

INCH-POUND

MIL-PRF-6106/15F
25 October 2021
SUPERSEDING
MIL-PRF-6106/15E
15 February 2011

PERFORMANCE SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, 50 AMPERES, DC, SPDT, HERMETICALLY SEALED

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

The requirements for acquiring the relay described herein shall
consist of this specification sheet and the latest issue of [MIL-PRF-6106](#).

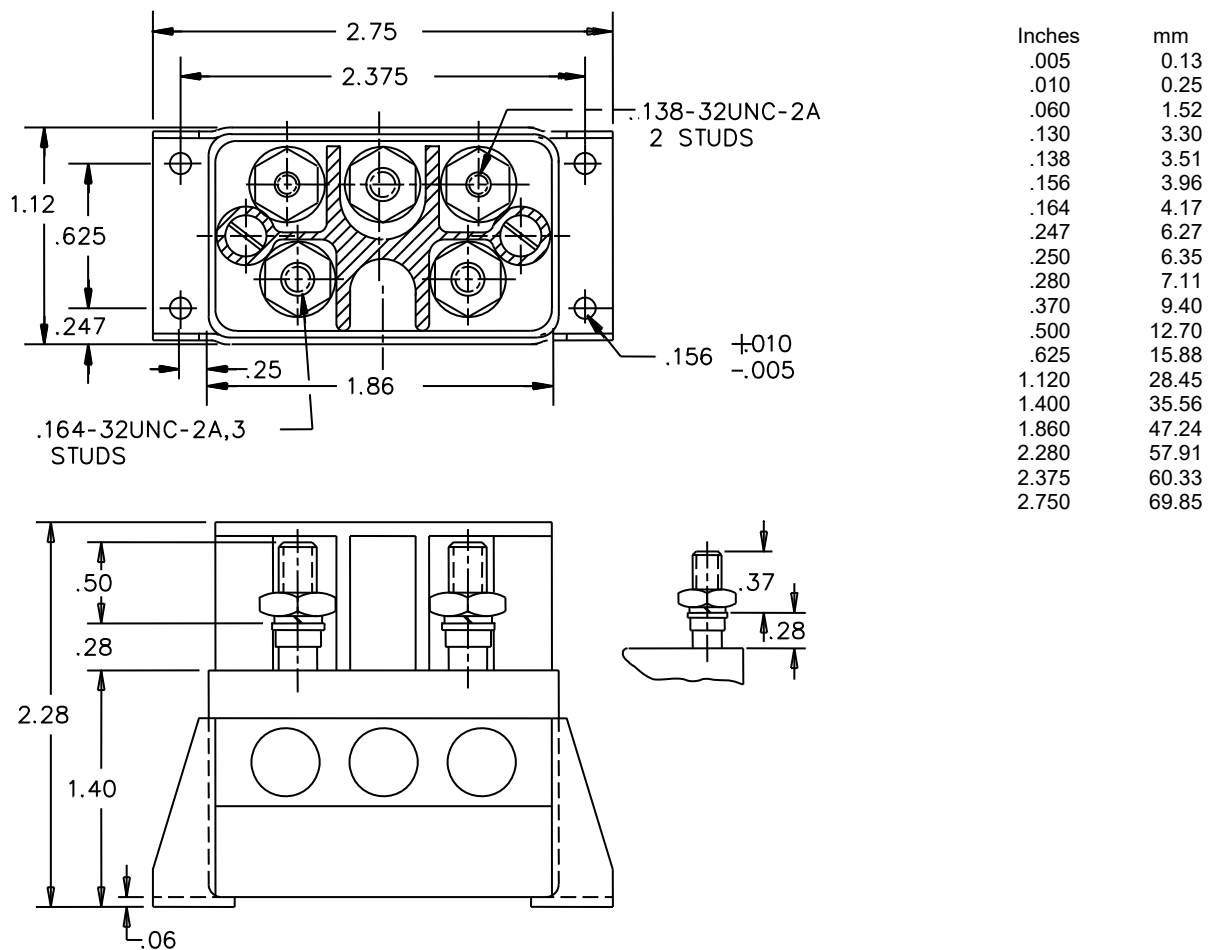


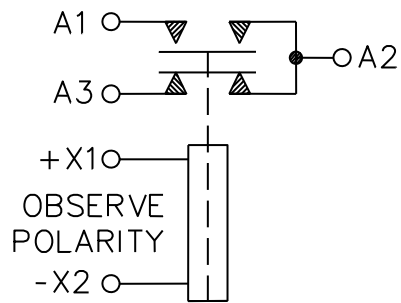
FIGURE 1. Configurations and dimensions (-001 and -002).

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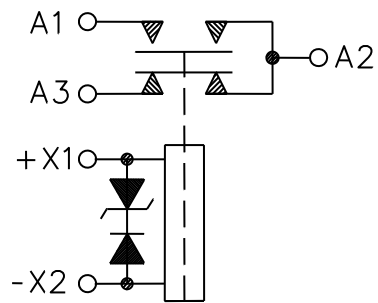
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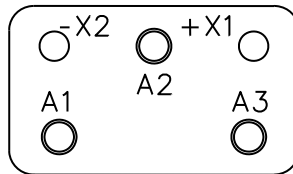




CIRCUIT DIAGRAM -001



CIRCUIT DIAGRAM -002
SEE NOTE 6

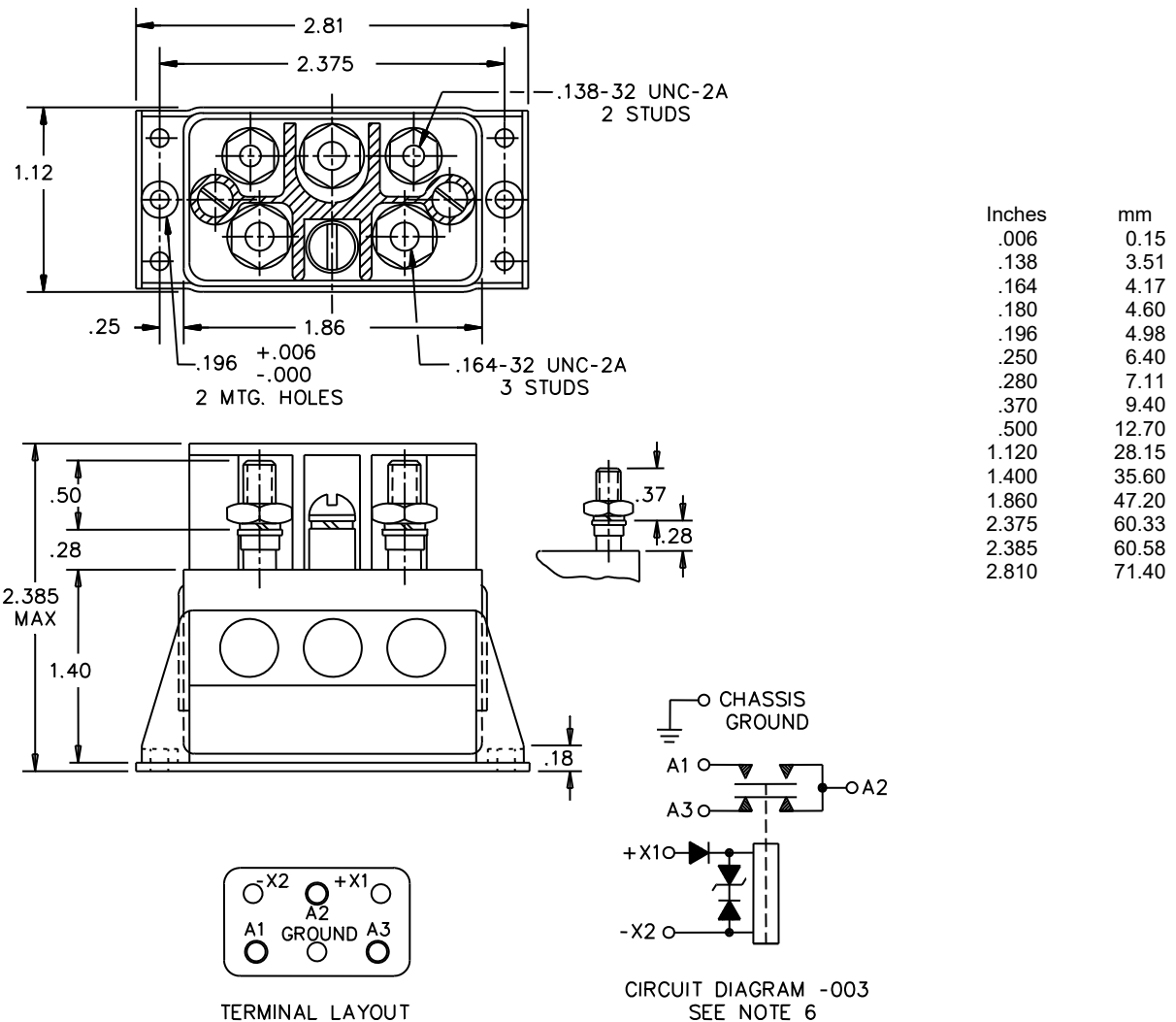


TERMINAL LAYOUT

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ± 0.03 (0.76 mm) for two place decimals and ± 0.010 (0.25 mm) for three place decimals.
4. Terminal identification and locations designated by diagram on relay case.
5. Relay shall not operate or be damaged by reverse coil polarity.
6. Coil transient voltage limited to ± 42 volts referenced to zero volts.

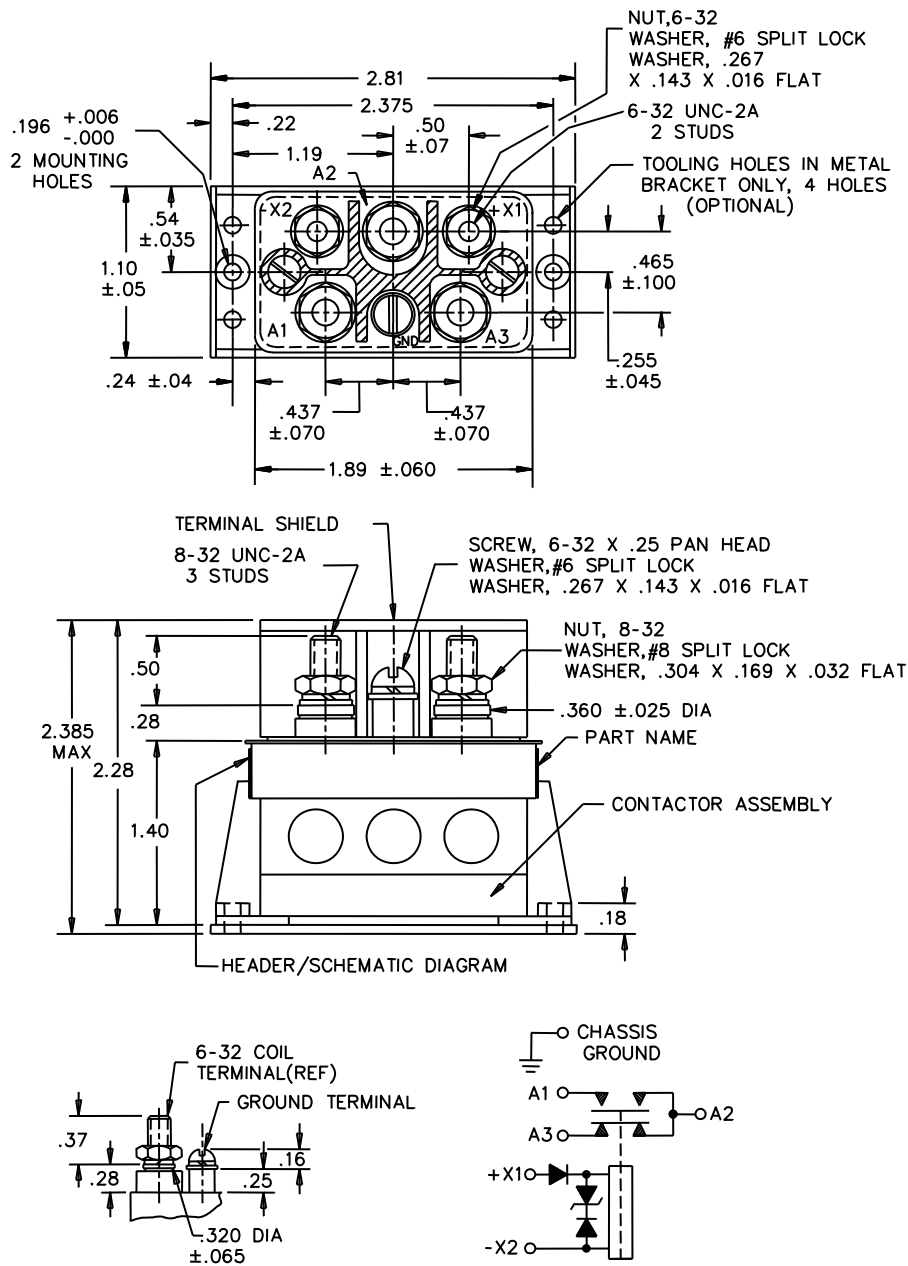
FIGURE 1. Configurations and dimensions (-001 and -002) - Continued.



NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ± 0.03 (0.76 mm) for two place decimals and ± 0.010 (0.25 mm) for three place decimals.
4. Terminal identification and locations designated by diagram on relay case.
5. Relay shall not operate or be damaged by reverse coil polarity.
6. Coil transient voltage limited to ± 42 volts referenced to zero volts.

FIGURE 2. Configurations and dimensions (-003).

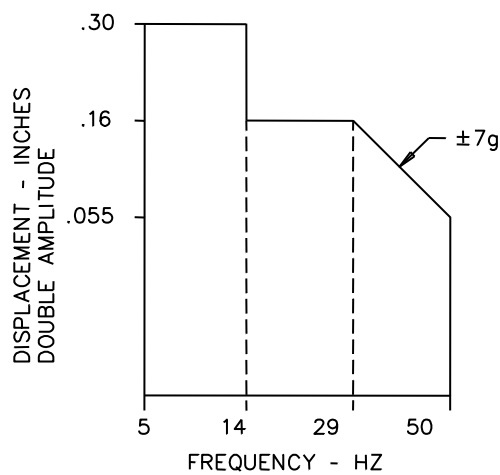
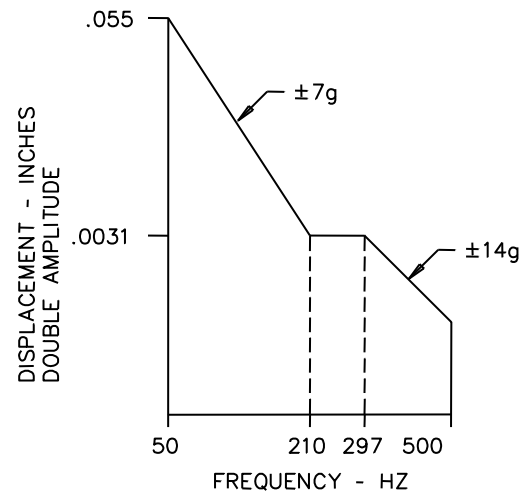


Inches	mm
.006	0.15
.016	0.41
.025	0.64
.032	0.81
.035	0.89
.040	1.00
.045	1.14
.050	1.27
.060	1.52
.065	1.65
.070	1.78
.080	2.00
.100	2.54
.143	3.63
.160	4.06
.169	4.29
.180	4.57
.196	4.98
.220	5.59
.240	6.10
.250	6.35
.255	6.48
.267	6.78
.280	7.11
.304	7.72
.320	8.13
.360	9.14
.370	9.40
.437	11.10
.440	11.18
.465	11.80
.500	12.70
.540	13.72
1.100	27.90
1.190	30.23
1.400	35.56
1.890	48.00
2.280	57.91
2.375	60.33
2.385	60.58
2.810	71.37

FIGURE 3. Configurations and dimensions (-004).

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ± 0.03 (0.76 mm) for two place decimals and ± 0.010 (0.25 mm) for three place decimals; and angles $\pm 0.5^\circ$.
4. Terminal identification and locations designated by diagram on relay case.
5. Internal contacts shall enable the product to meet the performance requirements of this specification and shall be approved by the qualifying activity. Preoxidized, silver cadmium oxide contacts have been considered acceptable.
6. Coil transient voltage limited to ± 42 volts referenced to zero volts.
7. Case shall be electrically insulated from mounting surface.
8. Terminal flat and lock washer may be reversed for shipping purposes. Drawing shows proper installation sequence.

FIGURE 3. Configurations and dimensions (-004) - Continued.FIGURE 4. Sinusoidal vibration
low frequency performance.FIGURE 5. Sinusoidal vibration
high frequency performance.

REQUIREMENTS

Dimensions and configurations: See [figure 1](#) through [figure 3](#).

Load ratings: See [table I](#).

TABLE I. Rated contact load (amperes per pole) (case grounded through 22 AWG wire).

Type of load	Life operating cycles X 10 ³		28 V dc			
	M6106/15 -001, -002, -003	M6106/15 -004	Main		Auxiliary	
			NO	NC	NO	NC
Resistive	50	55	50	50	---	---
Inductive	50	50 3/	50	50	---	---
Motor	50	55	20	20	---	---
Lamp	50	55	20 1/	20 1/	---	---
Mechanical life, reduced current	100	110	12.5	12.5	---	---
Mixed loads	50	55	5	5	---	---
Capacitive	---	10 2/	90 for 2 milliseconds	90 for 2 milliseconds	---	---

[1/](#) M6106/15-004 lamp load requirement is 10 amperes.

[2/](#) The capacitive load test for M106/15-004 shall be performed on units which have passed the burn-in test. The capacitive load test setup shall be in accordance with [figure 6](#).

[3/](#) Load suppression shall meet the requirements of [MIL-STD-704](#).

Burn-in test: All M6106/15-004 relays shall be subject to 500 electrical life cycles of operations with a resistive load of 50 amperes at 28 V dc applied to both normally open and normally closed contacts. Coil voltage shall be 20 V dc. One cycle shall consist of: 1 second ON, 1 second OFF. Contacts shall be monitored to verify conformance to table III operating characteristics. No failures are permitted.

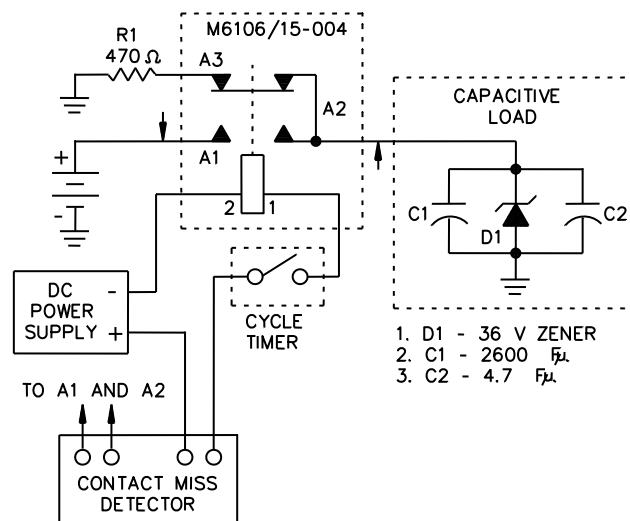


FIGURE 6. Capacitive load test for M6106/15-004.

MIL-PRF-6106/15F

Weight: .430 pound (195 grams) maximum for -001, -002, and -003.

.450 pound (204 grams) maximum for -004.

Temperature range: -70°C to +125°C.

Maximum altitude rating: 80,000 feet.

Shock g-level: 25 g.

Duration: 11 ms.

Maximum duration contact opening: 10 µs.

Vibration-sinusoidal (for -001, -002, and -003):

G-level: 15 g.

Frequency range: 10 to 2,000 Hz.

Acceleration (for -001, -002, and -003): 15 g.

Vibration-sinusoidal (for -004):

G-level: See [figure 4](#) and [figure 5](#).

Frequency range: 5 to 500 Hz (see [figure 4](#) and [figure 5](#)).

Low frequency, performance: [MIL-STD-202-201](#), applicable, except the frequency range/sweep rate shall be logarithmic from 5-50-5 Hz in 7.5 minutes at levels of [figure 4](#) herein. The total sweep time shall be 90 minutes per axis.

High frequency, performance: [MIL-STD-202-204](#), test condition A applicable, except the frequency range/sweep rate shall be logarithmic from 50-500-50 Hz in 7.5 minutes at levels of [figure 5](#) herein. The total sweep time shall be 30 minutes per axis.

Narrow band, performance: Narrow band sweeps shall be conducted, ±5 percent about each center frequency of [table II](#) herein, at approximately the same sweep rate as high frequency herein are applicable for each axis.

TABLE II. Sinusoidal vibration test schedule, narrow band performance.

Center frequencies for narrow band sweeps	Test time (minutes)
67 Hz	7.50
100 Hz	7.50
135 Hz	7.50
200 Hz	15.00
267 Hz	7.50
300 Hz	7.50
335 Hz	7.50
400 Hz	15.00
467 Hz	7.50
500 Hz	7.50
Total time each axis	90.00

MIL-PRF-6106/15F

Vibration-random (for -004): [MIL-STD-202-214](#).

Low level, performance: Test condition ID applies for a total test time of 30 minutes per axis.

High level, non-performance: Test condition IG applies for a total test time of 2 hours per axis.

High level, performance: Test condition IJ applies except the test frequency shall be the 500 to 2,000 Hz frequency band of the specified curve and rolloff of -9 dB/OCT with an overall GRMS of 29.5. The total test times shall be 30 minutes per axis.

Strength of terminals and mounting studs: See [MIL-PRF-6106](#).

Insulation resistance: 100 megohms.

Dielectric withstanding voltage (sea level):

All terminals (initial and after life tests): 1,050 V rms.

Dielectric withstanding voltage (altitude):

All terminals (initial and after life tests): 500 V rms.

Maximum contact voltage drop initial: 0.150 volt.

After life test: 0.175 volt.

Overload current: 400 amperes dc.

Rupture current: 500 amperes dc.

Duty rating: Continuous.

Qualification by similarity: See [MIL-PRF-6106](#).

Part or Identifying Number (PIN): M6106/15 (and a dash number from [table III](#)).

TABLE III. Dash number and operating characteristics.

Dash no.	Coil data								Time-milliseconds-max 5/		
	Nominal voltage (V dc) 1/	Max		Max pick-up voltage			Drop out voltage 3/ , 4/	Hold voltage 3/ , 4/	Operate	Release	Bounce
		V dc	Amp 2/	Normal 3/ , 4/	High temp. test	Cont. current test					
-001	28	30	.114	18	20	20	1.5	7.0	25	25	2
-002	28	30	.114	18	20	20	1.5	7.0	25	25	2
-003	28	32	.120	18	20	20	1.5	7.0	50	40	2
-004	28	32	.210	18	20	20	2.0	7.0	25 4/	40 4/	2 4/

[1/](#) CAUTION: Use of any coil voltage less than nominal voltage will compromise the operation of the relay.

[2/](#) At 25°C.

[3/](#) Pickup, hold, and dropout voltages shown are for test purposes only and shall not be used for design criteria.

[4/](#) Over the temperature range.

[5/](#) With nominal coil voltage.

[6/](#) Relay shall not operate or be damaged by reverse coil polarity.

For Government logistical purposes, use M6106/15-004 in lieu of the ST5M1629-002 and ST5M1629-003.

The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the previous issue.

Referenced documents. In addition to [MIL-PRF-6106](#), this document references the following:

[MIL-STD-202-201](#) [MIL-STD-202-204](#) [MIL-STD-202-214](#) [MIL-STD-704](#)

Custodians:

Navy - AS
Air Force - 85
DLA - CC

Preparing activity:

DLA - CC

(Project 5945-2021-034)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil/>.