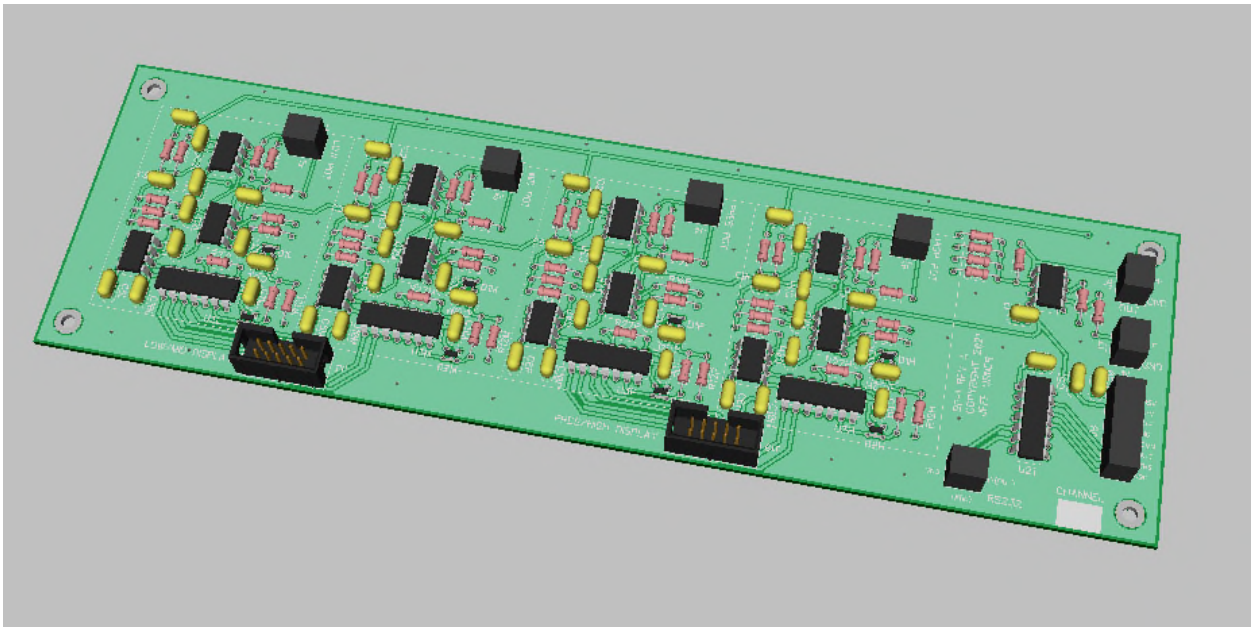
BP1 board assembly:



The BP1 is divided into 4 sections where each circuit is identical apart from the filter values C1, R8, C2 and R7 and the average detector resistor R12. The component suffix of L,M,P or H is used to identify which band the component resides in these 4 sections. All other components will not have this suffix.

DIP Socket Placement

1) Orient the pcb silkscreen side facing up.
2) Locate the 13 eight pin and 5 fourteen pin DIP sockets.
3) Orient the sockets to locate pin 1 per the silkscreen and install the sockets in the board. *If the SMD version of the DG418 is placed, omit the sockets at U1L, U1M, U1P, U1H.*
4) Using cardboard to hold the sockets flat to the board, flip the assembly over and tack solder two diagonal pins of the

sockets. Examine the sockets for proper placement and seating to the board surface. Solder the remaining pins.

Capacitor placement

5) Place 28pcs of the 4.7uf ceramic capacitors at C3L,C4L,C6L,C10L,C11L,C14L,C3M,C4M,C6M,C10M,C11M,C14M,C3P, C4P,C6P,C10P,C11P,C14P,C3H,C4H,C6H,C10H,C11H,C14H,C30,C49, C50 & C51
6) Place 2 pcs of the 2.2nf ceramic capacitors at C2M,C1P
7) Place 1 pc of the 180pf ceramic capacitors at C2H
8) Place 5 pcs of the 390pf ceramic capacitors at C7L,C7M,C7P,C7H,C2P
9) Place 1 pc of the 18nf ceramic capacitors at C1L
10) Place 1 pc of the 12nf ceramic capacitors at C1M
11) Place 1 pc of the 1.8nf ceramic capacitors at C1H
12) Place 5 pcs of the 3.3nf ceramic capacitors at C2L,C9L, C9M, C9P, C9H
13) Observing polarity to the silkscreen, place 8 pcs of the 4.7uf tantalum capacitors at C12L, C13L, C12M, C13M, C12P, C13P, C12H, C13H

Resistor Placement

14) Place 9 pcs of the 3.9k resistor at R1L,R5L,R1M,R5M,R1P,R5P,R1H,R5H,R12P
15) Place 1 pc of the 750k resistor at R7L
16) Place 2 pcs of the 200k resistor at R7M, R7P

17) Place 1 pc of the 75k resistor at R7H

18) Place 4 pcs of the 120k resistor at R2L, R2M, R2P, R2H

19) Place 1 pc of the 137k resistor at R8L

20) Place 2 pcs of the 36k resistor at R8M, R8P

21) Place 1 pc of the 7.5k resistor at R8H

22) Place 21 pcs of the 10k resistors at R3L,R10L,R27L ,R3M,R10M,R27M,R3P,R10P,R27P,R3H,R10H,R27H,R12L,R12M,R53,R54,R55,R56,R57,R58,R59

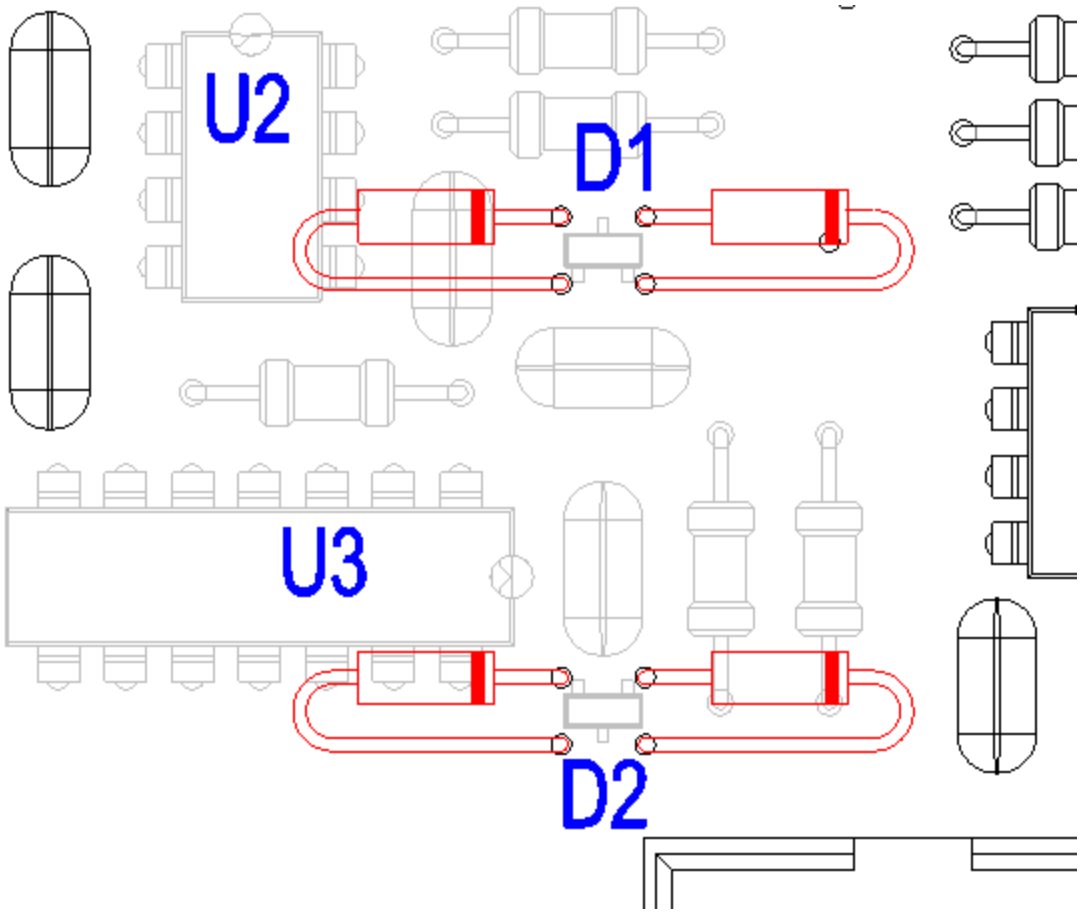
23) Place 4 pcS of the 13k resistor at R6L, R6M, R6P, R6H

24) Place 4 pcs of the 1k resistor at R11L,R11M,R11P,R11H If using linear pots (or trimpots)for level controls, place 4 pcs at R4L, R4M, R4P and R4H. If using log taper pots a wire jumper or low value resistor can be used to limit the minimum level.

25) Place 5 pcs of the 1.3k resistor at R12H, R13L, R13M, R13P, R13H

Diode Placement

26) If the PCB has the BAS40-04 SMD diodes placed omit this step. If placing the SMD diodes observe the orientation on the silkscreen. If installing through hole parts, follow the diagram below to place D1 and D2 using 4 through hole parts. The orientation is shown horizontally for clarity but the diodes should be mounted vertically.



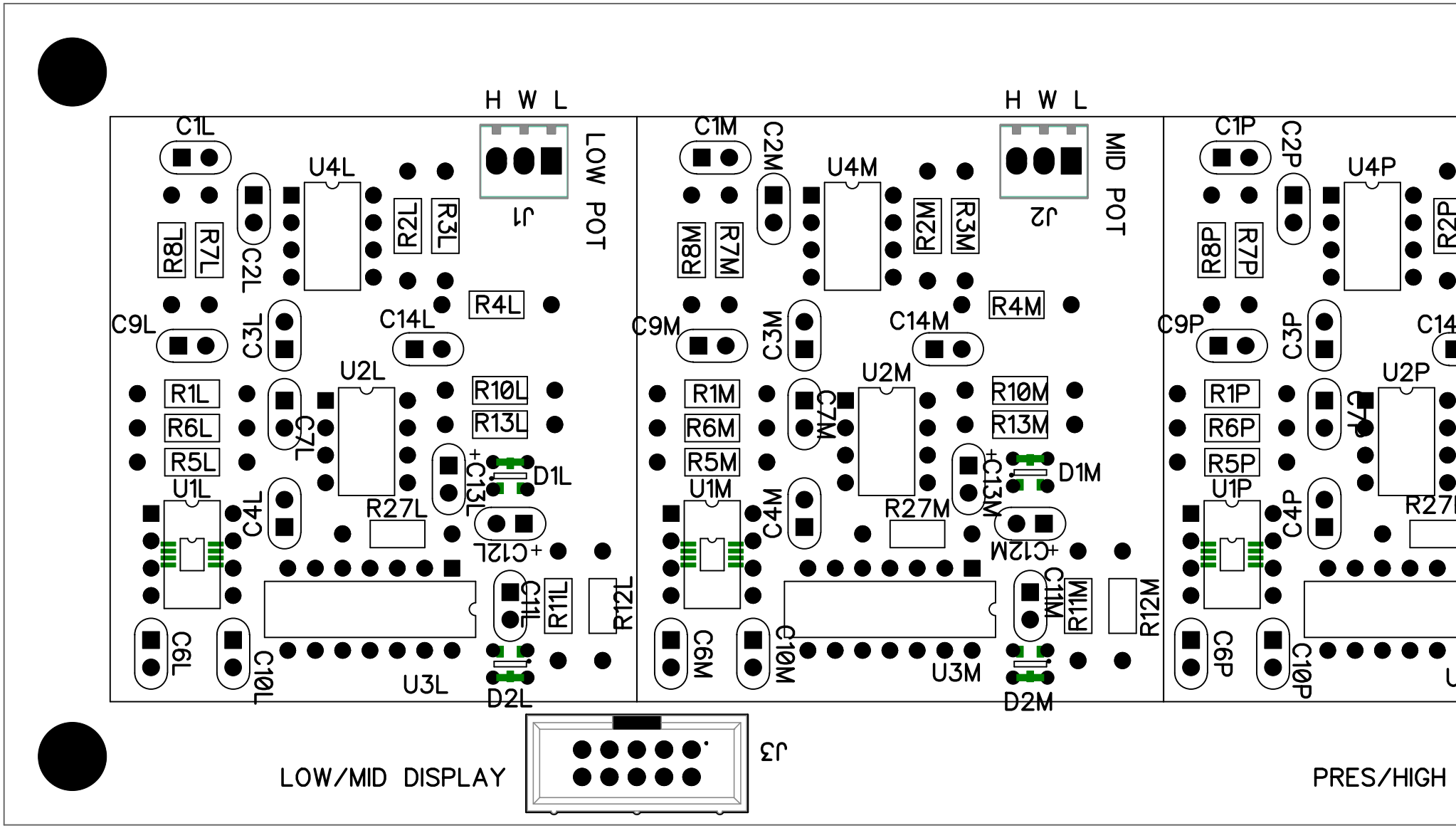
Connector Placement

27) Place 2 pcs of the 10 pin IDC box headers with the slot oriented as shown on the silkscreen as indicated with the thick line.

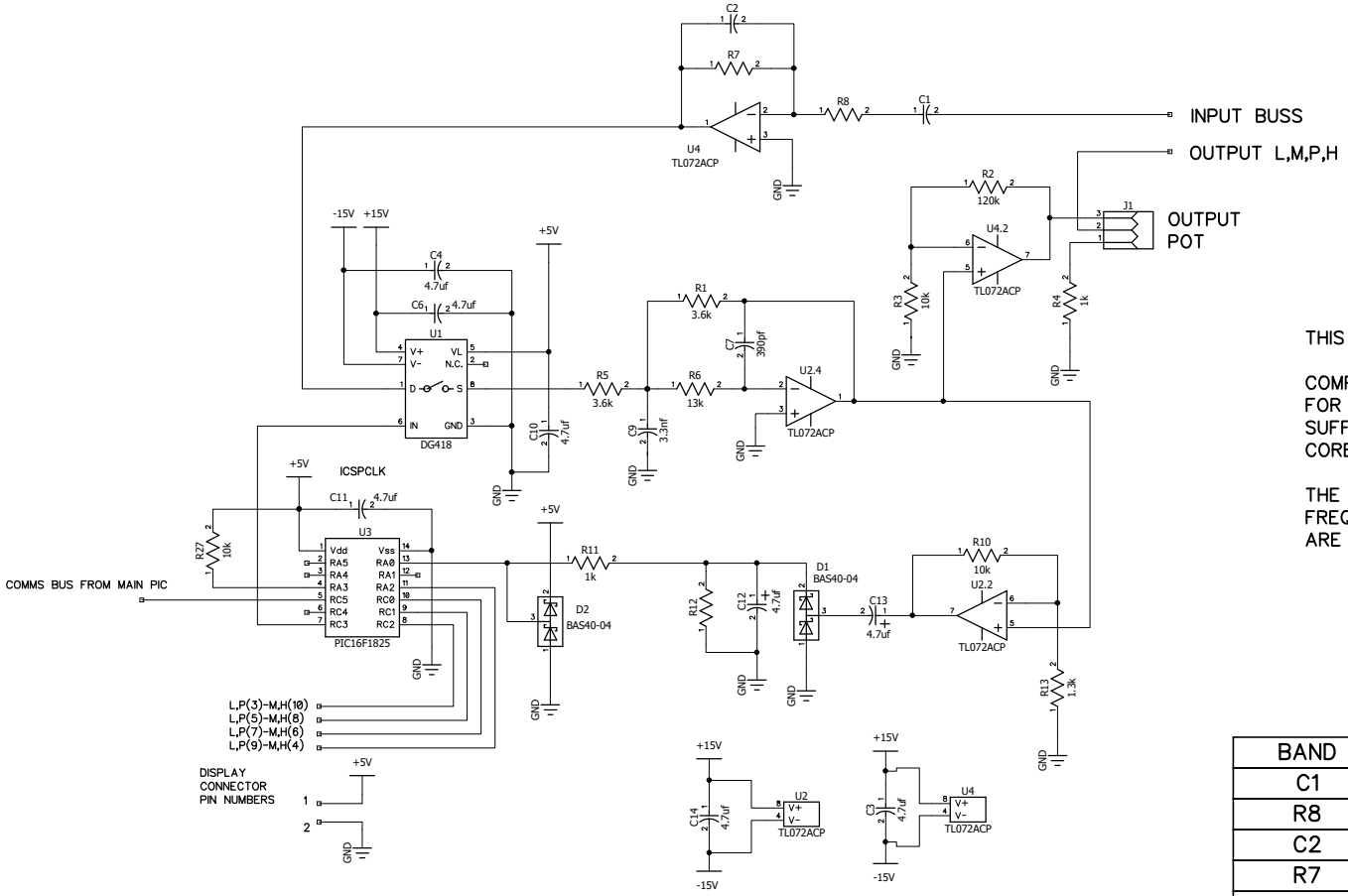
28) Prior to placing the band level potentiometer terminal blocks, if you intend to set these via a panel mounted pot, proceed with placement. Alternatively a trimpot can be installed in these locations if the levels are to be set and not user adjustable. Place 7 pcs of the 3 position

screw terminal blocks with the terminal openings facing toward the board edge

29) Place 1 pc of the 8 position screw terminal block with the terminal openings facing toward the board edge
30) Install 9 pcs of the TL072 at U2L, U4L, U2M, U4M, U2P, U4P, U2H, U4H, U22
31) If the board contains the SMD version of the DG418 skip this step or place it at the following locations indicated for the DIP parts. If placing the DIP DG418 install 4 pcs at U1L, U1M, U1P, U1H
32) Install 4 pcs of the pre-programmed band processor PIC16F1825. They are unique to each band. “L” marking goes in U3L, “M” marking goes in U3M, “P” marking goes in U3P, “H” marking goes in U3H.
33) Install 1 pc of the pre-programmed main control PIC16F1825 marked with an “X” at U21. *Note: If building two BP1 boards for a 2 channel system it is only necessary to install one U21 in one of the boards, since one main controller will be linked across both boards.*
34) Clean any solder flux from the board and inspect the board.
35) Label the PCB as left or right channel


H W L
LOW POT
J1
C1L
U4L
R8L
R7L
C2L
R2L
R3L
R4L
C9L
C3L
C14L
U2L
R1L
R6L
R5L
C7L
R10L
R13L
+C13L
D1L
U1L
C4L
R27L
+C12L
C11L
R11L
R12L
C6L
C10L
U3L
D2L
H W L
MID POT
J2
C1M
C2M
U4M
R8M
R7M
R2M
R3M
R4M
C9M
C3M
C14M
U2M
R1M
R6M
R5M
C7M
R10M
R13M
+C13M
D1M
U1M
C4M
R27M
+C12M
C11M
R11M
R12M
C6M
C10M
U3M
D2M
C1P
C2P
U4P
R8P
R7P
R2P
C9P
C3P
U2P
R1P
R6P
R5P
C7P
U1P
C4P
C6P
C10P
J3
LOW/MID DISPLAY
PRES/HIGH

H W L
PRES POT
J4
U4P
R2P
R3P
R4P
C14P
U2P
R10P
R13P
D1P
C13P
C12P
R27P
C11P
R11P
R12P
U3P
D2P
C1H
C2H
R8H
R7H
C9H
C3H
U4H
R2H
R3H
R4H
C14H
U2H
R1H
R6H
R5H
C7H
C4H
U1H
R10H
R13H
D1H
C13H
C12H
R27H
C11H
R11H
R12H
C6H
C10H
U3H
D2H
H W L
HIGH POT
J5
R56
R55
R54
R53
R57
U22
C30
R58
R59
J6
OUT
GND
+
J7
IN
GND
+
C49
C51
C50
J8
+15V
-15V
+5V
GND
COMM
GATE
DENS
AGC
U21
BP-1 REV A
COPYRIGHT 2021
JEFF ORNER
J9
GND
RX(OUT)
TX(IN)
RS232
J10
RES/HIGH DISPLAY



THIS CIRCUIT IS DUPLICATED 4X

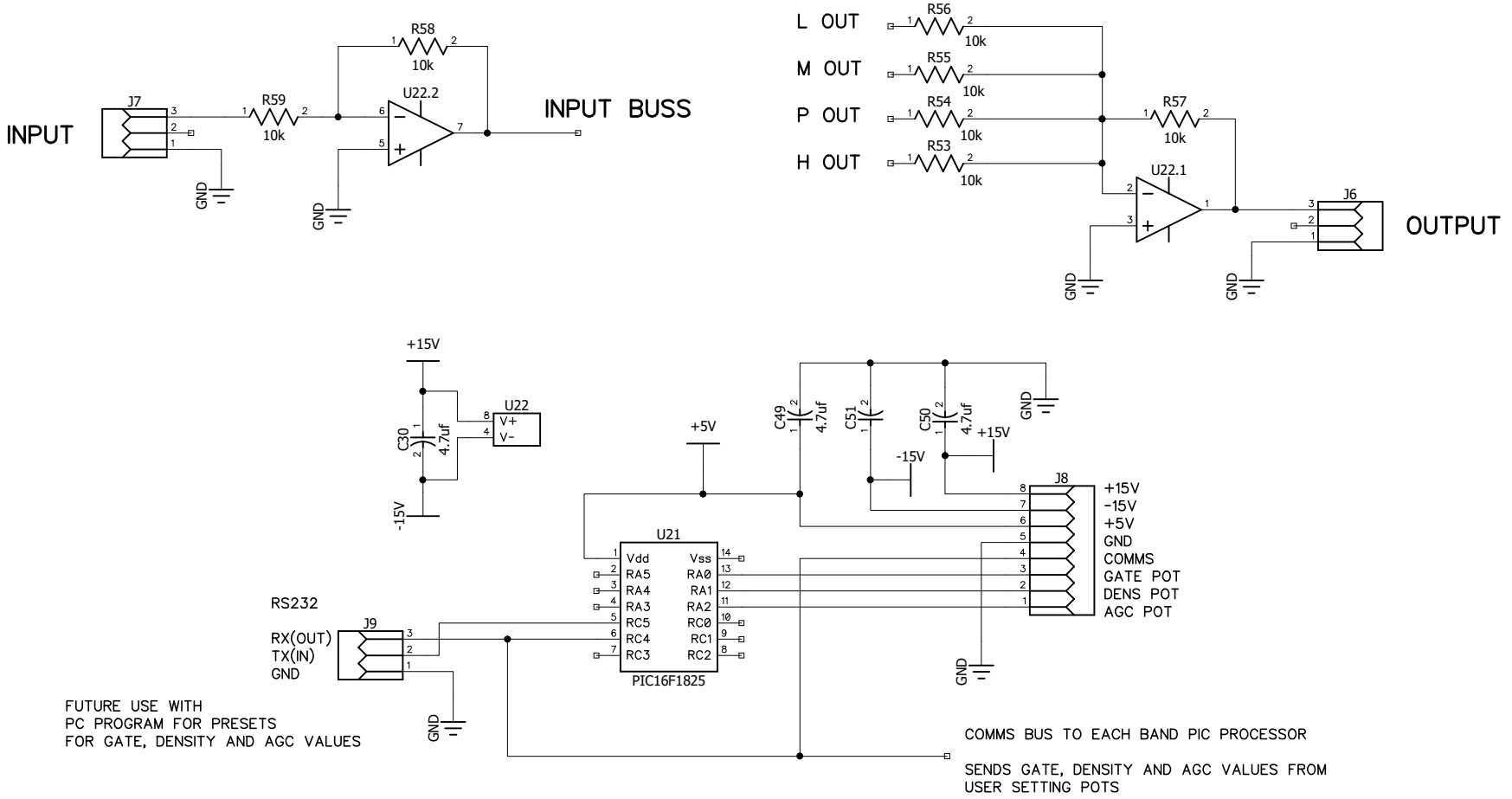
COMPONENT NUMBERS ARE IDENTICAL FOR EACH CIRCUIT WITH THE COMPONENT SUFFIX ENDING WITH "L","M","P" OR "H" CORESPONDING TO THE FREQ BAND

THE SELECT VALUES FOR EACH FREQUENCY BAND AND TIME CONSTANT ARE GIVEN IN THE TABLE

BAND	LOW	MID	PRES	HIGH
C1	18nf	12nf	2.2nf	1.8nf
R8	137k	36k	36k	7.5k
C2	3.3nf	2.2nf	390pf	180pf
R7	750k	200k	200k	75k
R12	10k	10k	3.6k	1.3k

BAND PROCESSOR BP-1

SIZE	FSCM NO.	DWG NO.	REV 1.0
SCALE		Sheet 1	



BAND PROCESSOR BP-1

SIZE	FSCM NO.	DWG NO.	REV 1.0
SCALE		Sheet 2	

#	RefDes	Name	Value	Manufacturer	Manufacturer PN	Part Number (Digi-Key)	Part number (Mouser)	Quantity
1	C3,C4,C6,C10,C11,C14,C30,C49,C50,C51	CAP NP0 CERAMIC	4.7uf	Murata	RCER71H475K3DBH03A	490-7555-1-ND		28
2	C2M,C1P	CAP NP0 CERAMIC	2.2nf	Murata	RCE5C2A222J1DBH03A	490-7448-1-ND		2
3	C2H	CAP NP0 CERAMIC	180pf	Murata	RCE5C2A181J0DBH03A	490-7438-1-ND		1
4	C7,C2P	CAP NP0 CERAMIC	390pf	Murata	RCE5C2A391J0DBH03A	490-7466-1-ND		5
5	C1L	CAP NP0 CERAMIC	18nf	Murata	RCE5C1H183J1DBH03A	490-7348-1-ND		1
6	C1M	CAP NP0 CERAMIC	12nf	Murata	RCE5C1H123J1DBH03A	490-7332-1-ND		1
7	C1H	CAP NP0 CERAMIC	1.8nf	Murata	RDE5C1H182J0S1H03A	490-8987-1-ND		1
8	C2L,C9	CAP NP0 CERAMIC	3.3nf	Murata	RCE5C1H332J0DBH03A	490-7372-1-ND		5
9	C12,C13	4.7uf TANTALUM	4.7uf	AVX	TAP475K020SCS	478-1905-ND		8
10	D1,D2 (SMD PRE-PLACED)	BAS40-04		Diodes Inc	BAS40-04-7-F	BAS40-04FDICT-ND		8
10	THROUGH HOLE EQUIVALENT	1N5711						
11	R1,R5,R12P	1/4W 1% axial res	3.6k	Stackpole	RNMF14FTC3K60	S3.6KCACT-ND		9
12	R7L	1/4W 1% axial res	750k	Stackpole	RNMF14FTC750K	S750KCACT-ND		1
13	R7M,R7P	1/4W 1% axial res	200k	Stackpole	RNMF14FTC200K	S200KCACT-ND		2
14	R7H	1/4W 1% axial res	75k	Stackpole	RNMF14FTC75K0	S75KCACT-ND		1
15	R2	1/4W 1% axial res	120k	Stackpole	RNMF14FTC120K	S120KCACT-ND		4
16	R8L	1/4W 1% axial res	137k	Stackpole	RNF14FAD137K	RNF14FAD137KTB-ND		1
17	R8M,R8P	1/4W 1% axial res	36k	Stackpole	RNMF14FTC36K0	S36KCACT-ND		2
18	R8H	1/4W 1% axial res	7.5k	Stackpole	RNMF14FTC7K50	S7.5KCACT-ND		1
19	R3,R10,R27,R12L,R12M,R53,R54,R55,R56,R57,R58,R59	1/4W 1% axial res	10k	Stackpole	RNMF14FTC10K0	S10KCACT-ND		21
20	R6	1/4W 1% axial res	13k	Stackpole	RNMF14FTC13K0	S13KCACT-ND		4
21	R4,R11	1/4W 1% axial res	1k	Stackpole	RNMF14FTC1K00	S1KCACT-ND		8
22	R12H,R13	1/4W 1% axial res	1.3k	Stackpole	RNMF14FTC1K30	S1.3KCACT-ND		5
23	U2L,U4L,U2M,U4M,U2P,U4P,U2H,U4H,U22	IC OPAMP JFET 2 CIRCUIT 8DIP		TI	TL072BCP	296-7192-5-ND		9
24	U1L,U1M,U1P,U1H (SMD PRE-PLACED)	IC ANALOG SWITCH 8MSOP		Vishay	DG418BDQ-T1-E3	DG418BDQ-T1-E3CT-ND		4
24	THROUGH HOLE EQUIVALENT				DG418 OR DG419			4
25		CONN HEADER VERT 10POS 2.54MM		Wurth	61201021621	732-2094-ND		2
26		TERM BLK 3P SIDE ENT 2.54MM PCB		On Shore	OSTVN03A150	ED10562-ND		7
27		TERM BLK 8P SIDE ENT 2.54MM PCB		On Shore	OSTVN08A150	ED10566-ND		1
28		CONN IC DIP SOCKET 14POS TIN		Amphenol	DILB14P-223TLF	609-4712-ND		5
29	9 PCS IF DG418 IS SMD - 13 PCS IF DIP	CONN IC DIP SOCKET 8POS TIN		Amphenol	DILB8P-223TLF	609-4717-ND		9
30	BAND CONTROL PROGRAMMED PIC				PIC16F1825-I/P	PIC16F1825-I/P-ND	579-PIC16F1825-I/P	4
31	MASTER CONTROL PROGRAMMED PIC				PIC16F1825-I/P	PIC16F1825-I/P-ND	579-PIC16F1825-I/P	1