

T. 29 N., R. 53 E.

The survey completing the subdivision of Township 29 North, Range 53 East was executed with a light mountain transit made by Buff & Buff Manufacturing Company, Serial No. 9210, 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 stadia method of measurement was not used and a description of the stadia hairs is omitted. The instrument is equipped with the improved Smith solar attachment; radius of latitude arc is $2\frac{1}{2}$ ins. and declination arc, $3\frac{1}{2}$ ins., each with verniers reading to single minutes. The instrument was in good condition, and having been placed in satisfactory adjustment prior to beginning of the survey and tested and found free from appreciable error, was approved by the district cadastral engineer on August 1, 1939. I examined all the instrumental adjustments before making the field tests hereinafter recorded.

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

The data furnished with the special instructions gives the geographic position of the SE. cor. of the township as follows: latitude, $40^{\circ} 19' N.$ and longitude $115^{\circ} 57' W.$

August 19, 1939, in camp near the corner of secs. 4, 5, 32 and 33, on the south boundary of T. 29 N., R. 53 E., at 9h 56.1m p.m., l.m.t., or 9h 39.3m p.m. by my watch, which reads correct 120th meridian time as determined by radio 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 8 chs. N. After sunrise, I lay off the azimuth of Polaris, $1^{\circ} 20' 52''$ and find a point in the meridian thus determined marked by a lone tree, approximately 80.00 chs. S.

In order to verify the latitude of the station I make a meridian observation of the sun, first setting on the sun's 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.

Mean observed altitude $62^{\circ} 14'$

Reduced latitude $40^{\circ} 19' 37''$

Every 30 min. from 7 to 10:30 a.m., and from 1:30 to 6 p.m., I make proper settings on the arcs of the solar attachment and ascertain that the resulting orientation of the instrument, when compared with the meridian established by Polaris observation has a maximum error of less than $1' 30''$.

I repeat the tests of the arcs daily by noon observation and verify the meridional indications at frequent intervals throughout the survey.

The observed magnetic declination is $19^{\circ} 00' E.$

Chains

ESTABLISHMENT OF CORNERS ALONG A PORTION OF THE SOUTH BOUNDARY OF T. 29 N., R. 53 E.

Beginning at the cor. of T. 29 N., Rs. 53 and 54 E., which is an iron post, 3 ins. diam., 14 ins. above ground, mkd. and witnessed as described in the official record.

West, on true line along the S. bdy. of sec. 36.

I find the topography along this portion of the S. bdy. of T. 29 N., R. 53 E., to be in agreement with the official record of the survey of the N. bdy. of T. 28 N., R. 53 E.

36.87

The $\frac{1}{4}$ sec. cor. for sec. 1; an iron post, 1 in. diam., 24 ins. above ground, in a mound of stone, mkd. and witnessed as described in the official record.