



Kern PG 2-AT Semi-Automatic Stereoplotter System



Introduction

Since March 1974 Kern offers the photogrammetrist a unique, revolutionary stereoplotter system. Revolutionary, because here, in one instrument are combined for the first time the best features of the mechanical, analog stereoplotter and the latest state of the art electronics at a modest price.

The PG 2-AT is properly called a system. The user can start out with the basic PG 2 stereoplotter and by adding one building block after another arrive at an integrated plotter system which will solve nearly all of the mensuration and plotting tasks found in a modern mapping organization. The PG 2-AT provides the first step towards economical semi-automatic plotting.

Description of the PG 2-AT

The Kern PG 2-AT in its basic configuration consists of the PG 2 stereoplotter fitted with X, Y (and Z) encoders, and the AT automatic plotting table.

The plotting table provides in its standard execution a neat drafting area of 860 × 1360 mm (34 × 54 inches) and can be inclined over 90° from the horizontal to the vertical position. It is stepper motor-driven from the impulses given by the X, Y (and Z) encoders in the model space of the PG 2.

A hard-wired microprocessor serves as the link between the PG 2 and the automatic plotting table. It contains two electronic scalars, so that the X and Y axes can be scaled individually. Scale factors between 0.1 and 9.9 can be introduced, so that a maximum enlargement of 12.5 times from photo to plot is obtained. In addition thereto the microprocessor provides the operator with different working modes (see page 4).

Advantages of the Kern PG 2-AT Semi-Automatic-Stereoplotter System

1. One-man instrument

Even at maximum 12.5× enlargement, the PG 2-AT is a true one-man instrument. The plotting table is located immediately to the right of the operator and he can annotate the manuscript without getting up from his chair. Since all man-made features are plotted as straight lines semi-automatically, no table assistant is needed. Plotting time of a large scale dense-detail model is reduced by at least 50% as compared to conventional stereoplotting.

2. Ink manuscript

The manuscript is drawn in ink with a pressurized ballpoint pen or with the Kern Prontograph technical pen. A neat, directly reproduceable manuscript is obtained which requires generally little editing. Drafting time should be reduced by about 80%.

3. Maximum precision

Planimetric detail is no longer traced or ticked, but it is obtained by means of accurate single pointings. The map is drawn departing from the model coordinates, hence digital mapping. The enlargement from model to plot is purely electronic, so there is no degradation of accuracy.

4. Versatility and efficiency

The PG 2-AT is a simple, fast and inexpensive "digital" plotter with near-universal application through its building block system.

Standard delivery

- AT automatic table
- Drawing head with drawing tool spindles and precise step-over
- Two pen holders, diameter 2.54 mm for Fisher Space Pen (pressurized ball-point)

Optional accessories

- Drawing head with rotation of drawing tools
- Microscope for scale adjustment
- Holder for Mechanical Pencil, fixed lead diameter of 0.3 or 0.5 mm
- Holder for Kern Prontograph technical pen
- Kern Prontograph for AT table, with tungsten carbide tips for line widths 0.18 mm, 0.25 mm, 0.35 mm, 0.50 mm
- Electrostatic holddown. The manuscript can electrostatically be fixed extremely flat on the plotting surface.

Technical specifications

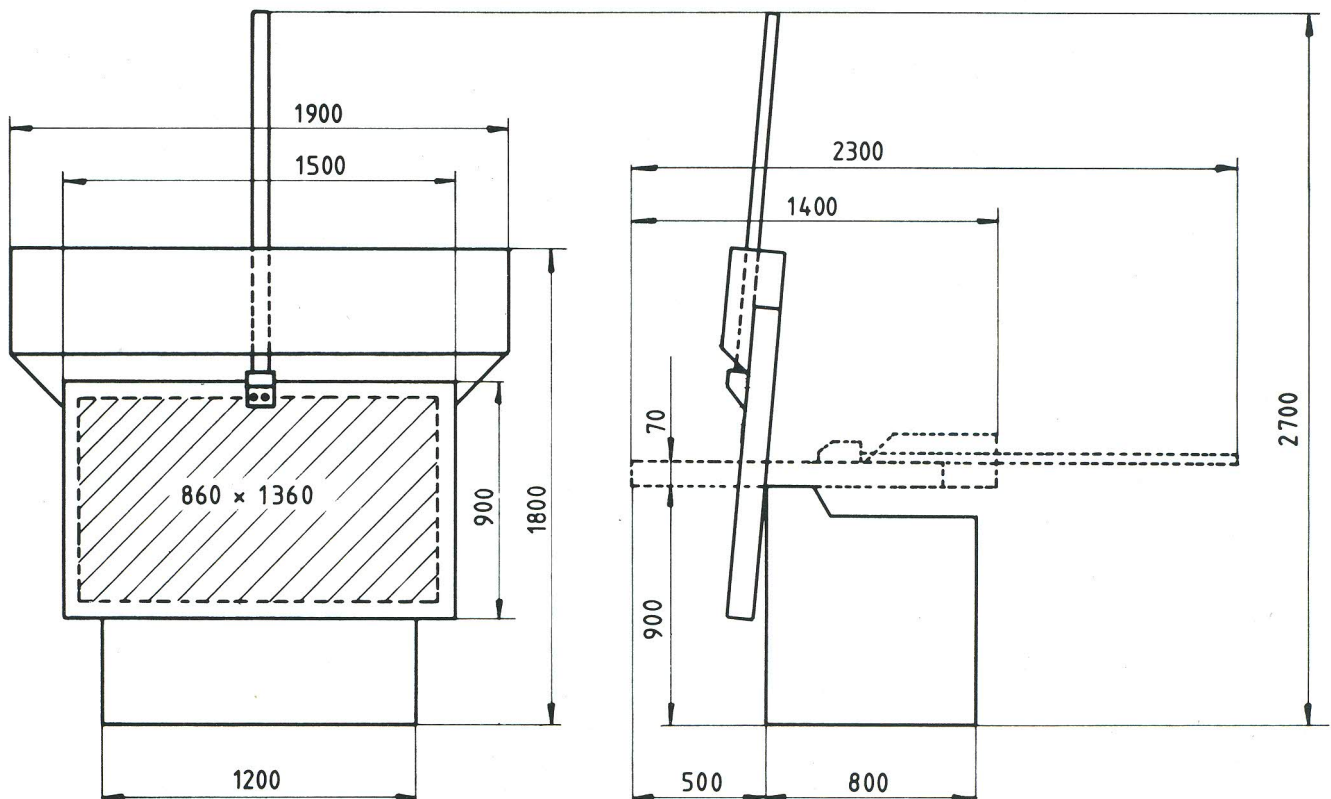
- Hard wired interface between the encoders of the PG 2 or PG 3 and the Automatic Table
- Two electronic scalars, allowing individual scaling of the plotter X and Y axes
- Scale factors from 0.1 to 9.9 in steps of 0.1 for X and Y
- Axes interchange: All three axes can be interchanged with one another. X and Y can be interchanged and X or Y can be substituted for Z.
- Maximum enlargement from photo to plot:
Kern PG 2: up to 12.5×
Kern PG 3: up to 22×
- Neat plotting area: 860×1360 mm
- Plotting surface can be inclined over 90° from horizontal to vertical position
- Resolution: 0.0625 mm (0.0025")
- Accuracy: 0.07 mm (0.0028") r.m.s.
- Two drawing tool spindles on the drawing head
- Automatic precise step-over which allows the use of different combinations of drawing tools
- Drawing tools can be rotated (optional)
- Drawing tools
 - Pencil
 - Pressurized ball point pens
 - Technical pens Kern Prontograph
 - Hard metal points

- Eccentric ballpoint pen holder for drawing circles with variable diameters up to 5 mm (optional)
- Drawing speeds
 - Variable in 16 steps between 10 mm and 200 mm per second (½" to 8" per second) when on-line with stereo-plotter.
 - Variable in 16 steps between 25 mm and 400 mm per second (1" to 16" per second) when off-line under computer control
- Temporary off-set of the drawing head of 75 mm in Y direction with automatic precise re-positioning, for visual inspection of the plot in the vicinity of the drawing tool.
- Weight: 330 kg

Electrical specifications

Power supply: 110 Volt/60 Hz,
220 Volt/50 Hz
Power consumption: 750 W

Dimensions of the Kern AT (in mm)



The Building Blocks for the Kern PG 2 Stereoplottting System



Stereoplotter for plotting from wide- and superwide-angle photography at scales between 0.5 and 2 times the photo scale (see pamphlet 203e).

Stereoplotter for plotting from wide- and superwide-angle photography at scales between 0.9 and 5.2 times the photo scale (see pamphlets 203e and 224e).

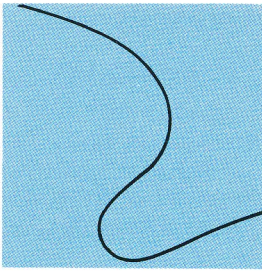
Digitizer and coordinatograph with X, Y and Z encoders to read and record model coordinates in digital form (see pamphlet 221e).

Autocollimation system and bridging microscopes for semi-analytical aerotriangulation with independent models (see pamphlets 207e and 208e).

Profiling guide bar for all volumetric measurements and profiling (see pamphlet 222e).

Automatic plotting table for semi-automatic stereoplottting at all scales between 0.1 and 12.5 times the photo scale.

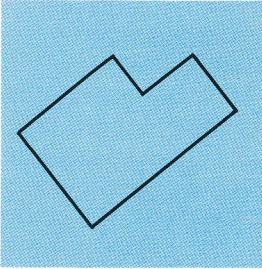
Orthophoto projector for on-line orthophoto mapping from wide-angle photography (see pamphlet 227e).



Plotting Modes

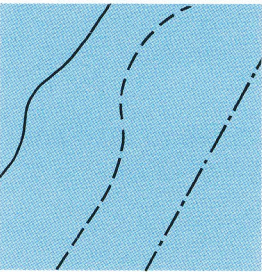
Track mode

For continuous on-line plotting of all nature-made features (contours, creeks, trees, etc.).



Line mode

For semi-automatic plotting of all man-made features (houses, roads, etc.). The automatic table draws a straight line between two points. The operator positions the floating mark only at house corners and at selected positions along roads, etc. For curved roads he chooses smaller to very small intervals.

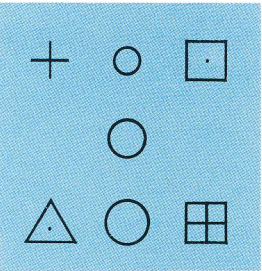


Line types

Solid line

Dash-dash lines (interrupted lines) with dash lengths selectable between 3 mm and 11 mm, in 10 steps.

Dot-dash lines with dash lengths selectable between 1 mm and 10 mm, in 10 steps.



Symbols

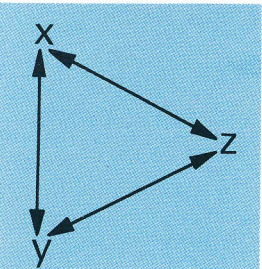
Cross

Square with centre point

Square with cross

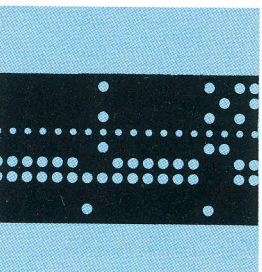
Triangle with centre point

Circle with variable diameter up to 5 mm (optional)



Axes interchange

All three axes can be interchanged with one another. X and Y can be interchanged and X or Y can be substituted for Z. Since the microprocessor has two scalars, profiles can be plotted at exaggerated scale.



Off-line mode

The Kern AT can also be used as an off-line computer-driven flatbed plotter. For this purpose the AT table can be equipped with a special interface which has an RS 232 C serial port. The computer must be equipped with an RS 232 C serial port.

Manufacturing Program

For more than 160 years Kern has manufactured surveying instruments and drawing equipment that have an outstanding reputation in all parts of the world.

The present manufacturing program includes:

Levels
Theodolites
Self-reducing tachymeters
Electro-optical distance meters
Optical precision plummets
Planetable equipment
Photogrammetric equipment
Compasses
Technical pens Prontograph
Lettering and drawing templates
Lenses for motion picture and still cameras
Optical instruments for military use
Special optical equipment



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