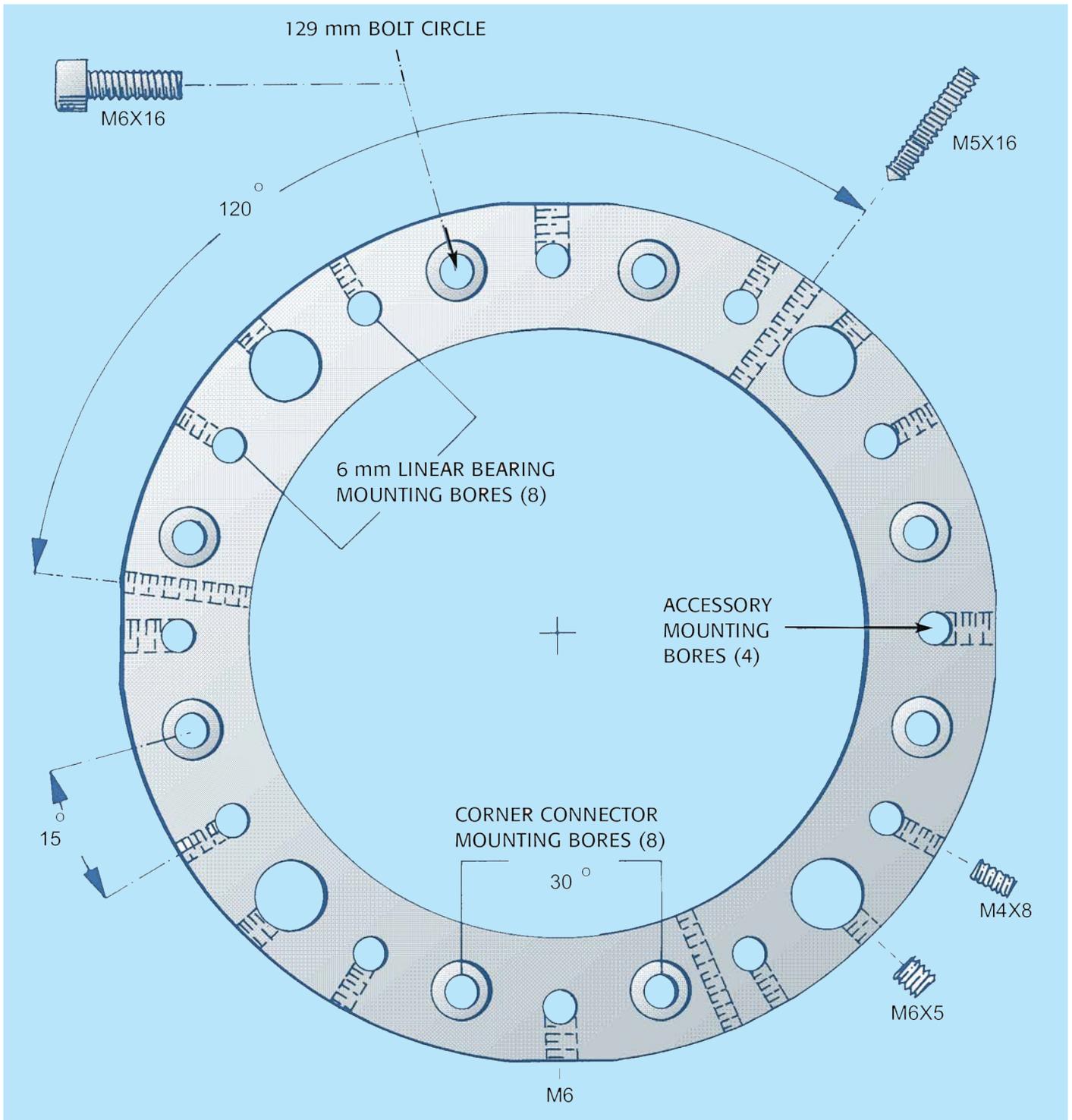


Optoform

Macroptic System 150

How to use Macroptic 150
Macroptic 150 Accessories
Macroptic 150 Applications



Be Different. Think Different. Do it with Taste. Make it a better product

Macroptic 150

150-100 Macroptic Standard Mount 105

Macroptic mounts can secure mounted optics up to 105 mm in diameter. Four 12 mm oval shaped bores, 90 degrees apart, allow insertion of 12 mm support rods, and can be rigidly secured at any point along the rods.

There are 8 counter-bores that work with corner connectors, and oblique rods to construct three dimensional structures. Three cone tipped M5 screws, 120 degrees apart, are designed to secure mounted optics, and would allow centering.

150-102 Macroptic Standard Mount 110

Identical to 150-100 but with 110 mm clearance aperture.

150-104 Macroptic Angle Plate 105

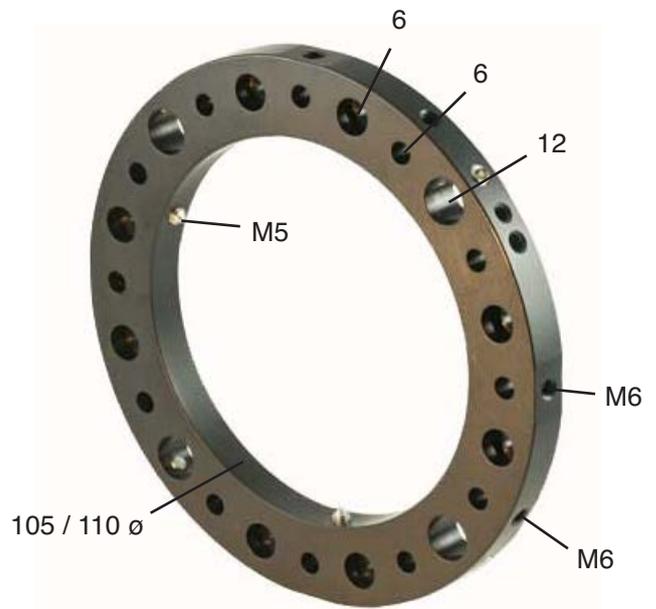
Angle plates may be attached to end of rods, or act as a carrier for mounted optics, and accessories. All the bolt pattern in Macroptic angle plate are counter bored.

150-106 Fixed Linear Bearings Mount 65

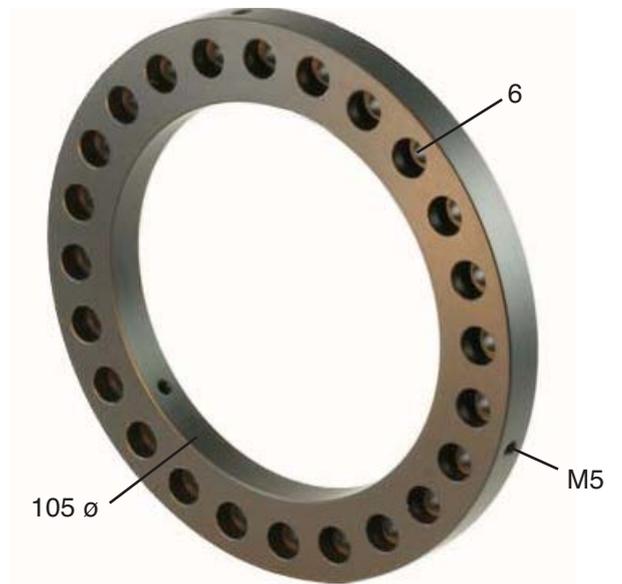
Linear bearing mounts are designed to perform precise translation along the optical axis. They work with a pair of linear bearings, a micrometer, and a return spring. 150-106 works with 150-100 to construct a compact lab jack with a 24 mm minimum height. Using a micrometer, the lab jack could lift up 13 mm, or 25 mm depending the micrometer used.

150-108 Traveling Linear Bearings Mount 65

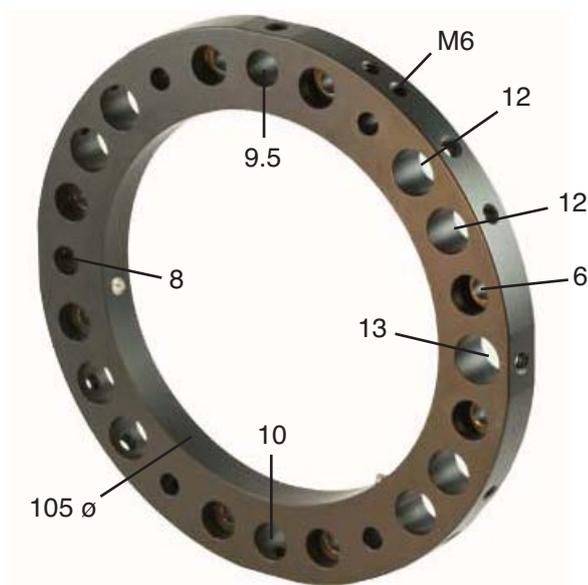
Similar to 150-106 but with enlarged clearance bores to allow sliding action without contact with support rods. It works in conjunction with 150-100 or 150-106 as its stationary platform.



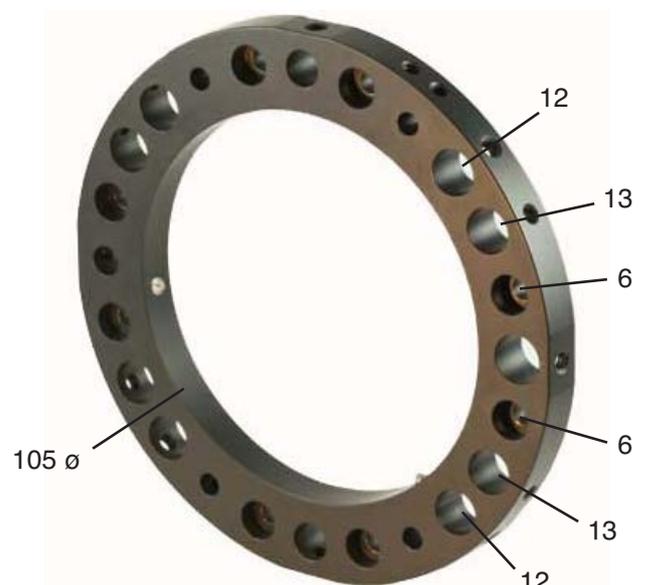
150-100 / 150-102 Standard Mount 105 / 110



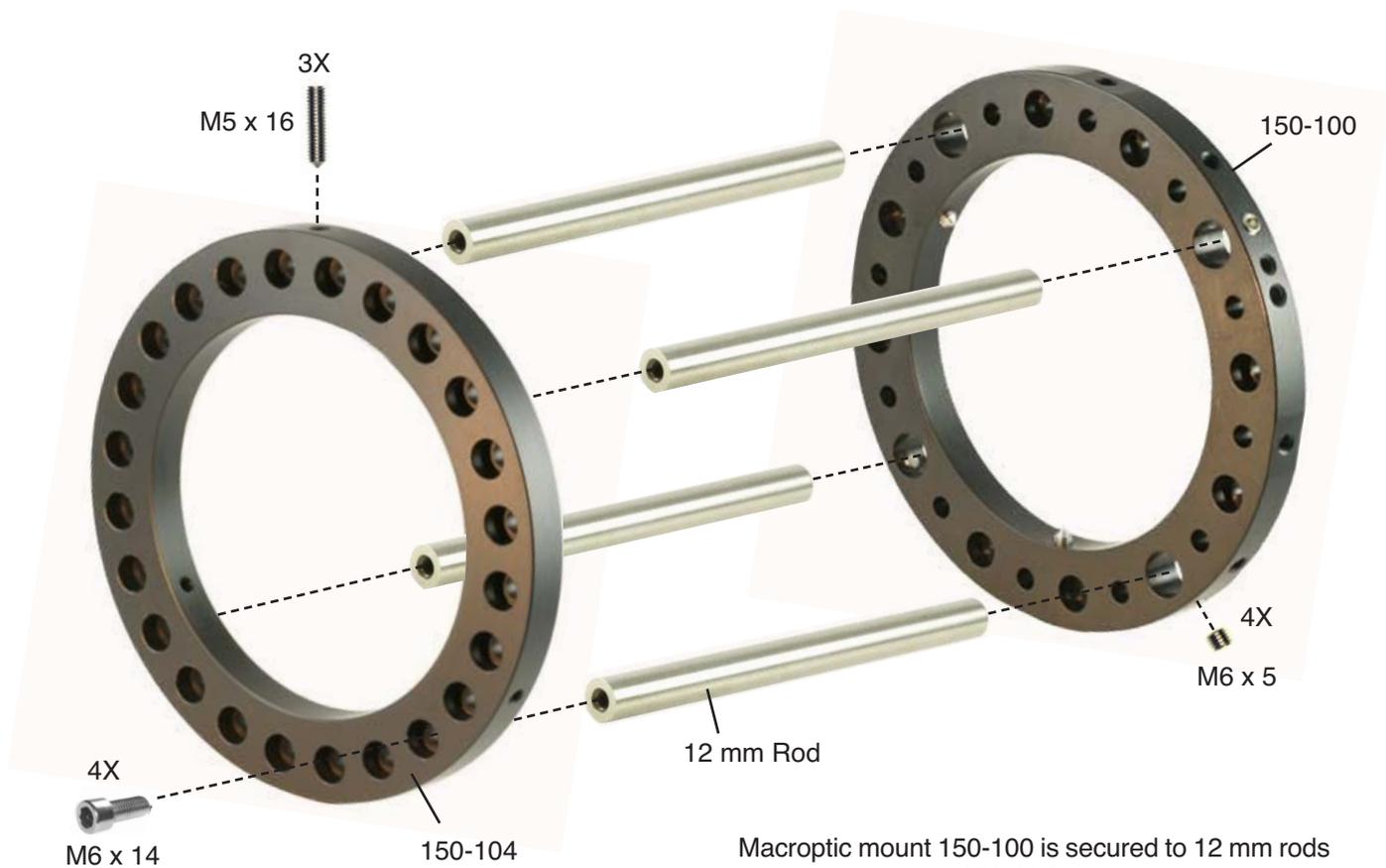
150-104 Standard Mount 105



150-106 Linear Bearing Mount 105

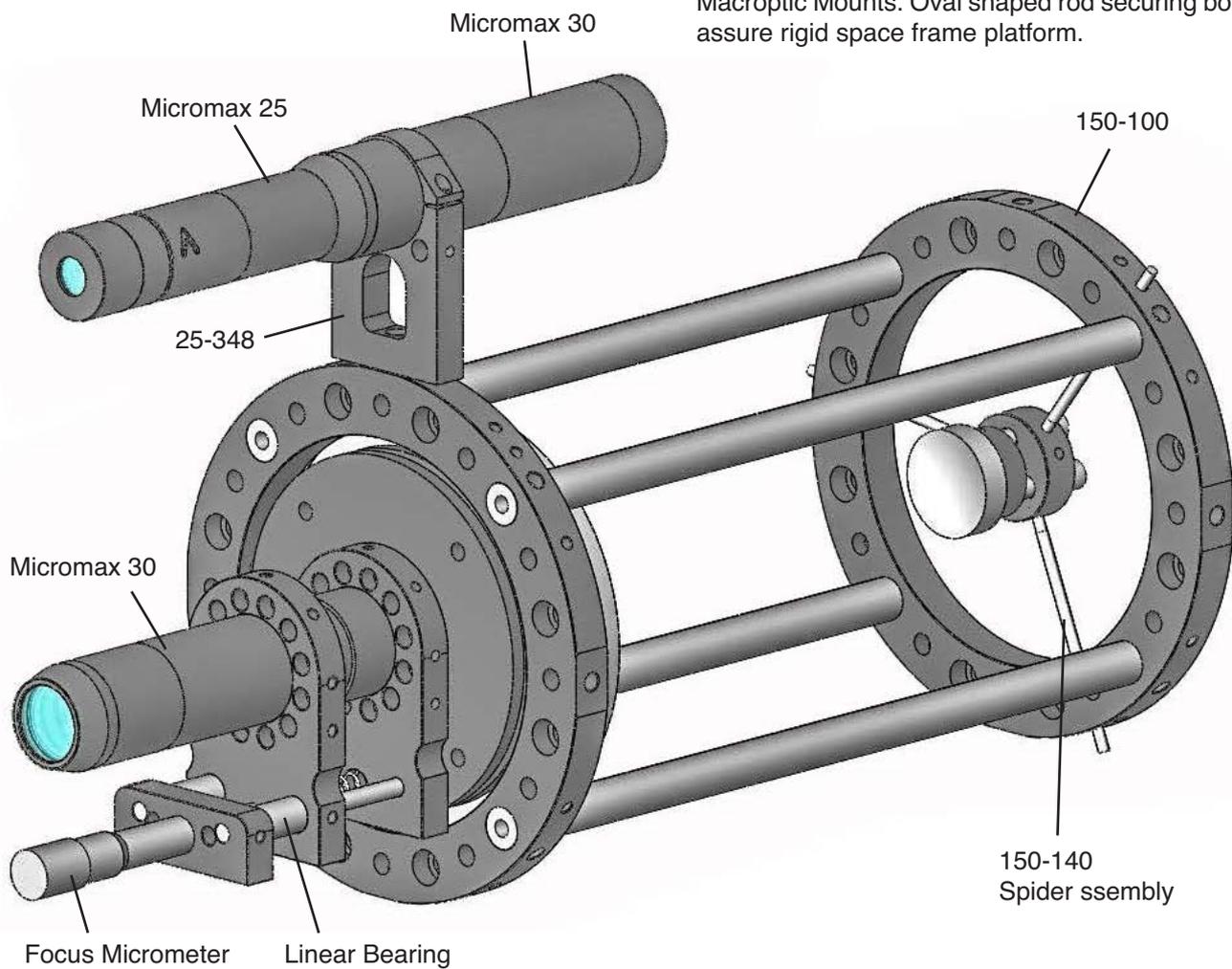


150-108 Linear Bearing Mount 105



Macroptic mount 150-100 is secured to 12 mm rods via M6 set screws. 150-104 mount can be mounted to the threaded end of rods via M6 Allen Screws.

Below, Constructing a Cassegrain telescope with Macroptic Mounts. Oval shaped rod securing bores assure rigid space frame platform.



150-116 Standard Corner Connector

Standard corner connector to secure two Macroptic 150 mounts at right angles.

150-118 4-Way Corner connector

Allows both perpendicular, and paralell mounting of two Macroptic mounting plates.

150-120 Macro / Mini Corner Connector

Connects Macroptic 150 to Minioptic 100 mounts at right angles.

150-122 Macro / Micro Corner Connector

Connects Macroptic 150 to Microptic 50 mounts at right angles.

150-124 Minioptic Centering Mount 100 / 65

Mates with Minioptic 100 mounts via M5 Allen screws. Allows centering, and tilt adjustment in conjunction with Belleville Washers 00-272. Allows 10 mm Minioptic support rods to pass through.

150-128 Centering Ring for Support Tube 50.8

Microptic tubes can be secured to the inside aperture of this centering mount. May be modified in a lathe to secure custom sized optics.

150-130 Microptic Centering Mount 30

Mates with Microptic 50 mounts via M3 screws with or without M3 threaded bores. Allows centering, and tilt adjustment via Belleville Washers 00-270. Mates with Minioptic 100 mounts via M5 screws. Allows 6 mm Microptic support rods to pass through.

150-136 Breadboard Plate with M6 Bore Pattern

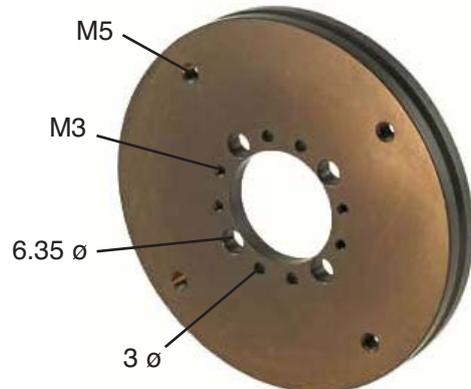
This centering disc can accept a variety of stages, and accessories. It can also be a mounting base for any table-top Microptic 50 setup, i.e., an alignment telescope, or a small microscope stand.



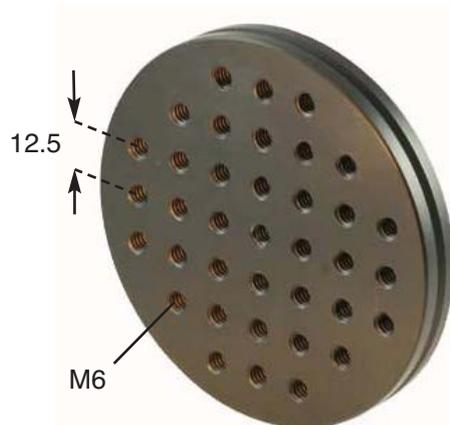
150-124 Centering Mount 100 / 65



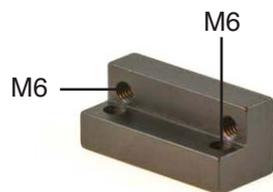
150-128 Centering Mount 100 / 50.8



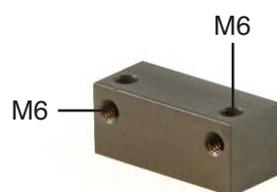
150-130 Microptic Centering Mount 100



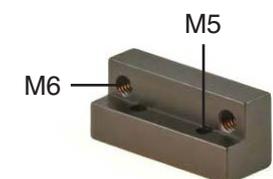
150-136 Breadboard Plate 100 / M6



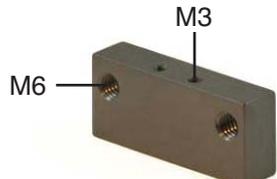
150-116 Corner Connector



150-118 4- way Corner Connector

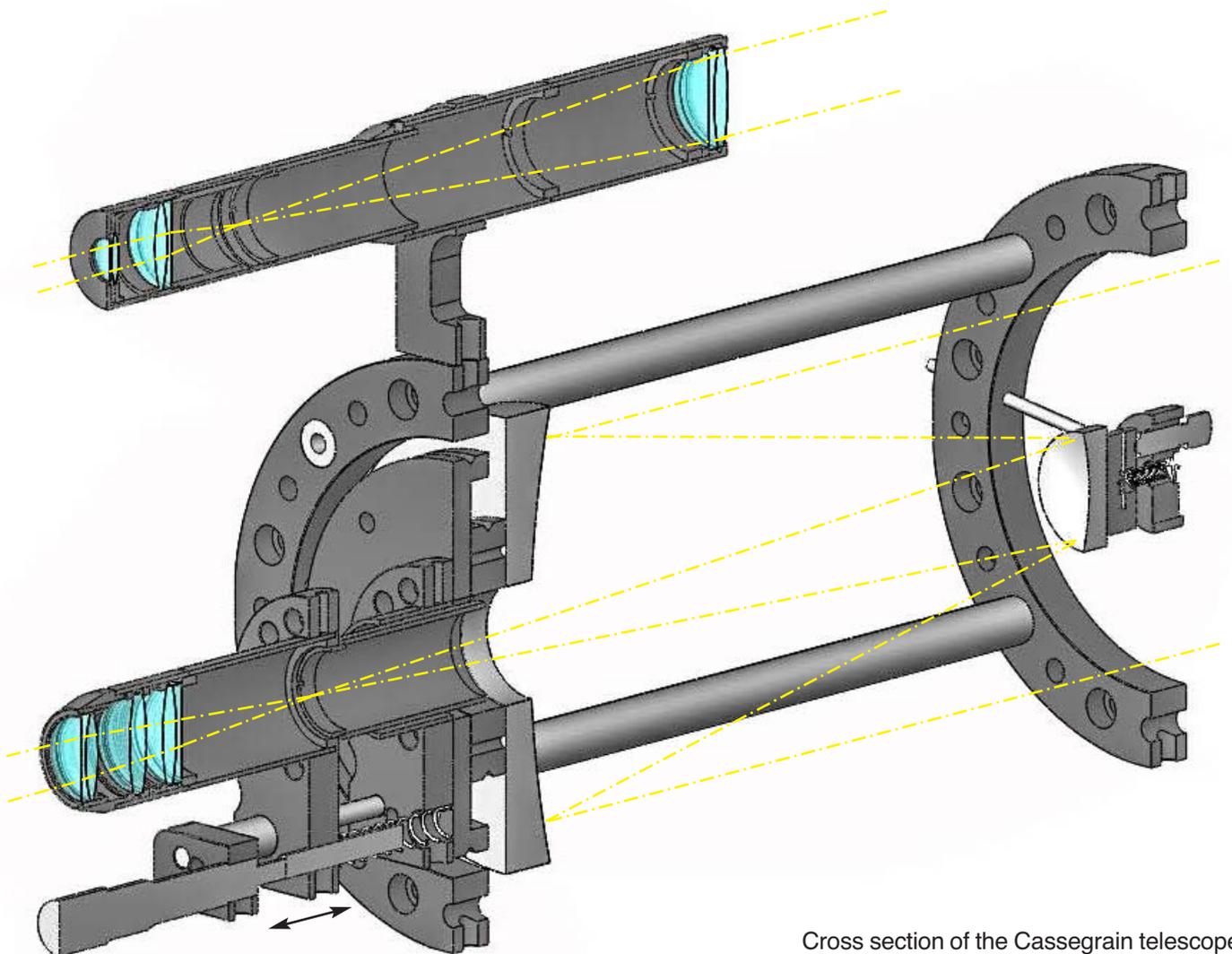
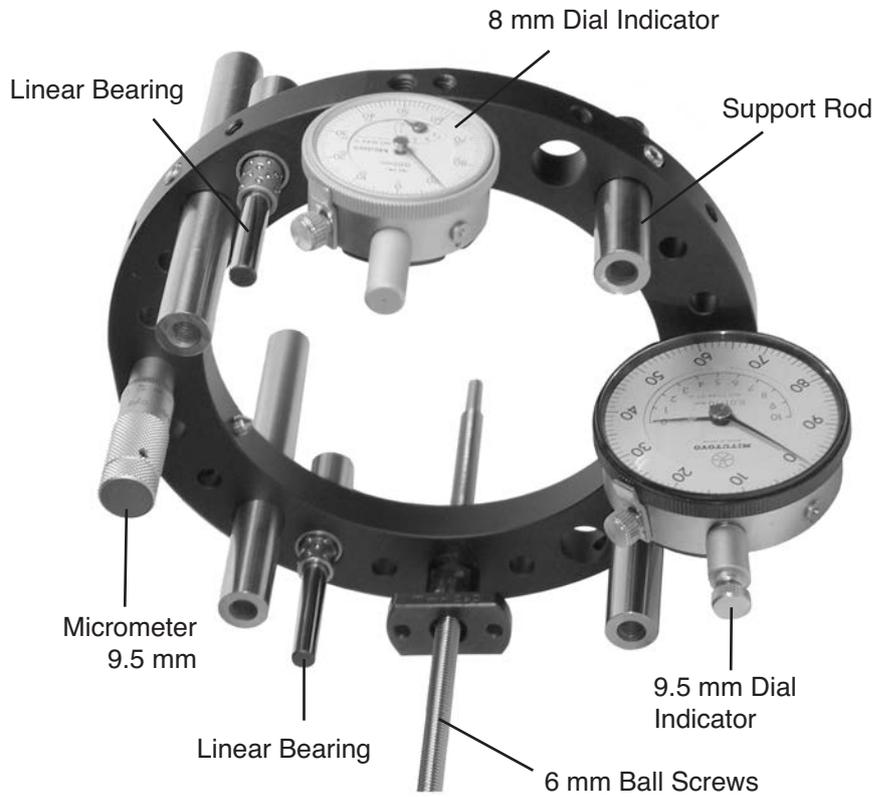


150-120 Macro/Mini Connector



150-122 Macro/Micro Connector

Two views of mounting versatility of 150-106 / 108 Linear Bearing Mounts to accept micrometers, dial indicators, and ball screws. Applications include Microscopy, lens testing, and micro-focusing applications.



Cross section of the Cassegrain telescope reveals the primary and secondary mirror mounts, and its erect image optical path.

150-140 Spider Assembly 150 / 25

Compact spider assembly secures inside the three optics securing bores 120 Deg. apart that is built into every Macroptic mount. The central ring (30 mm O.D.) accepts Microptic, and Micromax components.

150-144 Oblique Rod 45 / 45

Oblique rods provide additional rigidity to 90 degree orientation of Macroptic mounts secured together at 90 degrees with corner connectors.

150-146 Oblique Rod 45 / 90

Similar to 150-144 but to secure mounts together at 45 deg. angles.

150-156 Lens Mount 100 for With Retaining Ring

Suitable for securing Achromats 100 mm in diameter, and not more than 16 mm in edge thickness. Does not require a spanner wrench for securing the lens.

150-160 Support Ring 65 for Minioptic accessories

Accepts all Minioptic 100 accessories within Macroptic 150 mounts. Useful in constructing microscopes utilizing wide choice of observation head, and nosepiece turret mounts available in 65 mm Minioptic centering rings.

150-214 Diaphragm Unit 100

19-blade iris diaphragm unit with adjustable aperture from 74 mm down to 4 mm. Mounted on 100 mm ø centering ring.



100 ø

150-156 Lens Mount 100



65 ø

150-160 Support Ring 65



150-214 Diaphragm Unit 100



25 ø

150-140 Spider Assembly 150 / 25



M6

150-144 Oblique Rod 45 / 45



M6

150-146 Oblique Rod 45 / 90

150-164 Long Travel Linear Bearing, L = 120

Long travel linear bearings could provide a relatively long distance translation, i.e., up to 200 mm. They could be utilized in delay lines, translated by ball screws 120-176, and position monitored with linear scale 120-162.



150-164 Long Travel Linear bearing

150-168 High Sensitivity Linear Bearing, L = 80

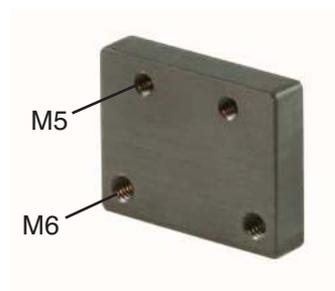
For critical focusing in microscopy, and interferometry. The 6 mm shaft of the linear bearing is secured inside 6 mm precision bores of 150-100, and the 12 mm sliding shell is secured inside precision 12 mm bores of 150-106 or 150-108. At least a pair is required for up to 60 mm of travel.



150-168 High Sensitivity Linear bearing

150-216 Macro / Mini Side Connector

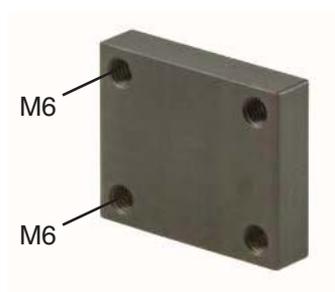
Secures a Macroptic 150, and Miniopic 100 side to side with 5" center to center distance.



150-216 Macro / Mini Side Connector

150-218 Macroptic Side Connector

Secures two Macroptic 150 mounts side by side with 6" center to center distance.



150-218 Macroptic Side Connector

150-200 X-Y Stage 100

Cross Roller Bearing X-Y stage for macroptic mounted on 100 mm Dia. centering disc. Ideal for microscopy objectives, and sample stages. 13 mm travel in both axis.

100-320 Mitutoyo Objective Adapter

Replaces the Microptic mount in 150-200 X-Y stage to accept Mitutoyo objectives.



150-200 X-Y Stage

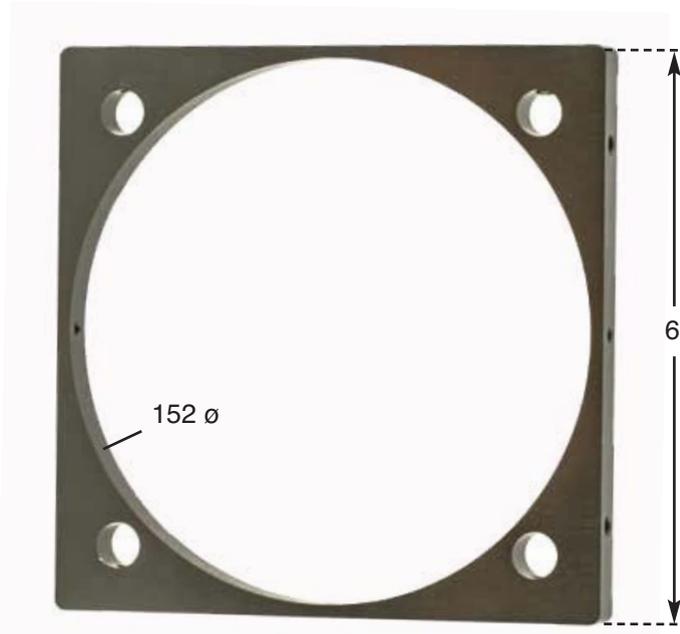


100-320 Mitutoyo Adapter

Macroptic 6 X 6

150-500 Macroptic 6x6 Mounts 152

Expands the capacity of Macroptic mounts to accommodate up to 6" optics by placing the rods at four corners of the mount. Centering ring **150-528** has centering steps for both 100, and 110 mm optics. The optics must be epoxied.



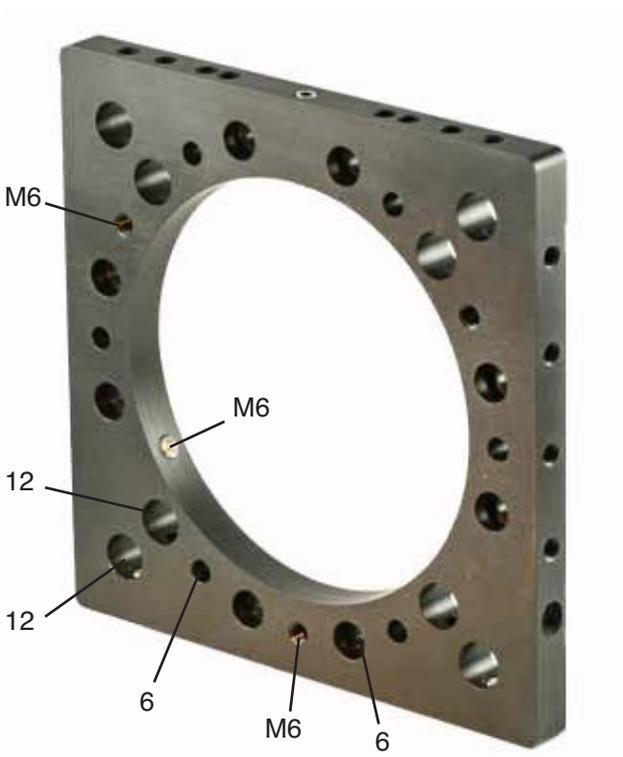
150-506 Macroptic Mount 145



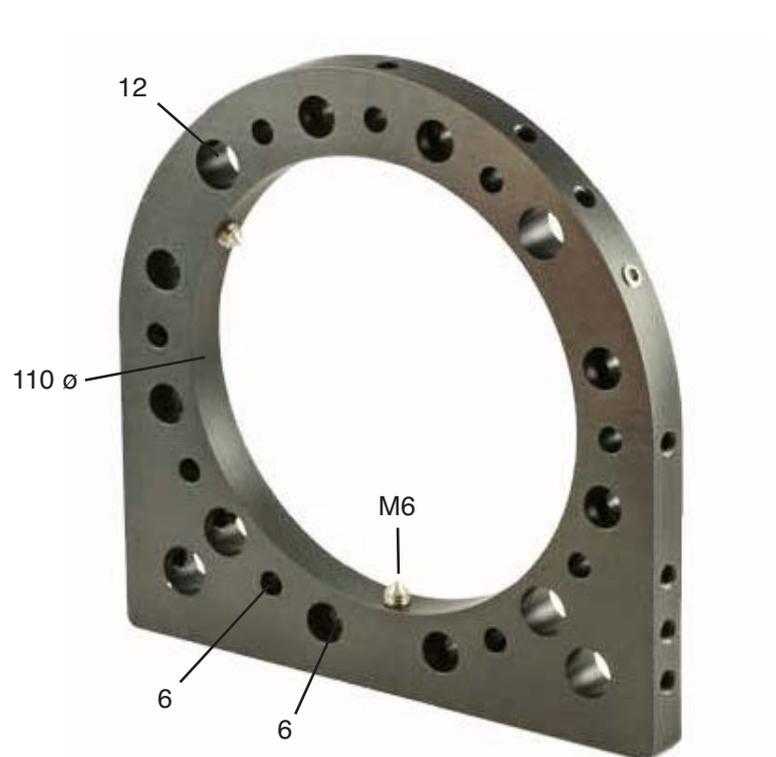
150-528 Optics Mount 100 / 110

150-504 Macroptic 6x6 Mount 110, 150-530 Compact Macroptic 6x6 Mount 110

Combines the bore pattern in both Macroptic 6x6, and Macroptic 150, to allow stepping up or down from one system to the other. 150-530 is specially suited in Microscopy applications, where four rods could support the structure in the back plane while accommodating large nosepiece turrets carrying six objectives.



150-504 Macroptic 6x6 Mount 110



150-530 Compact Macroptic 6x6 Mount 110

Mechanical Hardware for Macroptic

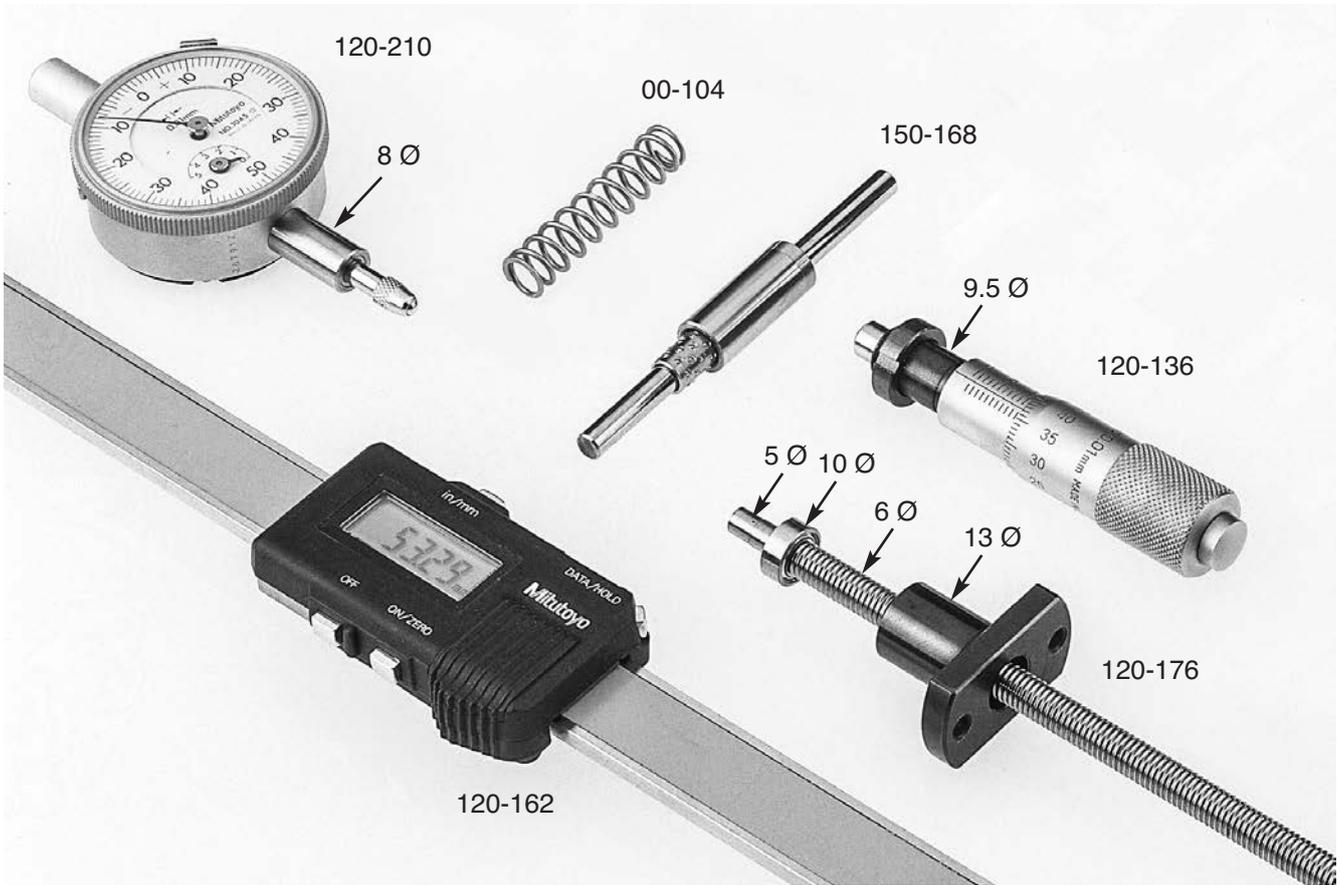
Mechanical hardware for Macroptic includes micrometers, dial indicators, linear scale devices, and ball screws. Rods are case hardened to Rockwell 55. This makes Macroptic ideal for setting up test fixtures for lens testing, and other testing instrumentation. Macroptic setups may be covered with 6" tubing to light seal the system.



T150 Tubes, L = 75 ~ 2000 mm



12 mm Rods, L = 50 ~ 1000 mm



00 Mounting Hardware consists of bolts, cone-tip screws, and springs specially suited for Macroptic system.



Design Example: Third Harmonic Generation Microscope

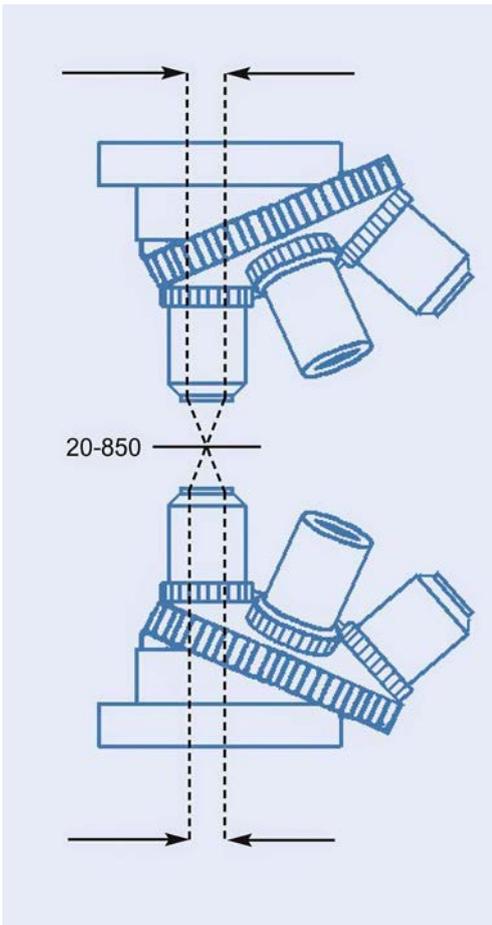
Many research institutions, and university laboratories have been using Optoform to build complex microscopes due to the enormous savings and design flexibility that it offers. Here is a Third Harmonic Generation microscope built at University of San Diego Wilson-Squire group:

There are four layers in this design:

- 1) The upper layer acts as a delay line for one of the arms of the interferometer.
- 2) There are two linear bearing platforms supporting the upper, and lower Microscope turret with separate X-Y stages for beam centration.
- 3) The sample stage has its own X-Y stage, and rapid Z-Axis focusing.

X-Y scanning galvos are not shown.

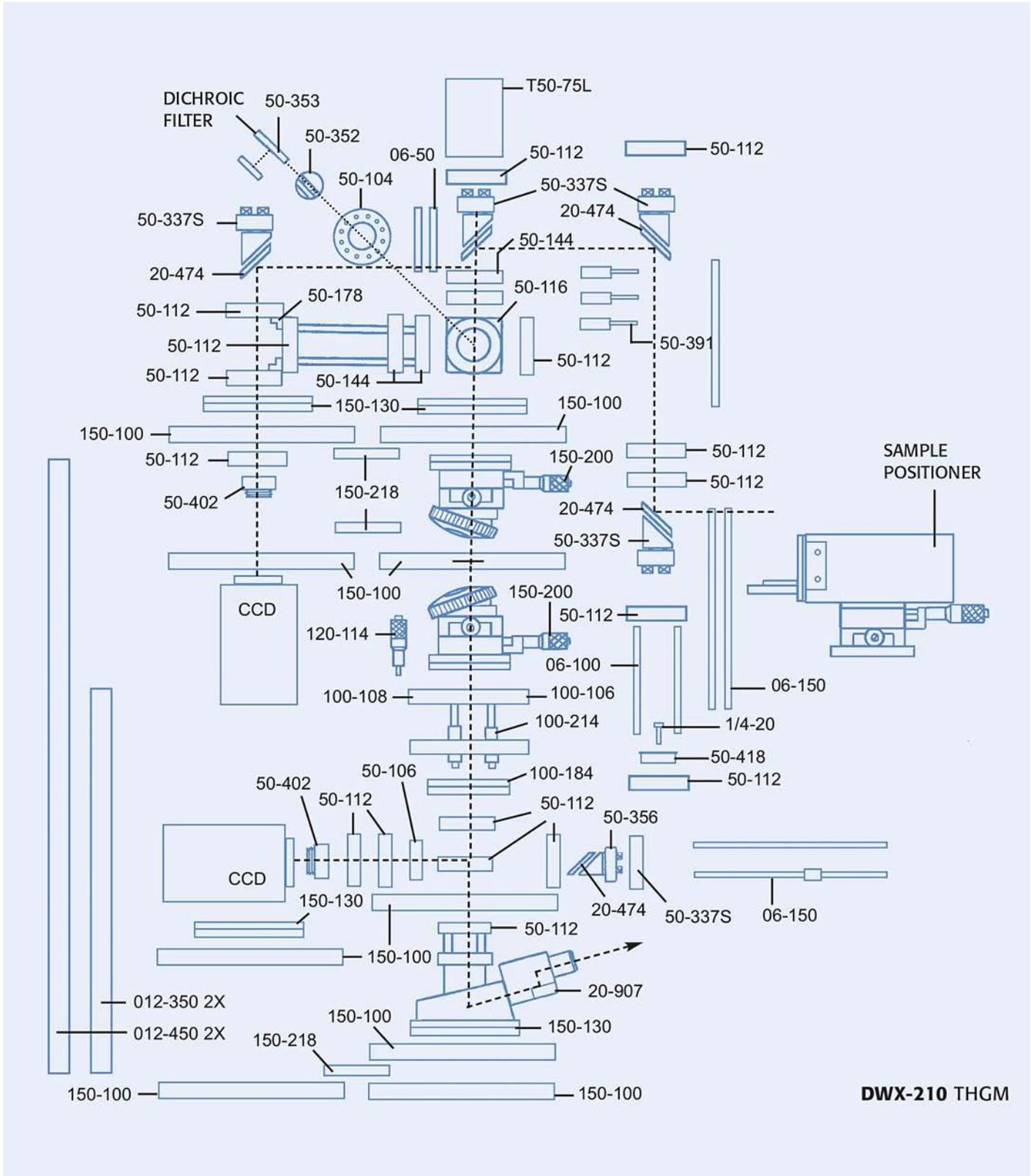
Courtesy Dr. Jef Squier, UCSD

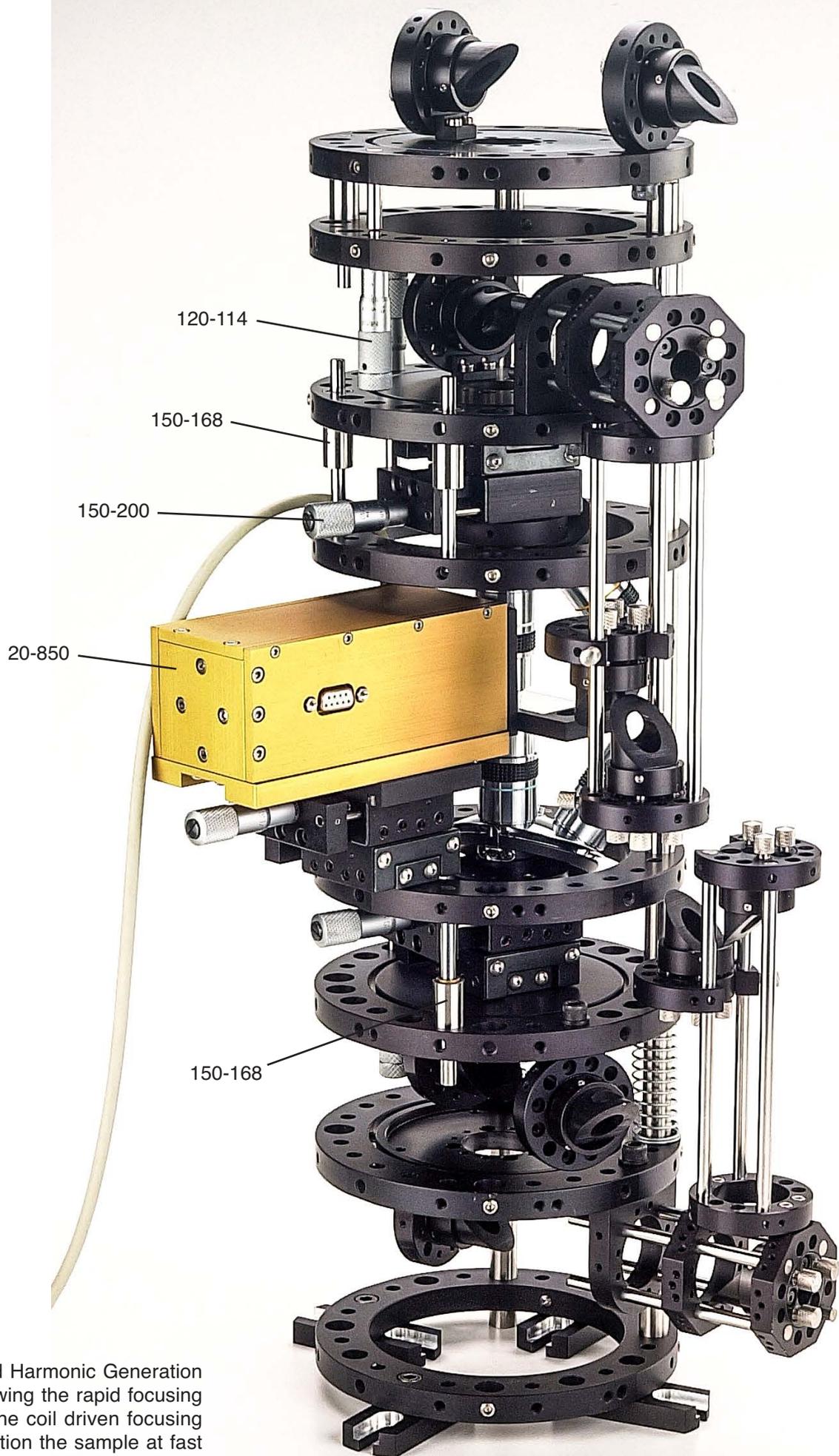


Two nosepiece turrets are utilized to change both switch the objective, and to match the objective below the sample for illumination. The scan plane is where both beams coincide.

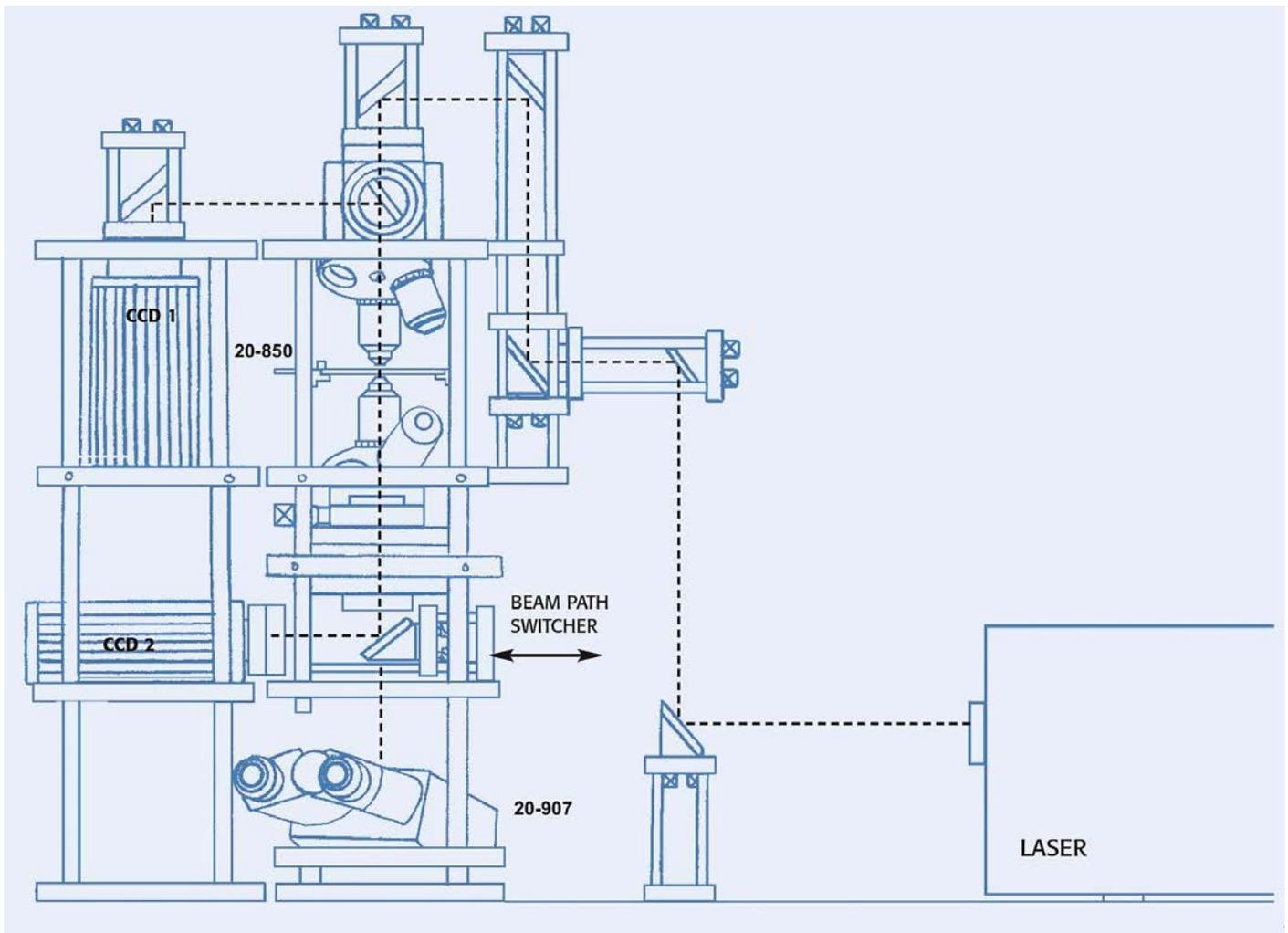
Design Works (DWX) to simplify using Optoform

Design works is a collection of optoform components that you could purchase with just one part number. This allows the optical lab technician to get a working design, and its schematic to construct a complex Optoform setup without having to undergo training sessions to implement them. Although an extensive collection of these designs would take years to accumulate, but eventually, a useful library of designs will be available to choose from. If you don't see a design you could use, we will help you design it. We have been supporting R&D labs to implement their ideas for 20 years. We don't care much about hearing the details of your proprietary design. We only care to help you implement them. Design works is a good tool for you to start implementing your ideas with Optoform.





Back view of 3rd Harmonic Generation microscope showing the rapid focusing stage 20-850. The coil driven focusing stage could position the sample at fast pace for volume scanning of the sample.



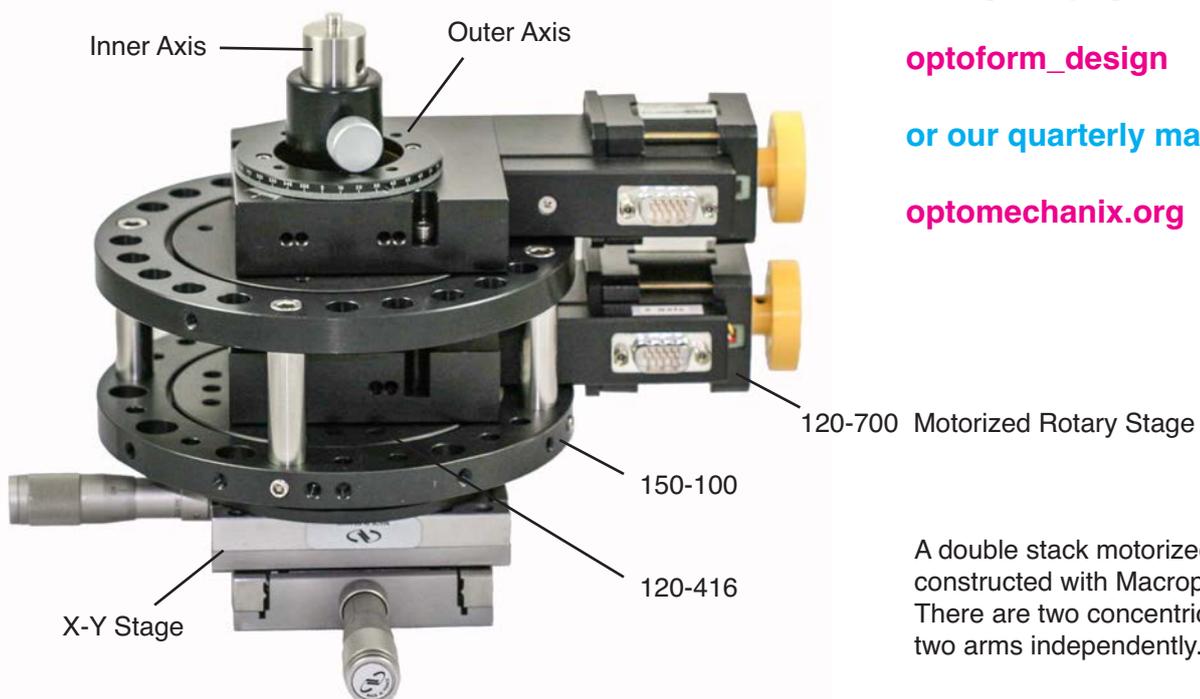
Optical path through 3rd Harmonic Generation microscope: The observation head is placed at the bottom of the setup for convenient viewing, and to be able to align the setup. There are two CCD cameras, viewing the image through the sample, and reflected from the sample.

For assembly videos visit our Instagram page:

[optoform_design](#)

or our quarterly magazine at:

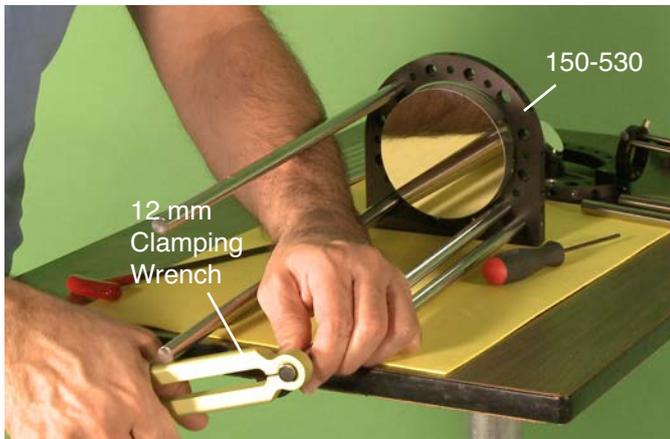
[optomechanix.org](#)



A double stack motorized rotary stage constructed with Macroptic in MIT labs. There are two concentric axis to rotate two arms independently.

Planetary Interferometry with Macroptic 150

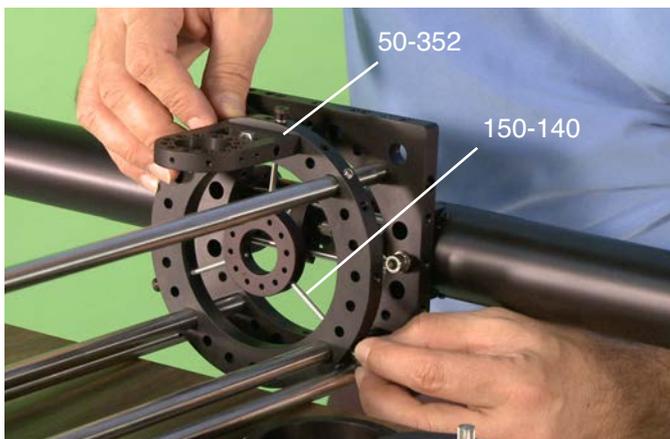
Utilizing Minioptic 100, in this stellar interferometer setup is a good example of how each Optoform piece is designed to work with every other part in the system. [There is an instructional video on Youtube for how this is put together:](https://youtu.be/gSAN2fM_VS0)
https://youtu.be/gSAN2fM_VS0



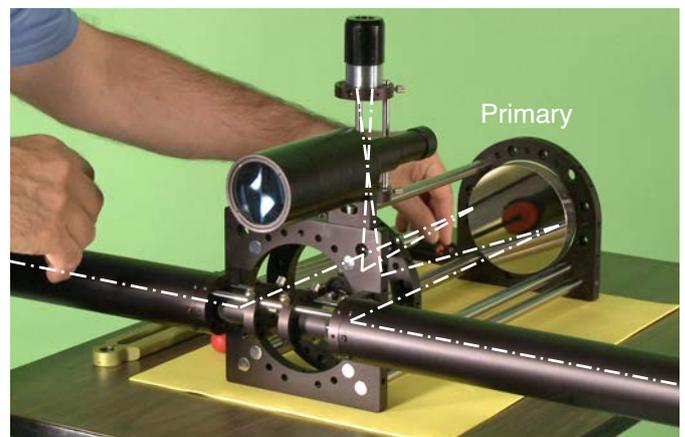
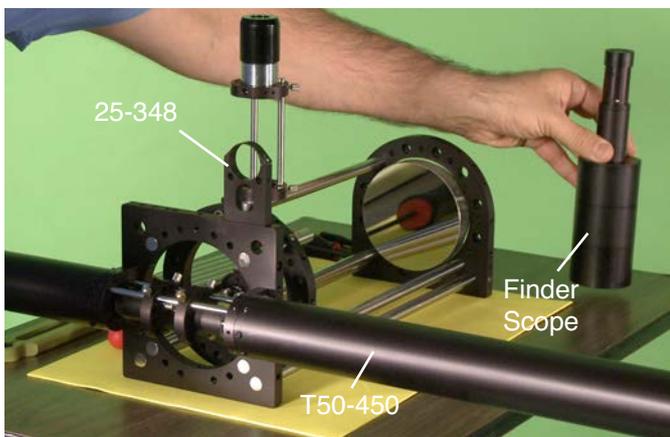
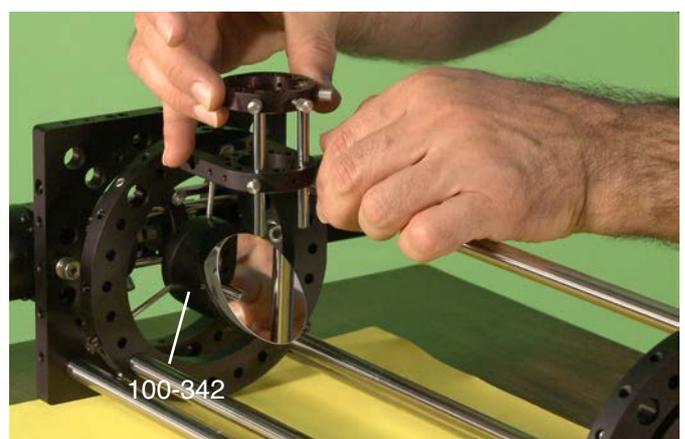
Any two 12 mm rods can be added together by screwing them together via 20 mm long M6 set screws.



Extending support rods 12-450 (L = 450 mm) with 12-100 rods, for longer telescope housing (L = 550 mm).



A large elliptical mirror is installed in this Newtonian telescope arrangement by utilizing spider assembly 150-140.



The light is brought in from two views of the planet, 1 meter apart to the fold mirrors in front of the spider assembly (right) then the two beams are brought into focus by the primary mirror, and to the eyepiece by a third fold mirror. This is a scaled down version of Michelson interferometer installed on 100 inch Mount Wilson telescope by Michelson in 1914.