NOTES
1) REFER TO "Borehole XRF Head Process Assembly RevX.X" FOR
DETAILED XRF HEAD ASSEMBLY AND WIRING INFORMATION.

XIREF HEAD UMBILICAL,
CABLE ASSEMBLY
SYSTEM LEVEL
BOREHOLE XRF PROTOTYPE

WIRING DETAIL

WIRING TO A1A3 ARE SOLDERED
CONNECTIONS TO PCB PLATE
THRU HOLES.

WIRES FROM W1P1 LAY IN RECESSED CHANNEL. CHANNEL IS FIRST
COVERED WITH INSULATING MATERIAL, THEN COPPER SHIELDING FOIL
USING CUSTOM TOOL.
WARNING: DO NOT SOLDER TO XRAY TUBE TERMINALS. MUST USE PUSH ON TERMINALS.

HV WIRE SHIELD, DRAIN WIRE, SOLDER DRAIN WIRE 24 AWG TO SHIELD AND TERMINATE TO RING TERMINAL.

USE AMP MOD IV HOUSING TERMINALS FOR T1 TO A4 CONNECTION.

WARNING: DO NOT SOLDER TO XRAY TUBE TERMINALS. MUST USE PUSH ON TERMINALS.

HV WIRE IS SOLDERED TO BUS WIRE. CRIMPED TO TERMINAL -.125 INCH TERMINAL TO BUS WIRE FOR HV WIRE MUST CONNECT TO XRAY TUBE LEAD WITH SHORTING WIRE TO XRAY TUBE METAL END.

USE 5 MINUTE EPOXY TO STIFFEN TERMINALS AGAINST TRANSFORMER APPLIED PHYSICS LABORATORY UNIVERSITY OF WASHINGTON SEATTLE WASHINGTON XRF HEAD UMBILICAL, CABLE ASSY A0W1P1 DETAIL, SYSTEM LEVEL, BOREHOLE XRF PROTOTYPE.
XRF HEAD UMBILICAL, CABLE ASSY 40118 DETAIL, SYSTEM LEVEL, BOREHOLE XRF PROTOTYPE

MAGNET WIRE

TBD

RED 24 AWG

BLU 24 AWG

BLK 24 AWG

VIO 24 AWG

SOLDER/HEATSHRINK SPLICE
XRF HEAD UMBILICAL, CABLE ASSY A0W1P3 AND A0W1P4 DETAIL, SYSTEM LEVEL, BOREHOLE XRF PROTOTYPE

NOTES:
1) REMOVE OUTER JACKET AND SHIELD FROM NATIONAL WIRE, NQ-624SJ BEFORE ROUTING DOWN XRF HEAD CABLE CHANNEL.
2) SOLDER DRAIN WIRE, 24 AWG BLK, TO SHIELD THEN SOLDER TO BLK WIRE OF THE TWISTED WIRE THEN TO PCB.
3) INSTALL 3MIL KAPTON INSULATION INTO WIRING CHANNEL USING CUSTOM TOOL
4) INSTALL CONETIC SHIELDING FOIL OVER KAPTON WITH CUSTOM TOOL
5) LAY CABLES INTO CHANNEL AND FOLD OVER KAPTON AND CONETIC FOIL, HOLD IN PLACE WITH RUBBER BANDS UNTIL FINAL ASSEMBLY WITH HEAD HOUSING

SOLDER 24 AWG BLK DRAIN WIRE TO 83317 SHIELD AND SOLDER TO CONETIC SHIELDING

NOTE: WIRE MADE UP WITH THE FOLLOWING:
1. TWISTED SHIELDED PAIR 83317
2. SHIELD PLACED OVER TSP 83317
3. NYLON BRAID PLACE OVER SHIELD
4. TIE TO TYGON TUBING USING HEAT SHRINK TUBING EVERY FOOT

SOLDER 24 AWG BLK DRAIN WIRE TO CONETIC SHIELD AND SOLDER TO BLK WIRE THAT GOES TO JP6
NOTE

THE MATING CONNECTORS FOR THIS CABLE ASSEMBLY FACE IN OPPOSITE DIRECTIONS WHICH RESULTS IN AN INVERSE MAPPING OF THE CONNECTOR NUMBERING. E.G. PIN1, A1A3J11 MAPS TO PIN 10 OF A1A2J1. THE ABOVE SCHEMATIC REFLECTS THIS MAPPING.
EXTERNAL INTERLOCK SWITCH
A5

SWITCH A
SWITCH RET B
N/C
CONNECT C
CONNECT RET D

W6P1 (ADA3J6)

15 FEET

BELDEN 8412

W6P1 (ADA3J6)

LABEL-APPLY USING LABEL WITH CLEAR HEAT SHRINK.

AMPHENOL
MIL-SPEC. PLUG, FEMALE
4 CONTACT
97-3106A-20S-25(417)
9767-14-6

SWITCH A
CONNECT C

20K OHMS

BELDEN 8412

EXTERNAL INTERLOCK SWITCH
A5

MIL-SPEC, PLUG, FEMALE
4 CONTACT
97-3106A-20S-25(417)
9767-14-6

APPLIED PHYSICS LABORATORY
UNIVERSITY OF WASHINGTON
SEATTLE WASHINGTON

EXTERAL INTERLOCK SWITCH,
CABLE ASSY A1W4,
SYSTEM LEVEL,
BOREHOLE XRF PROTOTYPE

FILENAME
BOREHOLE XRF PROTOTYPE CABLE ASSEMBLY DIAGRAMS REV1.14.VSD

DRAWN BY

LIGHT

CONTRACT NO.
AMPHENOL
APPLIED PHYSICS LABORATORY
UNIVERSITY OF WASHINGTON
SEATTLE WASHINGTON

XRAY ACTIVE LAMP, CABLE ASSY A0W7, SYSTEM LEVEL, BOREHOLE XRF PROTOTYPE

SIZE
CAGE CODE
DWG NO
REV
DATE
SHEET
FILENAME
DRAWN BY
CONTRACT NO.

AMPHENOL
ML-8FCC, PLUG, MALE 4-CONTACT
97-3155A-345-2P(417)
9767-14-6

XRAY ACTIVE LAMP HOT A
XRAY ACTIVE LAMP RET B
XRAY ACTIVE LAMP CONNECT C
XRAY ACTIVE LAMP CONNECT D

15 FEET

LABEL-APPLY USING LABEL WITH CLEAR HEAT SHRINK.

SPLICE TO MFG WIRE, APPLY HEATSHRINK

REPLACEMENT BULB FOR A6 SOLAMP-2WHD
or industry trade no. 1577DC (incandescent)

XRAY ACTIVE LAMP 12 WATTS, STEADY EDWARDS SIGNALING
PIN 104SINHR-NS A6

EDWARDS SIGNALING
P/N 104SINHR-N5 A6

BELDEN 8412

MFG

REPLACEMENT BULB FOR A650LMP-12WH-D
industry trade no. 15T7DC (incandescent)

N/C

XRAY ACTIVE LAMP 12 WATTS, STEADY EDWARDS SIGNALING
PIN 104SINHR-NS A6

EDWARDS SIGNALING
P/N 104SINHR-N5 A6
1. Polycarbonate rod drilled out to diameter of the high voltage wire.
2. Splice the two wires together.
3. Fill voids with 5 minute epoxy.
4. Put 2 pieces of shield belden 92171 over high voltage wire.
5. Soldered braid at the splice. Tie braid and nylon covering with heat shrink.
6. Tie shield to chassis.
**NOTE:**
CONTACT ORDERING NOT SEQUENTIAL ON A2J2

**NOTE:**
CONTACT ORDERING NOT SEQUENTIAL ON A2W4P1

- **+5V A**
- **+5V RET B**
- **+5V C**
- **+5V RET D**
- **15V K**
- **+15V RET L**
- **-15V M**
- **-15V RET N**
- **+15V HVPS P**
- **+15V HVPS RET Q**
- **NC R**
- **NC S**
- **+5V SHEILD F**
- **+5V SHEILD H**
- **+15V SHEILD E**
- **-15V SHEILD G**
- **NC W**
- **NC X**
- **NC Y**
- **NC T**
- **NC U**
- **NC V**
- **NC Z**
- **+15V HVPS SHEILD J**

**MFG WIRE (CUT OFF FROM MFG POWER SUPPLY)**

**LABEL-APPLY USING LABEL WITH CLEAR HEAT SHRINK**

**MFG PLUG CUT FROM POWER SUPPLY**

- **12"**
- **16"**
- **17"**

**AMPHENOL**
**BULKHEAD CONNECTOR**
**ML-SPEC, JACK, MALE**
**24 CONTACT**
**97-3102A-24-28P**

**REARVIEW**

**CABLE ASSEMBLY DIAGRAMS**
**REV.14-VSD**

**POWER INTERFACE**
**CABLE ASSEMBLY A2W4**
**XRF CONTROL UNIT A0A2**
**BOREHOLE XRF PROTOTYPE**
NOTE: NO CONNECTOR IS USED.
CONNECTOR IS PART OF FLEX CABLE.
NOTE:
CONTACT ORDERING NOT SEQUENTIAL ON A6

MOLEX
MINI FIT JR-12 CIRCUIT HOUSING
39-07-2100
CONTACTS
TERMINAL FEMALE,
39-00-0086

A3W4P1
XRAY ON/OFF 1 >
SAFETY INTERLOCK MICROCONTROLLER FAIL STATUS 2 >
XRAY ACTIVE LAMP CONNECT STATUS 3 >
XRAY ACTIVE LAMP STATUS 4 >
EXCESSIVE HVPS CURRENT 5 >
XRF HEAD GND FAULT 6 >
EXT INTERLOCK SWITCH FAILURE STATUS 7 >
EXT INTERLOCK SWITCH CONNECT STATUS 8 >
EXT INTERLOCK SWITCH STATUS 9 >
GND 10 >
GND 11 >
GND 12 >

A3W4P1
LABEL - APPLY USING LABEL
WITH CLEAR HEAT SHRINK.

MOLEX
MINI FIT JR-12 CIRCUIT HOUSING
39-07-2100
CONTACTS
TERMINAL FEMALE,
39-00-0086

USB DATA
ACQUISITION MODULE
MEASUREMENT
COMPUTING
USB-1408FS
A6

USB DATA
ACQUISITION MODULE
MEASUREMENT
COMPUTING
USB-1408FS
A6

TERMINAL BLOCK

TWISTED AWG22

STRIP INSULATION .25" FROM END OF WIRE AND TIN.
NOTE: CONTACT ORDERING NOT SEQUENTIAL ON A3W5P1

LABEL-APPLY USING LABEL WITH CLEAR HEAT SHRINK.

+5V FROM POWER SUPPLY

TWISTED PAIRS AWG22

STRIP INSULATION 2.5" FROM END OF WIRE AND TIN.
Voltronex Terminal Lug CRS-TV-1806

Molex Mini-Fit Jr 2 Circuit Housing 39-01-3022 Contacts Terminal Female, 39-00-008B

Label: Apply using label with clear heat shrink.

+5V to A3W9P1
+5V RET to A3W9P2

A3W9P2
A3W9P3

+5V
+5V RET

A3W9P2 (TB2 +5V)
A3W9P3 (TB2 +5V RET)

Twisted AWG22

Red Black

1 +5V
2 +5V RET

A3W9P3
A3W9P1 (A3A5J6)

A3W9P1

14" 2"

Volvex Terminal Lug CRS-TV-1806

Molex Mini Fit Jr 2 Circuit Housing 39-01-3022 Contacts Terminal Female, 39-00-008B

Label: Apply using label with clear heat shrink.

+5V to A3W9P1
+5V RET to A3W9P2

A3W9P2
A3W9P3

+5V
+5V RET

A3W9P2 (TB2 +5V)
A3W9P3 (TB2 +5V RET)

Twisted AWG22

Red Black

1 +5V
2 +5V RET

A3W9P3
A3W9P1 (A3A5J6)

A3W9P1

14" 2"

Volvex Terminal Lug CRS-TV-1806

Molex Mini Fit Jr 2 Circuit Housing 39-01-3022 Contacts Terminal Female, 39-00-008B

Label: Apply using label with clear heat shrink.
NOTE:
CONTACT ORDERING NOT SEQUENTIAL
ON A3W10P1

NOTE:
CONTACT ORDERING NOT SEQUENTIAL
ON A3J1