

ENCODER INTERFACE TO JOYSTICKS AND SWITCHES

GAA CUSTOM ELECTRONICS

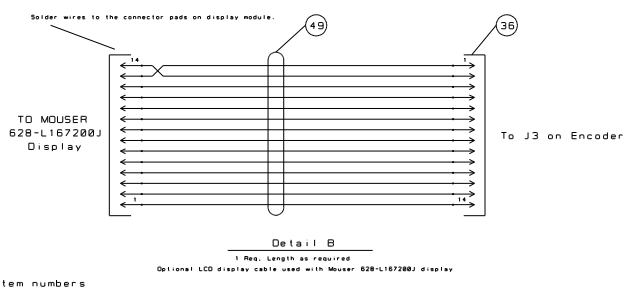
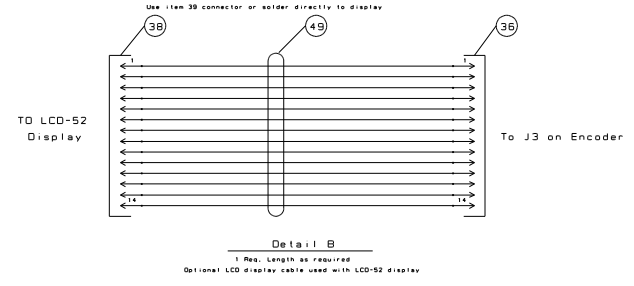
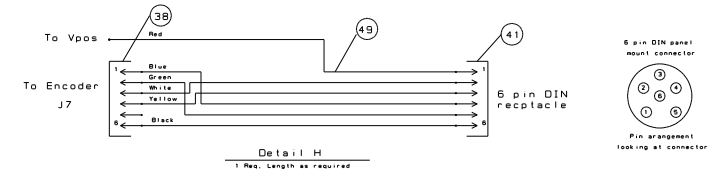
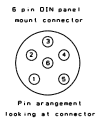
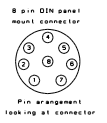
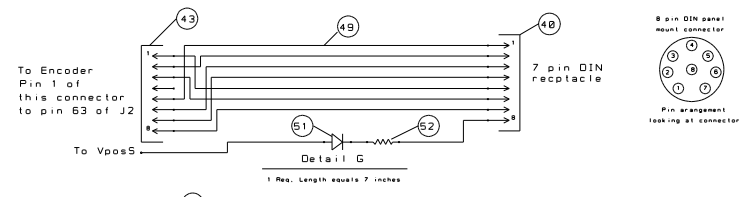
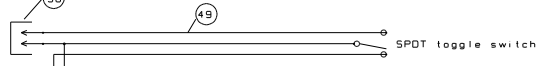
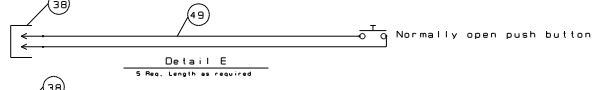
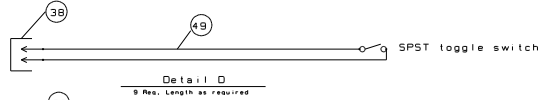
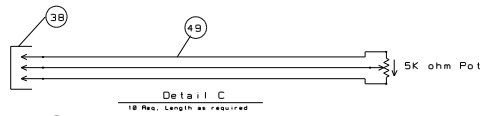
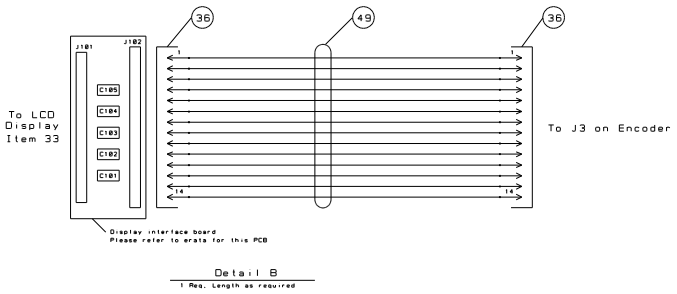
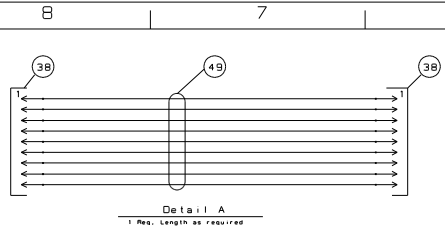
TITLE: Encoder

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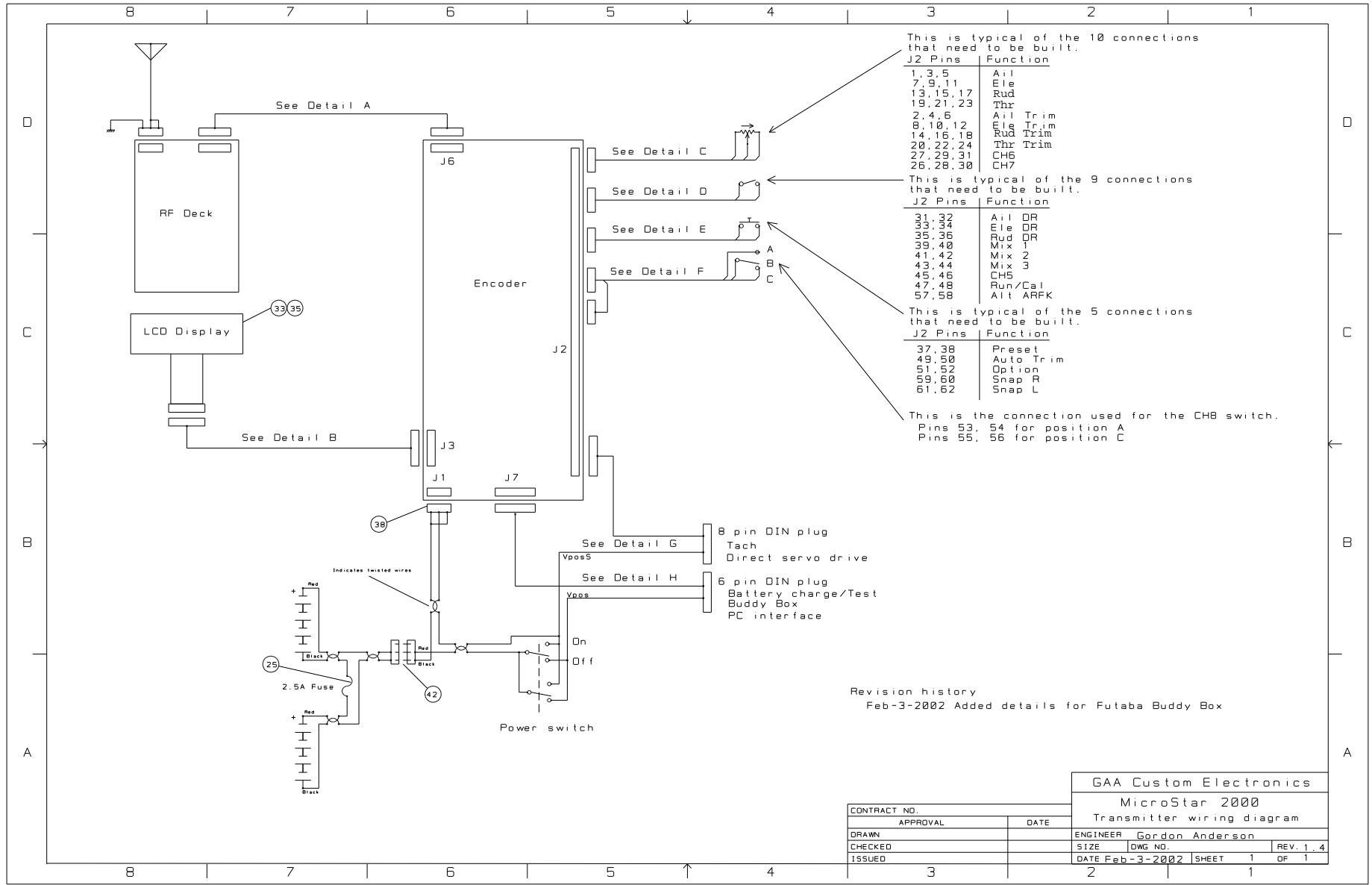


Notes:
1.) Numbers in bubbles indicate item numbers found on parts list

Revision history:
Feb-3-2002 Added details for Futaba Buddy Box support

CONTRACT NO.	APPROVAL	DATE
DRAWN		
CHECKED		
ISSUED		

GAA Custom Electronics		
MicroStar 2000		
Cable Details		
ENGINEER	Gordon Anderson	
SIZE	DMG NO.	REV. 1, 5
DATE	FEB-3-2002	SHEET 1 OF 1



This is typical of the 10 connections that need to be built.

J2 Pins	Function
1, 3, 5	Ail
7, 9, 11	Ele
13, 15, 17	Rud
19, 21, 23	Thr
2, 4, 6	Ail Trim
8, 10, 12	Ele Trim
14, 16, 18	Rud Trim
20, 22, 24	Thr Trim
27, 29, 31	CH6
26, 28, 30	CH7

This is typical of the 9 connections that need to be built.

J2 Pins	Function
33, 32	Ail DR
35, 36	Ele DR
39, 40	Rud DR
41, 42	Mix 1
43, 44	Mix 2
45, 46	Mix 3
47, 48	CH5
57, 58	Run/Cal
	All ARFK

This is typical of the 5 connections that need to be built.

J2 Pins	Function
37, 38	Preset
49, 50	Auto Trim
51, 52	Option
59, 60	Snap R
61, 62	Snap L

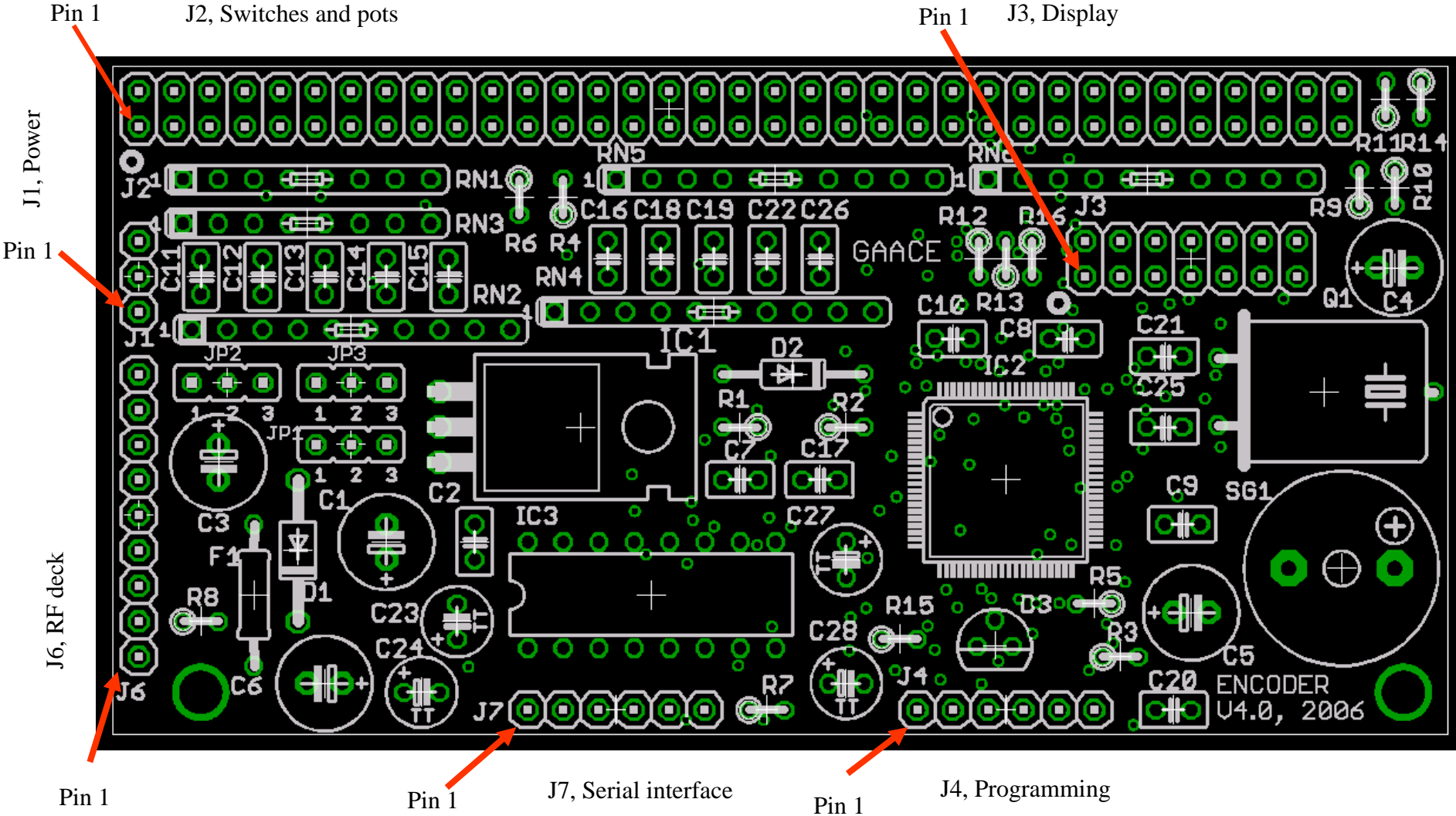
This is the connection used for the CHB switch.
 Pins 53, 54 for position A
 Pins 55, 56 for position C

Revision history
 Feb-3-2002 Added details for Futaba Buddy Box

GAA Custom Electronics
 MicroStar 2000
 Transmitter wiring diagram

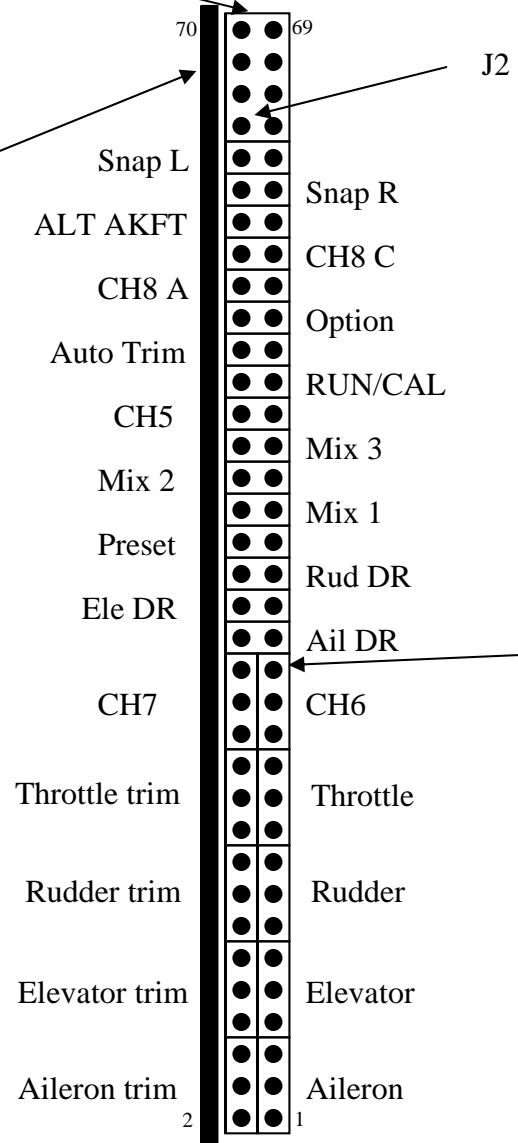
CONTRACT NO.	APPROVAL	DATE	ENGINEER	Gordon Anderson	REV: 1.4
			SIZE	DWG NO.	REV: 1.4
			ISSUED	DATE Feb-3-2002	SHEET 1 OF 1

Encoder Top, Component Side



To accessories connector on transmitter. Please see the details drawing.

Encoder, solder side



Encoder J2 connector pin assignments

Each of these connectors are cut from parts list item 37. You will need 10 three pin connectors and 16 two pin connectors.

Encoder Parts List, Rev 4.0

Item	Quantity	ID	Part number	Description	Supplier	Cost each	Total cost
Encoder Circuit Board and Components							
1	1	RN1	268-100-RC	100 ohm resistor network, individual	Mouser	0.20	0.20
2	2	RN2, RN4	652-4610X-2LF-1K	1K ohm resistor network, individual	Mouser	0.34	0.68
3	1	RN3	268-4.7K-RC	4.7K ohm resistor network, individual	Mouser	0.20	0.20
4	2	RN5,RN6	266-10K-RC	10K ohm resistor network, bussed	Mouser	0.25	0.50
5	3	R1,R9,,R13 (or R12 see notes)	10KQBK-ND	10K ohm, 1/4 watt	Digikey	0.05	0.15
6	4	R2,R5,R7,R15	1.0KQBK-ND	1K ohm, 1/4 watt	Digikey	0.05	0.20
7	1	R11	470QBK-ND	470 ohm, 1/4 watt	Digikey	0.05	0.05
8	1	R14	220QBK-ND	220 ohm, 1/4 watt	Digikey	0.05	0.05
9	2	R3,R8	2.7KQBK-ND	2.7K ohm, 1/4 watt	Digikey	0.05	0.10
10	2	R4,R6	4.7KQBK-ND	4.7K ohm, 1/4 watt	Digikey	0.05	0.10
11	1	R10	1.0QBK-ND	1 ohm, 1/4 watt	Digikey	0.05	0.05
12	1	R16	1.0KQBK-ND	1K ohm, 1/4 watt, adjust value to set display contrast	Digikey	0.05	0.05
13	5	C1,C3,C4,C5, C6	P981-ND	22uF 35V cap	Digikey	0.11	0.55
14	4	C23,C24,C27, C28	P993-ND	1 uF 50V	Digikey	0.08	0.32
15	16	C2,C7-C16,C18-C20,C22,C26	495-1066-1-ND	0.015 uF 50V ceramic	Digikey	0.14	2.24
16	2	C21,C25	490-3684-ND	12 pF, 50V, NPO ceramic	Digikey	0.28	0.56
17	1	C17	490-3810-ND	0.1 uF, 50V, ceramic	Digikey	0.16	0.16
18	1	SG1	102-1115-ND	Piezo Buzzer	Digikey	2.64	2.64
19	1	IC1	NJM#7805FA-ND	7805 5V regulator	Digikey	0.60	0.60
20	1	IC2	PIC18F8722-I/PT-ND	18F8722 PIC Microcontroller	Digikey	17.75	17.75
21	1	IC3	511-ST232EBN	RS232 level converter	Mouser	1.50	1.50
22	1	F1	F2321-ND	2.5 Amp pico fuse	Digikey	0.55	0.55
23	1	D1	1N4004GICT-ND	1N4004	Digikey	0.07	0.07
24	1	D2	1N4148DICT-ND	1N4148 signal diode	Digikey	0.03	0.03
25	1	D3	296-9559-5-ND	2.5 volt reference diode	Digikey	0.80	0.80
26	1	J2	S2111E-36-ND	Right angle header x 2	Digikey	3.96	3.96
27	1	J1,J6	S1111E-36-ND	Right angle header x 1	Digikey	2.11	2.11
28	1	J4,J7,JP1,JP2, JP3	S1011E-36-ND	Header x 1	Digikey	1.51	1.51
29	1	J3	S2011E-36-ND	Header x 2	Digikey	2.74	2.74
30	1	Q1	X021-ND	8MHz crystal	Digikey	0.40	0.40

Grand total

40.05

Transmitter Components

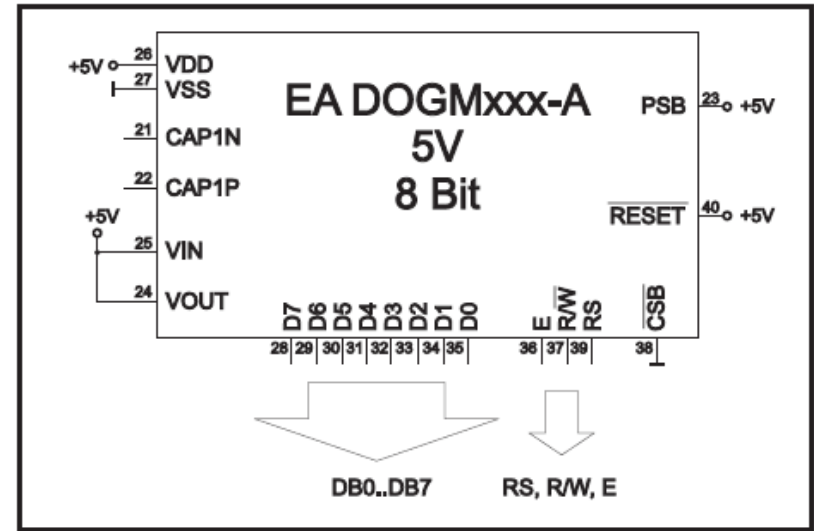
Item	Quantity	ID	Part number	Description	Supplier	Cost each	Total cost	Notes	Option 1	Option 2	Option 3
32	1		73-1037-ND	2 X 16 LCD display	Digikey	13.35	13.35	3	13.35		
33	1		73-1177-ND	2 X 16 LCD display	Digikey	15.08	15.08	3		15.08	
34	1	J101	HFG24T-ND	1mm Flex connector, RA	Digikey	1.37	1.37	4		1.37	
35	1		PRD250LPW-ND	Bezel	Digikey	3	3	2			
36	1		164-9007	IDC 2 x 7 connectors	Mouser	0.5	0.5		0.5	0.5	
37	1		ED80027-ND or A2125-ND	84 pin plcc socket	Digikey	1.14	1.14		1.14	1.14	1.14
38	3		929974-01-36-ND	Single row female	Digikey	1.23	3.69	2	3.69	3.69	3.69
39	2		534-612	Threaded bracket	Mouser	0.14	0.28		0.28	0.28	0.28
40	1		CP-1280-ND	8 pin DIN recptacle	Digikey	0.86	0.86		0.86	0.86	0.86
41	1		CP-1260-ND	6 pin DIN recptacle	Digikey	0.74	0.74		0.74	0.74	0.74
42	1		336DN3	3 pin deans connector pair	CERMARK	2	2	2			
43	1		929975-01-36-ND	Dual row female	Digikey	2.04	2.04		2.04	2.04	2.04
44	5	C101-C105	140-CC502B104K	0.1 uF capacitor, 1205	Mouser	0.07	0.35	1,4		0.35	
45	1		HFF18T-ND	1mm Flex connector	Digikey	0.88	0.88	5			0.88
46	1		260-100K	100K resistor, 805	Mouser	0.08	0.08	5			0.08
47	1		R011-10-ND	25 conductor multi ribbon	Digikey	5.69	5.69	2	5.69	5.69	5.69
48	1			Encoder PCB	GAA	10	10		10	10	10
49	1			On glass display PCB	GAA	2	2			2	
50	1		ECM-A1010	4x12 LCD display	Earth Tech	3	3	3			3
51	1		11DQ3-ND	Shottky Rectifier	Digikey	0.38	0.38	2			
52	1		1.0QBK-ND	1.0 ohm 1/4 W resistor	Digikey	0.28	0.28	2,6			

Notes

- 1 Sold in pkg of 10
- 2 Optional
- 3 Other display options are possible, select item 32, 33, or 50
- 4 Needed for item 33
- 5 Used for Earth Tech 4x12 display
- 6 Sold in pkg of 5

2 x 16 standard display total cost	38.29		
2 x 16 on glass display total cost		43.74	
4 x 12 surplus display total cost			28.4

DOGM162 Display Connection Details



Pin	Symbol	Level	Function
1	NC		(A1+: LED backlight)
2	NC		(C1-: LED backlight)
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19	NC		(C2-: LED backlight)
20	NC		(A2+: LED backlight)

Pin	Symbol	Level	Function
21	CAP1N	-	Voltage Booster + (0,1..1uF)
22	CAP1P	-	Voltage Booster - (0,1..1uF)
23	PSB	H / L	L= Serial Mode, H= Parallel Mode
24	VOUT	-	Voltage Booster Output
25	VIN	-	Voltage Booster Input
26	VDD	H	Power Supply +3,3..5V
27	VSS	L	Power Supply 0V (GND)
28	D7	H / L	Display Data (MSB)
29	D6	H / L	Display Data
30	D5	H / L	Display Data
31	D4	H / L	Display Data
32	D3	H / L	Display Data
33	D2	H / L	Display Data
34	D1	H / L	Display Data
35	D0	H / L	Display Data (LSB)
36	E	H	Enable (falling edge)
37	R/W	H / L	L= Write, H=Read
38	CSB	L	Chip Select
39	RS	H / L	L= Command, H= Data
40	RESET	L	Reset

DOGM162 Display Connection Details

DOG display pin number	Encoder J3 pin number
21	NC
22	NC
23	2
24	2
25	2
26	2
27	1
28	14
29	13
30	12
31	11
32	10
33	9
34	8
35	7
36	6
37	5
38	1
39	4
40	2

Note: R12, R13, and R16 are not required when using the DOG display.