

CHAINS

These surveys in township 25 south, range 3 west, were executed with solar compasses made by Young and Sons, Serial Nos. 8233 and 8461, constructed in accordance with the standard specifications of the General Land Office. The horizontal circles have diameters of $5\frac{1}{2}$ ins. with two double opposite verniers reading to single minutes; the sight vanes are $7\frac{1}{2}$ ins. long and are spaced $13\frac{1}{2}$ ins. apart. The instruments are equipped with Burt solar attachments, radii of latitude arcs $5\frac{3}{4}$ ins., and of declination arcs $4\frac{3}{4}$ ins., each with verniers reading to single minutes.

Observations in camp, for determination of reference meridians, latitude, and time, were made with a light mountain solar transit made by Buff and Buff, Serial No. 17998, constructed in accordance with the standard specifications of the General Land Office. The horizontal circle has a diameter of $4\frac{1}{2}$ ins., with two double opposite verniers reading to single minutes; the vertical circle has a diameter of 4 ins., with one double vernier reading to single minutes; the telescope has fixed stadia wires, ratio 1:132, with a focal constant of 1.2 lks. The instrument is equipped with the improved Smith solar attachment; radius of latitude arc $2\frac{1}{2}$ ins., and of declination arc $3\frac{1}{2}$ ins., each with verniers reading to single minutes.

The instruments were in good condition and having been placed in satisfactory adjustment, prior to beginning the survey, and tested and found free from appreciable error were approved by the district cadastral engineer on May 21, 1943. I examined all the instrumental adjustments before making the field tests hereinafter recorded.

The directions of the lines of these surveys were determined by solar compass method. The measurements were made with Lallie steel tapes, 2 chs. in length, graduated every link; and with Lallie steel tapes, 5 chs. in length, graduated every link for the first 100 lks., and the balance at intervals of 10 lks. The tapes were tested by comparison with a Lufkin standard and found correct. The measurements were made on the slope, and the vertical angle of each interval was ascertained by clinometers in good adjustment; the horizontal equivalents are entered in the field note record.

The data furnished with the special instructions give the geographic position for the NE. cor. of the Tp. as follows: latitude $43^{\circ} 26'$ N., and longitude $122^{\circ} 59\frac{1}{2}'$ W.

June 6, 1943, in camp near the cor. of secs. 4, 5, 8, and 9, T. 26 S., R. 3 W., in latitude $43^{\circ} 20'$ N., and longitude $123^{\circ} 04'$ W., at 2H 51M 56S a.m., l.m.t., or 3h 04m 12s a.m., by my watch, which reads correct 120th mer. time as determined by radio time signals I observe Polaris, at eastern elongation, making two sights each with the telescope in direct and reversed positions, and place a tack at the mean point, on a peg driven firmly in the ground 10 chs. N. At 5.45 a.m., I lay off the azimuth of Polaris, $1^{\circ} 23' 21''$, and make a meridian mark on a second peg, 24.25 lks. (16.01 ft.) to the west of the mean point in the line determined by the observation; I verify the angle by a vernier reading of the instrument.

In order to verify the latitude of this station and the reading of my watch, I make a meridian observation of the sun, first setting on the lower limb and noting the transit of the west limb, then, after reversal of the instrument, setting on the upper limb and noting the transit of the east limb as follows:

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| Mean observed altitude----- | 69° 18' 00" |
| Reduced latitude----- | 43° 19' 51" |
| Mean watch time of observation----- | 12h 10m 42s |
| Watch fast. of l.m.t. ----- | 12m 16s |
| Same by reference to radio time signals and calculated difference in longitude----- | 12m 16s |