

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Revised case design and electrical characteristics to conform to MIL-PRF-83532. Updated vendor table.	29 SEP 1987	Randy Larson
B	Changed footnote on page 5. Added vendor. Expanded information in 6.3.	7 JUL 1988	Randy Larson
C	Added two dash numbers (-12 and -13) and one vendor. Changed rise time requirement in 3.9. Editorial changes throughout.	27 SEP 1989	Randy Larson
D	Renumbered pins and added top view to figure 1. Added 3.25. Editorial changes throughout.	29 OCT 1991	David Moore
E	Added 3.3.3 and 6.3. Added note 6 to figure 1. Changed 1.2, 3.3.2, 4.1.1, and 6.2. Editorial changes throughout.	5 Jan 1993	David Moore
F	Validation and update.	6 May 2006	Kendall Cottongim
G	Performed editorial and boilerplate updates.	19 Jun 2008	Michael A. Radecki
H	Performed editorial and boilerplate updates. Removed two Approved Sources of Supply.	7 April 2014	Michael A. Radecki

CURRENT DESIGN ACTIVITY CAGE CODE 037Z3
 DEFENSE LOGISTICS AGENCY
 LAND AND MARITIME COLUMBUS
 COLUMBUS, OHIO 43218-3990

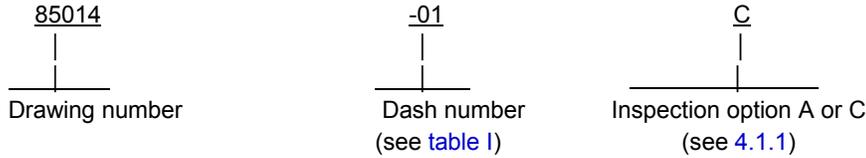
Prepared in accordance with ASME Y14.100

REV STATUS OF PAGES	REV	H	H	H	H	H	H	H	H	H								
	PAGES	1	2	3	4	5	6	7	8	9								
PMIC N/A	PREPARED BY Randy Larson							DESIGN ACTIVITY DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OH 45444-5000										
Original date of drawing 30 Aug 85	CHECKED BY Randy Larson							TITLE DELAY LINE, ACTIVE, 10 TAPS, 14 PIN DIP, TTL INTERFACED										
	APPROVED BY Ivan R. Jones																	
	SIZE A	CODE IDENT. NO. 14933						DWG NO. 85014										
	REV H							PAGE 1 OF 9										

1. SCOPE

1.1 Scope. This drawing describes the requirements for a family of TTL interfaced active delay lines with 14 pins and 10 taps.

1.2 Part or Identifying Number (PIN). The complete PIN shall be as follows:



2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

- [MIL-DTL-31000](#) - Technical Data Packages.
- [MIL-PRF-38535](#) - Integrated Circuits (Microcircuits) Manufacturing, General Specification For.
- [MIL-PRF-83532](#) - Delay Lines, Active, General Specification For.

DEPARTMENT OF DEFENSE STANDARD

- [MIL-STD-1285](#) - Marking of Electrical and Electronic Parts
- [MIL-STD-883](#) - Microcircuits.

(Copies of these documents are available online at <http://quicksearch.dla.mil/> or <https://assist.dla.mil/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

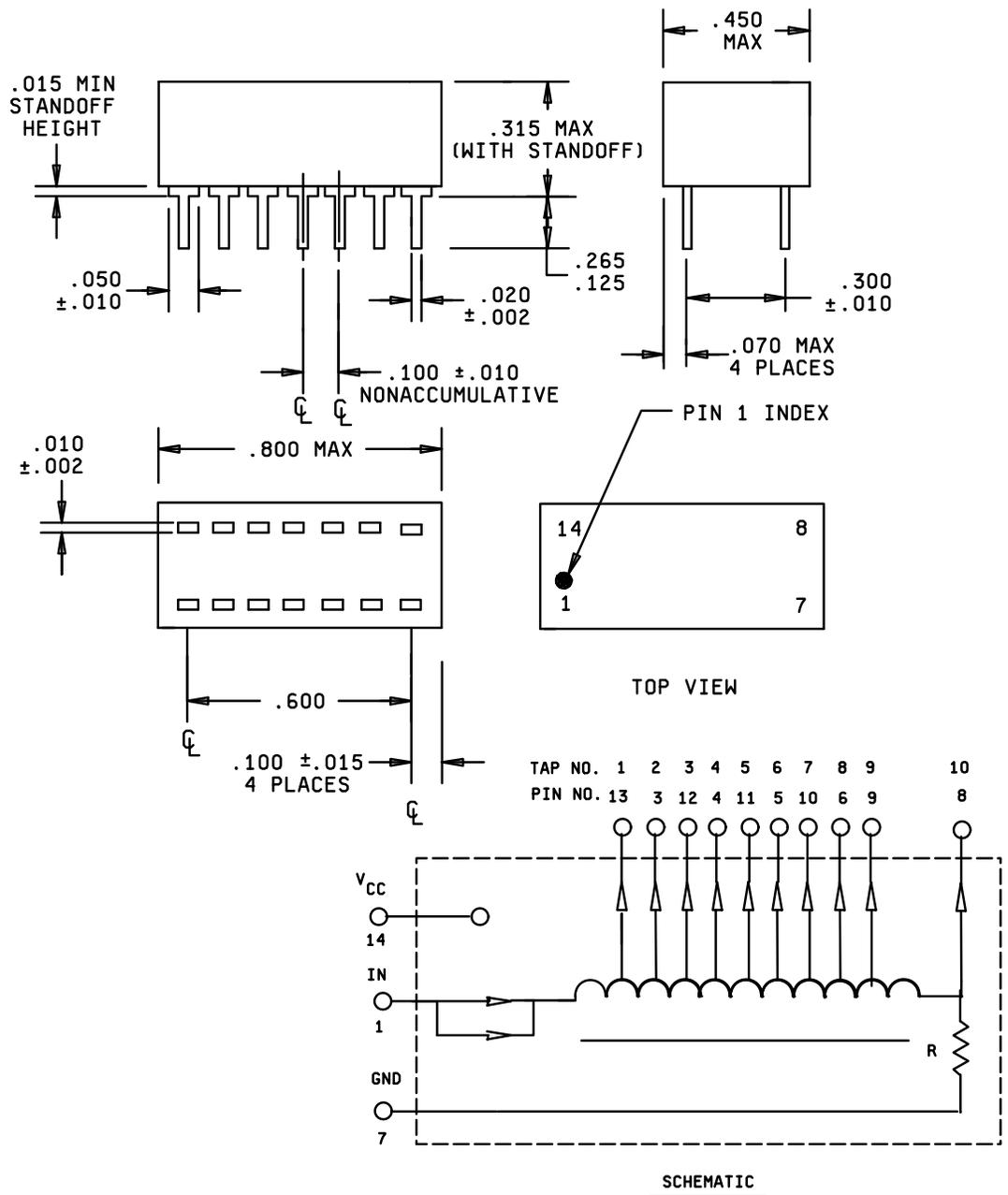
3.1 Interface and physical dimensions. This drawing shall be interpreted in accordance with [MIL-DTL-31000](#).

3.2 Materials.

3.2.1 Case. Case material shall be molded or encapsulated epoxy and shall conform to [MIL-PRF-83532](#).

3.2.2 Terminals. Terminal material and finish shall be in accordance with [MIL-PRF-38535](#).

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Inches	mm
.002	0.05
.010	0.25
.015	0.38
.020	0.51
.050	1.27
.060	1.52
.070	1.78
.100	2.54
.125	3.18
.265	6.73
.300	7.62
.315	8.00
.450	11.43
.600	15.24
.800	20.32

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are for general information only.
3. Unless otherwise specified, tolerance is $\pm .005$ (0.13 mm).
4. Pin number 2 is not connected and may be omitted at the manufacturer's option.
5. Location and shape of standoffs are optional. Height shall be as indicated.
6. Leads shall be free of case meniscus and other foreign material and shall be solderable for a minimum of .010 inch (0.25 mm) above the seating plane of the delay line.

FIGURE 1. Design, construction, and dimensions.

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- 3.2.3 Microcircuits. Microcircuits shall meet the requirements of [MIL-STD-883](#), level B (minimum).
- 3.3 Design, construction, and dimensions. See [figure 1](#).
- 3.4 PIN's. See [table II](#).
- 3.5 Delay time. Delay time from input to all taps shall be as specified in [tables I](#) and [II](#).
- 3.6 Delay time variation with temperature. See [tables I](#) and [II](#).
- 3.7 Delay tolerance. See [tables I](#) and [II](#).
- 3.8 Rise time (applied to leading edge only). Rise time shall be 4 nanoseconds (ns) maximum for dash numbers -01 through -11. Rise time shall be 5 ns maximum for dash numbers -12 and -13. Conditions (T_C -55°C to +125°C): $V_{CC} = 5.0$ V; $TR_1 \leq 3$ ns; $C_L = 50$ pF; $R_L = 500$ ohms.
- 3.9 Input pulse width. Delay lines shall be capable of passing a minimum input pulse width of 50 percent of total delay time.
- 3.10 DC characteristics. See [table III](#).
- 3.11 Logic 1 fanout. Twenty per unit maximum (one tap capable of driving 20 TTL inputs).
- 3.12 Logic 0 fanout. Ten per tap maximum (one tap capable of driving 10 TTL inputs).
- 3.13 Thermal shock. In accordance with [MIL-PRF-83532](#).
- 3.14 Sealing. In accordance with [MIL-PRF-83532](#).
- 3.15 Terminal strength. In accordance with [MIL-PRF-83532](#).
- 3.16 Vibration. In accordance with [MIL-PRF-83532](#).
- 3.17 Shock. In accordance with [MIL-PRF-83532](#).
- 3.18 Immersion. In accordance with [MIL-PRF-83532](#).
- 3.19 Moisture resistance. In accordance with [MIL-PRF-83532](#).
- 3.20 Solderability. In accordance with [MIL-PRF-83532](#).
- 3.21 Resistance to solvents. In accordance with [MIL-PRF-83532](#).
- 3.22 Operating temperature range. Operating temperature range shall be -55°C to +125°C.
- 3.23 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.
- 3.24 Manufacturer eligibility. To be eligible for listing as an approved source of supply, a manufacturer shall be listed on the [MIL-PRF-83532](#) Qualified Product List for at least one part, or perform the group A and group B inspections specified herein on a sample of parts agreed upon by the manufacturer and DLA Land and Maritime-VA.

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3.25 Certificate of compliance. A certificate of compliance shall be required from manufacturers requesting to be an approved source of supply.

3.26 Pure tin. The use of pure tin, as an underplate or final finish is prohibited both internally and externally. Tin content of delay lines components and solder shall not exceed 97 percent, by mass. Tin shall be alloyed with a minimum of 3 percent lead, by mass (see 6.3).

3.27 Marking. Marking shall be in accordance with MIL-STD-1285, except the (part name) shall be marked with the PIN as specified herein (see 1.2), the manufacturer's name or Commercial and Government Entity (CAGE) code, and date lot codes

3.28 Workmanship. The delay line shall be uniform in quality and free from any defects that will affect life, serviceability, or appearance in accordance with MIL-PRF-83532.

TABLE I. Dash numbers and delay characteristics at 25°C, V_{CC} = 5.00 ±.01 volts. 1/

Dash number	Tap 1 pin 13	Tap 2 pin 3	Tap 3 pin 12	Tap 4 pin 4	Tap 5 pin 11	Tap 6 pin 5	Tap 7 pin 10	Tap 8 pin 6	Tap 9 pin 9	Tap 10 pin 8
01	6 ±2 ns	1 ±2 ns	2 ±2 ns	3 ±2 ns	4 ±2 ns	5 ±2 ns	6 ±2 ns	7 ±2ns	8 ±2 ns	9 ±2 ns
02	6 ±2 ns	2 ±2 ns	4 ±2 ns	6 ±2 ns	8 ±2 ns	10 ±2 ns	12 ±2 ns	14 ±2 ns	16 ±2 ns	18 ±2 ns
03	6 ±2 ns	2.5 ±2 ns	5 ±2 ns	7.5 ±2 ns	10 ±2 ns	12.5 ±2 ns	15 ±2 ns	17.5 ±2 ns	20 ±2 ns	22.5 ±2 ns
04	5 ±2 ns	10 ±2 ns	15 ±2 ns	20 ±2 ns	25 ±2 ns	30 ±2 ns	35 ±2 ns	40 ±2 ns	45 ±5%	50 ±5%
05	10 ±2 ns	20 ±2 ns	30 ±2 ns	40 ±2 ns	50 ±5%	60 ±5%	70 ±5%	80 ±5%	90 ±5%	100 ±5%
06	15 ±2 ns	30 ±2 ns	45 ±5%	60 ±5%	75 ±5%	90 ±5%	105 ±5%	120 ±5%	135 ±5%	150 ±5%
07	20 ±2 ns	40 ±2 ns	60 ±5%	80 ±5%	100 ±5%	120 ±5%	140 ±5%	160 ±5%	180 ±5%	200 ±5%
08	25 ±2 ns	50 ±5%	75 ±5%	100 ±5%	125 ±5%	150 ±5%	175 ±5%	200 ±5%	225 ±5%	250 ±5%
09	30 ±2 ns	60 ±5%	90 ±5%	120 ±5%	150 ±5%	180 ±5%	210 ±5%	240 ±5%	270 ±5%	300 ±5%
10	40 ±2 ns	80 ±5%	120 ±5%	160 ±5%	200 ±5%	240 ±5%	280 ±5%	320 ±5%	360 ±5%	400 ±5%
11	50 ±5%	100 ±5%	150 ±5%	200 ±5%	250 ±5%	300 ±5%	350 ±5%	400 ±5%	450 ±5%	500 ±5%
12	60 ±5%	120 ±5%	180 ±5%	240 ±5%	300 ±5%	360 ±5%	420 ±5%	480 ±5%	540 ±5%	600 ±5%
13	70 ±5%	140 ±5%	210 ±5%	280 ±5%	350 ±5%	420 ±5%	490 ±5%	560 ±5%	630 ±5%	700 ±5%

1/ Delays at taps 2 through 10 are referenced to tap 1 for dash numbers 01, 02, and 03.

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TABLE II. Dash numbers and delay characteristics at -55°C, and +125°C, $V_{CC} = 5.00 \pm 0.01$ volts. 1/

Dash number	Tap 1 pin 13	Tap 2 pin 3	Tap 3 pin 12	Tap 4 pin 4	Tap 5 pin 11	Tap 6 pin 5	Tap 7 pin 10	Tap 8 pin 6	Tap 9 pin 9	Tap 10 pin 8
01	6 ±3 ns	1 ±3 ns	2 ±3 ns	3 ±3 ns	4 ±3 ns	5 ±3 ns	6 ±3 ns	7 ±3 ns	8 ±3 ns	9 ±3 ns
02	6 ±3 ns	2 ±3 ns	4 ±3 ns	6 ±3 ns	8 ±3 ns	10 ±3 ns	12 ±3 ns	14 ±3 ns	16 ±3 ns	18 ±3 ns
03	6 ±3 ns	2.5 ±3 ns	5 ±3 ns	7.5 ±3 ns	10 ±3 ns	12.5 ±3 ns	15 ±3 ns	17.5 ±3 ns	20 ±3 ns	22.5 ±3 ns
04	5 ±3 ns	10 ±3 ns	15 ±3 ns	20 ±3 ns	25 ±3 ns	30 ±3 ns	35 ±3 ns	40 ±8%	45 ±8%	50 ±8%
05	10 ±3 ns	20 ±3 ns	30 ±3 ns	40 ±8%	50 ±8%	60 ±8%	70 ±8%	80 ±8%	90 ±8%	100 ±8%
06	15 ±3 ns	30 ±3 ns	45 ±8%	60 ±8%	75 ±8%	90 ±8%	105 ±8%	120 ±8%	135 ±8%	150 ±8%
07	20 ±3 ns	40 ±8%	60 ±8%	80 ±8%	100 ±8%	120 ±8%	140 ±8%	160 ±8%	180 ±8%	200 ±8%
08	25 ±3 ns	50 ±8%	75 ±8%	100 ±8%	125 ±8%	150 ±8%	175 ±8%	200 ±8%	225 ±8%	250 ±8%
09	30 ±3 ns	60 ±8%	90 ±8%	120 ±8%	150 ±8%	180 ±8%	210 ±8%	240 ±8%	270 ±8%	300 ±8%
10	40 ±8%	80 ±8%	120 ±8%	160 ±8%	200 ±8%	240 ±8%	280 ±8%	20 ±8%	360 ±8%	400 ±8%
11	50 ±8%	100 ±8%	150 ±8%	200 ±8%	250 ±8%	300 ±8%	350 ±8%	400 ±8%	450 ±8%	500 ±8%
12	60 ±8%	120 ±8%	180 ±8%	240 ±8%	300 ±8%	360 ±8%	420 ±8%	480 ±8%	540 ±8%	600 ±8%
13	70 ±8%	140 ±8%	210 ±8%	280 ±8%	350 ±8%	420 ±8%	490 ±8%	560 ±8%	630 ±8%	700 ±8%

1/ Delays at taps 2 through 10 are referenced to tap 1 for dash numbers 01, 02, and 03.

TABLE III. DC characteristics.

Test	Symbol	Conditions $-55^{\circ}\text{C} \leq T_C \leq +125^{\circ}\text{C}$	Limits		Unit
			Min	Max	
High level output voltage	V_{OH}	$V_{CC} = 4.5\text{ V}$ $V_{IH} = 2.0\text{ V}$ $I_{OH} = -1\text{ mA}$	2.5		V
Low level output voltage	V_{OL}	$V_{CC} = 4.5\text{ V}$ $V_{IL} = 0.8\text{ V}$ $I_{OL} = 20\text{ mA}$	---	0.5	V
Input clamp voltage	V_{IC}	$V_{CC} = 4.5\text{ V}$ $I_I = -18\text{ mA}$ $T_C = +25^{\circ}\text{C}$	---	-1.2	V
High level input current	I_{IH1}	$V_{CC} = 5.5\text{ V}$ $V_{IH} = 2.7\text{ V}$	---	100	μA
	I_{IH2}	$V_{CC} = 5.5\text{ V}$ $V_{IH} = 5.5\text{ V}$	---	2,000	μA

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TABLE III. DC characteristics - Continued

Test	Symbol	Conditions $-55^{\circ}\text{C} \leq T_c \leq +125^{\circ}\text{C}$	Limits		Unit
			Min	Max	
Low level input current	I_{IL}	$V_{CC} = 5.5\text{ V}$ $V_{IL} = 0.5\text{ V}$	---	-4.00	mA
Short circuit output current	I_{OS}	$V_{CC} = 5.5\text{ V}$ $V_{OS} = 0.0\text{ V}$ (Not more than one output shorted at a time)	-40	-150	mA
Low level supply current	I_{CCL}	$V_{CC} = 5.5$ $V_I = 0.0\text{ V}$	---	130	mA

4. QUALITY ASSURANCE PROVISIONS

4.1 Conformance inspection.

4.1.1 Inspection of product for delivery. Inspection of product for delivery shall consist of option A or option C (see [table IV](#)) as stipulated by the acquiring activity. The tests listed shall be performed in the order shown and shall be in accordance with the group A inspection of [MIL-PRF-83532](#).

TABLE IV. Inspection of product for delivery.

Option A	Option C
Subgroup I	Subgroup I
Thermal shock (15 cycles)	Delay time
Seal	Rise time
Delay time	DC characteristics
Rise time	
DC characteristics	
Subgroup II	Subgroup II
Delay time at temperature extremes	Delay time at temperature extremes
Dimensions	Dimensions
Visual inspection	Visual inspection

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5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

6.1 Intended use. Delay lines conforming to this drawing are intended for use when military specifications do not exist and when devices that will perform the required function are not available for OEM application. Items conforming to this drawing will replace similar items manufactured in accordance with contractor-prepared specifications and drawings.

6.2 Ordering data. The contract or purchase order should specify the following:

- a. Complete PIN (see 1.2).
- b. Requirement for delivery of one copy of the conformance inspection data or certificate of compliance that parts have passed conformance inspection with each shipment of parts by the manufacturer.
- c. Requirement for the manufacturer to notify the contracting activity in the event of a change in product.
- d. Requirements for packaging and packing.

6.3 Supersession data. Effective with revision E of this drawing, a suffix letter (see 1.2 and 4.1.1) shall be used in the PIN by the acquiring activity to denote the extent of acceptance testing desired. PIN's which include an 'A' suffix supersede all PIN's listed in previous revisions.

6.4 Tin whisker growth. The use of alloys with tin content greater than 97 percent, by mass, may exhibit tin whisker growth problems after manufacture. Tin whiskers may occur anytime from a day to years after manufacture and can develop under typical operating conditions, on products that use such materials. Conformal coatings applied over top of a whisker-prone surface will not prevent the formation of tin whiskers. Alloys of 3 percent lead, by mass, have shown to inhibit the growth of tin whiskers. For additional information on this matter, refer to [ASTM-B545](#) (Standard Specification for Electrodeposited Coatings of Tin).

6.5 Users of record. Coordination of this document for future revisions is coordinated only with the approved source(s) of supply and the users of record of this document. Requests to be added as a recorded user of this drawing may be achieved online at <mailto:relay@dla.mil> or if in writing to: DLA Land and Maritime, Columbus, ATTN: DLA Land and Maritime/VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-4481 or DSN 850-4481.

6.6 Approved source(s) of supply. Approved source(s) of supply are listed herein. Additional sources will be added as they become available. Assistance in the use of this drawing may be obtained online at <mailto:relay@dla.mil>, or by contacting DLA Land and Maritime, Columbus, ATTN: DLA Land and Maritime-VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-4481 or DSN 850-4481.

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DESC drawing PIN 85014- ^{1/}	Vendor CAGE codes and similar PIN's ^{1/}
	CAGE 22519
01	DDU7-8497-1
02	DDU7-8497-2
03	DDU7-8497-3
04	DDU7-8497-4
05	DDU7-8497-5
06	DDU7-8497-6
07	DDU7-8497-7
08	DDU7-8497-8
09	DDU7-8497-9
10	DDU7-8497-10
11	DDU7-8497-11
12	DDU7-8497-12
13	DDU7-8497-13

^{1/} Parts must be purchase to the DLA Land and Maritime PIN to assure that all performance requirements and tests are met.

Vendor CAGE
code

Vendor name and address

22519

Data Delay Devices, Incorporated
3 Mount Prospect Avenue
Clifton, NJ 07013-1915
(973) 773-2299

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