

INCH-POUND

MIL-DTL-28748/10G  
10 October 2001  
SUPERSEDING  
MIL-DTL-28748/10F  
17 July 2001

PERFORMANCE SPECIFICATION SHEET

CONNECTORS, ELECTRICAL, RECTANGULAR, RACK AND PANEL,  
POLARIZED CENTER JACKSCREW OR GUIDE PIN STYLE  
CRIMP TYPE REMOVABLE SOCKET CONTACTS, SIZE 16

This specification is approved for use by all Departments  
and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of  
this specification and MIL-DTL-28748.

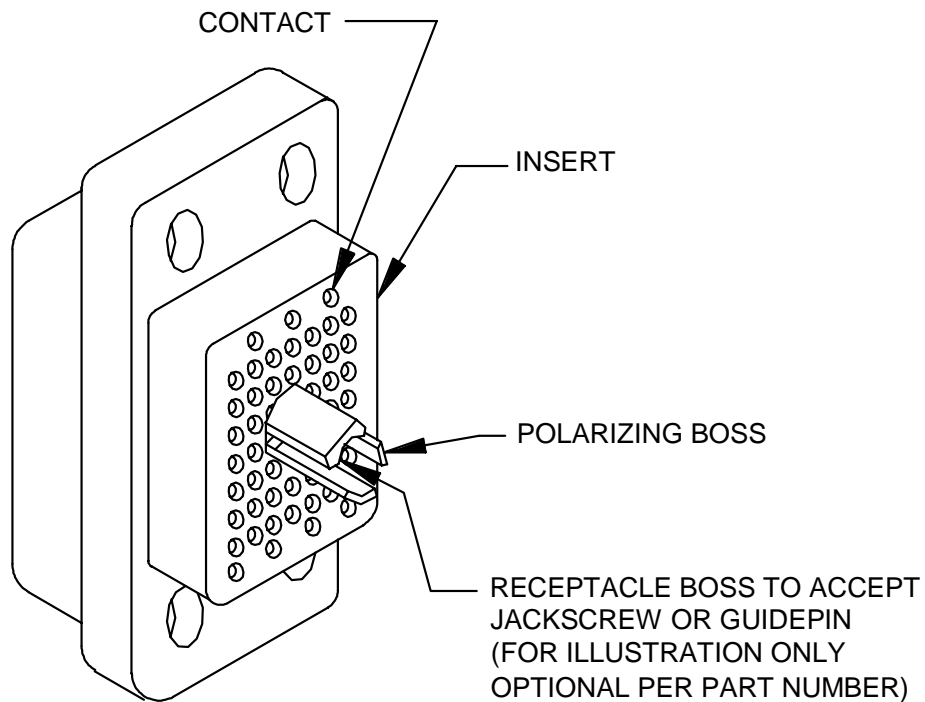


FIGURE 1. Connector.

TABLE I Polarization type

Type	A	B
1	90°	135°
2	85°	137°30'

Center polarizing hardware may be rotated by removing retaining ring and spacer or removing cap (left hand thread) at rear of insert.

## POLARIZATION TYPE (SEE TABLE I)

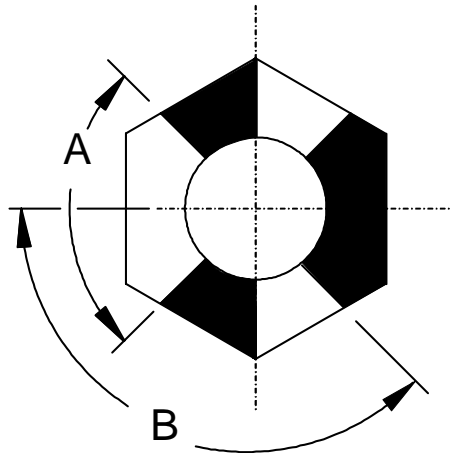
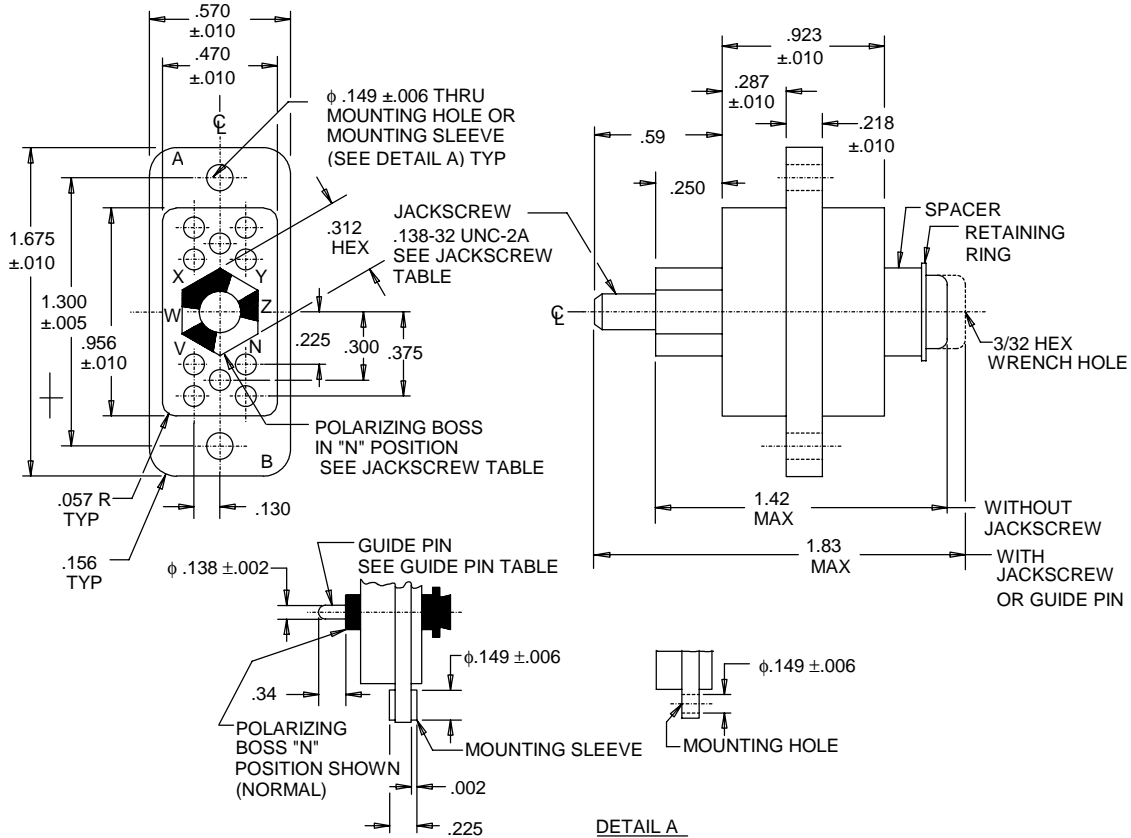


FIGURE 2. Polarization type.



Inches	mm	Inches	mm
.002	0.05	.312	7.92
.005	0.13	.340	8.64
.006	0.15	.375	9.53
.010	0.25	.470	11.94
.057	1.45	.570	14.48
.094	2.39	.579	15.71
.130	3.30	.590	14.99
.138	3.51	.838	21.29
.149	3.78	.923	23.44
.156	3.96	.956	24.28
.218	5.54	1.300	33.02
.225	5.72	1.38	35.05
.250	6.35	1.420	36.07
.287	7.29	1.675	42.55
.300	7.62	1.83	46.48

Insert with through hole configuration A  
 Insert with mounting sleeve configuration J

FIGURE 3. Insert configuration 10 position insert.

Polarization positions- Jackscrew.

Type (see table I)	Polarization 1/	Jackscrew
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss threaded internally .138-32 UNC-2B
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Polarization positions - Guide pin.

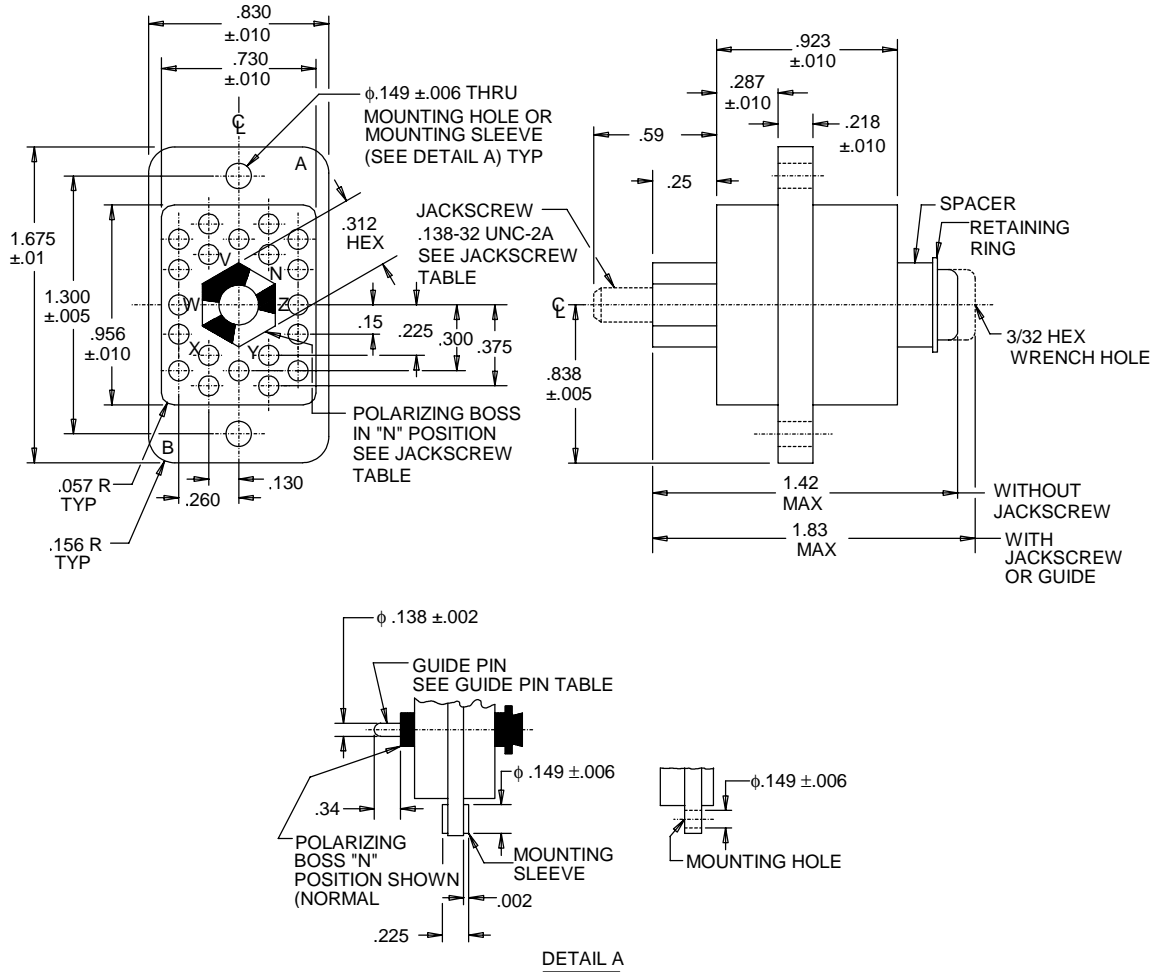
Type (see table I)	Polarization 1/	Guide pin
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss with .144 ± .002 (3.66 ± .051 mm) inch I.D to accept guide pin
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

## NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ±.02 inch (0.51 mm) for two place decimals. and ±.015 (0.38 mm) inch for three place decimals.
4. Tolerance between any two adjacent contact centers shall be ±.004 inch (0.10 mm). Tolerance between any two contact centers, other than adjacent contacts, shall be ±.006 inch(0.15 mm).
5. Dimensions symmetrical about centerlines.
6. Contact identification may be located on either side of the contact hold but shall appear on the front and rear face of the contact insert.
7. Flatness, squareness, and parallelism shall be within dimensional tolerances.
8. Maximum insertion and withdrawal force (connector assembly) shall be 9 lbf (40 N).
9. Maximum torque required at jackscrew to properly engage or disengage connector shall be 1.5 in lbf (0.17 N m).
10. Jackscrew wrench size 3/32 hex.

FIGURE 3. Insert configuration 10 position insert - Continued.



Inches	mm	Inches	mm	Inches	mm
.002	0.05	.156	3.96	.415	10.54
.005	0.13	.218	5.54	.590	14.99
.006	0.15	.225	5.72	.730	18.54
.010	0.25	.250	6.35	.830	21.08
.057	1.45	.260	6.60	.956	24.28
.094	2.39	.287	7.29	1.300	33.02
.130	3.30	.300	7.62	1.38	35.05
.138	3.51	.312	7.92	1.420	36.07
.149	3.78	.340	8.64	1.675	42.55
.150	3.81	.375	9.53	1.83	46.48

Insert with through mounting hole configuration B.  
 Insert with mounting sleeve configuration K.

FIGURE 4. Insert configuration 20 position insert.

Polarization positions - Jackscrew.

Type (see table I)	Polarization <u>1/</u>	Jackscrew
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss threaded internally .138-32 UNC-2B
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Polarization positions - Guide pin.

Type (see table I)	Polarization <u>1/</u>	Guide pin
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss with .144 ± .002 (3.66 ± .051 mm) inch I.D to accept guide pin
1	V	
1	W	
2	X	
2	Y	
2	Z	

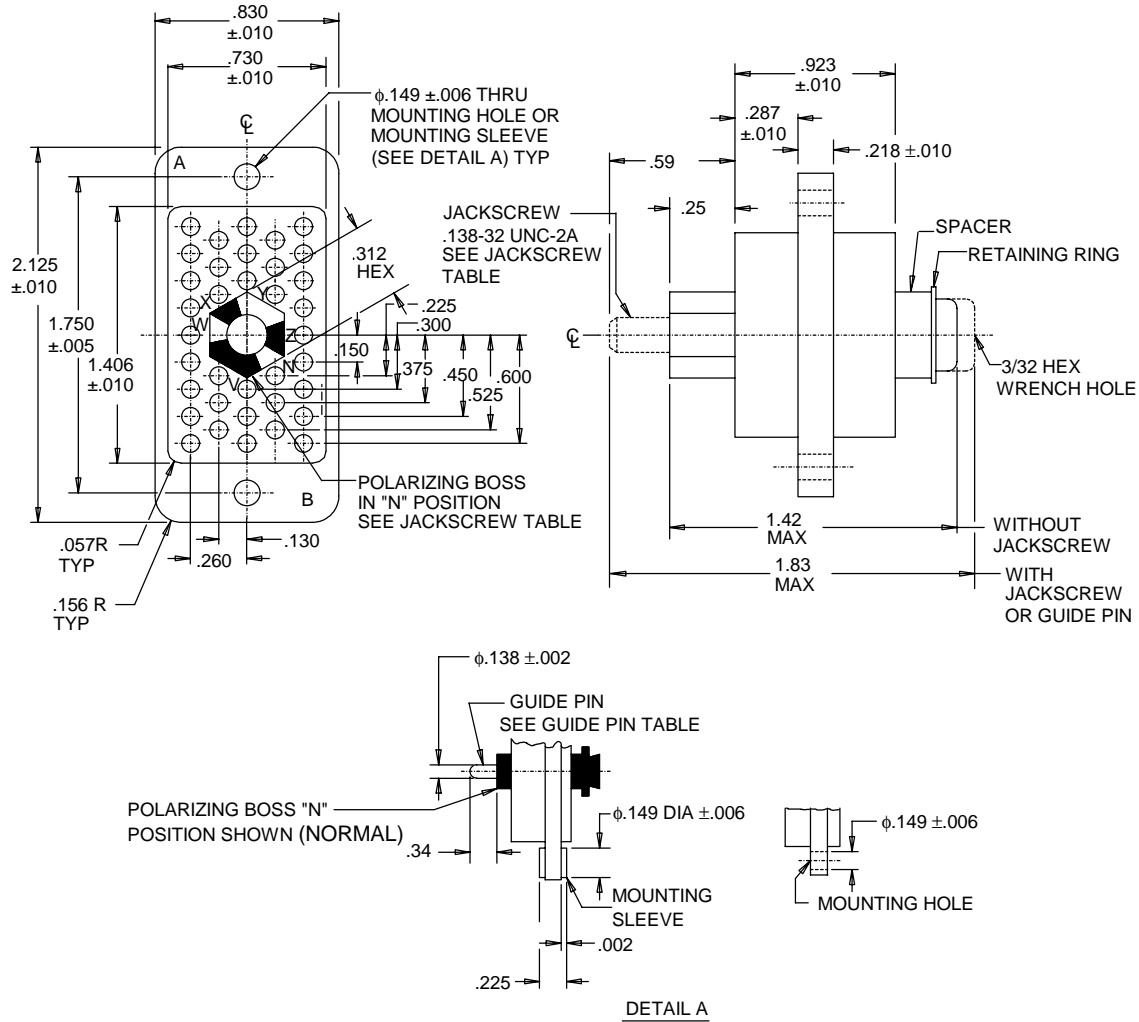
1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Insert with through mounting hole configuration B.  
Insert with mounting sleeve configuration K.

## NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ±.02 inch (0.51 mm) for two place decimals. and ±.015 inch (0.38 mm) for three place decimals.
4. Tolerance between any two adjacent contact centers shall be ±.004 inch (0.10 mm). Tolerance between any two contact centers, other than adjacent contacts, shall be ±.006 inch (0.15 mm).
5. Dimensions symmetrical about centerlines.
6. Contact identification may be located on either side of the contact hold but shall appear on the front and rear face of the contact insert.
7. Flatness, squareness, and parallelism shall be within dimensional tolerances.
8. Maximum insertion and withdrawal force (connector assembly) shall be 18 lbf (80 N).
9. Maximum torque required at jackscrew to properly engage or disengage connector shall be 2 in lbf (0.27 N m).
10. Jackscrew wrench size 3/32 hex.

FIGURE 4. Insert configuration with 20 positions - Continued.



Inches	mm	Inches	mm	Inches	mm
.002	0.05	.218	5.54	.525	13.34
.005	0.13	.225	5.72	.590	14.99
.006	0.15	.250	6.35	.600	15.24
.010	0.25	.260	6.60	.730	18.54
.057	1.45	.287	7.29	.830	21.08
.094	2.39	.300	7.62	.923	23.44
.130	3.30	.312	7.92	1.38	35.05
.138	3.51	.340	8.64	1.406	35.71
.149	3.78	.375	9.53	1.750	44.45
.150	3.81	.415	10.54	1.83	46.48
.156	3.96	.450	11.43	2.125	53.98

Insert with through mounting hole configuration C.  
 Insert with mounting sleeve configuration L.

FIGURE 5. Insert configurations Insert with 36 positions.

Polarization positions - Jackscrew.

Type (see table I)	Polarization 1/	Jackscrew
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss threaded internally .138-32 UNC-2B
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Polarization positions - Guide pin.

Type (see table I)	Polarization 1/	Guide pin
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss with .144 ± .002 (3.66 ± .051 mm) inch I.D to accept guide pin
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

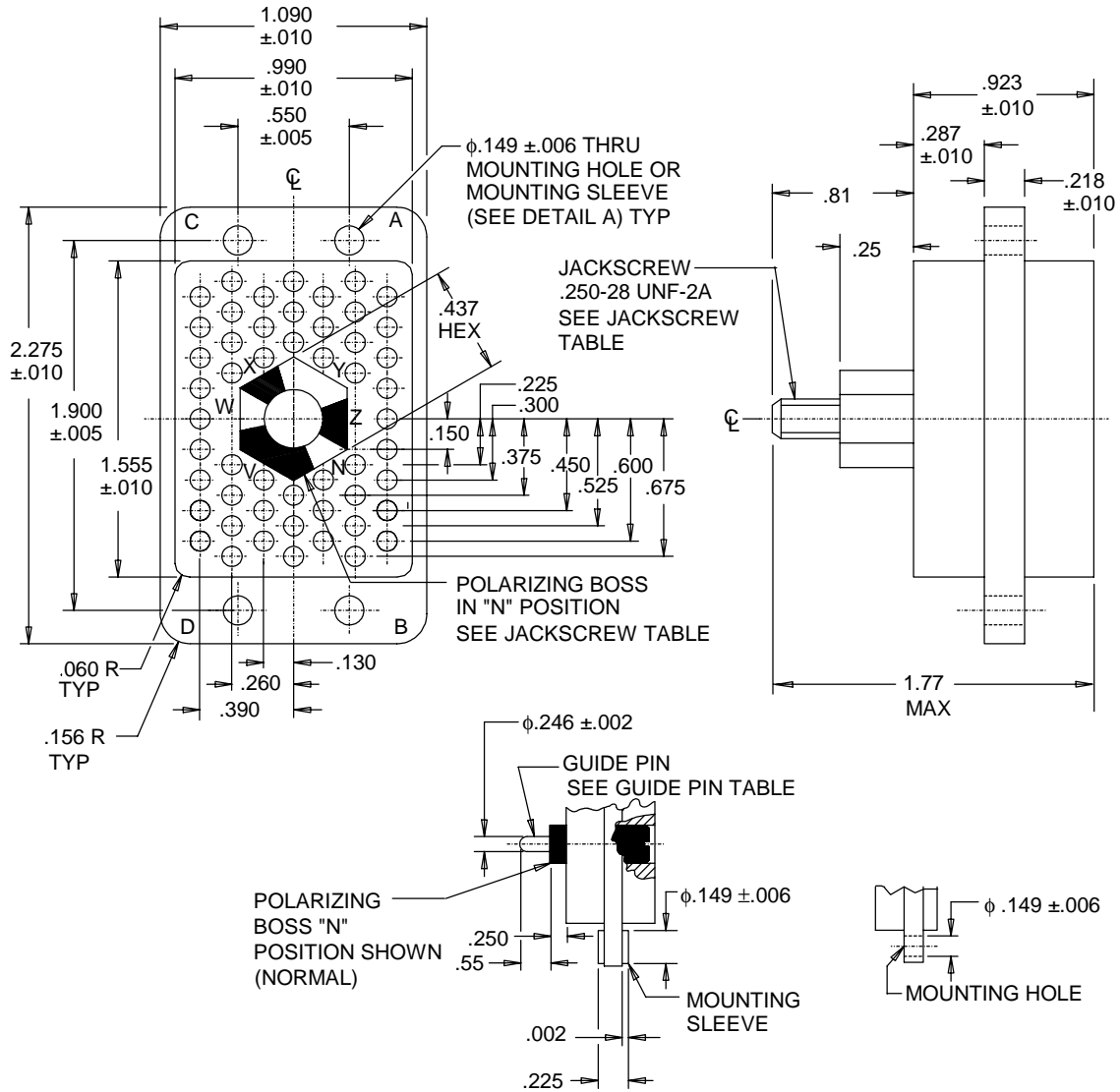
Insert with through mounting hole configuration C.  
Insert with mounting sleeve configuration L.

## NOTES:

- Dimensions are in inches.
- Metric equivalents are given for general information only.
- Unless otherwise specified, tolerances are ±.02 inch (0.51 mm) for two place decimals. and ±.015 inch (0.38 mm) for three place decimals.
- Tolerance between any two adjacent contact centers shall be ±.004 inch (0.10 mm). Tolerance between any two contact centers, other than adjacent contacts, shall be ±.006 inch (0.15 mm).
- Dimensions symmetrical about centerlines.
- Contact identification may be located on either side of the contact hold but shall appear on the front and rear face of the contact insert.
- Flatness, squareness, and parallelism shall be within dimensional tolerances.
- Maximum insertion and withdrawal force (connector assembly) shall be 34 lbf (151 N).
- Maximum torque required at jackscrew to properly engage or disengage connector shall be 3 in lbf (0.34 N m).
- Jackscrew wrench size 3/32 hex.

FIGURE 5. Insert configuration Insert with 36 positions - Continued.





DETAIL A

Inches	mm	Inches	mm	Inches	mm
.002	0.05	.246	6.25	.550	13.97
.005	0.13	.250	6.35	.600	15.24
.006	0.15	.260	6.60	.675	17.15
.010	0.25	.287	7.29	.81	20.6
.060	1.52	.300	7.62	.923	23.44
.130	1.91	.375	9.53	.990	25.15
.149	3.78	.390	9.91	1.090	27.69
.150	3.81	.437	11.10	1.555	39.50
.156	3.96	.450	11.43	1.900	48.26
.225	5.72	.525	13.34	2.275	57.78

Insert with through mounting hole configuration D.  
 Insert with mounting sleeve configuration M.

FIGURE 6. Insert configuration with 52 positions.

Polarization positions - Jackscrew.

Type (table I)	Polarization 1/	Jackscrew
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
2	N	Not supplied with connector polarizing boss threaded internally .250-28 UNF-2B
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Polarization positions - Guide pin.

Type (table I)	Polarization 1/	Guide pin
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
2	N	Not supplied with connector polarizing boss with .254 ± .002 (3.66 ± .051 mm) inch I.D to accept guide pin
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

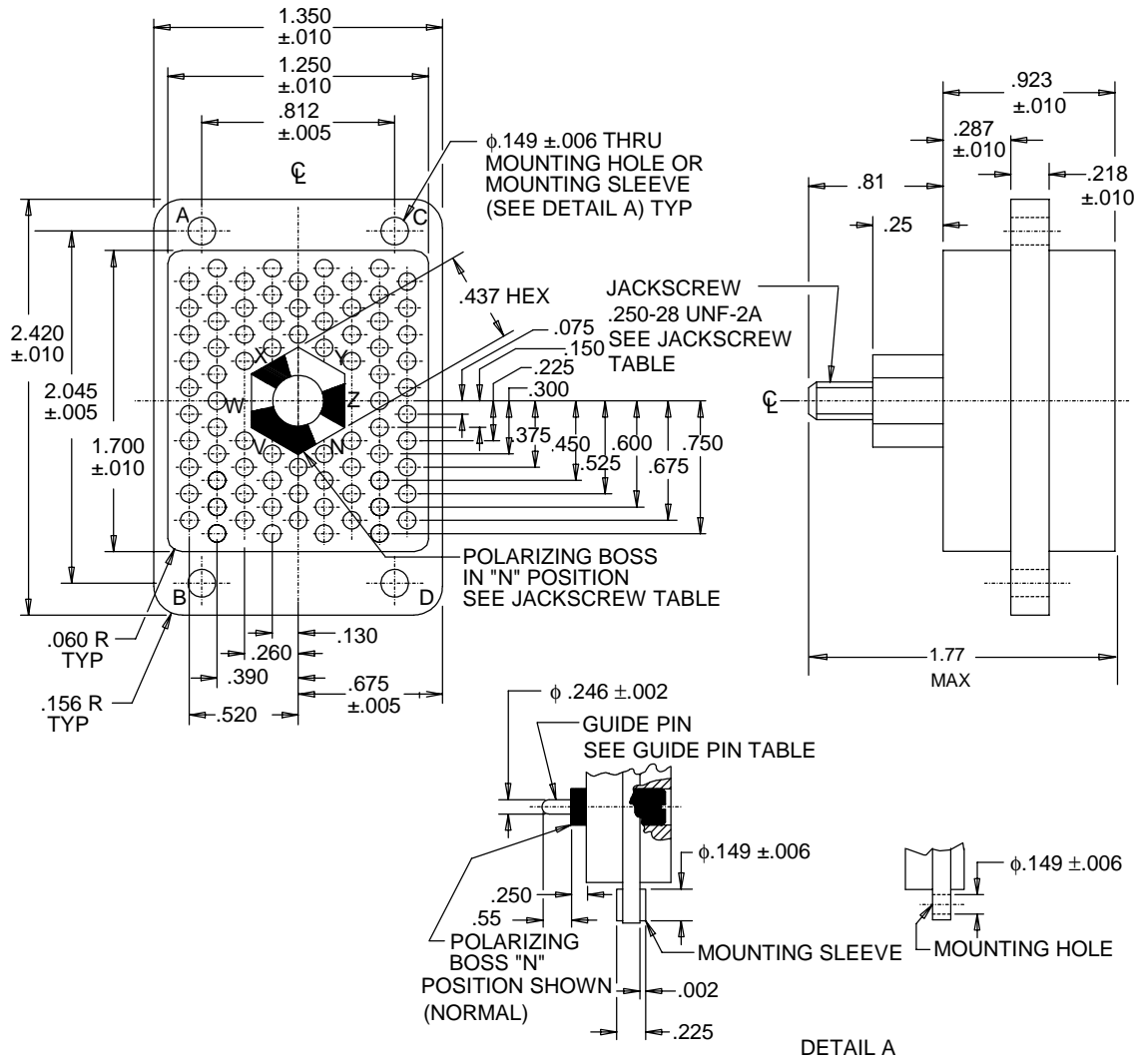
Insert with through mounting hole configuration D.

Insert with mounting sleeve configuration M.

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ±.02 inch (0.51 mm) for two place decimals. and ±.015 inch (0.38 mm) for three place decimals.
4. Tolerance between any two adjacent contact centers shall be ±.004 (0.10 mm) inch. Tolerance between any two contact centers, other than adjacent contacts, shall be ±.006 inch (0.15 mm).
5. Dimensions symmetrical about centerlines.
6. Contact identification may be located on either side of the contact hold but shall appear on the front and rear face of the contact insert.
7. Flatness, squareness, and parallelism shall be within dimensional tolerances.
8. Maximum insertion and withdrawal force (connector assembly) shall be 48 lbf (215 N).
9. Maximum torque required at jackscrew to properly engage or disengage connector shall be 4l in lbf (0.45 N m).
10. Jackscrew wrench size 5/32 hex.

FIGURE 6. Insert configuration Insert with 52 positions - Continued.



Inches	mm	Inches	mm	Inches	mm
.002	0.05	.246	6.25	.600	15.24
.005	0.13	.250	6.35	.675	17.15
.006	0.15	.260	6.60	.750	19.05
.010	0.25	.287	7.29	.81	20.57
.060	1.52	.300	7.62	.812	20.63
.075	1.91	.375	9.53	.923	23.44
.130	3.30	.390	9.91	1.250	31.75
.149	3.78	.437	11.10	1.350	34.29
.150	3.81	.450	11.43	1.700	43.18
.156	3.96	.520	13.21	2.045	51.94
.218	5.54	.525	13.34	2.420	61.47
.225	5.72	.55	13.97		

Insert with through mounting hole configuration E.  
 Insert with mounting sleeve configuration N.

FIGURE 7. Insert configuration with 80 positions.

Polarization positions - Jackscrew.

Type (see table I)	Polarization <u>1/</u>	Jackscrew
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss threaded internally .250-28 UNF-2B
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Polarization positions - Guide pin.

Type (see table I)	Polarization <u>1/</u>	Guide pin
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss with .254 ± .002 (3.66 ± .051 mm) inch I.D to accept guide pin
1	V	
1	W	
2	X	
2	Y	
2	Z	

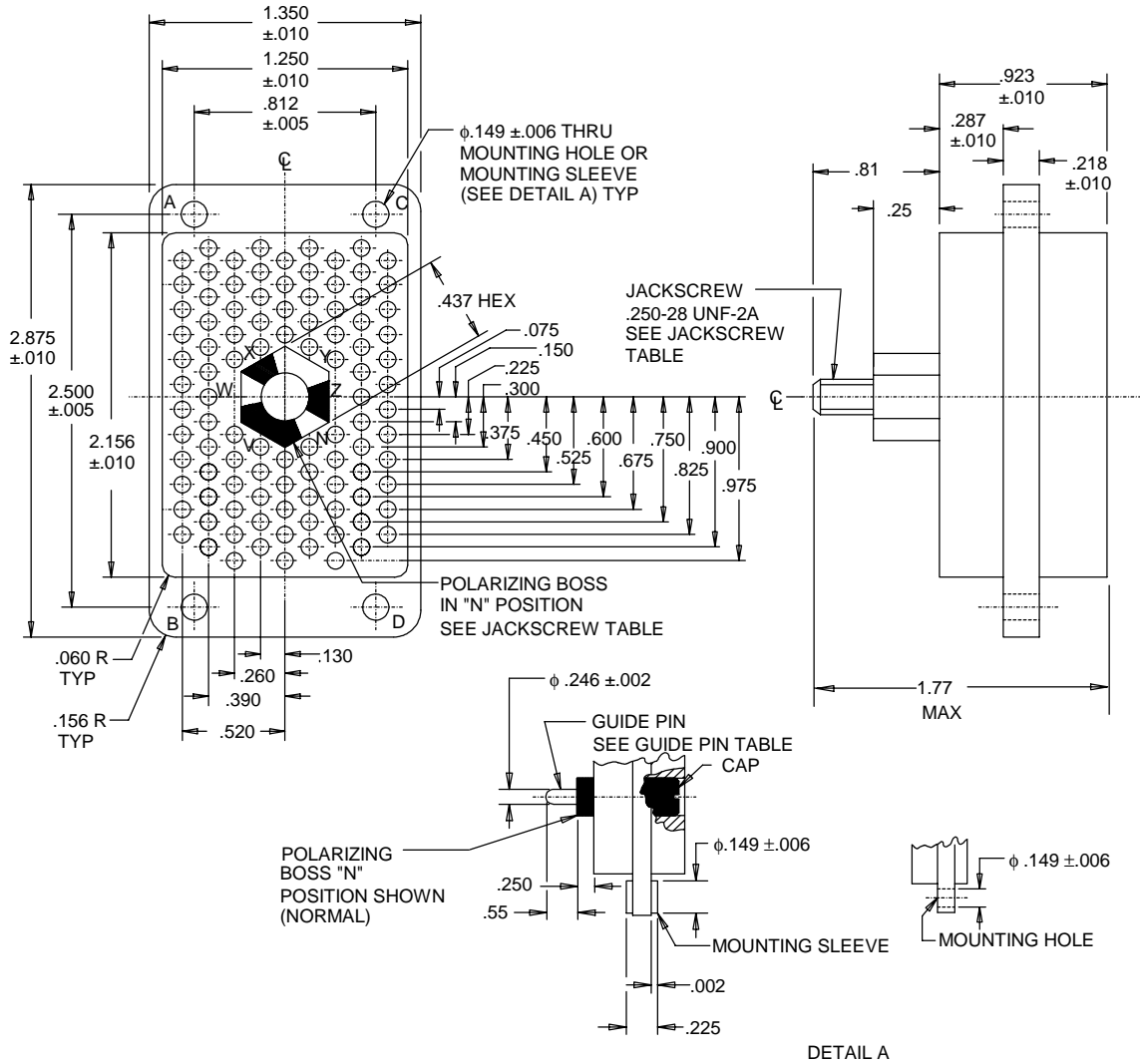
1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Insert with through mounting hole configuration E.  
Insert with mounting sleeve configuration N.

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ±.02 inch (0.51 mm) for two place decimals. and ±.015 (0.38 mm) inch for three place decimals.
4. Tolerance between any two adjacent contact centers shall be ±.004 inch (0.10 mm). Tolerance between any two contact centers, other than adjacent contacts, shall be ±.006 inch (0.15 mm).
5. Dimensions symmetrical about centerlines.
6. Contact identification may be located on either side of the contact hold but shall appear on the front and rear face of the contact insert.
7. Flatness, squareness, and parallelism shall be within dimensional tolerances.
8. Maximum insertion and withdrawal force (connector assembly) shall be 75 lbf (334 N).
9. Maximum torque required at jackscrew to properly engage or disengage connector shall be 6 in lbf (0.68 N m).
10. Jackscrew wrench size 5/32 hex.

FIGURE 7. Insert configuration Insert with 80 positions - Continued.



Inches	mm	Inches	mm	Inches	mm
.002	0.05	.246	6.25	.675	17.15
.005	0.13	.250	6.35	.750	19.05
.006	0.15	.260	6.60	.810	20.57
.010	0.25	.287	7.29	.812	20.63
.060	1.52	.300	7.62	.825	20.96
.075	1.91	.375	9.53	.900	22.86
.130	3.30	.390	9.91	.923	23.44
.149	3.78	.437	11.10	.975	24.77
.150	3.81	.450	11.43	1.250	31.75
.156	3.96	.520	13.21	1.350	34.29
.218	5.54	.525	13.34	2.156	54.76
.225	5.72	.55	13.97	2.500	63.50
		.600	15.24	2.875	73.03

Insert with through mounting hole configuration F.  
 Insert with mounting sleeve configuration P.

FIGURE 8. Insert configuration with 104 positions.

Polarization positions - Jackscrew.

Type (see table I)	Polarization <u>1/</u>	Jackscrew
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss threaded internally .250-28 UNF-2B
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Polarization positions - Guide pin.

Type (see table I)	Polarization <u>1/</u>	Guide pin
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss with .254 ± .002 (3.66 ± .051 mm) inch I.D to accept guide pin
1	V	
1	W	
2	X	
2	Y	
2	Z	

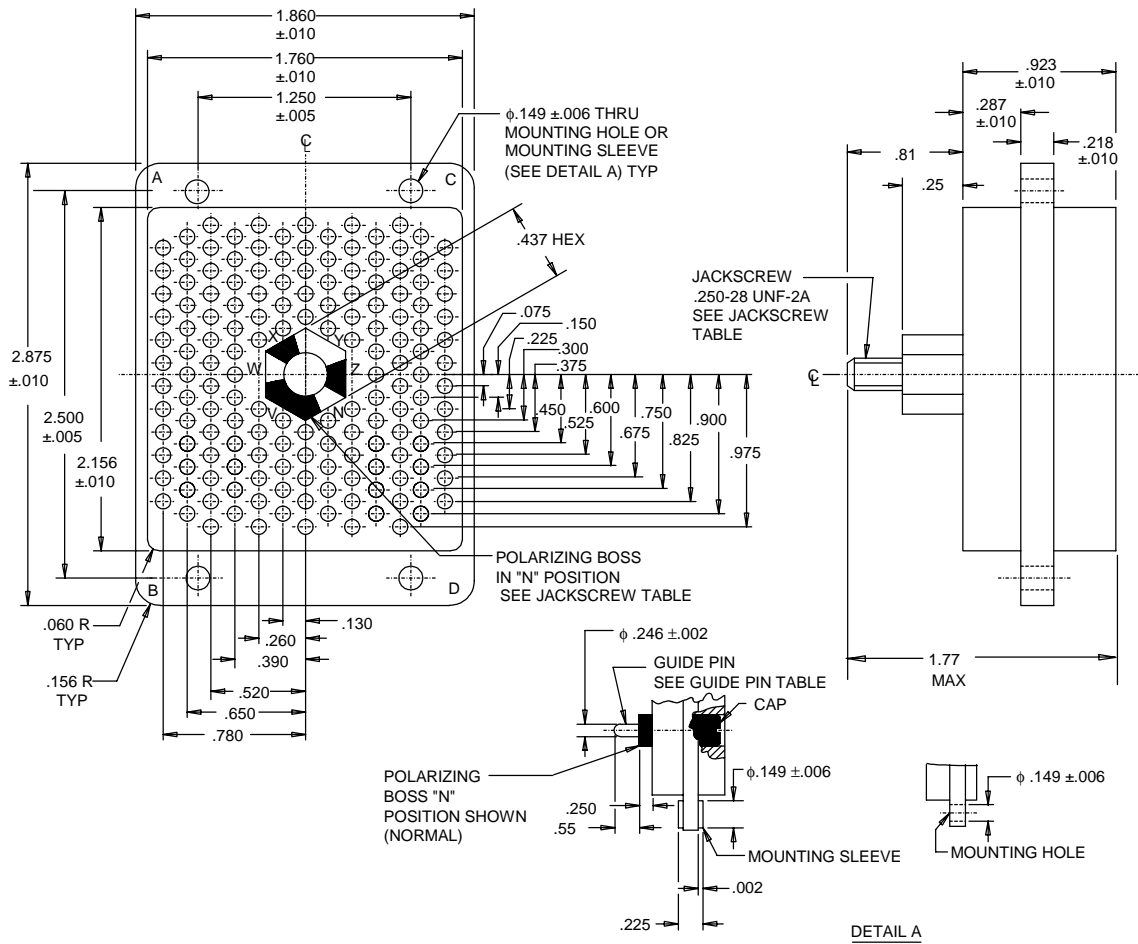
1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Insert with through mounting hole configuration F.  
Insert with mounting sleeve configuration P.

## NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ±.02 inch (0.51 mm) for two place decimals and ±.015 inch (0.38 mm) for three place decimals.
4. Tolerance between any two adjacent contact centers shall be ±.004 inch (0.10 mm). Tolerance between any two contact centers, other than adjacent contacts, shall be ±.006 inch (0.15 mm).
5. Dimensions symmetrical about centerlines.
6. Contact identification may be located on either side of the contact hold, but shall appear on the front and rear face of the contact insert.
7. Flatness, squareness, and parallelism shall be within dimensional tolerances.
8. Maximum insertion and withdrawal force (connector assembly) shall be 100 lbf (445 N).
9. Maximum torque required at jackscrew to properly engage or disengage connector shall be 7 in lbf (0.79 N m)
10. Jackscrew wrench size 5/32 hex.

FIGURE 8. Insert configuration with 104 positions - Continued.



Insert with through mounting hole configuration G.  
 Insert with mounting sleeve configuration R.

FIGURE 9. Insert configuration with 158 positions.

Polarization positions - Jackscrow.

Type (see table I)	Polarization <u>1</u> /	Guide pin
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss threaded internally .250-28 UNF-2B
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Polarization positions - Guide pin.

Type (see table I)	Polarization <u>1</u> /	Guide pin
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss with .254 ± .002 (3.66 ± .051 mm) inch I.D to accept guide pin
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Insert with through mounting hole configuration G.  
Insert with mounting sleeve configuration R.

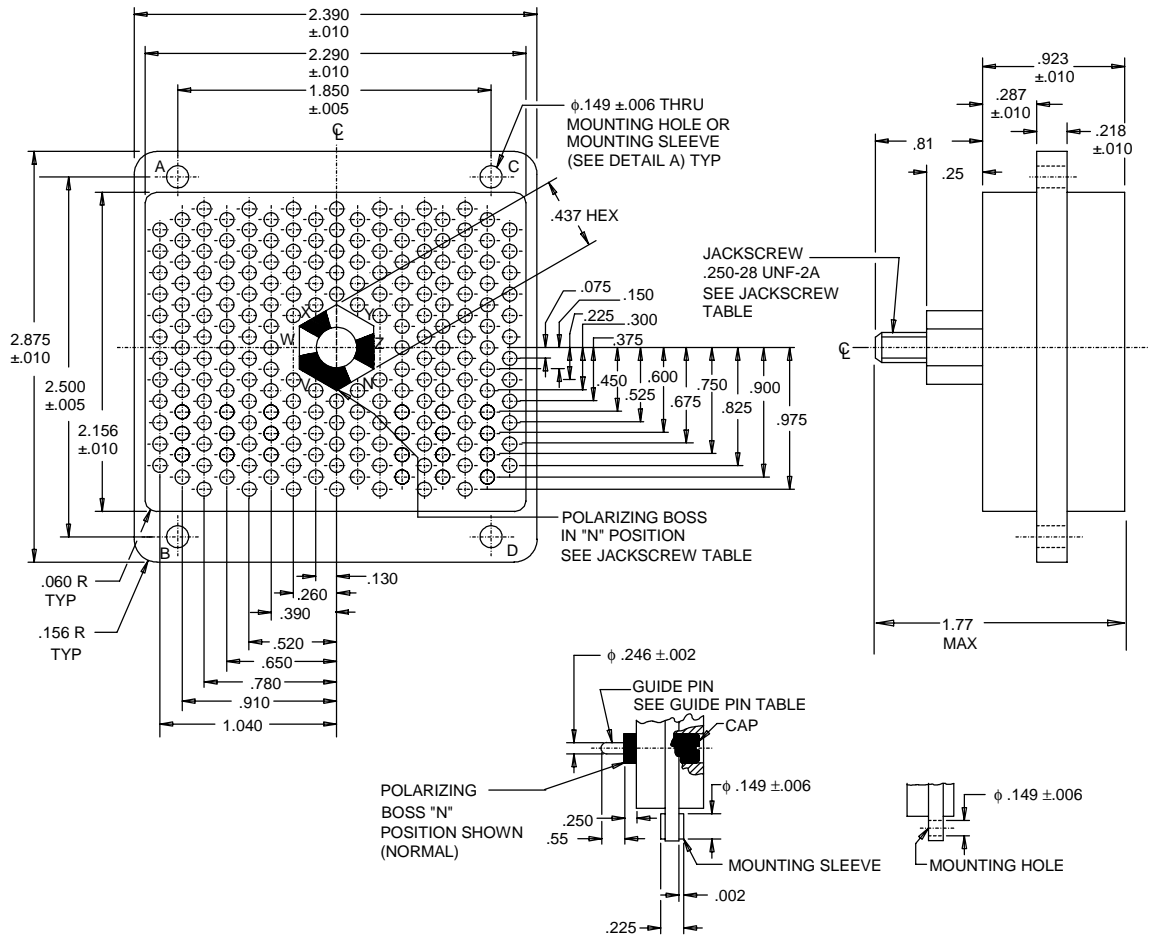
NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ±.02 inch (0.51 mm) for two place decimals. and ±.015 inch (0.38 mm) for three place decimals.
4. Tolerance between any two adjacent contact centers shall be ±.004 inch (0.10 mm). Tolerance between any two contact centers, other than adjacent contacts, shall be ±.006 inch (0.15 mm).
5. Dimensions symmetrical about centerlines.
6. Contact identification may be located on either side of the contact hold, but shall appear on the front and rear face of the contact insert.
7. Flatness, squareness, and parallelism shall be within dimensional tolerances.
8. Maximum insertion and withdrawal force (connector assembly) shall be 148 lbf (658 N).
9. Maximum torque required at jackscrew to properly engage or disengage connector shall be 10 in lbf (1.13 N m).
10. Jackscrew wrench size 5/32 hex.

FIGURE 9. Insert configuration with 158 positions - Continued.



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DETAIL A

Inches	mm	Inches	mm	Inches	mm
.002	0.05	.260	6.60	.810	20.57
.005	0.13	.287	7.29	.825	20.96
.006	0.15	.300	7.62	.900	22.86
.010	0.25	.375	9.53	.910	23.11
.060	1.52	.390	9.91	.923	23.44
.075	1.91	.437	11.10	.975	24.77
.130	3.30	.450	11.43	1.040	26.42
.149	3.78	.520	13.21	1.850	46.99
.150	3.81	.525	13.34	2.156	54.76
.156	3.96	.600	15.24	2.290	58.17
.218	5.54	.650	16.51	2.390	60.71
.225	5.72	.675	17.15	2.500	63.50
.246	6.25	.750	19.05	2.875	73.03
.250	6.35	.780	19.81		

Insert with through mounting hole configuration H.  
 Insert with mounting sleeve configuration S.

FIGURE 10. Insert configuration with 212 positions.

Polarization positions - Jackscrew.

Type (see table I)	Polarization <u>1</u> /	Jackscrew
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss threaded internally .250-28 UNF-2B
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Polarization positions - Guide pin.

Type (see table I)	Polarization <u>1</u> /	Guide pin
1	N	Supplied with connector
1	V	
1	W	
2	X	
2	Y	
2	Z	
1	N	Not supplied with connector polarizing boss with .254 ± .002 (3.66 ± .051 mm) inch I.D to accept guide pin
1	V	
1	W	
2	X	
2	Y	
2	Z	

1/ Large opening in polarization boss must be adjacent to polarization letter on connector body.

Insert with through mounting hole configuration H.  
Insert with mounting sleeve configuration S.

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ±.02 inch (0.51 mm) for two place decimals. and ±.015 inch (0.38 mm) for three place decimals.
4. Tolerance between any two adjacent contact centers shall be ±.004 inch (0.10 mm). Tolerance between any two contact centers, other than adjacent contacts, shall be ±.006 inch (0.15 mm).
5. Dimensions symmetrical about centerlines.
6. Contact identification may be located on either side of the contact hold but shall appear on the front and rear face of the contact insert.
7. Flatness, squareness, and parallelism shall be within dimensional tolerances.
8. Maximum insertion and withdrawal force (connector assembly) shall be 198 lbf (881 N).
9. Maximum torque required at jackscrew to properly engage or disengage connector shall be 13 in lbf (1.47 N m).
10. Jackscrew wrench size 5/32 hex.

FIGURE 10. Insert configuration with 212 positions - Continued.

## REQUIREMENTS:

Dimensions and configuration: See figures 1 through 10 for inserts and table II for contact sizes.

Insert material shall be in accordance with MIL-DTL-28748.

Insert contact hole details shall be in accordance with MIL-DTL-28748.

Mating connectors: MIL-DTL-28748/9.

Part or Identifying Number (PIN) as shown in the following example:

Example of PIN:

<u>M28748/10</u> Basic Number of specification sheet	<u>A</u> Insert	<u>0</u> Shield and shield clamp location or retaining plate	<u>A</u> Shell type (polarization)	<u>L</u> Jackscrews or guidepins	<u>1A</u> Contacts (see table II)
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PIN code:

<u>Insert with through mounting hole</u>	<u>Number of contacts</u>	<u>Shield and shield clamp location or retaining plate</u>	<u>Shell type (polarization) see insert figures 3/ 4/ 5/ 6/</u>	<u>1A Contacts (see table II)</u>
A	10	0 - None included <u>1/</u>	A - 1 N	
B	20	1 - Insert identifier	B - 1 V	
C	36	for piece parts <u>2/</u>	C - 1 W	
D	52		D - 1 X	
E	80		E - 1 Y	
F	104		F - 1 Z	
G	158		N - 2 N	
H	212		V - 2 V	
			W - 2 W	
			X - 2 X	
			Y - 2 Y	
			Z - 2Z	
			G - 3N	
			H - 3 V	
			J - 3 W	
			K - 3 X	
			L - 3 Y	
			M - 3 Z	
			P - 4 N	
			Q - 4 V	
			R - 4 W	
			S - 4 X	
			T - 4 Y	
			U - 4 Z	
			0 - None included <u>1/</u>	
		<u>Jackscrews or guidepins</u>		
		L - Long jackscrew		
		G - Guidepin		
		O - Boss for jackscrew		
		B - Boss for guidepin		
		N - None included		

1/ The number zero (0) is used to indicate which parts are not included, except where specified.

2/ No insert included, use the number 1 in conjunction with insert designator to order jackscrew, guidepins, or polarization boss piece parts.

3/ A through F are for use with jackscrews, supplied with connector.

4/ N through Z are for use with the boss for jackscrews, not supplied with connector.

5/ G through M are for use with guidepins, supplied with connector.

6/ P through U are for use with the boss for guidepins, not supplied with connector.

TABLE II. Contact size percent.

Contact designator	Size 16 - 16	Size 16 - 20	Size 20 - 20
	M39029/37-280 <u>1/</u> (percent)	M39029/37-279 <u>1/</u> (percent)	M39029/80-438 <u>2/</u> M39029/80-439 <u>2/</u> (percent)
1A	100	0	0
1B	90	0	10
1C	80	0	20
1D	70	0	30
1E	60	0	40
1F	50	0	50
1G	40	0	60
1H	30	0	70
1J	20	0	80
1K	10	0	90
1L	0	0	100
1Z	0	0	0
2A	0	100	0
2B	0	90	10
2C	0	80	20
2D	0	70	30
2E	0	60	40
2F	0	50	50
2G	0	40	60
2H	0	30	70
2J	0	20	80
2K	0	10	90

1/ Basic crimp tool: M22520/1-01  
Positioner: M22520/1-03(A).  
Installing tool: M81969/18-01.  
Removal tool: M81969/20-01.

2/ Basic crimp tool: TMDC16CX4 (Hughes).  
Installing tool: M81969/17-04.  
Removal tool: M81969/19-08.

Superseding data: See table III.

TABLE III. Superseded MS sheets to M28748 designator.

MS sheet	Number of contacts	M28748/10 designator 1/ 2/
Jackscrew		Jackscrew
MS18156-1(N, V, W)	10	M28748/10(A or J)0(A, B, or C)L1Z
MS18156-1(X, Y, Z)	10	M28748/10(A or J)0(D, E, or F)L1Z
MS18158-1(N, V, W)	20	M28748/10(B or K)0(A, B, or C)L1Z
MS18158-1(X, Y, Z)	20	M28748/10(B or K)0(D, E, or F)L1Z
MS18160-1(N, V, W)	36	M28748/10(C or L)0(A, B, or C)L1Z
MS18160-1(X, Y, Z)	36	M28748/10(C or L)0(D, E, or F)L1Z
MS18162-1(N, V, W)	52	M28748/10(D or M)0(A, B, or C)L1Z
MS18162-1(X, Y, Z)	52	M28748/10(D or M)0(D, E, or F)L1Z
MS18164-1(N, V, W)	80	M28748/10(E or N)0(A, B, or C)L1Z
MS18164-1(X, Y, Z)	80	M28748/10(E or N)0(D, E, or F)L1Z
MS17779-1(N, V, W)	104	M28748/10(F or P)0(A, B, or C)L1Z
MS17779-1(X, Y, Z)	104	M28748/10(F or P)0(D, E, or F)L1Z
MS18166-1(N, V, W)	158	M28748/10(G or R)0(A, B, or C)L1Z
MS18166-1(X, Y, Z)	158	M28748/10(G or R)0(D, E, or F)L1Z
MS18168-1(N, V, W)	212	M28748/10(H or S)0(A, B, or C)L1Z
MS18168-1(X, Y, Z)	212	M28748/10(H or S)0(D, E, or F)L1Z
MS sheet jackscrew	Number of contacts	Jackscrew
MS18156-2(N, V, W)	10	M28748/10(A or J)0(A, B, or C)O1Z
MS18156-2(X, Y, Z)	10	M28748/10(A or J)0(D, E, or F)O1Z
MS18158-2(N, V, W)	20	M28748/10(B or K)0(A, B, or C)O1Z
MS18158-2(X, Y, Z)	20	M28748/10(B or K)0(D, E, or F)O1Z
MS18160-2(N, V, W)	36	M28748/10(C or L)0(A, B, or C)O1Z
MS18160-2(X, Y, Z)	36	M28748/10(C or L)0(D, E, or F)O1Z
MS18162-2(N, V, W)	52	M28748/10(D or M)0(A, B, or C)O1Z
MS18162-2(X, Y, Z)	52	M28748/10(D or M)0(D, E, or F)O1Z
MS18164-2(N, V, W)	80	M28748/10(E or N)0(A, B, or C)O1Z
MS18164-2(X, Y, Z)	80	M28748/10(E or N)0(D, E, or F)O1Z
MS17779-2(N, V, W)	104	M28748/10(F or P)0(A, B, or C)O1Z
MS17779-2(X, Y, Z)	104	M28748/10(F or P)0(D, E, or F)O1Z
MS18166-2(N, V, W)	158	M28748/10(G or R)0(A, B, or C)O1Z
MS18166-2(X, Y, Z)	158	M28748/10(G or R)0(D, E, or F)O1Z
MS18168-2(N, V, W)	212	M28748/10(H or S)0(A, B, or C)O1Z
MS18168-2(X, Y, Z)	212	M28748/10(H or S)0(D, E, or F)O1Z
MS sheet guide pin	Number of contacts	Guide pin
MS18156-3(N, V, W)	10	M28748/10(A or J)0(A, B, or C)G1Z
MS18156-3(X, Y, Z)	10	M28748/10(A or J)0(D, E, or F)G1Z
MS18158-3(N, V, W)	20	M28748/10(B or K)0(A, B, or C)G1Z
MS18158-3(X, Y, Z)	20	M28748/10(B or K)0(D, E, or F)G1Z
MS18160-3(N, V, W)	36	M28748/10(C or L)0(A, B, or C)G1Z
MS18160-3(X, Y, Z)	36	M28748/10(C or L)0(D, E, or F)G1Z
MS18162-3(N, V, W)	52	M28748/10(D or M)0(A, B, or C)G1Z
MS18162-3(X, Y, Z)	52	M28748/10(D or M)0(D, E, or F)G1Z
MS18164-3(N, V, W)	80	M28748/10(E or N)0(A, B, or C)G1Z
MS18164-3(X, Y, Z)	80	M28748/10(E or N)0(D, E, or F)G1Z
MS17779-3(N, V, W)	104	M28748/10(F or P)0(A, B, or C)G1Z
MS17779-3(X, Y, Z)	104	M28748/10(F or P)0(D, E, or F)G1Z
MS18166-3(N, V, W)	158	M28748/10(G or R)0(A, B, or C)G1Z
MS18166-3(X, Y, Z)	158	M28748/10(G or R)0(D, E, or F)G1Z
MS18168-3(N, V, W)	212	M28748/10(H or S)0(A, B, or C)G1Z
MS18168-3(X, Y, Z)	212	M28748/10(H or S)0(D, E, or F)G1Z

See notes at end of table.

TABLE III. Superseded MS sheets to M28748 designator - Continued

MS sheet	Number of contacts	M28748/10 designator <u>1/</u> <u>2/</u>
Guide socket		Guide Socket
MS18156-4(N, V, W)	10	M28748/10(A or J)0(A, B, or C)B1Z
MS18156-4(X, Y, Z)	10	M28748/10(A or J)0(D, E, or F)B1Z
MS18158-4(N, V, W)	20	M28748/10(B or K)0(A, B, or C)B1Z
MS18158-4(X, Y, Z)	20	M28748/10(B or K)0(D, E, or F)B1Z
MS18160-4(N, V, W)	36	M28748/10(C or L)0(A, B, or C)B1Z
MS18160-4(X, Y, Z)	36	M28748/10(C or L)0(D, E, or F)B1Z
MS18162-4(N, V, W)	52	M28748/10(D or M)0(A, B, or C)B1Z
MS18162-4(X, Y, Z)	52	M28748/10(D or M)0(D, E, or F)B1Z
MS18164-4(N, V, W)	80	M28748/10(E or N)0(A, B, or C)B1Z
MS18164-4(X, Y, Z)	80	M28748/10(E or N) 0(D, E, or F)B1Z
MS17779-4(N, V, W)	104	M28748/10(F or P)0(A, B, or C)B1Z
MS17779-4(X, Y, Z)	104	M28748/10(F or P)0(D, E, or F)B1Z
MS18166-4(N, V, W)	158	M28748/10(G or R)0(A, B, or C)B1Z
MS18166-4(X, Y, Z)	158	M28748/10(G or R)0(D, E, or F)B1Z
MS18168-4(N, V, W)	212	M28748/10(H or S)0(A, B, or C)B1Z
MS18168-4(X, Y, Z)	212	M28748/10(H or S)0(D, E, or F)B1Z

1/ Reference PIN code for insert and polarization options.

2/ PIN constructed represent complete connectors without contacts.

## CONCLUDING MATERIAL

## Custodians:

Army - CR  
Navy - EC  
Air Force - 11  
DLA - CC

## Preparing activity:

DLA - CC

(Project 5935-4515-02)

## Review activities:

Army - AR, AT, AV, CR4, MI  
Navy - AS, MC, OS, SH  
Air Force - 99