

## MAGNETIC BASES

Magnetic bases provide a convenient and stable method of positioning optical components. A magnetic field clamps the base to a ferromagnetic plate. The handle actually does not move the magnet into position to attract the table but moves a piece of metal which shunts the magnetic field into itself, acting as a barrier to the magnetic force, out of the way. In this way both the north and south poles of the magnet contribute to the holding force, making a strong bond.

The principle was pioneered by the Gaertner Scientific Corporation of Chicago<sup>1</sup>, at the suggestion of Dr. T. Jeong. It has its roots in Magnetic bases that are used in machine shops to hold gauges for measuring flatness or roundness. They are the most popular mounting system in use in the optics field.

The bases are the foundation of the rod and clamp system of fixturing, with rods screwed into them directly, or thick support post holders (see Gaertner Picture) screwed into the base and a rod dropped into it, all the way to the bottom preferably, for the maximum stability. This makes for a much sturdier assembly.

We have six different types of magnetic bases. A description of each follows. It is surprising that all the different types follow the same protocol in switching on and off: to the right to unlock, to the left to activate.

The typical way to implement them is to have the support post or rod oriented vertically, with a right angle clamp connecting the optic to it. This system allows the greatest variety of positioning variations: the base can be moved in the plane of the table, and the clamp can be moved up or down the post, for translation in the X, Y, and Z axes. The optic's rod can be rotated in the clamp to align it parallel to the table top or in the case of ascending or descending beams to align the optic's central axis with the laser beam's.

**NEWPORT:** We have three variations of the NEWPORT bases: The classic Model 100, "Compact Heavy Duty Base", and the newer Model 110, with the "kinematic" top, which have been removed, as they really don't relocate like they say, plus it seemed to make the unit unstable. But in their defense, they do have the strongest magnets of the bunch.

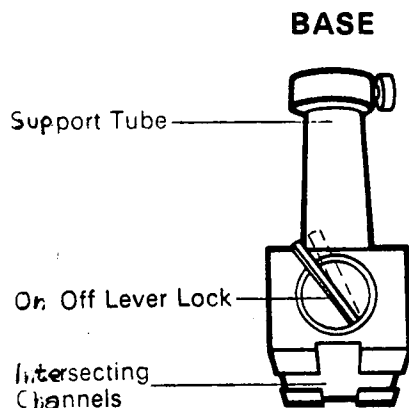
There is also a Model 150, "Low Profile, Heavy Duty Base", which is the only base Newport makes that will accommodate their damped rods. It is tied up in the transfer set up. For your inconvenience the unit is turned off using an Allen Key, but don't let that worry you because there is no need to ever move it from its position. There are also a couple of MB-1 "Utility Baseplates", neglected in the CLAMP DRAWER of the FILING CABINET.

All the holes on the NEWPORT bases are 1/4"-20, so that rods or VPH-2, 3, 6 can be attached to them.

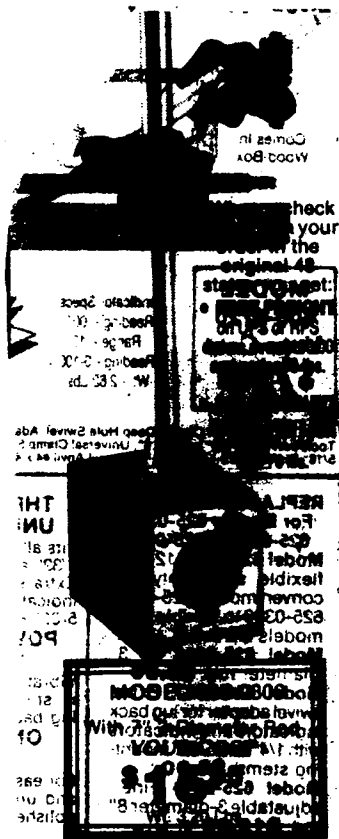
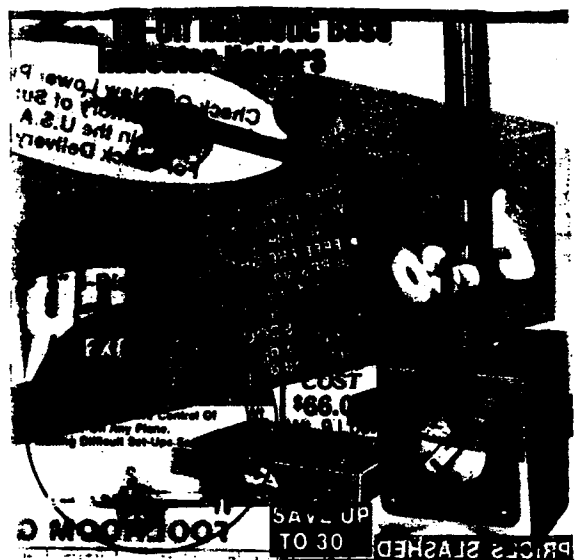
---

<sup>1</sup> Great Art Deco factory building at 1201 West Wrightwood Avenue, Chicago, IL 60614, just a few blocks west of Club 950 a.k.a. The Lucky Number.

**GAERTNER:** These are from the earliest incarnation of the Holography Department at SAIC. They are grey with a chrome knob, and there are support post holders that fit onto them of the same color, along with some homemade ones. Notice that they made the bases with four feet on the bottom, and they will sometimes rock unless the magnet is turned on. It may be necessary to hot glue the base to the table in critical applications. The thread in the center of the base is 3/8"-13, while the four smaller corner holes are 8-32, which are useful for attaching a Newport B-2 to it as an interface between the two different manufacturers.



**EMCO:** These are from a company which distributes products from the Far East. We have samples of two catalog numbers. The smaller ones seem to be losing their handles, so if you see any floating around the lab, put them with the bases or in a MISCELLANEOUS METAL PARTS box. The magnets weren't so strong to begin with, and some of them it's hard to tell if the magnetic field is on or off, so reserve the use of these bases for lightweight

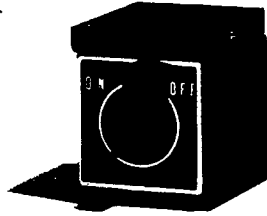
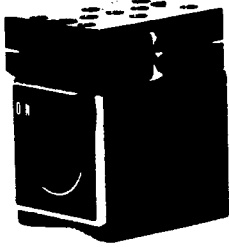


things. The hole on top is 5/16"-18, and some of the Newport VPH-4's had their bottom

1/4"-20 thread drilled out to provide a clean hole for a 5/16" bolt to pass through to attach it to the base, like the holders for the Beginning Table's half-wave plate rotator and polarizing beamsplitter cube assemblies. It is best not to disassemble them. The chrome-plated rods which came with them are also usable, and the clamping hardware show in the picture is in the **CLAMP DRAWER**. We ordered the larger one several different times, and although the catalog number was always the same, red, black, and blue bases arrived. They have some sort of metric thread in them, so they are best used with the chrome-plated rods that came with them.



110



Includes kinematic top plate



Model 110's kinematic top plate provides sub-milliradian position repeatability at no extra cost.



## Kinematic, Heavy-Duty Magnetic Base

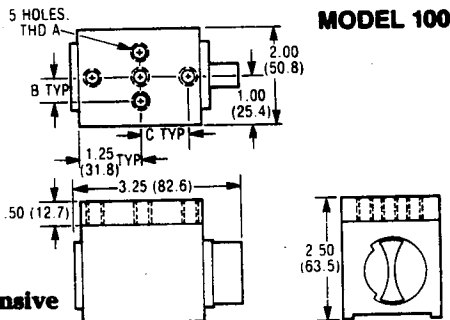
- **New— the industry's first kinematic magnetic base**  
Standard kinematic top plate for repeatable positioning
- **Compact size with generous hole pattern**  
Combines easy component mounting with close spacing capability
- **Non-magnetic mounting surface**
- **High holding force**

Newport's unique new **Model 110 Kinematic Magnetic Base** is a space-efficient base that adds an inset kinematic interface to a generous array of tapped mounting holes. Components may be attached directly to the base, or the unique kinematic top plate lets you remove components and replace them in position—reliably, time after time.

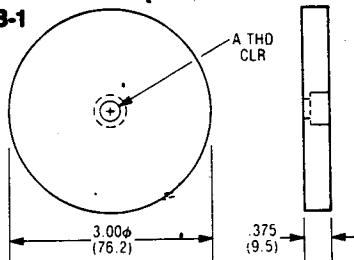
This base is the totally new replacement to our popular Model 100 base. It offers the same platform height, non-magnetic mounting surface, convenient on/off knob and similar package size. Enhancements include an improved magnet, an even more generous mounting hole pattern, and the unique kinematic top plate. Model 110 may also be attached to tables on its side. Yet even with these new features, it is still priced to fit any budget.

The kinematic top plate is equipped with spring-steel clamping hooks which hold the kinematic plates together. Alternatively, two bolts may be used to clamp the plates together. This provides secure clamp-down of cantilevered or rod-mounted loads. The locking bolts are accessible even when a standard 1.5 inch (38 mm) rod is attached. Extra kinematic top plates may be purchased.

- **Inexpensive**

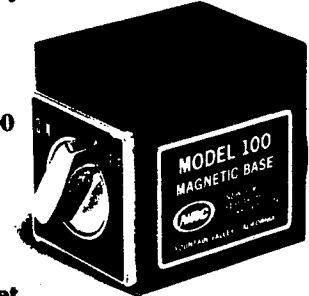


### MODEL MB-1



## Compact Heavy-Duty Base

100



- **Strong, stable magnet**  
200 lb. (90 kg) holding force does not degrade with use
- **Compact size allows close component spacing**
- **Low field leakage**
- **Non-magnetic mounting surface with versatile hole patterns**

Newport's **Model 100** is a space-efficient magnetic base with exceptionally high holding force for its size. A simple 90° rotation of its locking knob attaches it securely to a ferromagnetic surface. Field leakage is low, so Model 100 may be used in proximity to sensitive electronic equipment.

Model 100 has a convenient array of tapped mounting holes for mounting components, including **Models 40 and 70 Rods** (page G-9). Its mounting surface is non-magnetic, so ferromagnetic components may be mounted without degrading its holding force. If a larger mounting surface is needed, the **Model 38 Platform** (page G-13) is useful.

## Utility Baseplate

MB-1



- **New 4.0 lb (1.8 kg) holding force**

Small components can be quickly positioned on ferromagnetic optical tables and breadboards using the **MB-1 Utility Baseplate**. It features an improved magnet for greater holding force. Components mount to the MB-1 by a single bolt.

## Ordering Information

	English Model	Metric Model	Price
Low profile, heavy duty Bases	200	M-200	\$265
	150	M-150	\$245
Kinematic Magnetic Base	110	M-110	\$155
Compact Base	MB-2A	M-MB-2A	\$ 55
Micro Magnetic Base	MMB	M-MMB	\$ 35
Utility Baseplate	MB-1	M-MB-1	\$ 35
Extra Kinematic Top Plate for Model 110:	BK-1T	M-BK-1T	\$ 32

# Magnetic Bases

**Magnetic Bases** reduce experimental set-up time significantly, as they allow free positioning and instant clamp-down of components. They are ideal accessories for all laboratories with ferromagnetic work surfaces such as Newport optical tables or breadboards. Newport offers a selection of magnetic bases with cost and performance options to satisfy every requirement.

Newport magnetic bases use strong, compact magnets in a switchable magnetic circuit that provides the highest holding force for their size along with convenient switching for quick repositioning. We paid special attention to the choice of magnets and details of the magnetic circuit design to ensure that the maximum holding force of Newport bases remains constant over time. And if your needs require it, our

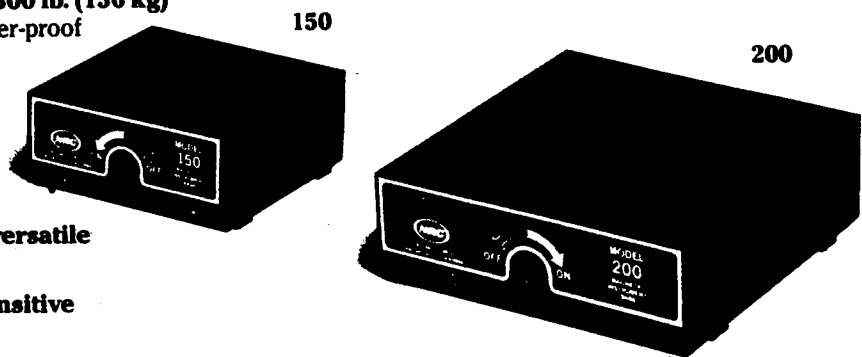
**Models 100, 150, and 200** offer exceptionally low flux leakage for safe operation near photomultipliers and other sensitive equipment.

For maximum holding power, magnetic bases should be used on unpainted ferromagnetic surfaces at least 3/16 in. (5 mm) thick (for 410 or 430 stainless steel). Even thin layers of paint or powder coating will significantly reduce the holding force of any magnetic base.

Also see Newport's **BU Series Universal Bases** (page D-8) and **BK Series Kinematic Bases** (page G-7). These provide single-bolt tie-down, anywhere on an optical table, for component positioning almost as convenient as with magnetic bases.

## Low-Profile, Heavy Duty Bases

- **Highest holding force available— up to 300 lb. (136 kg)**  
Continuously variable from two sides; tamper-proof lockdown
- **Stable magnets**  
Holding force does not degrade with use
- **Wide, stable low-profile base**  
Suitable for cantilevered loads
- **Non-magnetic mounting surfaces with versatile hole patterns**
- **Low field leakage— safe for use near sensitive equipment**

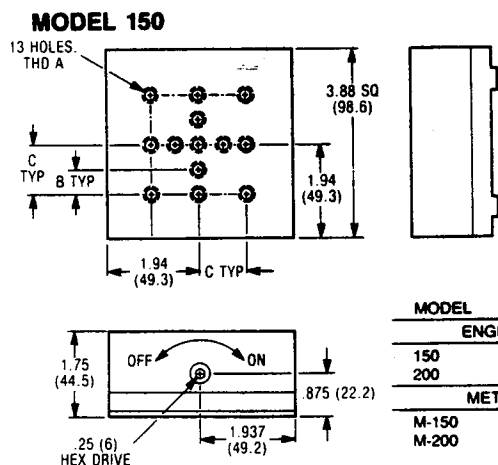


Newport's **Models 150 and 200** are premier magnetic bases that combine all the most desirable features: a large holding force that does not degrade with use, a low profile, mounting flexibility, exceptionally low field leakage, continuously variable force with easy-to-reach adjustments, and a non-magnetic mounting surface.

These bases incorporate a carefully engineered, stable magnetic circuit design which involves a linear translation of the magnets to turn the holding force OFF and ON. As the magnets are translated by a rotating leadscrew, the magnetic flux is routed either through the table surface—

producing the strong holding force—or contained entirely in the base—allowing quick repositioning of components. An inset adjustment screw which varies the holding force is conveniently accessible from either side of the base. Four turns of the ball driver (supplied with each base) vary the force from full ON to full OFF. Using a ball driver instead of a thumbwheel ensures that the bases can be adjusted even when oversized components are mounted.

Both bases feature a versatile array of tapped mounting holes for mounting Newport components.



MODEL	THREAD	
	A	B
ENGLISH		
150	1/4-20	.500
200	1/4-20	.500
METRIC		
M-150	M6	12.5
M-200	M6	12.5

## Magnetic Bases

Holding Force [lb. (kg)]	English Model	Metric Model
<b>Low-Profile Heavy Duty Bases</b>		
300 (136)	200	M-200
200 (90)	150	M-150
<b>Compact Heavy-Duty Base</b>		
200 (90)	100	M-100
<b>Economy Base</b>		
75 (34)	MB-2	M-MB-2
<b>Utility Baseplate</b>		
4.0 (1.8)	MB-1	M-MB-1