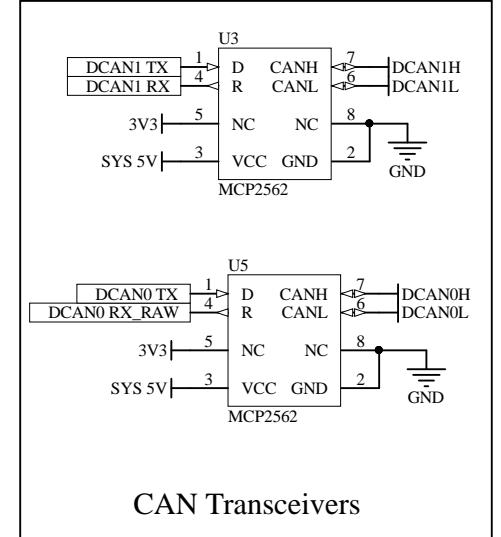
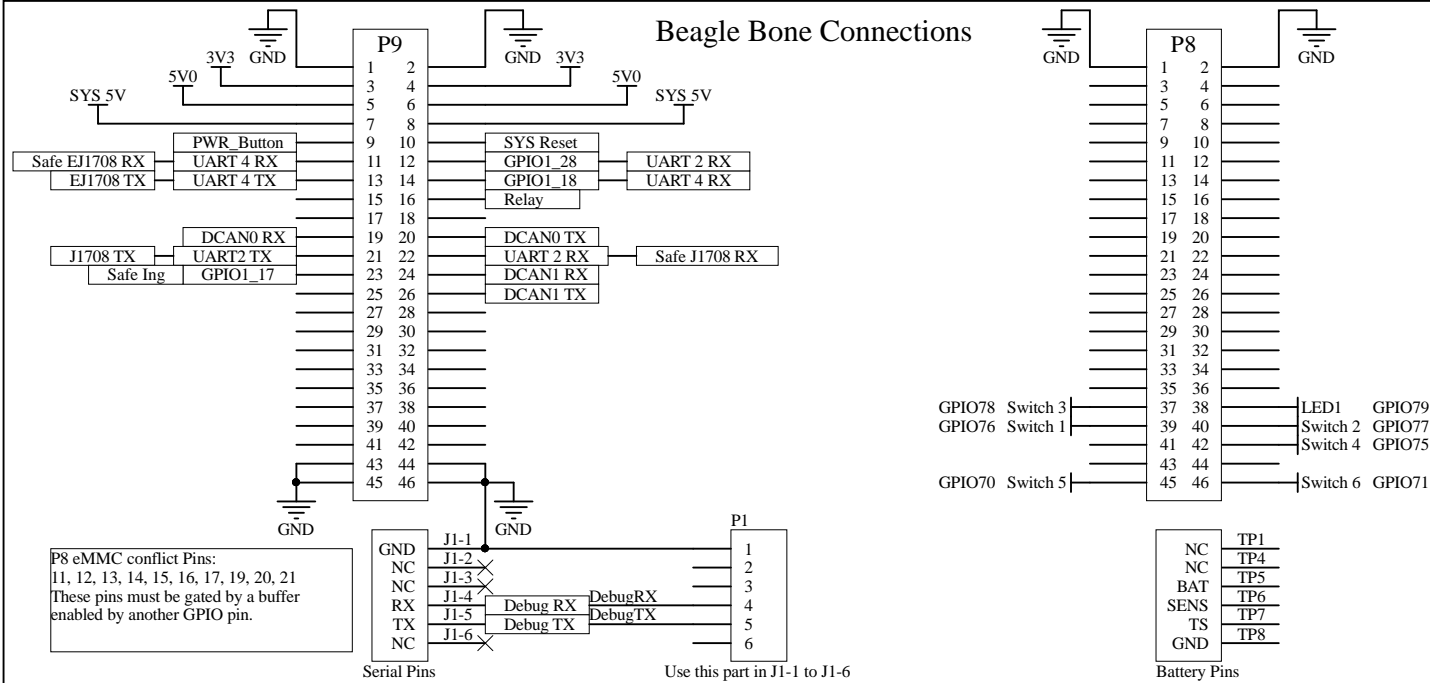


Beagle Bone Connections



Contents of /etc/rc.local for GPIO Control

```
#!/bin/sh -e
# Switch 5
echo "70" > /sys/class/gpio/export
echo "out" > /sys/class/gpio/gpio70/direction
echo "1" > /sys/class/gpio/gpio70/value
echo "0" > /sys/class/gpio/gpio70/value

# Switch 6
echo "71" > /sys/class/gpio/export
echo "out" > /sys/class/gpio/gpio71/direction
echo "1" > /sys/class/gpio/gpio71/value
echo "0" > /sys/class/gpio/gpio71/value

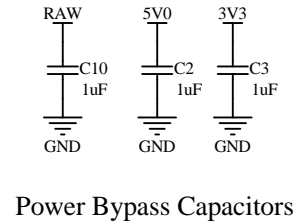
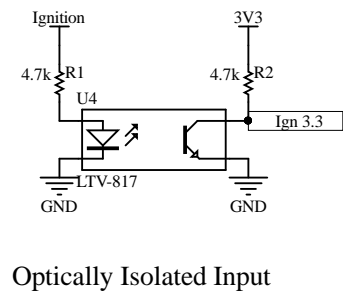
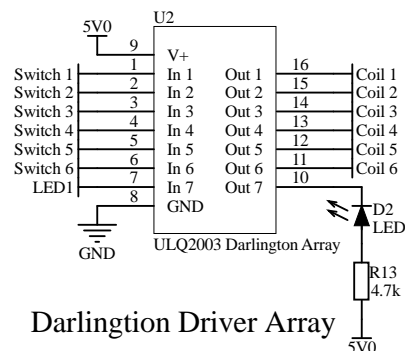
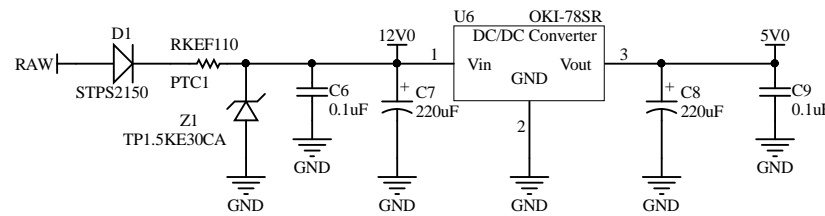
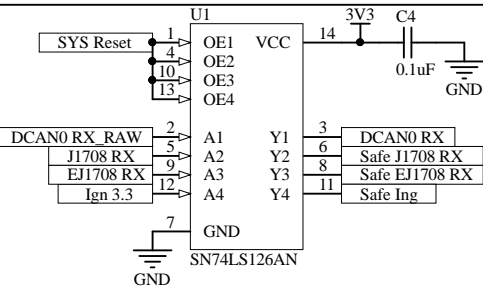
# Switch 4
echo "75" > /sys/class/gpio/export
echo "out" > /sys/class/gpio/gpio75/direction
echo "1" > /sys/class/gpio/gpio75/value
echo "0" > /sys/class/gpio/gpio75/value

# Switch 1
echo "76" > /sys/class/gpio/export
echo "out" > /sys/class/gpio/gpio76/direction
echo "1" > /sys/class/gpio/gpio76/value
echo "0" > /sys/class/gpio/gpio76/value

# Switch 2
echo "77" > /sys/class/gpio/export
echo "out" > /sys/class/gpio/gpio77/direction
echo "1" > /sys/class/gpio/gpio77/value
echo "0" > /sys/class/gpio/gpio77/value

# Switch 3
echo "78" > /sys/class/gpio/export
echo "out" > /sys/class/gpio/gpio78/direction
echo "1" > /sys/class/gpio/gpio78/value
echo "0" > /sys/class/gpio/gpio78/value

# LED
echo "79" > /sys/class/gpio/export
echo "out" > /sys/class/gpio/gpio79/direction
echo "1" > /sys/class/gpio/gpio79/value
```



Title **Beaglebone Black Truck Cape - MITM**

Size: Letter

Number: Headers, J1708 CAN, Power

Revision: 4

Date: 2/24/2019

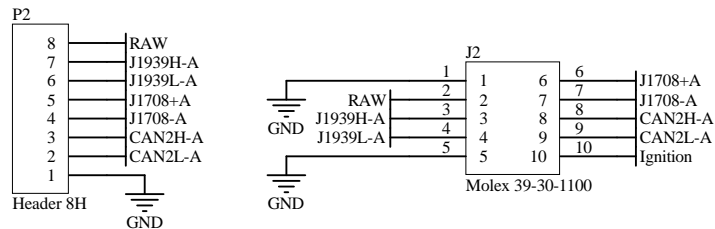
Time: 12:43:24 PM

Sheet 1 of 2

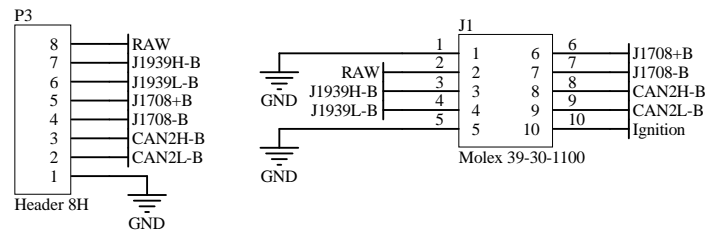
File: C:\Users\jeremy-daily\OneDrive - University of Tulsa\Electronics\Truck Cape\TruckCape BeagleBone Headers v4 - MITM.SchDoc

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800 S. Tucker Dr
Tulsa, OK 74104





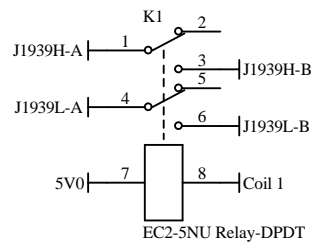
Connector Group A



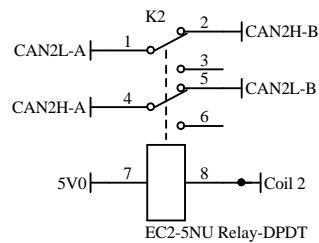
Connector Group B

9-Pin connector Interface (Use PG11 Cordgrip)

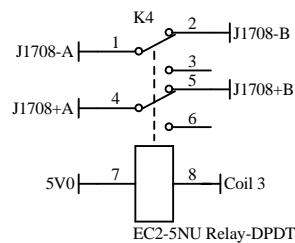
Man In The Middle Relays



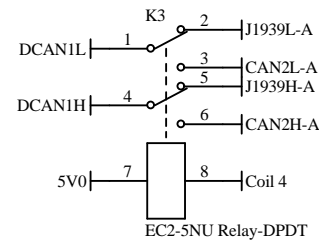
Default has J1939A and J1939B Disconnected



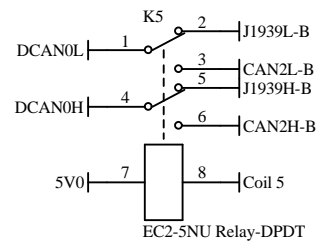
Default has second CAN channel passing through



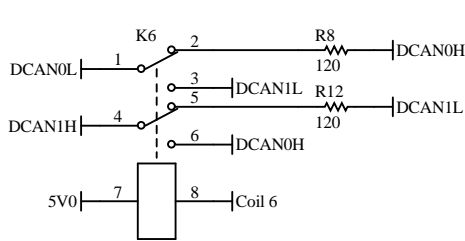
Default has J1708 passing through



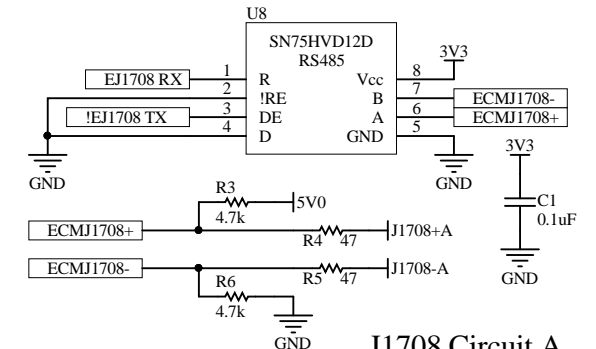
Default has A side J1939 to DCAN1



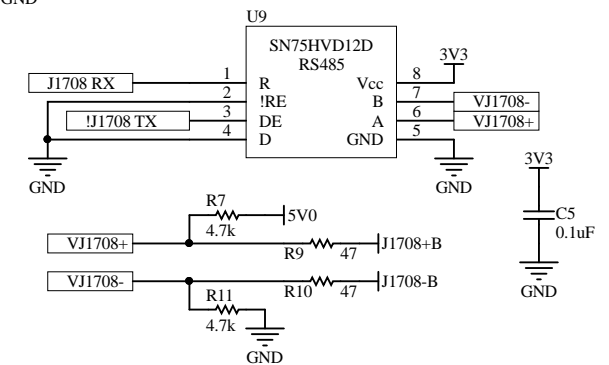
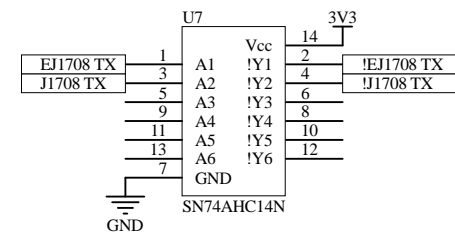
Default has B side J1939 to DCAN0



Default has terminating resistors connected



J1708 Circuit A



J1708 Circuit B

Title **Beaglebone Black Truck Cape - MITM**

Size: Letter

Number: J1708 and Switching Relays

Revision: 3

Date: 2/24/2019

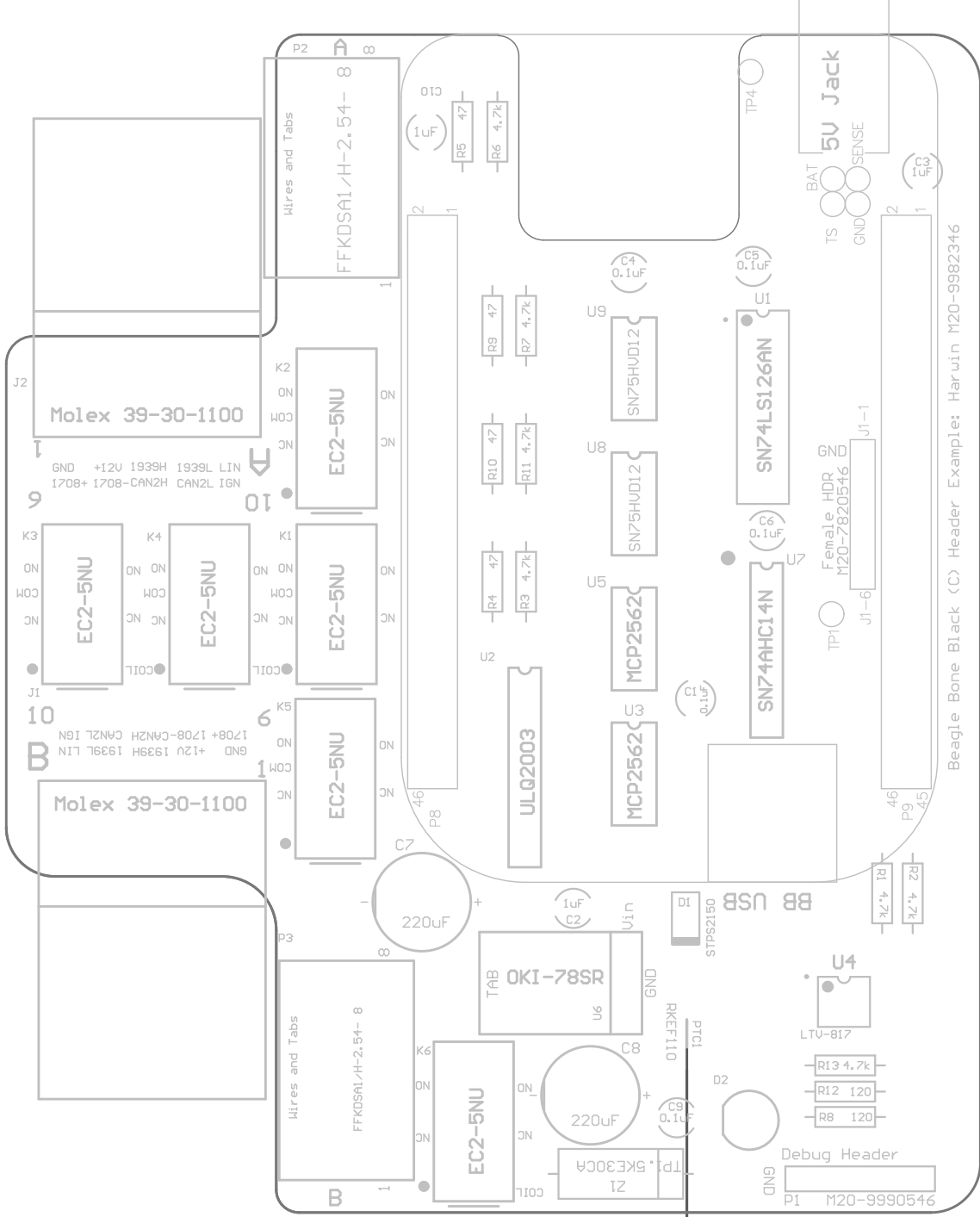
Time: 12:43:24 PM

Sheet 2 of 2

File: C:\Users\jeremy-daily\OneDrive - University of Tulsa\Electronics\Truck Cape\TruckCape J1708 and Relays v4 - MITM.SchDoc

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Item #	Quantity	Designator	Comment	Footprint	Description	Manufacturer	PartNumber	Supplier 1	Supplier Part Number 1	Name Error:Alt
1	1	BeagleBoneBlack1	BeagleBoneBlack	Beagleboneblack	46 Positions Header, Breakaway Connector 0.100" (2.54mm) Through Hole Tin	Sullins Connector Solutions	PREC023DAAN-RC	Digi-Key	S2012EC-23-ND	
2	5	C1, C4, C5, C6, C9	0.1uF	CAPR5-4X5	CAP CER 0.1UF 100V X7R RADIAL	Vishay BC Components	K104K20X7RH53H5	Digi-Key	BC5139-ND	
3	3	C2, C3, C10	1uF	CAPR5-4X5	CAP CER 1UF 100V X7R RADIAL	Murata Electronics North America	RDER72A105K2M1H03A	Digi-Key	490-9198-1-ND	
4	2	C7, C8	220uF	Elec. Cap 5 x 10mm	220uF 50V Aluminum Electrolytic Capacitors Radial, Can 175 mOhm @ 10kHz 5000 Hrs @ 105°C	EPCOS (TDK)	B41858C6227M000	Digi-Key	495-6000-ND	
5	1	D1	STPS2150	DO-41	Diode Schottky 150V 2A Through Hole DO-15	STMicroelectronics	STPS2150	Digi-Key	497-3213-1-ND	
6	1	D2	LED	LED - 5mm Through Hole	Green 569nm LED Indication - Discrete 2.1V Radial	Lite-On Inc.	LTL-4233	Digi-Key	160-1130-ND	
7	2	J1, J2	Molex 39-30-1100	10 pos Mini-Fit Jr. R/A Header	10 Positions Header Connector 0.165" (4.20mm) Through Hole, Right Angle Tin	Molex	39-30-1100	Digi-Key	WM1355-ND	
8	6	K1, K2, K3, K4, K5, K6	EC2-5NU Relay-DPDT	RELAY - EC2	General Purpose Relay DPDT (2 Form C) Through Hole	KEMET	EC2-5NU	Digi-Key	399-11052-5-ND	
9	1	P1	Use this part in J1-1 to J1-6	HDR1X6	CONN HEADER FEMALE 6POS .1" GOLD	Sullins Connector Solutions	PPPC061LFBN-RC	Digi-Key	S7039-ND	
10	2	P2, P3	Header 8H	8 CKT Spring Header	8 Position Wire to Board Terminal Block Vertical with Board 0.100" (2.54mm) Through Hole	Phoenix Contact	1789472	Digi-Key	277-14044-ND	
11	1	PTC1	RKEF110	PTC	Polymeric PTC Resettable Fuse 60V 1.1A 1h Through Hole Radial, Disc	Littelfuse Inc.	RKEF110	Digi-Key	RKEF110HF-ND	
12	7	R1, R2, R3, R6, R7, R11, R13	4.7k	Axial-0.4	RES SMD 4.7K OHM 1% 1/10W 0603	Yageo	CFR-25JB-52-4K7	Digi-Key	4.7KQBK-ND	
13	4	R4, R5, R9, R10	47	Axial-0.4	47 Ohms ±5% 0.25W, 1/4W Through Hole Resistor Axial Carbon Film	Yageo	CFR-25JB-52-47R	Digi-Key	47QBK-ND	
14	2	R8, R12	120	Axial-0.4	120 Ohms ±0.1% 0.25W, 1/4W Through Hole Resistor Axial Metal Film	Yageo	MFP-25BRD52-120R	Digi-Key	120ADCT-ND	
15	1	U1	SN74LS126AN	N14A	Quad 3-State Buffer	Texas Instruments	SN74LS126AN	Digi-Key	296-3643-5-ND	
16	1	U2	ULQ2003 Darlington Array	DIP16	High voltage, high current Darlington arrays each containing seven open collector Darlington pairs with common emitters.	Texas Instruments	ULQ2003AN	Digi-Key	296-22623-5-ND	
17	2	U3, U5	MCP2562	DIP8	1/1 Transceiver Half CAN 8-PDIP	Microchip Technology	MCP2562-E/P	Digi-Key	MCP2562-E/P-ND	
18	1	U4	LTV-817	DIP-4	Optoisolator Transistor Output 5000Vrms 1 Channel 4-DIP	Lite-On Inc.	LTV-817	Digi-Key	160-1366-5-ND	
19	1	U6	OKI-78SR	OKI-78SR	5V DC/DC Converter (7805 replacement)	Murata Power Solutions Inc.	OKI-78SR-5/1.5-W36H-C	Digi-Key	811-2692-ND	
20	1	U7	SN74AHC14N	DIP14	Inverter IC 6 Channel Schmitt Trigger 14-PDIP	Texas Instruments	SN74AHC14N	Digi-Key	296-4550-5-ND	
21	2	U8, U9	SN75HVD12	DIP8	IC 3.3V DIFF TXRX 8-SOIC	Texas Instruments	SN75HVD12P	Digi-Key	SN75HVD12P	
22	1	Z1	TP1.5KE30CA	DIODE-0.7	TVS DIODE 25.6V 41.4V DO201	Littelfuse Inc.	TP1.5KE30CA	Digi-Key	F7610CT-ND	