NAVSHIPS 0924-001-6000

Technical Manual

ALIDADE, TELESCOPIC, MARINE

MARK 7, MOD. 0 (7-1/2 INCH)

OPTIC-ELECTRONIC CORP.
2605 Manana Dr.
Dallas, Texas

BUREAU OF SHIPS • NAVY DEPARTMENT • WASHINGTON, D. C.

TYPE II
TECHNICAL MANUAL

ALIDADE, TELESCOPIC, MARINE

MARK 7 MOD 0 (7-1/2 INCH)

OPTIC-ELECTRONIC CORPORATION
2605 MANANA DRIVE
DALLAS, TEXAS 75220

CONTRACT N104-3366A

APPROVAL AND PROCUREMENT RECORD

BASIC APPROVAL DATA FOR: NAVSHIPS 0924-001-6000

TITLE: ALIDADE, TELESCOPIC, MARINE
MARK 7 MOD 0 (7-1/2 INCH)

Approved by Ships Parts Control Center letter #773A-2.6B/2S/3366A
dated 12 February 1965 to Optic-Electronic Corporation, Dallas,Texas

Contract	Date	Vessels Applicable	Quantity of Manuals	Building Yard
N104-3366A	10-8-64	Various	17	Optic-Electronic Corp.

CERTIFICATION:

It is hereby certified that the manuals provided under contract N104-3366A are exactly identical to NAVSHIPS 524-0488 approved by authority of the basic approval data shown above. Further it is certified that this identical manual has been provided under other contracts as listed above.

OPTIC-ELECTRONIC CORPORATION

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RECORD OF CORRECTIONS MADE

Pages	Numbers	Date	Signature

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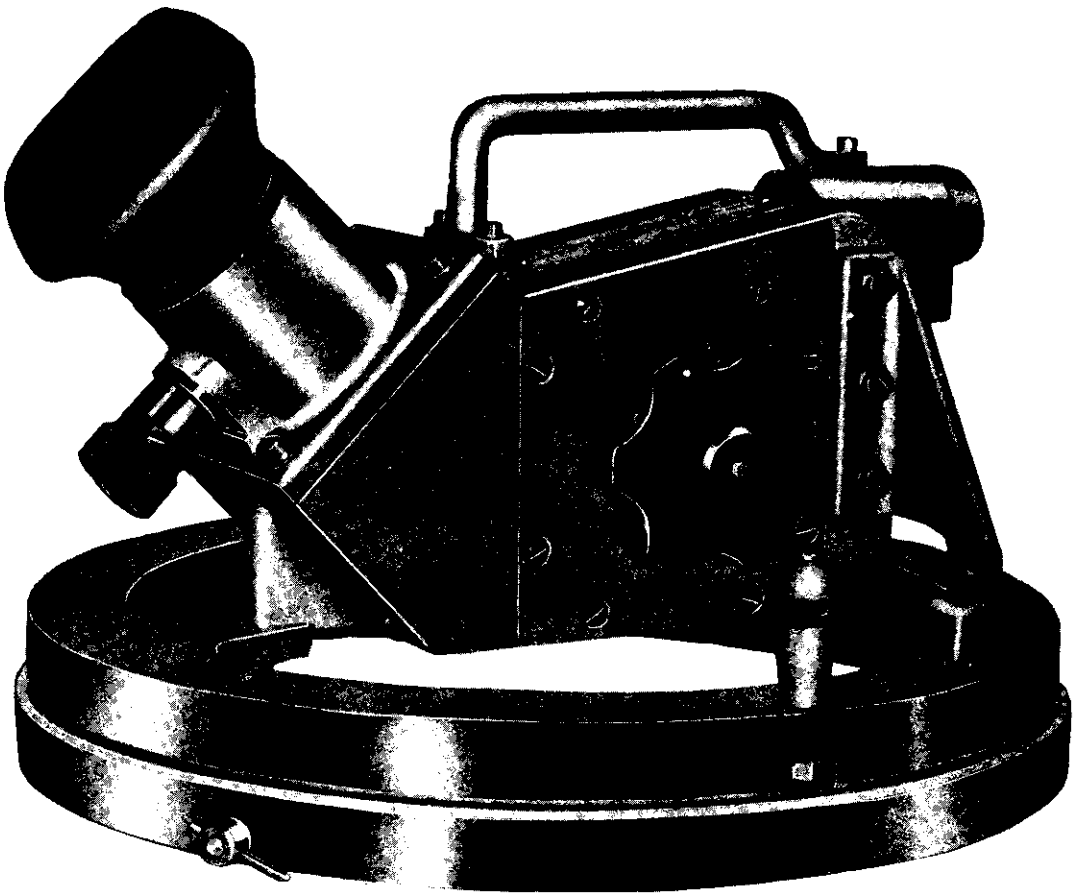


Figure 1-1 Marine, Telescopic Alidade 7 ½ inch, Mark 7 Mod 0 on adapter ring A

SECTION 1

GENERAL INFORMATION

1-1 General Data

Mark 7 Mod 0 (7-1/2 inch), Telescopic Alidade shown in figure 1-1 is used with a magnetic compass, or ships course indicator for bearing measurements. The Mark 7 Mod 0 Alidade is designed for use with the 7-1/2 inch Navy Number 1 magnetic compass or one of the 7-1/2 inch ship's course indicators listed in paragraph 1-3.

The alidade contains a main and an auxiliary optical system. The main optical system is six power, with an adjustable eyepiece, and contains variable density polarizing filters for observations against the sun. The auxiliary optical system transmits to the main optical system eyepiece an image of the compass card indicating the true or magnetic bearing of a distant object, and an image of the level vial attached to the alidade housing.

The alidade is sealed, flushed, and filled with dry nitrogen under a pressure of four psig to maintain internal dryness and prevent fogging.

Navy Type Designation:	Alidade, Telescopic, Marine (7-1/2 inch) MK 7 Mod 0
Case Dimensions:	12x12x9 inches
Magnifying Power:	6
True Field:	8 degrees, 45 minutes
Weight: (including case)	17 lbs. (including adapter rings)

1-2 Introduction

The Mark 7 Mod 0, Telescopic Alidade is a portable navigational instrument. It consists of a housing, bearing ring, handle, supports, level vial, and an auxiliary and a main optical system. The Mark 7 Mod 0 Alidade is provided with an adapter ring to fit the 7-1/2 inch gyrocompass indicator, and also with a second ring to fit a Navy Number 1 magnetic compass. When the alidade is mounted on an indicator or compass, the auxiliary optical system forms an image of the level vial, the reticle, and 25 degrees of the indicator or compass card; the main optical system forms an image of the object or target in the field of view of the instrument.

The stowage case contains the Alidade and the adapter rings when they are not in service.

The piece number references included throughout the manual are to the drawings included in Section 7. Unless otherwise stated, these numbers apply to the Mark 7 Mod 0 alidade.

1-3 Detailed Description

The housing casting (Piece 15), supports and encloses both the main optical system and the auxiliary optical system. After assembly and installation of all components, the housing is flushed and filled with dry nitrogen to 4 psig. An air valve (See General Assembly Drawing) for introducing and gaging the dry nitrogen is mounted on the left side of the housing. The housing is so cast that the dry nitrogen passes over the maximum number of air-glass surfaces. The housing is also gasketed and sealed to prevent entrance of moisture and loss of the dry nitrogen during long periods of storage, and under service conditions.

The main optical system is composed of: the objective lens (Piece 8), mounted in the objective mount (Piece 65), which is threaded into the front wall of the housing casting (Piece 15); either the polarizing filters (2-Piece 6), or compensator lens (Piece 7), which are held in the filter assembly and can be brought into or out of the system by rotation of knob (Piece 44); the Amici prism (Piece 4), bonded to the Amici prism mount (Piece 40), and held in the prism assembly by the prism mount plate (Piece 30); the reticle (Piece 42); and the eyepiece assembly, in which the focusing lens mount (Piece 20), holds the field lens (Piece 1), and center lens (Piece 2), allowing them to move in relation to the eyelens (Piece 3), which is fixed in the eyepiece housing (Piece 32). This motion is accomplished by rotation of the focusing knob (Piece 27).

The auxiliary optical system is composed of: the sealing window (Piece 9), held in the wall of the housing casting by lock ring (Piece 70); the front surface mirror (Piece 13), bonded to the mirror retainer (Piece 84); the auxiliary objective, composed of outer lens (Piece 12), and inner lens (Piece 11), held in a cell (Piece 77); the erector assembly, two erector lenses (Piece 10), in cell (Piece 75); and the auxiliary prism (Piece 5), bonded to its mount (Piece 41), and held in the prism assembly by the prism mount plate (Piece 39).

The eyepiece is an internal focusing type, sealed against dirt, dust and moisture. The focusing range is minus 3 diopters to plus 1 diopter with scale and index lines on the focusing knob (Piece 27), to indicate the diopter setting.

The filter assembly is a two position type, which inserts either variable density polarizing filters or a glass compensator into the main optical system. The control is a two concentric knob device with the larger knob inserting the filters or compensator, and the smaller knob adjusting the density of the filters.

Sealing is accomplished in the telescopic alidade in the following manner. The objective mount (Piece 65), filter assembly cover (Piece 90), eyepiece housing (Piece 32), and plug (Piece 79), are sealed with 0 rings. The sealing window (Piece 9), prism cover (Piece 19), eyelens (Piece 3), and air valve assembly are sealed by rubber gaskets. The pipe plug (Piece 38) and all through setscrews, are sealed with a polysulfide type curing compound. The filter stop (89), filter drive shaft (Piece 93), and focusing shaft (Piece 26), are sealed by stuffing boxes with rubber packings and gland nuts. The sealing is designed and tested to hold dry nitrogen at four pounds overpressure under all conditions of service. The seals should not be disturbed in any way except at an optical shop, where facilities for renewing the seal and reflushing and refilling with dry nitrogen are available.

The eyepiece cap (Piece 16), is mounted in the eyepiece housing (Piece 32), to protect the eyelens from rain, spray, dust, and dirt while not in service.

The objective cover (Piece 64), is attached by means of captive screws to the housing supports (Piece 94 and 95), to protect the objective lens from rain, spray, dust and dirt while not in service.

The rubber eyepiece (Piece 22), which is attached by means of a eyepiece clamp (Piece 21), provides a cushion for the observer and excludes stray light. It is rotatable, for use with either eye, by loosening the eyepiece clamp screw (Piece 150).

The left housing support (Piece 94), and the right housing support (Piece 95), connect the housing casting (Piece 15), to the bearing ring (Piece 37). The left and right housing supports and the bearing ring are different on the two types of alidade. The telescopic alidade, when mounted, is secured against accidental removal by vibration or shock by two knobs (Piece 80), and two locking shafts (Piece 73).

On the Mark 7 Mod 0 alidade, the bearing ring rests on the adapter ring, Type A (Piece 56), which is mounted on the upper bowl of the 7-1/2 inch Navy

Number 1 Magnetic Compass, or on the adapter ring, Type B (Piece 135), which may be mounted on the upper bowl rim of any one of the 7-1/2 inch ship's course indicators, listed below:

Mark 3 Mod 11, FSN H6320-504-0608
Mark 3 Mod 12, FSN H6320-504-0610
Mark 5 Mod 8, FSN H6320-504-0737
Mark 19 Mod 6, FSN H6320-504-0738
Mark 20 Mod 2, FSN H6320-295-1492
Mark 5 Mod 7, SNSN 61-C-11962-150

Adapter ring, Type A (Piece 56), contains two radial lock screws (Piece 55), which can be withdrawn into counterbores in the ring to allow it to slip over the bezel of the magnetic compass. The lock screws, when advanced, contact the upper bowl rim of the compass. The compass must be tilted in its gimbal ring in order to fit the adapter ring over the bezel.

Adapter ring, Type B (Piece 135), has three adapter ring clamps (Piece 136), which can be rotated in outward positions while the adapter ring is slipped over the indicator bezel. While in the outward position, the clamps clear the outer graduated ring of the indicator. When the adapter ring is seated on the indicator bezel, the clamps can be turned to the inward position and tightened by means of knurled knobs (Piece 137), to engage the underside of the indicator bowl rim and thereby clamp the adapter ring securely to the indicator.

SECTION 2

PRINCIPLES OF OPERATION

2-1 Main Optical System

The main optical system of the Mark 7 Mod 0 (7-1/2 inch), Telescopic Alidade is a terrestrial telescope which consists of an objective lens (Piece 8), polarizing filters (2-Piece 6), a compensator lens (Piece 7), an Amici prism (Piece 4), a reticle (Piece 42), and the eyepiece elements. The objective lens receives light from a distant object and forms an image which is subsequently magnified by the eyepiece optical elements. The two polarizing filters may be rotated in or out of the line of sight as situations require. Placed in the path of light they reduce light intensity and glare. One polarizing filter may be independently rotated to vary the intensity of light received from the distant object. The compensator lens is also mounted in the filter assembly, but it is only positioned in the line of sight when the polarizing filters have been rotated to the down position. The compensator lens is used to converge the light path and maintain the required focus when the polarizing filters are rotated out of the line of sight. The light from the compensator lens or polarizing filters is then focused through a fixed stop aperture onto the eyepiece side of the Amici Prism. The Amici prism inverts and reverts the image and deviates the line of sight through a 45-degree angle. The reticle wire (Piece 62) is superimposed on the image and the eyepiece elements, which consist of a field lens (Piece 1), center lens (Piece 2) and eye lens (Piece 3), produce an enlarged virtual image of the distant object at the eyepoint of the alidade.

2-2 Auxiliary Optical System

The auxiliary optical system consists of a sealing window (Piece 9), front surface mirror (Piece 13), an outer objective lens (Piece 12), an inner objective lens (Piece 11), erector lenses (2-Piece 10), and an auxiliary optical system prism (Piece 5). The image of the compass or indicator card and level vial is transmitted through the window and reflected into the auxiliary optical system by the front surface mirror. The inner and outer objective lenses converge the image from the front surface mirror, through the stop in the erector lens cell (Piece 75), into the auxiliary optical system prism. The erector lens inverts the image of the inner and outer objective lens, while the auxiliary optical system prism re-inverts the image in the plane of the mask (Piece 43), and reticle wire. The reticle wire is superimposed on the compass card and the bubble in the level vial (Piece 14), and an image is formed at the eyepoint of the alidade.

The complete image formed at the eyepoint of the alidade consists of the distant object with reticle wire superimposed, as viewed through the main optical system, and the image of the compass card, bubble in the level vial, and the reticle wire superimposed, transmitted through the auxiliary optical system.

2-3 Focusing Assembly

To accommodate for the visual variations between different observers, the alidade has a focusing assembly. The focusing assembly includes a focusing knob (Piece 27), focusing shaft (Piece 26), focusing plate (Piece 30), diopter scale (Piece 28), and a stuffing box (Piece 23). When the focusing knob is rotated,

the focusing shaft alters the position of the focusing lens mount (Piece 20). By this movement the observer may adjust the eye lenses to his desired focus. The diopter scale on the focusing knob may be aligned with the white line on the stuffing box to obtain a diopter setting.

2-4 Filter Assembly

The filter assembly provides a means of controlling the light intensity and glare within the alidade. The filter assembly includes two polarizing filters, a compensator lens, a filter knob (Piece 46), knob (Piece 44), filter drive shaft (Piece 93), filter shaft disc (Piece 83), filter stop shaft (Piece 67), filter stop (Piece 89), and filter housing (Piece 58). The filter knob through the filter drive shaft rotates a polarizing filter to increase or decrease light intensity. The large knob rotates the polarizing filters out of the line of sight and inserts the compensator lens.

SECTION 3

OPERATING INSTRUCTIONS

NOTE: Mounting instructions are contained in Section 4, of this manual. Personnel using the alidade should be familiar with the mounting instructions before attempting operation of the alidade.

3-1 Before Operation Instructions

Adjustments to the eyepiece assembly and filtering assembly must be made before proceeding to operate the alidade.

a. If the required diopter setting is known, rotate the focusing knob until the index line of the stuffing box (Piece 23), corresponds to the graduation on the diopter scale (Piece 28). If the required diopter setting is not known, it can be found from the following procedure.

Step 1. Rotate the focusing knob to the +1 position on the diopter scale.

Step 2. While looking into the eyepiece rotate the focusing knob slowly in the opposite direction, toward the minus figures. Accuracy will be greater if the alidade and compass are tilted so that a clear background is the only image seen. Observe the reticle wire (Piece 62), before and during the start of the focusing adjustment. Stop the rotation of the focusing knob as soon as a clear, sharp image of the vertical reticle wire is seen.

Step 3. Note the value indicated on the diopter scale at which rotation was stopped.

Step 4. Repeat the operation detailed in Steps 1, 2 and 3 above several times. Do not look into the eyepiece while rotating the focusing knob toward the plus end of the scale. An average of several diopter scale values will be sufficiently close to the observer's eye correction to enable him to use the average value as a setting of the scale for future use. The observer should not use the average value for both eyes, unless he has satisfied himself, after a series of test settings, that the average value is the same for both eyes.

b. The following procedure will aid the observer in making filter adjustments after the proper diopter setting is obtained.

(1) Glare conditions, sun high. When glare from the water surface is present, and the sun or moon is greater than 15 degrees above the horizon, operate the knob (Piece 44), counterclockwise (top surface of knob rotated toward the eyepiece end of the alidade) until it is stopped by a pin (Piece 124). This rotation, a maximum of 90°, positions the polarizing filters (Piece 6), into the optical system. The fixed polarizing filter is set to reduce glare

reflected from the water surface to a minimum. The movable polarizing filter may be set at any rotational orientation to the fixed filter. When not sighting directly into the sun, the filter knob (Piece 46), must be rotated until a maximum of light is observed in the field. This rotation is not limited by a stop. A rotation of approximately 90 degrees of the filter knob (Piece 46), is sufficient to rotate the moving filter from minimum to maximum light transmission.

(2) Glare conditions, sun low. Where glare from the water surface is present, and the sun or moon is lower than 15 degrees, operate the knob (Piece 44), counterclockwise to position the polarizing filters, then operate the filter knob (Piece 46), to cut down the light intensity in the field, as required. Care should be exercised in low moon conditions with unlighted or faintly lighted targets. Reducing light intensity too far under these conditions can make readings so taken of little value.

(3) Normal or poor light conditions. When normal or poor lighting is encountered rotate the knob (Piece 44), clockwise until stopped by pin (Piece 124). This rotation removes the polarizing filters from the system, replacing them with the clear glass compensator (Piece 7). Maximum light transmission is accomplished at this setting of knob (Piece 44).

(4) The filter settings mentioned are easily made even while swinging the alidade from one target to the other. Place the filters in the system before looking into the eyepiece when glare conditions are to be expected.

3-2 Operating Procedures

After performing the before operation instructions, the alidade is ready for observation of the target and reading of the bearing. Operation of the alidade is accomplished by the following steps.

Step 1. Rotate the alidade into the general area of the target.

Step 2. Sight the eyepiece and adjust the rotational position of the alidade until the image of the target is centered on the reticle wire (Piece 62).

Step 3. As soon as the reticle wire bisects the target, direct your vision to the upper third of the eyepiece and read the bearing represented by the compass card division indicated by the reticle wire.

Step 4. Check the position of the level bubble while reading the bearing. The most accurate bearings are obtained with the alidade level.

Step 5. Call off or record the bearing reading.

SECTION 4

INSTALLATION

4-1 Unpacking

The Mark 7 Mod 0 (7-1/2 inch), Telescopic Alidade is a precision instrument. Extreme care must be used when handling these alidades to prevent misalignment of the internal optical system or damage to the external controls.

4-2 Installation

4-2-1 Mark 7 Mod 0 Telescopic Alidade

Refer to paragraph 1-3 in Section 1, for the selection of the proper adapter ring. The procedure for installing the proper adapter ring and alidade is presented below. Step 1 through Step 6, pertain to the Type A, adapter ring. Step 7, through Step 11, pertain to the Type B, adapter ring.

Step 1. Adapter rings, Type A (Piece 56), is fitted to the magnetic compass by unscrewing the two radial lock screws (Piece 55), until their points are completely within the counterbores in the ring.

Step 2. Fit the adapter ring down over the compass bezel, tilting the compass in its inner gimbal ring to allow the head ends of lock screw (Piece 55), to clear the gimbal ring.

Step 3. Rotate the adapter ring so that both lock screws are clear of gimbal bearing bosses and filler plug bosses.

Step 4. Screw in lock screws (Piece 55), until their points touch the compass bowl rim.

Step 5. Make sure adapter ring is seated snugly and squarely on compass bezel, then tighten lock screws (Piece 55), gradually moving from one to the other around the ring.

Step 6. The adapter ring may be left on the compass, permitting the attachment and removal of the alidade from the fitted ring as necessary.

Step 7. Adapter ring, Type B (Piece 135), is fitted to ship's course indicators by first making sure the three right angle clamps (Piece 136), are set outward so they will clear the outer graduated ring of the indicator.

Step 8. Fit the adapter ring down over the indicator bezel, taking care to avoid the outer graduated ring.

Step 9. Unscrew the 3 knurled knobs (Piece 137), enough to allow the clamps (Piece 136), to be rotated into a radial position in order to be able to clamp under the upper rim of the indicator bowl. A slight rotation of the adapter ring may be necessary for the clamps to clear the nuts under the rim. On some Marks and Mods of ship's course indicators, it may be necessary to remove the ring clamps to ensure an adequate fit.

Step 10. Secure the knurled knobs, raising the clamps until they contact the underside of the indicator bowl rim.

Step 11. Make sure the adapter ring is seated snugly and squarely on the indicator bezel, then tighten the knurled knobs gradually moving from one to the next around the ring.

The adapter ring fitting procedures described may be accomplished whether or not the alidade is locked to the adapter ring. It may prove easier to fit the adapter ring to the compass or indicator and to lock the alidade to the adapter ring in two separate operations. The procedure for locking the alidade to either adapter ring is described below:

Step 1. Make sure knobs (Piece 80), are in the disengaged or open position.

Step 2. Hold the alidade by its handle, slide forward over the adapter ring so that first contact with the adapter ring is obtained at the eyepiece, or rear part of the alidade bearing ring (Piece 37).

Step 3. When the alidade is far enough forward to insure engagement of the locking shafts (Piece 73), in the adapter ring groove, lower the front end of the alidade into contact with the upper surface of the adapter ring.

Step 4. While holding the alidade down so that it is in solid contact with the adapter ring, turn the knobs (Piece 80), to the lock position.

Step 5. Hold the alidade by its handle, and rotate it on the adapter ring, lifting slightly at the same time. This is necessary to make sure the alidade is properly locked.

SECTION 5

MAINTENANCE

5-1 Preventive Maintenance

Inspect the alidade periodically to be certain all parts and assemblies are present. Examine the housing for dents and cracks. Check the focusing and filter assemblies for bent or broken parts. These assemblies should operate easily. Inspect for dirt and moisture on the interior optical parts; their presence will indicate improper internal pressure in the housing. The diopter scale must be clearly defined and easily readable. The exterior finish of the alidade must be intact to maintain protection against corrosion. No dirt, smears, scratches, digs, chips, fractures, fungus growth or cement separations should be visible inside the alidade as viewed through the objective lens. With the use of the method called shadowing, it is possible to locate these defects in the lenses. Shadowing is the technique of looking obliquely into the eyepiece or objective end of an instrument to obtain a reflection from a particular surface in the optical system. Seen in this way, the surfaces of the lenses appear dark grey and any defects show up as white particles. If salt spray marks appear on the exterior glass surfaces, they should be removed by rinsing in fresh water before any other glass cleaning is attempted. Glass cleaning methods are detailed in Navships 250-624-12, BuShips Navigational Instruments Control Manual. Extreme care should be taken to keep the instrument seals intact. Optical shop facilities are required to reseal, flush and refill with dry nitrogen to prevent the possibility of fogging of interior glass surfaces by condensation of moisture. The exterior of the instrument must be kept free of dirt and dust by occasional wiping.

5-2 Corrective Maintenance

Trouble shooting is the isolation of defective or malfunctioning assemblies and the corrective action necessary to bring the alidade to normal functioning. A trouble shooting guide for corrective maintenace is listed below.

Table 5-1

Malfunction	Probable Cause	Corrective Action
Alidade will not seat properly on adapter ring (Mark 7).	a) dirt has formed on the bearing ring	a) remove the alidade and clean bearing ring or bezel
Binding when focusing adjustment is made.	a) dirt has formed under focusing knob	a) remove and clean the focusing knob
Filter will not rotate out of line of sight.	a) set screws loose on large knob on right side of housing	a) tighten set screws
Filter knob binding	a) dirt under filter knob	a) remove the filter knob and clean

Malfunction	Probable Cause	Corrective Action
Target blurred to eye of observer	a) alidade not focused	a) focus the alidade

NOTE: The following malfunctions will require that the corrective action required must be accomplished by qualified personnel in a fully equipped optical shop.

Focusing assembly moves loosely.	a) focusing shaft worn	a) remove assembly and replace shaft
Not able to control light transmission with filters.	a) ball bearings are damaged	a) remove filter assembly and replace ball bearing
	b) "0" ring worn	b) remove filter assembly and replace "0" ring
Moisture inside alidade.	a) loss of gas pressure in housing	a) recharge alidade with gas mixture
	b) faulty seals or gaskets in housing	b) replace worn gaskets and seals
Poor definition of target	a) defective optical elements	a) determine defect and correct
	b) Incorrect position and assembly of optical elements	b) check that lenses are properly positioned
Parallax	a) objective lens loose	a) tighten objective lens

Specific adjustments of the alidade's optical system are referred to in the following paragraphs. These adjustments should be reserved for optical shop personnel.

a. Collimation: The alidade requires a collimator adapter which simulates the bezel ring of the compass, and, in addition, contains a scale with graduations properly located and oriented to simulate the compass card. A setting fixture is also necessary to set the adapter so that the center of the bezel ring and the center mark of the scale are capable of being aligned along the line of sight of the collimator telescope.

b. Main Optical Prism Adjustment: The main system Amici prism is bonded to a metal mount held by three screws to the prism mount plate. Sufficient clearance is allowed for a small adjustment in height, distance along axis, and rotation in a vertical plane defined by the optical axis, of the mounted prism. There is no provision for rotation, or tilt, of the prism in any other plane. After adjustment, screws must be taken up tightly.

c. Auxiliary Objective Adjustment: In the adjustment of the auxiliary system, it has been found advisable to set the erector assembly approximately midway of its travel, and to adjust by moving the auxiliary objective cell in or out. This

operation is best performed after the filter assembly has been removed, providing access to the back end of the auxiliary objective cell. The set screw holding the auxiliary optical cell is below the forward nameplate screw, in the same threaded hole. Care should be taken to back off this set screw before attempting to remove the cell, and to take it up tightly after completion of the adjustment.

d. Auxiliary Mirror Adjustment: The auxiliary optical system mirror, bonded to its threaded mount, can be adjusted to change the height of the card and level vial images, to change the lateral positioning of these images, and to tilt or correct tilt introduced by other elements. All three of these adjustments are functions of the rotational and longitudinal position of the threaded mount in the housing casting wall, and, therefore they are not independent adjustments. Care should be taken to make sure all three factors are satisfactory before locking the mount in position with its setscrew. Final adjustment should not be made until the auxiliary optical system prism has been adjusted and locked.

e. Auxiliary Prism Adjustment: The auxiliary optical system prism is bonded to a metal mount and fastened to the prism mount plate in a manner similar to that used with the main optical system prism. Adjustments are the same. Any rotation of image or sidewise displacement must be corrected by small rotational adjustments of the auxiliary mirror mount.

f. Fixed Polarizing Filter Adjustment: Removal or replacement of the fixed polarizing filter requires attention to its orientation in the mount. Since it is required to reduce glare from the water surface, its index lines should be vertical, or perpendicular to the filter shaft, when it is locked into position in the filter mount. This should be checked after tightening the retaining ring, as the final movement of the retainer ring may have caused the filter to rotate.

SECTION 6

PARTS LIST

PIECE NO.	NAME	BUSHIPS DWG. MARK 7 MOD 0	NO REQD.
1	Eyepiece Field Lens	400-533897	1
2	Eyepiece Center Lens	400-533897	1
3	Eyepiece Eye Lens	400-533897	1
4	Amici Prism	400-533897	1
5	Aux. Optical System Prism	400-533897	1
6	Polarizing Filter	400-533897	2
7	Compensator	400-533897	1
8	Objective	400-533897	1
9	Window (Sealing)	400-533897	1
10	Aux. O. S. Erector Lens	400-533898	2
11	Aux. O. S. Comb. Inner Lens	400-533898	1
12	Aux. O. S. Comb. Outer Lens	400-533898	1
13	Front Surface Mirror	400-533898	1
14	Level Vial	400-533908	1
15	Housing Casting	400-533903	1
16	Eyepiece Cap	400-533909	1
17	Handle	400-533904	1
18	Lens Spacer	400-533900	1
19	Prism Cover	400-533904	1
20	Focusing Lens Mount	400-533900	1
21	Eyepiece Clamp	400-533900	1
22	Rubber Eyepiece	BUORD 8-Z-1165	1
23	Stuffing Box	400-533900	1
24	Packing Ring	400-533900	3
25	Washer	400-533900	5
26	Focusing Shaft	400-533900	1
27	Focusing Knob	400-533901	1
28	Diopter Scale	400-533901	1
29	Gland Nut	400-533901	2
30	Focusing Plate	400-533902	1
31	Field Lens Lock Ring	400-533902	1
32	Eyepiece Housing	400-533901	1
33	Eye Lens Seal	400-533902	1
34	#4-40 NC-2x3/32" Round Hd Scr	400-533917	2
35	Washer	400-533902	1
36	Eye Lens Lock Ring	400-533902	1
37	Bearing Ring	400-533912	1
38	Pipe Plug	400-533902	1
39	Prism Mount Plate	400-533911	1
40	Amici Prism Mount	400-533911	1
41	Aux. O. S. Prism Mount	400-533911	1
42	Reticle	400-533902	1

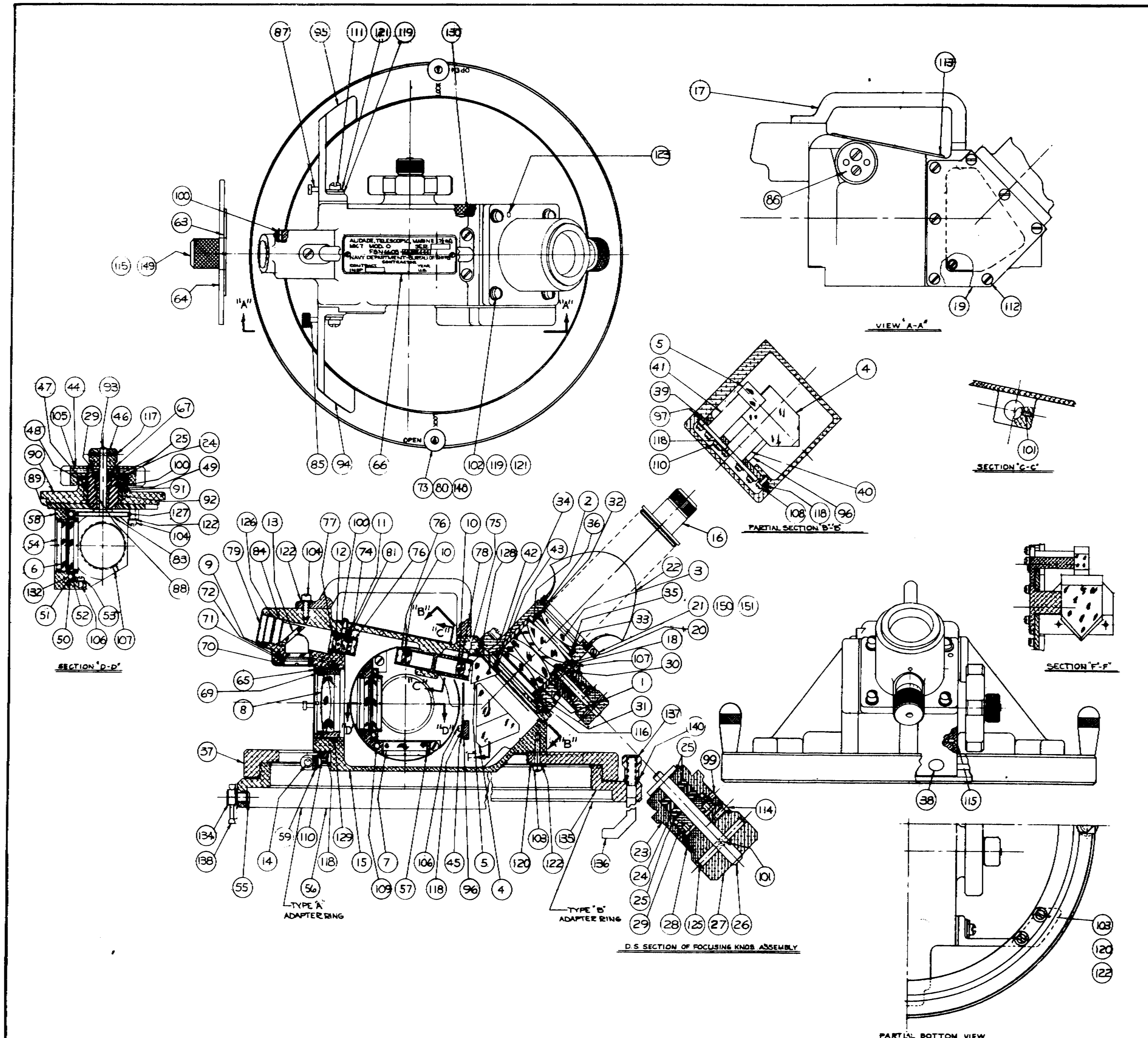
PIECE NO.	NAME	BUSHIPS DWG. MARK 7 MOD 0	NO REQD.
43	Mask	400-533902	1
44	Knob	400-533905	1
45	Stop	400-533911	1
46	Filter Knob	400-533906	1
47	Wave Washer	400-533906	1
48	Washer	400-533906	1
49	Gland Nut	400-533906	1
50	Ball Bearing Ring	400-533906	1
51	Ball Bearing Retainer	400-533906	1
52	Filter Mount	400-533906	1
53	Filter Mount Retainer	400-533905	1
54	Filter Lock Ring	400-533905	2
55	Lock Screw	400-533914	2
56	Adapter Ring Type A	400-533914	1
57	Compensator Lock Ring	400-533907	1
58	Filter Housing	400-533905	1
59	Bracket	400-533908	1
62	.011" Dia. x 3 Reticle Wire		
63	Objective Cover Seal Pad	400-533908	1
64	Objective Cover	400-533908	1
65	Objective Mount	400-533909	1
66	Nameplate	400-533907	1
67	Filter Stop Shaft	400-533909	1
69	Objective Lock Ring	400-533909	1
70	Lock Ring	400-533908	1
71	Washer	400-533908	1
72	Gasket	400-533908	1
73	Locking Shaft	400-533912	2
74	Spacer	400-533910	1
75	Erector Lens Cell	400-533910	1
76	Lens Holder	400-533910	3
77	Aux. O. S. Cell	400-533910	1
78	Spacer	400-533910	2
79	Plug	400-533909	1
80	Knob	400-533912	2
81	Spacer	400-533910	1
83	Filter Shaft Disc	400-533907	1
84	Mirror Retainer	400-533909	1
85	Knurled Hd. Screw	400-533910	1
86	Gas Inlet Valve	MS16858-1	1
87	Shoulder Screw, Obj. Cover	400-533907	1
88	Bushing	400-533907	1
89	Filter Stop	400-533907	1
90	Filter Assembly Cover	400-533905	1
91	Washer	400-533907	1
92	Packing Ring	400-533902	2
93	Filter Drive Shaft	400-533907	1
94	Left Housing Support	400-533904	1
95	Right Housing Support	400-533904	1

PIECE NO.	NAME	BUSHIPS DWG. MARK 7 MOD 0	NO REQD.
96	Stop Bracket	400-533911	1
97	Prism Cover Gasket	400-533911	1
99	#2-56NC-3x1/8" Cup Set Scr.	400-533917	1
100	#4-40NC-3x1/8" Cup Set Scr.	400-533917	5
101	#4-40NC-3x1/4" Cup Set Scr.	400-533917	2
103	#6-32NC-3x1/2" Fil. Hd. Scr.	400-533917	5
104	#6-32NC-3x3/8" Fil. Hd. Scr.	400-533917	5
105	#6-32NC-3x3/8" Full Dog Set Scr.	400-533917	2
106	#4-40NC-3x3/16" Fil. Hd. Scr.	400-533917	3
107	#4-40NC-3x5/32" Cup Set Scr.	400-533917	3
108	#4-40NC-3x1/4" Fil. Hd. Scr.	400-533917	5
109	#6-32NC-3x2" Fil. Hd. Scr.	400-533917	1
110	#4-40NC-3x3/8" Fil. Hd. Scr.	400-533917	10
111	#10-24NC-3x1/2" Fil. Hd. Scr.	400-533917	10
112	#6-32NC-3x5/8" Flat Hd. Scr.	400-533917	7
113	#4-40NC-2x1/8" Round Hd. Scr.	400-533917	2
114	#2-56NC-3x3/16" Flat Hd. Scr.	400-533917	1
115	#6-32NC-3x1/4" Flat Hd. Scr.	400-533917	10
116	#4-40NC-3x1/4" Flat Hd. Scr.	400-533917	1
117	.062" Dia. x .688" Spring Pin	400-533917	1
118	#4 Lock Washer	400-533917	17
119	#10 Washer	400-533917	10
120	#6 Washer	400-533917	5
121	#10 Lock Washer	400-533917	10
122	#6 Lock Washer	400-533917	11
123	.125" Dia. x 7/16" Dowel Pin	400-533917	1
124	.125" Dia. x .340" Dowel Pin	400-533917	1
125	.094" Dia. x 13/16" Spring Pin	400-533917	1
126	"O" Ring	400-533917	1
127	"O" Ring	400-533917	1
128	"O" Ring	400-533917	1
129	"O" Ring	400-533917	1
130	"O" Ring	400-533917	1
131	Case	400-533892	1
132	.125" Dia. Stl. Ball	400-533917	18
134	Lock Screw Collar	400-533914	3
135	Adapter Ring	400-533915	1
136	Adapter Ring Clamp	400-533915	3
137	Knurled Knob	400-533915	3
138	Lock Screw Pin	400-533914	3
139	#4-40NC-3x1/4" Bind Hd. Scr.	400-533917	2
140	Washer	400-533915	3
148	Spring Pin	400-533917	2
149	Knob	400-533908	1
150	#2-56NC-2x1/2" Round Hd. Scr.	400-533917	1
151	#2-56NC-2 Hex Nut	400-533917	1
102	#10-24NC-3x9/16 Fil. Hd. Scr.	400-533917	4

SECTION 7

DRAWINGS

The following drawings are included for reference. All piece numbers mentioned in the text refer to the drawings reproduced here.



LIST OF MATERIAL

QUANTITIES FOR ONE ALIDADE

PC. NO.	NAME	NO. REQD	MATERIAL	MATL SPEC	BUSHIPS DWG NO
1	EYEPIECE FIELD LENS	1	GLASS	JAN-G-174	400-533897
2	EYEPIECE CENTER LENS	1	GLASS	JAN-G-174	400-533897
3	EYEPIECE EYE LENS	1	GLASS	JAN-G-174	400-533897
4	AMICI PRISM	1	GLASS	JAN-G-174	400-533897
5	AUX OPTICAL SYSTEM PRISM	1	GLASS	JAN-G-174	400-533897
6	~~POLARIZING FILTER~~	2	GLASS	MIL-F-21424	400-533897
7	COMPENSATOR	1	GLASS	JAN-G-174	400-533897
8	OBJECTIVE	1	GLASS	JAN-G-174	400-533897
9	WINDOW (SEALING)	1	GLASS	JAN-G-174	400-533897
10	AUX. O.S. ERECTOR LENS	2	GLASS	JAN-G-174	400-533898
11	AUX. O.S. COMB. INNER LENS	1	GLASS	JAN-G-174	400-533898
12	AUX. O.S. COMB. OUTER LENS	1	GLASS	JAN-G-174	400-533898
13	FRONT SURFACE MIRROR	1	GLASS	JAN-G-174	400-533898
14	LEVEL VIAL	1	GLASS		400-533906
15	HOUSING CASTING	1	CAST AL.	QQ-A-601	400-533903
16	EYEPIECE CAP	1	AL. ROD	QQ-A-325	400-533909
17	HANDLE	1	CAST AL.	QQ-A-601	400-533904
18	LENS SPACER	1	AL. ROD	QQ-A-325	400-533900
19	PRISM COVER	1	CAST AL.	QQ-A-601	400-533904
20	FOCUSING LENS MOUNT	1	CRES #304	QQ-S-763	400-533900
21	EYEPIECE CLAMP	1	CRES #304	QQ-S-766	400-533916
22	RUBBER EYEPIECE	1	RUBBER		BUORD 8-Z-1165
23	STUFFING BOX	1	AL. ROD	QQ-A-325	400-533900
24	PACKING RING	3	SYN. RUBBER	MIL-R-900	400-533900
25	WASHER	5	CRES #304	QQ-S-766	400-533900
26	FOCUSING SHAFT	1	CRES #304	QQ-S-763	400-533900
27	FOCUSING KNOB	1	AL. ROD	QQ-A-325	400-533901
28	DIOPTER SCALE	1	AL. ROD	QQ-A-325	400-533901
29	GLAND NUT	2	AL. ROD	QQ-A-325	400-533901
30	FOCUSING PLATE	1	AL. SHT.	QQ-A-327	400-533902
31	FIELD LENS LOCK RING	1	AL. ROD	QQ-A-325	400-533902
32	EYEPIECE HOUSING	1	CAST AL.	QQ-A-601	400-533901
33	EYE LENS SEAL	1	SYN. RUBBER	MIL-R-900	400-533902
34	#4-40NC-2×¼" ROUND HD. SCR.	2	CRES #304	QQ-S-763	400-533917
35	WASHER	1	CRES #304	QQ-S-766	400-533902
36	EYE LENS LOCK RING	1	AL. ROD	QQ-A-325	400-533902
37	BEARING RING	1	AL. PLATE	QQ-A-327	400-533912
38	PIPE PLUG	1	CRES #304	QQ-S-763	400-533902
39	PRISM MOUNT PLATE	1	AL. SHT.	QQ-A-327	400-533911
40	AMICI PRISM MOUNT	1	AL. ROD	QQ-A-325	400-533911
41	AUX. O.S. PRISM MOUNT	1	AL. ROD	QQ-A-325	400-533911
42	RETICLE	1	CRES #304	QQ-S-763	400-533902
43	MASK	1	CRES #304	QQ-S-766	400-533902
44	KNOB	1	CAST AL.	QQ-A-601	400-533905
45	STOP	1	AL. SHT.	QQ-A-327	400-533911
46	FILTER KNOB	1	AL. ROD	QQ-A-325	400-533906
47	WAVE WASHER	1	PHOS. BRZ.	QQ-P-330	400-533906
48	WASHER	1	CRES #304	QQ-S-766	400-533906
49	GLAND NUT	1	AL. ROD	QQ-A-325	400-533906
50	BALL BEARING RING	1	PLASTIC	MIL-P-15035	400-533906
51	BALL BEARING RETAINER	1	PLASTIC	MIL-P-15035	400-533906
52	FILTER MOUNT	1	AL. ROD	QQ-A-325	400-533906
53	FILTER MOUNT RETAINER	1	CRES #304	QQ-S-766	400-533905
54	FILTER LOCK RING	2	AL. ROD	QQ-A-325	400-533905
55	LOCK SCREW	2	CRES #304	QQ-S-763	400-533914
56	ADAPTOR RING	1	AL. PLATE	QQ-A-327	400-533914
57	COMPENSATOR LOCK RING	1	AL. ROD	QQ-A-325	400-533907
58	FILTER HOUSING	1	CAST AL.	QQ-A-601	400-533905
59	BRACKET	1	AL. ROD	QQ-A-325	400-533908
~~60~~	~~BEARING RING BUSHING~~	~~1~~	~~CRES #304~~	~~QQ-S-763~~	~~400-533904~~
~~61~~	~~#2-56NC-2×3/16" RD HD SCR.~~	~~1~~	~~NICKEL COPPER~~	~~MIL-N-1763~~	~~400-533917~~
62	.001 DIA.×3 RETICLE WIRE	1	PLATINUM IRIDIUM ALLOY		
63	OBJECTIVE COVER SEAL PAD	1	SYN. RUBBER	MIL-R-900	400-533908
64	OBJECTIVE COVER	1	AL. SHT.	QQ-A-327	400-533908
65	OBJECTIVE MOUNT	1	AL. ROD	QQ-A-325	400-533909
66	NAME PLATE	1	AL. SHT.	MIL-P-15024	400-533907
67	FILTER STOP SHAFT	1	CRES #304	QQ-S-763	400-533909
69	OBJECTIVE LOCK RING	1	CRES #304	QQ-S-763	400-533909
70	LOCK RING	1	CRES #304	QQ-S-763	400-533908
71	WASHER	1	CRES #304	QQ-S-766	400-533908
72	GASKET	1	SYN. RUBBER	MIL-R-900	400-533908
73	LOCKING SHAFT	2	CRES	QQ-S-763	400-533912
74	SPACER	1	AL. ROD	QQ-A-325	400-533910
75	ERECTOR LENS CELL	1	AL. ROD	QQ-A-325	400-533910
76	LENS HOLDER	3	AL. ROD	QQ-A-325	400-533910
77	AUX. O.S. CELL	1	AL. ROD	QQ-A-325	400-533910
78	SPACER	2	CRES #304	QQ-S-763	400-533910
79	PLUG	1	AL. ROD	QQ-A-325	400-533909
80	KNOB	2	CRES	QQ-S-763	400-533912
81	SPACER	1	CRES #304	QQ-S-763	400-533910
~~82~~	~~LOCK LEVER SPRING~~	~~1~~	~~CRES #302~~	~~QQ-S-763~~	~~400-533918~~
83	FILTER SHAFT DISC	1	CRES #304	QQ-S-763	400-533907
84	MIRROR RETAINER	1	AL. ROD	QQ-A-325	400-533909
85	KNURLED HD. SCREW	1	NICKEL COPPER	MIL-N-17163	400-533910
86	GAS INLET VALVE	1		MS 16848	
87	SHOULDER SCREW, OBJ. COVER	1	CRES #304	QQ-S-763	400-533907
88	BUSHING	1	BRONZE	QQ-M-80	400-533907
89	FILTER STOP	1	CRES #304	QQ-S-763	400-533907
90	FILTER ASSEMBLY COVER	1	CAST AL.	QQ-A-601	400-533905
91	WASHER	1	CRES #304	QQ-S-766	400-533907
92	PACKING	2	SYN. RUBBER	MIL-R-900	400-533902
93	FILTER DRIVE SHAFT	1	CRES #304	QQ-S-763	400-533907
94	LEFT HOUSING SUPPORT	1	CAST AL.	QQ-A-601	400-533904
95	RIGHT HOUSING SUPPORT	1	CAST AL.	QQ-A-601	400-533904
96	STOP BRACKET	1	AL. ROD	QQ-A-325	400-533911
97	PRISM COVER GASKET	1	SYN. RUBBER	MIL-R-900	400-533911
~~98~~	~~RETAINER ROD~~	~~1~~	~~CRES #304~~	~~QQ-S-763~~	~~400-533918~~
99	#2-56NC-3×1/8" CUP SET SCR.	1	CRES #304	QQ-S-763	400-533917
100	#4-40NC-3×1/8" CUP SET SCR.	8	CRES #304	QQ-S-763	400-533917
101	#4-40NC-3×1/8" CUP SET SCR.	2	CRES #304	QQ-S-763	400-533917
102	#10-32NC-3×3/16" FIL. HD. SCR.	4	NICKEL COPPER	MIL-N-17163	400-533917
103	#6-32NC-3×1/2" FIL. HD. SCR.	5	NICKEL COPPER	MIL-N-17163	400-533917

PC. NO.	NAME	NO. REQD	MATERIAL	MATL SPEC	BUSHIPS DWG NO
104	#6-32NC-3×5/16" FIL. HD. SCR.	5	NICKEL COPPER	MIL-N-17163	400-533917
105	#6-32NC-3×¼" FULL DOG SET SCR.	2	CRES #304	QQ-S-763	400-533917
106	#4-40NC-3×5/16" FIL. HD. SCR.	3	NICKEL COPPER	MIL-N-17163	400-533917
107	#4-40NC-3×⅛" CUP SET SCR.	3	CRES #304	QQ-S-763	400-533917
108	#4-40NC-3×¼" FIL. HD. SCR.	5	NICKEL COPPER	MIL-N-17163	400-533917
109	#6-32NC-3×¼" FIL. HD. SCR.	1	CRES #304	QQ-S-763	400-533917
110	#4-40 NC-3×3/8" FIL. HD. SCR.	10	NICKEL COPPER	MIL-N-17163	400-533917
111	#10-24NC-3×¼" FIL. HD. SCR.	6	NICKEL COPPER	MIL-N-17163	400-533917
112	#6-32NC-3×5/8" FLAT HD. SCR.	7	NICKEL COPPER	MIL-N-17163	400-533917
113	#4-40NC-2×¼" ROUND HD. SCR.	2	NICKEL COPPER	MIL-N-17163	400-533917
114	#2-56NC-3×3/16" FLAT HD. SCR.	1	NICKEL COPPER	MIL-N-17163	400-533917
115	#6-32NC-3×¼" FLAT HD. SCR.	10	NICKEL COPPER	MIL-N-17163	400-533917
116	#4-40NC-3×¼" FLAT HD. SCR.	1	CRES #304	QQ-S-763	400-533917
117	.062 DIA.×.688" PIN, SPRING	1	CRES #304	MIL-P-10971	400-533917
118	#4 LOCK WASHER	17	CRES #304	QQ-S-763	400-533917
119	#10 WASHER	10	CRES #304	QQ-S-766	400-533917
120	#6 WASHER	5	CRES #304	QQ-S-766	400-533917
121	#10 LOCK WASHER	10	CRES #304	QQ-S-763	400-533917
122	#6 LOCK WASHER	11	CRES #304	QQ-S-763	400-533917
123	.125 DIA.×7/16" DOWEL PIN	1	CRES #304	QQ-S-763	400-533917
124	.125 DIA.×.340" DOWEL PIN	1	CRES #304	QQ-S-763	400-533917
125	.094 DIA.×13/16" SPRING PIN	1	CRES #304	MIL-P-10971	400-533917
126	"O" RING	1	RUBBER	MIL-G-18586	400-533917
127	"O" RING	1	RUBBER	MIL-G-18586	400-533917
128	"O" RING	1	RUBBER	MIL-G-18586	400-533917
129	"O" RING	1	RUBBER	MIL-G-18586	400-533917
130	"O" RING	1	RUBBER	MIL-G-18586	400-533917
131	CASE	1	SEE ASSY DWG		400-533913
132	.125 DIA. STL. BALL	18	CRES #304	QQ-S-763	400-533917
~~133~~	~~LOCK LEVER COVER~~	~~1~~	~~CRES #304~~	~~QQ-S-766~~	~~400-533912~~
134	LOCK SCREW COLLAR	3	CRES #304	QQ-S-763	400-533914
135	ADAPTER RING	1	ALUMINUM	QQ-A-327	400-533915
136	ADAPTER RING CLAMP	3	CRES #304	QQ-S-763	400-533915
137	KNURLED KNOB	3	CRES #304	QQ-S-763	400-533915
138	LOCK SCREW PIN	3	CRES #304	QQ-S-763	400-533914
139	#4-40NC-3×½" BIND. HD. SCR.	2	CRES #304	QQ-S-763	400-533917
140	WASHER	3	CRES #304	QQ-S-763	400-533915
~~141~~	~~AIR VALVE SCREW~~	~~1~~	~~CRES #304~~	~~QQ-S-763~~	~~400-533916~~
~~142~~	~~RING PLUG~~	~~1~~	~~CRES #304~~	~~QQ-S-763~~	~~400-533916~~
~~143~~	~~INLET PLUG~~	~~1~~	~~CRES #304~~	~~QQ-S-763~~	~~400-533916~~
~~144~~	~~PIN~~	~~8~~	~~CRES #304~~	~~QQ-S-763~~	~~400-533916~~
~~145~~	~~GASKET~~	~~1~~	~~SYN. RUBBER~~	~~MIL-R-900~~	~~400-533916~~
~~146~~	~~"O" RING AN6227-1~~	~~1~~	~~RUBBER~~	~~MIL-P-5516~~	~~400-533917~~
~~147~~	~~"O" RING AN6227-5~~	~~1~~	~~RUBBER~~	~~MIL-P-5516~~	~~400-533917~~
148	SPRING PIN	2	CRES	QQ-S-763	400-533917
149	KNOB	1	AL. ROD	QQ-A-325	400-533908
150	#2-56NC-2×½" ROUND HD. SCR.	1	NICKEL COPPER	MIL-N-17163	400-533917
151	#2-56NC-2 HEX. NUT	1	CRES #304	QQ-S-763	400-533917

GENERAL NOTES

1. SEAL SET SCREW HOLES WITH 3M-EC801 OR EQUAL CONFORMING TO SPEC MIL-S-11031.
2. FILL SET SCREW HOLES WITH 3M-EC947 OR EQUAL CONFORMING TO SPEC MIL-S-11030.
3. SEAL STUFFING BOX TO EYEPIECE HOUSING WITH 3M-EC801 OR EQUAL CONFORMING TO SPEC MIL-S-11031.
4. STAKE PC 85 & 87 ON THREADED END AT ASSY. TO PREVENT REMOVAL
5. CEMENT PC 63 TO PC. 64 WITH 3M-EC711 OR EQUAL CONFORMING TO SPEC MIL-A-5092.
6. CEMENT PC. 50 TO PC 51 WITH 3M-EC711 OR EQUAL CONFORMING TO SPEC MIL-A-5092.
7. SEAT PC 14 INTO PC 59 WITH 3M-EC801 OR EQUAL CONFORMING TO SPEC MIL-S-11031.
8. SEAT PC 8 INTO PC. 65 WITH 3M-EC947 OR EQUAL CONFORMING TO SPEC MIL-S-11030.

REV	DATE	DESCRIPTION	DATE	APPD
B	2/28/61	DELETED PC'S. 60, 61, 82, 98, & 133. CHANGED "NO. REQ'D." FOR PC'S. 106, 108, & 110. CHANGED "NAME," "NO. REQ'D," & "MAT'L." FOR PC'S. 73, 80, & 148. ADDED REDESIGNED DETAILS OF PC'S. 37, 73, 80, & 148 TO DWG.	2/28/61	TSH
A	9/13/59	INITIAL ISSUE. DELETED AIR VALVE DETAILS, PC'S. 141, 142, 143, 144, 145, 146 AND 147. CHANGED PC. 86 TO GAS INLET VALVE.	9/13/59	TSH

NAVY DEPARTMENT — WASHINGTON, D.C.

BUREAU OF SHIPS

EXAMINED	
OFFICIAL	SIGNATURE
	TShue
	[illegible]
	665H
REVIEWED	[illegible]
TRACED	NObs-73784
DRAWN	NObs-73784

7½ IN. TELESCOPIC ALIDADE
MK. 7 MOD. 0
GENERAL ASSEMBLY

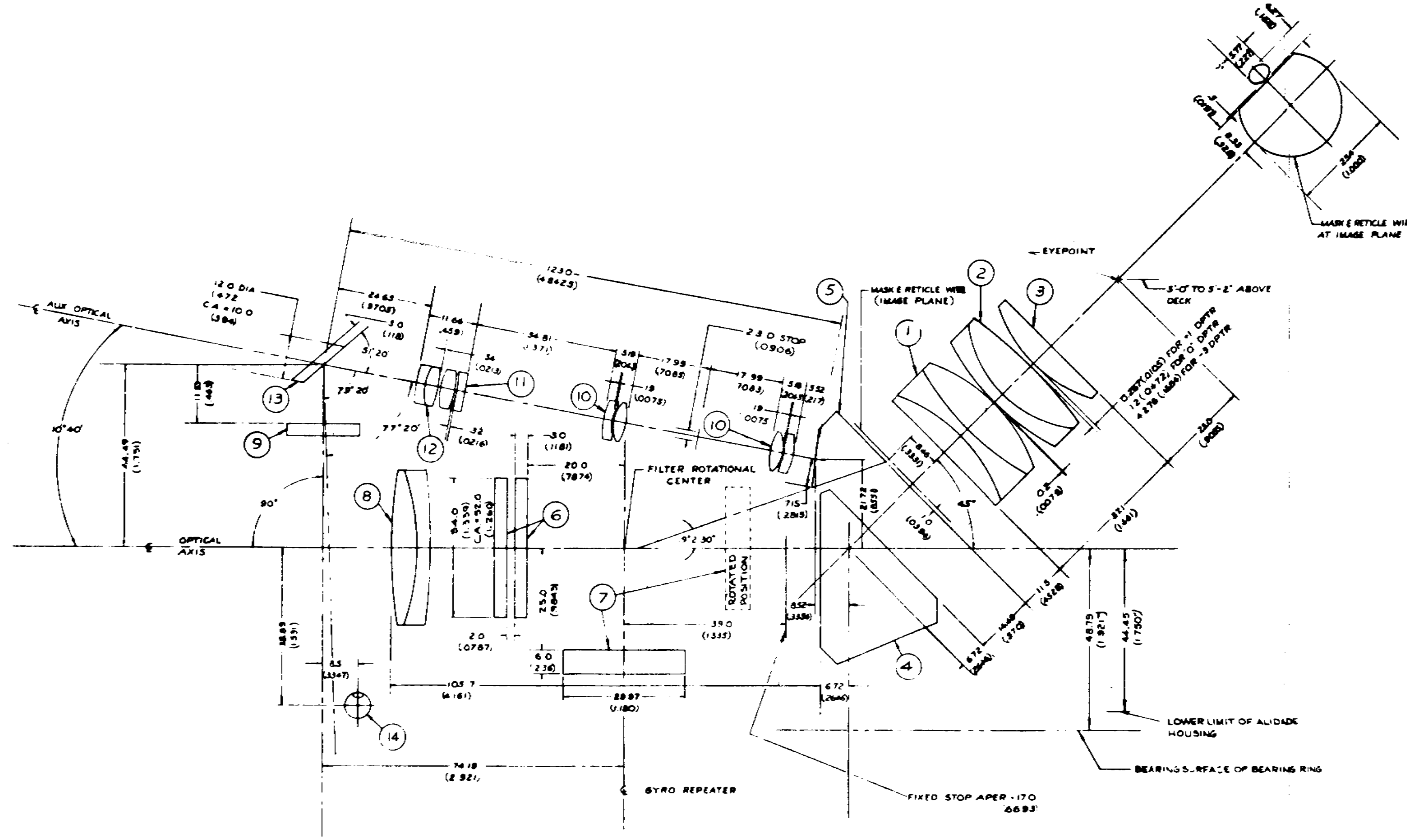
APPROVED — FEBRUARY 8, 1960 — FOR CHIEF OF BUREAU

NAVIGATIONAL EQUIPMENT
FSC 6605

NAVY DEPT. BUSHIPS DWG. NO. 400 533896 REV. B

SCALE: FULL SIZE — SHEET 1 OF 22

Figure 7-1 Mark 7 Mod 0 Telescopic Alidade General Assembly



NOTE ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED DIMENSIONS IN PARENTHESIS ARE IN INCHES

LIST OF MATERIAL

QUANTITIES FOR ONE ALIDADE

PC. NO.	NAME	NO. REQD	MATERIAL	MAT'L SPEC.	BUSHIPS DWG NO
1	EYEPIECE FIELD LENS	1	GLASS	JAN-G-174	
2	EYEPIECE CENTER LENS	1	GLASS	JAN-G-174	
3	EYEPIECE EYE LENS	1	GLASS	JAN-G-174	
4	AMICI PRISM	1	GLASS	JAN-G-174	
5	AUX O.S. PRISM	1	GLASS	JAN-G-174	
6	POLARIZING FILTER	2	GLASS	[illegible]	
7	COMPENSATOR	1	GLASS	JAN-G-174	
8	OBJECTIVE	1	GLASS	JAN-G-174	
9	WINDOW (SEALING)	1	GLASS	JAN-G-174	
10	AUX. O.S. ERECTOR LENS	2	GLASS	JAN-G-174	
11	AUX O.S. OBJ COMB INNER LENS	1	GLASS	JAN-G-174	
12	AUX O.S. OBJ COMB OUTER LENS	1	GLASS	JAN-G-174	
13	AUX O.S. FRONT SURFACE MIRROR	1	GLASS	JAN-G-174	
14	LEVEL VIAL	1	GLASS		H-5210-376-7719

GENERAL NOTES

1. MAGNIFYING POWER = 6X ± 2%
2. MAIN FIELD OF VIEW = 8°46'
3. DIAMETER OF EXIT PUPIL = 5.80MM (MIN)
4. EQUIVALENT FOCAL LENGTH OF THE OBJECTIVE = 166.7MM ± 1.5%

REV	DATE	DESCRIPTION
A	[illegible]	INITIAL ISSUE

NAVY DEPARTMENT WASHINGTON, D.C.

BUREAU OF SHIPS

7½ IN TELESCOPIC ALIDADE MK 7 MOD 0

GENERAL OPTICAL ARRANGEMENT

TRACED NObs-73784
DRAWN NObs-73784

APPROVED FEBRUARY [illegible]

NAVIGATIONAL EQUIPMENT
FSC 6605

NAVY DEPT BUSHIPS DWG NO. 400 533899 REV A

SCALE AS NOTED SHEET 4 OF [illegible]

Figure 7-2 Mark 7 Mod 0 Telescopic Alidade General Optical Arrangement

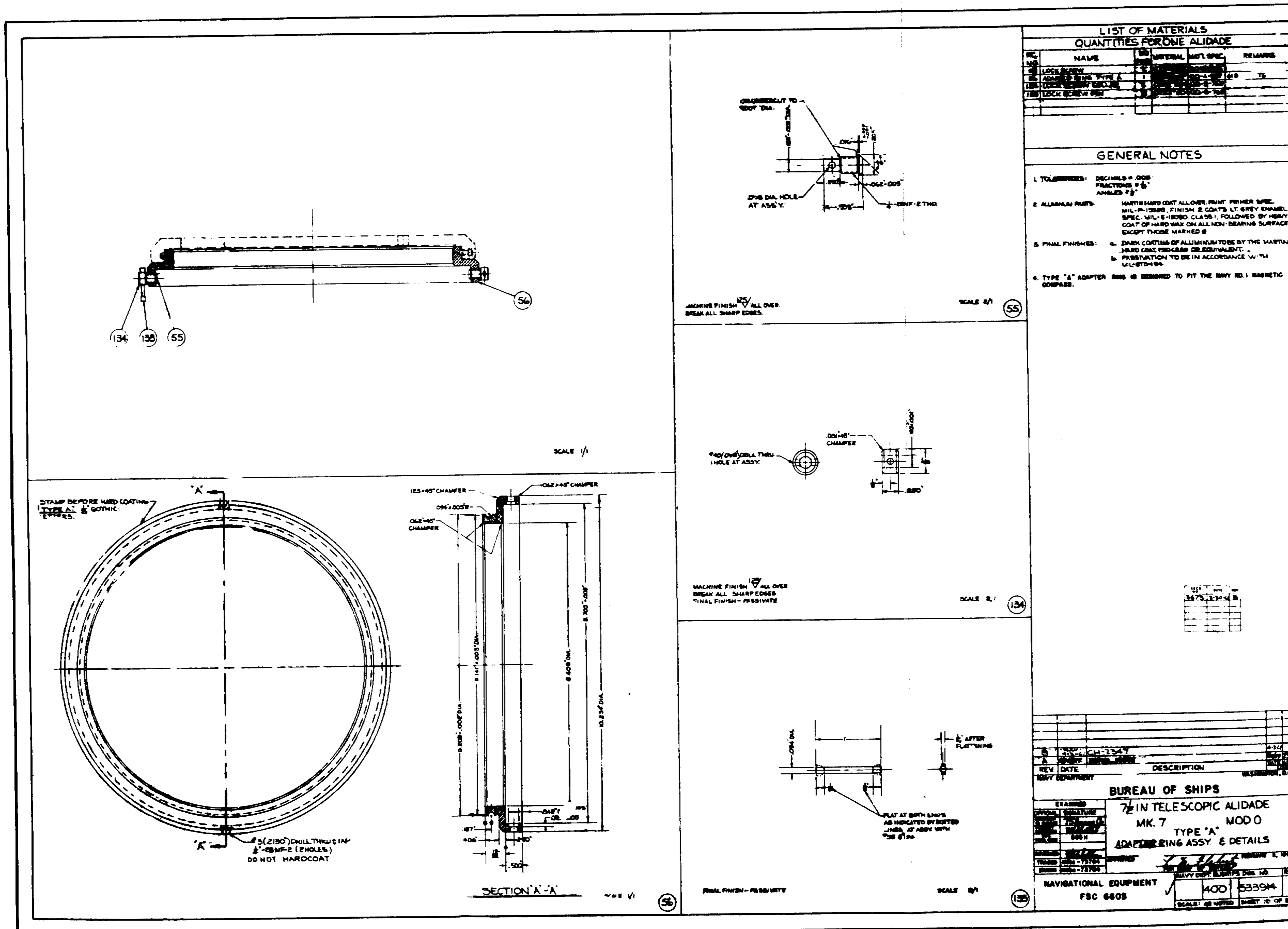
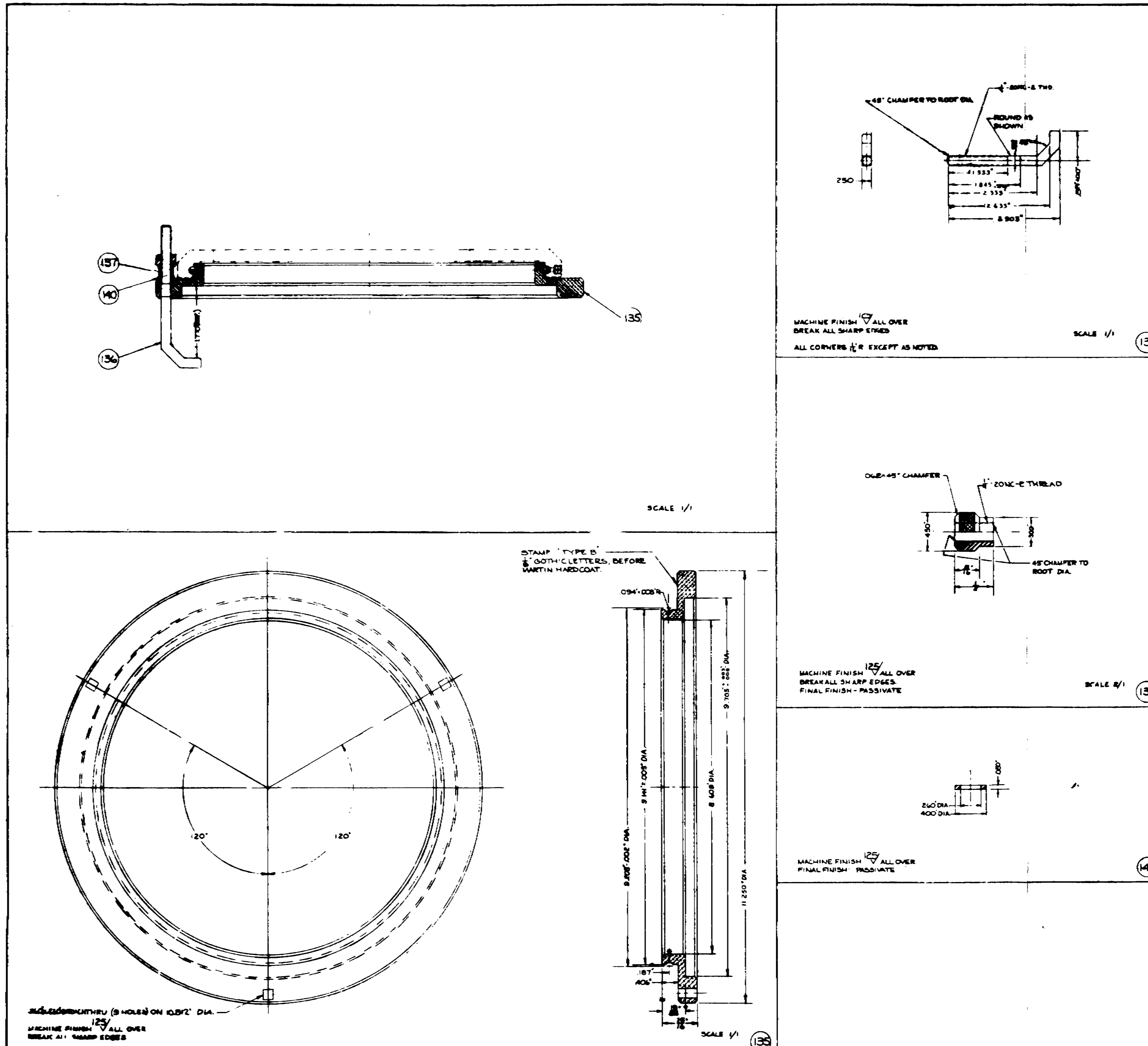


Figure 7-3 Mark 7 Mod 0 Telescopic Alidade Adapter Ring Assembly and Details Type A



LIST OF MATERIAL

QUANTITIES FOR ONE ALIDADE

PC NO.	NAME	NO REQD	MATERIAL	MATL SPEC	REMARKS
135	ADAPTER RING TYPE B	1	[illegible]	QQ-A-327	T4
136	ADAPTER RING CLAMP	8	K-MONEL	[illegible]	
137	KNURLED KNOB	8	CRES 304	QQ-S-763	
140	WASHER	8	CRES 304	QQ-S-763	

GENERAL NOTES

1. TOLERANCES — DECIMALS ±.005; FRACTIONS ±1/64"; ANGLES ±1/2°

2. ALUMINUM PARTS — MARTIN HARDCOAT ALL OVER. PAINT PRIMER SPEC MIL-P-15328 FINISH 2 COATS LT GREY ENAMEL SPEC MIL-E-5080 CLASS I, FOLLOWED BY HEAVY COAT HARD WAX ON ALL NON-BEARING SURFACES EXCEPT SURFACES MARKED ⊕

3. FINISHES
   a. DARK COATING ON ALUMINUM PARTS TO BE BY THE MARTIN HARD COAT PROCESS OR EQUIVALENT.
   b. PASSIVATION TO BE IN ACCORDANCE WITH MIL-STD-194.

4. TYPE "B" ADAPTER RING IS DESIGNED TO FIT THE FOLLOWING SHIPS COURSE INDICATORS

   MARK 3 MOD 11, FSN H6320-504-0808
   MARK 3 MOD 12, FSN H6320-504-0810
   MARK 5 MOD 8, FSN H6320-504-0737
   MARK 19 MOD 6, FSN H6320-504-0738
   MARK 20 MOD 2, FSN H6320-295-1492
   MARK 5 MOD 7

REV	DATE	DESCRIPTION
B	2/28/61	PC. 135, DIM. 9.705 WAS 9.690 D.
A	[illegible]	INITIAL ISSUE

NAVY DEPARTMENT — WASHINGTON, D.C.

BUREAU OF SHIPS

7 1/2 IN TELESCOPIC ALIDADE
MK. 7 MOD 0
TYPE "B"
ADAPTER RING ASSY. & DETAILS

EXAMINED	
OFFICIAL	SIGNATURE
	665H
REVIEWED	
TRACED	NObs-73784
DRAWN	NObs-73784

APPROVED — FEBRUARY 8, 1960 — FOR CHIEF OF BUREAU

NAVIGATIONAL EQUIPMENT
FSC 6605

NAVY DEPT BUSHIPS DWG. NO. 400 533915
SCALE: AS NOTED

Figure 7-4 Mark 7 Mod 0 Telescopic Alidade Adapter Ring Assembly and Details Type B

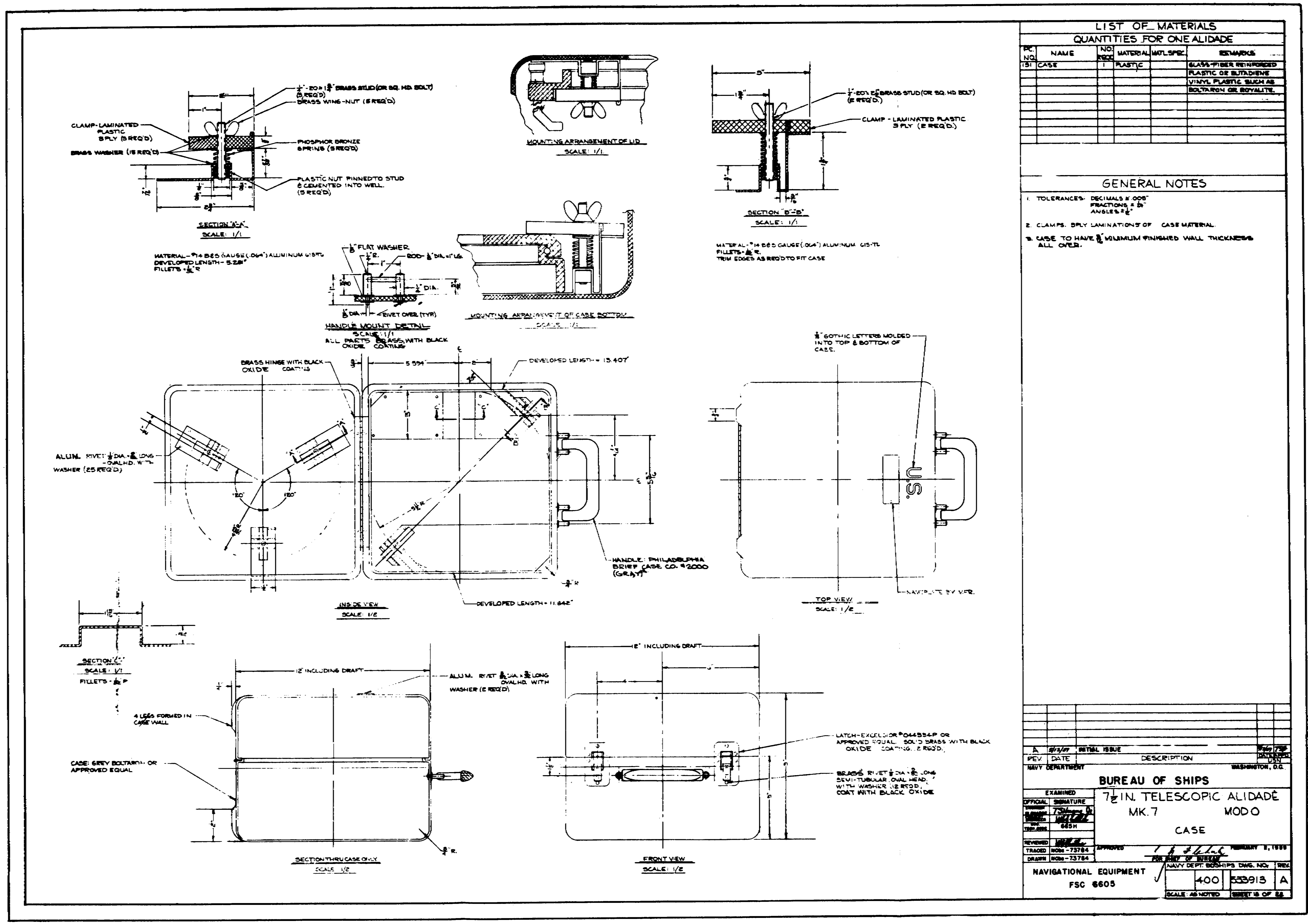


Figure 7-5 Mark 7 Mod 0 Telescopic Alidade Stowage Carrying Case