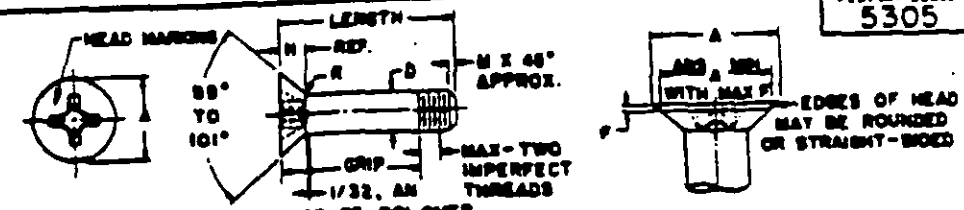
FED. SUP CLASS
5305



INCREASE OF .001 OVER D DIAMETER FROM THE POINT OF TANGENCY OF R AND THE SHANK WILL BE PERMISSIBLE

TABLE I

		#6	#10	1/4	5/16	3/8	7/16	1/2	9/16
NOMINAL SIZE / THREADS PER INCH		32UNC-3A	32UNF-3A	28UNF-3A	24UNF-3A	24UNF-3A	20UNF-3A	20UNF-3A	18UNF-3A
D Screw Diameter	Max	.164	[illegible]	.249	.3115	.374	.4365	.499	.5615
	Min	.161	.186	.246	.3065	.371	.4335	.495	.5575
A Head Diameter	Max Sharp	.332	.385	.507	.635	.762	.890	1.017	1.145
	Min Sharp	.319	.371	.491	.617	.742	.870	.992	1.118
	Abs Min	.281	.327	.447	.569	.686	.805	.919	1.036
F Flat	Max	.015	.016	.018	.020	[illegible]	.026	[illegible]	.034
H Head Height	Ref	.068	.080	.106	.133	.159	.166	[illegible]	[illegible]
M Point	Max	.031	.031	.031	.047	.047	.047	.047	.047
R Fillet Radius	Max	.015	.015	.015	.020	.020	[illegible]	.020	[illegible]
	Min	.005	.005	.005	.010	.010	.010	.010	.010

TABLE II

MINIMUM TENSILE STRENGTH LOAD POUNDS

NOMINAL SIZE	LOW-ALLOY STEEL	ALUMINUM ALLOY	CORROSION RESISTING STEEL
Nr.6-32UNC-3A	1730	870	1190
Nr.10-32UNF-3A	2600	1260	1700
1/4-28UNF-3A	4550	2280	3090
5/16-24UNF-3A	7250	3600	4930
3/8-24UNF-3A	10980	5440	7460
7/16-20UNF-3A	14840	7360	10090
1/2-20UNF-3A	19990	9910	13590
9/16-18UNF-3A	25380	12590	17260

* Based on 125,000 PSI maximum tensile strength for low-alloy steel, 62,000 PSI for aluminum alloy and 85,000 PSI for corrosion resisting steel. Load pounds are calculated by the stress areas indicated in Screw-Thread Standards for Federal Services, Handbook H28. (C)

MATERIAL: Steel, Low-Alloy - Rockwell Hardness C26 to C32: MIL-S-6049 or MIL-S-6050. Aluminum Alloy - Alloy 2024 of QQ-A-430 or alloy 2024, T4 temper of QQ-A-225. Steel, Corrosion Resisting - Fed. Std. No. 66, steel No. 302, 303, 304, 305 or 316 or equal to or interchangeable with 18-18 or 18-8 chromium nickel alloy steel (developed for cold heading).

PROTECTIVE COATING OR TREATMENT: Cadmium Plated - QQ-P-416, Type II, Class 3.
Anodize - MIL-A-8625, Type I or II.
Passivate - QQ-P-35.

MAGNETIC PERMEABILITY: These fasteners have a magnetic permeability of 2.0 maximum (air=1.0) for a field strength of H=200 oersteds using a magnetic indicator per MIL-I-17214.

HEAT TREATMENT: For Steel, Low-Alloy - 125,000 PSI to 145,000 PSI tensile strength, MIL-H-6875. For QQ-A-430 Aluminum Alloy - 62,000 PSI tensile strength (min), MIL-H-6088.

RECESS: The recess shall be in accordance with [illegible].

THREADS: The threads shall be in accordance with MIL-S-7742.

ECCENTRICITY: The conical surface of the head shall not be eccentric with the body more than a total runout of .005.

LENGTH TOLERANCE: Tolerance on the lengths for Nr. 6-32, Nr. 10-32, 1/4-28 and 3/8-24 screws = +1/32, -1/64; for 5/16-24 and 9/16-18 screws = +1/64, -0; for 7/16-20 and 1/2-20 screws = +1/64, -1/32.

HEAD MARKING: Low-Alloy Steel - One "X" required.
Corrosion Resisting Steel - One "_" required.
Aluminum Alloy - None required.

DIMENSIONS: All dimensions are in inches unless otherwise specified.

PART NUMBER: The MS part number consists of the MS number, plus the coded dash number. See sheet 2 and 3.

NOTES: (1) For design feature purposes, this standard takes precedence over procurement documents referenced herein.
(2) Referenced documents shall be of the issue in effect on date of invitations for bid.

(C) FOR CHANGE SEE SHEET 4

F.A. VC / Other Cust BY	TITLE: SCREW, MACHINE, FLAT COUNTERSUNK HEAD, 100°, STRUCTURAL, CROSS RECESSED, UNC-3A AND UNF-3A	MILITARY STANDARD MS24694
PROCUREMENT SPECIFICATION MIL-S-7839	SUPERSEDES: AN509	SHEET 1 OF 4

This military standard has been approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new and [illegible] applications and for repetitive use shall be made from this document.

APPROVED 5 AUG 60 REVISED (A) [illegible] (B) 6 NOV 68 (C) 17 FEB 69

FSC 5305

TABLE III
DASH NUMBERS AND CODES [illegible]

NOMINAL SIZE	#8-32UNC-3A			#10-32UNF-3A			1/4-28UNF-3A			5/16-24UNF-3A		
LENGTH	GRIP	TOL.	DASH NO.	GRIP	TOL.	DASH NO.	GRIP	TOL.	DASH NO.	GRIP	TOL.	DASH NO.
9/32 11/32 [illegible] 2-15/32	1/32 [illegible] 1-31/32	+1/32 -0 +1/64 -1/64	1 [illegible] 35	7/64 [illegible] 15/16 1-1/16 1-1/8 1-3/16 1-1/4 1-5/16 1-3/8 1-7/16 1-1/2 1-9/16 1-5/8 1-11/16 1-3/4 1-13/16 1-7/8 1-15/16 2 2-1/16 2-1/8 2-3/16 2-1/4 2-5/16 2-3/8 2-7/16 2-1/2 2-9/16	+1/32 -0 +1/64 -1/64	46 [illegible] 98	[illegible]/64 [illegible] 11/16 [illegible] 13/16 7/8 15/16 1 1-1/16 1-1/8 1-3/16 1-1/4 1-5/16 1-3/8 1-7/16 1-1/2 1-9/16 1-5/8 1-11/16 1-3/4 1-13/16 1-7/8 1-15/16 2 2-1/16 2-1/8 2-3/16 2-1/4 2-5/16 2-3/8 2-7/16 2-1/2	+1/32 -0 +1/64 -1/64	[illegible] 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 [illegible] 135	11/64 [illegible] 9/32 [illegible] 2-11/32 2-13/32 2-15/32	+1/32 -0 +1/64 -1/64	[illegible] 174 175 176 [illegible] 180

NOTE. For illustration, material, protective coating and other pertinent data, see sheet 1.

** DASH NUMBER CODE:

Add "S" before dash number for Cadmium Plated, Low-Alloy Steel Screw.
Add "A" before dash number for Anodized, Aluminum Alloy Screw.
Add "C" before dash number for Passivated, Corrosion Resisting Steel Screw.

EXAMPLES OF MS PART NUMBERS:

MS24694-S1 = #8-32UNC-3A Cadmium Plated, Low-Alloy Steel Screw, 9/32 inch long.
MS24694-A100 = 1/4-28UNF-3A Anodized, Aluminum Alloy Screw, 37/32 inch long.
MS24694-C230 = 7/16-20UNF-3A Passivated, Corrosion Resisting Steel Screw, 2-1/32 inches long.

APPROVED 8 AUG 60 REVISED (B) 11 APR 61 (B) 6 NOV 60 (C) FOR CHANGE SEE SHEET 1

REVISION: [illegible]

This military standard has been approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document.

P.A.		TITLE	MILITARY STANDARD
Other Cust.	82	SCREW, MACHINE, FLAT COUNTERSUNK HEAD, 100°, STRUCTURAL, CROSS RECESSED, UNC-3A AND UNF-3A	MS24694
PROCUREMENT SPECIFICATION MIL-S-7839		SUPERSEDES: [illegible]	SHEET 2 OF

DD FORM 672-1 [illegible]

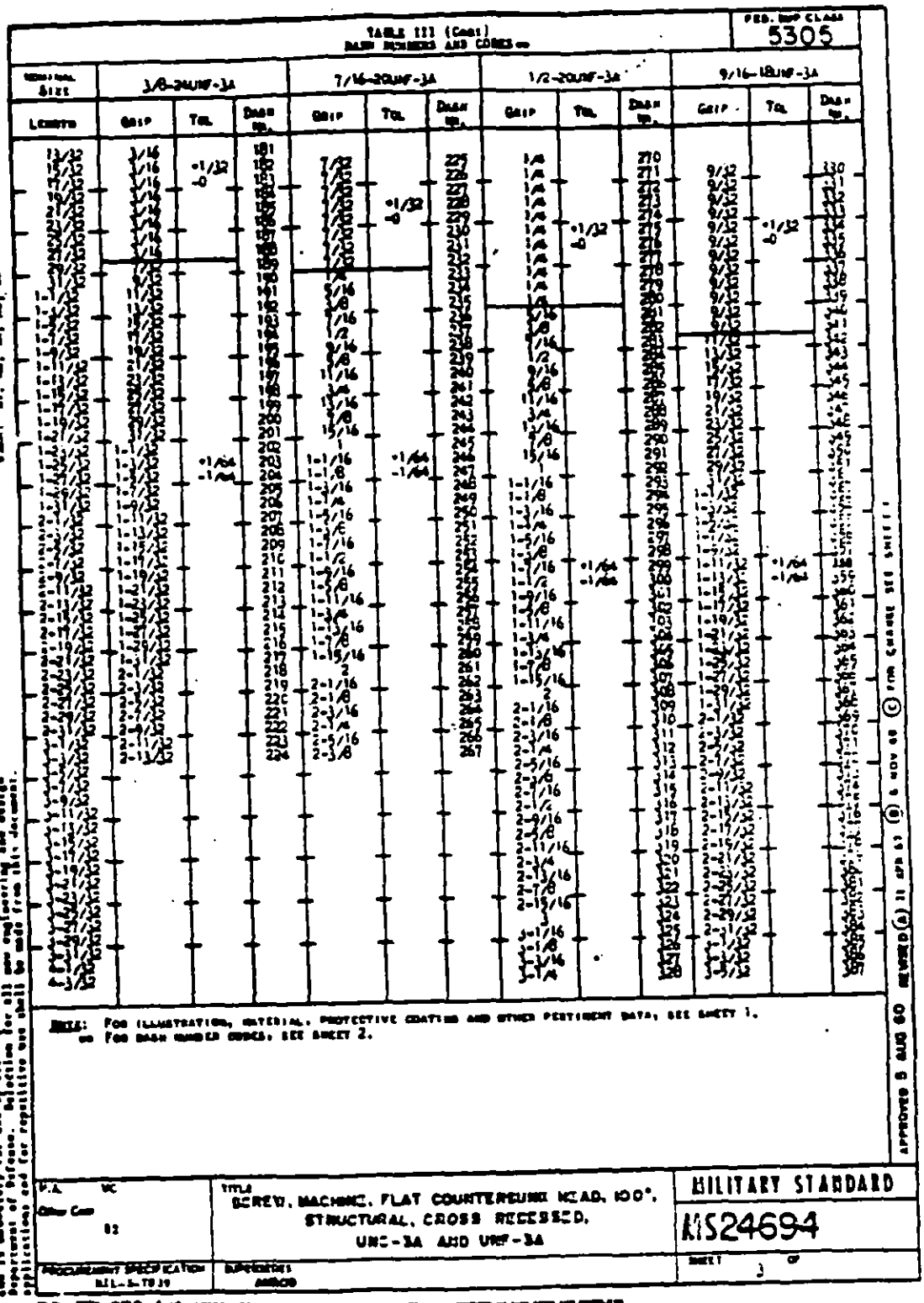


TABLE III (Cont)
DASH NUMBERS AND CODES

FED. SUP CLASS 5305

NOMINAL SIZE	3/8-24UNF-3A			7/16-20UNF-3A			1/2-20UNF-3A			9/16-18UNF-3A		
LENGTH	GRIP	THD	DASH NO.	GRIP	THD	DASH NO.	GRIP	THD	DASH NO.	GRIP	THD	DASH NO.
3/16	3/16	±1/32 -0	-3									
1/4	1/4		-4	1/4	±1/32 -0	-4						
5/16	5/16		-5	5/16		-5						
3/8	3/8		-6	3/8		-6	3/8	±1/32 -0	-6			
7/16	7/16		-7	7/16		-7	7/16		-7			
1/2	1/2		-8	1/2		-8	1/2		-8	1/2	±1/32 -0	-8
9/16	9/16		-9	9/16		-9	9/16		-9	9/16		-9
5/8	5/8		-10	5/8		-10	5/8		-10	5/8		-10
11/16	11/16		-11	11/16		-11	11/16		-11	11/16		-11
3/4	3/4		-12	3/4		-12	3/4		-12	3/4		-12
13/16	13/16		-13	13/16		-13	13/16		-13	13/16		-13
7/8	7/8		-14	7/8		-14	7/8		-14	7/8		-14
15/16	15/16		-15	15/16		-15	15/16		-15	15/16		-15
1	1	±1/64 -1/64	-16	1	±1/64 -1/64	-16	1	±1/64 -1/64	-16	1	±1/64 -1/64	-16
1-1/16	1-1/16		-17	1-1/16		-17	1-1/16		-17	1-1/16		-17
1-1/8	1-1/8		-18	1-1/8		-18	1-1/8		-18	1-1/8		-18
1-3/16	1-3/16		-19	1-3/16		-19	1-3/16		-19	1-3/16		-19
1-1/4	1-1/4		-20	1-1/4		-20	1-1/4		-20	1-1/4		-20
1-5/16	1-5/16		-21	1-5/16		-21	1-5/16		-21	1-5/16		-21
1-3/8	1-3/8		-22	1-3/8		-22	1-3/8		-22	1-3/8		-22
1-7/16	1-7/16		-23	1-7/16		-23	1-7/16		-23	1-7/16		-23
1-1/2	1-1/2		-24	1-1/2		-24	1-1/2		-24	1-1/2		-24
1-9/16	1-9/16		-25	1-9/16		-25	1-9/16		-25	1-9/16		-25
1-5/8	1-5/8		-26	1-5/8		-26	1-5/8		-26	1-5/8		-26
1-11/16	1-11/16		-27	1-11/16		-27	1-11/16		-27	1-11/16		-27
1-3/4	1-3/4		-28	1-3/4		-28	1-3/4		-28	1-3/4		-28
1-13/16	1-13/16		-29	1-13/16		-29	1-13/16		-29	1-13/16		-29
1-7/8	1-7/8		-30	1-7/8		-30	1-7/8		-30	1-7/8		-30
1-15/16	1-15/16		-31	1-15/16		-31	1-15/16		-31	1-15/16		-31
2	2		-32	2		-32	2		-32	2		-32
2-1/16	2-1/16		-33	2-1/16		-33	2-1/16		-33	2-1/16		-33
2-1/8	2-1/8		-34	2-1/8		-34	2-1/8		-34	2-1/8		-34
2-3/16	2-3/16		-35	2-3/16		-35	2-3/16		-35	2-3/16		-35
2-1/4	2-1/4		-36	2-1/4		-36	2-1/4		-36	2-1/4		-36
2-5/16	2-5/16		-37	2-5/16		-37	2-5/16		-37	2-5/16		-37
2-3/8	2-3/8		-38	2-3/8		-38	2-3/8		-38	2-3/8		-38
2-7/16	2-7/16		-39	2-7/16		-39	2-7/16		-39	2-7/16		-39
2-1/2	2-1/2		-40	2-1/2		-40	2-1/2		-40	2-1/2		-40
2-9/16	2-9/16		-41	2-9/16		-41	2-9/16		-41	2-9/16		-41
2-5/8	2-5/8		-42	2-5/8		-42	2-5/8		-42	2-5/8		-42
2-11/16	2-11/16		-43	2-11/16		-43	2-11/16		-43	2-11/16		-43
2-3/4	2-3/4		-44	2-3/4		-44	2-3/4		-44	2-3/4		-44
2-13/16	2-13/16		-45	2-13/16		-45	2-13/16		-45	2-13/16		-45
2-7/8	2-7/8		-46	2-7/8		-46	2-7/8		-46	2-7/8		-46
2-15/16	2-15/16		-47	2-15/16		-47	2-15/16		-47	2-15/16		-47
3	3		-48	3		-48	3		-48	3		-48
3-1/16	3-1/16		-49	3-1/16		-49	3-1/16		-49	3-1/16		-49
3-1/8	3-1/8		-50	3-1/8		-50	3-1/8		-50	3-1/8		-50
3-3/16	3-3/16		-51	3-3/16		-51	3-3/16		-51	3-3/16		-51
3-1/4	3-1/4		-52	3-1/4		-52	3-1/4		-52	3-1/4		-52

NOTE: (a) For illustration, material, protective coating and other pertinent data, see sheet 1.
(b) For dash number codes, see sheet 2.

APPROVED 5 AUG 60 REVISED (c) 6 NOV 68 (c) FOR CHANGE SEE SHEET 1

This military standard has been approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, Naval Air Engineering Center, Engineering Standardization Department (ESD), Code 93, Philadelphia, PA 19112, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

P.A. NC	TITLE	MILITARY STANDARD
Other Cust: 82	SCREW, MACHINE, FLAT COUNTERSUNK HEAD, 100°, STRUCTURAL, CROSS RECESSED, UNC-3A AND UNF-3A	MS24694
PROCUREMENT SPECIFICATION: MIL-S-7949	SUPERSEDING: AN509	SHEET 3 OF

DD FORM 672-1

FSC CLASS 5305

TABLE IV
INTERCHANGEABILITY - (Using Coded Dash Numbers)

After 21 April 1967 screws given as AN509 are canceled; But their existing stock should be used for maintenance purposes until depleted. USE ONLY THE NEW MS24694 SCREWS FOR NEW DESIGN AND ENGINEERING.

Codes for canceled and new dash numbers:

(1) For cadmium plated, carbon steel screws: The following AN509 dash numbers are superseded by the following MS dash numbers with a prefix "S" added. Example: AN509-8R4 superseded by MS24694-S1.

(2) For anodized, aluminum alloy screws: All dash numbers with a prefix "DD" superseded by MS dash numbers with a prefix "A". Example: AN509DD8R4 superseded by MS24694-A1.

(3) For passivated, corrosion resisting steel screws: All dash numbers with a prefix "C" superseded by MS dash numbers with a prefix "C". Example: AN509C8R4 superseded by MS24694-C1.

(4) For AN509 part numbers inactive for design after 31 January 1952: Brass screws, uncoated ("B" before first dash number) and cadmium plated ("P" before first dash number) are canceled and have no replacements.

(5) For AN509 part numbers inactive for design after 17 February 1950: Optional design II cross recessed ("R" between first and second dash numbers) and slotted head screws ("-" between first and second dash numbers) are canceled and superseded by the appropriately coded MS dash number. Example: AN509-8R4 or AN509-8-4 superseded by MS24694-S1.

CANCELED AN509 DASH NO	NEW MS24694 DASH NO	CANCELED AN509 DASH NO	NEW MS24694 DASH NO	CANCELED AN509 DASH NO	NEW MS24694 DASH NO	CANCELED AN509 DASH NO	NEW MS24694 DASH NO	CANCELED AN509 DASH NO	NEW MS24694 DASH NO	CANCELED AN509 DASH NO	NEW MS24694 DASH NO
8R4	1	10R31	73	516R5	137	616R23	199	716R42	261	816R61	325
8R5	2	10R32	74	516R6	138	616R24	200	716R43	262	816R62	326
8R6	3	10R33	75	516R7	139	616R25	201	716R44	263	816R63	327
8R7	4	10R34	76	516R8	140	616R26	202	716R45	264	816R64	328
8R8	5	10R35	77	516R9	141	616R27	203	716R46	265	916R7	330
8R9	6	10R36	78	516R10	142	616R28	204	716R47	266	916R8	331
8R10	7	10R37	79	516R11	143	616R29	205	716R48	267	916R9	332
8R11	8	10R38	80	516R12	144	616R30	206	816R6	270	916R10	333
8R12	9	10R39	81	516R13	145	616R31	207	816R7	271	916R11	334
8R13	10	10R40	82	516R14	146	616R32	208	816R8	272	916R12	335
8R14	11	10R41	83	516R15	147	616R33	209	816R9	273	916R13	336
8R15	12	10R42	84	516R16	148	616R34	210	816R10	274	916R14	337
8R16	13	10R43	85	516R17	149	616R35	211	816R11	275	916R15	338
8R17	14	10R44	86	516R18	150	616R36	212	816R12	276	916R16	339
8R18	15	10R45	87	516R19	151	616R37	213	816R13	277	916R17	340
8R19	16	10R46	88	516R20	152	616R38	214	816R14	278	916R18	341
8R20	17	10R47	89	516R21	153	616R39	215	816R15	279	916R19	342
8R21	18	10R48	90	516R22	154	616R40	216	816R16	280	916R20	343
8R22	19	416R5	92	516R23	155	616R41	217	816R17	281	916R21	344
8R23	20	416R6	93	516R24	156	616R42	218	816R18	282	916R22	345
8R24	21	416R7	94	516R25	157	616R43	219	816R19	283	916R23	346
8R25	22	416R8	95	516R26	158	616R44	220	816R20	284	916R24	347
8R26	23	416R9	96	516R27	159	616R45	221	816R21	285	916R25	348
8R27	24	416R10	97	516R28	160	616R46	222	816R22	286	916R26	349
8R28	25	416R11	98	516R29	161	616R47	223	816R23	287	916R27	350
8R29	26	416R12	99	516R30	162	616R48	224	816R24	288	916R28	351
8R30	27	416R13	100	516R31	163	716R6	225	816R25	289	916R29	352
8R31	28	416R14	101	516R32	164	716R7	226	816R26	290	916R30	353
8R32	29	416R15	102	516R33	165	716R8	227	816R27	291	916R31	354
8R33	30	416R16	103	516R34	166	716R9	228	816R28	292	916R32	355
8R34	31	416R17	104	516R35	167	716R10	229	816R29	293	916R33	356
8R35	32	416R18	105	516R36	168	716R11	230	816R30	294	916R34	357
8R36	33	416R19	106	516R37	169	716R12	231	816R31	295	916R35	358
8R37	34	416R20	107	516R38	170	716R13	232	816R32	296	916R36	359
8R38	35	416R21	108	516R39	171	716R14	233	816R33	297	916R37	360
10R4	46	416R22	109	516R40	172	716R15	234	816R34	298	916R38	361
10R5	47	416R23	110	516R41	173	716R16	235	816R35	299	916R39	362
10R6	48	416R24	111	516R42	174	716R17	236	816R36	300	916R40	363
10R7	49	416R25	112	516R43	175	716R18	237	816R37	301	916R41	364
10R8	50	416R26	113	516R44	176	716R19	238	816R38	302	916R42	365
10R9	51	416R27	114	516R45	177	716R20	239	816R39	303	916R43	366
10R10	52	416R28	115	516R46	178	716R21	240	816R40	304	916R44	367
10R11	53	416R29	116	516R47	179	716R22	241	816R41	305	916R45	368
10R12	54	416R30	117	516R48	180	716R23	242	816R42	306	916R46	369
10R13	55	416R31	118	616R5	181	716R24	243	816R43	307	916R47	370
10R14	56	416R32	119	616R6	182	716R25	244	816R44	308	916R48	371
10R15	57	416R33	120	616R7	183	716R26	245	816R45	309	916R49	372
10R16	58	416R34	121	616R8	184	716R27	246	816R46	310	916R50	373
10R17	59	416R35	122	616R9	185	716R28	247	816R47	311	916R51	374
10R18	60	416R36	123	616R10	186	716R29	248	816R48	312	916R52	375
10R19	61	416R37	124	616R11	187	716R30	249	816R49	313	916R53	376
10R20	62	416R38	125	616R12	188	716R31	250	816R50	314	916R54	377
10R21	63	416R39	126	616R13	189	716R32	251	816R51	315	916R55	378
10R22	64	416R40	127	616R14	190	716R33	252	816R52	316	916R56	379
10R23	65	416R41	128	616R15	191	716R34	253	816R53	317	916R57	380
10R24	66	416R42	129	616R16	192	716R35	254	816R54	318	916R58	381
10R25	67	416R43	130	616R17	193	716R36	255	816R55	319	916R59	382
10R26	68	416R44	131	616R18	194	716R37	256	816R56	320	916R60	383
10R27	69	416R45	132	616R19	195	716R38	257	816R57	321	916R61	384
10R28	70	416R46	133	616R20	196	716R39	258	816R58	322	916R62	385
10R29	71	416R47	134	616R21	197	716R40	259	816R59	323	916R63	386
10R30	72	416R48	135	616R22	198	716R41	260	816R60	324	916R64	387

APPROVED 6 AUG 1960 REVISED (A) 21 APR 67 (B) 6 NOV 68 (C) FOR CHANGE SEE SHEET 1

REVISED: [illegible]

This military standard has been approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. ... shall be made from this document.

P.A.	TITLE	MILITARY STANDARD
Other Cust 82	SCREW, MACHINE, FLAT COUNTERSUNK HEAD, 100°, STRUCTURAL, CROSS RECESSED, UNC-3A AND UNF-3A	MS24694
PROCUREMENT SPECIFICATION MIL-S-7839	SUPERSEDES: AN509	SHEET 4 OF