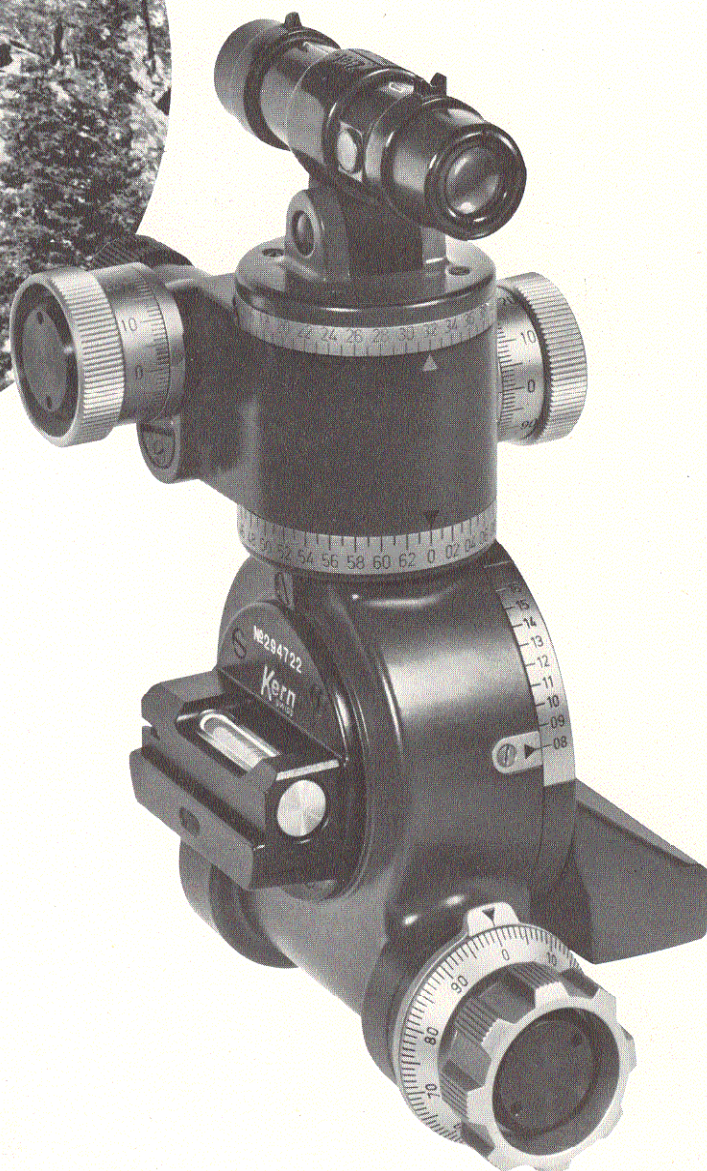
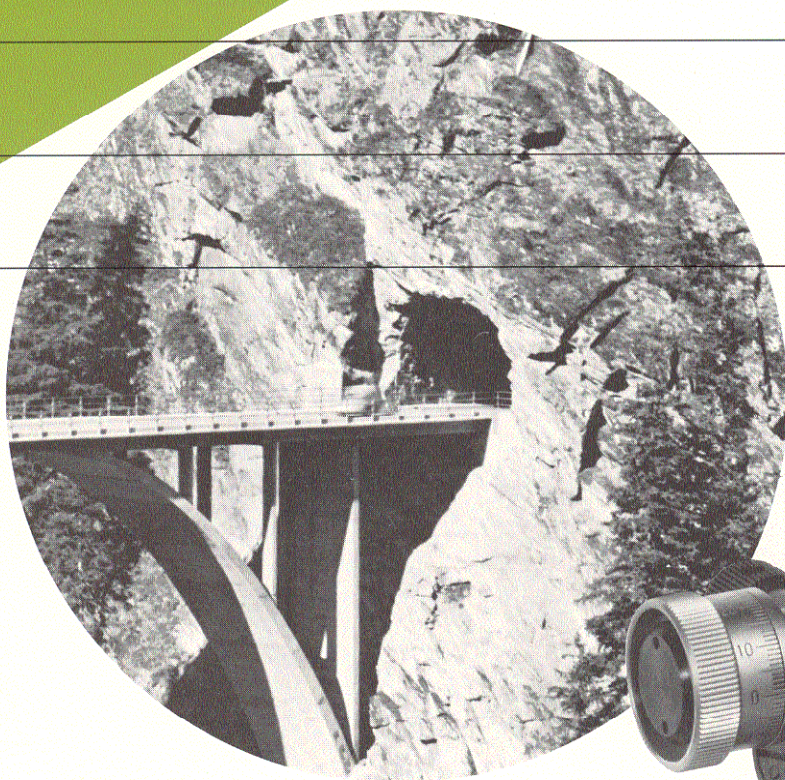


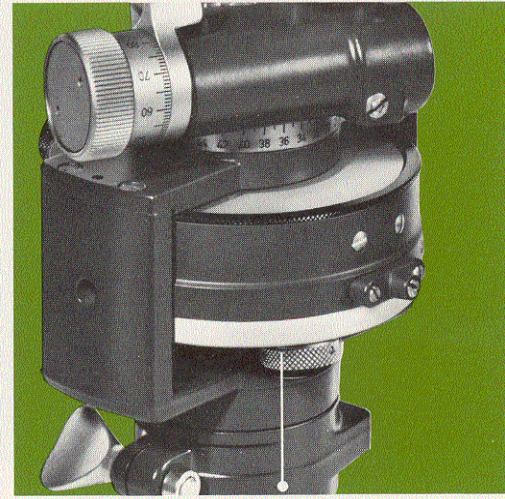
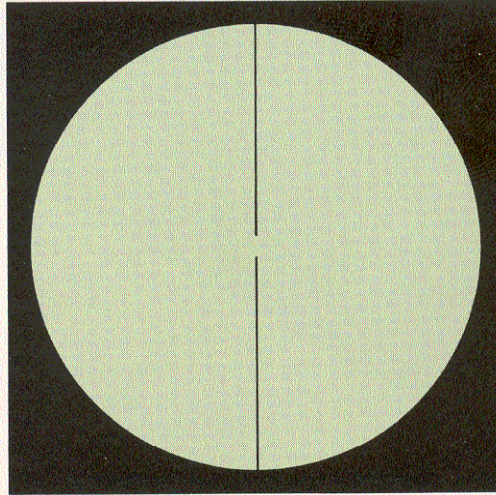


# Kern Director Sighting Attachment



# Kern Director: Perfected Technology down to the Last Detail

The director is a high-precision mechanical instrument with optical components and is mainly used for the exact indirect aiming of trench mortar batteries. The director consists of three major elements: a magnetic disk for aligning the instrument to magnetic north, director scales to measure horizontal angles and a sighting telescope for sighting aiming instruments and targets.



## Sighting Telescope

The sighting telescope is designed as a split telescope which can be swivelled in the vertical plane with a friction clutch. It's used to sight aiming instruments and targets. The ocular can be adjusted by  $\pm 5$  diopters to compensate for subjective ametropia.

## Illumination Window

An illuminating window is provided for illuminating the graticule under twilight or night conditions.

## Magnetic Disk Arrester

The magnetic disk arrester is an effective transportation lock. During periods of non-use, it automatically lifts the magnetic disk away from the precision bearing point.

## Circular Level

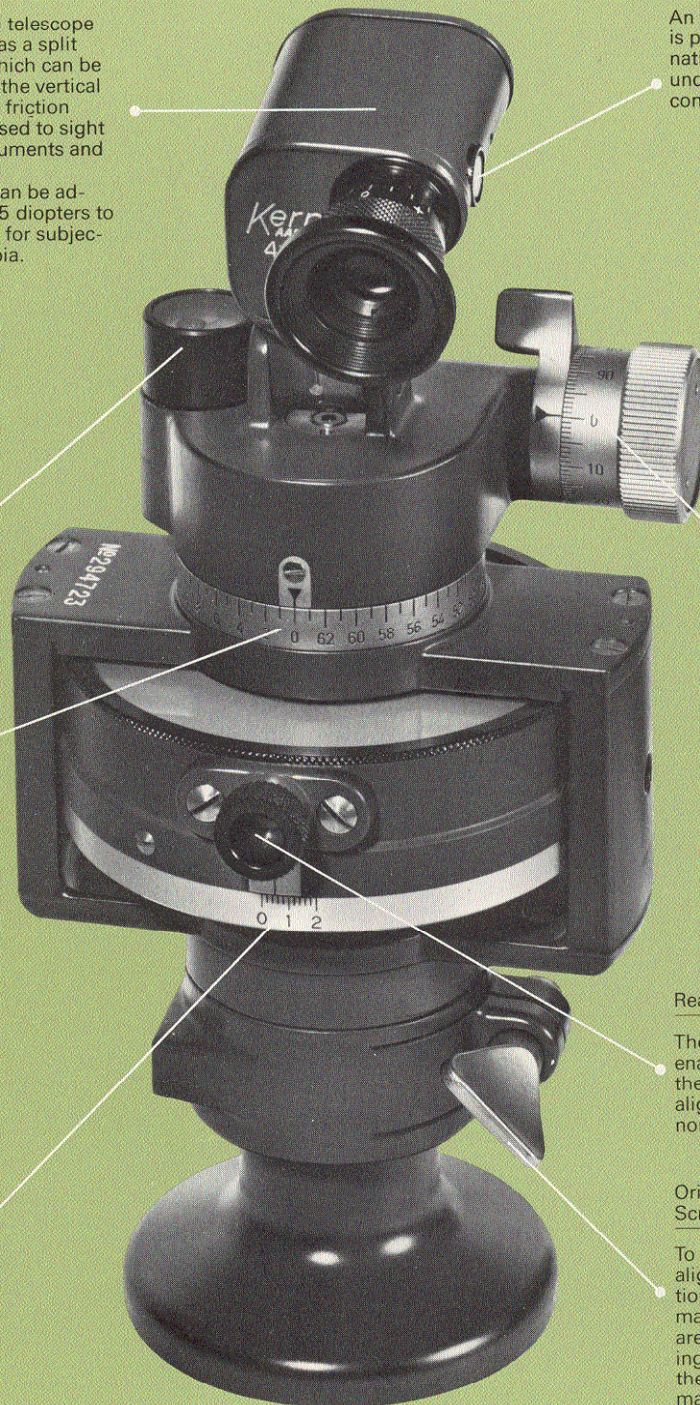
Together with the ball head of the nonmagnetic tripod, the circular level permits the exact leveling of the director.

## Azimuth Circle

The azimuth circle with a hundred-unit scale is divided into 6400 mil.

## Declination Scale

A deviation of the magnetic disk from true north can be corrected on the aiming circle. The declination can be read directly from the declination scale.



## Reading Magnifier

The reading magnifier enables the position of the magnetic disk (for alignment to magnetic north) to be read off.

## Orientation Clamping Screw

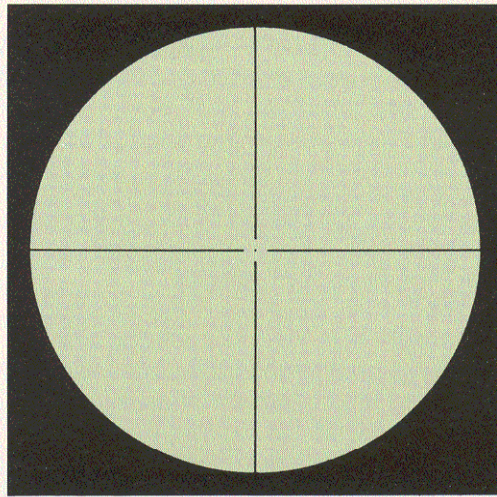
To effect magnetic north alignment, the orientation clamp screw and magnetic disk arrester are undone and the aiming circle rotated about the vertical axis until the magnetic disk is brought to north number 0.

## Traversing Drum With Release Lever

The traversing drum carries the micrometer scale with 1 mil graduations and with the aid of a precision worm drive permits the exact adjustment of the azimuth circle. The release lever allows rapid adjustment of the azimuth circle in the event of large deviations from the desired value by disengaging the worm drive.

# Kern Sighting Attachment: Perfected Technology down to the Last Detail

The sighting attachment is a high-precision mechanical instrument with optical components and is used as an azimuth aiming device for trench mortars. The sighting attachment is attached to the weapon and using the two horizontal measuring circles allows rapid and accurate aiming of trench mortars without the need for computation.



## Illumination Window

The sighting telescope is provided with an illumination window to light up the graticule under twilight or night conditions.

## Sighting Telescope

The sighting telescope with cross hairs allows the sighting of director and reference point. It can be swivelled in the vertical plane using a friction clutch.

## Traversing Drum for Laying Scale

The traversing drum carries the micrometer scale with 1 mil graduations and with the aid of a precision worm drive permits the exact adjustment of the laying scale. A release lever permits rapid adjustment of the laying scale in the event of large deviations from the desired value by disengaging the worm drive.

## Traversing Drum for Firing Scale

The traversing drum carries the micrometer scale with 1 mil graduations and with the aid of a precision worm drive permits the exact adjustment of the firing scale. A release lever permits rapid adjustment of the firing scale in the event of large deviations from the desired value by disengaging the worm drive.

## Laying Scale

The laying scale with hundred-unit scale is divided into 6400 mil.

## Firing Scale

The firing scale with hundred-unit scale is divided into 6400 mil.

## Elevation Level

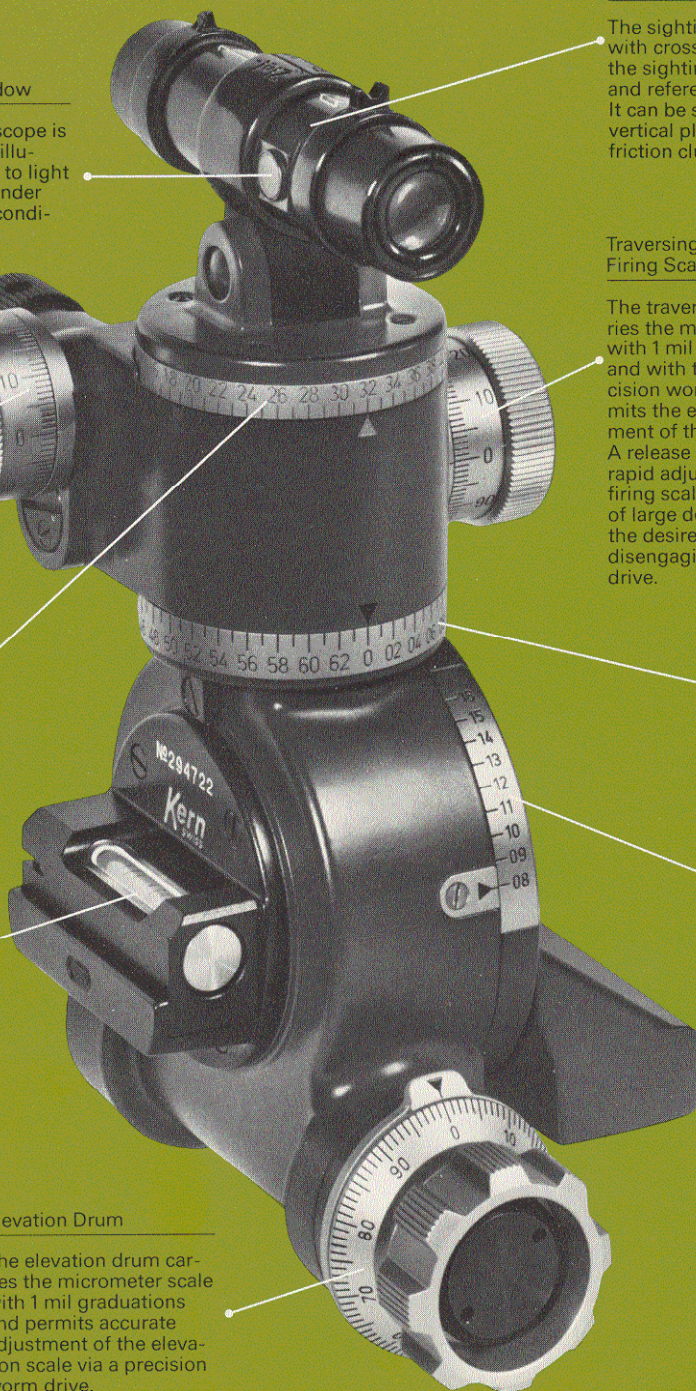
Permits the sighting attachment to be accurately leveled or the barrel of the trench mortar to be accurately oriented.

## Elevation Scale

The elevation scale with hundred-unit scale is divided between 800 to 1600 mil.

## Elevation Drum

The elevation drum carries the micrometer scale with 1 mil graduations and permits accurate adjustment of the elevation scale via a precision worm drive.



# Kern Director and Sighting Attachment: Top Quality Technical Products that conforms Stringent Military Requirements.

## Azimuthal Laying

Azimuthal laying is the simplest and most efficient procedure for aiming trench mortar barrels on an invisible target.

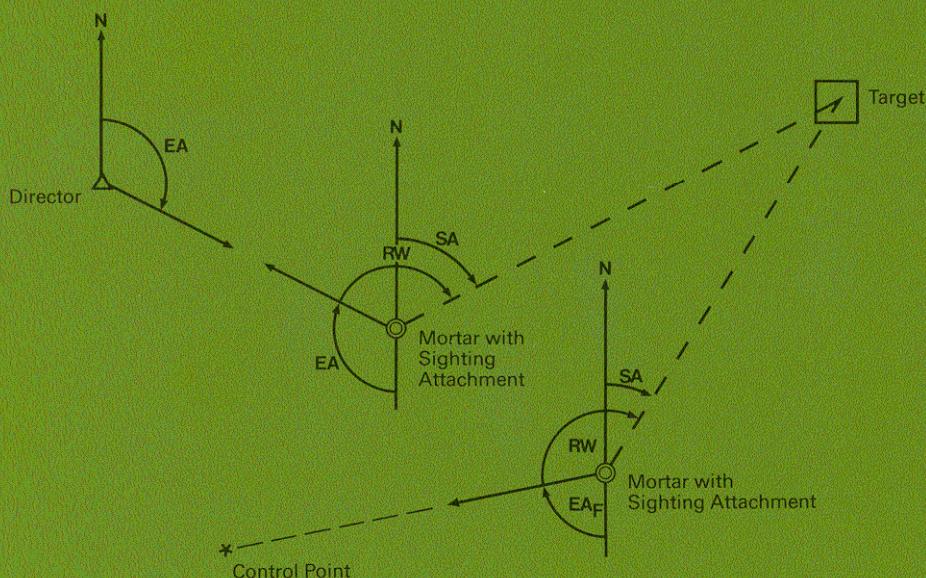
The term firing azimuth (SA) is used to designate the horizontal barrel direction, the azimuth computed from coordinates and the value to be set on the sighting attachment. The firing azimuth is defined as the horizontal angle between north and the vertical trajectory plane of the projectile.

### Advantages of Azimuthal Laying

- No preparational directions are established on the director. Only a northern orientation and to the mortar is measured.
- The azimuthal procedure permits the simultaneous deployment of individual mortars against various target areas from the same director.
- No computations are made at the mortar. Only settings are made with respect to north.
- Since all setting values represent an azimuth, they can immediately be checked by compass without computation.
- If some other reference direction to the target is available in place of the north direction, the procedure can immediately be adapted to this direction instead of to north.
- The azimuthal sighting attachment does not exclude conventional aiming methods using the simple scale.

### Indirect Aiming Procedural Principles:

- Level director and point northward.
- Sight the mortar and transfer the aiming azimuth (EA).
- Set aiming azimuth (EA) on laying scale of s. a.
- Set firing azimuth (SA) (calculated from firing position coordinates and target coordinates) on the firing scale of the s. a.
- Point and deploy the mortar by turning it until the aiming circle appears in the cross wires of the sighting attachment sighting telescope.
- Use the laying scale to aim the sighting attachment sighting telescope at some arbitrary control point. The mortar is now laid, i. e. its orientation in the field has been established.



## They Can Take It

The rugged design of both instruments guarantees long service lives even when in continuous use under the most adverse condition. The compact design effectively protects all important functional elements from damage. The performance and operational readiness of director and sighting attachment are not affected by unfavorable action and maintenance conditions.

## High-precision Azimuthal Aiming Devices

Kern uses top quality materials for all optical and mechanical components.

Directors and sighting attachments of the highest accuracy result from proven design, manufacture and quality assurance methods.

## Ruggedized, Dustproof, Water-resistant

Dependable in any environmental conditions.

## Ergonomic Shape

These compact, light and handy aiming devices feature ergonomically designed, easily manipulated operating elements.



Whenever the latest technologies are applied to the design of military optical instruments, Kern is at the forefront – and has been for decades.

In the future, Kern will continue to incorporate scientific knowledge and technical progress in development of new and improvement of existing products while taking into account the individual needs and requirements of the user community.

**Kern & Co. Ltd.**  
**Mechanical, Optical and Electronic Precision Instruments**  
**CH-5001 Aarau, Switzerland**  
**Telephone (064) 25 1111**

## Director: Technical Data

Telescope magnification	4 x
Entrance pupil diameter	18 mm
Exit pupil diameter	4.5 mm
Field of view at 1000 m	150 m
Field of view in degrees	8.4°
Diopter adjustment range	± 5 diopters
Vertical adjustment with friction clutch	± 30° self-locking
Azimuth circle division	1 x 6400 mil
Micrometer scale division	1 x 100 mil
Circular compass division	1 x 6400 mil (1 graduation per 10 mil)
Measuring accuracy of circular compass	2 mil
Declination	Adjustable from 0 to 200 mil (1 graduation per 20 mil)
Operating temperature range	- 30 °C to + 50 °C
Storage temperature range	- 40 °C to + 60 °C
Weight	2 kg
Approx. dimensions:	
Height	210 mm
Width	110 mm
Depth	110 mm

## Sighting Attachment: Technical Data

Telescope magnification	1.8 x
Entrance pupil diameter	8 mm
Exit pupil diameter	4.4 mm
Field of view at 1000 m	170 m
Field of view in degrees	9.6°
Vertical adjustment with friction clutch	± 30° self-locking
Laying scale division	1 x 6400 mil
Firing scale division	1 x 6400 mil
	The laying scale is rotated by 3200 mil with respect to the firing scale
Elevation scale division	800 to 1600 mil
Micrometer scale division	1 x 100 mil
Elevation level sensitivity	0.4 mil per interval
Elevation measuring accuracy	1 mil
Operating temperature range	- 30 °C to + 50 °C
Storage temperature range	- 40 °C to + 60 °C
Weight	2.7 kg
Approx. dimensions:	
Height	200 mm
Width	110 mm
Depth	125 mm