Tamaya Precision Marine Sextants

Precision Marine Sextants Since1925

TAMAYA®

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TAMAYA PRECISION MARINE SEXTANT

WARRANTY

The sextant is warranted against defects in materials and workmanship for one (1) year from date of delivery to original purchaser. During the warranty period, Tamaya Technics Inc. will repair or, at its option, replace components that prove to be defective. This warranty does not apply if the sextant has been damaged by accident or through misuse or as a result of service or modification by any person other than at Tamaya's authorized service facility. No other warranty is expressed or implied. Tamaya is not liable for consequential damages.

TAMAYA TECHNICS INC.
Tokyo, Japan

INTRODUCTION

70 Years of Craftsmanship

Tamaya marine sextants literally circumnavigate the globe. From the Cape of Good Hope to Cape Cod our sextants are in use by professional fishermen, merchant marines, navy personnel and yachtsmen alike.

Tamaya has specialized in the creation of precision marine sextants for over 70 years. During that period we have earned a reputation for precision, toughness, and reliability. The reason? We still create our sextants one-by-one, by hand. Each instrument is individually assembled, thoroughly checked, and then put through a rigorous series of tests utilizing the latest optical technology.

We guarantee quality. And we strive hard for precision, toughness, and reliability. Because we know that when you're miles out at sea, your life may depend on our craftsmanship.

Sextant and Celestial Navigation

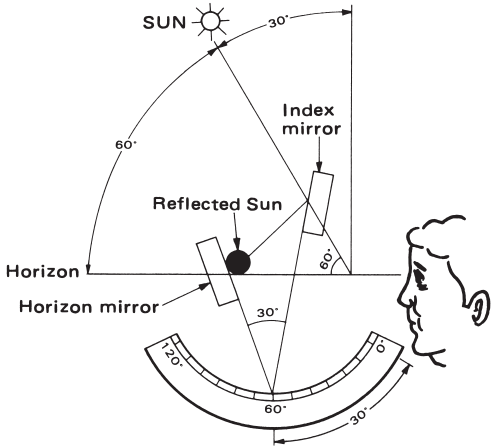
Celestial navigation is a method of determining the observer's position on the earth based on the principle that there is only one line (line of position) on the earth where one observes a particular celestial body at a certain altitude angle and at a certain time of the year.

The necessary tools for celestial navigation are sextant, a chronometer, the Nautical Almanac for the current year, and Tamaya Digital Navigation Computer (or sight reduction tables). In addition to sextants, Tamaya also offer these other tools wherever Tamaya products are sold.

Taking Sight with a Sextant

Taking a sight means to measure the vertical angle or altitude between a heavenly body and the horizon in order to ascertain the ship's position at sea. The sextant is used as a tool to accomplish this aim.

All marine sextants have two mirrors arranged as shown in Fig. 1 and work on the same principle. The index mirror reflects the image of the body to the horizon mirror. The horizon mirror is so constructed that one can see the horizon at the same time he sees the reflected image of the whole body. Thus, the altitude of the body is measured by adjusting the angle of the index mirror until the reflected image contacts the horizon (Fig. 2)



Sextant arc and reading

Fig. 1

INTRODUCTION

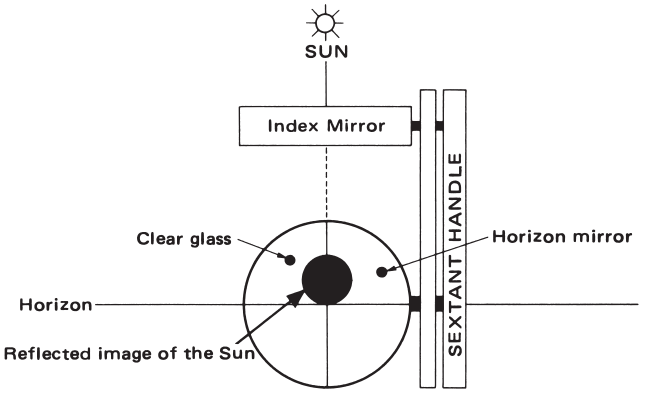


Fig. 2

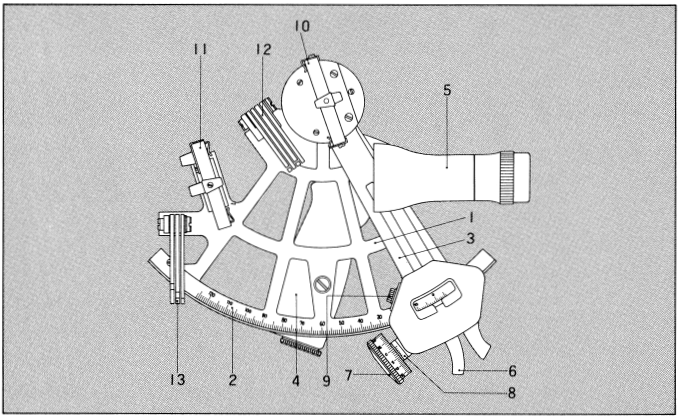
In a high quality sextant the altitude can be read by degrees, minutes and 1/10 minute. One minute of the sextant reading represents one nautical mile.
Because of its great value for determining position at sea, the sextant has been a tool of navigation for a long time. To do the job accurately, the navigator will need a good instrument. The design of Tamaya sextants has been reduced to an optimal simplicity. All the parts, telescope, lens, frame, arc, mirrors, shade glasses, etc. are manufactured with the utmost precision and then assembled into a complete unit with accuracy carefully checked by a master collimator in the factory.

Care of a Sextant

Tamaya marine sextant is a well-constructed, precision instrument capable of rendering many years of reliable service, with minimum care.
However, its usefulness can easily be impaired by careless handling or neglect. If it is ever dropped, or damaged, the instrument should be taken to an expert for inspection, and possible readjustment.
When not in use, a sextant should be kept in its box and properly stored away from excessive heat, dampness and vibration. The greatest enemy of the sextant is moisture. The mirror and the arc should be wiped dry after each use. The tangent screw and the teeth on the side of the limb should be kept clean and lightly oiled.

Components

1. **Frame**
2. **Arc**
3. **Index Arm**
4. **Handle**
5. **Telescope**
6. **Release**
7. **Micrometer Drum**
8. **Vernier**
9. **Light bulb**
10. **Index Mirror**
11. **Horizon Mirror**
12. **Shade Glasses for Index Mirror**
13. **Shade Glasses for Horizon Mirror**
14. **Limb**
15. **Switch**
16. **Leg-Frame**
17. **Slide-and-lock rising piece**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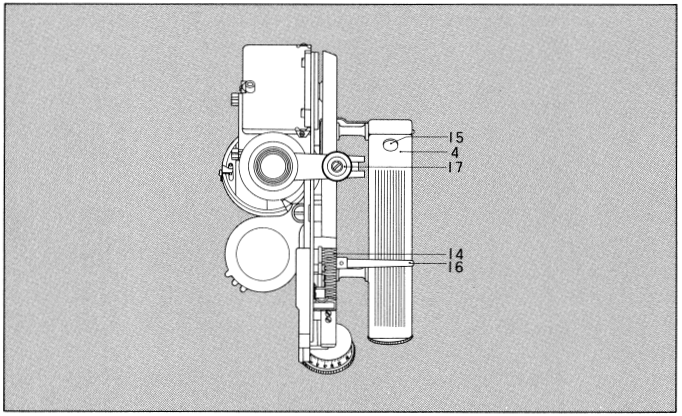
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Marine Sextants

SPECIFICATIONS:

Model	MS-733
Arc	Reads from -5° to 125° White engrav finished bronze. Radius 162mm
Micrometer Drum	White engravings on a black pl
Index mirror	Recta
Horizon mirror	Circular, 57mm
Shade glass	4 for index mirror, 3 for horizon mirror, and 1 polaroid glass for eyepiece of telesc
Telescopes	4×40mm angle of v
Illuminator	
Standard accessories	1 adjusting wrench, 2 dry cell UM-3,
Weight	1.9kgs.
Carrying case	Double wall air

MS-733

	MS-833
ings on black	Reads from −5° to 125° Black finished aluminum plate on bronze. Radius 162mm
lastic drum. Held securely to tangent screw with two locking devices. 1'scale. Vernier reads to 0'.2	
ngular, 57×42mm Aluminized on the rear side	
n diameter The right half aluminized on the rear side	
1 shade glass cope	4 for index mirror, 3 for horizon mirror
view 7°, or 7×35mm angle of view 6.5° All optics fully coated	
On both arc and drum	
2 light bulbs	1 Adjusting Wrench
	2.0kgs.
mold (H.D. Polyethylene). 335×335×165mm 1.7kgs.	

MS-833

Marine Sextants

SPECIFICATIONS:

Model	MS-1L
Arc	Reads from −5° to
Micrometer Drum	White engravings on a black plastic drum.
Index mirror	Rectangular,
Horizon mirror	Circular, 57mm
Shade glass	4 for index mirror, 3 for ho
Telescopes	4×40mm
Illuminator	
Standard	
Weight	1.9kgs.
Carrying case	Double wall air mold (H.D. Polyethylene)

MS-1L

MS-2L	MS-3L
o 125° White engravings on black finished bronze. Radius 162mm	
Held securely to tangent screw with two locking devices. 1'scale. Vernier reads to 0'.2	
57×42mm Aluminized on the rear side	
diameter The right half aluminized on the rear side	
orizon mirror. 1 shade glass and 1 polaroid glass for eyepiece of telescope	
angle of view 7°, or 7×35mm angle of view 7.5° All optics fully coated	
On both arc and drum	
1 adjusting wrench 2 dry cell UM-3 2 light bulb	
2.0kgs.	2.2kgs.
335×335×165mm 1.7kgs.	Wooden case with a locking device 375×300×170mm 2.9kgs.

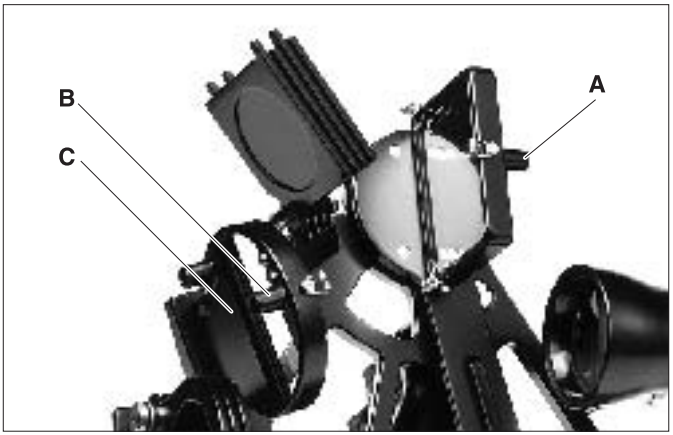
MS-2L

MS-3L

Sextant Adjustments

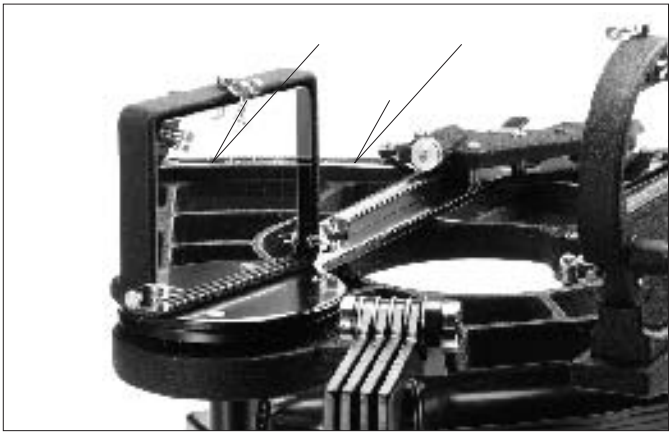
Non-adjustabel Error (Fixed Instrument Error)
In a Tamaya marine sextant the sum of non-adjustable error such as prismatic, graduation and centering of a sextant is eliminated to less than 0'.1-0'.3.
Each sextant is then checked by the collimator in the factory at every 15 degrees, and the slight unremovable errors still found are regarded as the fixed instrument error and stated on Tamaya's inspection certificate. The certificate is attached to the inside cover of the sextant carrying case.

Adjustable error
The sextant should be checked occasionally to see that the mirrors are perpendicular to the frame and parallel to each other. If misalignment is found, adjustment is necessary.



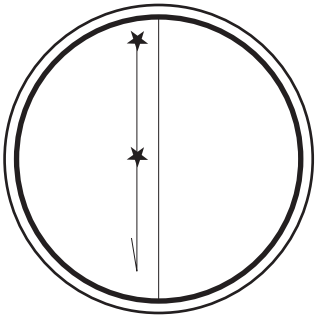
A. Perpendicularity of the index mirror

If the two lines of sight appear to be joined in a straight line, the mirror is perpendicular. If the line is not straight, it requires an adjustment of the screw designated in the photo marked "A".

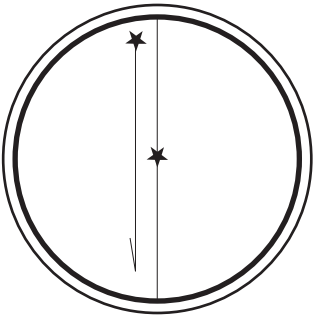


B. Side error

An error resulting from the horizon mirror not being perpendicular is called side error. To accomplish the adjustment, the sextant is sighted directly at a star at night with the index set at 0°. When the tangent screw is turned, the reflected image of the star should move in a vertical line exactly through the direct image (Illus. b1). If the line of movement is to one side or other of the direct image (Illus. b2), the horizon mirror is not perpendicular to the frame and should be adjusted by the screw designated in the photo marked "B".



(b1)



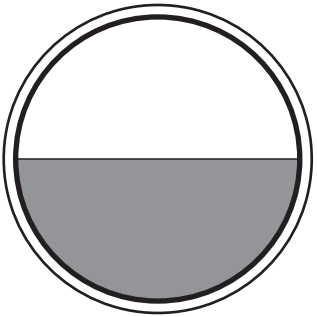
(b2)

Frequent manipulation of the adjusting screws should be avoided, as it may cause excessive wear. A slight lack of adjustment in perpendicularity has minimal effect on calculation and can be ignored.

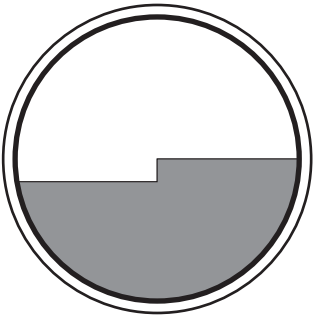
C. Index error

An index error is caused by a lack of perfect parallelism between the index mirror and horizon mirror when the sextant is set at 0˚00'.0. With the Tamaya sextants the horizon mirror is adjusted within the mirror frame. To eliminate or reduce excessive index error, the horizon mirror must be adjusted by the serew designated in the photo marked "C".

If the index error is small (less than 4'.0), it is best not to try to remove it. Instead subtract or add this error in your calculations.



Horizon in alignment



Horizon out of alignment
Index error present

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