DO YOU SURVEY?

THE MERIDI-O-GRAPH

Determines in a minute or two
TRUE MERIDIAN—AZIMUTH—TRUE NORTH
to an accuracy of 1' to 2'

YOU NEED
No Night Work
No Attachments
No Computation
No Books or Tables
No Knowledge of Time
No Knowledge of Astronomy
No Apprehension of Error
No Incumbrance on Transit
No Waste of Field Time

YOU DO NEED
A Transit
Two Minutes of Spare Time

A MERIDIOGRAPH

FIG. 1 shows the DAILY PATH OF THE SUN. The
surveyor measures its height above his horizon; then the
Meridiograph gives the exact horizontal angle from
the sun to the TRUE north line.

The MERIDI-O-GRAPH is a new instrument for surveyors and engineers to find
TRUE NORTH quickly and accurately. With its aid, any one who can read an
angle may determine in a few minutes a true meridian—without computation,
books, tables or attachments.

PROCEDURE—Measure the sun's altitude (Figs. 1 and 2), take its declination
from the ephemeris, and your latitude from a map. Set these angles on the
Meridiograph (Fig. 3)—just as angles are set on an ordinary protractor; and
read directly the exact horizontal angle from the sun to the TRUE NORTH (Figs.
1 and 4). An additional setting gives, if desired, accurate astronomic time.

Its accuracy in the early forenoon or late afternoon is within 1', closer to noon
within 2'. The field procedure takes 2 or 3 minutes; while the reduction with the
Meridiograph is made right at the transit (or checked in the office) in about a
minute. The Meridiograph is 7 INCHES IN DIAMETER; it consists of two
graduated, rotating discs,—and a reading arm. The graduations are 5' and 10'
mains, on them the data are set,—as on an ordinary protractor,—to an accuracy
of about 1'. The transit is used only to measure the sun's altitude; the Meridi-
ograph is not attached to, and in no way interferes with, the transit. Its use re-
quires no knowledge of mathematics or astronomy.

"Just what we Engineers have long
wanted and needed."——Civil Engineer.

"Am loth to part with it, as I use it daily
in my work."——Civil and Cons. Eng.
HOW TO
TRUE NORTH
BY THE MERIDI-OGRAPH

FIG. 2 shows DETAILS OF instrument and method of
measuring altitude of sun. Let image of sun fall through
holes, and bisect image both ways; then you have the
vertical and horizontal angles.

FIG. 3 shows how the MERIDI-OGRAPH is
set. It is assumed that the sun's altitude and vertical
and horizontal angles are set on an ordinary
chart, and that the observer knows his latitude. The
instrument gives the TRUE north line.

"Checked observations to nearest minute."—Inspector
General, U.S. Army.

"Made observations of sun's bearing and sun's altitudes
by means of a meridiograph; results checked with
ambrose"—Inspector General, U.S. Army.

"Surprised at its simplicity. I am pleased to recommend it.
—Civil Engineer.

FIG. 4 shows connecting sun's bearing may be measured
by means of the meridiograph; the meridiograph gives
the TRUE north line. The difference, or correction,
between the instrument readings shows where the
ASSUMED north line must be corrected.

FIG. 5 shows the MERIDI-OGRAPH
in the field. It is a miniature instrument, about
3 inches in diameter, sharply engraved, provided
with a level, lens, and tripod. It is used
primarily for marking points, as a
surveying instrument, for
field checks, and for
quick and accurate
work.

FIELD RECORD OF OBSERVATION

<table>
<thead>
<tr>
<th>DATA</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>0</td>
</tr>
<tr>
<td>b</td>
<td>5</td>
</tr>
<tr>
<td>c</td>
<td>10</td>
</tr>
<tr>
<td>d</td>
<td>15</td>
</tr>
</tbody>
</table>

Fig. 3 shows how the DATA L, H, and D are obtained; the
SOLUTION of A, B, and C is then made by
two settings of the Meridiograph.
TO FIND
NORTH
BY THE
O-GRAPH

MEANS OF MEASUREMENT. Aim through telescope, with the tangent
ways; read and record the vertical

ERIDIOGRAPH, Model 20. On it
its altitude and declination—just
ordinary protractor. This gives
ental angle from the sun to the

sions, results identical
ons on lines whose exact
s checked to the minute.
simplification method of ob-
heartily recommend or General.
its ease and rapidity; need it as a labor saver?
neer.

CTION IN THE FIELD. The
sured from any ASSUMED north
ives its bearing from the TRUE
correction angle, swung off from
s the TRUE north.

ERIDIOGRAPH, Model 10: 7 inches
precisely machined, with collaps-
g leather shoulder bag for field-

INFORMATION BLANK.—I am interested in the
ROSS MERIDIOGRAPH, but would like to have
other information with regard to:

ADDRESS BLANK.—The following men would
be interested in the ROSS MERIDIOGRAPH. Please
send them description.

Name
Address

Name
Address

Name
Address

OR SALE BY:
MODEL 10. The Meridiograph is made of bronzed metal; the graduations are sharply engraved, distinct, and easy to read; an adjustable magnifier is collapsibly mounted on the reading arm, to be swung instantly on or off scales as desired. The instrument is precisely machined, neatly finished, and tested; its weight is about 1 pound. Packed in a strong, sewed leather, shoulder bag, with additional pockets for note-books, etc., with full instructions and an Ephemeris—a complete, permanent and convenient North-finder.

Price Complete, $20

MODEL 20. A secondary grade is made of grained ivory-celluloid, water and weather proof; the scales are permanently protected from being soiled or worn; weighs 2 ounces, flexible and thoroughly durable. Packed in fine, flexible leather case, with full instructions and an Ephemeris—a serviceable, light and accurate North-finder.

Price Complete, $7.50

The mechanical superiority of the metal Meridiograph, Model 10, doubles its accuracy. For continuous surveys requiring the utmost precision it is strongly recommended.

Postpaid on receipt of price; money back if unsatisfactory.

COMPUTER MFG. CO., 25 California St., San Francisco

MADE ENTIRELY IN U. S. A.


"The Meridiograph does away entirely with laborious calculations and solves for a true meridian in a most satisfactory manner. Checked a number of observations, invariably obtained results within 1° (2° at the most) of those given by analysis."

M. Can. S. C. E.

"Tested the Meridiograph very thoroughly, and checked my meridian by observations on Polaris within 1°."—Civil Engineer.

"Would like to have one for each of our crews."—U. S. Asst. Superv. Surveys.

"I consider it a valuable addition to my equipment."—U. S. Surveyor.

ORDER BLANK

COMPUTER MFG. CO., 25 California St., San Francisco

Please send me a ROSS MERIDIOGRAPH, Model

No.________________________with complete directions. I enclose (money order or check)__________________________ for $__________________________

If the instrument fails to do what is claimed for it, or proves otherwise unsatisfactory, I will return it in good condition within two weeks after its receipt, and my remittance is to be refunded in full.

Name __________________________________________

Address _________________________________________

REMARKS:
The Ross Precision Computer is a new multiplier and divider of unusual precision. It solves problems like \(87.65 \times 72.638 \div 74.769 = 854.58\), with an accuracy of 5 figures, i.e., to an ultimate accuracy of \(1/1000\) of \(1\%\), or \(1\) in \(100,000\). It is 100 times as accurate as the slide-rule; if a slide-rule were made 100 FEET long and graduated with spaces no greater than the ordinary 10-inch rule, it would still be less accurate than the Precision Computer. Send for folder M44.

The Ross Meridiograph reduces quickly and accurately the observation for finding TRUE NORTH. A practicing civil engineer writes:

"I have consumed $100 worth of time at night and exhausted all of my patience trying to get satisfactory results from Polaris observations; whilst with your Meridiograph I can refer every survey to the true meridian in a few minutes, with absolutely no loss of time in making observation." Send for folder M1.

The Ross RAPID COMPUTER corresponds to a 20-inch slide-rule in accuracy, but excels it in many ways. It is simpler—can be used at first sight. It handles three—note, THREE factors at one setting; figures traverses, stadia, and all trigonometric problems with great facility. Double Dial in form; flexible, durable. No warping, shrinkage, or binding; no glass parts to break. Eight-inch desk size, and 6-inch pocket Computer. Send for folder M4.

COMPUTER MFG. CO., 25 California St., San Francisco
DECLINATION.—The sun travels parallel to the equator; North of it in Summer, South of it in Winter,—changing gradually from 23° 27' north to 23° 27' south. Its distance from the equator is called “declination”—and is given for each day of the year in the sun-diary. In the figure the declination is about 10° north, that is about April 15, or August 25.

LATITUDE.—If you were as far north of the equator as the sun is, the sun's path would lie directly overhead. If you are farther north, as in figure, the sun is south of you. Your latitude less the sun's declination is the amount the sun is south of you. In figure the observer is at about 40° latitude, the sun's path is therefore 30° south of him.

ALTITUDE vs. BEARING AND TIME.—In the figure, the sun is about 45° high; its direction, or bearing is then about S. 57° E., and the sun-time is about 9.20 a.m. The higher the sun, the nearer to noon, the less its bearing. At any given latitude and date (the date gives the declination), the sun's altitude fixes its bearing, and also the sun-time.

MERIDI-O-GRAPH.—The relation between the sun's altitude and bearing is solved by the Meridiograph. Knowing the sun's bearing, the true bearing of any line desired can be located from it on the ground. Look up your latitude and the sun's declination; measure the sun's altitude. Set them on the Meridiograph; it gives your true meridian and local sun time.