

FED-STD-H28/17A  
25 January 1985  
SUPERSEDING  
FED-STD-H28/17  
August 31, 1978

**FEDERAL STANDARD**  
**SCREW-THREAD STANDARDS FOR FEDERAL SERVICES**  
**SECTION 17**  
**SURVEYING INSTRUMENT MOUNTING THREADS**

This standard was approved by the Assistant Administrator,  
Office of Federal Supply and Services, General Services  
Administration, for the use of all Federal Agencies.

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NO DELIVERABLE DATA REQUIRED BY THIS DOCUMENT.

THIS

## INFORMATION SHEET ON FEDERAL STANDARDS

This Federal Standard is issued in loose-leaf form to permit the insertion or removal of new or revised pages and sections.

All users of Federal Standards should keep them up to date by inserting revised or new pages as issued and removing superseded and cancelled pages.

New and revised pages will be issued under Change Notices which will be numbered consecutively and will bear the date of issuance. Change Notices should be retained and filed in front of the standard until such times as they are superseded by a reissue of the entire standard.

### FOREWORD

In 1927 a manufacturers' subcommittee working with the Division of Simplified Practice of the National Bureau of Standards (NBS) prepared a specification for a tripod thread having a  $60^\circ$  thread angle and a nominal diameter of 3 1/2 inches, 8 threads per inch. This thread was considered suitable for use with transits having horizontal limbs 4 1/2 inches or more in diameter at the edge of graduation, and also for all engineers' levels. On March 6, 1958 the Subcommittee on Miniature, Microscope Objective, and Surveying Instrument Threads of ASA Sectional Committee B1 (now ASME Committee B1), passed a resolution recommending that this thread be adopted as an American National Standard. As all makers of the surveying instruments did not agree to its adoption, it does not have this status. The dimensions of this thread were first circulated in 1927 as NBS Drawing B-1180.

The surveying instrument mounting threads standard first appeared in the NBS Handbook H28 (1957) Section XVII. FED-STD-H28/17, 31 August 1978, superseded this section. The present issue is a complete revision of this standard.

FED-STD-H28/17A was prepared by the Defense Industrial Supply Center (DLA-IS) and incorporates the results of an Engineering Practices Study. Significant changes from the previous issue include the addition of the 5/8-11UNC-2A/2B mounting thread and deletion of surveying instrument tripod head and base plate details other than the special screw thread.

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## SECTION 17 - SURVEYING INSTRUMENT MOUNTING THREAD

1. Scope. This section provides the standards for the mating screw threads of the base plate and the tripod head used for securing a surveying instrument to its tripod or other base of support.

2. Referenced documents.

2.1. Government publications. The issues of the following documents in effect on the date of invitation for bids or request for proposal form a part of this standard to the extent specified herein.

Federal standards.

- FED-STD-H28/1 - Nomenclature, Definitions and Letter Symbols for Screw Threads
- FED-STD-H28/2 - Unified Inch Screw Threads - UN and UNR Thread Forms
- FED-STD-H28/6 - Gages and Gaging for Unified Screw Threads
- FED-STD-H28/20 - Inspection Methods for Acceptability of UN, UNR, UNJ, M and MJ Screw Threads

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3. Definitions. The terms applicable to this standard are defined in FED-STD-H28/1 and the following:

- (a) Surveying instrument. The term "surveying instrument" shall be deemed to apply to transits, levels, and similar types of apparatus most commonly used when mounted on a tripod.

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- (b) Tripod head. The tripod head is that portion of the tripod or other means of support to which the surveying instrument is affixed when in use.
- (c) Base plate. The base plate is that portion of the surveying instrument which contains the thread used for fastening it to the tripod head

4. General requirements.

4.1 Screw threads. Preferred screw threads are 3 1/2-8SPL 60 deg form threads in accordance with 5.1. Where a smaller mounting thread is required, 5/8-11UNC-2A/2B threads in accordance with FED-STD-H28/2 should be used.

4.2 Acceptability. Screw thread inspection methods for acceptability shall be in accordance with FED-STD-H28/20. The required gaging system shall be specified in accordance with that standard.

4.3 Gages and gaging. Gages and gaging shall be in accordance with FED-STD-H28/6 except gage dimensions for the 3 1/2-8 threads which are specified in 5.2.

5. Detailed requirements.

5.1 Dimensions for 3 1/2-8 threads. See table 17.1.

5.2 Dimensions for 3 1/2-8 thread gages. See table 17.2.

TABLE 17.1 - LIMITS OF SIZE, TOLERANCES, AND ALLOWANCES,  
3 1/2-8 SURVEYING INSTRUMENT MOUNTING THREADS

DIAMETER	TRIPOD HEAD (EXTERNAL) THREAD				BASE PLATE (INTERNAL) THREAD		
	Maximum	Minimum	Tolerance	Allowance	Minimum	Maximum	Tolerance
1	2	3	4	5	6	7	8
	in.	in.	in.	in.	in.	in.	in.
Major	3.4966	3.4804	0.0162	0.0034	3.5000		
Pitch	3.4154	3.4110	.0044	.0034	3.4188	3.4232	0.0044
Minor	3.3432	3.3298 <sup>a</sup>	.0134	.0125	3.3647	3.3792	.0145

<sup>a</sup> Corresponds to P/8 flat.

TABLE 17.2 - RECOMMENDED GAGE DIMENSIONS FOR 3 1/2-8  
SURVEYING INSTRUMENT MOUNTING THREADS

TRIPOD HEAD (EXTERNAL) THREAD		
	"Go" setting thread plug gage	"Not Go" setting thread plug gage
Major diameter, max _____	in. 3.4966	in. 3.4811
Major diameter, min _____	3.4959	3.4804
Pitch diameter, max _____	3.4154	3.4114
Pitch diameter, min _____	3.4150	3.4110
	"Go" thread gage	"Not Go" thread gage
Pitch diameter, max _____	in. 3.4154	in. 3.4114
Pitch diameter, min _____	3.4150	3.4110
Minor diameter, max _____	3.3647	3.3910
Minor diameter, min _____	3.3640	3.3917
BASE PLATE (INTERNAL) THREAD		
	"Go" thread gage	"Not Go" thread gage <sup>a</sup>
Major diameter, max _____	in. 3.5007	in. 3.4736
Major diameter, min _____	3.5000	3.4729
Pitch diameter, max _____	3.4192	3.4232
Pitch diameter, min _____	3.4188	3.4228
	"Go" thread setting ring	"Not Go" thread setting ring
Pitch diameter, max _____	in. 3.4191	in. 3.4303
Pitch diameter, min _____	3.4188	3.4301
Minor diameter, max _____	3.3650	3.3900
Minor diameter, min _____	3.3643	3.3293

Gage tolerance on lead:  $\pm 0.0004$  in.

Gage tolerance on half-angle of thread:  $\pm 0^{\circ}5$  min.

- <sup>a</sup> It will be noted that the "Not Go" thread gage is truncated on the major diameter below the corresponding dimension of the "Go" gage. This is to insure noninterference of the "Not Go" gage at the major diameter.

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MILITARY INTERESTS:

Custodians

Army - AR

Air Force - 11

Review Activities:

Army - GL

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA - FSS

PREPARING ACTIVITY:

DLA - IS

(DOD Project THDS-0053)