BOX NUMBER 19 ~~265~~

HANDBOOK

FOR THE

LONGUE-VUE MONOCULAIRE À PRISMES

(PRISMATIC TELESCOPE)

Type X

(CAMPAGNE—MODÈLE 1917)

(NOTES ON THE PRISMATIC FIELD MONOCULAR TELESCOPE, TYPE X, MODEL 1917).

Prepared by the American Expeditionary Forces.



42288

Army War College
February, 1918.

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WAR DEPARTMENT,
WASHINGTON, February 25, 1918.

The following notes on the "Prismatic Field Monocular Telescope, Type X, Model 1917," which have been adopted by the American Expeditionary Forces as standard, are published for the information and guidance of all concerned.

(062.1. A. G. O.)

By order of the Secretary of War,

JOHN BIDDLE,
Major General, Acting Chief of Staff.

Official:

H. P. McCAIN,
The Adjutant General.

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HANDBOOK

FOR THE

LONGUE-VUE MONOCULAIRE À PRISMES

Type X

(CAMPAGNE – MODÈLE 1917)

GENERAL DESCRIPTION.

The "lognue-vue monoculaire a prismes" is specially intended for the observation of targets and for the direction and control of fire. It is particularly suited for observation at long ranges.

The "Campagne TYPE X" was designed to replace the 1898 model battery telescope and is used with batteries provided with sights graduated in mils (6400 mils = 360 degrees), namely, the following: 75 m/m. guns, 65 m/m. mountain guns, 14 and 145 L Modèle 1916, 155 L modèle 1877-1914 and modèle 1917 SCHNEIDER, 155 C modèle 1915 SCHNEIDER, 220 m/m. SCHNEIDER howitzer, etc.

The "TYPE X" telescope comprises 3 eye-pieces A (fig. 2) mounted on a "revolver" B, the corresponding magnifications are × 15 × 23 and × 30.

The × 15 magnification is used in conditions of low visibility; the illumination of this magnification is better than that of the service pattern "night telescope."

The × 23 magnification is the one normally used, the illumination being slightly better than that of the 1909 service pattern × 8 prism binocular.

The × 32 magnification is found useful in conditions of exceptionally good visibility.

The telescope is mounted upon an elevation movement D carrying a sight clinometer C; it is used on a stand fitted with an azimuth movement (see figs. 1, 2 and 3).

The **sight clinometer** enables the measurement of angles of sight in mils (6400 mils = 360 degrees).

The **azimuth movement** comprises two dials—an upper dial, carrying elevation movement and telescope which can be moved over a lower dial by turning milled head T of a tangent screw. Without upsetting the relative positions of upper and lower dials the whole instrument can be rotated by turning milled head S of lower tangent screw.

There are two graduations:

(1) On the lower dial a continuous clockwise graduation (1) from 0 to 6400 mils, used in conjunction with black index on upper dial. Each division is worth 100 milliemes and intermediate values are read on the left-hand side-graduation of the tangent screw drum. Each graduation of the drum graduation is worth 1 mil, and it is read in conjunction with the black index mark (the one engraved on smooth ground).

(2) A second graduation on upper dial; this, in conjunction with the right-hand side graduation on tangent screw drum being intended for use specially with 75 m/m. and 65 m/m. mountain batteries when angles are measured in terms of "plateau" and "tambour" of the gun-sight. (See Annexe).

INSTRUCTIONS FOR USE.

§ 1.—Setting up—Observation of Terrain.

To set up the instrument.—Remove stand and azimuth movement from their case (see that clamp C is tight). Loosen clamps of tripod legs and adjust sliding portions to desired height; press each leg well into the ground. Free the ball-and-socket joint R of the tripod by turning clamping nut G in counter-clock wise direction and bring the bubble to the centre of the spherical level H; then clamp ball-and-socket joint by turning nut G in clockwise direction.

Remove the elevation movement from the telescope case; see that the clamping lever E (fig. 1) of the elevation movement is pressed right down. Fit it onto the pivot I of the azimuth movement, seeing that spur J on the latter engages with slot on elevation movement. Tighten clamping lever E. Carefully remove telescope from its case and fit it into clamping collar.

To observe with the telescope.—Remove object glass cover M and pull out ray shade N—see that the eye-piece which it is desired to use is in correct position (turn "revolver" until "catch" is felt). Focus eye-piece by sighting on a distant object and turning milled collar until definition is at its best. The graduations on milled collar are in dioptries.

To change magnification.—Turn revolver until eye-piece of desired magnification is in correct position.

To lay on a determined point without making angular measurements.—Loosen clamp C fixing azimuth movement to stand. The telescope can then be turned freely in a horizontal plane. Elevate or depress as required by milled head P.

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(1) Corresponding to the graduation of gun sights with 75 m/m. guns, 65 m/m. mountain guns and the Schneider material mentioned on page 5. It should be noted that in the Schneider gun sights the index is fixed and the graduation movable, whereas in the 75 m/m. gun sight the "plateau" is fixed and the index movable. But in both cases **an increase in deflection is left deflection.**

§ 2.—Preparatory Operations.

To measure an angle of sight (in mils).—Slacken clamp C and lay roughly for direction; tighten clamp C and adjust accurately by milled head S. Bring the centre of the cross of the micrometer on the target by means of elevation movement P.

Turn the clinometer on the telescope hinge until a "catch" is felt; bring the bubble of the clinometer level in the centre of its run by turning milled head U.

Read the angle in hundred of mils on the divided disc V (placed at the side of the clinometer) and the intermediate values on the drum Z. Black figuring corresponds to positive angles of sight, red figuring to negative angles. The black and red figures of the drum Z correspond to the figures of same color on the sector V.

To measure the horizontal angle between two points (in mils).—If the two points come at the same time in the field of the telescope make use of the horizontal scale of the micrometer (see fig. 4) each division of which is worth 5 mils.

In the other case proceed as follows—set the azimuth movement to zero by turning milled head T so that the zero on the lower dial coincides with index X on upper dial and the zero of the tangent screw drum coincides with index Y. Lay roughly on the left-hand side point by loosening clamp C, tighten c amp C and lay accurately by turning milled head S of general movement. Now lay on the right-hand side point by turning milled head T of relative movement (1). Read angle measured on lower graduation and tangent screw drum (indexes X and Y respectively).

To measure deflection for a given target.—Set the azimuth movement to zero and lay on target, then lay on aiming point by turning milled head T. Read off deflection—this can be expressed either as a true angle as indicated on continuous graduation (o—6400 mils—see paragraph headed "To measure the horizontal angle between two points) or in terms of "plateau" and "tambour" (see Annexe).

To lay a gun parallel to a given direction (by reciprocal observations).—1° Using gun-sights with graduation divided into 4 quadrants and with "zero position" at 100 mils. (75 m/m. and 65 m/m mountain batteries). Station instrument about 50 metres from gun and lay it in the given direction (target or expected direction of fire) by using clamp C and milled head S, the instrument being set to zero. Now lay instrument on gun-sight pillar and read in terms of "plateau" and "tambour" the deflection which must be given to the gun. (see Annexe). Lay the gun with this deflection on the centre of the instrument.

2° Using gun-sights with continuous graduations divided in 6400 mils with zero position at 0 mils. Station instrument about

(1) When it is desired to measure an angle of several hundred mils it is quicker to throw tangent screw out of action by pressing pallet W right down. The upper dial will then turn freely over the lower dial. Before using slow motion see that the screw has properly engaged—but do not attempt to force it home—turn milled head T and screw will soon fill into gear.

50 meters from gun; set the instrument at 3200 mils and lay in the given direction by using clamp C and milled head S. Now lay instrument on gun-sight pillar using milled head T; read off the angle as indicated by instrument. Subtract 3200 if the reading obtained is greater than or equal to 3200. Lay the gun with this deflection on the centre of the instrument.

3° Using gun-sights with graduation in two halves divided in 3200 mils in the same direction and with zero position at 1000 mils. Station instrument about 50 metres from gun; set the instrument at 4200 mils and lay in the given direction, using clamp C and milled head S. Now lay instrument on gun-sight pillar using milled head T; read off the angle as indicated by instrument. Substract 3200 if the reading obtained is greater than or equal to 3200. Lay the gun with this deflection on the centre of the instrument.

§ 3.—Direction and Control of Fire.

To determine the height of burst (in mils).—Make use of the vertical scale of the micrometer—divided every 5 mils. The distance between the dotted line and the zero graticule represents 3 mils and is equal to height of the top of the cross above centre line—this angle is the "hauteur type" (the normal height of burst) for 75 m/m. guns.

Correction of deflection.—The instrument being laid in direction of target, bring the point of burst onto the vertical graticule of micrometer by turning milled head T. The deflection of gun must be increased (or diminished) by the angle by which the instrument reading has increased (or diminished).

Change of target.—The instrument being laid on the old target, direct telescope on the new target turning milled head T. The deflection of the gun must be increased (diminished) by the angle by which the instrument reading has diminished (increased).

TRANSPORTATION.

To put the telescope and elevation movement in the telescope case.—Turn the "revolver" until the x 15 eye-piece is in position—push in the ray shade and replace object glass cover. Remove telescope from clamping collar and place it in its case, object glass first. Shut clamping collar and tighten up clamping nut. Put the elevation movement in its case, fasten it in by means of strap and cover it with leather protecting flap. Shut lid and do up strap. This case is carried either over the shoulders or on the back like a haversack.

To put the tripod and azimuth movement in their case.—Fold up tripod and insert it in its case, legs first so that feet are in contact with bottom of case. Close lid and do up fastening strap. The tripod in its case is carried across the shoulder.

UP-KEEP.

It is essential that the instrument should be very carefully handled so as to avoid shocks and falls. Cleaning of internal parts

and dismounting of the dials or telescope are strictly forbidden. If necessary the instrument should be returned for repairs to the "Service Géographique de l'Armée". External parts only are to be cleaned. In cleaning a lens, never rub it with a cloth or anything which might grease or scratch the glass; breath on the surface and dry immediately by rubbing gently with a piece of fine linen which is not fluffy. Repeat this until the vapour condenses regularly and evaporates concentrically.

If the ball-and-socket joint does not work smoothly remove clamping nut by first undoing stop screw. Take the ball-and-socket joint to pieces and apply thick grease.

ACCESSORIES.

The accessories include:

1 reinforced leather case with strap, containing telescope and elevation movement.

1 waterproof-cloth case with leather lining containing tripod and azimuth movement.

OPTICAL AND OTHER DATA.

Magnification.....about	15, × 23, × 30
Real field.....about	50, 36, 27 mils.
Dia. of exit pupil.....about	5, 3, × 23, × 5 mm.
Weight of telescope without case.....	3 kgs.
Weight of telescope and elevation movement with case.....	7 kgs. 500.
Weight of tripod and azimuth movement with case.....	9 kgs.

ANNEXE

TO READ DEFLECTION IN TERMS OF *PLATEAU* AND *TAMBOUR*.

When the telescope is used with 75 mm. batteries and set up close to the battery, by using the quadrant graduation on upper dial and the two indexes, Y, W of the tangent screw drum the commands can be given in terms of "plateau" and "tambour".

"It should be noted that when the instrument is at zero, i. e., when the index X is in line with zero division of lower graduation, the reading in terms of plateau and tambour is "plateau: 0", "tambour : 100".

To read in terms of "plateau".—One quadrant of upper dial is divided into 8 sectors marked P L 0, P L 2, etc., P. L. 14. As the optical axis of the telescope passes through the four quadrants of the "cercle fictif de pointage" (fig. 5) the quadrant on the upper dial passes successively over 4 arrow-shaped indexes which fall on the 0, 16, 32 and 48 marks of lower (continuous) graduation, whence the rule:

The "plateau" number is the number of the sector on which one of the indexes falls (1) (see example fig. 6).

To read in terms of "tambour".—Each sector of the divided quadrant comprises a smooth and a ruled portion. In reading in terms of "plateau", note in which of this two portions the index falls and read the tangent screw drum accordingly, i. e., use either reader Y on smooth ground or reader W on ruled ground (see example fig. 6).

(1) When laying a gun for direction by "reciprocal sighting" (page 7), the proximity of the gun renders the consideration of the quadrant useless; in this case, it will be seen that the indexes of the gun-sight and the telescope are necessarily brought into opposite quadrants.

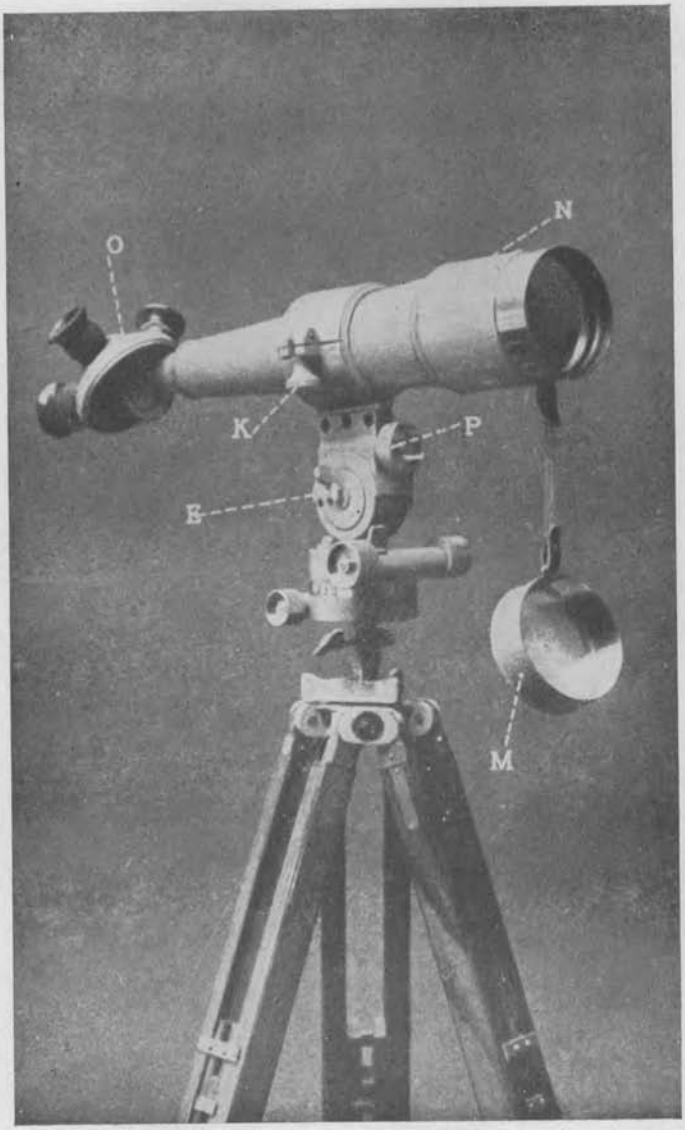


Fig. 1.

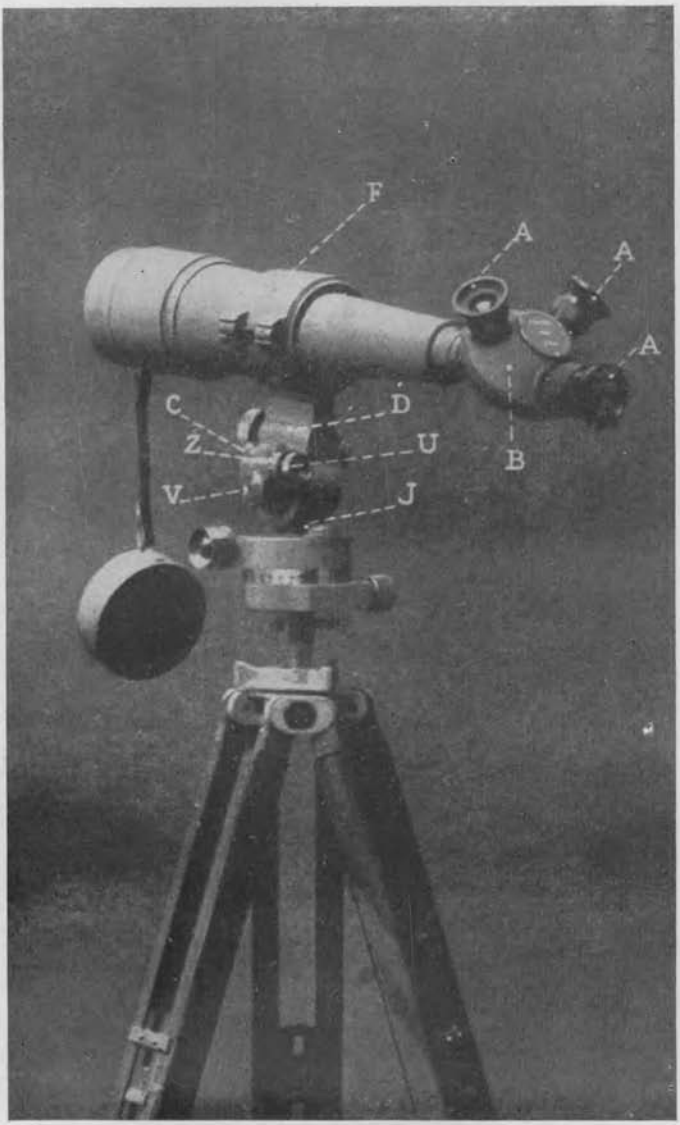


Fig. 2.

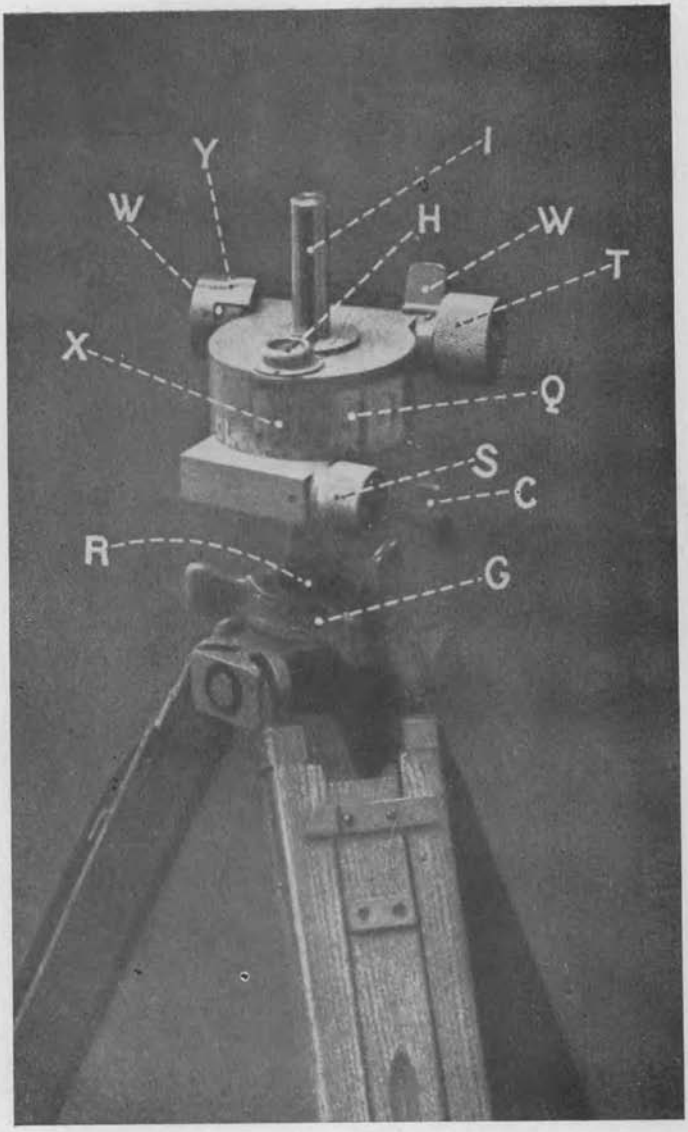


Fig. 3.

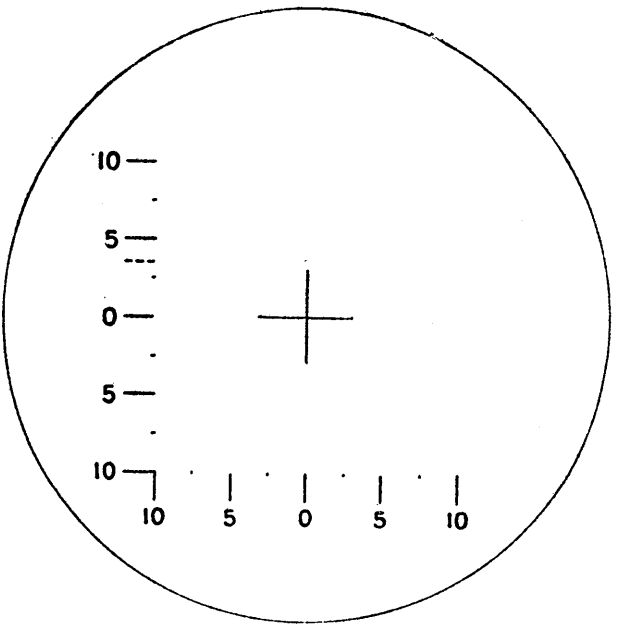


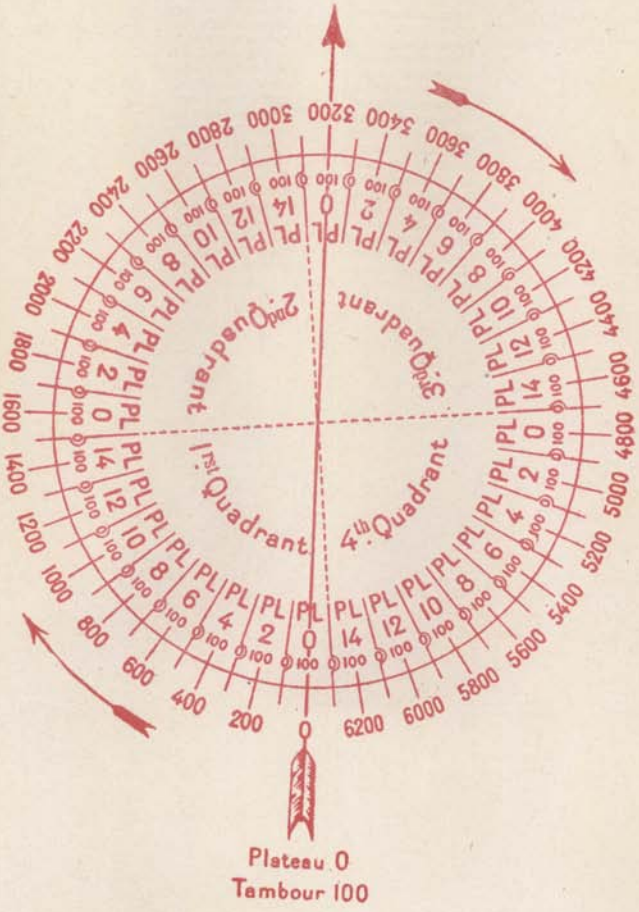
Figure 4. — *Micrometer.*

The center of the cross indicates the optical axis of the instrument.

Each division of vertical and horizontal scales is worth 5 mils.

The length of any arm of the cross is worth 3 mils. The top of the cross and the dotted line above the zero graticule facilitate the obtention of the normal height of burst of 3 mils, when the center of the cross coincides with the base of the target.

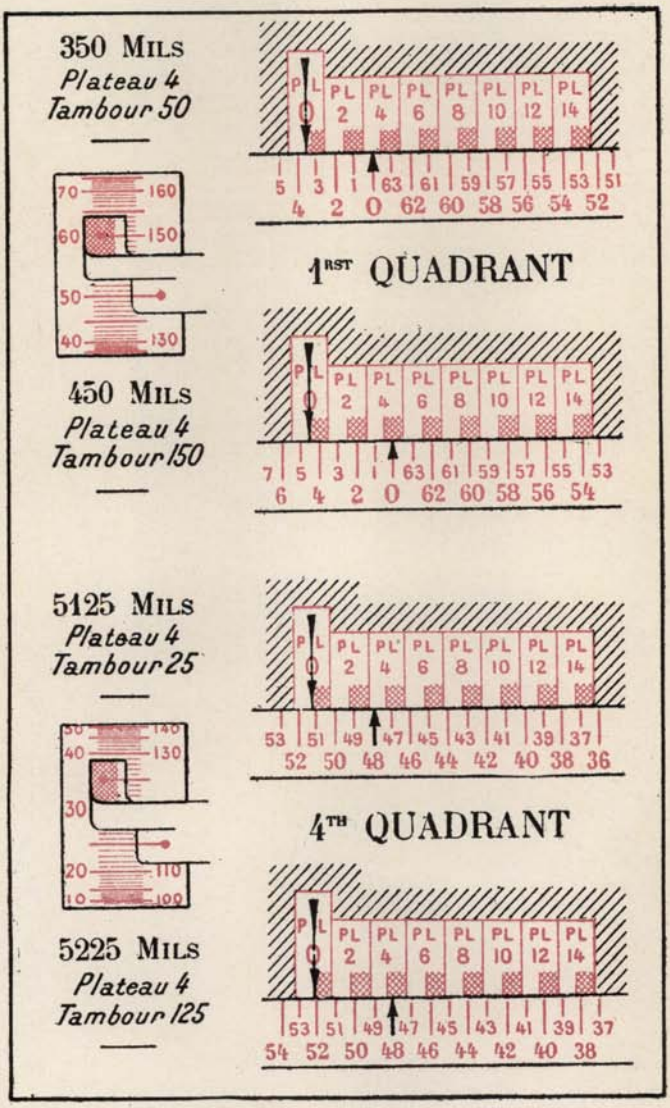
Figure 4.



CERCLE FICTIF DE POINTAGE

(THEORETICAL SIGHT DIAL)

Figure 5.


350 MILS
Plateau 4
Tambour 50
70
160
60
150
50
40
130
450 MILS
Plateau 4
Tambour 150
5125 MILS
Plateau 4
Tambour 25
40
130
30
20
110
10
100
5225 MILS
Plateau 4
Tambour 125
PL 0
PL 2
PL 4
PL 6
PL 8
PL 10
PL 12
PL 14
5 3 1 63 61 59 57 55 53 51
4 2 0 62 60 58 56 54 52
1RST QUADRANT
7 5 3 1 63 61 59 57 55 53
6 4 2 0 62 60 58 56 54
53 51 49 47 45 43 41 39 37
52 50 48 46 44 42 40 38 36
4TH QUADRANT
53 51 49 47 45 43 41 39 37
54 52 50 48 46 44 42 40 38