4 Feedthroughs

TM OSEMs

TM OSEM to BF Cable
JGW-D1503901 Sheet 01

OSEM		Type 5-2.2 (BS) or -1.7 (SR)	BF to F0 Signal Cable JGW-D1503901 Sheet 08	PI-Flange Signal Cable JGW_D1503901 Sheet 11	Feedthrough	Anti-Feedthrough Adapter Cable	OSEM External Cable	Sat Amp #0 D1402809
			Type 3-4	Type 1				
BS-TM-H1	Glenair GMR7590-9P-1BPN	Glenair MWDM2L-9SS						
	BS-TM-H1	C-BS-TM-H1-0A / C-BS-TM-H1-0B	C-BS-TM-H1-1A / C-BS-TM-H1-1B	C-BS-TM-H1-2A / C-BS-TM-H1-2B	F-BS-TM-H1-A / F-BS-TM-H1-B	C-BS-TM-H1-3A / C-BS-TM-H1-3B	C-BS-TM-H1-4A / C-BS-TM-H1-4B	J101
	LEDK TMH1							
	LEDA TMH1							
	COIL- TMH1							
	COIL+ TMH1							
	PDA TMH1							
	PDK TMH1							
	DMicroM	DMicroF / D-Sub 9M	D-Sub 9F / D-Sub 9M	D-Sub 9F / D-Sub 9F	D-Sub 9M / D-Sub 9M	D-Sub 9F / D-Sub 9M	D-Sub 9F / D-Sub 9M	D-Sub 9F
BS-TM-H2		Type 5-2.4 (BS) or -2 (SR						
	BS-TM-H2	C-BS-TM-H2-0A / C-BS-TM-H2-0B	C-BS-TM-H2-1A / C-BS-TM-H2-1B	C-BS-TM-H2-2A / C-BS-TM-H2-2B	F-BS-TM-H2-A / F-BS-TM-H2-B	C-BS-TM-H2-3A / C-BS-TM-H2-3B	C-BS-TM-H2-4A / C-BS-TM-H2-4B	J102
	LEDK TMH2							
	LEDA TMH2							
	COIL- TMH2							
	COIL+ TMH2							
	PDA TMH2							
	PDK TMH2							
	DMicroM	DMicroF / D-Sub 9M	D-Sub 9F / D-Sub 9M	D-Sub 9F / D-Sub 9F	D-Sub 9M / D-Sub 9M	D-Sub 9F / D-Sub 9M	D-Sub 9F / D-Sub 9M	D-Sub 9F
BS-TM-H3		Type 5-2.4 (BS) or -2 (SR)						
	BS-TM-H3	C-BS-TM-H3-0A / C-BS-TM-H3-0B	C-BS-TM-H3-1A / C-BS-TM-H3-1B	C-BS-TM-H3-2A / C-BS-TM-H3-2B	F-BS-TM-H3-A / F-BS-TM-H3-B	C-BS-TM-H3-3A / C-BS-TM-H3-3B	C-BS-TM-H3-4A / C-BS-TM-H3-4B	J103
	LEDK TMH3							
	LEDA TMH3							
	COIL- TMH3							
	COIL+ TMH3							
	PDA TMH3							
	PDK TMH3							
	DMicroM	DMicroF / D-Sub 9M	D-Sub 9F / D-Sub 9M	D-Sub 9F / D-Sub 9F	D-Sub 9M / D-Sub 9M	D-Sub 9F / D-Sub 9M	D-Sub 9F / D-Sub 9M	D-Sub 9F
BS-TM-H4		Type 5-2.2 (BS) or -2 (SR)						
	BS-TM-H4	C-BS-TM-H4-0A / C-BS-TM-H4-0B	C-BS-TM-H4-1A / C-BS-TM-H4-1B	C-BS-TM-H4-2A / C-BS-TM-H4-2B	F-BS-TM-H4-A / F-BS-TM-H4-B	C-BS-TM-H4-3A / C-BS-TM-H4-3B	C-BS-TM-H4-4A / C-BS-TM-H4-4B	J104
	LEDK TMH4							
	LEDA TMH4							
	COIL- TMH4							
	COIL+ TMH4							
	PDA TMH4							
	PDK TMH4							
	DMicroM	DMicroF / D-Sub 9M	D-Sub 9F / D-Sub 9M	D-Sub 9F / D-Sub 9F	D-Sub 9M / D-Sub 9M	D-Sub 9F / D-Sub 9M	D-Sub 9F / D-Sub 9M	D-Sub 9F

Male

Female

Each OSEM has a D-Micro male, which looks superficially like it might be female but has pins in recesses. The OSEM and cable were both shown with the wrong gender until -v13 of this diagram. Note that pins are numbered from top left on male and top right on female.

Type 5 cables have a flip to correct a flexicircuit issue.

The BS Test Hang used full OSEMs with PDs and LEDs at the TM level, but the BS Final Hang and the SRs use coil-only OSEMs.

Resistances/voltages at male end of Type 5 OSEM cable:

1/6: PD, 0.466 V

2/7: Coil, 14.5-15.1 Ω

3/8: LED, 0.975 V

The OSEMS on the BS are on the HR side of the optic and the layout looking directly at them is

H4 H1
H3 H2

The OSEMs on the SR are on the AR side and the layout looking directly at them is
H1 H4
H2 H3

This was chosen to make the orientation the same when looking towards +L.

In some cases, especially on the BS, the Type 1 cable was replaced by a flipping Female-Female gender changer because there was excess length.

This then required a NON-flipping Anti-Feedthrough Adapter on the outside of the feedthrough.

Title	Type B Suspension Cabling - TM OSEMs		
Size	Number		Revision
A3	JGW-D1503600		-v16
Date:	2019/06/16	Sheet 1of 19	
File:	\\..\01 TM OSEMs.SchDoc	Drawn By:	

6 Feedthroughs

IM OSEMs

OSEM	IM OSEM to BF Cable JGW-D1503901 Sheet 02	BF to F0 Signal Cable JGW-D1503901 Sheet 08	PI-Flange Signal Cable JGW_D1503901 Sheet 11	Feedthrough	Anti-Feedthrough Adapter Cable	OSEM External Cable	Sat Amp #1 D1402809
Glenair GMR7590-9P-1BPN	Glenair MWDM2L-9SS	Type 5-1.7	Type 3-4	Type 1-2			
BS-IM-V1	C-BS-IM-V1-0A / C-BS-IM-V1-0B	C-BS-IM-V1-1A / C-BS-IM-V1-1B	C-BS-IM-V1-2A / C-BS-IM-V1-2B	F-BS-IM-V1-A / F-BS-IM-V1-B	C-BS-IM-V1-3A / C-BS-IM-V1-3B	C-BS-IM-V1-4A / C-BS-IM-V1-4B	J-BS-SA2-101
BS-IM-V2	C-BS-IM-V2-0A / C-BS-IM-V2-0B	C-BS-IM-V2-1A / C-BS-IM-V2-1B	C-BS-IM-V2-2A / C-BS-IM-V2-2B	F-BS-IM-V2-A / F-BS-IM-V2-B	C-BS-IM-V2-3A / C-BS-IM-V2-3B	C-BS-IM-V2-4A / C-BS-IM-V2-4B	J-BS-SA2-102
BS-IM-V3	C-BS-IM-V3-0A / C-BS-IM-V3-0B	C-BS-IM-V3-1A / C-BS-IM-V3-1B	C-BS-IM-V3-2A / C-BS-IM-V3-2B	F-BS-IM-V3-A / F-BS-IM-V3-B	C-BS-IM-V3-3A / C-BS-IM-V3-3B	C-BS-IM-V3-4A / C-BS-IM-V3-4B	J-BS-SA2-103

Sat Amp #2 D1402809

	Type 5-1.7	Type 3-4	Type 1-2				
BS-IM-H1	C-BS-IM-H1-0A / C-BS-IM-H1-0B	C-BS-IM-H1-1A / C-BS-IM-H1-1B	C-BS-IM-H1-2A / C-BS-IM-H1-2B	F-BS-IM-H1-A / F-BS-IM-H1-B	C-BS-IM-H1-3A / C-BS-IM-H1-3B	C-BS-IM-H1-4A / C-BS-IM-H1-4B	J-BS-SA3-101
BS-IM-H2	C-BS-IM-H2-0A / C-BS-IM-H2-0B	C-BS-IM-H2-1A / C-BS-IM-H2-1B	C-BS-IM-H2-2A / C-BS-IM-H2-2B	F-BS-IM-H2-A / F-BS-IM-H2-B	C-BS-IM-H2-3A / C-BS-IM-H2-3B	C-BS-IM-H2-4A / C-BS-IM-H2-4B	J-BS-SA3-102
BS-IM-H3	C-BS-IM-H3-0A / C-BS-IM-H3-0B	C-BS-IM-H3-1A / C-BS-IM-H3-1B	C-BS-IM-H3-2A / C-BS-IM-H3-2B	F-BS-IM-H3-A / F-BS-IM-H3-B	C-BS-IM-H3-3A / C-BS-IM-H3-3B	C-BS-IM-H3-4A / C-BS-IM-H3-4B	J-BS-SA3-103

Pin	Signal
1	LEDK BS-IM-V1
2	LEDA BS-IM-V1
3	COIL- BS-IM-V1
4	COIL+ BS-IM-V1
5	PDA BS-IM-V1
6	PDK BS-IM-V1
7	
8	
9	
10	
11	

Pin	Signal
1	LEDK BS-IM-V2
2	LEDA BS-IM-V2
3	COIL- BS-IM-V2
4	COIL+ BS-IM-V2
5	PDA BS-IM-V2
6	PDK BS-IM-V2
7	
8	
9	
10	
11	

Pin	Signal
1	LEDK BS-IM-V3
2	LEDA BS-IM-V3
3	COIL- BS-IM-V3
4	COIL+ BS-IM-V3
5	PDA BS-IM-V3
6	PDK BS-IM-V3
7	
8	
9	
10	
11	

Pin	Signal
1	LEDK BS-IM-H1
2	LEDA BS-IM-H1
3	COIL- BS-IM-H1
4	COIL+ BS-IM-H1
5	PDA BS-IM-H1
6	PDK BS-IM-H1
7	
8	
9	
10	
11	

Pin	Signal
1	LEDK BS-IM-H2
2	LEDA BS-IM-H2
3	COIL- BS-IM-H2
4	COIL+ BS-IM-H2
5	PDA BS-IM-H2
6	PDK BS-IM-H2
7	
8	
9	
10	
11	

Pin	Signal
1	LEDK BS-IM-H3
2	LEDA BS-IM-H3
3	COIL- BS-IM-H3
4	COIL+ BS-IM-H3
5	PDA BS-IM-H3
6	PDK BS-IM-H3
7	
8	
9	
10	
11	

DMicroF / DMicroM / D-Sub 9F / D-Sub 9M

Type 5 cables have a flip to correct flexicircuit issue.

Each OSEM has a D-Micro male, which looks superficially like a female but has pins in recesses. The OSEM and cable were both shown with the wrong gender until -v13 of this diagram

Resistances/voltages at male end of Type 5 OSEM cable:

1/6: PD, 0.466 V

2/7: Coil, 14.5-15.1 Ω

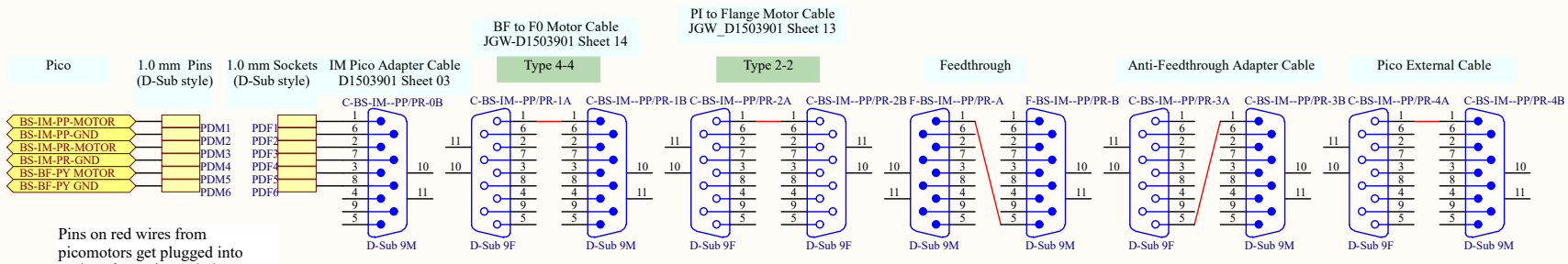
3/8: LED, 0.975 V

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

Title	Type B Suspension Cabling - IM OSEMs		
Size A3	Number JGW-D1503600		Revision -v16
Date:	2019/06/16	Sheet 2 of 19	
File:	\\..\02 IM OSEMs.SchDoc	Drawn By:	

1 Feedthrough

IM Picomotors & BF Yaw Picomotor



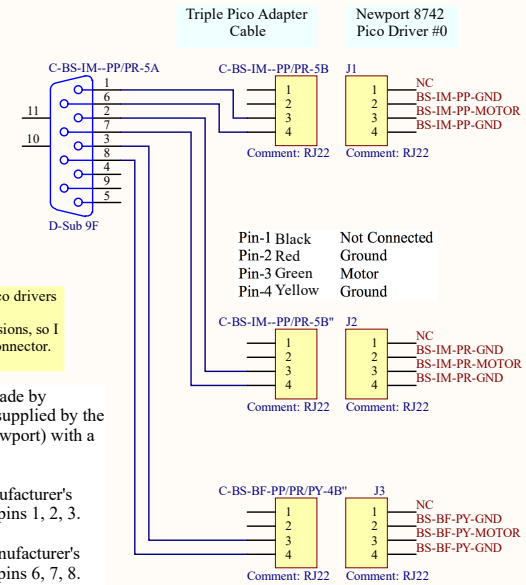
Pins on red wires from picomotors get plugged into sockets from pins 1, 2, 3.

Pins on white wires from picomotors get plugged into sockets from pins 6, 7, 8.

The pico motor at the bottom level of the IM does pitch and gets plugged into 1&6.

The pico motor at the top level of the IM does roll and gets plugged into 2&7.

The pico motor in the BS does IM yaw and gets plugged into 3&8.



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.

The adapter cable is made by combining the cables supplied by the pico manufacturer (Newport) with a D-Sub 9 female.

Green wires from manufacturer's cables get soldered to pins 1, 2, 3.

Yellow wires from manufacturer's cables get soldered to pins 6, 7, 8.

In -v10, the BS Yaw Pico was moved to the IM sheet and grouped with the IM picos, because it's more physically convenient for wiring and more logical (it actually rotates the IM).

Title	Type B Suspension Cabling - IM Picos and BF Yaw Pico	
Size A3	Number JGW-D1503600	Revision -v16
Date: 2019/06/16		Sheet 3of 19
File: \\..\03 IM Picos & BF Yaw Pico.SchDoc		Drawn By:

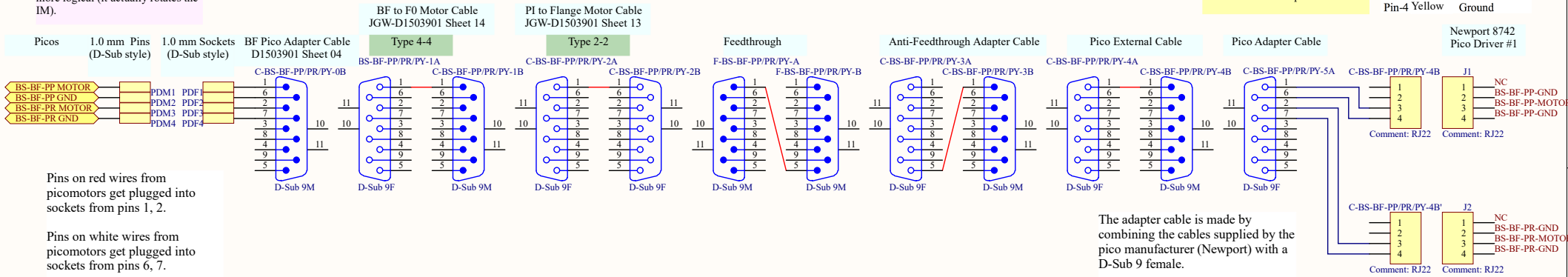
3 Feedthroughs

BF and F1
Picomotors and Steppers

In -v10, the BS Yaw Pico was moved to the IM sheet and grouped with the IM picos, because it's more physically convenient for wiring and more logical (it actually rotates the IM).

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.

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



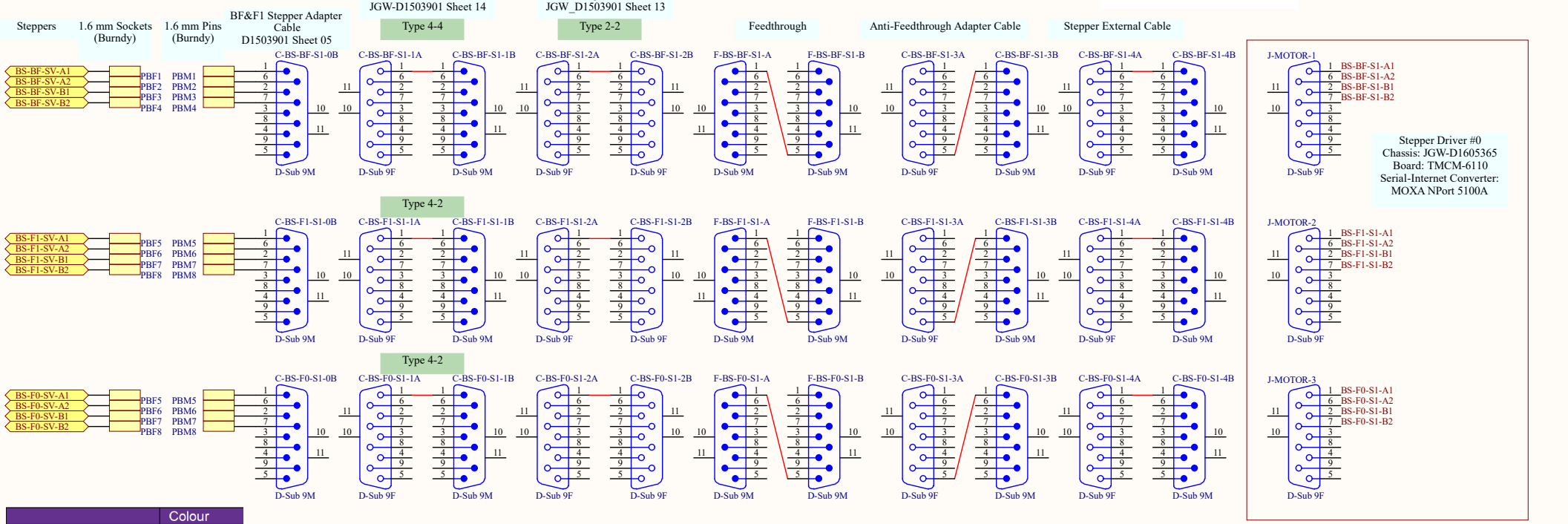
Pins on red wires from picomotors get plugged into sockets from pins 1, 2.

Pins on white wires from picomotors get plugged into sockets from pins 6, 7.

The adapter cable is made by combining the cables supplied by the pico manufacturer (Newport) with a D-Sub 9 female.

Green wires from manufacturer's cables get soldered to pins 1, 2.

Yellow wires from manufacturer's cables get soldered to pins 6, 7.



	Colour
Phase A+	Green
Phase A-	Grey
Phase B+	Black
Phase B–	White
Thermocouple +	Brown
Thermocouple -	Blue

Coil resistances (including one "Type 3" cable):

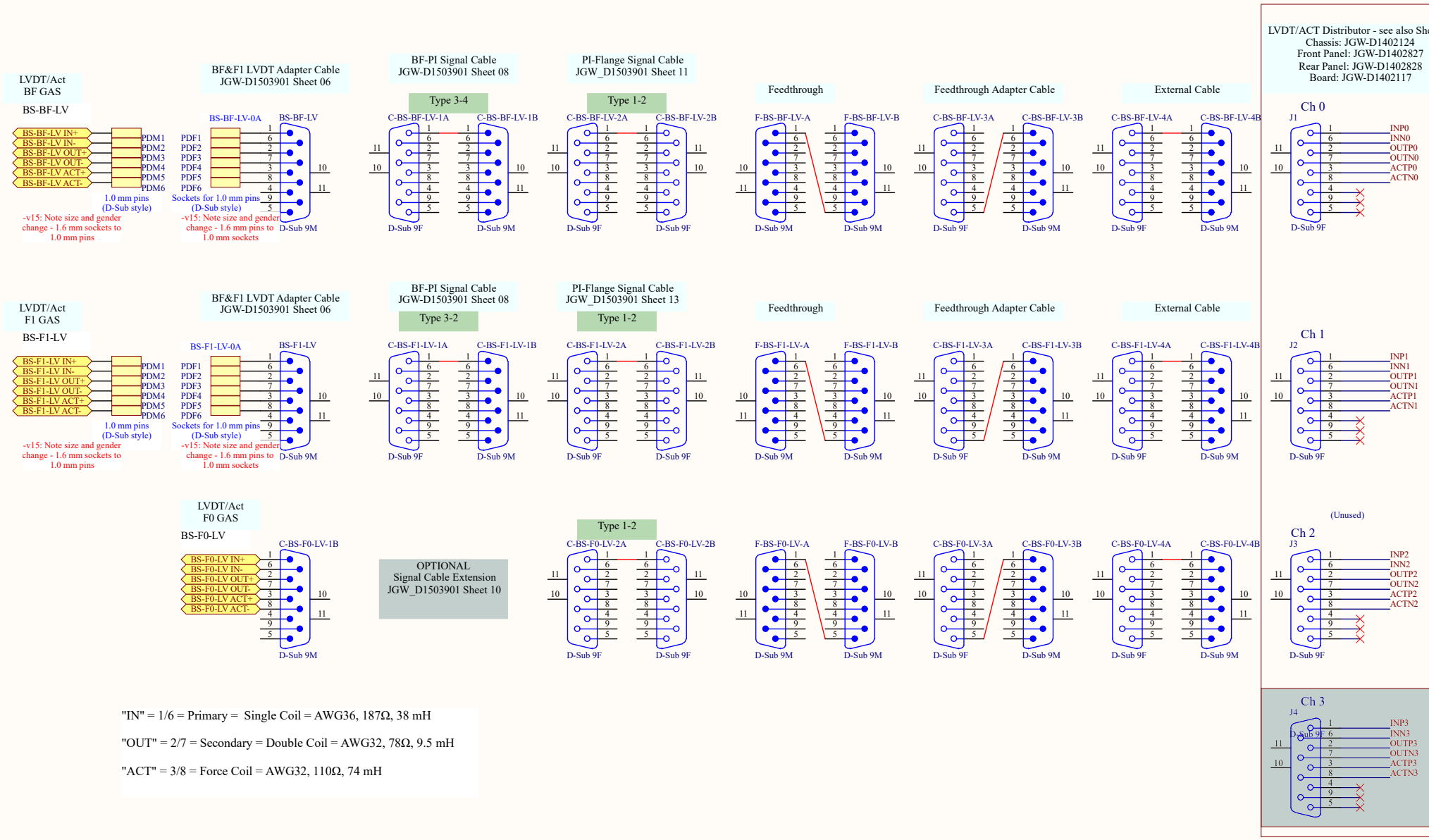
SV: 5.5 Ω

-v16: For the first time, the stepper motor channel assignments correctly reflect the as-built default. HOWEVER, in several cases stepper driver channels have failed and stepper motors have had to be reassigned. See
http://gwwiki.icrr.u-tokyo.ac.jp/JGWwiki/KAGRA/Subgroups/DGS/Projects/StepperMotor
for the latest news.

Title	Type B Suspension Cabling - Bottom and Standard Filter Picos/Steppers	
Size A3	Number JGW-D1503600	Revision -v16
Date: 2019/06/16		Sheet 4of 19
File: \\..\04 BF&F1 Picos&Steppers.SchDoc		Drawn By:

GAS (BF, F1 and F0) LVDT/ACTs

2 Feedthroughs



"IN" = 1/6 = Primary = Single Coil = AWG36, 187Ω, 38 mH

"OUT" = 2/7 = Secondary = Double Coil = AWG32, 78Ω, 9.5 mH

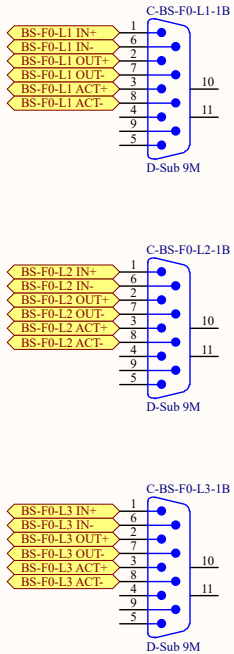
"ACT" = 3/8 = Force Coil = AWG32, 110Ω, 74 mH

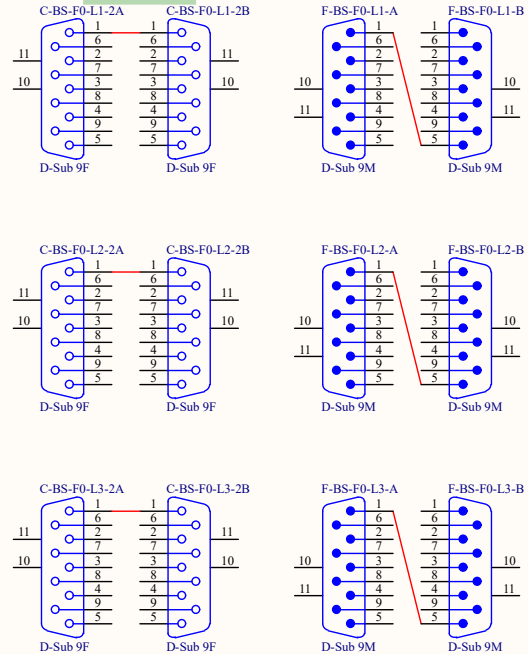
Title: Type B Suspension Cabling - GAS LVDTs		
Size: A3	Number: JGW-D1503600	Revision: -v16
Date: 2019/06/16		Sheet 5of 19
File: \\..\05 GAS LVDTs.SchDoc		Drawn By:

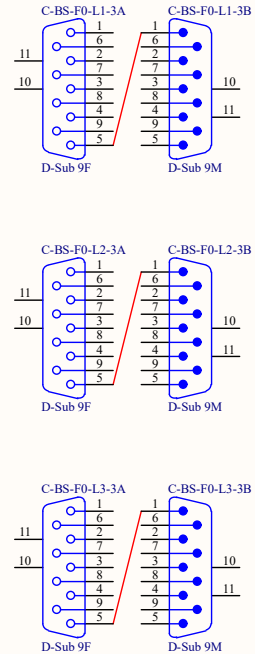
IP LVDTs

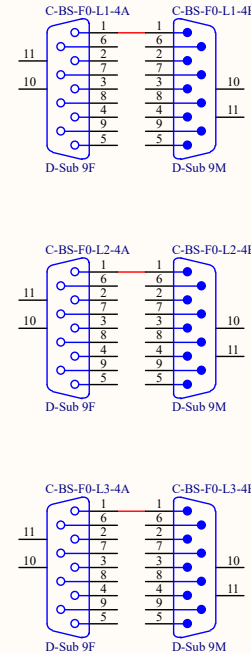
4 Feedthroughs

LVDT/ACT	OPTIONAL Signal Cable Extension JGW_D1503901 Sheet 10	PI-Flange Signal Cable JGW_D1503901 Sheet 11	Feedthrough	Anti-Feedthrough Adapter Cable	LVDT/ACT External Cable
C-BS-F0-L1-1B		Type 1-2 C-BS-F0-L1-2A / C-BS-F0-L1-2B	F-BS-F0-L1-A / F-BS-F0-L1-B	C-BS-F0-L1-3A / C-BS-F0-L1-3B	C-BS-F0-L1-4A / C-BS-F0-L1-4B
C-BS-F0-L2-1B		C-BS-F0-L2-2A / C-BS-F0-L2-2B	F-BS-F0-L2-A / F-BS-F0-L2-B	C-BS-F0-L2-3A / C-BS-F0-L2-3B	C-BS-F0-L2-4A / C-BS-F0-L2-4B
C-BS-F0-L3-1B		C-BS-F0-L3-2A / C-BS-F0-L3-2B	F-BS-F0-L3-A / F-BS-F0-L3-B	C-BS-F0-L3-3A / C-BS-F0-L3-3B	C-BS-F0-L3-4A / C-BS-F0-L3-4B

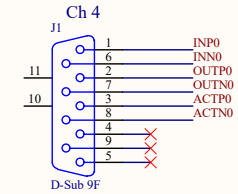


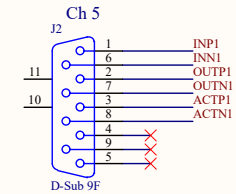


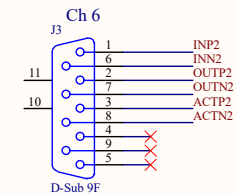


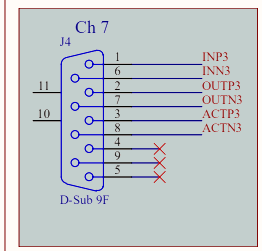


LVDT/ACT Distributor - see also Sheet 13
Chassis: JGW-D1402124
Front Panel: JGW-D1402827
Rear Panel: JGW-D1402828
Board: JGW-D1402117









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	

Coil resistances:

"IN" = 1/6 = Primary = Single Coil = 250 Ω

"OUT" =2/7 = Secondary = Double Coil = 320 Ω

"ACT" = 3/8 = Force Coil = 155 Ω

BS Currently has Primaries and Secondaries swapped, 2017-05-30

Title	Type B Suspension Cabling - IP LVDTs		
Size A3	Number JGW-D1503600		Revision -v16
Date: 2019/06/16		Sheet 6of 19	
File: \\..\06 IP LVDTs.SchDoc		Drawn By:	

Preisolator Steppers

4 Feedthroughs

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

TMCM-6110
Stepper Driver #2

Stepper Splitter Cable
Double Motor Version

Stepper Driver #1
Chassis: JGW-D1605365
Board: TMCM-6110
Serial-Internet Converter:
MOXA NPort 5100A

Stepper

F0 Stepper Adapter
JGW-D1503901 Sheet 24

PI to Flange Motor Cable
JGW-D1503901 Sheet 13

Feedthrough

Anti-Feedthrough Adapter Cable

Stepper External Cable

Type 2-2

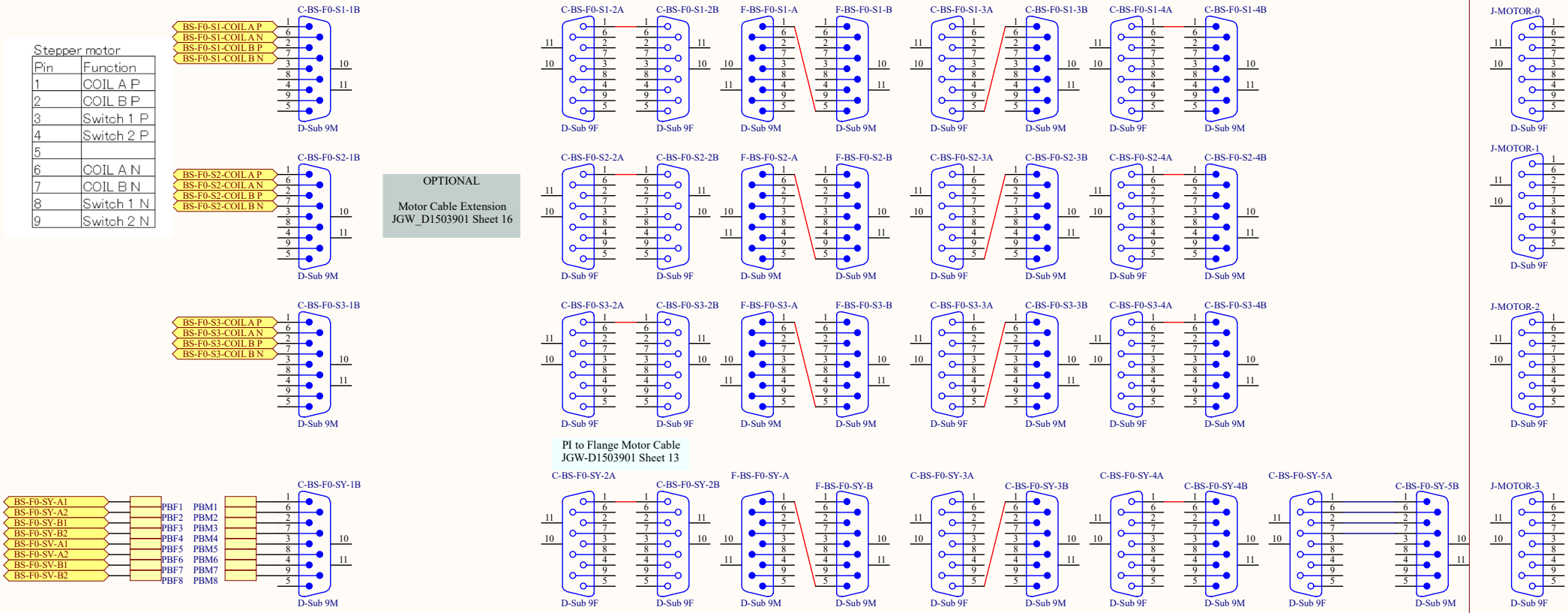
-v16: The horizontal stepper limit switches previously indicated were never implemented and have been removed.

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

OPTIONAL

Motor Cable Extension
JGW_D1503901 Sheet 16



PI to Flange Motor Cable
JGW-D1503901 Sheet 13

Coil resistances (including one "Type 3" cable):

S1/S2/S3: 6.8-7.2 Ω

SV: 5.5 Ω

SY: 5.2 Ω

-v16: For the first time, the stepper motor channel assignments correctly reflect the as-built default. HOWEVER, in several cases stepper driver channels have failed and stepper motors have had to be reassigned. See
http://gwwiki.icrr.u-tokyo.ac.jp/JGWwiki/KAGRA/Subgroups/DGS/Projects/StepperMotor
for the latest news.

Title: Type B Suspension Cabling - Preisolator Steppers		
Size: A3	Number: JGW-D1503600	Revision: -v16
Date: 2019/06/16		Sheet 7of 19
File: \\..\07 PI Steppers.SchDoc		Drawn By:

3 Feedthroughs

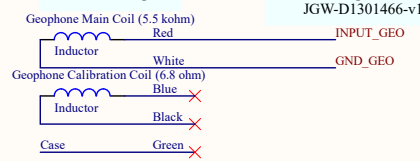
Preisolator Geophones

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

Sercel L4C Geophone

Nikhef Geophone Preamp
JGW-D1301466-v1



Geophone Pod

Geophone Adapter Cable
JGW-D1503901 Sheet 07

PI to Flange Geophone Cable
JGW-E1503901 Sheet 11
Type 1-2

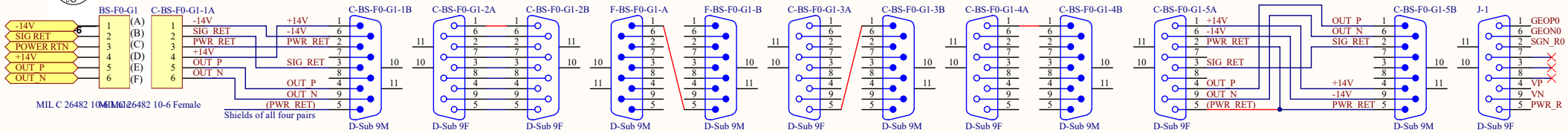
Feedthrough

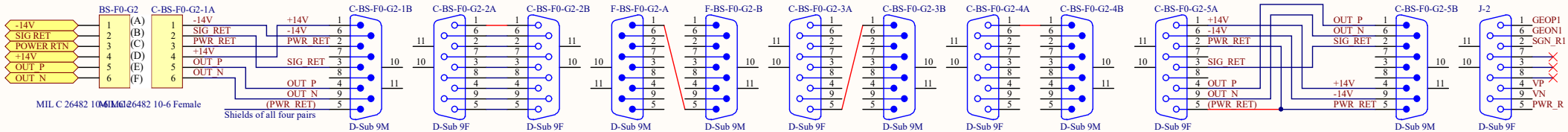
Anti-Feedthrough Adapter Cable

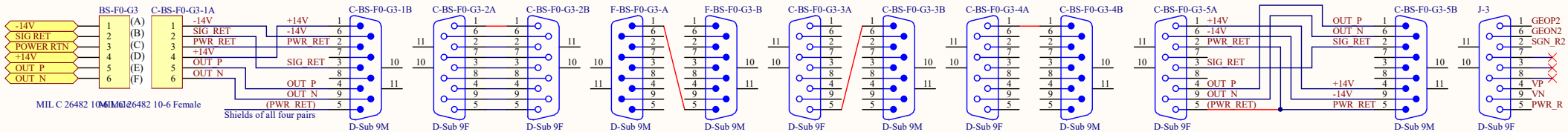
Geophone External Cable

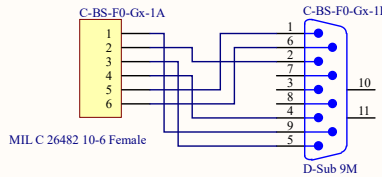
Geophone Unscrambler Cable

Geophone Distributor
JGW-D1402120

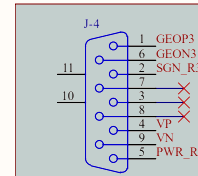








Old-style geophone adapter as used in Type B Test Hang at TAMA300. These should _not_ be used with Geophone Unscrambler Cables.



J-4 not used

Title: Type B Suspension Cabling - Preisolator Geophones		
Size: A3	Number: JGW-D1503600	Revision: -v16
Date: 2019/06/16	Sheet 8of 19	
File: \\..\08 PI Geophones.SchDoc	Drawn By:	

TM OSEM Sat Amp and Coil Driver

The original design called for low power coil drivers for the TM and IM OSEMs and the names of the boxes used here reflect this. The current baseline is TM=LPCD, IM-H=MPCD and IM-V=HPCD.

Sat Amp #0

Chassis: JGW-D1503498,
Front Panel: JGW-D1503500,
Rear Panel: JGW-D1503500,
Board: JGW-D1503499

Inputs from TM OSEMs (see Sheet 1)

J101 J103 J102 J104 — D-Sub 9F

J501 — DB15M — Coil Drive Inputs

J502 — DB9F — PD Outputs

J503 — DB9F — LED Current Monitor Outputs

AI Chassis #0 D1100650

AI Out 0-3 — J1 — D Connector 9

Generic D-Sub 9 Cable M-F: D-Sub 9M → D-Sub 9F

Generic D-Sub 15 Cable M-F: DB15F → DB15M

AA Chassis #0 D1100621

AA In 1-4 — J4 — D-Sub 9M

Generic D-Sub 9 Cable M-F: D-Sub 9M → D-Sub 9F

AA Chassis #1 D1100621

AA In TBD — TBD3 — D-Sub 9M

AA In TBD — TBD2 — D-Sub 9M

AA In TBD — TBD1 — D-Sub 9M

Generic D-Sub 9 Cable M-F: D-Sub 9F → D-Sub 9M

Low Power Coil Driver #0

Coil Current Request Inputs — J3 — D-Sub 9M

Coil Drive Ouputs — J4 — DB15F

J2 — D-Sub 9F — Noise Monitor Input

Voltage Monitor Outputs — J3 — D-Sub 9M

Fast Current Monitor Outputs — J4 — D-Sub 9M

J5 — D-Sub 9M — Slow Current Monitor Outputs

Binary IO 2 DIO Input — J7

LP11	1	20	
Reset Pulse	2	21	
LP21	3	22	
LP31	4	23	
Test1	5	24	
LP12	6	25	
LP22	7	26	
LP32	8	27	
Test2	9	28	
LP13	10	29	
LP23	11	30	
LP33	12	31	
Test3	13	32	
LP14	14	33	
LP24	15	34	
LP34	16	35	
Test4	17	36	
VRla/+15	18	37	
VRla/+15	19		

37 Pin D-Sub MALE — 0V

Binary IO 1 DIO Ouput — J6

LP1ON1	1	20	
Channel 1 not tripped	2	21	
LP2ON1	3	22	
Channel 2 not tripped	4	23	
LP3ON1	5	24	
Channel 3 not tripped	6	25	
TestMode1	7	26	
Channel 4 not tripped	8	27	
LP1ON2	9	28	
LP2ON2	10	29	
LP3ON2	11	30	
TestMode2	12	31	
LP1ON3	13	32	
LP2ON3	14	33	
LP3ON3	15	34	
TestMode3	16	35	
LP1ON4	17	36	
LP2ON4	18	37	
LP3ON4	19		
TestMode4			
VRla/+15			
VRla/+15			

37 Pin D-Sub FEMALE — 0V

Chassis: JGW-D1503506,
Front Panel: JGW-D1503508,
Main Board: JGW-D1503507
BIO Board: JGW-D1504332

Cable F-M and Gender Bender F-F 37 pin

?? ?? — Tyco 1-1634587-2 Tyco 1-1634587-2

CNB/CNA (Output 1) — Tyco 1-1634583-2

1	N-8/9		
20	N-A/B		
2	O-80		
21	O-A0		
3	O-81		
22	O-A1		
4	O-82		
23	O-A2		
5	O-83		
24	O-A3		
6	O-84		
25	O-A4		
7	O-85		
26	O-A5		
8	O-86		
27	O-A6		
9	O-87		
28	O-A7		
10	O-90		
29	O-B0		
11	O-91		
30	O-B1		
12	O-92		
31	O-B2		
13	O-93		
32	O-B3		
14	O-94		
33	O-B4		
15	O-95		
34	O-B5		
16	O-96		
35	O-B6		
17	O-97		
36	O-B7		
18	P-8/9		
37	P-A/B		
19	NC		

CNA/CNB (Input 2)

DIO Card #0

Contec DIO-6464L-PE

CNB CNA

PCB100WS Cable — PCB100WS Cable

CNB/CNB (Output 2) — See Sheet 16.

Cable M-F 37 pin

J? J? — Tyco 1-1634583-2 Tyco 1-1634583-2

CNA/ CNA (Input 1) — Tyco 1-1634583-2

1	NC		
20	NC		
2	I-00		
21	I-20		
3	I-01		
22	I-21		
4	I-02		
23	I-22		
5	I-03		
24	I-23		
6	I-04		
25	I-24		
7	I-05		
26	I-25		
8	I-06		
27	I-26		
9	I-07		
28	I-27		
10	I-10		
29	I-30		
11	I-11		
30	I-31		
12	I-12		
31	I-32		
13	I-13		
32	I-33		
14	I-14		
33	I-34		
15	I-15		
34	I-35		
16	I-16		
35	I-36		
17	I-17		
36	I-37		
18	P-0/1		
37	P-2/3		
19	NC		

Title	Type B Suspension Cabling - TM OSEM Sat Amp & Coil Driver	
Size: A3	Number: JGW-D1503600	Revision: -v16
Date: 2019/06/16	Sheet 9of 19	
File: \\..\09 TM Sat Amp & Coil Driver.SchDoc	Drawn By:	

IM Vertical OSEM Sat Amp and Coil Driver

The original design called for low power coil drivers for the TM and IM OSEMs and the names of the boxes used here reflect this. The current baseline is TM=LPCD, IM-H=MPCD and IM-V=HPCD.

Sat Amp #1

Chassis: JGW-D1503498,
Front Panel: JGW-D1503500,
Rear Panel: JGW-D1503500,
Board: JGW-D1503499

Inputs from IM OSEMs V1, V2, V3 (see Sheet 2)

J101, J103 — D-Sub 9F

J102, J104 — D-Sub 9F

J501 — DB15M

Coil Drive Inputs

J502 — DB9F

PD Outputs

J503 — DB9F

LED Current Monitor Outputs

AI Chassis #0 D1100650

AI Out 4-7

J1 — D Connector 9

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

Generic D-Sub 15 Cable M-F: DB15F — DB15M

AA Chassis #0 D1100621

AA In 1-4

J4 — D-Sub 9M

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

AA Chassis #1 D1100621

AA In TBD

TBD3 — D-Sub 9M

TBD2 — D-Sub 9M

TBD3 — D-Sub 9M

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

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

AA Chassis #1 D1100621

AA In TBD

TBD1 — D-Sub 9M

AA In TBD

Low Power Coil Driver #1

Coil Current Request Inputs

J3 — D-Sub 9M

Coil Drive Ouputs

J4 — DB15F

J2 — D-Sub 9F

Noise Monitor Input

Voltage Monitor Outputs

J3 — D-Sub 9M

Fast Current Monitor Outputs

J4 — D-Sub 9M

J5 — D-Sub 9M

Slow Current Monitor Outputs

Binary IO 2 DIO Input

J7 — 37 Pin D-Sub MALE

LP11	
Reset Pulse	
LP21	
LP31	
Test1	
LP12	
LP22	
LP32	
Test2	
LP13	
LP23	
LP33	
Test3	
LP14	
LP24	
LP34	
Test4	
VRla/+15	
VRla/+15	

0V

Binary IO 1 DIO Ouput

J6 — 37 Pin D-Sub FEMALE

LP1ON1	
Channel 1 not tripped	
LP2ON1	
Channel 2 not tripped	
LP3ON1	
Channel 3 not tripped	
TestMode1	
Channel 4 not tripped	
LP1ON2	
LP2ON2	
LP3ON2	
TestMode2	
LP1ON3	
LP2ON3	
LP3ON3	
TestMode3	
LP1ON4	
LP2ON4	
LP3ON4	
TestMode4	
VRla/+15	
VRla/+15	

0V

Chassis: JGW-D1503506,
Front Panel: JGW-D1503508,
Main Board: JGW-D1503507
BIO Board: JGW-D1504332

Cable F-M and Gender Bender F-F 37 pin

?? — ??

Tyco 1-1634587-2 Tyco 1-1634587-2

Tyco 1-1634583-2

CNB/CNA (Output 1)

1	N-8/9
20	N-A/B
2	O-80
21	O-A0
3	O-81
22	O-A1
4	O-82
23	O-A2
5	O-83
24	O-A3
6	O-84
25	O-A4
7	O-85
26	O-A5
8	O-86
27	O-A6
9	O-87
28	O-A7
10	O-90
29	O-B0
11	O-91
30	O-B1
12	O-92
31	O-B2
13	O-93
32	O-B3
14	O-94
33	O-B4
15	O-95
34	O-B5
16	O-96
35	O-B6
17	O-97
36	O-B7
18	P-8/9
37	P-A/B
19	NC

DIO Card #1

Contec DIO-6464L-PE

CNB — CNA

PCB100WS Cable — PCB100WS Cable

CNB/CNB (Output 2)
See Sheet 11.

Cable M-F 37 pin

J? — J?

Tyco 1-1634583-2 Tyco 1-1634583-2

Tyco 1-1634583-2

CNA/ CNA (Input 1)

1	NC
20	NC
2	I-00
21	I-20
3	I-01
22	I-21
4	I-02
23	I-22
5	I-03
24	I-23
6	I-04
25	I-24
7	I-05
26	I-25
8	I-06
27	I-26
9	I-07
28	I-27
10	I-10
29	I-30
11	I-11
30	I-31
12	I-12
31	I-32
13	I-13
32	I-33
14	I-14
33	I-34
15	I-15
34	I-35
16	I-16
35	I-36
17	I-17
36	I-37
18	P-0/1
37	P-2/3
19	NC

CNA/CNB (Input 2)
See Sheet 11.

Title	Type B Suspension Cabling - IM-V OSEM Sat Amp & Coil Driver		
Size A3	Number JGW-D1503600		Revision -v16
Date:	2019/06/16	Sheet 10 of	19
File:	\\..\10 IM-V Sat Amp & Coil Driver.SchDoc	Drawn By:	

IM Horizontal OSEM Sat Amp and Coil Driver

The original design called for low power coil drivers for the TM and IM OSEMs and the names of the boxes used here reflect this. The current baseline is TM=LPCD, IM-H=MPCD and IM-V=HPCD.

Sat Amp #2

Chassis: JGW-D1503498,
Front Panel: JGW-D1503500,
Rear Panel: JGW-D1503500,
Board: JGW-D1503499

Inputs from IM OSEMs
H1, H2, H3
(see Sheet 2)

J101 J103 J102 J104 — D-Sub 9F

Coil Drive Inputs — J501 — DB15M

PD Outputs — J502 — DB9F

LED Current Monitor Outputs — J503 — DB9F

AI Chassis #0
D1100650

AI Out 8-11
J1 — D Connector 9

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

Generic D-Sub 15 Cable M-F
DB15F — DB15M

AA Chassis #0
D1100621

AA In 1-4
J4 — D-Sub 9M

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

AA Chassis #1
D1100621

AA In TBD
TBD3 — D-Sub 9M
TBD2 — D-Sub 9M
TBD3 — D-Sub 9M

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

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

AA Chassis #1
D1100621

AA In TBD
TBD1 — D-Sub 9M

Low Power Coil Driver #2

Coil Current Request Inputs
J3 — D-Sub 9M

Coil Drive Ouputs
J4 — DB15F

J2 — D-Sub 9F

Noise Monitor Input

Voltage Monitor Outputs
J3 — D-Sub 9M

Fast Current Monitor Outputs
J4 — D-Sub 9M

J5 — D-Sub 9M

Slow Current Monitor Outputs

Binary IO 2
DIO Input
J7

	1	20	
	2	21	
LP11	3	22	
Reset Pulse	4	23	
LP21	5	24	
	6	25	
LP31	7	26	
	8	27	
Test1	9	28	
	10	29	
LP12	11	30	
	12	31	
LP22	13	32	
	14	33	
LP32	15	34	
	16	35	
Test2	17	36	
	18	37	
LP13	19		

37 Pin D-Sub
MALE
0V

Binary IO 1
DIO Ouput
J6

	1	20	
LP1ON1	2	21	
Channel 1 not tripped	3	22	
LP2ON1	4	23	
Channel 2 not tripped	5	24	
LP3ON1	6	25	
Channel 3 not tripped	7	26	
TestMode1	8	27	
Channel 4 not tripped	9	28	
LP1ON2	10	29	
	11	30	
LP2ON2	12	31	
	13	32	
LP3ON2	14	33	
	15	34	
TestMode2	16	35	
	17	36	
LP1ON3	18	37	
	19		

37 Pin D-Sub
FEMALE
0V

Chassis: JGW-D1503506,
Front Panel: JGW-D1503508,
Main Board: JGW-D1503507
BIO Board: JGW-D1504332

Cable F-M and Gender Bender F-F 37 pin
?? — ?? — Tyco 1-1634587-2 Tyco 1-1634587-2

CNB/CNB (Output 2)
Tyco 1-1634583-2

1	20	N-8/9
2	21	N-A/B
3	22	O-80
4	23	O-A0
5	24	O-81
6	25	O-A1
7	26	O-82
8	27	O-A2
9	28	O-83
10	29	O-A3
11	30	O-84
12	31	O-A4
13	32	O-85
14	33	O-A5
15	34	O-86
16	35	O-A6
17	36	O-87
18	37	O-A7
19		O-90
		O-B0
		O-91
		O-B1
		O-92
		O-B2
		O-93
		O-B3
		O-94
		O-B4
		O-95
		O-B5
		O-96
		O-B6
		O-97
		O-B7
		P-8/9
		P-A/B
		NC

DIO Card #1

Contec DIO-6464L-PE

See also Sheet 10.

See Sheet 10.
CNB/CNA (Output 1)
CNB See also Sheet 10. PCB100WS Cable
CNA See also Sheet 10. PCB100WS Cable

See Sheet 10.
CNA/ CNA (Input 1)

Cable M-F 37 pin
J? — J? — Tyco 1-1634583-2 Tyco 1-1634583-2

CNA/CNB (Input 2)
Tyco 1-1634583-2

1	20	NC
2	21	I-00
3	22	I-20
4	23	I-01
5	24	I-21
6	25	I-02
7	26	I-22
8	27	I-03
9	28	I-23
10	29	I-04
11	30	I-24
12	31	I-05
13	32	I-25
14	33	I-06
15	34	I-26
16	35	I-07
17	36	I-27
18	37	I-10
19		I-30
		I-11
		I-31
		I-12
		I-32
		I-13
		I-33
		I-14
		I-34
		I-15
		I-35
		I-16
		I-36
		I-17
		I-37
		P-0/1
		P-2/3
		NC

Title	Type B Suspension Cabling - IM-V OSEM Sat Amp & Coil Driver	
Size A3	Number JGW-D1503600	Revision -v16
Date: 2019/06/16	Sheet 11 of 19	
File: \\..\11 IM-H Sat Amp & Coil Driver.Schdoc	Drawn By:	

GAS LVDT Driver Readout

Inputs from GAS LVDTs (see Sheet 5)

LVDT/ACT Distributor - see also Sheet 13
Chassis: JGW-D1402124
Front Panel: JGW-D1402827
Rear Panel: JGW-D1402828
Board: JGW-D1402117

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

Ch 0-3 LVDT-IN
J5
6E17C009SAJ120

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

Ch 1
J2
INP1
INN1
OUTP1
OUTN1
ACTP1
ACTN1

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

Ch 2
J3
INP2
INN2
OUTP2
OUTN2
ACTP2
ACTN2

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

Ch 3
J4
INP3
INN3
OUTP3
OUTN3
ACTP3
ACTN3

See sheet 13.

LVDT Driver - see also Sheet 13
Chassis: JGW-D1402826,
Main Board: JGW-D1301467
Input Boards (2): JGW-D1301467
Front Panel: JGW-D1402827

LVDT CARD 1 (Left)
J1
INP0
INN0
INP1
INN1
INP2
INN2
INP3
INN3

LVDT MAIN (Left)
J1

Gender Bender F-F

Generic D-Sub 9 Cable M-F

AA Chassis #1
JGW-D1100621
AA In 12-15
J3

LVDT CARD 1 (Right)
J2
OUTP0
OUTN0
OUTP1
OUTN1
OUTP2
OUTN2
OUTP3
OUTN3

DIST-OUT4
LEMO I Pin

Cable

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

J?
BNC

Signal Generator
10 kHz, 5 V

Title	Type B Suspension Cabling - GAS LVDT Driver Readout	
Size: A3	Number: JGW-D1503600	Revision: -v16
Date: 2019/06/16	Sheet 12 of 19	
File: \\..\12 GAS LVDT Drive Readout.SchDoc	Drawn By:	

GAS LVDT Driver Actuation/BIO

Inputs from GAS LVDTs (see Sheet 5)

LVDT/ACT Distributor - see also Sheet 13
Chassis: JGW-D1402124
Front Panel: JGW-D1402827
Rear Panel: JGW-D1402828
Board: JGW-D1402117

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

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

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

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

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 ACT
J?
ACTP0, ACTN0, ACTP1, ACTN1, ACTP2, ACTN2, ACTP3, ACTN3
6E17C009SAJ120
1734348-1
5747844-4

See sheet 12.

See sheet 12.

LVDT-Coil Driver Cable
D-Sub 9M
DB15M

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

AI Chassis #1
D1101521

AI Out 1-4
J1
D Connector 9

High Power Coil Driver #1

J2 — Noise Monitor Input — D-Sub 9F
J3 — Voltage Monitor Outputs — D-Sub 9M
J4 — Fast Current Monitor Outputs — D-Sub 9M
J5 — Slow Current Monitor Outputs — D-Sub 9M
PR3-HPCD-J4 — DB15F
PR3-HPCD-J3 — D-Sub 9M

Binary IO 2 DIO Input
J7
LP11, Reset Pulse, LP21, LP31, Test1, LP12, LP22, LP32, Test2, LP13, LP23, LP33, Test3, LP14, LP24, LP34, Test4, VRIa/+15, VRIa/+15, 0V
37 Pin D-Sub
MALE

Binary IO 1 DIO Output
J6
LP1ON1, Channel 1 not tripped, LP2ON1, Channel 2 not tripped, LP3ON1, Channel 3 not tripped, TestMode1, Channel 4 not tripped, LP1ON2, LP2ON2, LP3ON2, TestMode2, LP1ON3, LP2ON3, LP3ON3, TestMode3, LP1ON4, LP2ON4, LP3ON4, TestMode4, VRIa/+15, VRIa/+15, 0V
37 Pin D-Sub
FEMALE

High Power Coil Driver #1
Chassis: JGW-D1503504
Front Panel: JGW-D1503502
Rear Panel: JGW-D1503505,
Monitor Board: JGW-D1503510
Coil Driver Interface Board: JGW-D1504332
Main Board: JGW-D1503503

Cable F-M and Gender Bender F-F 37 pin
Tyco 1-1634587-2 — Tyco 1-1634587-2

Cable M-F 37 pin
Tyco 1-1634583-2 — Tyco 1-1634587-2

CNB/CNB (Output 2)
N-8/9, N-A/B, O-80, O-A0, O-81, O-A1, O-82, O-A2, O-83, O-A3, O-84, O-A4, O-85, O-A5, O-86, O-A6, O-87, O-A7, O-90, O-B0, O-91, O-B1, O-92, O-B2, O-93, O-B3, O-94, O-B4, O-95, O-B5, O-96, O-B6, O-97, O-B7, P-8/9, P-A/B, NC
Tyco 1-1634583-2

See Sheet 15.

CNB/CNA (Output 1)

DIO Card #2
Contec DIO-6464L-PE

CNB — PCB100WS Cable — CNA — PCB100WS Cable

CNA/ CNA (Input 1)

See Sheet 15.

CNA/CNB (Input 2)
NC, NC, I-00, I-20, I-01, I-21, I-02, I-22, I-03, I-23, I-04, I-24, I-05, I-25, I-06, I-26, I-07, I-27, I-10, I-30, I-11, I-31, I-12, I-32, I-13, I-33, I-14, I-34, I-15, I-35, I-16, I-36, I-17, I-37, P-0/1, P-2/3, NC
Tyco 1-1634583-2

The ports on the back of the BIO card are called CNA and CNB in teh Contec documentation, and the two arms of the PCB100WS splitter cable are _also_ called CNA and CNB!

Here, CNA/CNB means the CNA port and the CNB cable.

Title	Type B Suspension Cabling - GAS LVDT Driver Actuation/BIO	
Size: A3	Number: JGW-D1503600 13	Revision: -v16
Date: 2019/06/16	Sheet of 19	
File: \\..\13 GAS LVDT Drive Act&BIO.SchDoc	Drawn By:	

IP LVDT Driver Readout

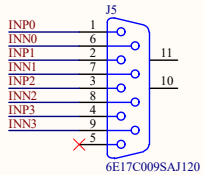
Inputs from F0 LVDTs (see Sheet 6)

(LVDT/ACT Distributor - see Sheet 12)
Chassis: JGW-D1402124,
Front Panel: JGW-D1402827
Rear Panel: JGW-D1402828,
Board: JGW-D1402117 #1

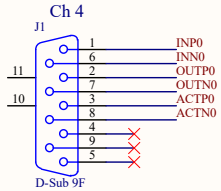
Front Panel

Rear Panel

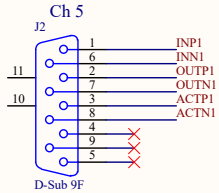
Ch 4-7 LVDT-IN



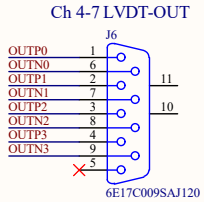
Ch 4



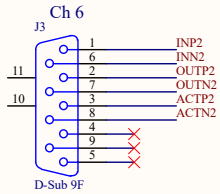
Ch 5



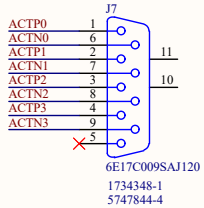
Ch 4-7 LVDT-OUT



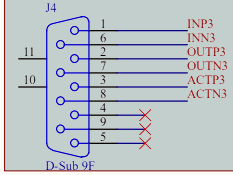
Ch 6



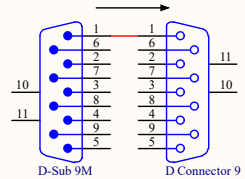
Ch 4-7 ACT



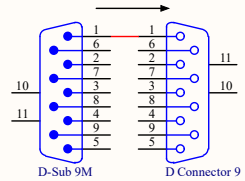
Ch 7



Generic D-Sub 9 Cable M-F



Generic D-Sub 9 Cable M-F

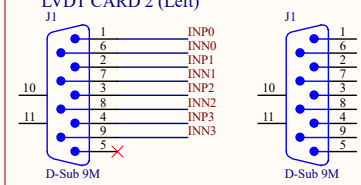


See sheet 15.

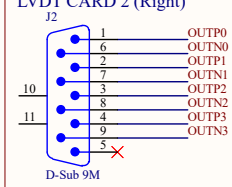
(LVDT Driver - see Sheet 12)
Chassis: JGW-D1402826,
Main Board: JGW-D1301467
Input Boards (2): JGW-D1301467
Front Panel: JGW-D1402827

LVDT CARD 2 (Left)

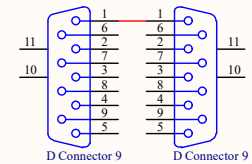
LVDT MAIN (Right)



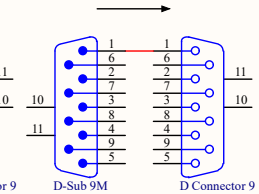
LVDT CARD 2 (Right)



Gender Bender F-F

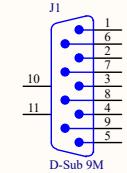


Generic D-Sub 9 Cable M-F



AA Chassis #1
JGW-D1100621

AA In 16-20



Title: Type B Suspension Cabling - IP LVDT Driver Readout		
Size: A3	Number: JGW-D1503600	Revision: -v16
	14	
Date: 2019/06/16		Sheet of 19
File: \\..\14 IP LVDT Drive Readout.SchDoc		Drawn By:

IP LVDT Driver Actuation/BIO

Inputs from IP LVDTs (see Sheet 6)

(LVDT/ACT Distributor - see Sheet 12)
Chassis: JGW-D1402124,
Front Panel: JGW-D1402827
Rear Panel: JGW-D1402828,
Board: JGW-D1402117 #1

Front Panel

Rear Panel

Ch 4

J1 — D-Sub 9F

1	INP0
6	INN0
2	OUTP0
7	OUTN0
3	ACTP0
8	ACTN0
4, 9, 5	

Ch 4-7 LVDT-IN

J5 — 6E17C009SAJ120

INP0	1
INN0	6
INP1	2
INN1	7
INP2	3
INN2	8
INP3	4
INN3	9
5	

See sheet 14.

Ch 5

J2 — D-Sub 9F

1	INP1
6	INN1
2	OUTP1
7	OUTN1
3	ACTP1
8	ACTN1
4, 9, 5	

Ch 4-7 LVDT-OUT

J6 — 6E17C009SAJ120

OUTP0	1
OUTN0	6
OUTP1	2
OUTN1	7
OUTP2	3
OUTN2	8
OUTP3	4
OUTN3	9
5	

See sheet 14.

Ch 6

J3 — D-Sub 9F

1	INP2
6	INN2
2	OUTP2
7	OUTN2
3	ACTP2
8	ACTN2
4, 9, 5	

Ch 7

J4 — D-Sub 9F

1	INP3
6	INN3
2	OUTP3
7	OUTN3
3	ACTP3
8	ACTN3
4, 9, 5	

Ch 4-7 ACT

J7 — 6E17C009SAJ120
1734348-1
5747844-4

ACTP0	1
ACTN0	6
ACTP1	2
ACTN1	7
ACTP2	3
ACTN2	8
ACTP3	4
ACTN3	9
5	

LVDT-Coil Driver Cable

D-Sub 9M — DB15M

1	1
6	9
2	2
7	10
3	3
8	11
4	4
9	12
5	5
	13
	6
	14
	7
	15
	8
10	16
11	17

AI Chassis #2
D1101521

AI Out 5-8

J? — D Connector 9

1	11
6	10
2	
7	
3	
8	
4	
9	
5	

Generic D-Sub 9 Cable M-F

D-Sub 9M — D Connector 9

1	1
6	6
2	2
7	7
3	3
8	8
4	4
9	9
5	5
10	11
11	10

High Power Coil Driver #0

Noise Monitor Input

J? — D-Sub 9F

1	11
6	
2	
7	
3	
8	
4	
9	
5	10

Voltage Monitor Outputs

J? — D-Sub 9M

5	11
9	
4	
8	
3	
7	
2	
6	
1	10

Fast Current Monitor Outputs

J? — D-Sub 9M

5	11
9	
4	
8	
3	
7	
2	
6	
1	10

Slow Current Monitor Outputs

J? — D-Sub 9M

5	11
9	
4	
8	
3	
7	
2	
6	
1	10

J4 — DB15F

8	
15	
7	
14	
6	
13	
5	
12	
4	
11	
3	
10	
2	
9	
1	
16	16
17	17

BS-HPCD-J3 — D-Sub 9M

1	11
6	
2	
7	
3	
8	
4	
9	
5	10

Binary IO 2 DIO Input

J? — 37 Pin D-Sub — MALE

1	20
LP11	2
Reset Pulse	21
LP21	3
	22
LP31	4
	23
Test1	5
	24
LP12	6
	25
LP22	7
	26
LP32	8
	27
Test2	9
	28
LP13	10
	29
LP23	11
	30
LP33	12
	31
Test3	13
	32
LP14	14
	33
LP24	15
	34
LP34	16
	35
Test4	17
	36
VRla/+15	18
VRla/+15	37
	19
38	38
39	39
0V	

Binary IO 1 DIO Output

J? — 37 Pin D-Sub — FEMALE

1	20
LP1ON1	2
Channel 1 not tripped	21
LP2ON1	3
Channel 2 not tripped	22
LP3ON1	4
Channel 3 not tripped	23
TestMode1	5
Channel 4 not tripped	24
LP1ON2	6
	25
LP2ON2	7
	26
LP3ON2	8
	27
TestMode2	9
	28
LP1ON3	10
	29
LP2ON3	11
	30
LP3ON3	12
	31
TestMode3	13
	32
LP1ON4	14
	33
LP2ON4	15
	34
LP3ON4	16
	35
TestMode4	17
	36
VRla/+15	18
VRla/+15	37
	19
38	38
39	39
0V	

High Power Coil Driver #0
Chassis: JGW-D1503504
Front Panel: JGW-D1503502
Rear Panel: JGW-D1503505,
Monitor Board: JGW-D1503510
Coil Driver Interface Board: JGW-D1504332
Main Board: JGW-D1503503

Cable F-M and Gender Bender F-F 37 pin

Tyco 1-1634587-2 Tyco 1-1634587-2

CNB/CNA (Output 1)

Tyco 1-1634583-2

1	N-8/9
20	N-A/B
2	O-80
21	O-A0
3	O-81
22	O-A1
4	O-82
23	O-A2
5	O-83
24	O-A3
6	O-84
25	O-A4
7	O-85
26	O-A5
8	O-86
27	O-A6
9	O-87
28	O-A7
10	O-90
29	O-B0
11	O-91
30	O-B1
12	O-92
31	O-B2
13	O-93
32	O-B3
14	O-94
33	O-B4
15	O-95
34	O-B5
16	O-96
35	O-B6
17	O-97
36	O-B7
18	P-8/9
37	P-A/B
19	NC

See Sheet 13.

CNA/ CNB (Input 2)

(DIO Card #2)
Contec DIO-6464L-PE

See Sheet 13.

CNB — CNA

(PCB100WS Cable) — (PCB100WS Cable)

CNB/CNB (Output 2)
See Sheet 13.

Cable M-F 37 pin

Tyco 1-1634583-2 Tyco 1-1634587-2

CNA/CNA (Input 1)

Tyco 1-1634583-2

1	NC
20	NC
2	I-00
21	I-20
3	I-01
22	I-21
4	I-02
23	I-22
5	I-03
24	I-23
6	I-04
25	I-24
7	I-05
26	I-25
8	I-06
27	I-26
9	I-07
28	I-27
10	I-10
29	I-30
11	I-11
30	I-31
12	I-12
31	I-32
13	I-13
32	I-33
14	I-14
33	I-34
15	I-15
34	I-35
16	I-16
35	I-36
17	I-17
36	I-37
18	P-0/1
37	P-2/3
19	NC

Title	Type B Suspension Cabling - IP LVDT Driver Actuation/BIO		
Size A3	Number JGW-D1503600		Revision -v16
		15	
Date: 2019/06/16		Sheet of 19	
File: \\..\15 IP LVDT Drive Act&BIO.SchDoc		Drawn By:	

Pico and Stepper Drivers

-v16: For the first time, the stepper motor channel assignments correctly reflect the as-built default. HOWEVER, in several cases stepper driver channels have failed and stepper motors have had to be reassigned. See
http://gwwiki.icrr.u-tokyo.ac.jp/JGWwiki/KAGRA/Subgroups/DGS/Projects/StepperMotor
for the latest news.

Outputs to IM Picos (see Sheet 3)

J1: NC, PR3-IM-PP-GND, PR3-IM-PP-MOTOR, PR3-IM-PP-GND — Comment: RJ22

J2: NC, PR3-IM-PR-GND, PR3-IM-PR-MOTOR, PR3-IM-PR-GND — Comment: RJ22

J3: NC, PR3-IM-PY-GND, PR3-IM-PY-MOTOR, PR3-IM-PY-GND — Comment: RJ22

Newport 8742 Pico Driver #0 "BS_IM" 10.68.150.16

AC

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.

LAN Cable

Ethernet Hub

PoE

LAN Cable

Outputs to BF Picos (see Sheet 4)

J1: NC, PR3-BF-PP-GND, PR3-BF-PP-MOTOR, PR3-BF-PP-GND — Comment: RJ22

J2: NC, PR3-BF-PR-GND, PR3-BF-PR-MOTOR, PR3-BF-PR-GND — Comment: RJ22

J3 — Comment: RJ22

Newport 8742 Pico Driver #1 "BS_BF" 10.68.150.17

AC

LAN Cable

Outputs to BF and F1 GAS Steppers (see Sheet 4) and F0 GAS stepper (see sheet 7).

J-MOTOR-0: BS-BF-SV-A1, BS-BF-SV-A2, BS-BF-SV-B1, BS-BF-SV-B2 — D-Sub 9F

J-MOTOR-1: BS-F1-SV-A1, BS-F1-SV-A2, BS-F1-SV-B1, BS-F1-SV-B2 — D-Sub 9F

J-MOTOR-2: BS-F0-SV-A1, BS-F0-SV-A2, BS-F0-SV-B1, BS-F0-SV-B2 — D-Sub 9F

J-MOTOR-3, J-MOTOR-4, J-MOTOR-5 — D-Sub 9F

Stepper Driver #0:
Chassis: JGW-D1605635
Board: Newport TMCM-6110
Serial: MOXA NPort 5100A

J1 — BNC

BNC Cable

LAN Cable

Cable M-F 37 pin

DIO Card #0

See Sheet 9.

Contec DIO-6464L-PE

CNB/CNA (Output 1)

CNB

CNA

CNA/CNB (Input 2)

PCB100WS Cable

CNA/CNA (Input 2)
See Sheet 9.

CNB/CNB (Output 2)

J?: Tyco 1-1634587-2

J?: Tyco 1-1634583-2

J?: Tyco 1-1634587-2

BIO Adapter JGW-D1605239

Outputs to Watchdog (see Sheet 19)

J-BO-0 — D-Sub 9F

J-BO-1 — D-Sub 9F

J-BO-2 — D-Sub 9F

J24, J25, J26, J27, J28, J29, J30, J31 — BNC

BNC Cable

J1 — BNC

Outputs to IP and F0 Yaw Steppers (see Sheet 7)

Stepper Driver #1
Chassis: JGW-D1605365
Board: TMCM-6110
Serial: MOXA NPort 5100A

-v16: stepper limit switch connections previously shown here were never implemented and have been removed.

J-MOTOR-0: BS-F0-S1-A1, BS-F0-S1-A2, BS-F0-S1-B1, BS-F0-S1-B2 — D-Sub 9F

J-MOTOR-1: BS-F0-S2-A1, BS-F0-S2-A2, BS-F0-S2-B1, BS-F0-S2-B2 — D-Sub 9F

J-MOTOR-2: BS-F0-S3-A1, BS-F0-S3-A2, BS-F0-S3-B1, BS-F0-S3-B2 — D-Sub 9F

J-MOTOR-3: BS-F0-SY-A1, BS-F0-SY-A2, BS-F0-SY-B1, BS-F0-SY-B2 — D-Sub 9F

J-MOTOR-4 — D-Sub 9F

J-MOTOR-5 — D-Sub 9F

Title	Type B Suspension Cabling - Pico and Stepper Drivers	
Size: A3	Number: JGW-D1503600	Revision: -v16
Date: 2019/06/16	Sheet 16 of 19	
File: \\..\16 Pico&Stepper Drive.SchDoc	Drawn By:	

3 Feedthroughs

Geophone Readout

Inputs from F0
Geophones
(see Sheet 8)

Geophone Distributor
D1402120
Front Panel
D1402122
Board
D1402121

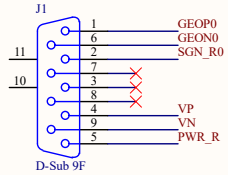
Geophone Distributor
D1402120
Rear Panel
D1402123
Board
D1402121

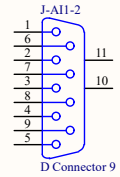
Generic D-Sub 9 Cable M-F

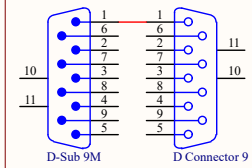
AA Chassis #0
JGW-D1100621

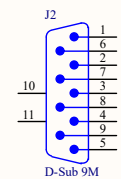
AA In 21-24

Ch 0

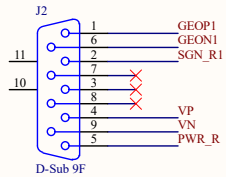




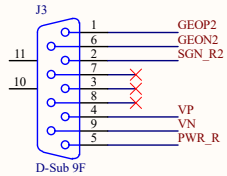




Ch1

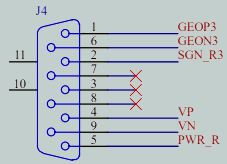


Ch 2



(Unused)

Ch 3

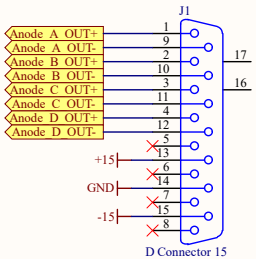


Title: Type B Suspension Cabling - Geophone Readout		
Size: A3	Number: JGW-D1503600 17	Revision: -v16
Date: 2019/06/16		Sheet of 19
File: \\..\17 Geophone Readout.SchDoc		Drawn By:

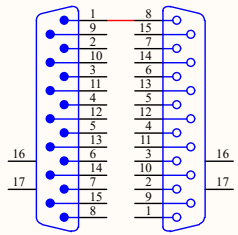
OpLev Etc

-v15: OutConfigBoards added by Izumi-san-tachi, klog 4879, 2018-04-28

OL QPD Amp 1
D1402411

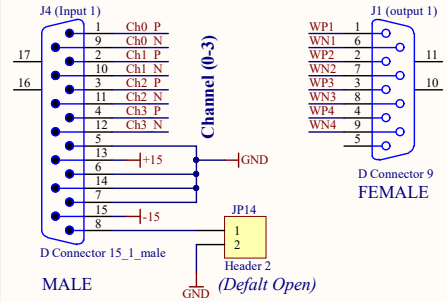


Generic D-Sub 15 Cable M-F

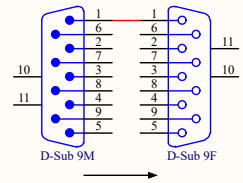


Whitening Chassis
D1302087
Front Panel
D1302088
Board
D1302081+D1402416

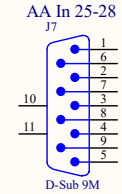
Whitening Chassis
D1302087
Rear Panel
D1302084
Board
D1302081+D1402416



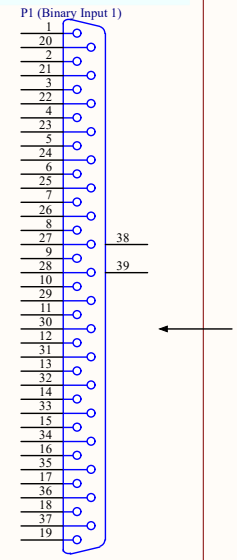
Generic D-Sub 9 Cable M-F



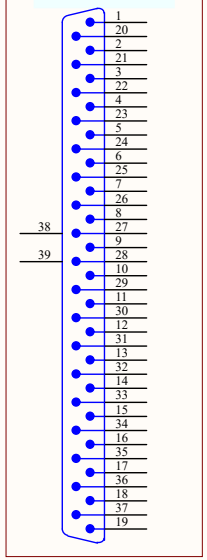
AA Chassis #0
D1100621



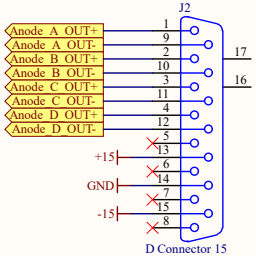
(Whitening Chassis Continuted)



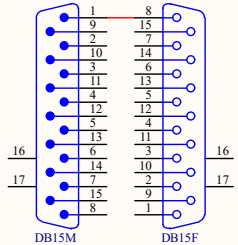
OutConfigBoard #1
D1605310

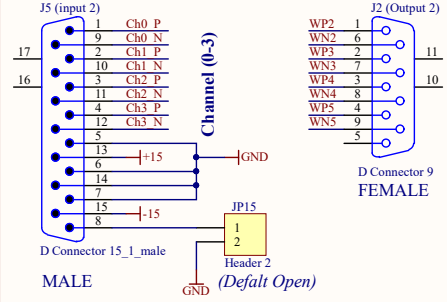


OL QPD Amp 2
D1402411

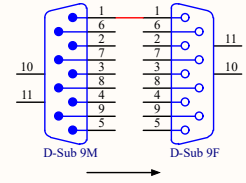


Generic D-Sub 15 Cable M-F

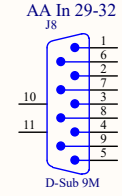


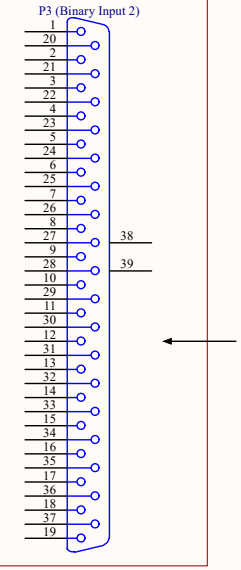


Generic D-Sub 9 Cable M-F

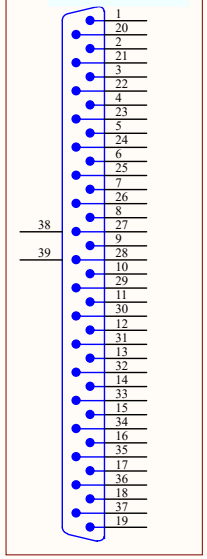


AA Chassis #0
D1100621





OutConfigBoard #2
D1605310



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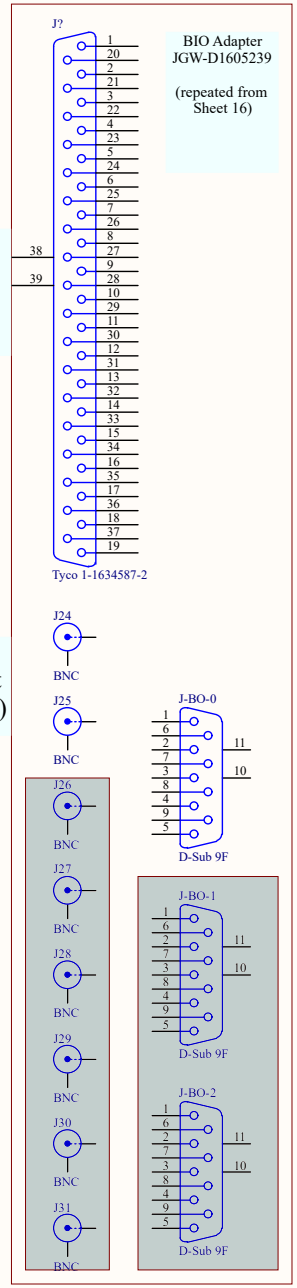
Size A3	Number JGW-D1503600 19	Revision -v16
Date: 2019/06/16		Sheet of 19
File: \\..\18 OpLev Etc.SchDoc		Drawn By:

Watchdog



Add Watchdog Stuff Here!

Title: Type B Suspension Cabling - Watchdog		
Size: A3	Number: JGW-D1503600 19	Revision: -v16
Date: 2019/06/16		Sheet of 19
File: \\..\19 Watchdog.SchDoc		Drawn By: