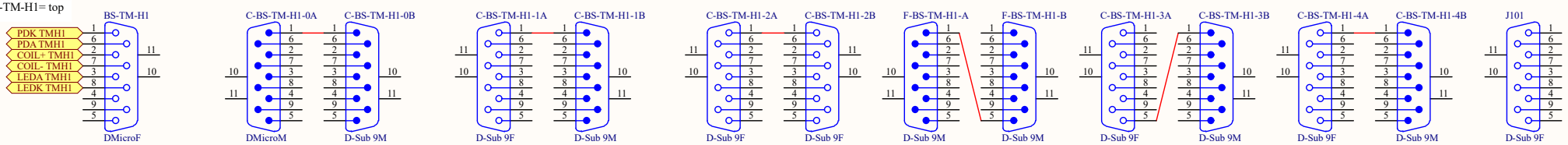
4 Feedthroughs

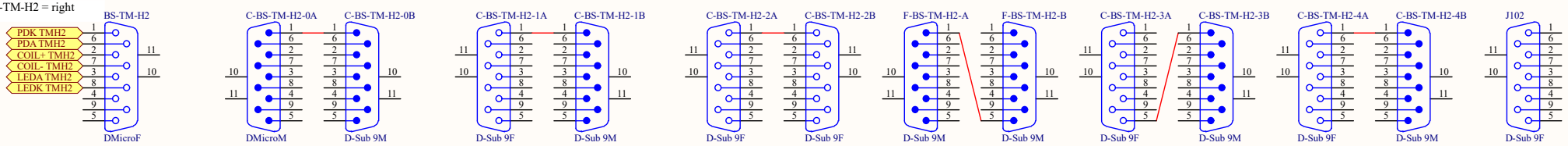
TM OSEMs

OSEM	TM OSEM to BF Cable JGW-D1503901 Sheet 01	BF to PI Signal Cable JGW-D1503901 Sheet 08	TR-Flange Signal Cable JGW_D1503901 Sheet 19	Feedthrough	Anti-Feedthrough Adapter Cable	OSEM External Cable	Sat Amp #1 D1402809
Glenair GMR7590-9P-1BPN	Glenair MWDM2L-9SS						

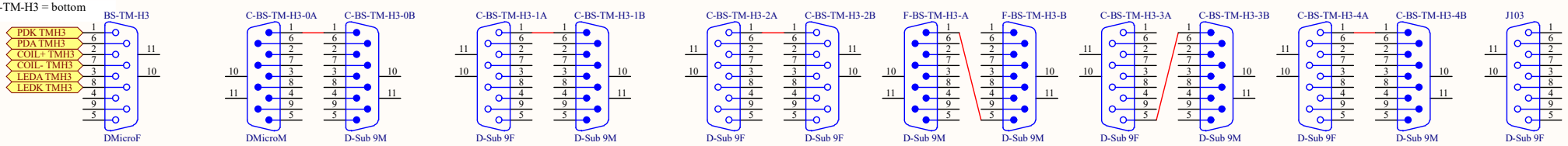
BS-TM-H1= top



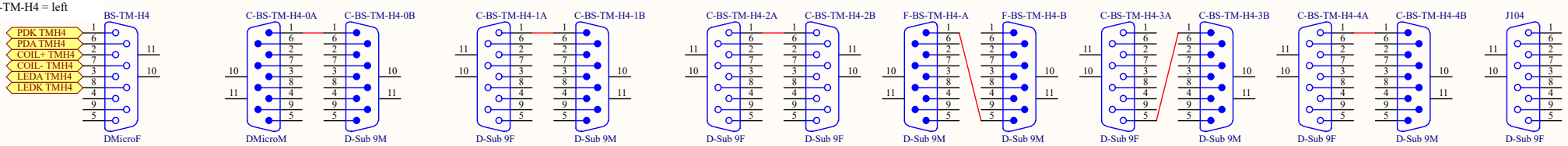
BS-TM-H2 = right

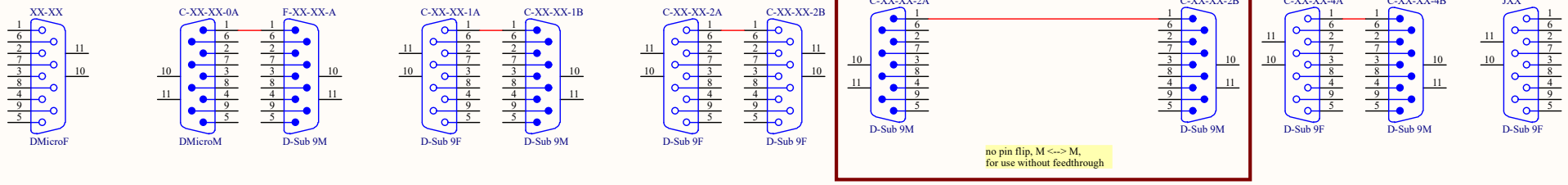


BS-TM-H3 = bottom



BS-TM-H4 = left



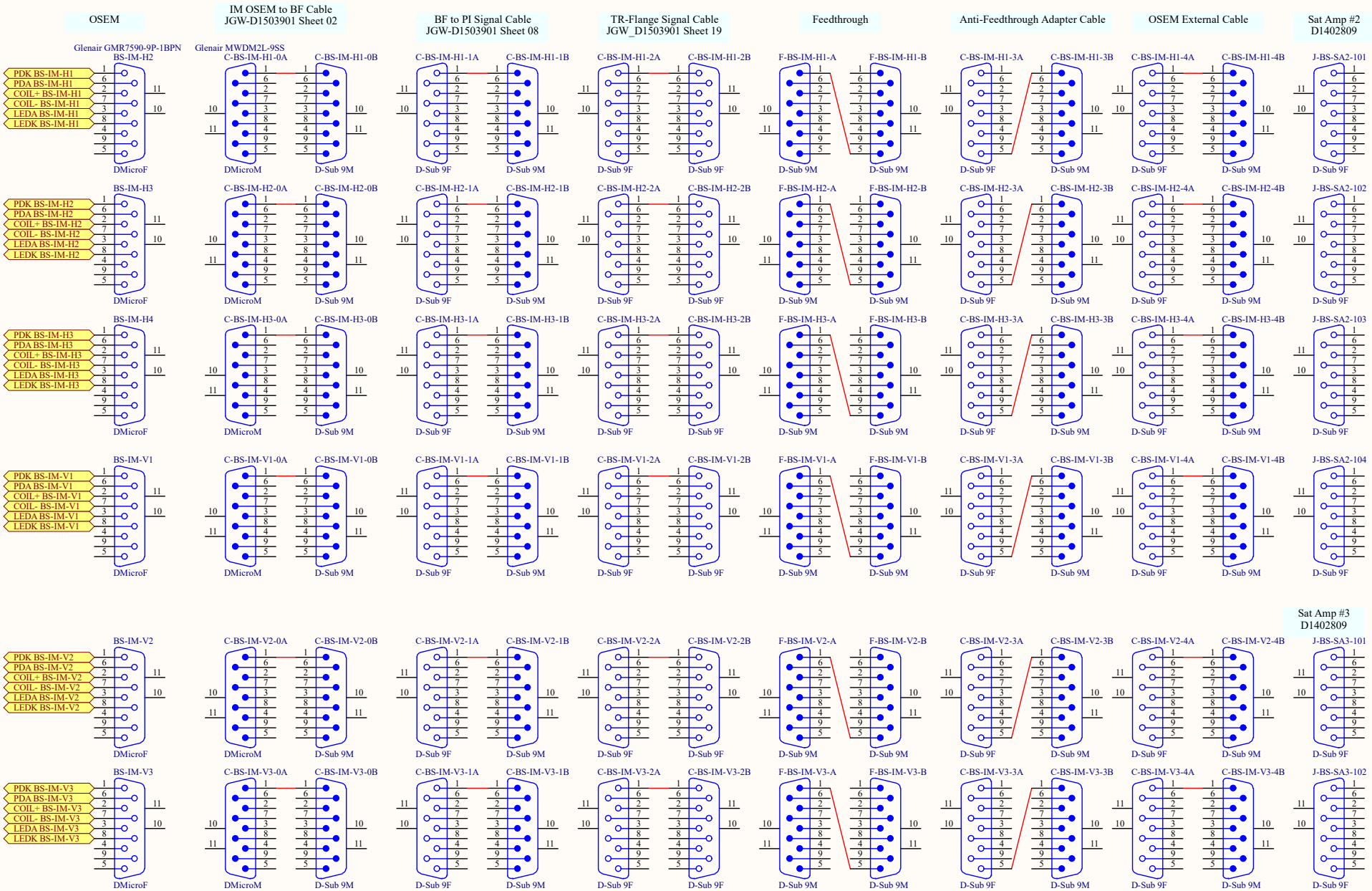


For testing the suspension outside the vacuum tank,
there should be a supply of plain M-M gender changers
to replace the combination of Feedthrough+Anti-Feedthrough adapter cable.

Title	BS Suspension Cabling - Test Mass OSEMs	
Size A3	Number JGW-D1503600	Revision -v7
Date: 2016/04/10		Sheet 1of 14
File: \\..\01 TM OSEMs.SchDoc		Drawn By:

6 Feedthroughs

IM OSEMs

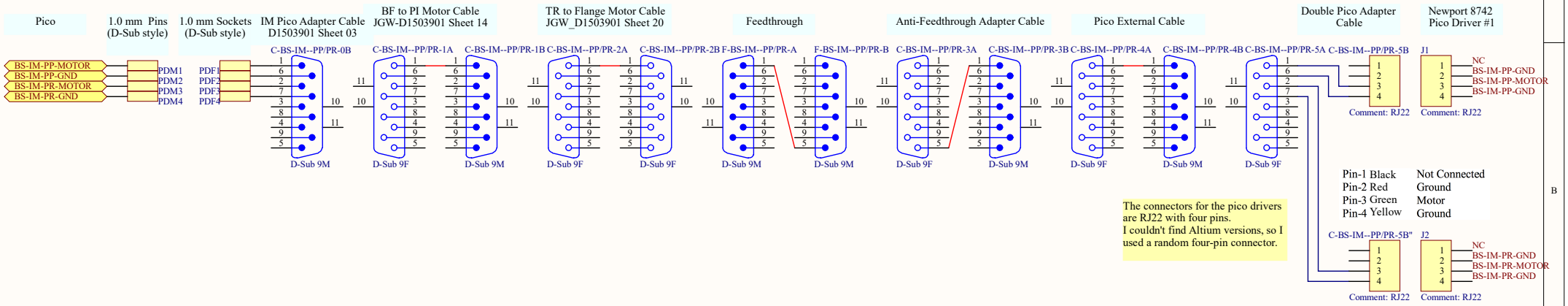


J-BS-SA3-103 and J-BS-SA3-104 not used

Title: BS Suspension Cabling - Intermediate Mass OSEMs		
Size: A3	Number: JGW-D1503600	Revision: -v7
Date: 2016/04/10	Sheet 2 of 14	
File: \\..\02 IM OSEMs.SchDoc	Drawn By:	

1 Feedthrough

IM Picomotors

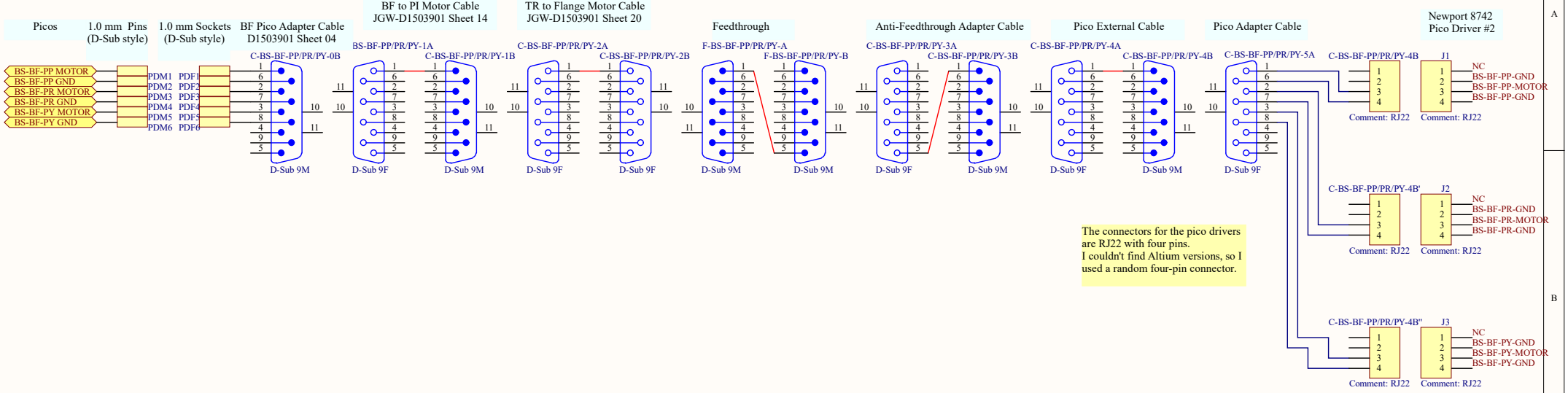


Title	BS Suspension Cabling - Intermediate Mass Picos	
Size: A3	Number: JGW-D1503600	Revision: -v7
Date: 2016/04/10		Sheet 3of 14
File: \\..\03 IM Picos.SchDoc		Drawn By:

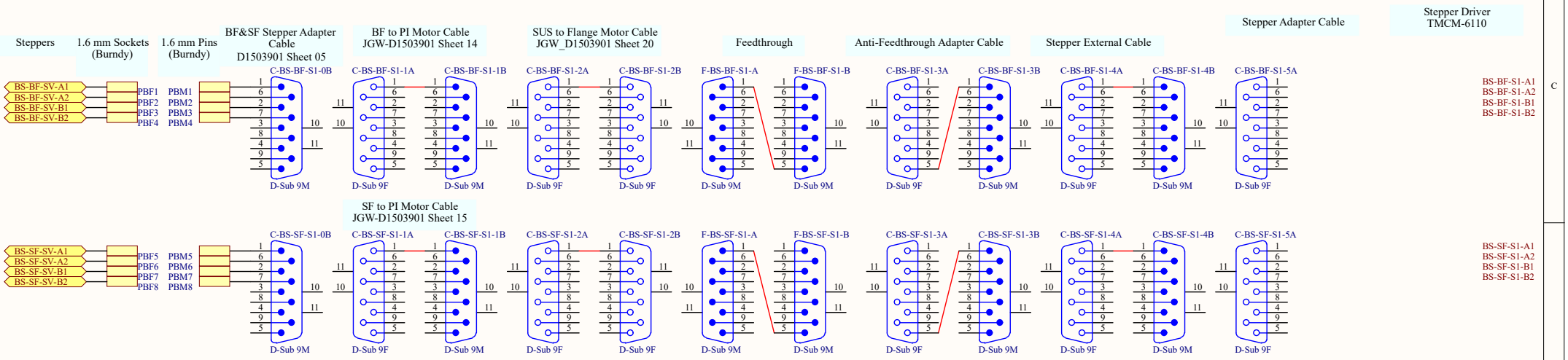
BF and SF
Picomotors and Steppers

3 Feedthroughs

Pin-1 Black — Not Connected
Pin-2 Red — Ground
Pin-3 Green — Motor
Pin-4 Yellow — Ground



The connectors for the pico drivers are RJ22 with four pins.
I couldn't find Altium versions, so I used a random four-pin connector.



Title	BS Suspension Cabling - Bottom and Standard Filter Picos/Steppers		
Size A3	Number JGW-D1503600		Revision -v7
Date: 2016/04/10		Sheet 4of 14	
File: \\..\04 BF&SF Picos&Steppers.SchDoc		Drawn By:	

BF and SF LVDT/ACTs

2 Feedthroughs

LVDT/ACT Distributor
JGW-D1402124,
Front Panel
JGW-D1402827
Board
JGW-D1402117 #2

LVDT/Act

BS-BF-LV

BF&SF LVDT Adapter Cable
JGW-D1503901 Sheet 06

BF-PI Signal Cable
JGW-D1503901 Sheet 08

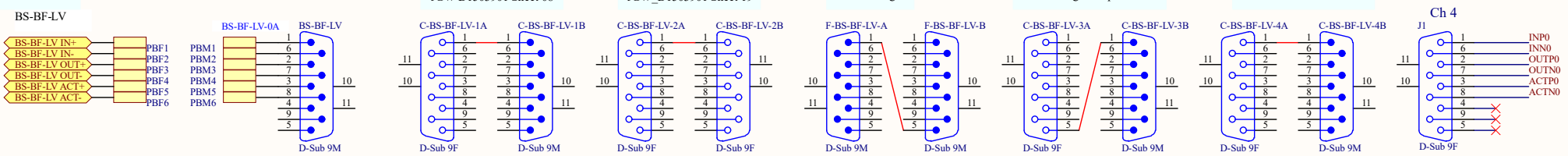
SUS-Flange Signal Cable
JGW_D1503901 Sheet 19

Feedthrough

Feedthrough Adapter Cable

External Cable

Ch 4



J-BS-LA-6 and J-BS-LA-7 not used

LVDT/Act

BS-SF-LV

BF&SF LVDT Adapter Cable
JGW-D1503901 Sheet 06

SF-PI Signal Cable
JGW-D1503901 Sheet 09

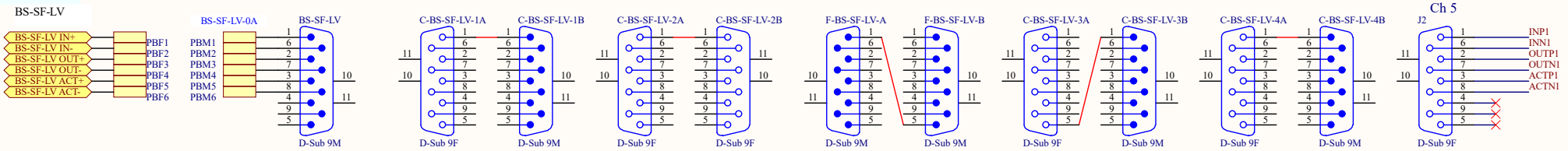
SUS-Flange Signal Cable
JGW_D1503901 Sheet 19

Feedthrough

Feedthrough Adapter Cable

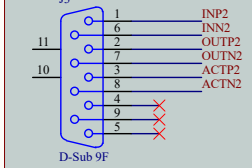
External Cable

Ch 5

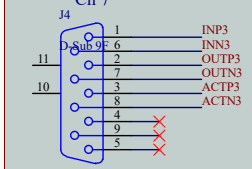


(Unused)

Ch 6



Ch 7

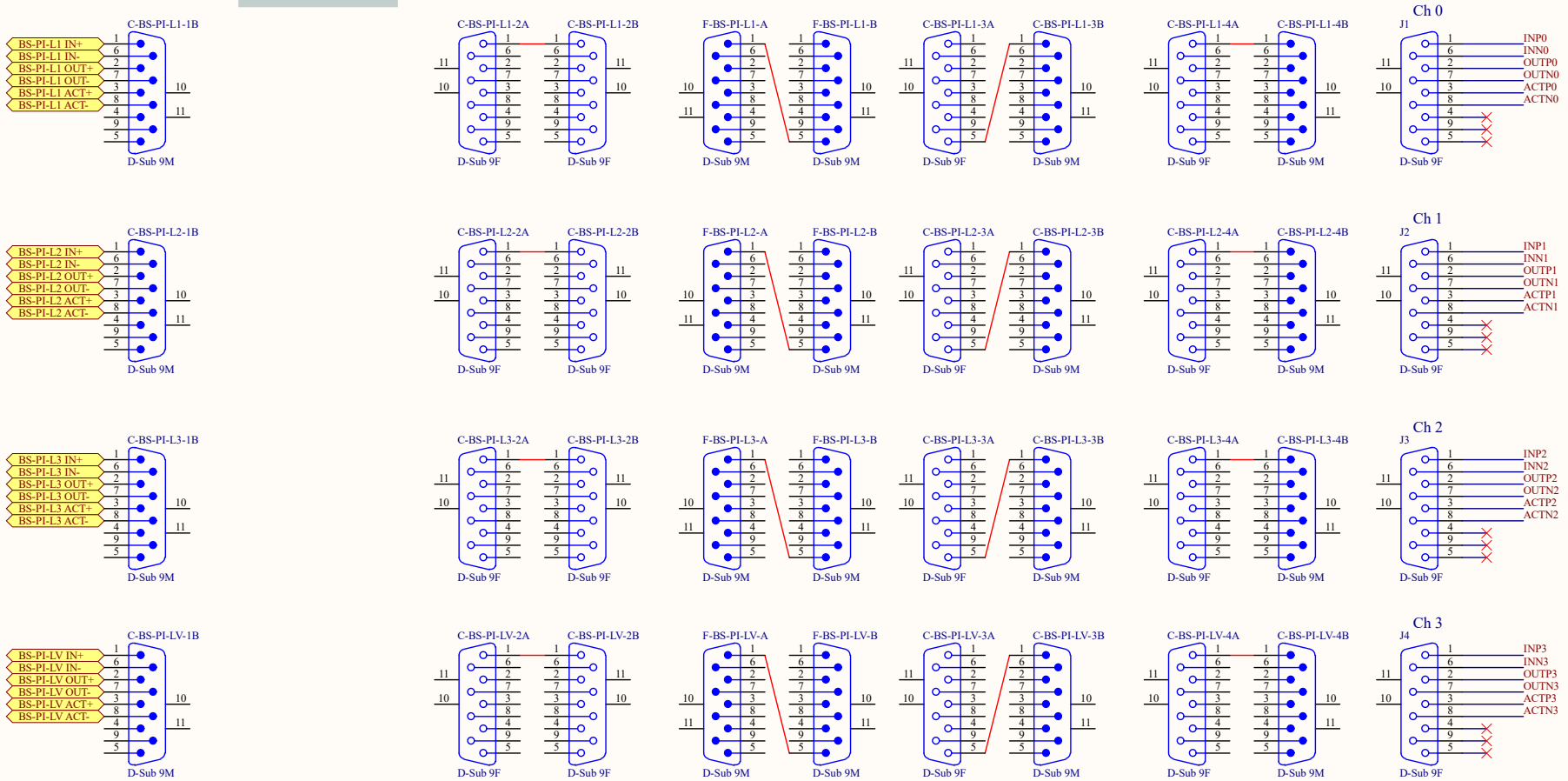


Title: BS Suspension Cabling - Bottom and Standard Filter LVDTs		
Size: A3	Number: JGW-D1503600	Revision: -v7
Date: 2016/04/10		Sheet 5of 14
File: \\..\05 BF&SF LVDTs.SchDoc		Drawn By:

4 Feedthroughs

Preisolator LVDT/ACTs

LVDT/ACT	OPTIONAL Signal Cable Extension JGW_D1503901 Sheet 10	TR-Flange Signal Cable JGW_D1503901 Sheet 19	Feedthrough	Anti-Feedthrough Adapter Cable	LVDT/ACT External Cable	LVDT/ACT Distributor JGW-D1402124, Front Panel JGW-D1402827 Board JGW-D1402117 #1



LVDT-COIL

Pin	Function
1	LVDT IN P
2	LVDT OUT P
3	COIL P
4	
5	
6	LVDT IN N
7	LVDT OUT N
8	COIL N
9	

Title	BS Suspension Cabling - Preisolator LVDT/Actuators		
Size A3	Number JGW-D1503600		Revision -v7
Date: 2016/04/10		Sheet 6of 14	
File: \\..\06 PI LVDTs.SchDoc		Drawn By:	

Preisolator Steppers

4 Feedthroughs

Stepper

PI Stepper Adapter
JGW-D1503901 Sheet 24

OPTIONAL

Motor Cable Extension
JGW_D1503901 Sheet 16

TR to Flange Motor Cable
JGW-D1503901 Sheet 20

Feedthrough

Anti-Feedthrough Adapter Cable

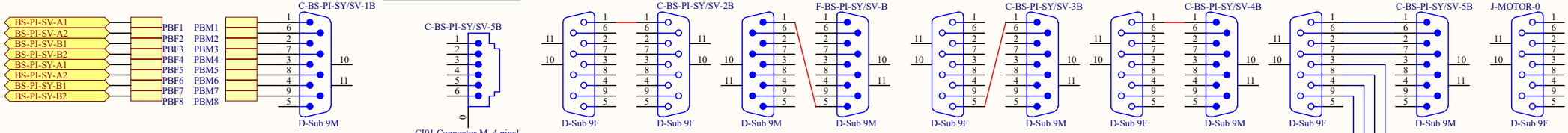
Stepper External Cable

Stepper Splitter Cable
Double Motor Version

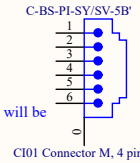
TMCM-6110
Stepper Driver #2

CI0104S0000
CVIlux CI01 series,
4 pins, 2mm pitch

CI0104P1VK0-LF
CVIlux CI01 series,
4 pins, 2mm pitch

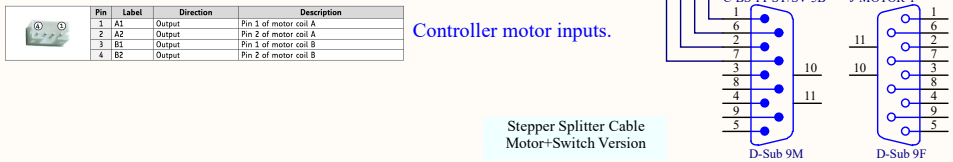


The vertical and yaw steppers have no limit switches and are combined on a single cable that VIS needs to provide.



Pin	Label	Direction	Description
1	A1	Output	Pin 1 of motor coil A
2	A2	Output	Pin 2 of motor coil A
3	B1	Output	Pin 1 of motor coil B
4	B2	Output	Pin 2 of motor coil B

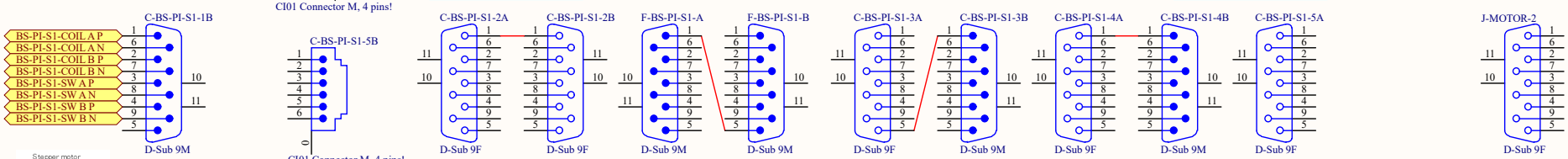
Controller motor inputs.



The horizontal steppers have limit switches and will be wired as indicated by the IP manufacturer.

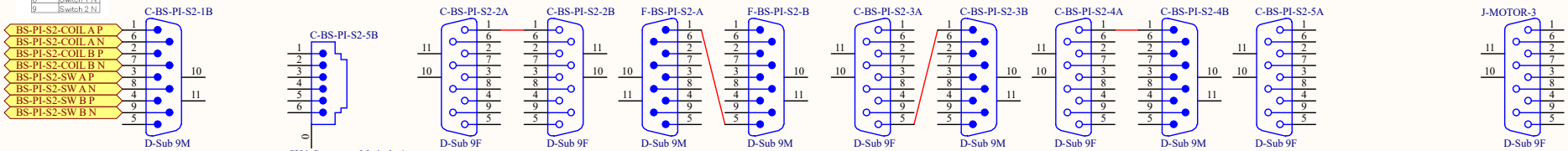
PI to Flange Motor Cable
JGW-D1503901 Sheet 13

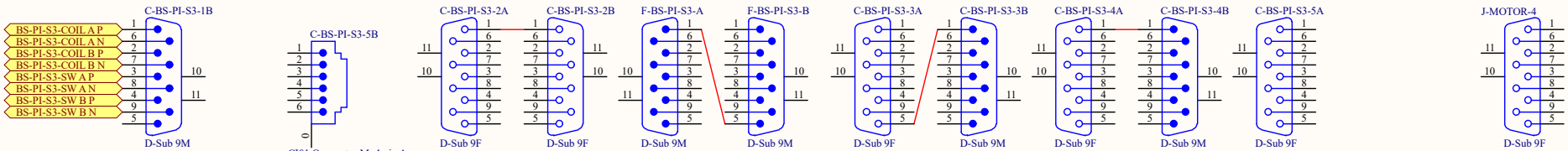
Stepper Splitter Cable
Motor+Switch Version



Stepper motor

Pin	Function
1	COIL A P
2	COIL B P
3	Switch 1 P
4	Switch 2 P
5	
6	COIL A N
7	COIL B N
8	Switch 1 N
9	Switch 2 N





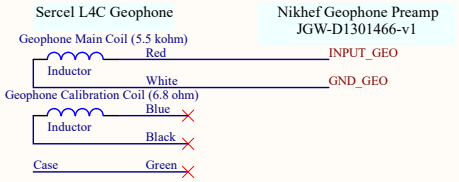
Title: BS Suspension Cabling - Preisolator Steppers		
Size: A3	Number: JGW-D1503600	Revision: -v7
Date: 2016/04/10		Sheet 7of 14
File: \\..\07 PI Steppers.SchDoc		Drawn By:

3 Feedthroughs

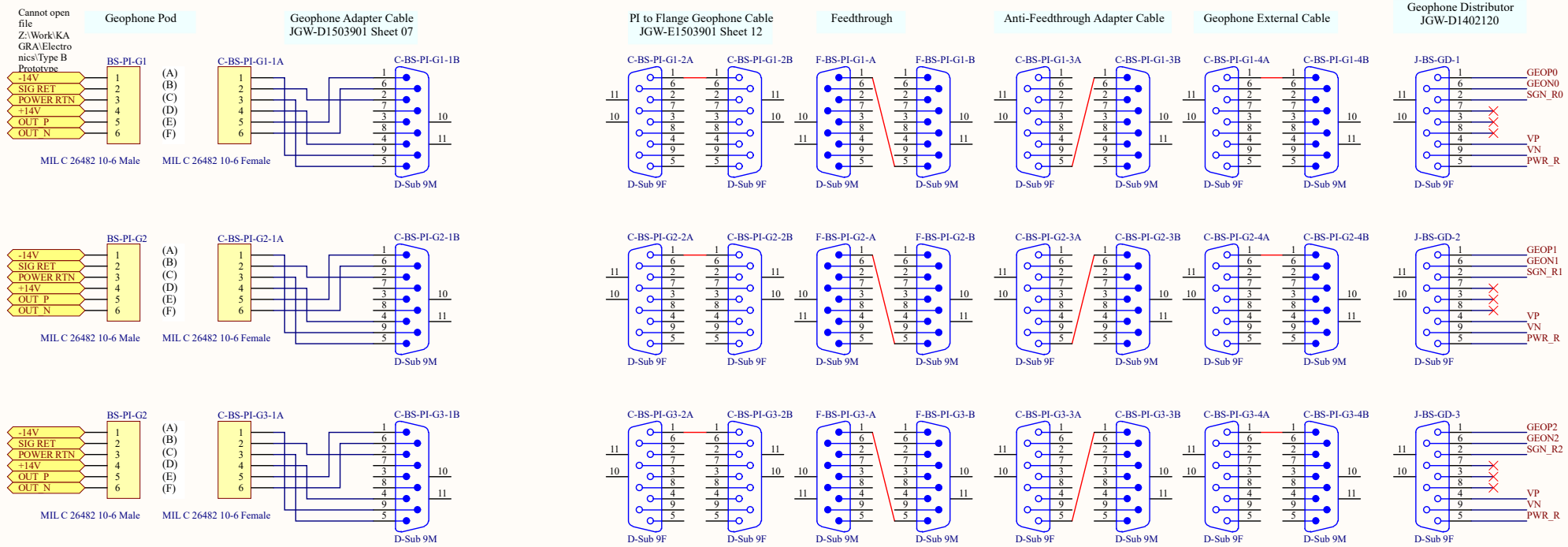
Preisolator Geophones

Geophone Pod Internal Cabling
(same for all three pods):

Pod #1: geophone L400002322, preamp 15
Pod #2: geophone L400002321, preamp 12
Pod #3: geophone L400002323, preamp 14



Cannot open file Z:\Work\KAGRA\Electronics\Type B Prototype



J-BS-GD-4 not used

Title	BS Suspension Cabling - Preisolator Geophones		
Size A3	Number JGW-D1503600		Revision -v6
Date: 2016/04/10		Sheet 8of 14	
File: \\..\08 PI Geophones.SchDoc		Drawn By:	

OSEM Sat Amps and Drivers

Sat Amp Inputs from OSEMs (see Sheets 1&2)

Sat Amp #1, JGW-D1503498, Rear Panel , JGW-D1503500, Board, JGW-D1503499

J101 D-Sub 9F, J103 D-Sub 9F, OSEMs, J102 D-Sub 9F, J104 D-Sub 9F

Sat Amp #2, JGW-D1503498, Rear Panel , JGW-D1503500, Board, JGW-D1503499

J101 D-Sub 9F, J103 D-Sub 9F, OSEMs, J102 D-Sub 9F, J104 D-Sub 9F

Sat Amp #3, JGW-D1503498, Rear Panel , JGW-D1503500, Board, JGW-D1503499

J101 D-Sub 9F, J103 D-Sub 9F, J102 D-Sub 9F, J104 D-Sub 9F

Sat Amp PD Outputs

Sat Amp #1 D1503498, Front Panel, JGW-D1503500, Board, JGW-D1503499 — J502 DB9F

Sat Amp #2 D1503498, Front Panel, JGW-D1503500, Board, JGW-D1503499 — J502 DB9F

Sat Amp #3 D1503498, Front Panel, JGW-D1503500, Board, JGW-D1503499 — J502 DB9F

Generic D-Sub 9 Cable M-F

J502 DB9F → D-Sub 9M → D-Sub 9F

Sat Amp LED Current Monitor Outputs

Sat Amp #1 D1503498, Front Panel, JGW-D1503500, Board, JGW-D1503499 — J503 DB9F

Sat Amp #2 D1503498, Front Panel, JGW-D1503500, Board, JGW-D1503499 — J503 DB9F

Sat Amp #3 D1503498, Front Panel, JGW-D1503500, Board, JGW-D1503499 — J503 DB9F

Generic D-Sub 9 Cable M-F

J503 DB9F → D-Sub 9M → D-Sub 9F

AA Chassis D1100621

AA In 13-16 J4 D-Sub 9M

AA In 17-20 J5 D-Sub 9M

AA In 22-24 J6 D-Sub 9M

AA In TBD TBD1 D-Sub 9M

AA In TBD TBD2 D-Sub 9M

AA In TBD TBD3 D-Sub 9M

Sat Amp Coil Current Inputs

Sat Amp #1 JGW-D1503498, Front, JGW-D1503500, Board, JGW-D1503499 — J501 DB15M

Sat Amp #2 JGW-D1503498, Front, JGW-D1503500, Board, JGW-D1503499 — J501 DB15M

Sat Amp #3 JGW-D1503498, Front, JGW-D1503500, Board, JGW-D1503499 — J501 DB15M

Generic D-Sub 15 Cable M-F

J501 DB15M → DB15F

Low Power Coil Driver #1 JGW-D1503506, Rear Panel, JGW-D1503509, Board, JGW-D1503507 — J4 DB15F

Low Power Coil Driver #2 JGW-D1503506, Rear Panel, JGW-D1503509, Board, JGW-D1503507 — J4 DB15F

Low Power Coil Driver #3 JGW-D1503506, Rear Panel, JGW-D1503509, Board, JGW-D1503507 — J4 DB15F

Coil Current Request Inputs

Low Power Coil Driver #1 JGW-D1503506, Front Panel, JGW-D1503508, Board, JGW-D1503507 — J3 D-Sub 9M

Low Power Coil Driver #2 JGW-D1503506, Front Panel, JGW-D1503508, Board, JGW-D1503507 — J3 D-Sub 9M

Low Power Coil Driver #3 JGW-D1503506, Front Panel, JGW-D1503508, Board, JGW-D1503507 — J3 D-Sub 9M

Generic D-Sub 9 Cable M-F

J3 D-Sub 9M → D-Sub 9F

AI Chassis #1 D1101521

AI Out 1-4 J1 D Connector 9

AI Out 5-8 J2 D Connector 9

AI Out 9-12 J3 D Connector 9

Title	BS Suspension Cabling - OSEM Sat Amps & Drivers	
Size A3	Number JGW-D1503600	Revision -v7
Date: 2016/04/10	Sheet 9of 14	
File: \\..\09 Sat Amps & Coil Drivers.SchDoc	Drawn By:	

BS&SF LVDT Drivers

Inputs from BS&SF LVDTs (see Sheet 5)

LVDT/ACT Distributor JGW-D1402124, Front Panel JGW-D1402827 Board JGW-D1402117 #2

LVDT/ACT Distributor JGW-D1402124, Rear Panel JGW-D1402828, Board JGW-D1402117 #2

Ch 4-7 LVDT-IN

J5 — INP0, INN0, INP1, INN1, INP2, INN2, INP3, INN3 — 6E17C009SAJ120

Ch 4

J1 — INP0, INN0, OUTP0, OUTN0, ACTP0, ACTN0 — D-Sub 9F

Ch 5

J2 — INP1, INN1, OUTP1, OUTN1, ACTP1, ACTN1 — D-Sub 9F

Ch 4-7 LVDT-OUT

J6 — OUTP0, OUTN0, OUTP1, OUTN1, OUTP2, OUTN2, OUTP3, OUTN3 — 6E17C009SAJ120

Ch 4-7 ACT

J7 — ACTP0, ACTN0, ACTP1, ACTN1, ACTP2, ACTN2, ACTP3, ACTN3 — 6E17C009SAJ120

1734348-1

5747844-4

2 inputs unused

Ch 6

Ch 7

Generic D-Sub 9 Cable M-F — D-Sub 9M to D Connector 9

Generic D-Sub 9 Cable M-F — D-Sub 9M to D Connector 9

LVDT-Coil Driver Cable — D-Sub 9M to DB15M

LVDT Driver Chassis JGW-D1402826, Front Panel JGW-D1402827 Input Board #2 JGW-D1301467

LVDT CARD 2 (Left)

J1 — INP0, INN0, INP1, INN1, INP2, INN2, INP3, INN3 — D-Sub 9M

LVDT CARD 2 (Right)

J2 — OUTP0, OUTN0, OUTP1, OUTN1, OUTP2, OUTN2, OUTP3, OUTN3 — D-Sub 9M

LVDT Driver Chassis JGW-D1402826, Front Panel JGW-D1402827 Main Board JGW-D1301467

LVDT MAIN (Right)

J1 — D-Sub 9M

Gender Bender F-F — D Connector 9 to D Connector 9

Generic D-Sub 9 Cable M-F — D-Sub 9M to D Connector 9

AA Chassis JGW-D1100621

AA In 9-12

J3 — D-Sub 9M

High Power Coil Driver #2 JGW-D1503504, Rear Panel, JGW-D1503505, Monitor Board JGW-D1503510

PR3-HPCD-J4 — DB15F

PR3-HPCD-J3 — D-Sub 9M

High Power Coil Driver #1 JGW-D1503504, Front Panel, JGW-D1503502, Driver Board JGW-D1503503

Generic D-Sub 9 Cable M-F — D Connector 9 to D-Sub 9M

AI Chassis #2 D1101521

AI Out 1-4

J1 — D Connector 9

Signal Generator 10 kHz, 5 V

J? — BNC

The LVDT Chassis has provision for an oscillator card, but until such time as the cards are available, an external oscilator will be required

Cable

LVDT Driver Chassis JGW-D1402826, Front Panel JGW-D1402827 Interface Board JGW-D1402829

DIST-OUT4 LEMO 1 Pin

Title	BS Suspension Cabling - BS&SF LVDT Drivers	
Size A3	Number JGW-D1503600 10	Revision -v7
Date: 2016/04/10		Sheet of 14
File: \\..\10 BS&SF LVDT Drive.SchDoc		Drawn By:

PI LVDT Drivers

Inputs from PI LVDTs (see Sheet 6)

LVDT/ACT Distributor JGW-D1402124, Front Panel JGW-D1402827 Board JGW-D1402117 #1

LVDT/ACT Distributor JGW-D1402124, Rear Panel JGW-D1402828, Board JGW-D1402117 #1

Ch 0
J1
INP0 INN0 OUTP0 OUTN0 ACTP0 ACTN0
D-Sub 9F

Ch 1
J2
INP1 INN1 OUTP1 OUTN1 ACTP1 ACTN1
D-Sub 9F

Ch 2
J3
INP2 INN2 OUTP2 OUTN2 ACTP2 ACTN2
D-Sub 9F

Ch 3
J4
INP3 INN3 OUTP3 OUTN3 ACTP3 ACTN3
D-Sub 9F

Ch 0-3 LVDT-IN
J5
INP0 INN0 INP1 INN1 INP2 INN2 INP3 INN3
6E17C009SAJ120

Ch 0-3 LVDT-OUT
J6
OUTP0 OUTN0 OUTP1 OUTN1 OUTP2 OUTN2 OUTP3 OUTN3
6E17C009SAJ120

Ch 0-3 ACT
J7
ACTP0 ACTN0 ACTP1 ACTN1 ACTP2 ACTN2 ACTP3 ACTN3
6E17C009SAJ120
1734348-1
5747844-4

Generic D-Sub 9 Cable M-F
D-Sub 9M — D Connector 9

Generic D-Sub 9 Cable M-F
D-Sub 9M — D Connector 9

LVDT-Coil Driver Cable
D-Sub 9M — DB15M

LVDT Driver Chassis JGW-D1402826, Front Panel JGW-D1402827 Input Board #1 JGW-D1301467

LVDT CARD 1 (Left)
J1
INP0 INN0 INP1 INN1 INP2 INN2 INP3 INN3
D-Sub 9M

LVDT CARD 1 (Right)
J2
OUTP0 OUTN0 OUTP1 OUTN1 OUTP2 OUTN2 OUTP3 OUTN3
D-Sub 9M

LVDT Driver Chassis JGW-D1402826, Front Panel JGW-D1402827 Main Board JGW-D1301467

LVDT MAIN (Left)
J1
D-Sub 9M

High Power Coil Driver #1 JGW-D1503504, Rear Panel, JGW-D1503505, Monitor Board JGW-D1503510

High Power Coil Driver #1 JGW-D1503504, Front Panel, JGW-D1503502, Driver Board JGW-D1503503

J4
DB15F

BS-HPCD1-J3
D-Sub 9M

Gender Bender F-F
D Connector 9 — D Connector 9

Generic D-Sub 9 Cable M-F
D-Sub 9M — D Connector 9

Generic D-Sub 9 Cable M-F
D Connector 9 — D-Sub 9M

AA Chassis JGW-D1100621
AA In 1-4
J1
D-Sub 9M

AI Chassis #2 D1101521
AI Out 5-8
J2
D Connector 9

Title	BS Suspension Cabling - PI LVDT Drivers	
Size A3	Number JGW-D1503600 11	Revision -v7
Date: 2016/04/10		Sheet of 14
File: \\..\11 PI LVDT Drive.SchDoc		Drawn By:

Pico and Stepper Drivers

Outputs to IM Picos (see Sheet 3)

Joystick cable

Joystick #1

J1
1 NC
2 PR3-IM-PP-GND
3 PR3-IM-PP-MOTOR
4 PR3-IM-PP-GND
Comment: RJ22

Newport 8742 Pico Driver #1

J2
1 NC
2 PR3-IM-PR-GND
3 PR3-IM-PR-MOTOR
4 PR3-IM-PR-GND
Comment: RJ22

AC

LAN Cable

LAN Cable

LAN Cable

Stepper Driver #`2
JGW-D1600TBD
Board
TMCM-6110
Serial-Internet Converter
MOXA

BOX STILL IN DESIGN!!!
GUESS AT FINAL PINOUT!!!

J-MOTOR-0
BS-PI-SV-A1 1
BS-PI-SV-A2 6
BS-PI-SV-B1 2
BS-PI-SV-B2 7
3
8
4
9
5
11
10
D-Sub 9F

J-MOTOR-1
BS-PI-SY-A1 1
BS-PI-SY-A2 6
BS-PI-SY-B1 2
BS-PI-SY-B2 7
3
8
4
9
5
11
10
D-Sub 9F

NOTE: 3 channels use switches

J-MOTOR-2
BS-PI-S1-A1 1
BS-PI-S1-A2 6
BS-PI-S1-B1 2
BS-PI-S1-B2 7
BS-PI-S1-SA1 3
BS-PI-S1-SA2 8
BS-PI-S1-SB1 4
BS-PI-S1-SB2 9
5
11
10
D-Sub 9F

J-MOTOR-3
BS-PI-S2-A1 1
BS-PI-S2-A2 6
BS-PI-S2-B1 2
BS-PI-S2-B2 7
BS-PI-S1-SA1 3
BS-PI-S1-SA2 8
BS-PI-S1-SB1 4
BS-PI-S1-SB2 9
5
11
10
D-Sub 9F

J-MOTOR-4
BS-PI-S3-A1 1
BS-PI-S3-A2 6
BS-PI-S3-B1 2
BS-PI-S3-B2 7
BS-PI-S1-SA1 3
BS-PI-S1-SA2 8
BS-PI-S1-SB1 4
BS-PI-S1-SB2 9
5
11
10
D-Sub 9F

J-MOTOR-5
1
6
2
7
3
8
4
9
5
11
10
D-Sub 9F

AC

Outputs to PI Steppers (see Sheet 7)

The connectors for the pico drivers are RJ22 with four pins.
I couldn't find Altium versions, so I used a random four-pin connector.

Outputs to BF Picos (see Sheet 4)

J1
1 NC
2 PR3-BF-PP-GND
3 PR3-BF-PP-MOTOR
4 PR3-BF-PP-GND
Comment: RJ22

Newport 8742 Pico Driver #2

J2
1 NC
2 PR3-BF-PR-GND
3 PR3-BF-PR-MOTOR
4 PR3-BF-PR-GND
Comment: RJ22

Ethernet Hub

AC

LAN Cable

J3
1 NC
2 PR3-BF-PY-GND
3 PR3-BF-PY-MOTOR
4 PR3-BF-PY-GND
Comment: RJ22

Joystick cable

Joystick #2

AC

LAN Cable

Output to BF Stepper (see Sheet 4)

BOX STILL IN DESIGN!!!
GUESS AT FINAL PINOUT!!!

J-MOTOR-1
1 BS-BF-SV-A1
6 BS-BF-SV-A2
2 BS-BF-SV-B1
7 BS-BF-SV-B2
3
8
4
9
5
11
10
D-Sub 9F

Stepper Driver #`1
JGW-D1600TBD
Board
TMCM-6110
Serial-Internet Converter
MOXA

Female
Male
CI0104P1VK0-LF
CVIlux CI01 series,
4 pins, 2mm pitch

Output to SF Stepper (see Sheet 4)

J-MOTOR-2
1 BS-SF-SV-A1
6 BS-SF-SV-A2
2 BS-SF-SV-B1
7 BS-SF-SV-B2
3
8
4
9
5
11
10
D-Sub 9F

J-MOTOR-3
J-MOTOR-4
J-MOTOR-5
J-MOTOR-6
1
6
2
7
3
8
4
9
5
11
10
D-Sub 9F

LAN Cable

AC

Title	BS Suspension Cabling - Pico and Stepper Drivers	
Size A3	Number JGW-D1503600 12	Revision -v7
Date: 2016/04/10	Sheet of 14	
File: \\..\12 Pico&Stepper Drive.SchDoc	Drawn By:	

3 Feedthroughs

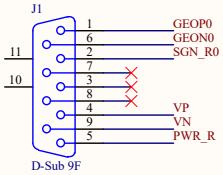
Geophone Readout

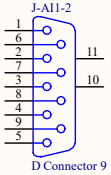
Inputs from PI Geophones (see Sheet 8)

Geophone Distributor
D1402120
Front Panel
D1402122
Board
D1402121

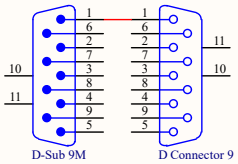
Geophone Distributor
D1402120
Rear Panel
D1402123
Board
D1402121

Ch 0



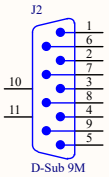


Generic D-Sub 9 Cable M-F

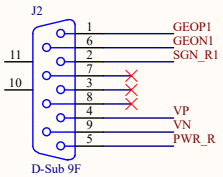


AA Chassis
JGW-D1100621

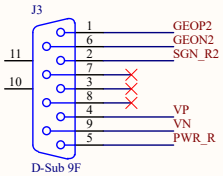
AA In 5-8



Ch1

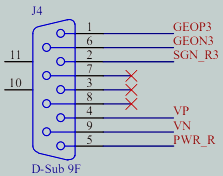


Ch 2



(Unused)

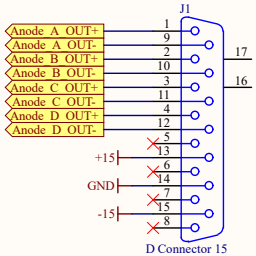
Ch 3



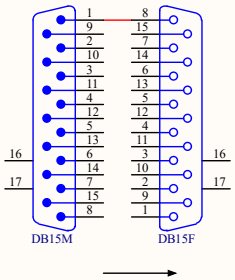
Title: BS Suspension Cabling - Geophone Readout		
Size: A3	Number: JGW-D1503600	Revision: -v6
Date: 2016/04/10	Sheet 14 of 14	
File: \\..\13 Geophone Readout.SchDoc	Drawn By:	

OpLev

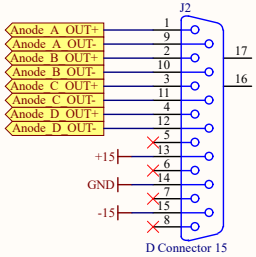
OL QPD Amp #1
D1402411



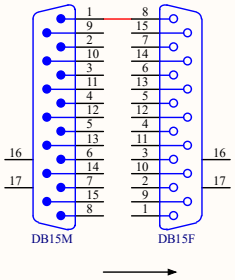
Generic D-Sub 15 Cable M-F



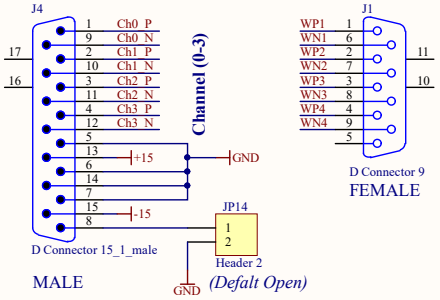
OL QPD Amp #2
D1402411

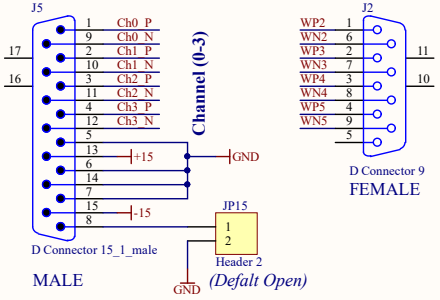


Generic D-Sub 15 Cable M-F



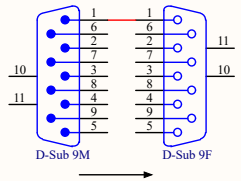
Whitening Chassis
D1302087
Front Panel
D1302088
Board
D1302081+D1402416



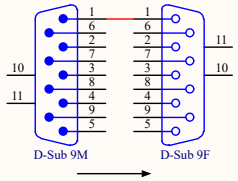


Whitening Chassis
D1302087
Rear Panel
D1302084
Board
D1302081+D1402416

Generic D-Sub 9 Cable M-F

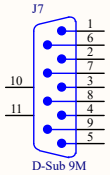


Generic D-Sub 9 Cable M-F

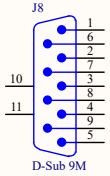


AA Chassis
D1100621

AA In 25-28



AA In 29-32



Title	BS Suspension Cabling - OpLev	
Size: A3	Number: JGW-D1503600	Revision: -v7
Date: 2016/04/10	Sheet 14 of 14	
File: \\..\14 OpLev Readout.SchDoc	Drawn By:	