



SYNCHRO TO ARINC 429 HS CONVERTER

P/N: 933800-24

INSTALLATION MANUAL

REV B

**Shadin Avionics
6831 Oxford Street
St. Louis Park, MN 55426
USA**

**Sales: (800) 328-0584
Technical Support: (800) 388-2849
WWW.SHADIN.COM**

MANUAL P/N: IM3800-24

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| 4038-150 | Installation, Synchro to ARINC 429 HS Converter, P/N 933800-24 | Apr. 15, 1997 | – |
| 4038-055 | Installation, Remote Mounting Tray P/N 613253-6 | Apr. 15, 2003 | B |
| N/A | Parts List, Install Kit P/N IK9338 | Feb. 9, 2007 | D |

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REVISION LOG

| REV. | DATE | APP'D | CHANGE |
|------|---------|-------|--|
| - | 6-6-01 | ZK | Baseline Release |
| A | 9-13-05 | CB | Updated Company Name, Install Dwg, Install Kit, ECO 0509/014 |
| B | 2-23-07 | ZK | Updated Company Name, Logo, and Install Kit |
| | | | |
| | | | |
| | | | |
| | | | |

The information in this manual is subject to change without notification. To ensure complete and current updates, note the Revision Log above and call Technical Assistance for updated information.

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1. OVERVIEW

1.1 THE MANUAL

This manual is intended to guide the proper installation of the SYNCHRO to ARINC 429 HS Converter. Installation instructions should be read and followed.

1.2 PRODUCT DESCRIPTION

This is a general purpose converter, which can be used whenever Synchro to ARINC 429 High speed conversion is required. The purpose of the SYNCHRO TO ARINC 429 HS CONVERTER is to receive three 3-wire Synchro ARINC 407 inputs: pitch, roll and magnetic heading. The received labels are then converted to ARINC 429 high speed. The output labels are: 320 (Magnetic Heading), 324 (Pitch) and 325 (Roll). It also receives 3 discrete flag inputs which are used to enable or disable the output of ARINC 429 labels associated with roll (325), pitch (324) and magnetic heading (320). In addition, the converter outputs a “canned” discrete label 270 with data bit 14 set to a valid (1) state and all other data bits set to zero (0). The converter contains a strapping input, flag 4 that when strapped high (28VDC) disables label 270 output.

The format and output rates for the ARINC 429 HS data is as shown below.

| Label | Description | TX Interval |
|-------|-------------------------|-------------|
| 320 | Heading | 50msec |
| 324 | Pitch | 20msec |
| 325 | Roll | 20msec |
| 270 | Canned Data, Bit 14 set | 500msec |

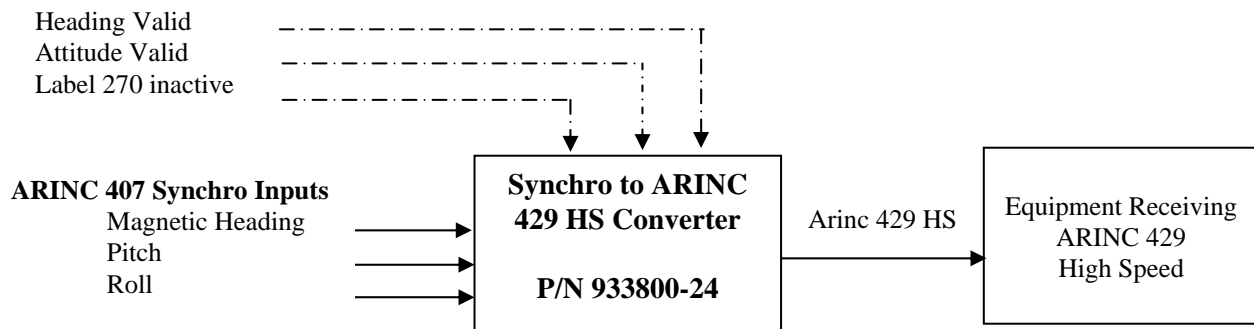


Figure 1. Functional Block Diagram

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1.3 SPECIFICATIONS**Physical Specifications:**

Box Size: 8.562L x 3.305W x 3.680H (Inches)
 Weight: 1.5 lbs.
 Mounting: Rack

Electrical and Functional:

Power Supply Voltage +28VDC or 26VAC 400Hz
 Supply Current 300mA at 28VDC
 Protection Not internally fused

Inputs:

Magnetic Heading, ARINC 407 3-wire Synchro
 Pitch, ARINC 407 3-wire Synchro
 Roll, ARINC 407 3-wire Synchro
 Heading Reference, 26VAC 400Hz Excitation 11.8V_{L-L}

Outputs:

ARINC 429 High Speed Labels:
 320 (Magnetic Heading)
 324 (Pitch)
 325 (Roll)

Environmental:

Categories: RTCA/DO-160C (By similarity to 933800-21)
 F1-CABS2(B2)XXXXXXXXZBAZZVVLXXX

Operating Temperature -20°C to +55°C
 Storage Temperature -55°C to +85°C
 Operating Altitude Up to 55,000 FT
 In-flight loss of Cooling Equipment can run indefinitely with no cooling

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1.4 INPUTS

This section specifies the interfaces for the Shadin Avionics SYNCHRO TO ARINC 429 HS CONVERTER.

ARINC 407 3-wire Synchro Inputs:

Magnetic Heading

Pitch

Roll

1.5 OUTPUTS

ARINC 429 High Speed Labels

| Label | Description | Transmit Interval |
|-------|------------------|-------------------|
| 320 | Magnetic Heading | 50msec |
| 324 | Pitch | 20msec |
| 325 | Roll | 20msec |

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2. INSTALLATION PROCEDURE

2.1 MOUNTING

The SYNCHRO TO ARINC 429 HS CONVERTER (P/N 933800-24) should be mounted in a dry location and the equipment should be installed in a temperature controlled, non-pressurized location.

The converter should be mounted according to Installation Drawing No. 4038-150, using the hardware included in the Install Kit provided, P/N IK9338.

2.2 ELECTRICAL CONNECTIONS

Connection to Power Supply

| 933800-24 | | Description |
|-----------|----|-----------------|
| J1:7 | To | +28VDC Power IN |
| J1:8, 9 | To | Power GND |
| J1:1, 2 | To | H, 26VAC 400Hz |
| J1:5, 6 | To | C, 26VAC 400Hz |

Inputs

| 933800-24 | | Description |
|-----------|----|-----------------------------------|
| J3:1 | To | Pitch Z Input |
| J3:2 | To | Pitch Y Input |
| J3:3 | To | Pitch X Input |
| J3:4 | To | GND |
| J3:5 | To | Roll Z Input |
| J3:6 | To | Roll Y Input |
| J3:7 | To | Roll X Input |
| J3:8 | To | GND |
| J3:9 | To | Heading Z Input |
| J3:10 | To | Heading Y Input |
| J3:11 | To | Heading X Input |
| J3:12 | To | GND |
| J3:13 | To | Reference H, 26VAC 400Hz |
| J3:14 | To | Reference C, 26VAC 400Hz |
| J3:21 | To | Flag 1, Sig (+), Heading |
| J3:22 | To | Flag 2, Sig (+), Attitude |
| J3:24 | To | Flag 4, Sig (+), Label 270 EN/DIS |
| J3:29 | To | Flag 1, Return, Heading |
| J3:30 | To | Flag 2, Return, Attitude |
| J3:32 | To | Flag 4, Return, Label 270 EN/DIS |

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Outputs

| 933800-24 | | Description |
|------------------|----|-----------------------|
| J4:1 | To | TX ARINC 429 B Output |
| J4:3 | To | TX ARINC 429 A Output |
| J4: 4 | To | GND (Shield) |

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This EQF pertains to P/N 933800-21 which is a different Shadin P/N. It is a superset of the hardware used in P/N 933800-24. This data can be used to qualify P/N 933800-24 to RTCA/DO-160C standards by similarity.

3.0 ENVIRONMENTAL QUALIFICATION FORM (EQF)**NOMENCLATURE:** ARINC 429 IN – ARINC 561 OUT CONVERTER**TYPE/MODEL/PART NO:** 933800-21 **TSO NUMBER:** C5e**MANUFACTURER'S SPECIFICATION AND/OR OTHER APPLICABLE SPECIFICATION:**

Report 4038-21, RTCA/DO-160C

MANUFACTURER: Shadin Avionics**ADDRESS:** 6831 Oxford Street, St. Louis Park, Minnesota 55426-4412

| <u>CONDITIONS</u> | <u>SECTION</u> | <u>DESCRIPTION OF TESTS CONDUCTED</u> |
|------------------------------------|-----------------------|--|
| Temperature and Altitude | 4.0 | Tested to Category F1. |
| Low Temperature | | |
| High Temperature | | |
| Altitude | | |
| Decompression | | |
| Overpressure | | |
| Temperature Variation | 5.0 | Tested to Category C. |
| Humidity | 6.0 | Tested to Category A. |
| Operational Shock and Crash Safety | 7.0 | Tested to Category B. |
| Vibration | 8.0 | Tested to Category S2 (B2). |
| Explosion | 9.0 | Identified as Category X. Not tested |
| Waterproofness | 10.0 | Identified as Category X. Not tested. |
| Fluids Susceptibility | 11.0 | Identified as Category X. Not tested. |

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ENVIRONMENTAL QUALIFICATION FORM (Cont.)

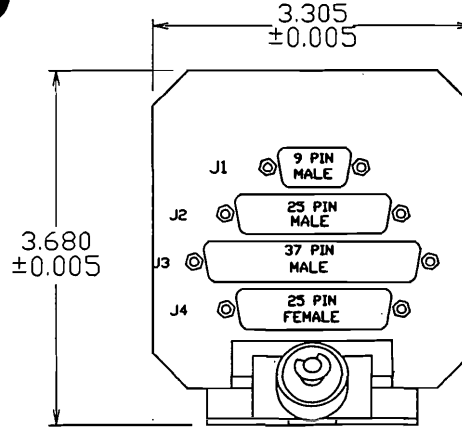
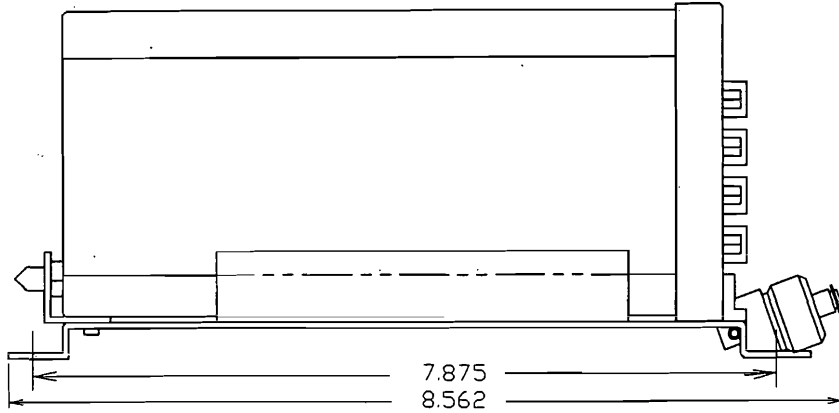
| <u>CONDITIONS</u> | <u>SECTION</u> | <u>DESCRIPTION OF TESTS CONDUCTED</u> |
|--|-----------------------|--|
| Sand and Dust | 12.0 | Identified as Category X. Not tested. |
| Fungus | 13.0 | Identified as Category X. Not tested. |
| Salt Spray | 14.0 | Identified as Category X. Not tested. |
| Magnetic Effect | 15.0 | Tested to Category Z. |
| Power Input | 16.0 | Tested to Category B. |
| Voltage Spike | 17.0 | Tested to Category A. |
| Audio Frequency Susceptibility | 18.0 | Tested to Category Z. |
| Induced Signal Susceptibility | 19.0 | Tested to Category Z. |
| Radio Frequency Susceptibility | 20.0 | Tested to Category VV. |
| Radio Frequency Emission | 21.0 | Tested to Category L. |
| Lightning Induced Transient Susceptibility | 22.0 | Identified as Category X. Not tested. |
| Lightning Direct Effects | 23.0 | Identified as Category X. Not tested. |
| Icing | 24.0 | Identified as Category X. Not tested. |

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SECTION 4.0

**INSTALLATION DRAWINGS AND
INSTALL KIT PARTS LISTS**

The following drawings are arranged in the sequence specified on page i of the Page Control Chart.



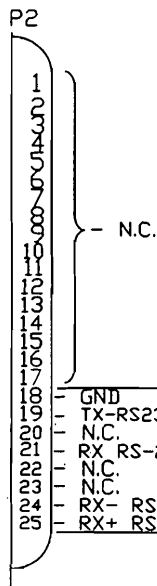
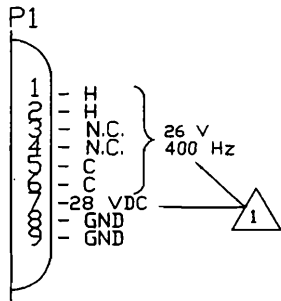
MATING CONNECTORS:

P1 - FEMALE
M24308/2-1 (CINCH)
DE-24657 (CINCH)
2061K-ND (KEYSTONE) (2)

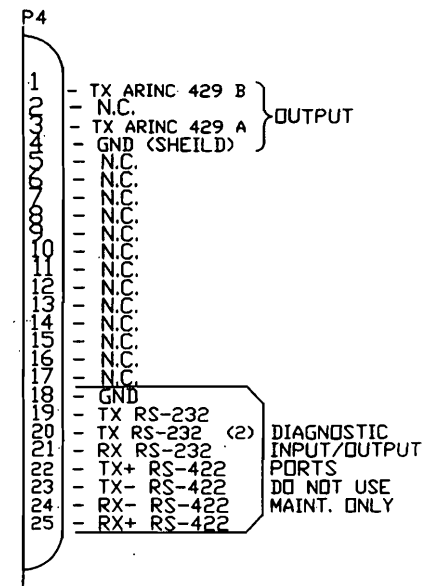
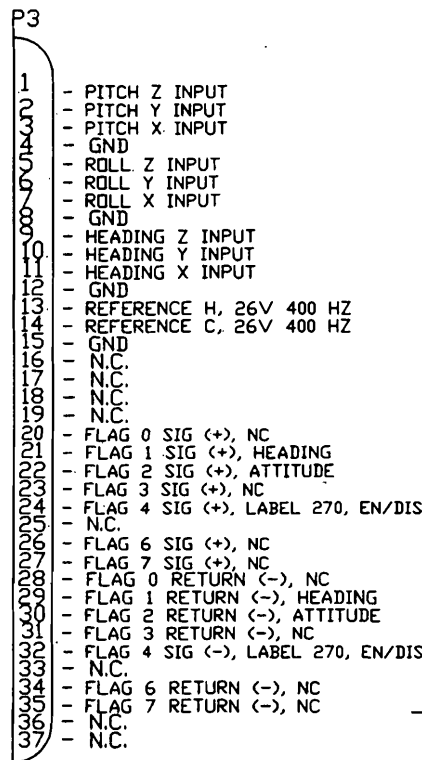
P2 - FEMALE
M24308/2-3 (CINCH)
DB-24659 (CINCH)
2061K-ND (KEYSTONE) (2)

P3 - FEMALE
M24308/2-4 (CINCH)
DC-24660 (CINCH)
2061K-ND (KEYSTONE) (2)

P4 - MALE
M24308/4-3 (CINCH)
DB-24659 (CINCH)
2061K-ND (KEYSTONE) (2)



DIAGNOSTIC
INPUT/OUTPUT
PORTS
DO NOT USE
MAINT. ONLY



DIAGNOSTIC
INPUT/OUTPUT
PORTS
DO NOT USE
MAINT. ONLY

NOTES

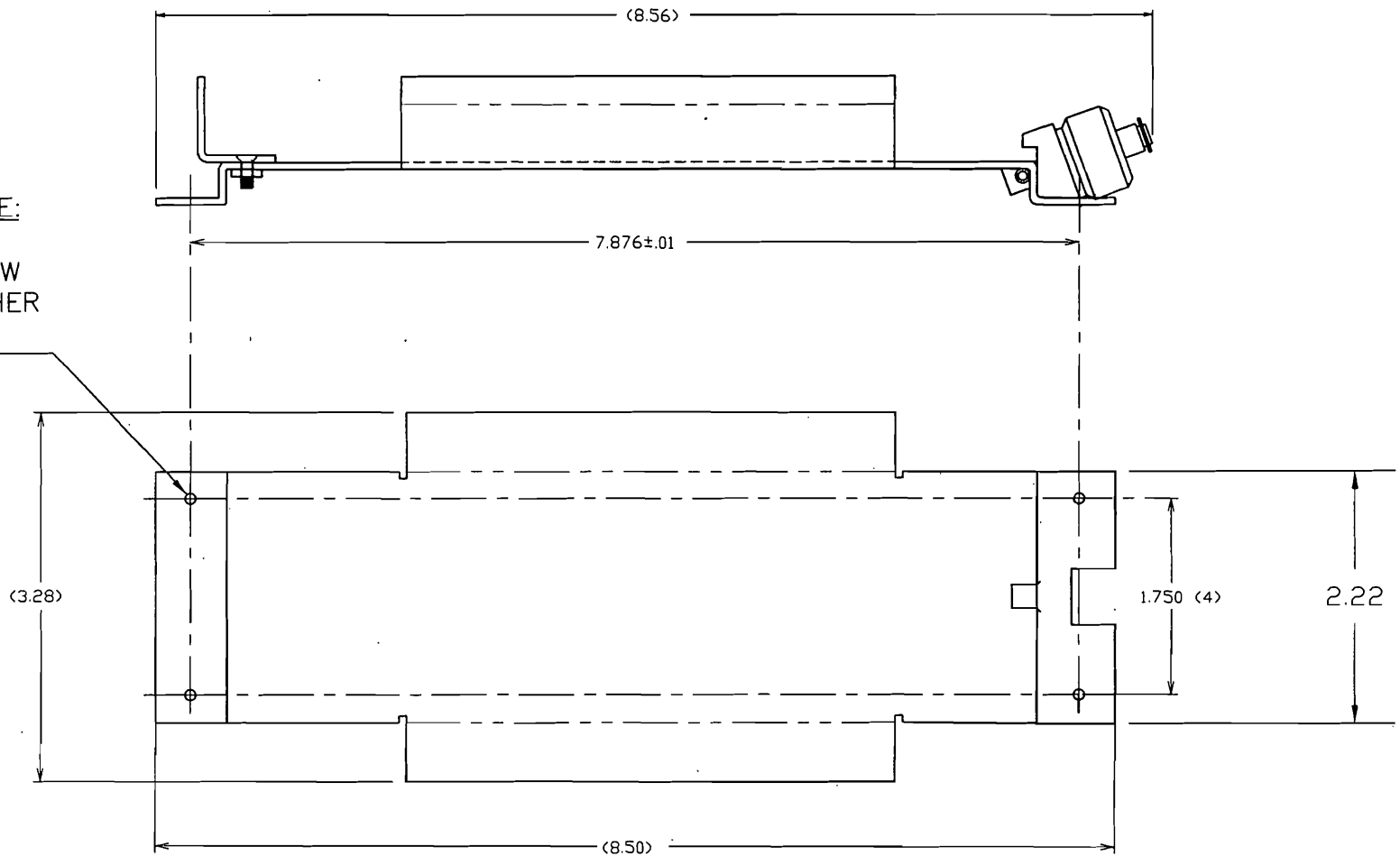
1 - THE CONVERTER IS SET UP TO ACCEPT 26 VAC. OR 28 VDC. DO NOT USE BOTH.

| | | | |
|-----------------------------|---|-----------|----------|
| DRAWING DATE 4/15/97 | SHADIN MINNEAPOLIS, MN 55426 | | |
| DRAFTSMAN PAB | INSTALLATION, SYNCHRO TO ARINC 429 HS CONV | | |
| APPROVED PG | DRAWING NO. 4038-150 | SIZE A | REV - |
| FILE NAME 933800-24-JDWG | P/N933800-24 | | |
| DIRECTORY 933800-24 | SHEET 1 OF 1 | | |

| | | | | | |
|----------|------|---------|-----|-------|-----------------|
| 9704/024 | - | 4/15/97 | PAB | PG | BASLINE RELEASE |
| ECD # | REV. | DATE | BY | APP'D | DESCRIPTION |

SCALE: NONE

INSTALLATION HARDWARE:
 (TYP. 4 PLACES)
 AN 526-632R8 SCREW
 AN 960-6 WASHER
 AN 364-632 NUT



| | | | |
|---|-------------------------------------|-----------|--------------|
| DRAWING DATE 10/31/94 | SHADIN MINNEAPOLIS, MN 55426 | | |
| DRAFTER WMP | INSTALLATION, REMOTE MOUNTING TRAY | | |
| APPROVED SES | DRAWING NO. 4038-055 | SIZE A | P/N 613253-6 |
| FILE NAME 613253-6B.DWG DIRECTORY 613253-6 | REV B | | |

| ECO # | REV. | DATE | BY | APP'D | DESCRIPTION |
|----------|------|----------|-----|-------|---|
| 0303/041 | B | 4/15/03 | PAB | ZK | ADJUSTED DIMENSIONS |
| 9912/005 | A | 12/10/99 | LJM | AR | CONVERT FROM DESIGN CAD TO ACAD, ADD TEXT |
| 9410/026 | - | 10/31/94 | WMP | SES | BASELINE RELEASE |

SCALE: NONE

SHEET 1 OF 1

Report: 4038-21
 ECO Date: February 8, 2007
 Rev: D
 Sec.: IX
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ECO # 0702/003
 Release date: 2-9-07
 Approved: *Ron RBT*

PARTS LIST

Part #: **IK9338**

Drawing #: N/A

Description: **ARINC429 IN – ARINC561 OUT CONVERTER, INSTALL KIT**

| <u>FN</u> | <u>P/N</u> | <u>QTY.</u> | <u>DESCRIPTION</u> | <u>MFG.</u> | <u>MFG.#</u> | <u>DESIGNATION</u> | <u>COMMENTS</u> |
|-----------|------------|-------------|--|-------------|--------------|--------------------|-----------------|
| 5 | 230020-4 | 1 | HOOD, 9 Pin D-Sub | CIN | DE-24657 | | |
| 10 | 230082 | 1 | CONN HOOD, 37 Pin D-Sub ST | CIN | DC-24660 | | |
| 15 | 230088 | 1 | CONN SHELL, 25 Pin D-Sub Fem Crimp Type | AMP | 205165-1 | | |
| 20 | 230089 | 2 | HOOD, 25 Pin D-Sub, ST | CIN | DB-24659 | | |
| 25 | 230090 | 1 | CONN SHELL, 25 Pin D-Sub Male Crimp Type | AMP | 205166-1 | | |
| 30 | 232001 | 1 | CONN SHELL, 9 Pin D-Sub Fem Crimp Type | AMP | 205161-1 | | |
| 35 | 232002 | 1 | CONN SHELL, 37 Pin D-Sub, Fem Crimp | AMP | 205167-1 | | |
| 40 | 230055 | 71 | PIN, Crimp D-Sub, Female, 20-24 AWG | POS | FC6020D | | |
| 45 | 230054 | 25 | PIN, Crimp D-Sub, Male, 20-24 AWG | POS | MC6020D | | |
| 50 | 511002 | 8 | SCREW, 4-40 x 1/4"L, Phil Pan HD SS | MCM | 91772A106 | | |
| 55 | 541001 | 8 | WASHER, #4 Split Lock SS | MCM | 92147A005 | | |

120 items