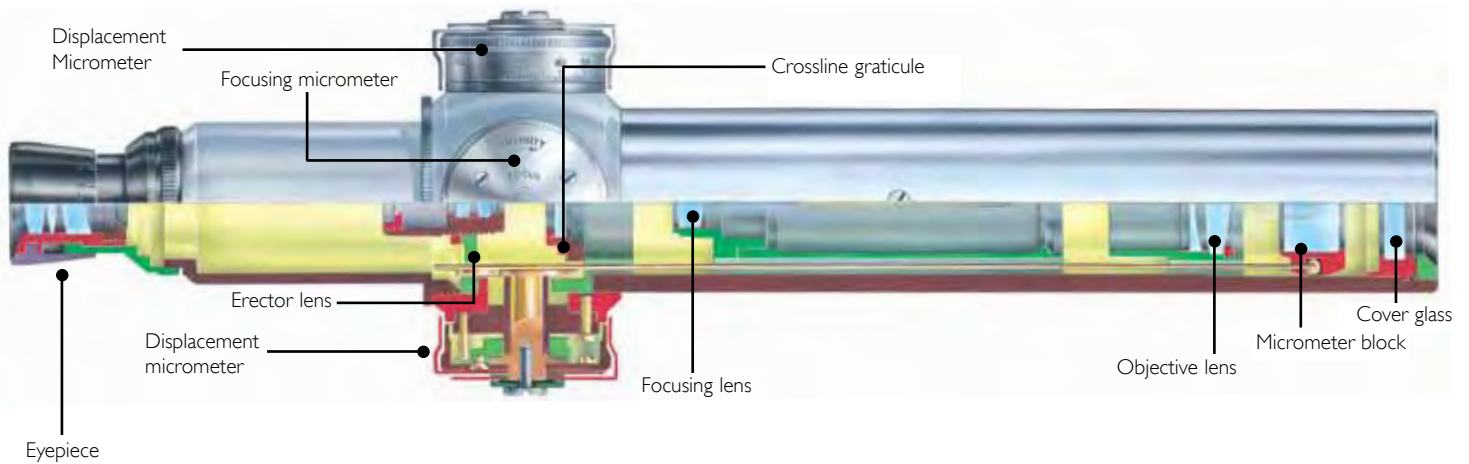


Alignment Systems

For checking and setting, straightness, alignment, verticality, parallelism, flatness, squareness and level



Solving problems of alignment – The Micro Alignment Telescope



Since the late 1930s Taylor Hobson has sold thousands of alignment telescopes to industries throughout the world. The Micro Alignment Telescope is used to set and check alignment, squareness, straightness, flatness, parallelism, verticality and level. With its wide range of accessories the Micro Alignment Telescope forms a unique and comprehensive system for solving alignment problems in a wide variety of applications and industries.

The Micro Alignment Telescope system:

- Is simple and easy to use
- Is versatile and adaptable
- Enables improved product performance
- Enables reliable, accurate installation
- Reduces warranty and maintenance costs
- Is robust, reliable and portable
- Can be digitised

The Micro Alignment Telescope has:

- Optical and Mechanical axes aligned to within 3 seconds and concentric within 6 μm (0.00025 in)
- Achievable accuracy within 0.05 mm at 30 m (0.002 in at 100 ft)
- Field of view: 50 mm at 2 m (2 in at 6.5 ft)
600 mm at 30 m (24 in at 100 ft)



CCTV with magnifications up to x8
(code 137-2161-01)



Digital Alignment Telescope
(code 112-3389)

Principles of alignment

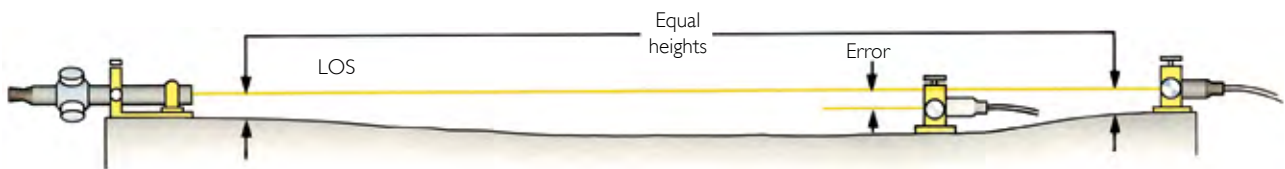
The basic measurement principles available with the Micro Alignment Telescope system are alignment, squareness, flatness, autocollimation and autoreflection. The Micro Alignment Telescope generates a straight line of sight from zero to infinity. This forms the basic reference from which all measurements are taken.

To measure squareness a penta prism is used to deviate the straight line through exactly 90 degrees. A similar rotating pentaprism is used to generate a plane for flatness measurement.

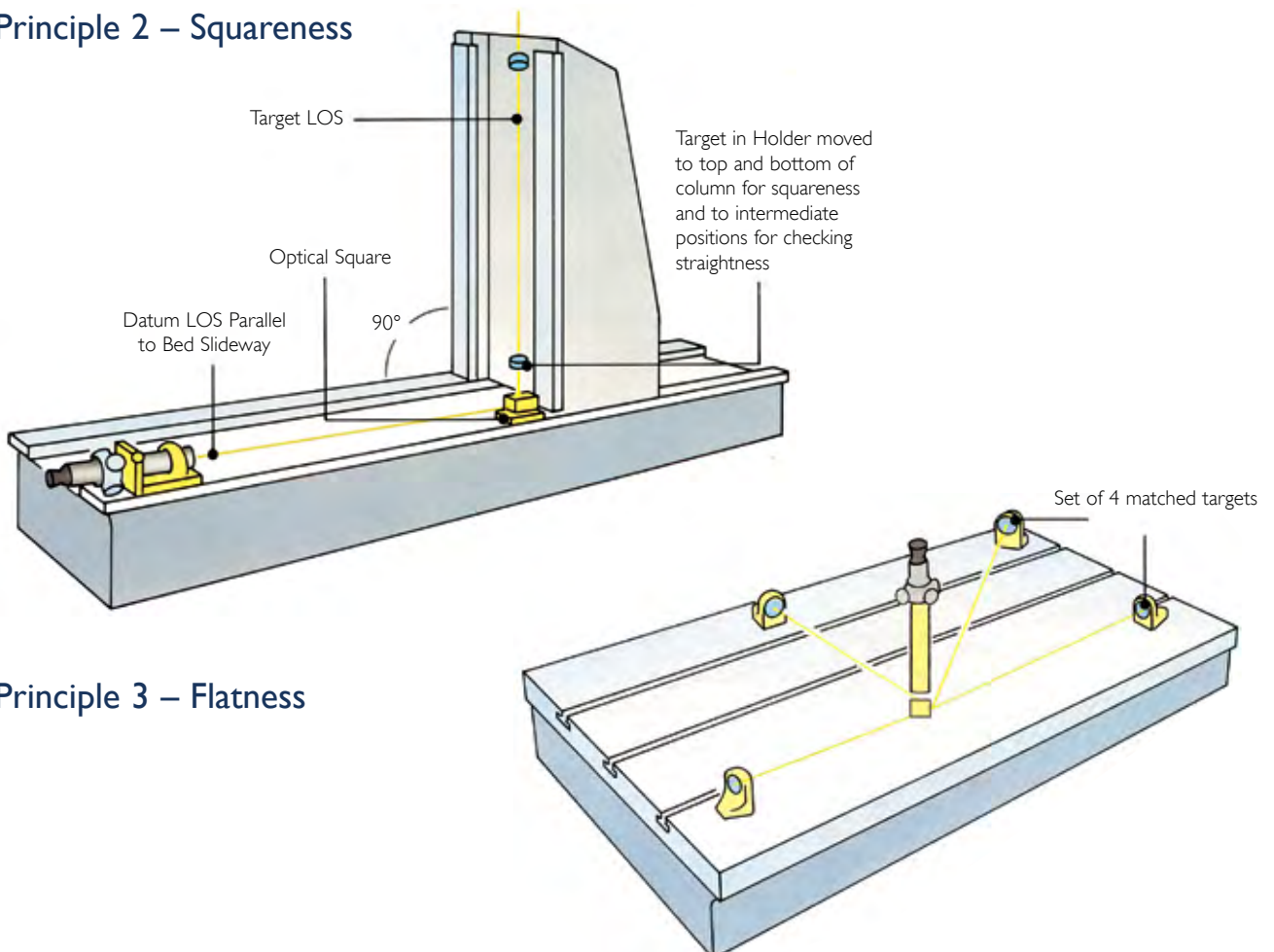
The Telescope is designed to allow autocollimation and auto-reflection, providing for squareness and angular measurement using reflective mirror targets.

A comprehensive range of accessories allow the telescope, targets and prisms to be mounted to the work concerned.

Principle 1 – Alignment



Principle 2 – Squareness



Principle 3 – Flatness

Alignment checks (externally and internally)

Typical applications

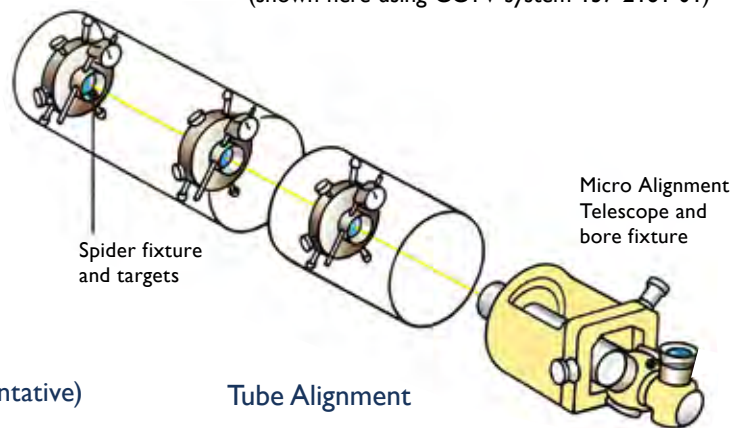
- Alignment of periscope bearings using the main bearing in the hull of the submarine as the datum
- Alignment of diesel engine bearings and boring bar
- Checking straightness of gun barrels using a digital MAT and sliding a target on a sledge along the inside of the gun barrel and its rifling.



Diesel engine alignment
(shown here using CCTV system 137-2161-01)

Typical equipment used

- Micro Alignment Telescope (112-2582 or 112-2583)
- Adjusting Bracket (112-645)
- Bore Fixture (112-1168)
- Mounting Sphere (112-376)
- Right Angle Eyepiece (112-568)
- Spider Fixture (137-1943),
- Target Illuminator (112-642)
- Targets



(Additional items may be required –
please consult your local Taylor Hobson representative)

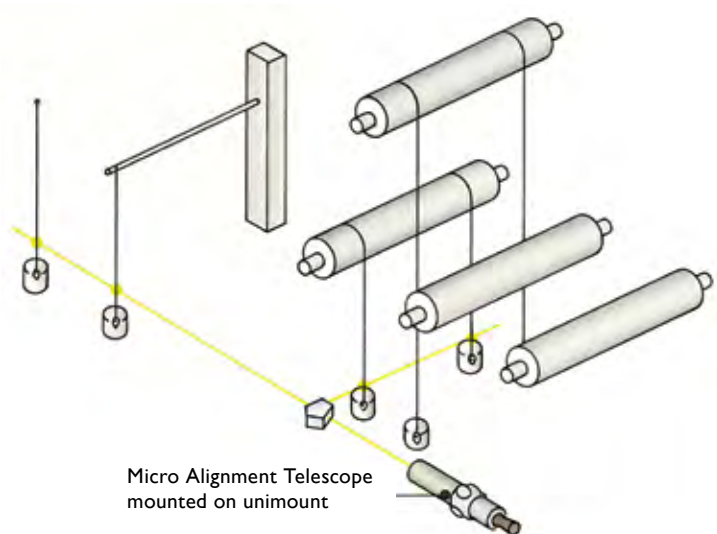
Squareness and parallelism measurement

Typical applications

- Rollers must be parallel and in some cases horizontal to eliminate damage to paper or other materials being processed.
- Vertical Presses: the movement of a press must be square to its main slideway. This is achieved by using an optical square to produce a square reference line to the main machine slideway.
- Weapons Harmonisation: weapons systems have a number of features that all must be set parallel to each other.

Typical equipment used

- Micro Alignment Telescope (112-2582 or 112-2583)
- 4in Offset Square (112-1130)
- Unimount (137-1916)
- Trivet Stands (137-1904 or 1905)



(Additional items may be required –
please consult your local Taylor Hobson representative)

Horizontal and vertical measurement

Typical applications

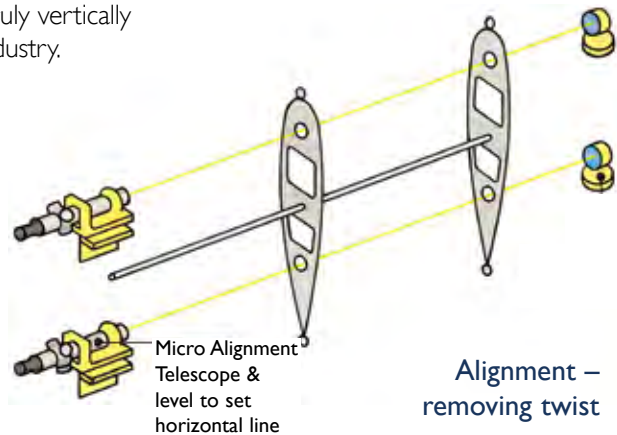
- The line of sight of the Alignment Telescope is parallel to its mechanical axis. Hence by using an electronic level it can be set truly horizontal. If two lines are set horizontal then they are parallel in at least one direction.
- Platforms for satellites: two platforms are set first in line then (using optical squares) set parallel to each other.
- The Alignment Telescope can be set both horizontally & truly vertically – this feature can be used to great effect in the nuclear industry.



Typical equipment used

Micro Alignment Telescope (112-2582 or 112-2583),
 Horizontal Base (112-656), Adjusting Bracket (112-645),
 Flange Cup (112-471), Mounting Sphere (112-376),
 Talyvel (M112-3659), Stride Base (112-2315)
 Mounting Sphere (112-376),
 Sphere Clamp (112-657),
 Flange Cup (112-471) Target (various) and illuminator (112-642).

(Additional items may be required – please consult your local Taylor Hobson representative)



Horizontal lines and flatness measurement

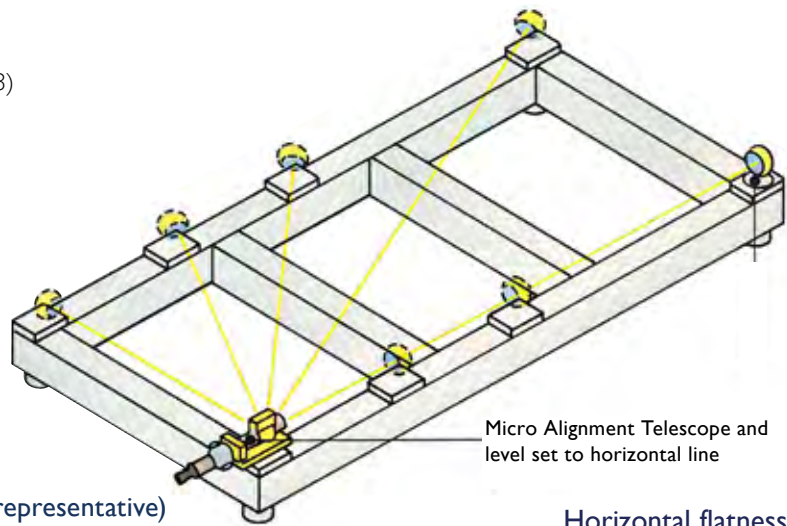
Typical applications

- Engine bed plates: must be made flat so the top of the engine housing fits with the bottom bed plate.
- Bearing faces: need to be flat and parallel to each other to make a good fit
- Rail systems: in some cases not only need to be parallel but also at the same height or plane to each other

Typical equipment used

Micro Alignment Telescope (112-2582 or 112-2583)
 Horizontal Base (112-656)
 Adjusting Bracket (112-645)
 Flange Cup (112-471)
 Mounting Sphere (112-376)
 Talyvel (M112-3659),
 Stride Base (112-2315)
 Mounting Sphere (112-376),
 Sphere Clamp (112-657),
 Flange Cup (112-471), Target (various) &
 Illuminator (112-642)

(Additional items may be required – please consult your local Taylor Hobson representative)



Straightness measurement

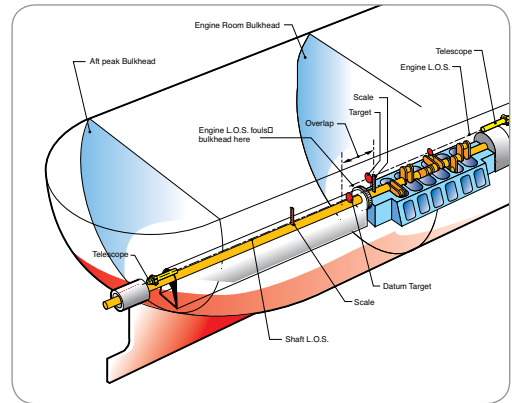
Typical applications

- The large focusing range of the alignment telescope makes it ideal for checking long machine slideways
- The rails in a submarine torpedo tube need to be set straight
- Propellor shafts are getting increasingly long and the Alignment Telescope is ideal for this long distance bearing alignment work

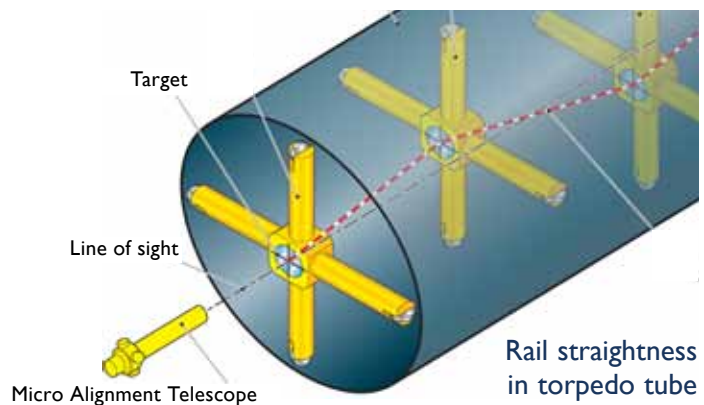
Typical equipment used

Micro Alignment Telescope (112-2582 or 112-2583)
 or Digital Micro Alignment Telescope (112-3389)
 Horizontal Base (112-656)
 Adjusting Bracket (112-645)
 Flange Cup (112-471)
 Mounting Sphere (112-376)
 Target Holder
 Targets (various) and illuminator (112-642)

(Additional items may be required – please consult your local Taylor Hobson representative)



Propellor shaft alignment



Rail straightness in torpedo tube

Square and in line

Typical applications

- Many weapons optical systems need to be set in line and square. The Alignment Telescope can be used in autocollimation mode to put things square and in alignment mode to put them in line. An Infra-red version of the Telescope is also available.
- Engine bearings to ships engine: the alignment telescope can be put in line and square with a mirror target using autoreflection/ autocollimation and then other bearings put in line to this.
- Helicopter drive shafts must be put straight and square to their main drive system.

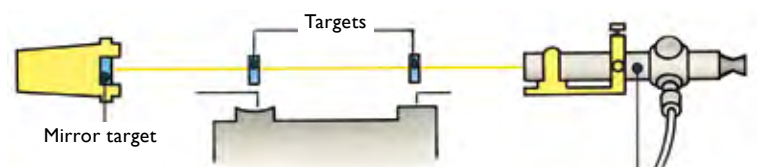
Typical equipment used

Micro Alignment Telescope (112-2582 or 112-2583)
 Lamphouse (112-1365)
 Horizontal Base (112-656)
 Adjusting Bracket (112-645)
 Mounting Sphere (112-376)
 Adjustable Height Cup (112-849)
 Targets, including mirror target and holders.

(Additional items may be required – please consult your local Taylor Hobson representative)



Alignment on textile machines



Alignment using Autoreflection

Micro Alignment Telescope with horizontal base and lamphouse

The alignment systems range

Digital Alignment Telescope (code 112-3389)

Using high resolution CCD technology and dedicated software, the Alignment Telescope can be digitised to automatically calculate the displacement from a set datum to ensure fast set up and repeatable readings as well as digitally outputting the result. This is particularly useful on large alignment projects such as aircraft jigs or large machine tools since a single operator can make measurements and adjustments along the construction or fixture while the target is displayed on the monitor. (see further details on page 10).



Micro Alignment Telescope (code 112-2582 Metric 112-2583 British)

The Micro Alignment Telescope focuses from zero to infinity and incorporates an optical micrometer to measure deviations from an optical line of sight in two directions at right angles to each other.



Alignment Telescope (code 112-850)

Similar to the Micro Alignment Telescope but without the X and Y micrometers. Used when placing items in line where there is no need to take measured results.

Micro Alignment Infra-Red system (code 112-3745)

This is a standard Micro Alignment Telescope but with source, coatings and camera for use in the infra-red.

Small Telescope (code 112-4939)

This is a smaller telescope for less demanding jobs. The instrument contains an autoreflection target. The target is illuminated from the rear by an autocollimation light source. This telescope can be used with the standard targets in our range and can be mounted in V blocks. Custom mounting fixtures are available on request.

Micro Alignment Laser System (code 112-3331)

Ideal for dynamic measurement, the Micro Alignment Laser System comprises a highly stable transmitter, high precision Position Sensing Device (PSD) receiver with electronic processing system and dedicated software (further details on page 15).

Specifications

	Digital Micro Alignment Telescope	Standard Micro Alignment Telescope	Focusing Alignment Telescope	Laser Alignment	Infra-Red Telescope	Small Telescope
Code	112-3389	112-2582 112-2583	112-850	112-3331	on application	112-4939
Max working distance	20 m	infinity	infinity	10 m (bigger on application)	10 m	infinity
Measuring range	50 mm	+/-1.2 mm*	none	5 mm	+/-1.2 mm	none
Best accuracy**	5 µm	10 µm	10 µm	5 µm	not applicable	26 µm
Resolution	1 µm	10 µm	10 µm	0.1 µm	not applicable	26 µm
Targets	dedicated CCD target	see page 14	see page 14	dedicated detector only	dedicated IR target	see page 14
Magnification	x34	x34***	x34***	not applicable	not applicable	x20
Barrel diameter	57.137–57.147 mm	57.137–57.147 mm	57.137–57.147 mm	rectangular – cylindrical on request	57.137–57.147 mm	44.43–44.44 mm

* with the use of the calibrated glass targets this is increased

** at longer distances this is proportionally decreased by 50-70 µm at 30 m

*** higher magnifications can be achieved with the high magnification eyepiece (112-4940) or CCTV camera (137-2161-01)

How to select the right accessories for

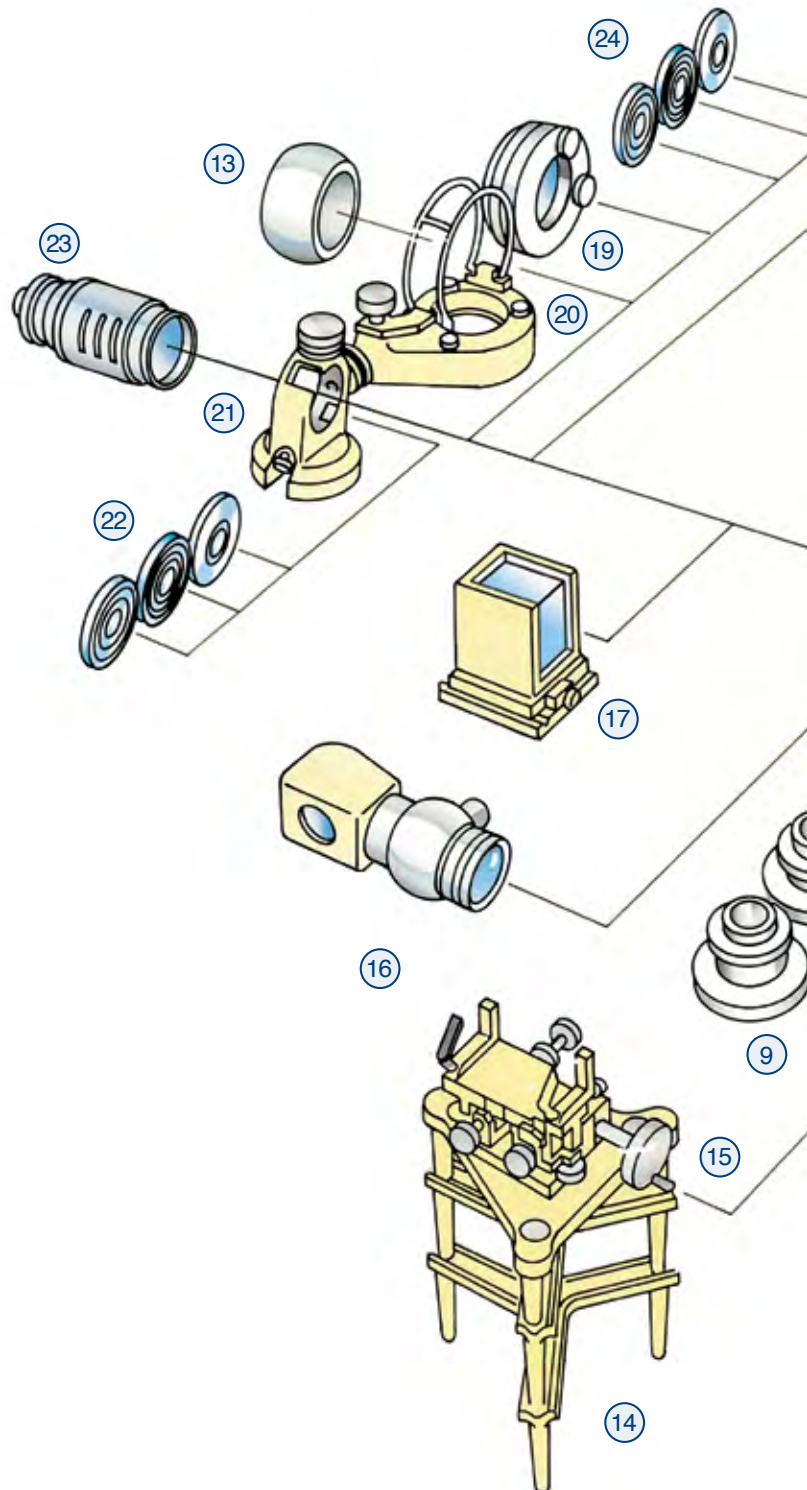
①	Alignment Telescope*	see previous page
②	Right Angle Eyepiece Adaptor	112-568
③	Telescope Lamphouse	112-1365
④	Stride Base	112-2315
⑤	Stride Bubble	112-2318
⑥	Talyvel Electronic Level	M112-4515
⑦	Adjusting Bracket	112-645
⑧	Horizontal Base	112-656
⑨	Adjustable Height Cup	112-849
⑩	Flange Cup	112-471
⑪	Plain Cup	112-472
⑫	Bore Fixture	112-1168
⑬	Mounting Sphere	112-376
⑭	Trivet Stands**	137-1904 or 1905
⑮	Unimount**	137-1916
⑯	4 in Offset Square	112-1130
⑰	Optical Square	142-77
⑱	Spider Fixture	137-1943
⑲	Adjustable Mirror Target Holder	112-729
⑳	Sphere Clamp	112-657
㉑	Adjustable Target Holder	112-837
㉒	Targets (2.25 in / 57 mm)***	See page 14
㉓	Target Illuminator****	112-642
㉔	Mirror Targets***	See page 14
㉕	Targets (1.5 in / 38 mm)***	See page 14

* CCTV cameras (137-2161) and high magnification eyepieces (112-4940) are available for higher magnification viewing

** A simpler version of unimount is available (112-5451). Tripods are also available with adaptor plates (112-4942 & 112-4943)

*** Not suitable for use with the Digital Alignment Telescope which has a dedicated target. Targets can be made to order to suit individual applications

**** Battery operated illuminator (112-3453) and high intensity target illuminator (137-4944) are also available

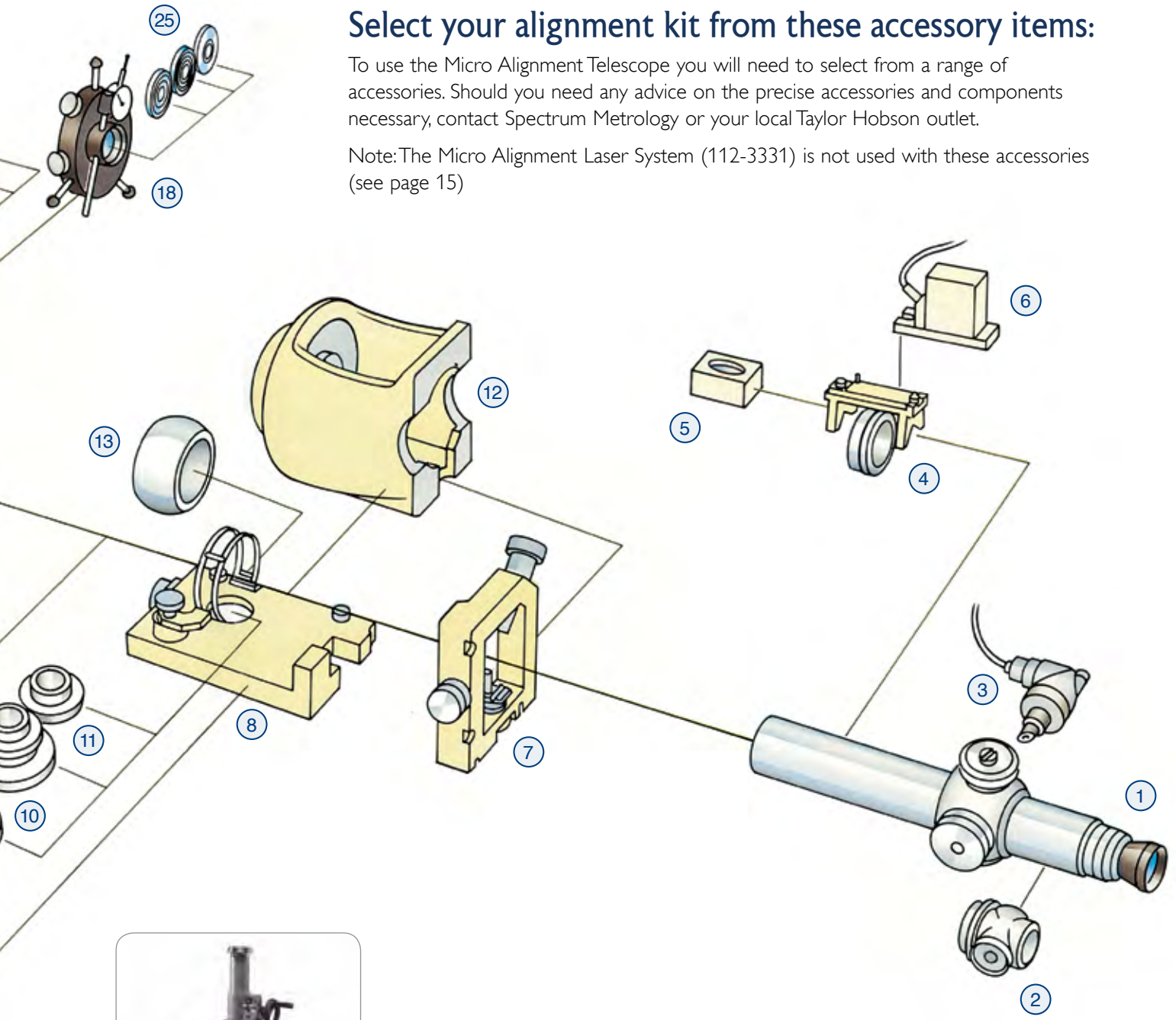


the Micro Alignment Telescope System

Select your alignment kit from these accessory items:

To use the Micro Alignment Telescope you will need to select from a range of accessories. Should you need any advice on the precise accessories and components necessary, contact Spectrum Metrology or your local Taylor Hobson outlet.

Note: The Micro Alignment Laser System (112-3331) is not used with these accessories (see page 15)



An adjustable tripod is available as an alternative to the unimount (code 112-4942 & adaptor 112-4943)

Micro Alignment Telescope accessories

Digital CCD Accessory (code 137-2160-01) (connects to any Taylor Hobson Telescope)

Available as an accessory upgrade for existing Micro Alignment Telescopes in the field, a high resolution CCD system with software automatically senses the centre position of the dedicated CCD targets then calculates the displacement from a set datum to ensure a fast set up time with repeatable readings, as well as digitally outputting the result. This is particularly useful on large alignment projects such as aircraft jigs or large machine tools since a single operator can make measurements and adjustments along the construction or fixture while the target is displayed on the monitor.

- Clear digital output of X and Y minimises operator error
- Graphical output for reporting & storage of results
- Repeatability of measurement provided by CCD
- Rapid calculation of results for quick and easy assessment
- Ideal for automatic remote monitoring with datalogging
- Typical accuracies: 5 µm over 3 m (decreasing with distance)

Target readings are recorded along the component and can then be output as a graph/results table or saved for further analysis. Analysis of the results can give advice on the required precise adjustment of the component under construction to bring it in line quickly.



137-2160-01 CCD Digital System Accessory with software (112-3389 when ordered as a complete telescope system including 112-850 telescope)

CCTV Camera (code 137-2161-01) (connects to any Taylor Hobson Telescope)

- Choice of image magnifications up to x8
- Minimises eye fatigue
- Uses notebook PC with dedicated software
- Image can be viewed in difficult/awkward locations
- Minimises parallax error

A miniature CCTV camera can be fitted to the telescope eyepiece to remotely view the target when working for example in difficult locations. The camera features fine adjustment for focus and centring. A notebook/tablet PC is included with operator software that allows the user to magnify the target image from x2 up to x8. Templates can also be selected to aid with viewing and images can be saved to archive.

Viewing the target image on the monitor allows the operator to adjust the machine tool, targets or fixtures that require setting, without having to return to the Telescope each time.



137-2161 CCTV accessory

Right Angle Eyepiece Adaptor (code 112-568)

Enables the Telescope to be viewed at right angles to the line of sight. Especially useful where space is cramped or the sighting position inconvenient.

High Magnification Eyepiece (code 112-4940)

Eyepiece with increased magnification is available which increases the eyepiece magnification to x50.

Laser Alignment Aid (code 112-4941)

This attaches to the telescope barrel to speed up initial setting time in finding the target.



112-568 Right Angle Eyepiece



Customised cases are available. These are padded and reinforced to absorb shocks. The case contains compartments to accommodate the Telescope and its accessories.

Micro Alignment Telescope accessories

Mounting the telescope

Adjusting Bracket (code 112-645)

Provides a fine azimuth and elevation adjustment for sighting the Telescope, used with a Horizontal Base or Bore Fixture.

Horizontal Base (code 112-656)

Used for mounting the Adjusting Bracket onto either the Plain, Flange or Adjustable Cup. When used on flat surfaces (plain cup), two fence pins provide a sideways location.

Plain Cup (code 112-472)

Locates the Mounting Sphere on the Horizontal Base with its centre 73.5 mm (2.9 in) from the base of the Cup.

Flange Cup (code 112-471)

Locates the Mounting Sphere on the Horizontal Base with its centre 110 mm (4.33 in) from the base of the Cup.

Adjustable Height Cup (code 112-849)

Similar to code 112-471, but adjustable to height 110 mm \pm 5 mm (4.33 in \pm 0.188 in).

Mounting Sphere (code 112-376)

The Mounting Sphere accepts either the Telescope or Target. Used on the Telescope it serves to provide a pivot when sighting the Telescope. The line of sight always passes through the Sphere centre.

A Collet Clamp key (code 116-27) serves any number of spheres. A shoulder ring (code 112-465) positions the pattern side of the Target at the centre of the sphere and is threaded to take the Target Illuminator (code 112-642).

Bore Fixture (code 112-1168)

Used in conjunction with the Adjusting Bracket and Mounting Sphere to mount the Telescope in bores. The mounting diameter of 120.625-120.637 mm (4.7490-4.7495 in) is concentric with the Sphere.

Trivets (code 137-1904 & 1905)

Used to mount the Telescope remotely from the work. Trivet stands are either 185 mm (7.3 in) or 85 mm (3.3 in) high and provide an extremely rigid mounting up to approximately 2 metres (78 in) high.

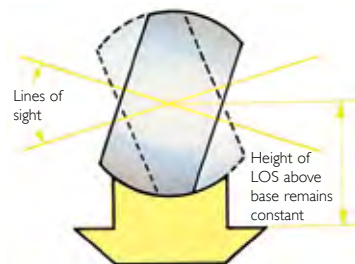
TriPods are also available (code 112-4942 and adaptor 112-4943)

Unimount (code 137-1916)

This lightweight universal mounting system is used when using the Telescope remotely from the component to be measured. It is normally mounted on Trivet Stands to the required height and provides all the facilities for moving the Telescope through \pm 2.5° elevation, \pm 2° fine (360° coarse) azimuth, 100 mm (3.9 in) vertical, 76 mm (3 in) horizontal and 40 mm (1.6 in) sideways.

A simpler version is also available (code 112-5451)

Photos Top to bottom: 112-645 & 112-656
(shown with 112-376, cup and telescope)
Left to right: 112-471, 112-472, 112-849
112-376 & 112-465
112-1168 with 112-645 & 112-376
137-1904 with 137-1906 (table top)
137-1916



Micro Alignment Telescope accessories

Mounting the target

Sphere Clamp (code 112-657)

Retains the sphere onto its Mounting Cup when the Sphere is used to hold a Target.

Target Illuminator (power supply inc, code 112-642)

This accessory provides glare free background illumination for ideal viewing of the Target pattern.

The illuminator fits the sphere, shoulder ring, adjustable target holder and spider fixture. A battery operated version is also available. (code 112-3453). When working over long distances, a high intensity target illuminator (code 137-4944) is available, incorporating a green LED light source and brightness adjustment.

Adjustable Target Holder (code 112-837)

Normal height from base to centre of target 76 mm (3 in) and a range of vertical and horizontal adjustment of approx +/-3 mm (0.125 in). It has magnetic feet, can be located against fence pins and incorporates vertical and horizontal adjustment screws. Takes 2.25 in targets and is threaded to accept the target illuminator.

Spider Fixture (code 137-1943)

Enables a target to be positioned in the centre of bores from 200 mm to 1 m (8-40 in). Larger diameter fittings to special request. Target centring is shown by a rotating dial indicator. The spider fixture is threaded to take the illuminator. Uses 1.5 in targets.

Setting a horizontal line

Talyvel Electronic Level (code M112-4515)

with Stride Base (code 112-2315)

Using the stride base, Talyvel is mounted on the Telescope barrel for setting horizontal lines of sight. Talyvel is a pendulum type Electronic Level, which provides a digital reading in angular measure or gradient. Typical accuracy setting is 0.2 arc second; ie 1 μ m per metre. For further details please refer to our Talyvel brochure.

Stride Level (code 112-2315 & 112-2318)

Used for establishing horizontal lines of sight, this is a precision bubble level mounted directly on the Telescope barrel. Accuracies of 5 seconds are obtainable. Other types of level are available on request, including methods to set truly vertical.

Optical squares

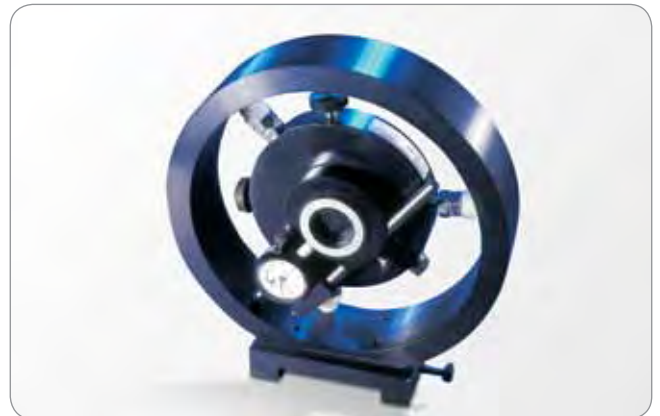
These are used to deviate the Telescope's line of sight precisely 90° within 1 arc second; ie 5 μ m per metre. The 4 in offset square is mounted on the barrel of the Telescope. Rotated with the Telescope, it is used to sweep out planes perpendicular to the Telescope reference line of sight.

Optical Square (code 142-77)

This optical square enables a 90° line of sight to be set up vertically or horizontally from the Telescope.

The height of the sighting aperture is normally 76 mm (3 in) corresponding to the Plain Cup mounting height for the Telescope.

A reduced specification version (code 142-212) is also available



Top to bottom: 112-657 (shown with 112-642, sphere & cup), 112-837 (shown with target), 137-1943 (shown with target in a demonstration ring), Talyvel, 112-2315 (shown on 112-2318), 142-77

Micro Alignment Telescope accessories

4in Offset Square (code 112-1130)

Has its 90° line of sight 4 in (102 mm) forward of its mounting sphere and is used to sweep the full 360°. It has a through sighting facility, enabling the reference target to be viewed at all times.

Other accessories and types of squares are available on request such as devices for sweeping a plane.

Autoreflexion and autocollimation*

When fitted with a lamphouse, the Micro Alignment Telescope can be used for setting or checking squareness, and measuring small gradients of tilt, by autoreflexion or autocollimation.

* Note the Digital Micro Alignment Telescope (code 112-3389) cannot measure in this mode.

Telescope Lamphouse (code 112-1365)

Inserted into the Telescope to illuminate the integral cover glass target, it has a partially reflecting mirror that does not obscure the line of sight. Power supply included.

Adjustable Mirror Target Holder (code 112-729)

For mounting a Mirror Target on the end of a rotating spindle or shaft. The two adjusting screws enable the mirror target to be tilted so that the spindle axis can be aligned with the Telescope line of sight, using Autoreflexion. Has a 95.25 mm (3.75 in) diameter locating spigot concentric with the Target pattern.

Squaring-On Reflector (code 112-722)

Assists in preliminary lining up of the workpiece when the Autoreflexion image is initially outside the Telescope field of view. Two images are seen through the viewing aperture and these converge as the workpiece is brought square to the line of sight.

Telescope Calibration Equipment

Intended for users who wish to carry out their own calibration check on their Telescopes, including variable focus collimator (code 137-583), rotating Test Wedge (code 137-829) and Micro Alignment Telescope bench (code 137-1917). Parallelism of the Telescope line of sight with respect to the barrel of the Telescope is checked by sighting into the Variable Focus Collimator and revolving the Telescope through 180°.

The variable focus of the collimator simulates all focal distances, enabling the straightness of the Telescope line of sight to be checked. The graduated scale target on the front of the collimator is used for checking concentricity of the Telescope line of sight to its barrel, and also linearity of the Telescope micrometers. The test wedge is used to measure the angle of parallelism.



Top to bottom: 112-1130, 112-1365, 112-729 (shown with mirror), 137-1917, 137-829

Targets*

The targets listed below are available for various applications. All targets have a parallelism within 2 arc seconds, minimizing possible refraction errors. Mirror targets are used when both alignment and squareness are checked concurrently using autoreflection or autocollimation. Other targets are available on request.

Nominal diameter	Type	Pattern	Parallelism	Use	Code	
					British	Metric
57 mm	Target	Standard circular	2	Intermediate target	112-1052	112-1058
38 mm	Target	Standard circular	2	Intermediate target	112-1050	112-1056
57 mm	Long distance	Long distance circular	2	25-75 m (80 ft-250 ft)	112-856	
57 mm	Long distance	Standard circular	2	60-135 m	112-857	
57 mm	Mirror target	Standard circular	2	Back face location	112-1054	112-1060

1.5in target Diameter: 38.075-38.087 mm (1.4990-1.4995 in)

Thickness: 9.27-9.78 mm (0.365-0.385 in)

2.25in target Diameter: 57.132-57.148 mm (2.2493-2.2498 in)

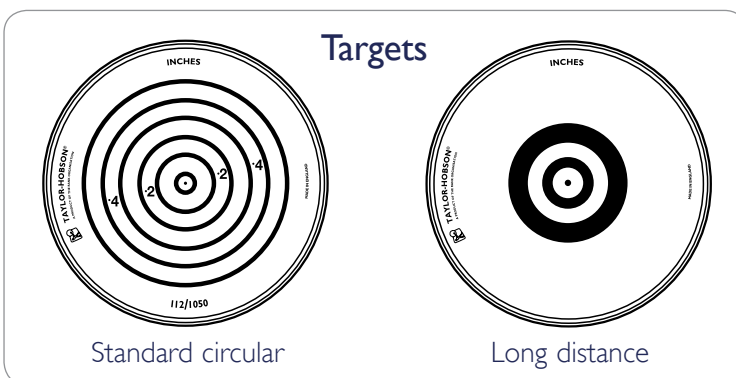
Thickness: 12.45-12.95 mm (0.490-0.510 in)

Pattern concentric with outside circumference of target:-

Long distance targets: within 0.0127 mm (0.0005 in).

All other targets within 0.0064 mm (0.00025 in)

Special targets are available on request.



* The Digital Micro Alignment Telescope 112-3389 uses its own dedicated target.

Special applications

In addition to the range of standard accessories shown in this brochure, equipment can be designed or manufactured to special order to meet specific applications, for example to set the Micro Alignment Telescope truly vertical.

Contact our technical support agent, Spectrum Metrology, or your local Taylor Hobson outlet for details.

Industry applications

Many applications which have utilised the Taylor Hobson range of Micro Alignment Telescopes are the subject of application reports, including:

- Technical note T129: Pipes (Measuring perpendicularity and parallelism of pipe end faces)
- Technical note T128: Machine Tools (Electro optical metrology in the machine tool industry)
- Technical note T132: Aircraft (Electro optical metrology in the aircraft industry)
- Technical note T133: Defence (Electro optical metrology in the defence industry)
- Technical note T147: Shipbuilding (Electro optical metrology in the shipbuilding industry)
- Industry note A152: Engine (Alignment, checking and setting of engines, turbines and generators)
- Industry note A144: Railway (Electro optical metrology in the railway industry)
- Industry note A151: Helicopters (helicopter applications for Micro Alignment Telescope)
- Technical note T148: Submarine (Electro optical metrology in submarines)
- Industry note A154: Roller (Checking level and parallelism during roll system installation and maintenance)
- Industry note A150: Optics (Electro optical metrology in the optical industry)

Training and calibration

Training

Detailed training courses are available either on-site or at Spectrum Metrology's facility in Leicester, UK. Price on application.

UKAS Certification

Micro Alignment Telescopes can be supplied with a United Kingdom Accreditation Service (UKAS) certificate which gives an independent and authoritative traceable guarantee of instrument performance and accuracy. Regular servicing and UKAS calibration will guarantee that the performance specification is maintained.

Micro Alignment Laser Alignment System code 112-3331

Micro Alignment Laser is a laser measuring instrument equipped with the latest optical and electronic components for precise measuring of straightness, flatness, parallelism, perpendicularity, alignment and much more. It comprises a highly stable laser transmitter with integrated micro-adjustment for fine alignment of the laser beam, a high-precision position sensitive device (PSD) receiver with a complete electronic processing system and software. The software provides users with comprehensive support for extensive geometrical measuring including recording of data in reports.

- Ideal for dynamic measurement
- Simple and compact design
- Easy, icon-driven software
- Digital output with clear graphical output and report writing facilities
- Battery operated
- Available in cylindrical casings (price on application)



Typical applications include:

- Dynamic checking of assembled machine slideways for straightness and squareness
- Parallelism measurements and adjustment of tracks and guides
- Monitoring of movement, deformation and deflection of structures

The Micro Alignment Laser System comprises the following components:

Laser Transmitter: a highly stable semi-conductor laser which incorporates a sophisticated adjustment technique for fast setup.

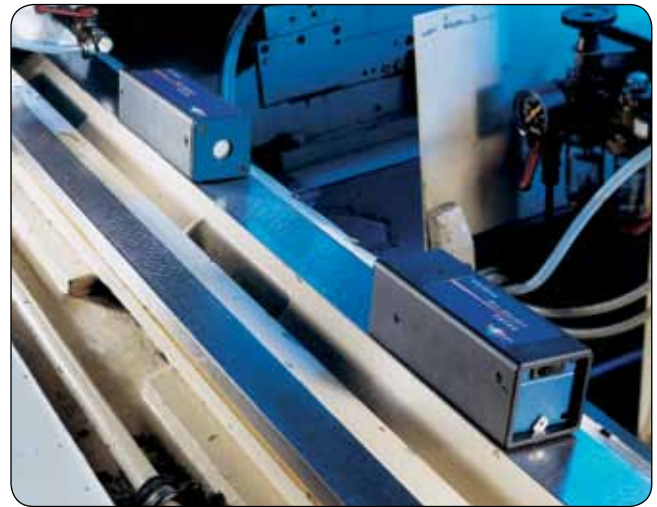
Laser Receiver: Highly precise optoelectronic position recognition. State of the art technology ensures optimal processing of measuring signals, eliminating external disturbances such as oscillation of buildings, etc.

IR-Remote Control: can be used almost anywhere to trigger operations such as individual measurements, adjustments or determining measuring point.

Software: data can be transferred to PC using either fiber optics or radio signals to an RS232 serial interface. This user-friendly software allows real-time measurements in graphical or numeric form.

Cableless radio link: Included as standard with the system.

A wide range of accessories is available to suit individual applications.



Specification

Transmitter	
Laser Power	≤ 1 mW
Laser Class	2
Laser Wave Length	630-670 nm (red)
Power Supply	
Dimensions (LxBxH)	137x50x50 mm
Weight	0.73kg inc. Battery

Receiver	
Measuring Range (X/Y)	5x5 mm*
Measuring Resolution	0.1 µm
Linearity)1)2	0.4%
Reproducibility)1)2	±0.25 µm
Power supply)3	7.2V
Dimensions (LxBxH)	156x50x50mm
Weight	0.63kg, inc. Battery

*Wider measuring range option available on request

System	
Measuring Distance)4	0.1-10m (longer distances may be available on request)
Temperature Range	10-35°C
Case (LxBxH)	460x350x110mm
Weight of Case & contents	4.0kg

Processing	
Software	Straightness, parallelism, rectangularity, alignment (Windows 98/XP/2000/NT4.0)

1) Data measured at 20° C

2) Within 80% of range

3) With Li-Ion Battery or mains adapter

4) depends on environmental conditions