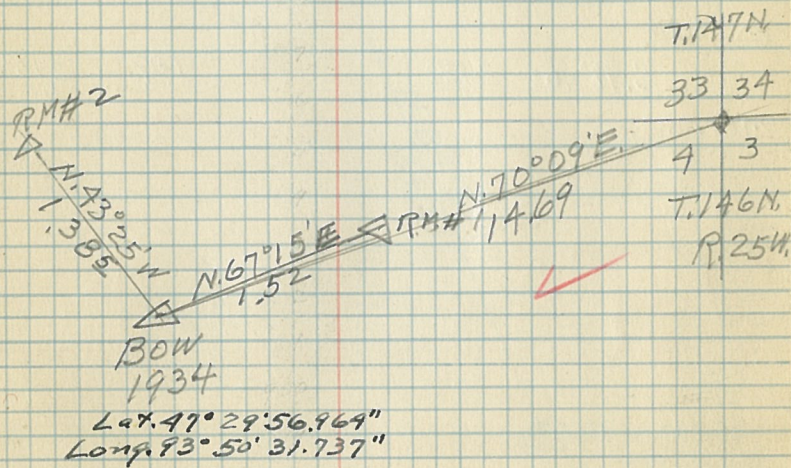
J.A. G. G. G. G.  
11/20/35

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34

△ Bow Located on Knob about 4 chains  
1934 West and South of Mr. Sanderson's  
house

T. 147N  
33 | 34  
Sec. Cor. 4 | 3 Intersection of Roads E and W  
and South.  
T. 146N.  
R. 25W.



Used 6°30' Dec.

Sta	Course	Log Cos	Log Sin	N	S	E	W
Sec. Cor.	S. 3°00'E	9.999404 1.463594 1.462998	8.718800 1.463594 0.182394			29.04	1.52
Pt #1	S. 89°05'E	8.204070 1.098990 -1.303060	9.999944 1.098990 1.098934			0.20	12.56
Pt #2	S. 7°E	9.996751 0.294466 0.291217	9.085894 0.294466 -1.380360			1.96	0.29
Water Tank Deer River							
Tie	N. 24°39'W (34.33)			(31.20)		(14.32)	

Tie - Sec. Cor. to  
Creamy S. 26°28'E, 36.96 (33.09) (16.47)

△ Tank  
S. 48°40'E 2.88 1.89 2.15

□ Cream

J. A. Gjelvang  
11/20/35

Coppier

35

Sec. Cor. 26/25 T. 145N.  
35/36 R. 25W.

⊙ Center of Water Tank  
Deer River  
Lat. 47°20'00.23"  
Long. 93°47'29.25"

26 25  
35 36

N. 24°39'W.  
34.33

⊙ Deer River  
Water Tank  
S. 48°40'E  
2.88

Lat. 47°19'58.99"  
Long. 93°47'27.20"  
Deer River  
Creamy  
Stack.

Used Solar transit.  $\Delta$  5.55' at  $\Delta$  Sta.

Sta.	Course	Log Cos	Log Sin	N	S	E	W
$\Delta$ Grand 1934	S. 32° 48' W	9.924572	9.733765			12.76	8.22
		1.181272	1.181272				
		1.105844	0.915037				
Center $\frac{1}{4}$ Cor. Sec. 18	N. 0° 15' E	9.999996	7.639816			39.00	0.17
		1.591065	1.591065				
		1.591061	-1.230881				
$\frac{1}{4}$ Cor. Tie	N. 17° 03' W (27.46)			(26.24)			(8.05)

J.A. Giehlhandy  
11/21/35

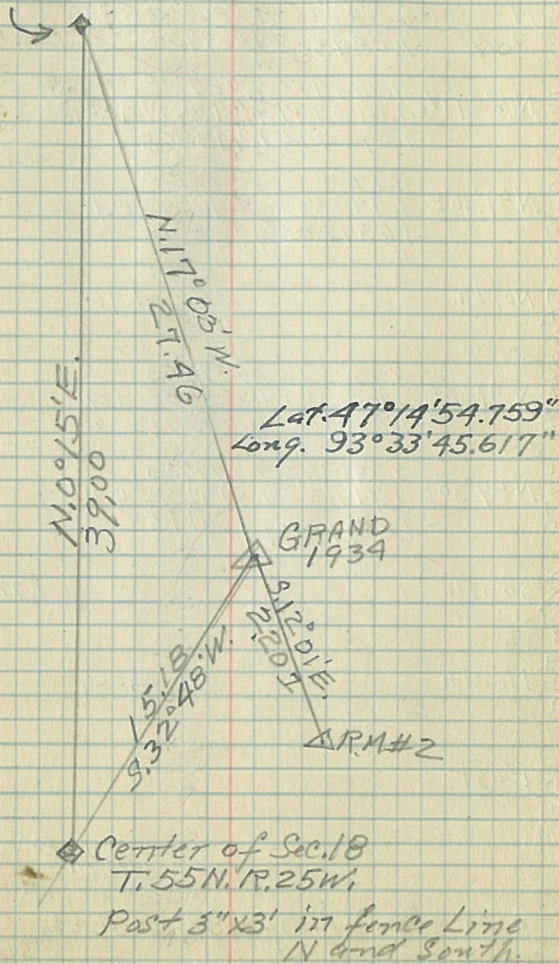
Coppreg

36

$\Delta$  GRAND 1934 Located 82415 N.E. of County Poor farm Brick Building New Home.

Center (Snow and frozen ground didn't take time to dig up R.Marks.)  
 $\frac{1}{4}$  Cor. of Sec. 18 T. 55 N. R. 25 W.

$\frac{1}{4}$  Cor. between Secs. 7-18  
T. 55 N. R. 25 W.



Used Solar Transit.  
Chained twice and Bearing for check.

Sta. C.A. Dist	Course	Log Cos.	Log Sin	N.	S	E	W
Norman Grove	North				0.96		
PT#1 So. Rail	S. 83° 06' E	9.079676	9.996843			3.226	26.653
		1.428944	1.428944				
PT#2 So. Rail	N. 5° 30' W	9.997996	8.981573				3.70
	Pa. 7°	1.586362	1.586362				
1/4 Cor.	N. 16° 09' W	9.997493	9.029918				5.545
		1.613997	1.613997				
Sec. Cor.	N 89° 30' E	7.940842	9.999983				55.00
		1.740363	1.740363				
PT#3		-1.681205	1.740346				
	North				1.42		
Approx 1/4 Cor #4	N 89° 30' E	7.940842	9.999983				42.59
		1.629308	1.629308				
Sec Cor #5	N 89° 30' E	7.940842	9.999983				82.06
		1.914132	1.914132				
PT#6		-1.854974	1.914115				
	South				2.77		
Sec Cor 016	North				38.89		
PT#9	East					5.06	

① Nushik  
L.O.

The Δ Start to 1/4 Cor N. 32° 48' E (35.63) (22.96)

the Δ to Sec Cor N. 12° 49' E (78.46) (76.50) (17.91)

J. A. Gjelhaug  
11/22/35

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37

△ Norway Grove 4" Pipe and Brass Cap  
Mississippi River Commission 1898  
Located 46.418 South of So. Rail G.N.Ry  
on high bank about 643 Ft. East of  
Mile post 144. In good condition

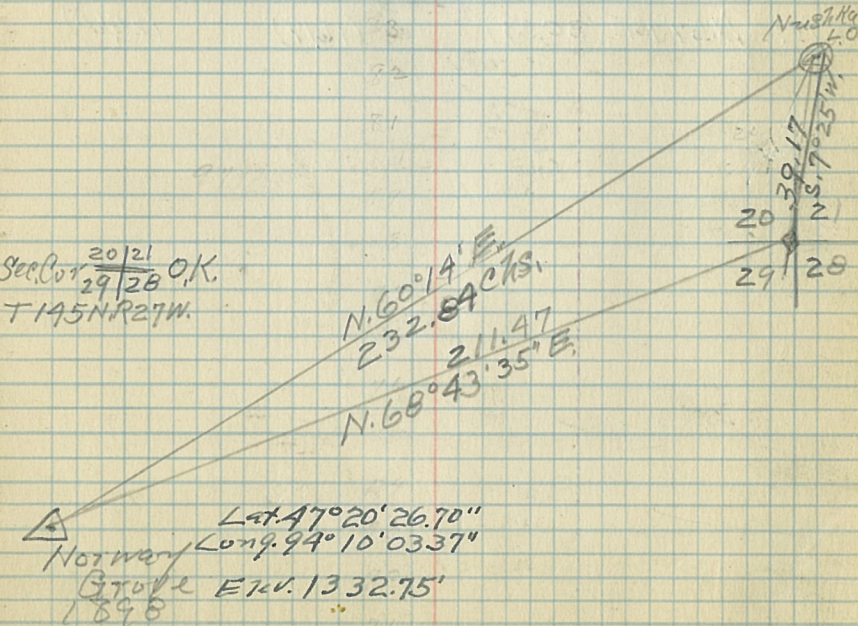
1/4 Cor. betw. Sec's. 25 & 30 (9)  
T. 145 N. R28 R27

Iron pipe 2 1/2" x 2' above Gr.

Sec. Cor. 24 | 19 Iron pipe 2 1/2" x 2' (?)

25 | 30 These Iron Caped  
T. 145 N. R28 R27 W. pipes are not  
marked and a resurvey should be made.

Sec Cor 20 | 21 O.K.  
T. 145 N. R27 W.

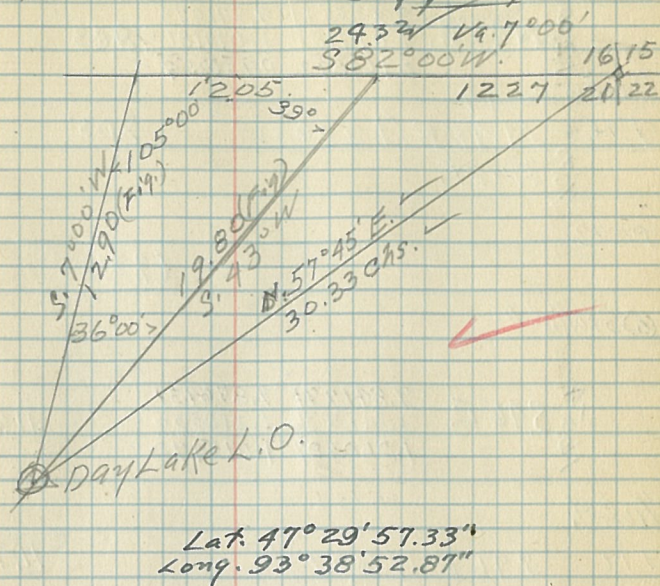


used Transit, Dec. 7<sup>o</sup>

Sta. <sup>Ch.</sup> <sub>Dist.</sub>	Course	Log. Cos.	Log. Sin	N.	S	E	W.
sec. Cor. <sup>1615</sup> <sub>21/22</sub>							
1227	S. 82° 00' W.	9.143555 ✓ 1.088895 ✓ 0.232400 ✓	9.995783 ✓ 1.088895 ✓ 1.087598 ✓	1.71 ✓			12.15 ✓
pt. #1							
1980	S. 43° 00' W.	9.864127 ✓ 1.296465 ✓ 1.160792 ✓	9.833783 ✓ 1.296665 ✓ 1.130448 ✓	14.48 ✓			13.50 ✓
Day Lake L.O.				16.19 ✓			25.65 ✓
pt. #1				1.71 ✓			12.15 ✓
1205	S 82° 00' W.	9.143555 ✓ 1.080987 ✓ 0.224542 ✓	9.995783 ✓ 1.080987 ✓ 1.076770 ✓	1.68 ✓			11.94 ✓
pt. #2							
1206	S 7° 00' W.	9.996751 ✓ 1.110590 ✓ 1.107341 ✓	9.085894 ✓ 1.110590 ✓ 0.196484 ✓	12.80 ✓			11.57 ✓
Day Lake L.O.				16.19 ✓			25.66 ✓
Tie. (N. 57° 45' E) (30.33) ✓				(16.19) ✓			(25.65) ✓

Surveyed by Jennings.  
 Computed by J.A. Jennings. 12/14/35  
 16/15 T. 58 N. R. 26 W.  
 Sec. Cor. 21/22

38



J.A.B.  
 Solar 5/20/36  
 S 89° 40' W. 16 15  
 8.60  
 21 22  
 S 56° 34' W  
 Day Lake L.O.



Sta. <sup>1200</sup> Course N S E W

Stokes L.O.  
<sup>1200</sup> N 48° E 9.82351 9.871073  
 1.079181 1.079181 ✓ 8.03 8.92 ✓  
 0.904692 0.950259 ✓

Quarter Sec. 29

Tie - N 48° E (1200) ✓ 8.03 8.92 ✓

1705

P. 42

Stokes L.O.

<sup>1654</sup> S 46° E 9.841771 9.856934  
 1.218536 1.218536 ✓ 11.49 11.90 ✓  
 1.060307 1.075470 ✓

1/16 cor.

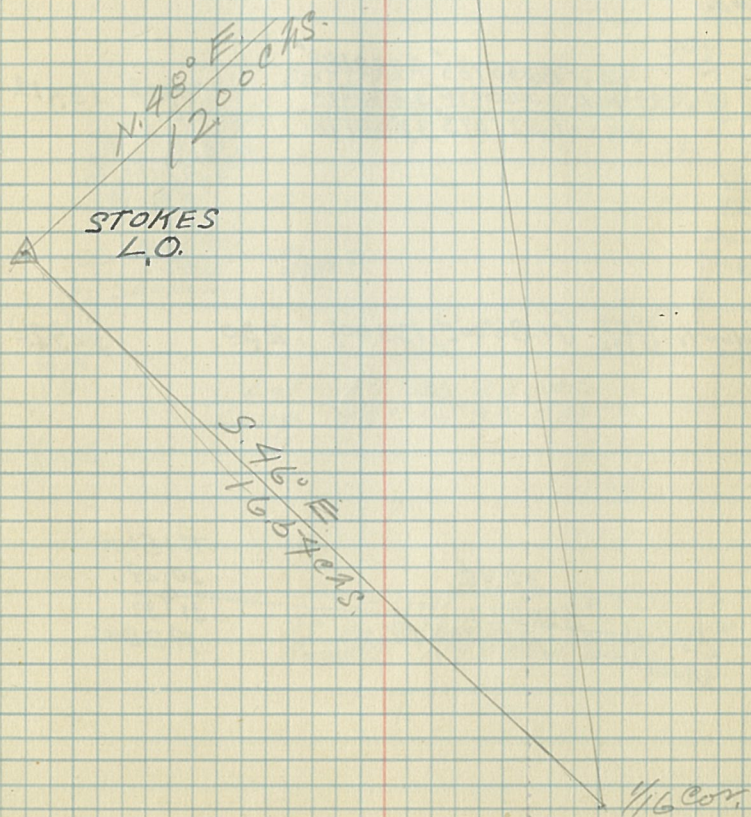
Tie S 46° E (1654) ✓ 11.49 11.90 ✓

Tie made by F.J. Fjosne  
 Surveyor, Const Foreman.

39

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Centerly Cor.  
 Sec. 29  
 T. 60N. R. 26.



used Geodetic Azimuth and Solar Check

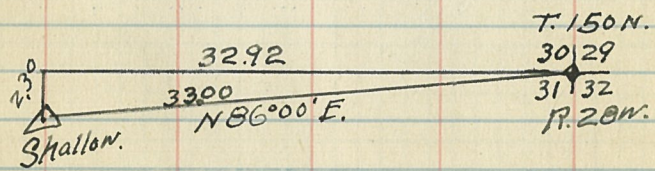
Sta.	Chs. Dist	Course	Log Cos.	Log Sin	N	S	E	W
△ Shallow	3.72	N 42° 21' E	9.868670 2.570543 2.439213	9.828439 2.570543 2.398982			2.75	2.506

Tr. Pt. #1	Chs. Dist	Course	Log Cos.	Log Sin	N	S	E	W
	12.00	S 89° 50' E	7.463726 3.079181 0.542907	9.999998 3.079181 3.079179			0.035	12.00

Tr. Pt. #2	Chs. Dist	Course	Log Cos.	Log Sin	N	S	E	W
	18.42	S 88° 42' E	8.355783 3.265290 1.621073	9.999888 3.265290 3.265178			0.418	18.414

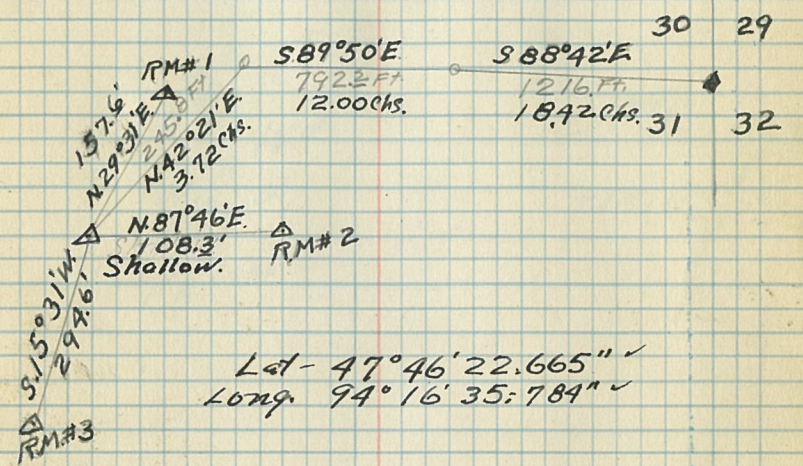
30 | 29  
31 | 32  
T. 150 N.  
R. 23 W.

Tie  
△ Shallow to 1934 30 | 29 31 | 32 (N. 86° 00' E) (33.00) 230 32.92



△ Shallow

J.A. Gjelhaug  
5/19/36



Lat - 47° 46' 22.665"  
Long. 94° 16' 35.789"

Point for Sec Cor.  
is intersection of Sec. Line  
Road Q NTS and West.

5/20/36

$134^{\circ}$   $12'$   $85^{\circ}$   $30'$   
 $S 45^{\circ} W$   $1/4$   $Co.$   
 $\Delta$   $176$   $67$   $chs.$   
 Jessie Lake  
 L.O.

T. 148 N.

33 39

T. 147 N.

4 3

R. 25 W.



Sta. <sup>Ch. Dist</sup> Course Log. Cos. Log. Sine N. S E W.

△ Coleraine L.O. 2.07 East. 2.07

Tr. Pt. #1 Range L.M. 14.24 North. 14.24

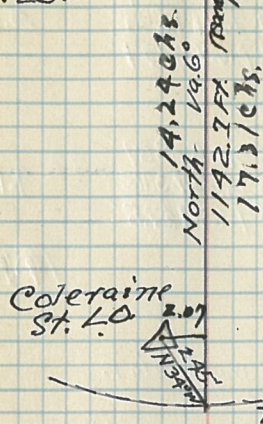
T. 56 N. 36, 31  
T. 6  
T. 55 N.  
R. 25 W. R. 24 W.

Tie (N. 8° 16' E.) (14.39) 14.24 2.07

△ to Twp. Cor.

Coleraine St. L.O. 42  
5/21/36  
LAG, plhang.

36 31  
1 6  
T. 55 N.  
R. 25 W. R. 24 W.



Lat. 47° 16' 48.49" ✓  
Long. 93° 26' 55.09" ✓

Compass 4 1/2" needle  
and 2 ch. tape.

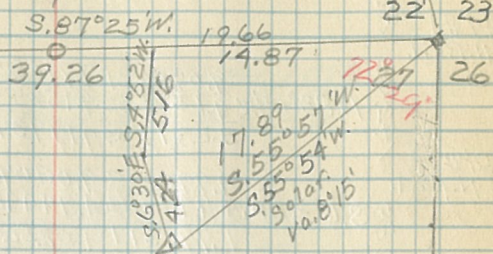
Sta.	Dist.	Course	Log cos.	Log sin	N.	S	E	W.
Tie on Walker L.O. Va. 7°00'								
22/23	27/26		8.653911	9.999558				
	1987	S. 87°25' W.	3.172311	3.172311		0.67		14.86
			1.826222	3.171869				
Pt. #1.	5/16	S. 4°52' W.	9.998431	8.928587		5.19		0.99
			2.712650	2.712650				
			2.711081	1.676239				
Pt. #2	7.24	S. 6°30' E.	9.997199	9.053859		4.21		0.98
			2.627366	2.627366				
			2.624565	1.681225				
Walker L.O.								
Tie = (S. 55°57' W.) (17.89)					10.02		14.82	

Tie (S. 55°55' W.) checked with Solar.

Walker L.O. Survey 5/28/36

43

22 Brass Cap.  
G.L.O. 19.60  
1/4 cont. 19.60  
27



Sec. 27

T. 143 N. R. 31 W.

87° 25'  
55 57  
-----  
31° 28'

17.89  
17.89  
-----  
10.02  
21.47

5) 4.46  
4.  
-----  
46  
99  
-----  
88

Sta. <sup>Dist. <sub>to</sub></sup>	Course	Log cos	Log sin	Lat.		Dep.	
				N.	S	E.	W.
Δ Ball.		9.999564	8.651102				
Pt #1 N. Rail.	S. 2° 34' W.	2.942008	2.942008		8.74		0.40
		2.941572	1.593110				
Pt #2 N. Rail.	N. 83° 07' W.	9.078631	9.996858				
		4.152532	4.152532	17.03		141.06	
Pt #3 N. Rail.	S. 6° 55' W.	9.996828	9.080719		0.87		0.11
		1.944483	1.944483				
Δ Mississippi 1898		1.941311	1.025202				
				7.42		141.57	

2 checks on New Δ Ball 1934  
with Old Δ Mississippi and Divide 1898 44  
5/22/36

Solar Transit & 2 chain tape  
used Geodetic Azimuth.  
Checked with Solar.

Fm. Δ Ball 1934 to Δ Mississippi 1898  
Lat. 47° 19' 26.919"  
Long. 93° 56' 09.869"  
Lat. 47° 19' 29.340"  
Long. 93° 58' 23.450"

North. 3.75 chs. West. 139.44 chs.  
Actual N. 7.42 "  
Diff. N. 3.67 Actual W. 141.57 "  
Diff. W. 2.13

Sta.	Course	Log cos	Log sin	Lat.		Dep.	
				N.	S	E.	W.
Δ Ball.							
Pt #1 N. Rail.	S. 2° 34' W.				8.74		0.40
Pt #2 N. Rail.	N. 83° 07' W.	9.078631	9.996858				
		4.507195	4.507195	38.53		319.19	
Pt #3 N. Rail.	S. 6° 55' W.	9.996828	9.080719		0.53		0.06
		1.944483	1.944483				

Fm. Ball Δ 1934 to Divide Δ 1898  
Lat. 47° 19' 26.919"  
Long. 93° 56' 09.869"  
Lat. 47° 19' 43.430"  
Long. 94° 01' 14.180"

North 25.52 chs. West 317.63 chs.  
Actual N. 29.26 "  
Diff. N. 3.74 Actual W. 319.65 "  
Diff. W. 2.02 "

Sta.	Course	Log cos	Log sin	Lat.		Dep.	
				N.	S	E.	W.
Δ Divide 1898				29.26		319.65	
Δ Divide 1898	N. 6° 55' E. 0.45			0.44		0.05	
T. Pt #1				4.69		38.92	
" " #2	N. 83° 07' W. 39.20				28.02	0.12	
36.31	S. 0° 15' E. 28.02						
1	T. (T. Δ S. 59° 27' W. 44.99)			22.87		38.74	

7.77 chs. East of Mile Post 137  
Divide

Lat. 47° 19' 46.012"  
Long. 94° 01' 16.053"  
Index No. 3086  
R. 27m T. 26m S. 59° 27' W. 44.99 chs.  
T. 145N  
36.31  
T. 144N.



Sta.	Course	Log Cos	Log Sin	N.	S.	E.	W.
△ SPANG		9.459688	9.981171				
1.98	N.73°15'E	2.170262	2.170262	0.421		1.417	
1.629950		2.151933					
Tr. # 1		9.299655	9.991193				
2.60	S.78°30'E	2.419973	2.419973		0.518	2.548	
1.714628		2.406166					
Tr. # 2		9.841771	9.856934				
2.68	S.46°00'E	2.670246	2.670246		3.251	3.365	
2.512017		2.527180					
# 3		8.753528	9.999301				
4.78	S.86°45'E	2.679428	2.679428		0.271	4.773	
1.432956		2.678729					
# 4		9.317879	9.990404				
1.62	S.78°00'E	2.209515	2.209515		0.337	1.585	
1.527394		2.199919					
# 5		9.459688	9.981171				
2.75	N.73°15'E	2.439333	2.439333	0.792		2.633	
1.899021		2.422504					
# 6		9.668027	9.946937				
3.98	N.62°15'E	2.599883	2.599883	1.852		3.522	
2.267910		2.546820					
# 7		9.376003	9.987372				
2.69	S.76°15'E	2.429752	2.429752		0.637	2.613	
1.805755		2.417124					
# 8		9.412996	9.989944				
4.50	S.75°00'E	2.653213	2.653213		1.165	4.347	
2.066209		2.638157					
# 9		9.391206	9.986427				
1.82	N.75°45'E	2.260071	2.260071	0.448		1.768	
1.651277		2.246498					
# 10		9.453342	9.981737				
4.33	S.73°30'E	2.636488	2.636488		1.232	4.152	
2.089830		2.618225					
# 11		9.625948	9.957276				
3.32	S.65°00'E	2.521138	2.521138		1.403	3.009	
2.147086		2.478414					

3.521 8819 35.728  
 2.3521  
 5.293

Sta.	Course	Log Cos	Log Sin	N.	S.	E.	W.
△ SPANG		8.981573	9.997996				
3.65	S.84°30'E	2.562293	2.562293		0.352	3.632	
1.543866		2.560289					
Tr. # 12		9.668027	9.946937				
1.98	S.62°15'E	2.170262	2.170262		0.689	1.310	
1.838289		2.117199					
# 14		8.718800	9.999404				
4.29	S.87°00'E	2.632457	2.632457		0.225	4.284	
1.351257		2.631861					
# 15		9.280599	9.991947				
5.32	S.79°00'E	2.725912	2.725912		1.015	5.222	
2.006511		2.717859					
# 16		9.600700	9.962398				
3.90	S.66°30'E	2.591065	2.591065		1.555	3.576	
2.191765		2.553463					
# 17		9.692339	9.939697				
4.77	S.60°30'E	2.678518	2.678518		2.349	4.152	
2.370857		2.618215					
# 18		9.899467	9.784447				
2.87	S.37°30'E	2.457882	2.457882		2.277	1.747	
2.357349		2.242329					
# 19		9.962398	9.600700				
5.22	S.23°30'E	2.717671	2.717671		4.787	2.081	
2.680069		2.318371					
# 20		9.841771	9.856934				
5.68	S.46°00'E	2.754348	2.754348		3.945	4.085	
2.596119		2.611282					
# 21		9.976957	9.501476				
5.53	S.18°30'E	2.742725	2.742725		5.244	1.755	
2.719682		2.244201					
# 22		9.998659	8.894643				
5.73	S.4°30'E	2.734800	2.734800		5.412	0.426	
2.733459		1.629443					
# 23		9.983917	9.426899				
4.76	S.15°30'E	2.677607	2.677607		4.587	1.272	
2.661518		2.104506					
# 24							

3243233594

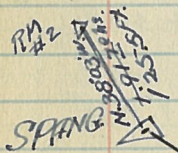


△ SPANG continued Va. G. 20° 11/17/36

Sta.	Course	Log Cos	Log Sin	N	S	E	W
Tript #24	S. 5° 15' E.	9.998174	8.961429		4.44	0.408	
#25		2.649335	2.649335				
		2.647509	1.610764				
#26	S. 23° 30' E.	9.962398	9.600700		4.686	2.032	
		2.708421	2.708421				
		2.670819	2.309121				
#27	S. 11° 00' W.	9.991947	9.280599		4.898		0.952
		2.698101	2.698101				
		2.690048	1.978700				
#28	S. 19° 30' W.	9.974347	9.523495		2.894		1.025
		2.487138	2.487138				
		2.461485	2.010633				
#29	S. 20° 45' E.	9.970874	9.549360		4.582	1.736	
		2.690196	2.690196				
		2.661070	2.239556				
#30	S. 42° 00' E.	9.871073	9.825511		4.578	4.122	
		2.789581	2.789581				
		2.660654	2.615092				
#30	S. 40° 15' E.	9.882657	9.810316		3.885	3.282	
		2.706718	2.706718				
		2.589375	2.517034				

19120  
3029 T. 53 N. P. 26 W.  
Ash Post 4" x 3"  
Basswood 10" N 56" W. 94  
Scribed Post 10" x 10"

used Goodrich Az. to set  
Dir. of Compass.



Lat. 47° 04' 11.066"  
Long. 93° 41' 46.009"  
U.S.C. & G.S. 1934

△ - Tript. 1 - S 81° 36' E 36.12

T. 11 - T. #2 S 46° 00' E 46.66

#2 - 3029 S 17° 45' E 31.47

The Δ  $\frac{19120}{3029}$  S 49° 23' E (103.93)

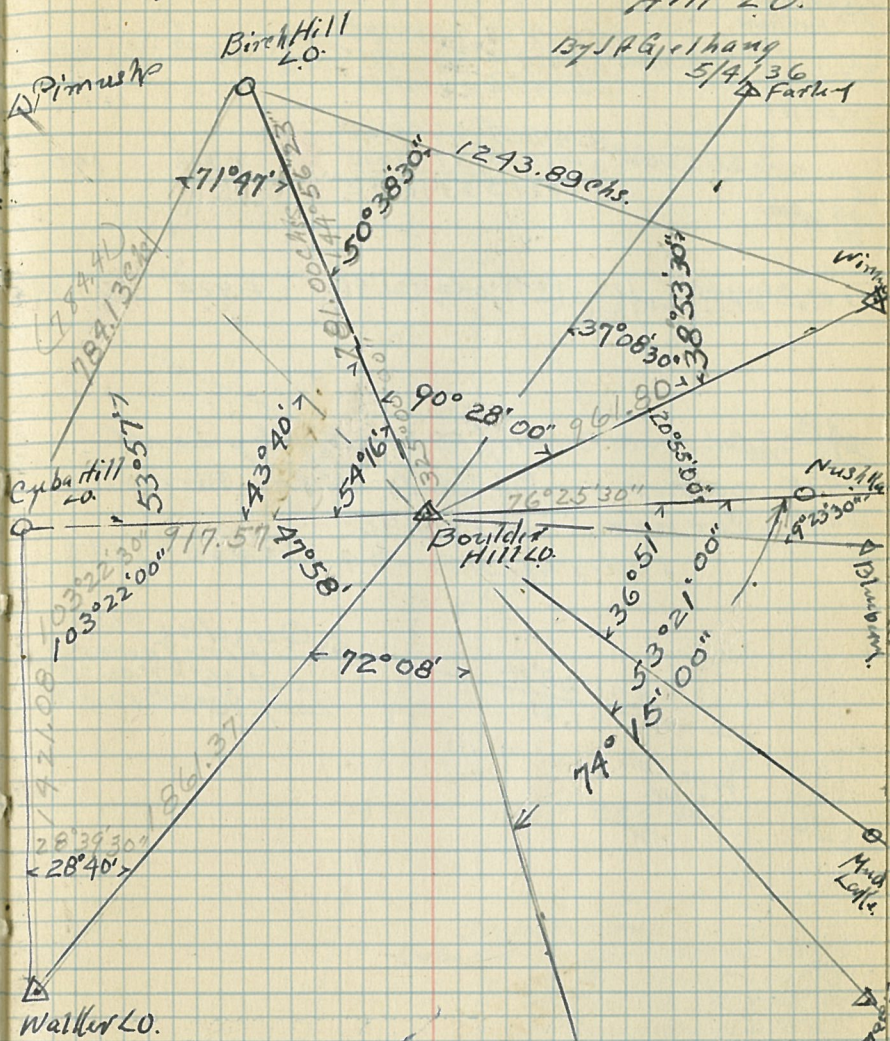
5282 3578

32.412 33.564

29.972 9.592

67.692 78.888

Angles turned with transit from Boulder Hill L.O.



Boulder Hill to Birch Hill 1325.30'

" " " " " " 76° 53'

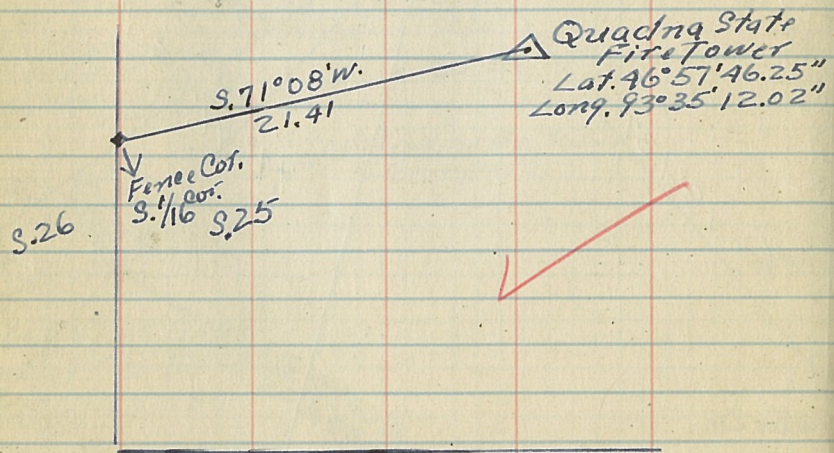
" " " " " " 113° 44'

△ Boulder Hill to Mud Lake

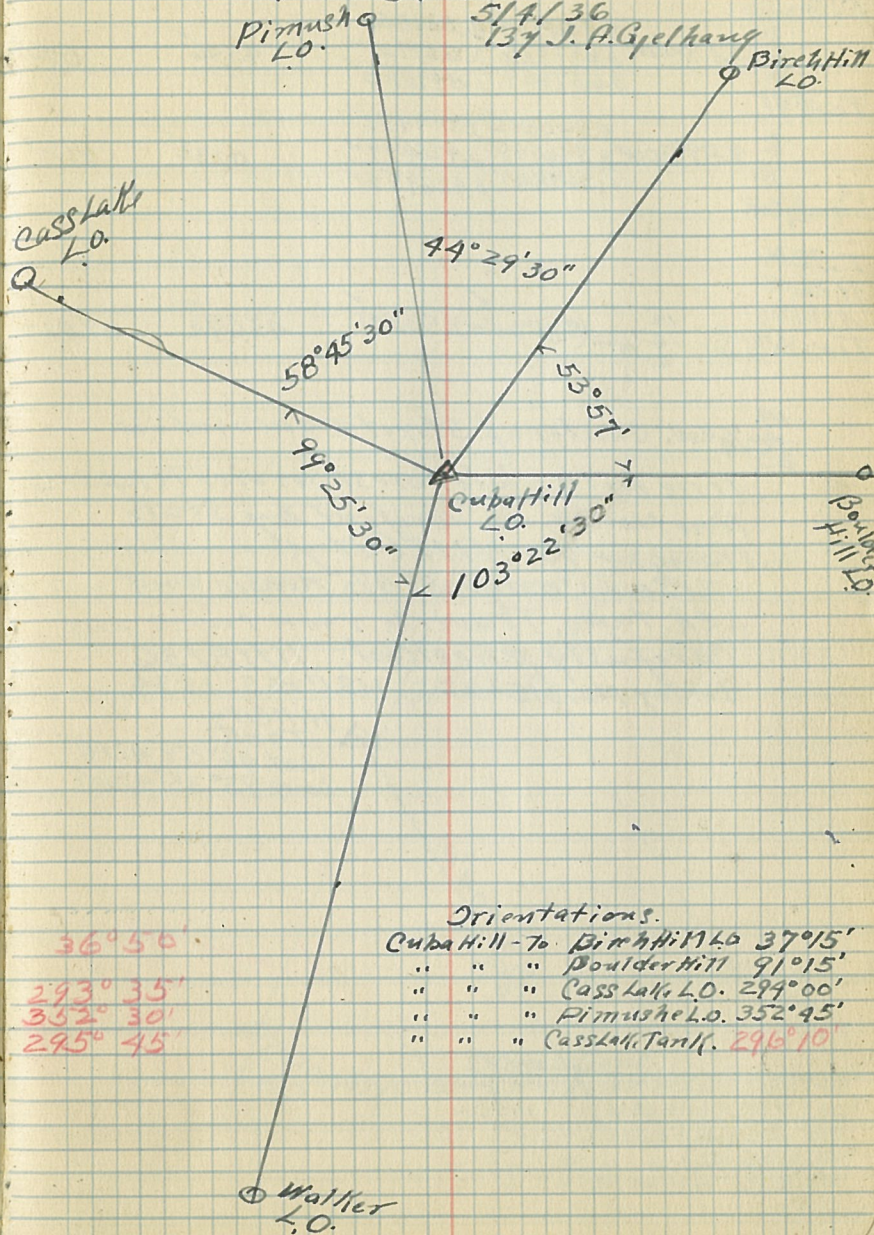
Quadra Fire Tower Va. 6°20'  
Compass 9 1/2" Needle

Sta.	Course	Log cos.	Log sin	N	S	E	W.
△ Quadra Fire Tower	3.93°00'W	9.864123 2.960471 2.824598	9.833783 2.960471 2.794254	✓	✓	6.673	6.227
Tript. #1	5.89°00'W	8.241855 3.147058 1.388913	9.999434 3.147058 3.146992	✓	✓	0.245	14.03
Tie: △ Quadra FT.	125/16 S. (3.71°08'W) (21.41)			✓	✓	6.922	20.257

26 1/2 S. 1/16 Cor. Fence Corner, as Verified by Land  
T. 52N. Owner in Sec. 26 to be the correct  
R26W. Corner 11/18/36  
4:12 PM. Index No. 315. - 24 U.S.C. & G.S. 1934



Angles turned with transit  
From Cuba Hill L.O.



Orientations.

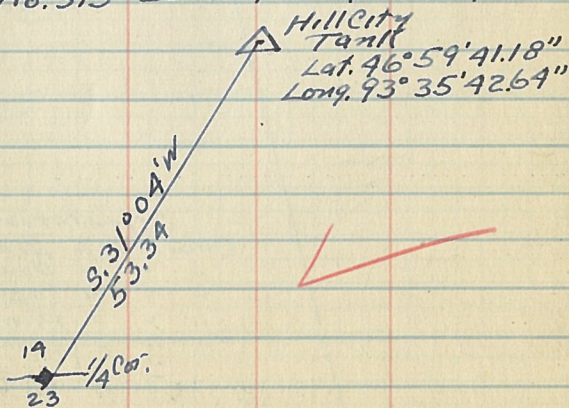
Cuba Hill - to Birch Hill L.O.	37°15'
" " " Boulder Hill	91°15'
" " " Cass Lake L.O.	299°00'
" " " Pimushe L.O.	352°45'
" " " Cass Lake Tanff.	296°10'

36°50'  
293°35'  
352°30'  
295°45'

Hill City Water Tank  $\vee 6^{\circ}20'$

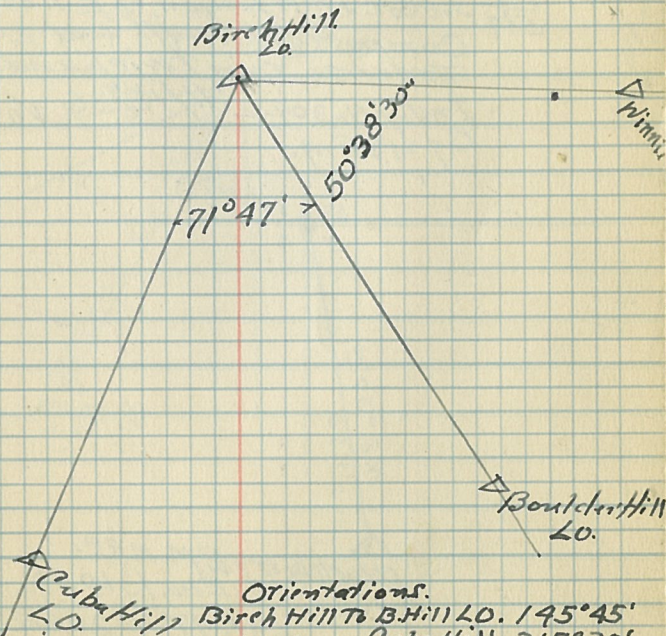
Sta.	Course	Log Cos.	Log Sin	N	S	E	W
$\Delta$ Hill City Tank	$3.1^{\circ}00'W$	$9.999934$	$8.241865$				
		$3.657725$	$3.657725$			45.46	0.794
		$3.657659$	$1.899580$				
Tript #1	$9.89^{\circ}30'W$	$7.940842$	$9.999983$				
		$3.426999$	$3.426999$			0.233	26.73
		$1.367841$	$3.426982$				
$\frac{1}{4}$ Cor.							
T. 52N.							
R. 26W.							
4th PM							
Tript #2	$\frac{1}{4}$ Cor. $(9.31^{\circ}04'W)$					45.693	27.524

$\frac{1}{4}$  Cor. Center of Street E & W and in line with State Forest Service Telephone line North, as verified by State Ranger in Hill City. Used Compass  $4\frac{1}{2}$ " needle and 2 ch. tape. Traverse run twice and carefully checked. 11/18/36  
Index No. 315-20 U.S.C. & G.S. 1934



Angles turned from Birch Hill L.O.  
5/5/36  
J.A. Gjelhaug

49



Orientalions.  
Birch Hill to B. Hill L.O.  $145^{\circ}45'$   
" " " Cuba Hill  $217^{\circ}30'$   
" " " Cass Lake Tank  $246^{\circ}00'$   
" " " " " L.O.  $246^{\circ}30'$   
" " " " " Pimishic  $303^{\circ}30'$

Sta. <sup>CAS.</sup> <sup>DIST</sup>  $\Delta$  Blackberry 1898 M.R. Com.  
 Course Logcos Logsin N S E W.

$\Delta$  Blackberry  
1898

1.64 East.

1.64

Tr. Pt. #1

39.66

N.0°15'E.

9.999996

7.639816

3.598353

1.238169

39.66

0.173

32133 Sec. Cor.

514

T. 54 N. P. 24 W.

4th P.M.

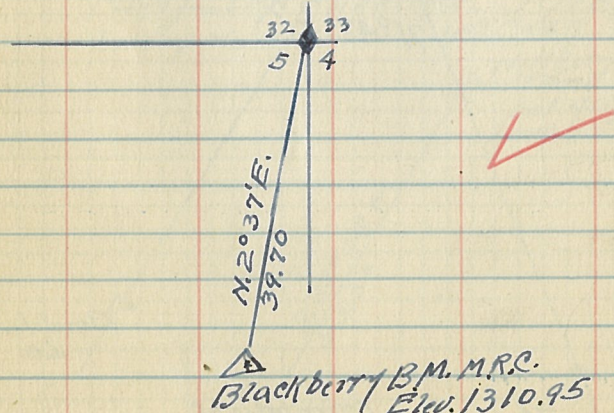
$\Delta$  Blackberry  
1898

32133 (N.2°37'E) (39.70)

39.66

1.813

32133 Sec. Cor. Intersection of Q Road E, W-N-S.  
 514 Compass 4 1/2" Needle and 2ch. tape  
 Traverse run twice and carefully.  
 Index No. 309-2 11/18/36 Va. 6°20'  
 By U.S. Eng.



Blackberry B.M. M.R.C.  
 Elev. 1310.95

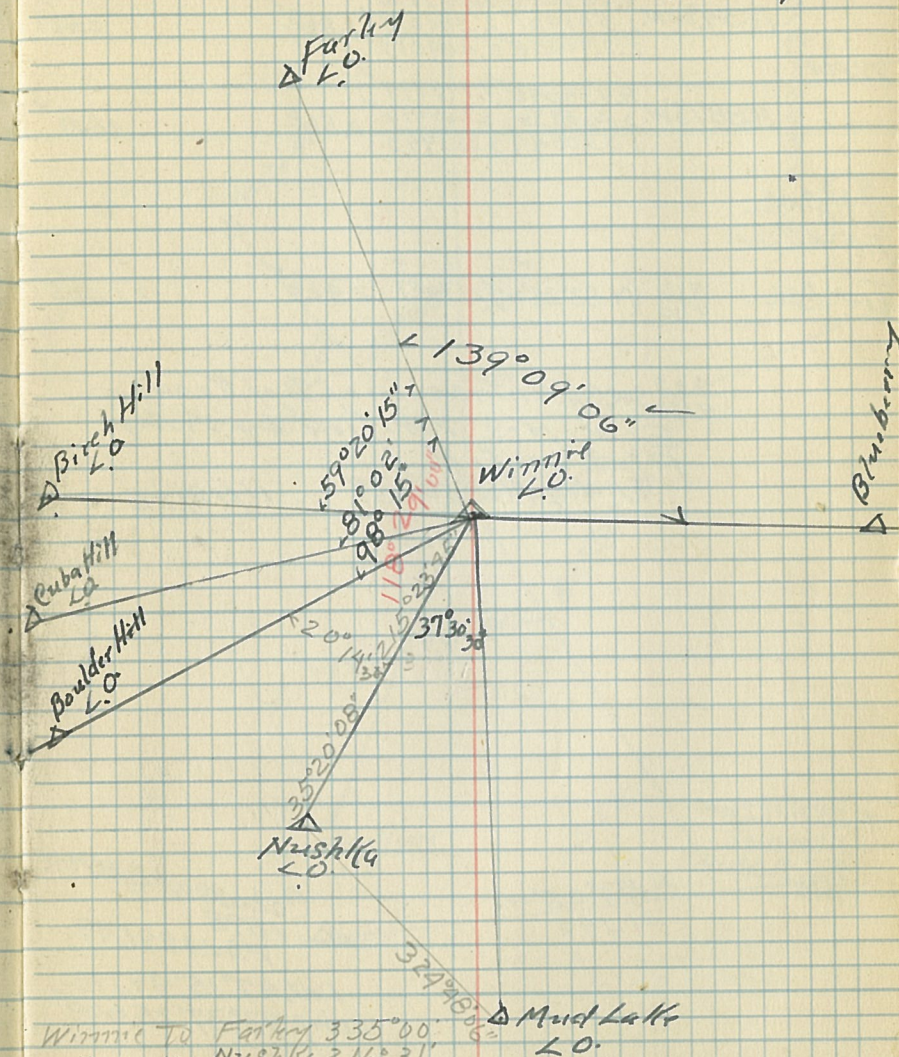
Lat. 47°11' 20.622"  
 Long. 93°24' 24.044"

Angles turned fm. Winnie L.O.

50

5/7/36

JAGjelhaug



Winnie To Farley 335°00'  
 " " Nushka 216°31'  
 " " Mud Lake 161°79'00"  
 " " Boulder Hill 236°45' Farley To Winnie 159°15'

Sta. <sup>Ck. Dist.</sup> <sup>1898</sup>  $\Delta$  Cohasset B.M. M.R.C. 1898  
 Course Log Cos. Log Sin N. S E W.

$\Delta$  Cohasset 1898  
 1895 317  
 N. 54° 00' W. 9.769219 9.907958  
 2.501059 2.501059 1.863  
 2.270298 2.409017 2.562  
 Tip #1  
 N. 88° 15' W. 8.484848 9.999797  
 3.265996 3.265996 0.562  
 1.750844 3.265993 18.44

$\frac{4}{9}$  Sec. Cor.  
 7.55 N. R. 26 W.

Tip  $\Delta$  Sta -  $\frac{913}{910}$  (N. 83° 25' W.) (21.145) 2.926 21.005

$\frac{4}{9}$  Sec. Cor. Intersection of  $\phi$  of Roads  
 E-W-N-S. Verified by Village  
 Plat on fill.  
 Index No. 309-7 11/18/36

T. 55 N. R. 26 W.

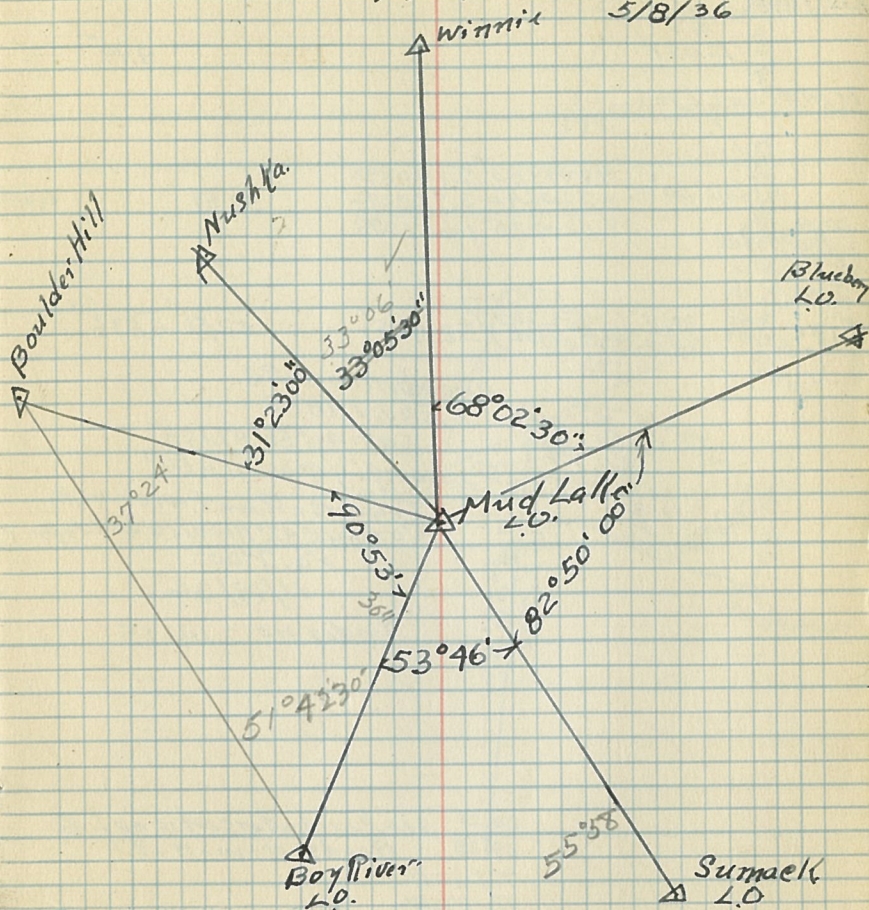
$\frac{4}{9}$  Sec. Cor.  
 $\frac{910}{910}$

N. 83° 25' W.  
 21.145

$\Delta$  Cohasset B.M. M.R.C.  
 1898  
 Elev. 1291.49  
 Lat. 47° 15' 49.196  
 Long. 93° 37' 25.658

Angles turned with Transit  
 From Mud Lake L.O. 5/8/36

51



Nushka to Winnic L.O. 36° 00' ✓  
 " " Mud Lake 145° 30' ✓  
 " " Boulder Hill 257° 09' ✓

Mud Lake L.O. to Nushka - 325° 30' ✓  
 " " Boulder Hill 299° 07' ✓  
 " " Boy R. 203° 14' ✓  
 " " Sumack 149° 28'

Chamberlin M.R.C. 1898 Va. 700'

Sta. <sup>Chs. Dist</sup> Course Log Cos Log Sin N S E W.

Chamberlin  
1878

4.99 East

4.99

Tr. pt. #1 Sec. line

52.51

90°30'W. 9999983 7.940842  
3.720242 3.720242 52.51 0.458

20/21  
29/28  
T. 140N.  
R. 32W.

3.720225 1.661084

Tie Sta. <sup>20/21</sup>/<sub>29/28</sub> (S. 4°56'E) (52.705) 52.51 4.532

Chamberlin M.R.C.  
Elev. 1489.5  
Lat. 46°55'47.178"  
Long. 94°44'41.456"  
Traverse Run twice with  
Compass 4 1/2" Needle & 2 ch tape.  
Va. 700'  
11/19/36  
Index No. 314-15

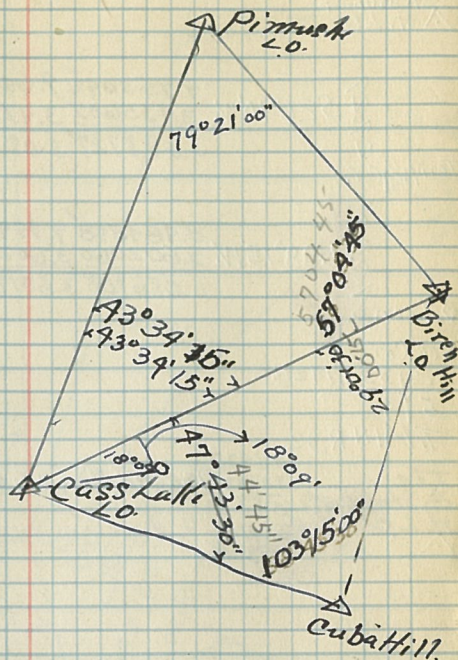
9.4°56'E  
52.705

20/21 Sec. Cor. Intersection of  
29/28 Roads. E-W-N-S.  
T. 140N.  
R. 32W.  
5th PM.

Station located on the  
NW Edge of J. Pine grove  
5 chs. W. of Road on  
The highest part of Ridge.  
Buildings all gone.

Angles turned from Cass Lake L.O.  
5/9/36

52



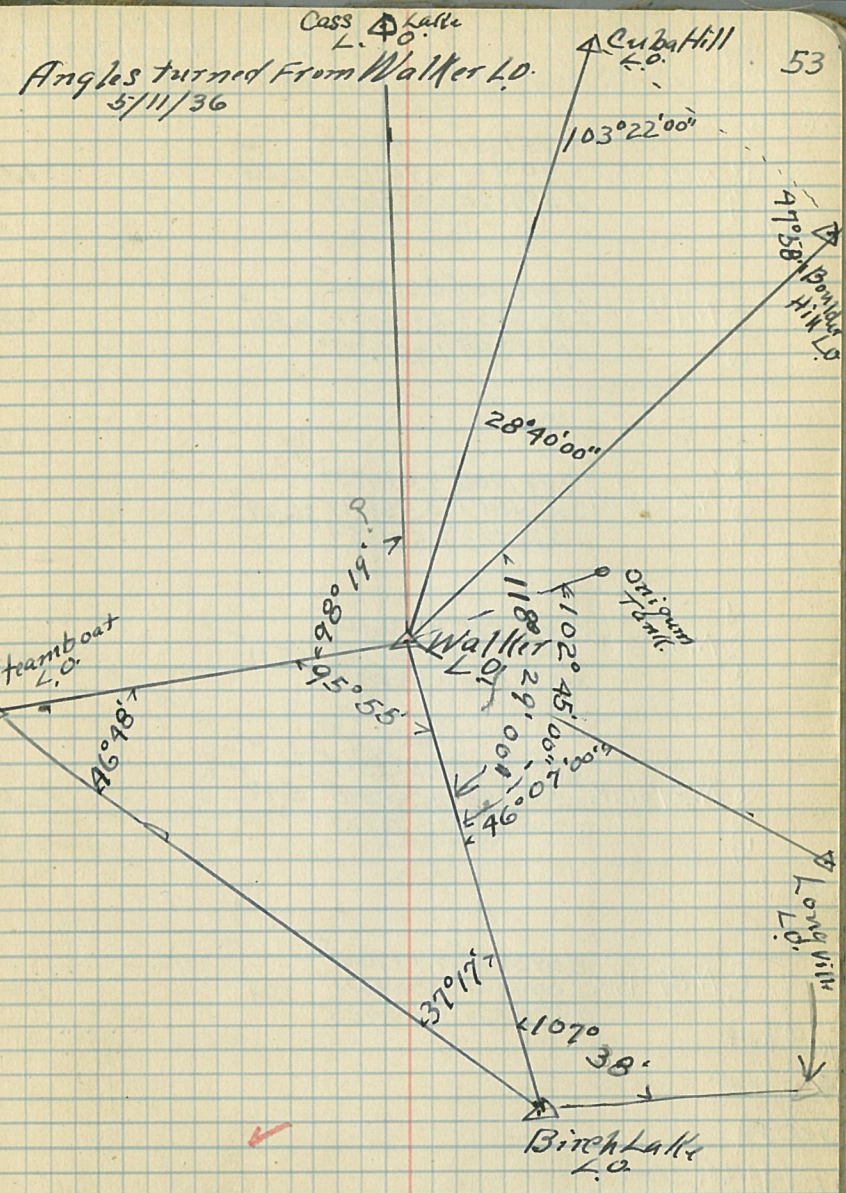
Present Readings

Orientations.

22°00'	22°45'	Cass Lake L.O. To Pimush	22°45'
65°30'	66°19'	" " " " Birch Hill	66°15'
113°15'	114°02'	" " " " Cuba Hill	119°00'

Tie of Steamboat L.O. State Va. 7°45' checked with Solar.

Sta.	Course	Log cos	Log sin	N	S	E	W
Steamboat St. L.O.		9.953042	9.644423				
	S 26° 10' W	3.435685	3.935685		24.48		12.02
		3.388727	3.080108				
Temp/Cor.							
Iron p.							
Sec. Cor.							
Tie Steamboat St. L.O.	T. 142 N 32 33 (S 65° 54' W) (56.97)				23.26		52.00
	T. 141 N 5 14						
	T. 141 N 18 32						



Tie of Longville L.O. 6/31/36  
 Solar Transit V. 8<sup>th</sup>  
 Course Log cos Log sin N S E W.

Angles turned at Longville L.O.  
 5/12/36 J.A.G. + 1 haug.

Longville L.O.  
 2.63  
 N. 26° 30' W. 9.951791 9.649527 ✓  
 2.403121 2.903121 2.26  
 2.354912 2.052648 1.13

Pt # 1  
 6.87  
 N. 4° 43' W. 9.998527 8.915022 ✓  
 2.836957 2.836957 6.85  
 2.835484 1.751979 0.56

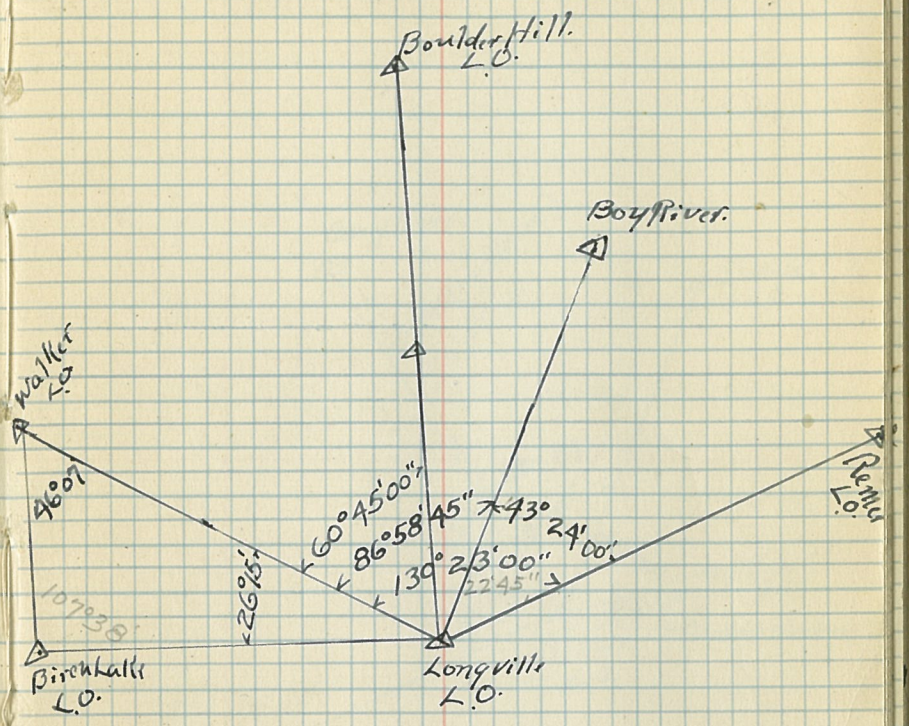
Pt # 2  
 36.46  
 N. 5° 53' W. 9.997706 9.010737 ✓  
 3.561817 3.561817 36.27  
 3.559523 2.572554 3.74

Pt # 3  
 18.02  
 N. 33° 00' W. 9.923591 9.736109 ✓  
 3.255155 3.255155 15.11  
 3.179346 2.992864 9.81

Pt # 4  
 5.86  
 N. 21° 00' W. 9.970152 9.554329 ✓  
 2.767898 2.767898 5.47  
 2.738050 2.322227 2.10

Pt # 5  
 0.1  
 N. 87° 45' W. 8.593948 9.999665 ✓  
 2.004321 2.004321 0.04  
 0.598269 2.003986 1.01

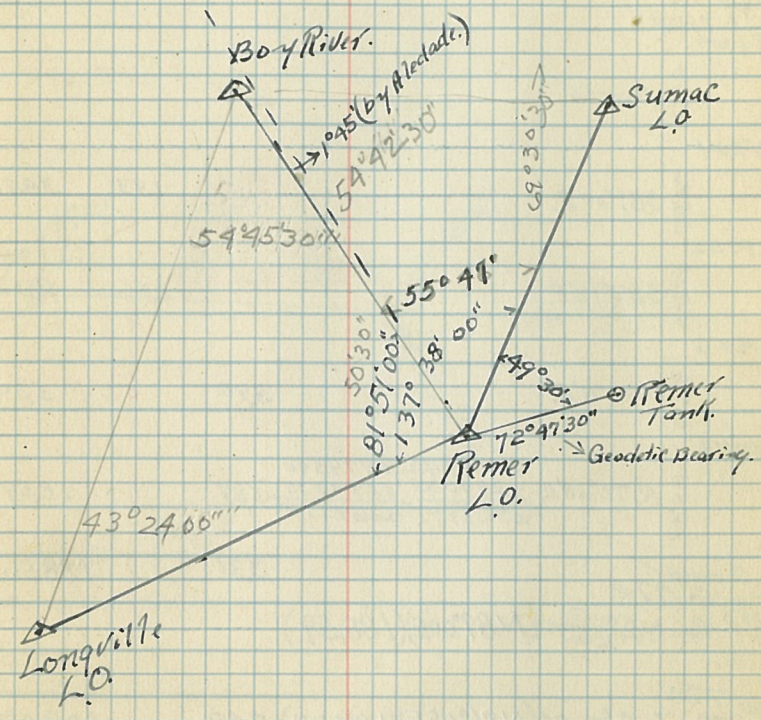
Iron King Bolt  
 1/4 Cor.  
 Sec 34  
 T. 14 N. R. 20 W.  
 Tie Δ. at ΔC 1/4 (N. 15° 32' W) (68.50) 66.00 ✓  
 Longville L.O. 5.34 18.35





△ Boulder Hill L.O.

Angles turned From REMER L.O.  
5/12/36  
J. A. Gehring.



Orientation for Boy River L.O.		Orientation of Remer L.O.	
△ To Mud Lake L.O.	23°00'	△ To Remer Tank	73°00' ✓
" To Remer L.O.	148°00' ✓	" To Sumac L.O.	23°30' ✓
" To Sumac L.O.	93°15' ✓	" To Boy River L.O.	327°45' ✓

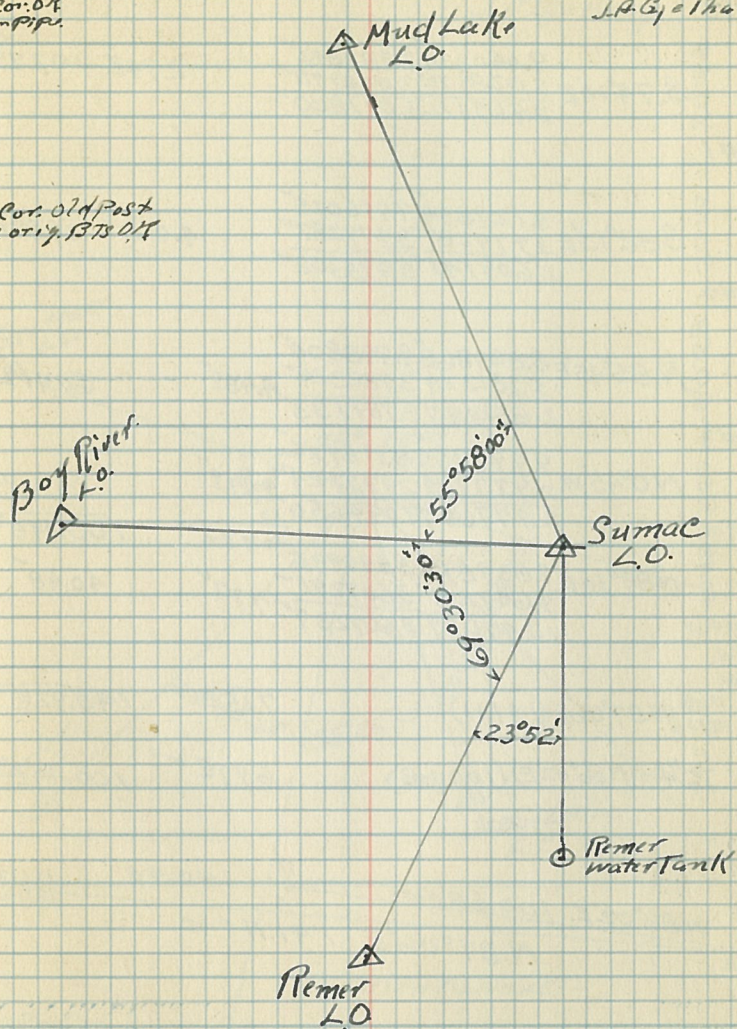
Sta. Chk. Dist.	Course	Log cos.	Log sin	N	S	E	W.
T. 143N 33 3/4 Sec 41 3/4 Cor. R. 26W.	S 87° 00' E.					4.17	79.59
Tr. Pt #1							
2.37	South.				2.37		
34 3/4 T. 143N 31 2 T. 142N R. 26W.							
2.37	North.			2.37			
Tr. Pt. #1							
38.96	S 87° 10' E.				1.93	38.91	
Tr. Pt #2							
48.28	S 87° 12' E.				2.36	48.22	
Tr. Pt. # 3							
6.76	N. 29° 11' E.			5.90		3.30	
Tr. Pt. #4							
19.50	N. 72° 28' E.	9.478942 3.290035 2.768977	9.979340 3.290035 3.269375		5.87	18.59	
$\Delta$ Sumac L.O. Tie				3.31		188.56	
33 3/4 Sec. Cor. to $\Delta$ Sumac L.O.	(N 89° 00' E) (188.59)						
34 3/4 T. 143 31 2 Sec. Cor. To $\Delta$ Sumac L.O.	(N 86° 05' E) (109.27)			7.48		109.02	

## Angles turned from SUMAC L.O. 56

See Cor. Old  
Tie Pipe.

5/13/36  
J. A. Gjelhaug

See Cor. Old Post  
+ 2 orig. B.T.S. Old



### Orientation for Sumac

- $\Delta$  To Boy River L.O. 272° 30'
- " " Mud Lake L.O. 328° 30'
- " To Remer L.O. 203° 00'
- " To Remer Tank 179° 08'

Sta. <sup>chs.</sup> <sup>Dist</sup> Course Log Cos Log Sin. N S E W.

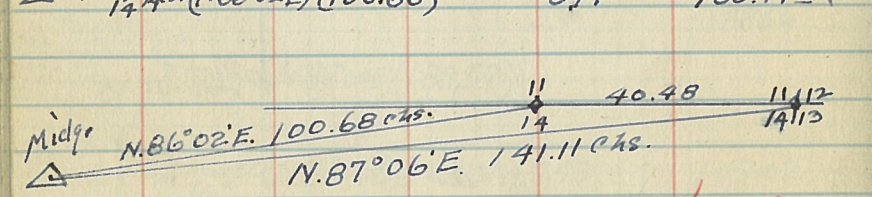
△ Midge 1898  
 10.69 S.74°00'E.  $\frac{9.440338 \quad 9.982842}{3.028978 \quad 3.028978}$  2.947 10.278  
 $\frac{2.467316 \quad 3.011820}{}$

Tr.pt#1  
 30.15 S82°15'E.  $\frac{9.129854 \quad 9.996015}{3.779287 \quad 3.479287}$  4.065 29.875  
 $\frac{2.609141 \quad 3.475302}{}$

Tr.pt#2  
 60.58 N.85°45'E.  $\frac{8.869868 \quad 9.998804}{3.782329 \quad 3.782329}$  4.481 60.414  
 $\frac{2.652197 \quad 3.781133}{}$

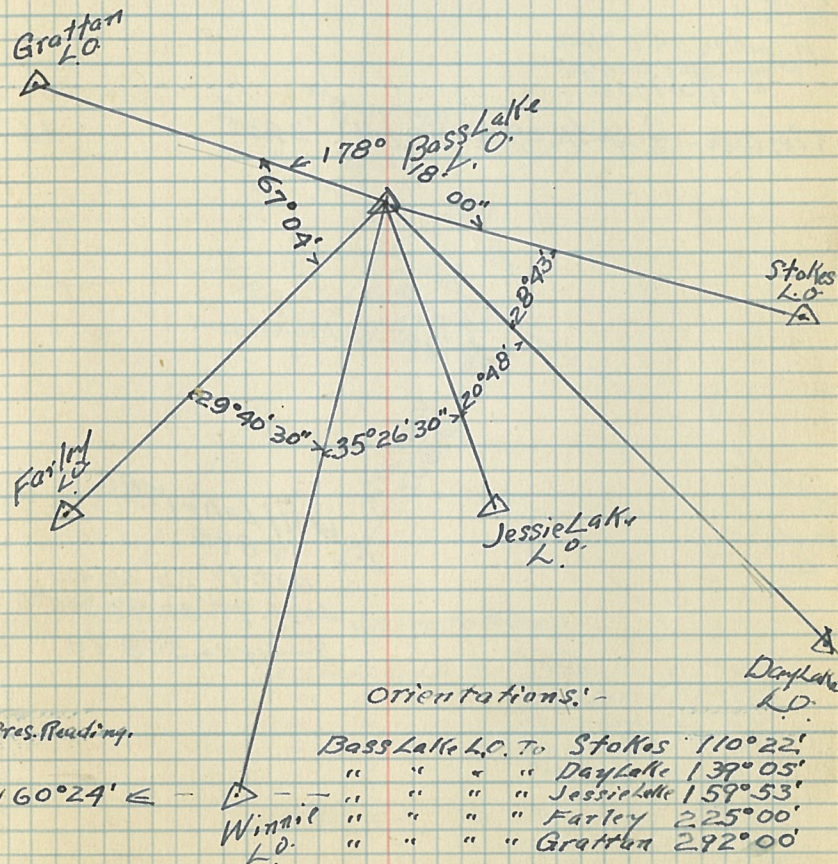
Tr.pt#3  
 9.50 N.0°45'W.  $\frac{9.999963 \quad 8.116926}{2.977724 \quad 2.977724}$  9.492 0.124  
 $\frac{2.977687 \quad 1.094650}{}$

11/12 See Cor.  
 14/13 T. 145 N.  
 R. 32 W.  
 △ Sta. -  $\frac{11}{14}$  (N.87°06'E) (141.11) 7.152 140.923  
 △ Sta. -  $\frac{11}{14}$  (N.86°02'E) (100.68) 6.975 100.442



11/14 cor. Intersection of Road E-W and South.  
 11/12 See Cor. Intersection of Road E-W.  
 14/13 Iron pipe in center of Road as pointed out by Land Owner Living near.

Angles turned at Bass Lake L.O. 57  
 5/19/36  
 J. R. Gjolhaug



Pres. Reading.

160°24' ←

Orientations:-

Bass Lake L.O. to Stokes 110°22'  
 " " " " Day Lake 139°05'  
 " " " " Jessie Lake 159°53'  
 " " " " Farley 225°00'  
 " " " " Gratton 292°00'

Gratton L.O. to Bass Lake 112°30'  
 " " " " Farley 188°15'

Sta. <sup>Chs. Dist</sup>  $\triangle$  Wolf Lake M.R.C. 1898 v. 7°00' 11/23/36  
 Course Log cos Log sin N S E W

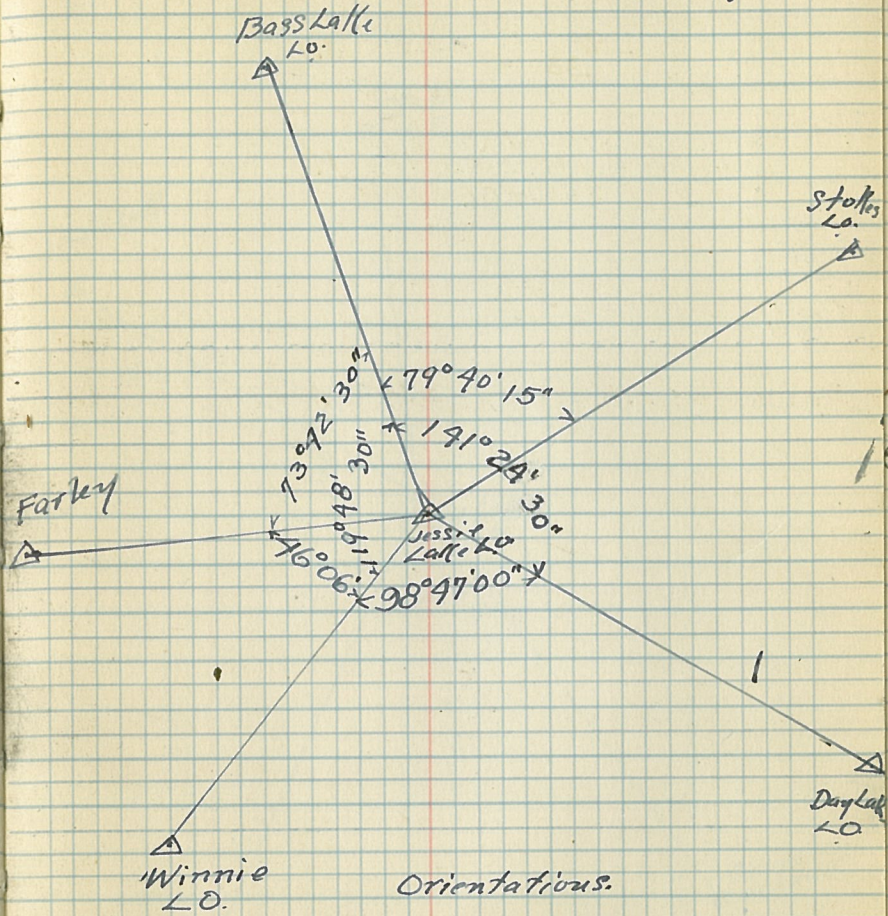
2.49  
 $\triangle$  Wolf Lake 1898  
 N 36°30' W. 9.905179 9.774388 1.962 1.451  
 2.387390 2.387390  
 2.292569 2.161778

Tr. pt. #1  
 1.485  
 N. 7°15' W. 9.996514 9.101056 1.473 0.182  
 2.171726 2.171726  
 2.16824 0.127282

25  
 $\frac{1}{4}$  Cor. T. 146 N. R. 32 W.  
 W. Oak 14°34' E 75418.  
 Brass Cap of Iron Pipe  
 137 Q.L.D. 1932  
 Tie.  $\triangle$  Sta. -  $\frac{25}{36}$   $\frac{1}{4}$  Cor. (N. 25°21' W) (3.801) 3.935 1.638

$\frac{25}{36}$   $\frac{1}{4}$  Cor. T. 146 N. R. 32 W.  
 N 25°21' W  
 3.801  
 Wolf Lake M.R.C.  
 1898  
 Lat. 47°25'26.421"  
 Long. 94°40'49.348"  
 Index No. 308-18

Angles turned at JESSIE LAKE LO. 58  
 5/20/36  
 J.A. Gjølhaug.

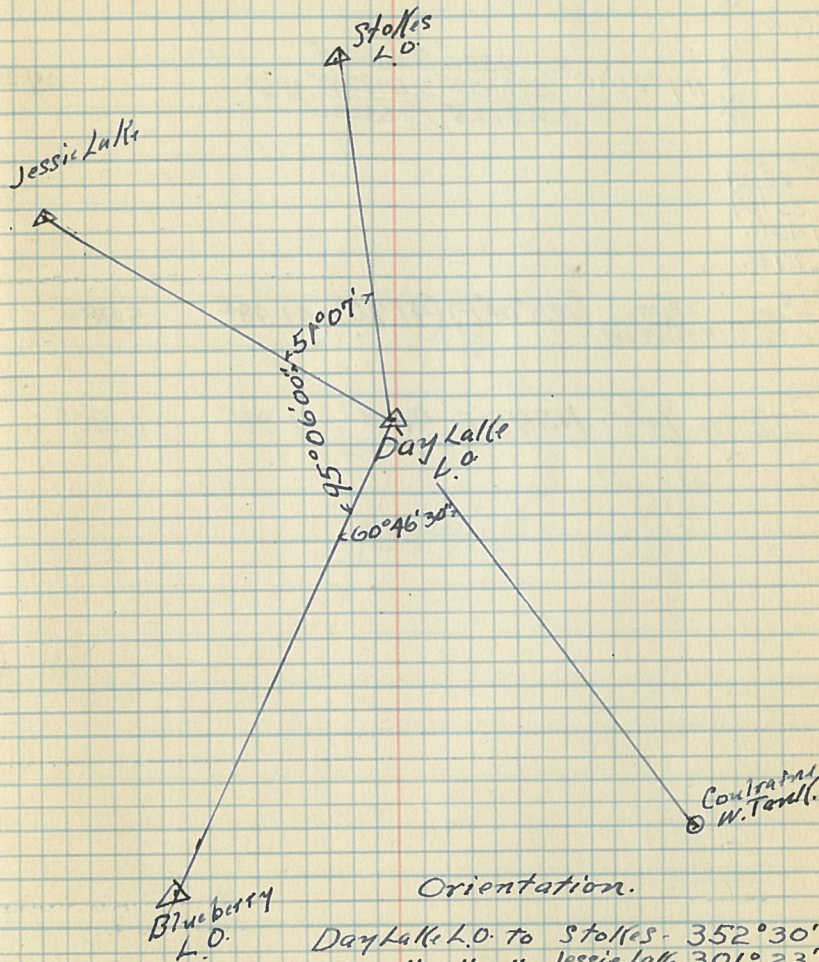


Orientations.  
 Jessie Lake Lo. to Stolles - 61°40'  
 " " " " Day Lake 22°25'  
 " " " " Bass Lake 391°00'  
 " " " " Spruce top 3°07'  
 " " " " Norway 85°37'  
 Stolles Lo. to Day Lake 173°03'  
 " " " Jessie Lake 290°13"  
 " " " Bass Lake 291°00"

Angles turned at DAY LAKE L.O. 59

5/20/36

J.A.G. Thurg.



Orientation.

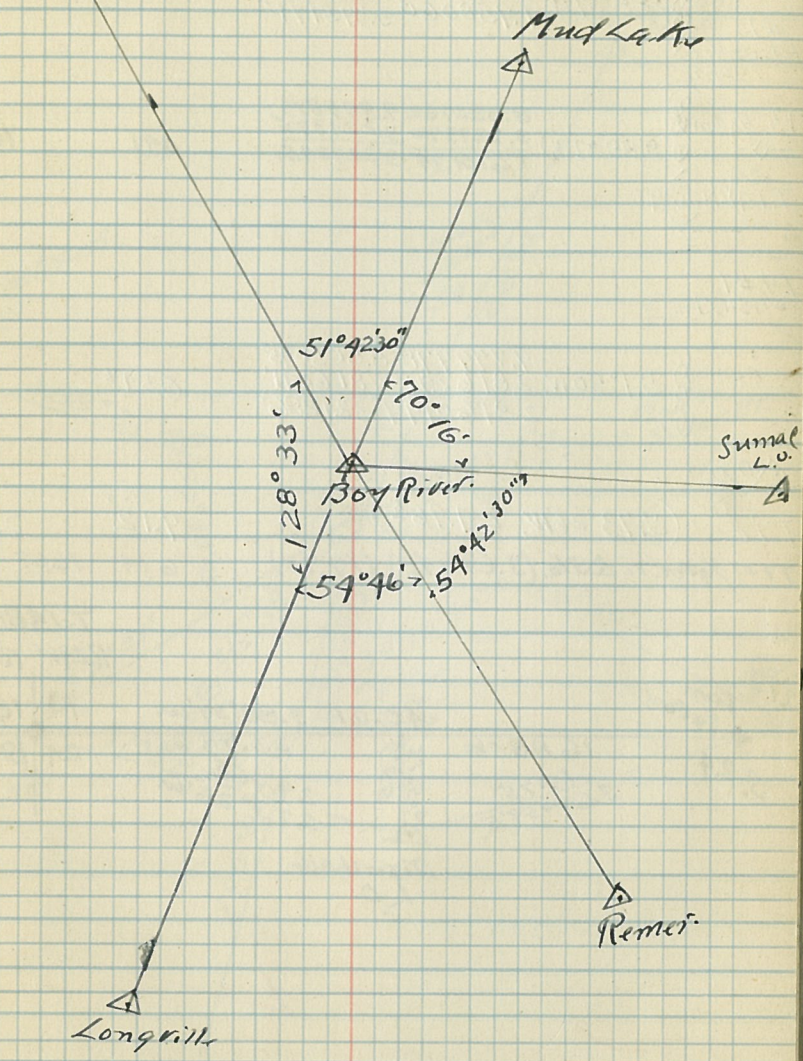
Day Lake L.O. to Stollis 352°30'  
" " " " Jessie Lake 301°23'  
" " " " Blueberry 206°17'

Solar Transit Va. 7°15'

Sta	Course	Log Cos	Log Sin	N	S	E	W.
△ Boy River L.O.	N. 74° 50' E.	9.417687 2.848189 2.265873	9.984603 2.848189 2.832792			6.805	
1/4 Cor.	N 1° 20' W.	9.999882 3.598243 3.598125	8.366777 3.598243 1.965020				0.923
△ See Cor 28127 33134 T 143 N. R. 27 W.							
Tie △ Boy River to L.O.	(N. 8° 04' E.)	(41.90)	41.885			5.882	
Tie △ Boy River to L.O.	1/4 Cor. N. 74° 50' E.	7.05	1.845			6.805	



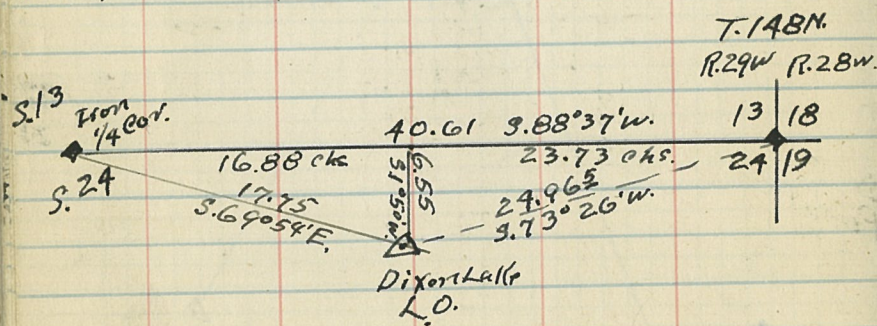
Boulder Hill Angles turned at Boy River L.O. 60  
6/1/36



Tie to Dixon Lake L.O.  
(Solar Transit Chained twice to check)

V<sub>97</sub>

Sta.	Obs. Dist.	Course	Log Cos.	Log Sin.	N	S	E	W.
13 1/4 Sec. Cont.	Iron pipe.		8.382762	9.999873				
24 1/9			3.375298	3.375298		0.573		23.72
		S 88° 37' W.	1.758060	3.375171				
#1 Pt. on Sec. 23 1/3								
13 1/4 Cont.			8.382762	9.999873				
24			3.227372	3.227372		0.41		16.88
		(S. 88° 37' W.)	1.610134	3.227245				
24		T. 148 N. R. 29 W.						
#1 on Section								
			9.999778	8.505045		6.543		0.21
		S. 1° 50' W.	2.816291	2.816241				
			2.816019	1.321286				
Dixon L.O.								
Tie -		(S. 73° 26' W., 24.965)			7.12			23.93
Tie 1/4 cont. to Δ Sta.		(S. 69° 54' E) (17.75)			6.14			16.67



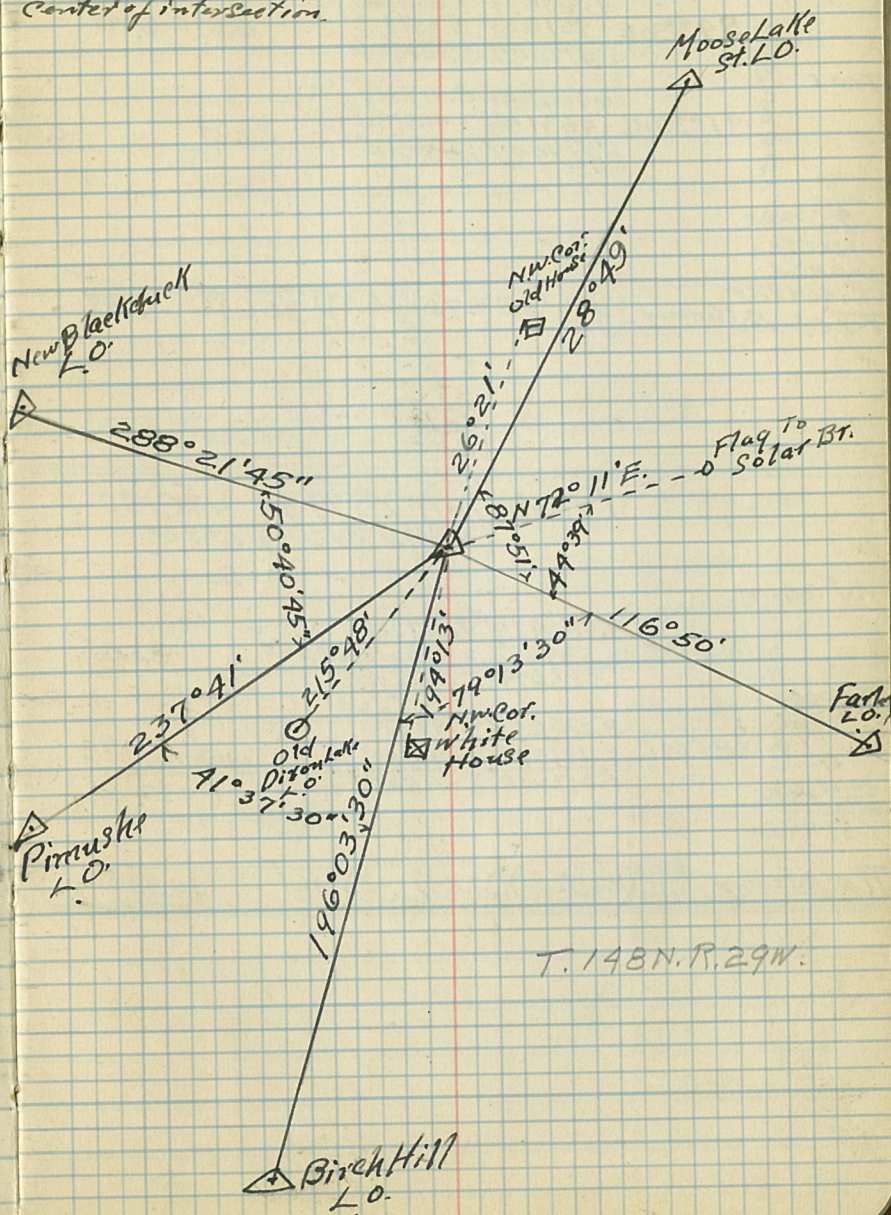
J.A. Gjelhaug. T.

7/22/36

61

New Dixon Lake L.O.

From Pipe in Center of intersection.



Kidney  $\Delta$  Comps  $4\frac{1}{2}$ " Needle, Va.  $6^{\circ}30'$   
 2 Ch. tape Traverses  
 Run twice

Sta.	Courses	Log Cos.	Log Sin.	N	S	E	W.
$\Delta$ Kidney 1934	$3.42^{\circ}30'E$	$9.867631$ $2.751823$ $2.819454$	$9.829683$ $2.951823$ $2.781506$			$6.592$	$6.042$
Tr. #1	$3.1^{\circ}30'W$	$9.999851$ $3.463146$ $3.762997$	$8.417919$ $3.463146$ $1.881065$		$29.04$		$0.76$

23/24 See Rec.  
 26/25  
 2 1/2" X 2" Pipe  
 Cap. Mk'd.

Tie:  $\Delta$  Kidney  $23/24$  ( $38^{\circ}27'E$ ) (36.03)  $35.63$   $5.287$   
 $26/25$

Frederick  $\Delta$  1934 U.S.C+G.S.  
 Geodetic AZ - Va.  $6^{\circ}20'$

		N	S	E	W.
$\Delta$ Frederick	$N.14^{\circ}15'E$	$9.986427$ $3.539452$ $3.525879$	$9.391206$ $3.539452$ $2.930658$	$33.564$	$8.521$
Tr. Pt. #1	$3.89^{\circ}00'E$	$8.241855$ $2.771587$ $1.013442$	$9.999934$ $2.771587$ $2.771521$		$0.103$ $5.91$

30/29 See Rec.  
 31/32  
 T.52 N. R.26 W.

Tie:  $\Delta$  Frederick  $30/29$  ( $N.23^{\circ}20'E$ ) (37.29)  $33.46$   $14.43$   
 $31/32$

Kidney  $\Delta$  1934 U.S.C+G.S.  
 11/16/36  
 J.A. Gietzberg

62

RM #1  
 $\Delta$  1934  
 11.98 FT

Lat.  $46^{\circ}55'32.389''$   
 Long.  $93^{\circ}55'27.362''$

5.8021 E.  
 36.03 Chs.

Iron Pipe  $2\frac{1}{2}$ " X 2" about 23/24 T.140 N. R.26 W  
 Cap marked.  $\rightarrow$  26/25 5:12 PM.

11/17/36 Frederick  $\Delta$  Lat.  $46^{\circ}57'08.100''$   
 Long.  $93^{\circ}40'49.286''$

30/29  
 31/32  
 37.29 Chs.  
 RM #1  
 $\Delta$  1934  
 31.76 FT

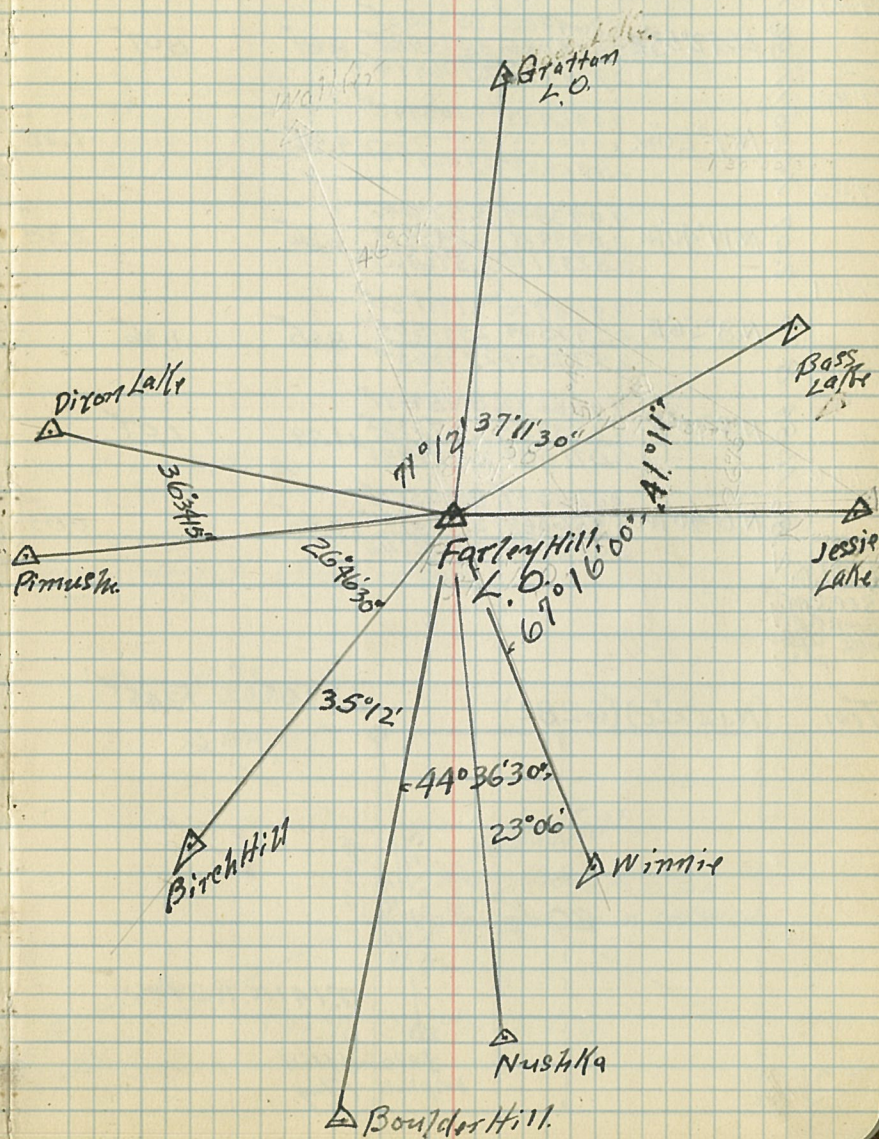
T.52 N. R.26 W.  
 4:11 PM.

Intersection of  
 Road E & W and South  
 as stated by  
 Mr. Frederick.  
 Same Verified  
 by Neighbors.



Angles Turned at Farley Hill  
7/24/36

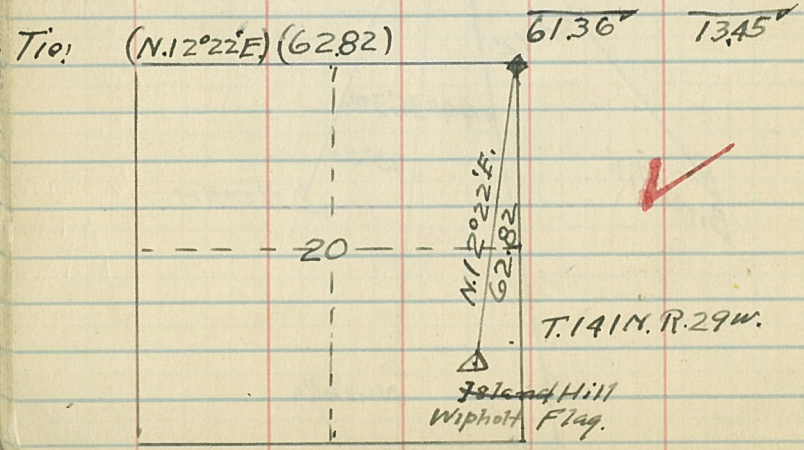
63



Tie for Whipcott Hall. Va. 7°15' at Flagsta.  
Solar Transit + 2 ch. tape

Sta.	Course	Log Cos.	Log Sin	N.	S	E	W.
Island							
14.50	N. 27° 15'	9.948910 3.161368 3.110278	9.660746 3.161368 2.822114	12.89		6.64	
Pt #1 11.86	N. 42° 53'	9.864950 3.074085 2.939035	9.832833 3.074085 2.906918	8.69		8.07	
Pt #2 10.00	N. 7° 20' W.	9.996433 3.000000 2.996833	9.105992 3.000000 2.105992	9.92		1.28	
Pt #3 7.07	N. 19° 40' W.	9.973897 2.849419 2.823316	9.527046 2.849419 2.376465	6.66		2.38	
Pt #4 8.76	N. 8° 56'	9.994700 2.942504 2.937204	9.191130 2.942504 2.133634	8.65		1.36	
Pt #5 11.84	N. 5° 10' E.	9.998232 3.073352 3.071584	8.954499 3.073352 2.027851	11.79		1.07	
Pt #6 2.86	N. 0° 40' W.	9.999971 2.956366 2.456337	8.065116 2.456366 0.522142	2.86		0.03	

AGLO  
Sec. Cor.  
Brass Cap.  
M.H. 20 21



5/27/36  
J.F. Gjeltrang  
Chain

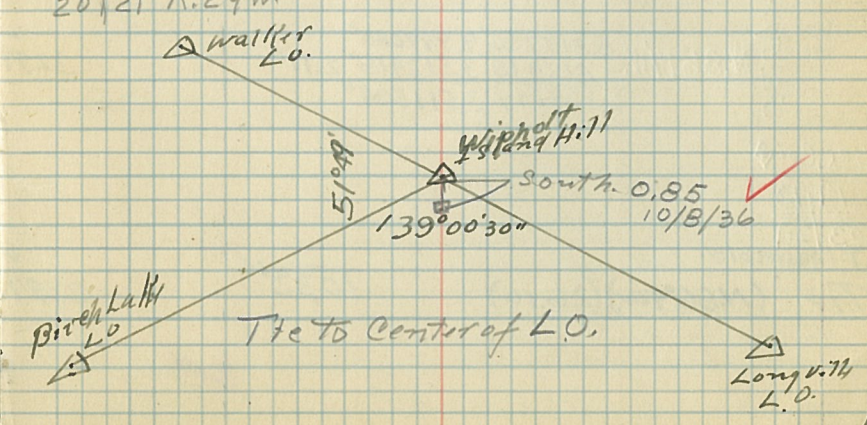
Tie to Whipcott New L.O.  
From Flag, South 0.85 ch.  
To Center of New Location  
10/8/36

S. 75° 40' E. 60 L.H.  
To Temp. 1/4 Cor.  
Backsight to Flag  
= S. 34° 16' W.

Backsight to Flag  
= S. 13° 03' W.

I. Pipe 2"  
Brass Cap. G.L.O. Dim Road East  
Center of Road. in Line.

17 | 16 T. 141 N.  
20 | 21 R. 29 W.



Tie on Camp Hill Flag.

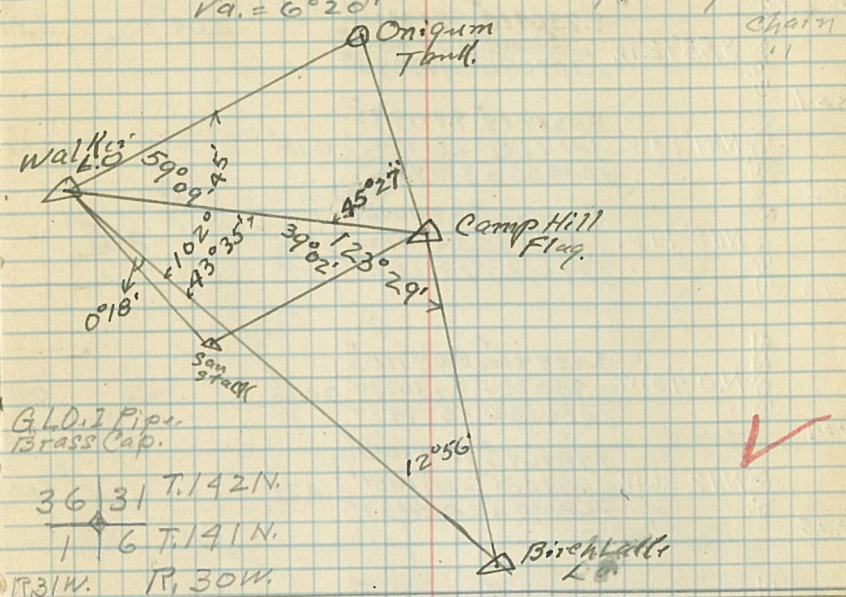
Sta.	Course	Log Cos	Log Sin	N.	S	E	W.
F Camp Hill	S. 59° 30' W	9.705469	9.835320			1.02	1.72
		2.301030	2.301030				
		2.006499	2.236350				

Pt. #1	S. 2° 29' W	9.999592	8.636776			9.52	0.91
		2.979093	2.979093				
		2.978685	1.615869				

41.57 x 9.53	S. 2° 52' E	9.999456	8.699073			41.52	2.08
		3.618780	3.618780				
		3.618236	2.317853				

GLD. v. sec. cor.  
 Tie. (S. 0° 03' W) (52.06)      52.06      0.05

Run with Solar Transit 5/27/36  
 2-Chain Taps  
 Va. = 6° 20'



Tie on Onigum Water Tank.

Sta.	Course	Log Cos	Log Sin	N.	S	E	W.
Tank Onigum	N. 46° 00' E	9.841771	9.856934			8.21	8.50
		3.072617	3.072617				
		2.914388	2.929551				

we. MC	N. 86° 17' W	8.811726	9.999086				32.97
		3.512418	3.512418			2.11	
		2.324144	3.511504				

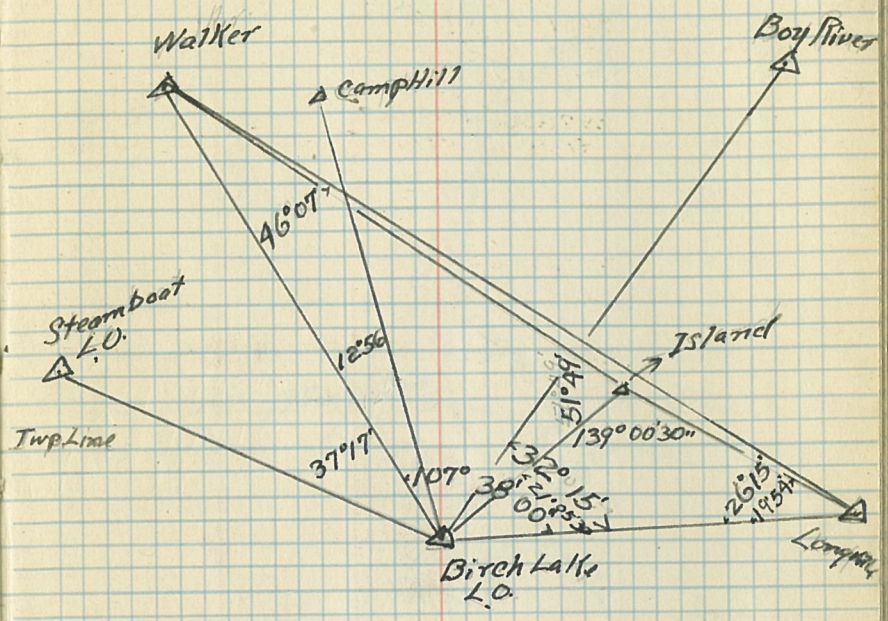
Sec. Cor.  
 1A/13  
 23/2A  
 T. 142N R. 31W.  
 Tie (N. 66° 42' W) (26.10)      10.32      23.97

Run with Solar Transit 5/29/35

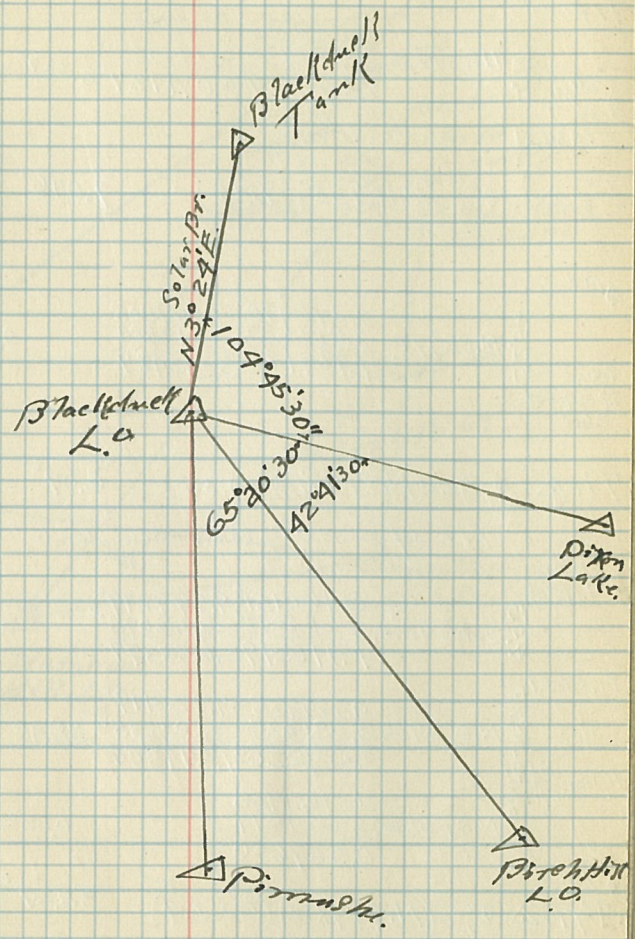
Tie of Birch Lake L.O. 5/25-26/36

Sta.	Chs. Dist.	Course	Log. Cos.	Log. Sin.	N	S	E	W.
Birch Lake L.O.			9.756418	9.914422			2.04	2.93
		5.55°12'W.	2.552668	2.552668				
			2.309086	2.467090				
Pt.#1	3.57		8.031919	9.999975				
		N.89°23'W.	3.217747	3.217747	0.18			16.51
			1.249666	3.217722				
Pt.#2	16.51		9.976361	9.506727				
		N.18°44'E.	3.410102	3.410102	24.35			8.26
			3.386463	2.916829				
Pt.#3	24.71		9.999966	8.097183				
		N.0°43'W.	3.480294	3.480294	30.22			0.38
			3.480260	1.577477				
Pt.#4	30.22		9.989693	9.333051				
		N.12°26'W.	2.691081	2.691081	4.79			1.06
			2.680774	2.024132				
Pt.#5	4.91		8.843585	9.998941				
		N.86°00'E.	3.450557	3.450557	1.97			28.15
			2.294142	3.449498				
Sec. Cor	28.22							
31	32	T.141N.						
		⑤ T.140N.						
		R.30W.						
Tie Δ Birch Lake L.O.	31   32	(N.14°38'E)	(61.46)	59.47				15.53

Solar Transit Va. 7°00'



Angles Turned at Blackduck L.O.  
8/19/36



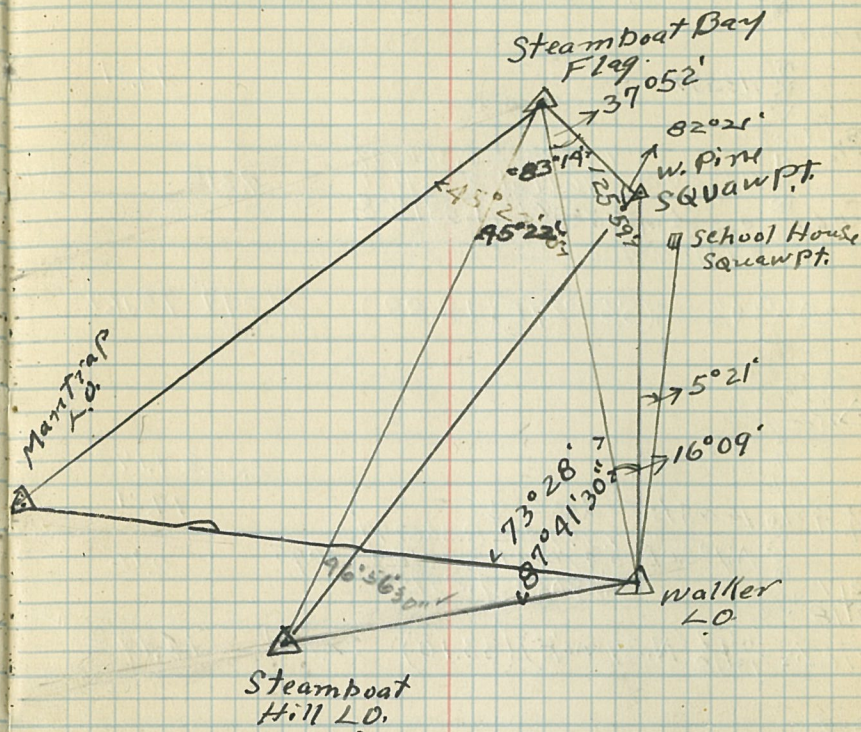
Tie of W. Pine Flag, Squaw Pt.

Sta. CAS. Dist.	Course	Log Cos.	Log sin	N	S	E	W
W.Pine Flag		9.999927	8.263042				
Tr. Pt. #1	N 1° 03' E	2.657056	2.657056	4.532		0.083	
		2.656983	0.920098				
26 MC	N 25° 10' E	9.956684	9.628647				1.178
		2.742480	2.942480				
		2.399164	2.071127	2.502			
Tie Δ	(N. 10° 13' E) (7.16)			7.096		1.261	
MC		8.476498	9.999805				
1/4 cor.	S. 88° 17' E	3.512684	3.512684		0.975	32.55	
		1.989182	3.512489				
Tie Δ	1/4 cor (N. 79° 49' E) (34.35)			6.07		33.81	

Tie of St. B. Bay Flag, Sec. 16 T. 143 N. R. 31 W.

Sta. CAS. Dist.	Course	Log Cos.	Log sin	N	S	E	W
S. B. Bay Flag		8.760151	9.999279				
Tr. Pt. #1	S. 86° 42' W	2.656098	2.656098		0.26	4.523	
		1.416249	2.655377				
Apr. 17 116	N. 0° 29' E	9.999985	7.926119				0.325
		3.585235	3.585235	38.48			
		3.585220	1.511354				
8/4 cor.	N. 89° 58' W	6.764756	8.0		0.023	40.26	
		3.604874					
		0.369630					
Tie Δ	1/4 cor (N. 49° 18' W) (58.64)			38.24		44.46	

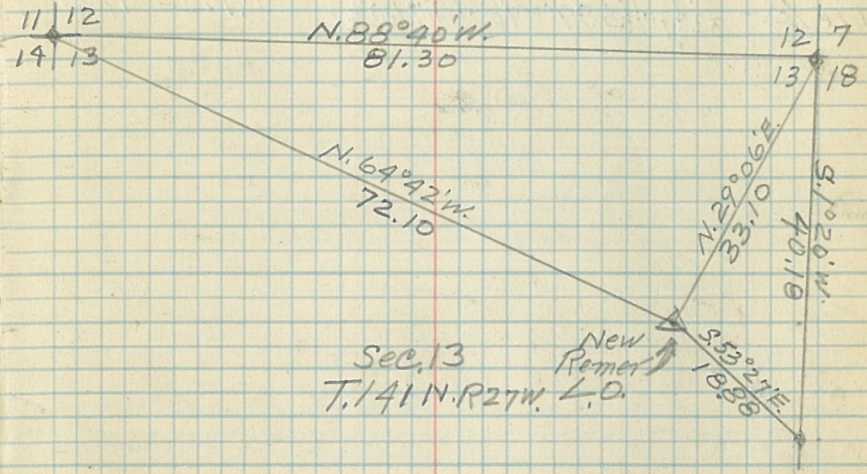
Angles turned at Steamboat Bay Flag. <sup>68</sup>  
8/31/36



Tie - New Remer L.O.  
 Sta D Course Log.Cos Log.Sin N S E W  
 New L.O.  
 Remer  
 2.34 S.30°03'E 2026 1.173  
 Tr. pt. #1 1421 East 1421  
 Sec. Line 9.22 S.1°20'W 9.999882 8.366777 9.218 0.219  
 2.964731 2.964731  
 1/4 Cor. 9.22 Sec. 13-18 2.964613 1.331508  
 T.141N.R.27-26W  
 Tie Δ L.O. 1/4 Cor. (S.53°27'E) (18.88) 11.244 15.162

New L.O.  
 Remer  
 2.34 S.30°03'E 2026 1.173  
 Tr. pt. #1 1421 East to Sec. Line 1421 14.21  
 3096 N.1°20'E 9.999882 8.366777 3095 0.72  
 3.490801 3.490801  
 1317 3.490683 1.857578  
 1318 Sec  
 Tie Δ 12.7 (N.29°06'E) (33.10) 28.924 16.103  
 1318  
 12.7 8.366777 9.999882  
 1318 81.30 N.88°40'W 3.910091 3.910091 1.892 81.28  
 2.276868 3.909973  
 11.12 2.276868 3.909973  
 1413 Tie Δ 11.12 (N.64°42'W) (72.10) 30.816 65.18  
 1413

Tie - New Remer L.O. 69  
 Solar Transit  
 2 Chain Tape  
 Chained Ties and carefully checked.  
 JAG:lhong 10/12/36  
 Sec. 13 T.141N.R.27W



Tie -  $\triangle$  Mizpah  
 Sta. Course Log. Cos Log. Sin N S E W.

$\triangle$  Mizpah

South

0.325

T.P. #1

389°50'E 7.463716

3.677607

0.138 47.60

1/31  
394

47.60

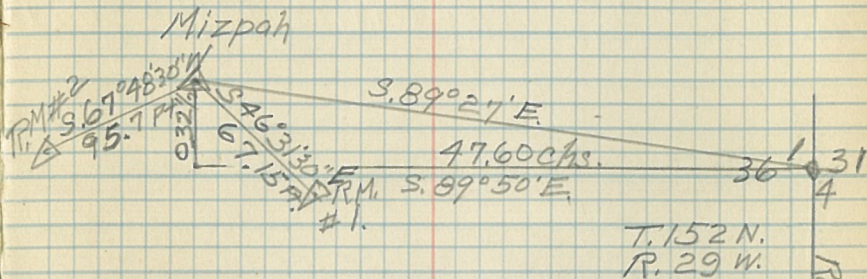
1.141333

Tie  $\triangle$  - 32  $\frac{1}{4}$  31 (S 89°27'E) (47.60  $\pm$ ) 0.462 47.60

$\triangle$  Mizpah  
 10/14/36

70

Geodetic Azimuth checked with Solar Transit  
 100 FT. Tape reduced to chains.  
 Chained twice and carefully checked.



Lat. 47°56'25.925"  
 Long. 94°18'07.506"

1/4 cor. in center of Road  
 Post on N. side of R. back.  
 Verified by two farmers  
 that this is correct cor.

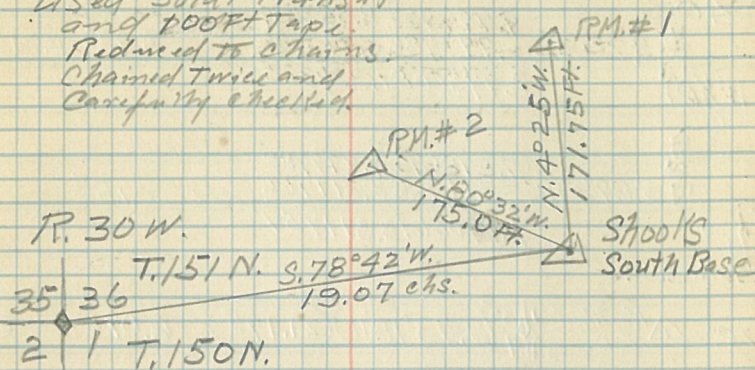


Sta.	Chk.	Dist.	Tiel-Shook's South Base		N	S	E	W.
△	Shook's S. Base	6.37	Course	Log Cos.	Log Sin.			
			S. 85° 16' W.	2.916550 2.804139	9.998516 2.804139	0.525	6.37	
				1.720689	2.802655			
	Ty. Pt. #1	12.12						
	T. 1.51 N. R. 30 W. 35/36		S 75° 16' W.	9.405382 3.083503	9.985480 3.083503	3.082	11.72	
	211			2.488885	3.068983			
	Tiel △ -	35/36 211	(S. 78° 42' W.)	(19.07)		3.608	18.07	

△ Shook's South Base  
JA Gjelthang 10/14/36

71

Used Solar Transit  
and 100 FT Tape.  
Reduced to chains.  
Chained twice and  
carefully checked.



Found Orig. B.T. w. Pine Stp. 24" S. 18° E. 26 Lks.

Lat. 47° 50' 44.723" ✓  
Long. 94° 26' 06.138" ✓

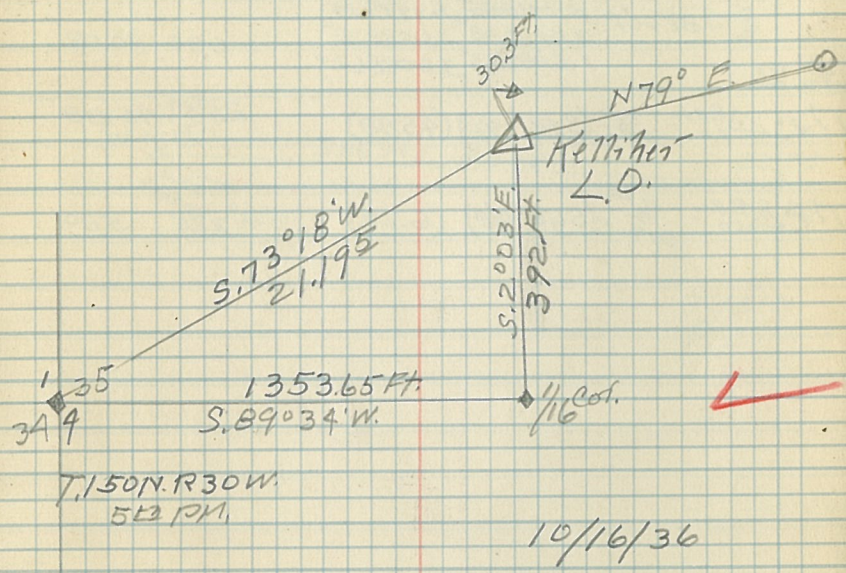


Tie of Kelliker L.O.

Sta.	COURSE	Log COS	Log Sin	N	S	E	W.
$\Delta$ Kelliker L.O.	$S. 2^{\circ} 03' E.$	9.999722	8.553539			5.936	0.213
		2.773786	2.773786				
		2.773508	1.327325				
$\frac{1}{2}$ W 1/16 C-C	$S. 89^{\circ} 34' W.$	7.878695	9.999988			0.15E	20.51
		3.311966	3.311966				
		1.190661	3.311954				
$\frac{1}{2}$ 3/4 T. 150 N. R. 30 W.							
Tie: $\Delta$ Kelliker L.O.	$S. 73^{\circ} 18' W.$		(21.195)	6.091			20.297

Tie of Kelliker L.O.  
J.A. Gellman 10/16/36

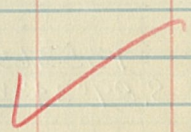
Lat.  $47^{\circ} 56' 28.61''$   
Long.  $94^{\circ} 27' 19.13''$



Used Solar Transit Cloudy  
Used Geodetic Azimuth  
100 ft. tape reduced to C.S.  
Checked with Village Plat.

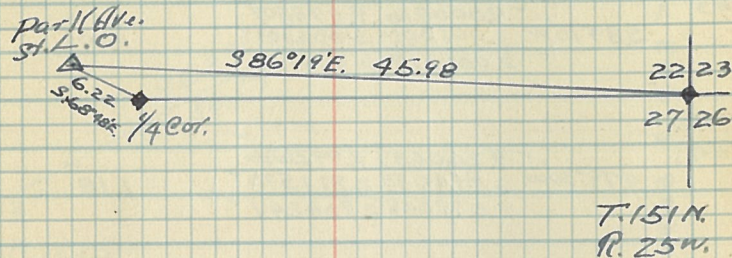
Tie of Park Ave. St. L.O.  
Sec: 22-T15N.R.25W.

Sta.	Course	Log Cos.	Log Sin.	N	S	E	W.
Chs. Dist. Park Ave. St. L.O. Tr. Pt #1 122 27A Cor.	South				2.15'		
	S. 89° 00' E.	8.241855	9.999934			0.10'	5.80'
		2.763928	2.763928				
		1.005283	2.763362				
40.08 22/23 Sec. 27/26 Cor.	S 89° 00' E.	8.241855	9.999934			0.70'	40.08'
		3.602928	3.602928				
		1.844783	3.602862				
Tie: $\Delta$ Park Ave. St. L.O. - 22/23	(S 86° 19' E) (45.98)			2.95'	45.88'		
Tie: $\Delta$ Park Ave. St. L.O. - 27/26	(S 68° 48' E) (6.22)			2.25'	5.80'		



Park Ave. St. L.O.

Traverse Run with 4 1/2" needle Compass  
and 2 ch. Taps  
Carefully Chained & checked  
No. 7° 00' 11/10/36  
J.A. Gjelhaug.



T. 151 N.  
R. 25 W.



Scenic St. L.O. Va. 7000'  
 Compass 4 1/2" needle - 20 ft. tape  
 Traverse Run twice

By J. A. Gjelhaug 11/12/36

Sta Course Log cos Log sin N. S E W

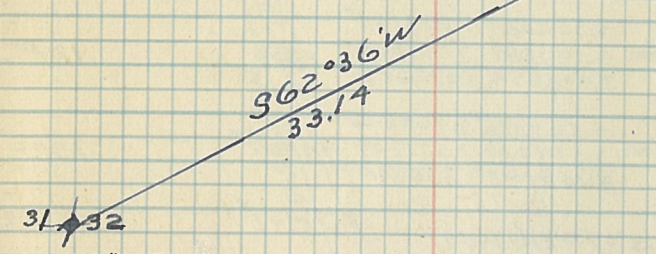
Scenic  
 St. L.O.

Tr.#	Course	Log cos	Log sin	N.	S	E	W
Tr.#1	N. 51° 00' W	9.798872	9.890503				2.552
		2.517196	2.517196	2.075			
		2.316068	2.407699				
Tr.#2	S. 89° 15' W	9.116926	9.999963			0.085	6.97
		2.810904	2.810904				
		0.927830	2.810867				
Tr.#3	N. 28° 15' W	9.994922	9.675155			6.15	3.304
		2.843855	2.843855				
		2.788777	2.519010				
Tr.#4	S. 84° 15' W	9.000816	9.997809			1.005	9.98
		3.001301	3.001301				
		2.002117	2.999110				
Tr.#5	S. 79° 30' W	9.260633	9.992666			1.18	6.374
		2.811575	2.811575				
		2.072208	2.804241				
Tr.#5	S. 2° 00' W	9.999735	8.542819			21.20	0.79
		3.326541	3.326541				
		3.326276	1.869350				

C/S Dist  
 329  
 697  
 698  
 1003  
 1698  
 2127

Sec 32

Scenic  
 St. L.O.

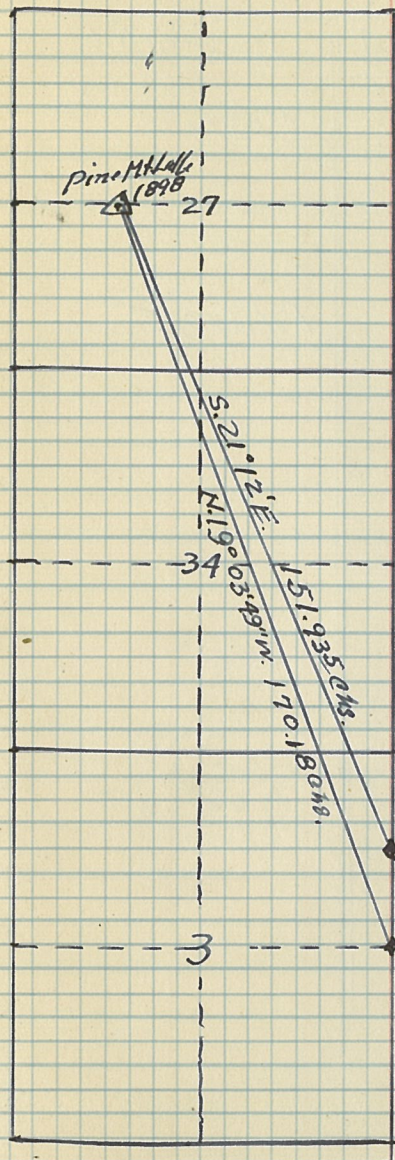


31-32  
 T. 61 N. T. 25 W  
 4:13 PM.  
 J. Pin 7" N 51 E 40 1/2 Lis  
 " " 7" N. 45 W. 78 "

31-32 1/4 cor.  
 Tie: Scenic St. L.O. - 31-32 1/4 cor. (S. 62° 36' W) (33.14) 15245 29422



Sta.	Course	Log Cos	Log Sin	N	S	E	W.
3 1/2 1/4 Cor.		9.999778	8.505045			19.99	0.67
	N. 1° 50' E.	3.301030	3.301030				
		3.300808	1.806075				
3 1/2 N. 1/16		9.999954	8.162681				
	N. 0° 50' E.	4.051885	4.051885	112.68		1.639	
		4.051839	2.217566				
T.P. #1		9.955789	9.632658				
	N. 25° 25' W.	3.054613	3.054613	10.24		4.867	
		3.010402	2.687271				
# 2		8.981573	9.997996				
	N. 84° 30' W.	2.797268	2.797268	0.601		6.241	
# 3		9.352088	9.988724				
	N. 77° 00' W.	3.103804	3.103804	2.852		12.375	
		2.455892	3.092528				
# 4		9.587386	9.964826				
	N. 67° 15' W.	3.571709	3.571709	14.923		39.40	
		3.159095	3.536535				
$\Delta$ 1898 P.M.T.							
Tie: 3 1/2 1/4 Cor. $\Delta$	(S. 19° 04' 35" E) (170.14)			160.791		55.602	
Mean Tie	(S 19° 03' 48" E) (170.18)			160.892		55.582	
$\Delta$ 1898 P.M.T.							
	S. 85° 45' E.	8.869868	9.998804			4.322	58.19
		3.766041	3.766041				
		2.635909	3.764845				
T.P. #5		9.999954	8.162681				
	S. 0° 50' W.	3.378398	3.378398	23.90		0.348	
		3.378352	1.541079				
# 1							
	S. 0° 50' W.			112.68		1.632	
3 1/2 N. 1/16							
	S. 1° 50' W.			19.99		0.67	
3 1/2 1/4 Cor.							
				160.892		55.582	
Mean Tie							
3 1/2 N. 1/16 $\Delta$	(N. 21° 12' W) (151.935)			141.652		54.992	



Lat. 46° 49' 37.811"  
 Long. 94° 35' 24.154"  
 Elev. 1605.0 ft.

R. 31 W.

At beginning of Traverse  
 used Solar Transit  
 Found Dec. to be 7° 00'

Cor <sup>d</sup>	Spec.	Dir.	Bearing	Dist	Remarks
A	Tam.	6'	N. 20° E.	25'	
	Spr.	5'	S 30° W.	35'	→ Poster

X

B.

12/16/39

B.

Sample Notes

2

A

X C — 66

g

8000

C

71

	55° E	
F	45° 20'	
	75° 30' E	
		25-S
		30-W

D

~~1483  
 130  
 61250  
 1422.6  
 539.00~~

~~1326  
 138  
 1422.6~~

1-2-3536  
 1-2-3536  
 1-2-3536

orig.

11042

37741

End  
 1181048E

14258  
 13039  
 1426

1426

11731 to center

53  
 31 center  
 31541  
 11411926

Sum. P. P. 1

11731  
 1426  
 13839  
 1426