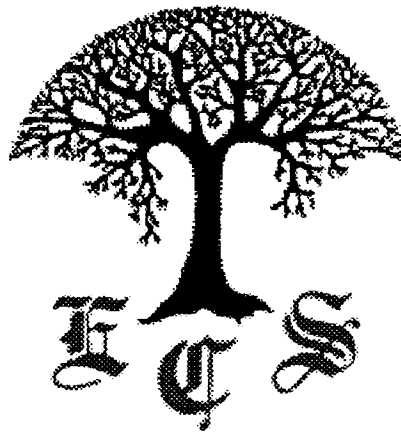


THRANE & THRANE A/S TT-3024A

Aero-C System Installation Kit Provisions



ECS

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Franklin, Wisconsin 53132, USA
Telephone: (414) 421-5300
Toll Free: (800) 327-9473
Facsimile: (414) 421-5301

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Installation Provisions for Thrane & Thrane Aero-C SATCOM System

SECTION INTRODUCTION

This section contains information on how to select installation provisions offered by ECS for Thrane & Thrane Aero-C Satcom systems. ECS designs and manufactures the installation provisions described below and can provide either individual components or complete installation kits.

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1.0 RF Coaxial Cable Components

ECS has designed a series of low-loss coaxial cables and connectors which can be utilized for the following interface applications on this Satcom system (W1, W2, W3).

1.1 ECS RF Cable & Connector Specifications

| ECS Cable Part Number | 310801 | 311201 | 311501 | 311601 | 311901 | 3C142B |
|--|--------|--------|--------|--------|--------|--------|
| Nominal Attenuation over Satcom Frequency (dB/100/Ft.) | 4.6 | 6.7 | 9.10 | 10.85 | 15.80 | 18.13 |
| Overall Diameter (in inches) (Nom.) | .452 | .317 | .229 | .229 | .195 | .195 |
| Pounds/100 Ft. | 15.0 | 8.6 | 5.2 | 5.0 | 4.3 | 4.0 |
| Male TNC Straight | CTS022 | CTS122 | CTS922 | CTS922 | CTS722 | CTS722 |
| Male TNC 90 | CTR022 | CTR122 | CTR922 | CTR922 | CTR722 | CTR722 |
| Male N Straight | CNS022 | CNS122 | CNS922 | CNS922 | CNS722 | CNS722 |
| Male N 90 | CNR022 | CNR122 | CNR922 | CNR922 | CNR722 | CNR722 |
| Female N Straight | BNS022 | BN3122 | BNS922 | BNS922 | BN3722 | BN3722 |
| ARINC 404 Size 5 RF Contact | N/A | N/A | 620033 | 620033 | 620021 | 620021 |

Figure A



1.2 Electrical Specifications

Thrane & Thrane have specified stringent electrical specifications which must either be met or exceeded for the following RF Coaxial Cable assemblies:

| Assembly | Attenuation max. over TX Band | Attenuation max. over RX Band | VSWR | DC Resistance Maximum |
|---------------------------------|-------------------------------|-------------------------------|-------|-----------------------|
| HPA/LNA to Antenna (W1) | 0.75 dB | 0.75 dB | 1.5:1 | N/A |
| HPA/LNA to Transceiver (W2, W3) | 19.0 dB | 19.0 dB | 1.5:1 | 0.7 |

Figure B

1.3 Physical Specifications

The following are ECS cable and connector types which meet Thrane & Thrane's specifications:

| Assembly and Connector Specifications | Maximum Cable Length (with connectors) over Satcom Frequency Band 1530 MHz to 1646.5 MHz | | | | | | |
|---|--|----------------|-----------------|------------------|----------------|----------------|--|
| | 310801 | 311201 | 311501 | 311601 | 311901 | 3C142B | |
| HPA/LNA (TNC) to Jet Blade Antenna (TNC) * W1 | 13.5 feet (4.2 M) | 9 feet (2.7 M) | 7 feet (2.1 M) | 6.0 feet (1.8 M) | 4 feet (1.2 M) | ----- | |
| Transceiver (Size 5) to HPA/LNA GPS Signal Connector (TNC) ** W2 | N/A | N/A | 207 feet (63 M) | 170 feet (52 M) | 92 feet (28 M) | 92 feet (28 M) | |
| Transceiver (Size 5) to HPA/LNA Inmarsat-C Signal Connector (N) ** W3 | N/A | N/A | 207 feet (63 M) | 170 feet (52 M) | 92 feet (28 M) | 92 feet (28 M) | |

Figure C

* Cable loss calculated over Transmit Frequency Band of 1626.5 MHz to 1646.5 MHz.

** Cable loss calculated over Receive Frequency Band of 1530.0 MHz to 1577.0 MHz to include GPS.



2.0 Cable Assembly Fabrication

2.1 Part Numbering & Serialization

ECS fabricates cable assemblies guaranteed to meet system specifications. Every cable assembly is fabricated with an individual part number and serial number which is permanently affixed to each end of the assembly. Electrical profiles of these assemblies are stored in an ECS database to ensure traceability and repeatability.

2.2 Testing

ECS tests all RF coaxial cable assemblies on a Network Analyzer to verify attenuation and VSWR performance. The results become part of an ECS database and are shipped with each cable assembly if requested. The cable run from the HPA/LNA to the ANTENNA will be tested over the receive and transmit frequency bands. The loss will be ≤ 0.75 dB and the VSWR will be $\leq 1.5:1$ over entire band. Cable runs from the Transceiver to the HPA/LNA will be tested over the receive and transmit frequency bands. The loss will be ≤ 19.0 dB and the VSWR will be $\leq 1.5:1$ over the entire band.

3.0 ARINC 404A Tray Assembly (Refer to Dwg. #P0299)

ECS fabricates a 1/4 ATR tray assembly for this system. Standard components of this preassembled tray include one (1) 1/4 ATR short/short tray shell, one (1) ARINC 404 DPX2 Connector plate, one (1) insertion-only thumbscrew holddown assembly, one (1) rear guide pin and associated hardware.

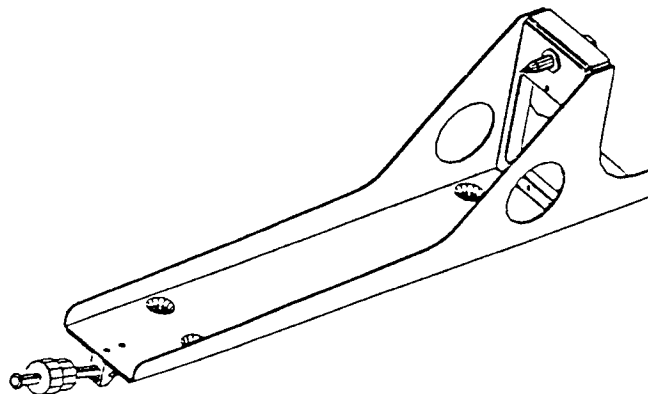


Figure E



4.0 ARINC 404 Connector Kit

ECS maintains stock on several varieties of connector kits necessary to accomplish the installation of this system. Please contact ECS for a complete listing of connector kits.

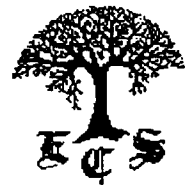
5.0 Cable Provisions

| Quantity | Part Number | Description |
|----------|---------------|---|
| A/R | 22759/16-18-9 | 18 AWG Wire (W7 Power) |
| A/R | 312010 | 10-Conductor 20AWG Shielded Composite Cable (W6 Printer Unit) |
| A/R | 322009 | 9-Conductor 20AWG Shielded Composite Cable (W4 Console) |
| A/R | 22759/16-16-9 | 16 AWG Wire (W7 Power) |

6.0 Wire Harness Assemblies (Refer to Page 3 of Installation Kit Drawing. Note: -601 Assembly)

ECS will provide completely terminated wire harness assemblies for the following interfaces:

- ⇒ **W4 Console**
- ⇒ **W6 Printer Unit**
- ⇒ **W7 Power**



7.0 Complete Installation Kits

The kit includes all the Hardware (Tray and Arinc Connector) and Wiring (RF Cable, Wire Harness and Power Cable) for the Transceiver, Antenna, Console, Printer and HPA/LNA (Refer to Installation Kit Drawing).

8.0 Drawings

Installation Kit Drawing

For Additional Information, Contact:

ECS
5300 West Franklin Drive
Franklin, Wisconsin 53132 USA
Toll Free: (800) 327-9473
Telephone: (414) 421-5300
Facsimile: (414) 421-5301

4

3

| | | |
|--------------------|------------|-------------|
| DWG. NO. XXXXXX | SHEET 1 | REV. N/C |
|--------------------|------------|-------------|

1

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| REVISIONS | | | | | | |
|-----------|-------|------|------|--|------|----------|
| ECN | SHEET | ZONE | REV. | BRIEF DESCRIPTION (SEE ECN FOR FULL DESCRIPTION) | DATE | APPROVED |
| XXXX | | | N/C | NEW RELEASE | | |

NOTES: UNLESS OTHERWISE SPECIFIED

- ▷ LABEL BOTH ENDS OF CABLE. COVER ALL LABELS WITH CLEAR HEAT SHRINK. APPLY BLACK ADHESIVE SHRINK TUBING ACCORDING TO ECS WORK INSTRUCTION 0007.
- 2. SHIP EACH KIT SEPARATELY. MARK OUTSIDE OF BOX WITH P.O. #, SERIAL #, AND CONTENTS DESCRIPTION AS FOLLOWS:
 P.O. # XXXXX
 SER # ESXXXX
 XXXXXX-501 SATCOM RF COAX KIT
- 3. INCLUDE APPROPRIATE TEST DOCUMENTATION WITH EACH SET.
- 4. SWEEP RF COAX CABLES FROM 1626.5 TO 1646.5 MHz. VSWR IS 1.5:1 MAX OVER ENTIRE FREQUENCY BAND. LOSS FOR CABLE -201 ≤ .75 dB. LOSS FOR CABLES -202 & -203 < 19 dB.
- 5. MANUFACTURE CABLE ASSEMBLIES WITHIN TOLERANCE PER ECS WORK INSTRUCTION W1009.


KIT INFORMATION

| | -201 | -202 | -203 | -601 |
|----------------------------------|------|------|------|------|
| XXXXXX-501 SATCOM RF COAX KIT | X | X | X | |
| XXXXXX-601 WIRE HARNESS KIT | | | | X |
| XXXXXX-602 COAX/WIRE HARNESS KIT | X | X | X | X |

KIT -501 INCLUDES COAX CABLES -201 THRU -203.
 KIT -601 INCLUDES WIRE HARNESS ASSEMBLY.
 KIT -602 INCLUDES COAX & WIRE HARNESS ASSEMBLY.

| | | | | | |
|-------------------|------|------|---------------------|---|----------|
| 1 | | | CNS722 | M39012/01-0503,1-225661-5,82-4427,KN-59-242 | 7 |
| | 1 | | CTS722 | M39012/26-0503,225555-6,31-4452,KA-59-292 | 6 |
| 1 | 1 | | 225791-2 | 620021 | 5 |
| | | 1 | CTS022 | | 4 |
| | | 1 | CTR022 | | 3 |
| XX | XX | | 3C142B | | 2 |
| | | XX | 310801 | | 1 |
| -203 | -202 | -201 | COMPONENTS PART NO. | ALTERNATE PART NO. | ITEM NO. |
| ASSEMBLY PART NO. | | | | | |

BILL OF MATERIALS (RF COAX CABLES)

| | | | | | |
|------------------------------|---------|---|-----------|---|----------------|
| ALL LENGTHS IN INCHES | |  | | ELECTRONIC CABLE SPECIALISTS FRANKLIN, WI 53132 PHONE: (414) 421-5300 | |
| APPROVALS | DATE | CUSTOMER: XXXXXX | | | |
| DRAWN BY: M TAUBENHEIM | 4/25/97 | TITLE: AERO-C SATCOM INSTALLATION KITS | | | |
| CHECKED BY: | | SIZE | CAGE CODE | LEVEL | DWG NO. XXXXXX |
| DESIGNED BY: | | B | 66197 | | |
| PROJECT ENG: | | SCALE: | | EFFECTIVITY: | SHEET: 1 OF 3 |
| ENG. MGR: | | | | | |

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3

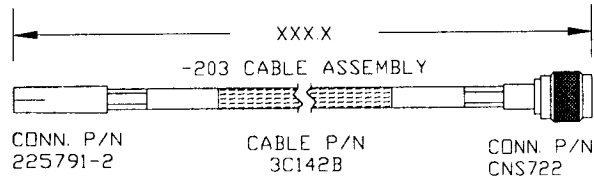
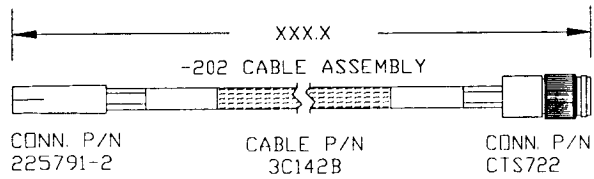
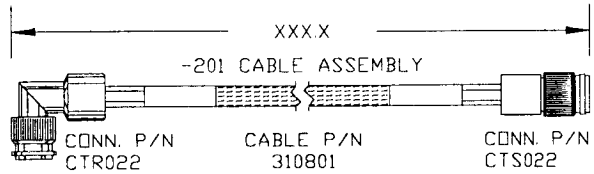
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ATTACHMENT 8.1

FOR REFERENCE ONLY

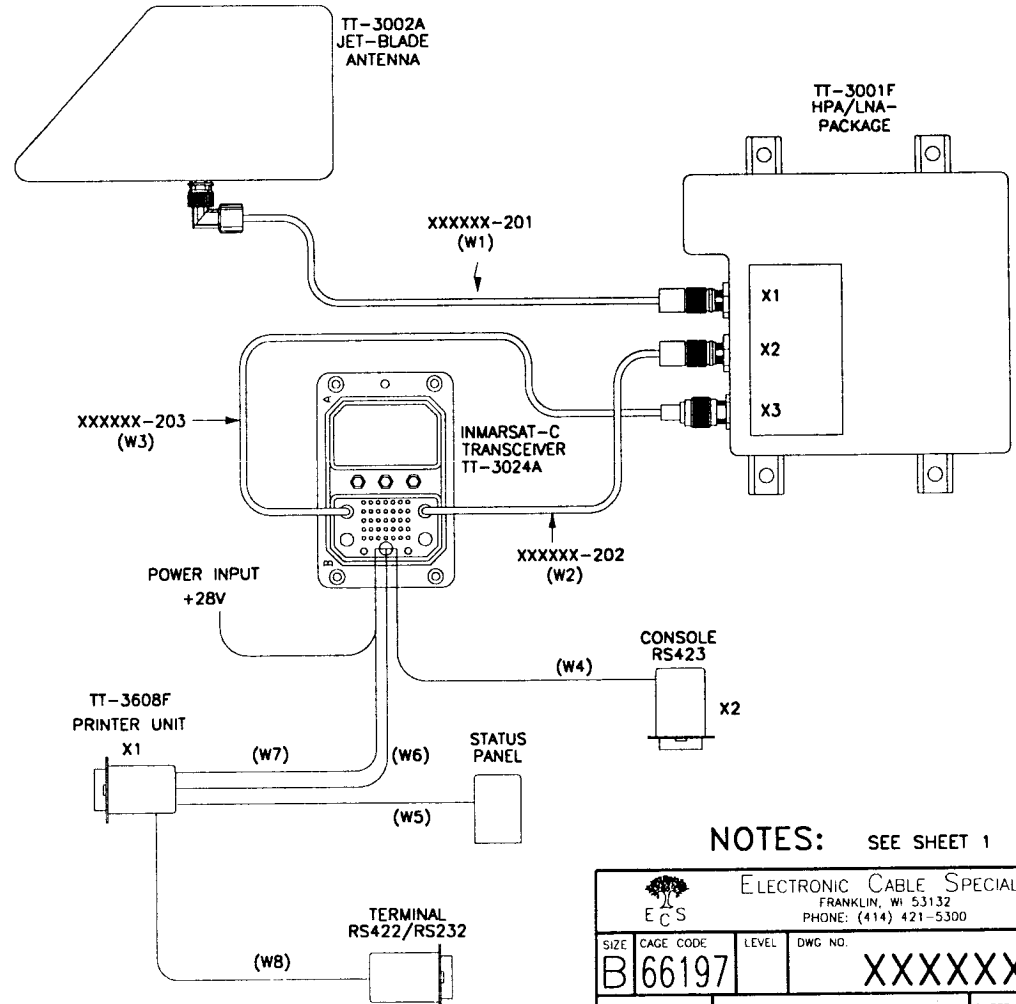
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|----------|-------|------|
| DWG. NO. | SHEET | REV. |
| XXXXXX | 2 | N/C |



RF CABLE LABELING ▶

XXXXXX-201(W1) XXXXXX-202(W2)
SER# ESXXXX SER# ESXXXX

XXXXXX-203(W3)
SER# ESXXXX



NOTES: SEE SHEET 1

| | | | | | | | |
|--------|--------------|-------|----------|------------------------------|--|--|--|
| ECS | | | | ELECTRONIC CABLE SPECIALISTS | | | |
| | | | | FRANKLIN, WI 53132 | | | |
| | | | | PHONE: (414) 421-5300 | | | |
| SIZE | CAGE CODE | LEVEL | DWG. NO. | | | | |
| B | 66197 | | XXXXXX | | | | |
| SCALE: | EFFECTIVITY: | | | SHEET: 2 OF 3 | | | |

4

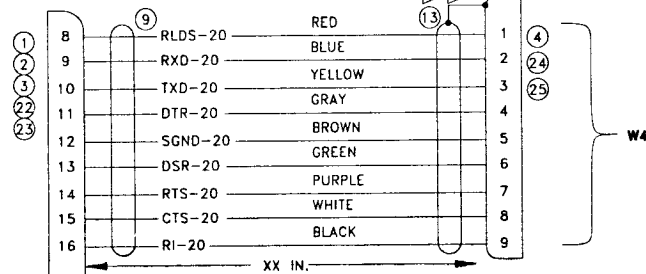
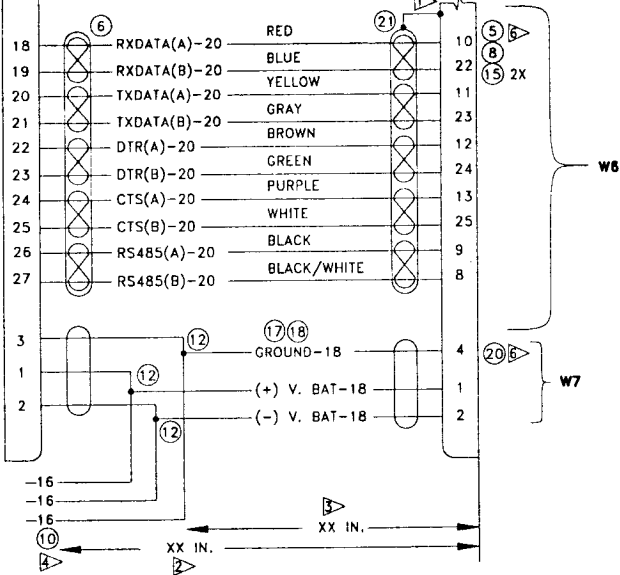
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| | | |
|---------|-------|------|
| DWG NO. | SHEET | REV. |
| XXXXXX | 3 | N/C |

1

-601 ASSEMBLYTT-3024A
(B PLUG)


CONSOLE RS423

TT-3608F
PRINTER UNIT**NOTES:**

- BAG AND IDENTIFY EXTRA PINS.
 - ALL WORK TO BE DONE IN ACCORDANCE WITH BOEING STANDARD PRACTICES AND A.C. 43.13 1A & 2A, CHAPTER 11.
- ▷ SOLDER SHIELD WIRE FROM SOLDER SLEEVE TO CONNECTOR HOOD.
 - ▷ LENGTH OF 16 AWG. WIRES IS XX IN.
 - ▷ LENGTH OF 18 AWG. WIRES IS XX IN. SPLICE 9 INCHES FROM TT-3024A CONN.
 - ▷ 16 AWG WIRES REQUIRE NO PIN TERMINATION.
 - ▷ REQUIRES AMP TOOL # 543344-1 AND DIE #543424-3 FOR METAL HOOD.
 - ▷ CRIMP CONTACTS WITH AMP TOOL # 90312-1.

| | | | |
|----------|-----------------------|--------------------------------|----------|
| 1 | 747579-8 | dB9 METAL HOOD FERRULE | 25 |
| 1 | 134752-3 | dB9 90° METAL HOOD | 24 |
| 4 | MS21044C04 | NUT, 4-40 SELF LOCKING | 23 |
| 4 | MS24693-S5 | SCREW, 4-40 C/S | 22 |
| 1 | D-104-00 | SOLDER SLEEVE | 21 |
| 3 | 031-1007-054 | CONTACT, #20, 18 AWG WIRE | 20 |
| - | DELETED | --- | 19 |
| XX IN. | MIL-W-22759/16-18-9 | WIRE, 18 AWG | 18 |
| XX IN. | 6749003 | FR EXPANDO SLEEVING, 1/4 | 17 |
| - | DELETED | --- | 16 |
| 2 | ETS-ZC/ST.438 | 2" SLOTTED THUMBSCREW | 15 |
| - | DELETED | --- | 14 |
| 1 | MB3519/1-5 | SOLDER SLEEVE | 13 |
| 3 | MB1824/1-3 | SPLICE | 12 |
| 1 | P0299-101 | TRAY, 1/4 ATR | 11 |
| XX IN. | MIL-W-22759/16-16-9 | WIRE, 16 AWG | 10 |
| XX IN. | 322009 | 9/C 20 AWG. SHLD. CABLE | 9 |
| 1 | M24308/2-3F | CONNECTOR, FEMALE (DB25 CRIMP) | 8 |
| - | DELETED | --- | 7 |
| XX IN. | 312010 | 10/C 20 AWG SHLD. CABLE | 6 |
| 1 | 745173-3 | Db25 METAL HOOD (AMP) | 5 |
| 1 | M24308/2-1F | CONNECTOR, FEMALE (DB9 CRIMP) | 4 |
| 3 | 205117-1 | CONTACT, #16 (AMP) | 3 |
| 19 | 205116-1 | CONTACT, #20 (AMP) | 2 |
| 1 | RM2P26S33C4S0001(201) | CONNECTOR, TT-3024A (AMP) | 1 |
| -601 KIT | MATERIAL P/N | DESCRIPTION | ITEM NO. |

BILL OF MATERIALS (-601 HARNESS ASSEMBLY)

| | | | |
|--|--------------|---------------|---------|
|  ELECTRONIC CABLE SPECIALISTS FRANKLIN, WI 53132 PHONE: (414) 421-5300 | | | |
| SIZE | CAGE CODE | LEVEL | DWG NO. |
| B | 66197 | | XXXXXX |
| SCALE: | EFFECTIVITY: | SHEET: 3 OF 3 | |

4

3

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ATTACHMENT 8.1

