

Elecraft K3 Schematics

This document contains the schematics for the Elecraft K3 Transceiver and its internal options. The schematics are preceded by a Block Diagram for context.

The schematics are ordered as the basic K3/10, then various options.

BLOCK DIAGRAM

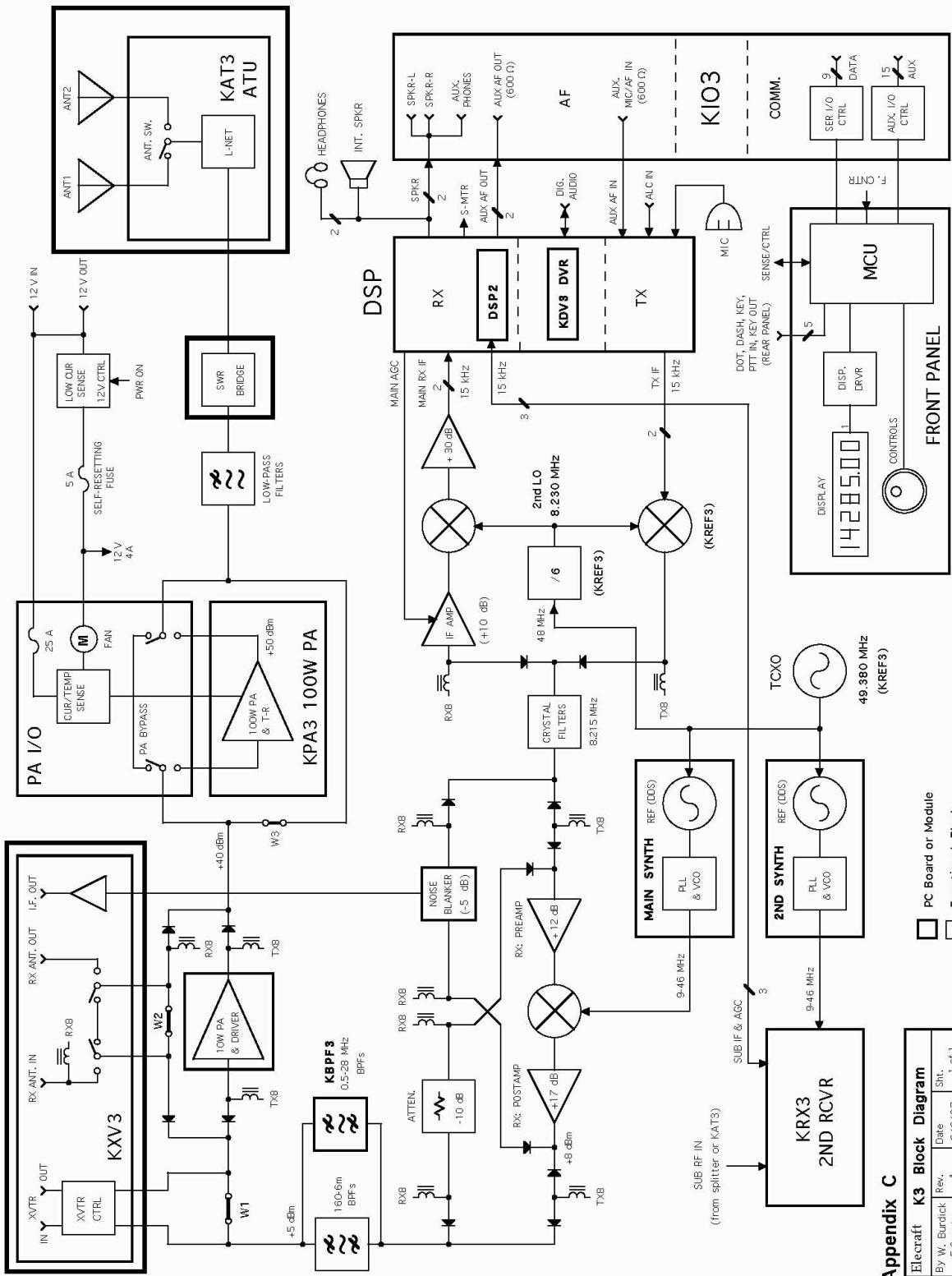
K3/10

RF Board	Main module
Band Stop Filter	1 st IF rejection
Mixer	High dynamic range 1 st mixer
Crystal Filter	Roofing filter
KIO3	I/O module
KANT3	Antenna Connector if no KPA3 installed
KNB3	Pre-IF Noise Blanker
KREF3	Reference oscillator, Tx mixer/Filter, Rx 2 nd Mixer
KSYN3	Synthesizer
Front Panel	Control logic
DSP	Digital Signal Processing
DSP LPF	Optional retrofit for earlier DSP boards
10-watt PA	Low power amplifier

OPTIONS

KBPF3	General Coverage Receiver Bandpass Filters
KXV3	Transverter Interface and Receive Antenna Switching
KXV3A	Transverter Interface and Rx Ant Switch w/K144XV Support
KAT3	100-watt Antenna Tuner
DVR	Digital Voice Record/Playback
KPAIO3	Part of 100-watt PA
KPA3	Part of 100-watt PA
AuxDSP	Part of KRX3 Second Receiver
KRX3	Part of KRX3 Second Receiver
K144XV	Internal 2m Module

K3 Block Diagram

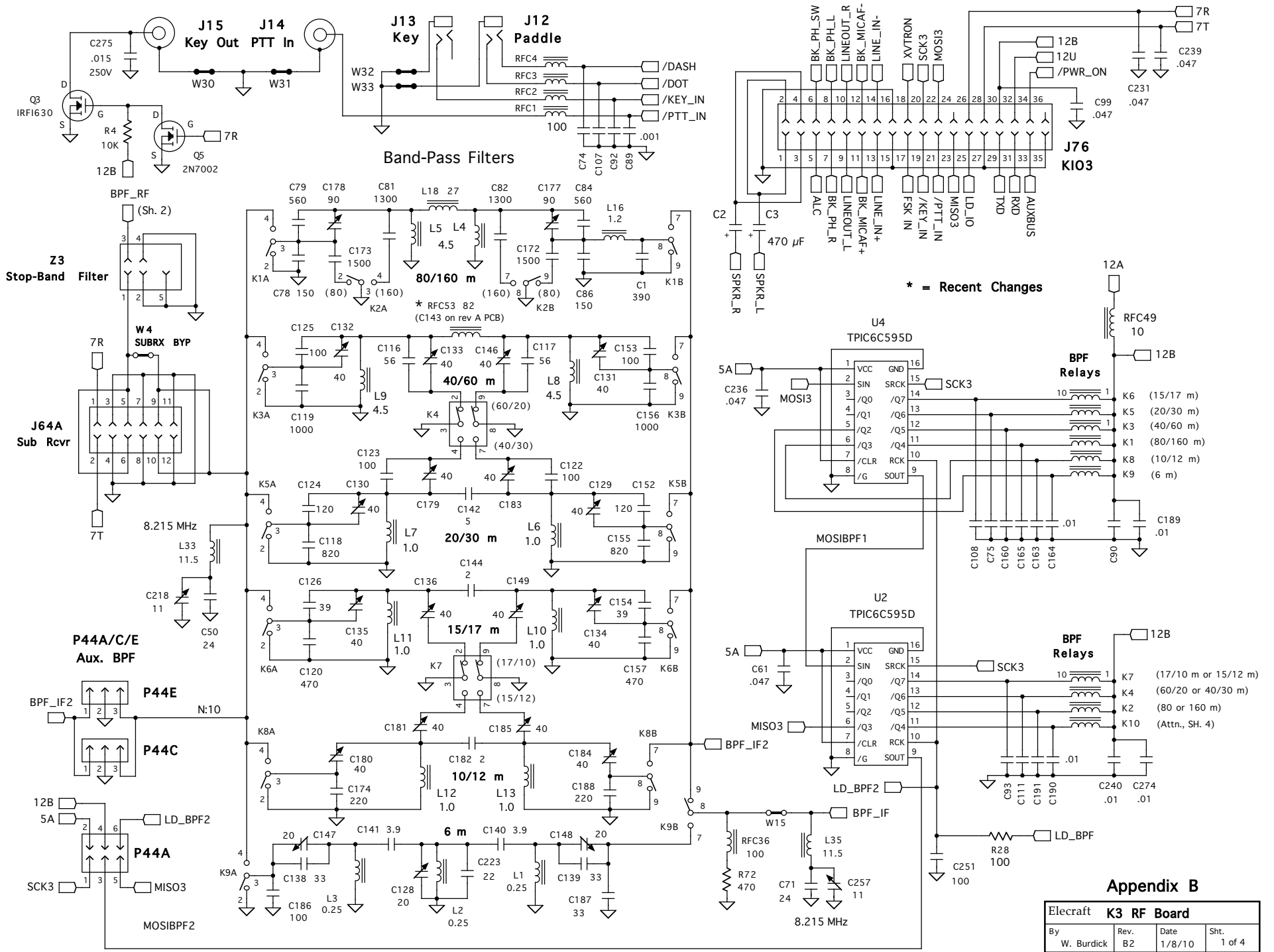


Appendix C

Elecraft K3 Block Diagram			
By W. Burdick	Rev. A	Date 6/7/07	Shr. 1 of 1

- PC Board or Module
- Functional Block

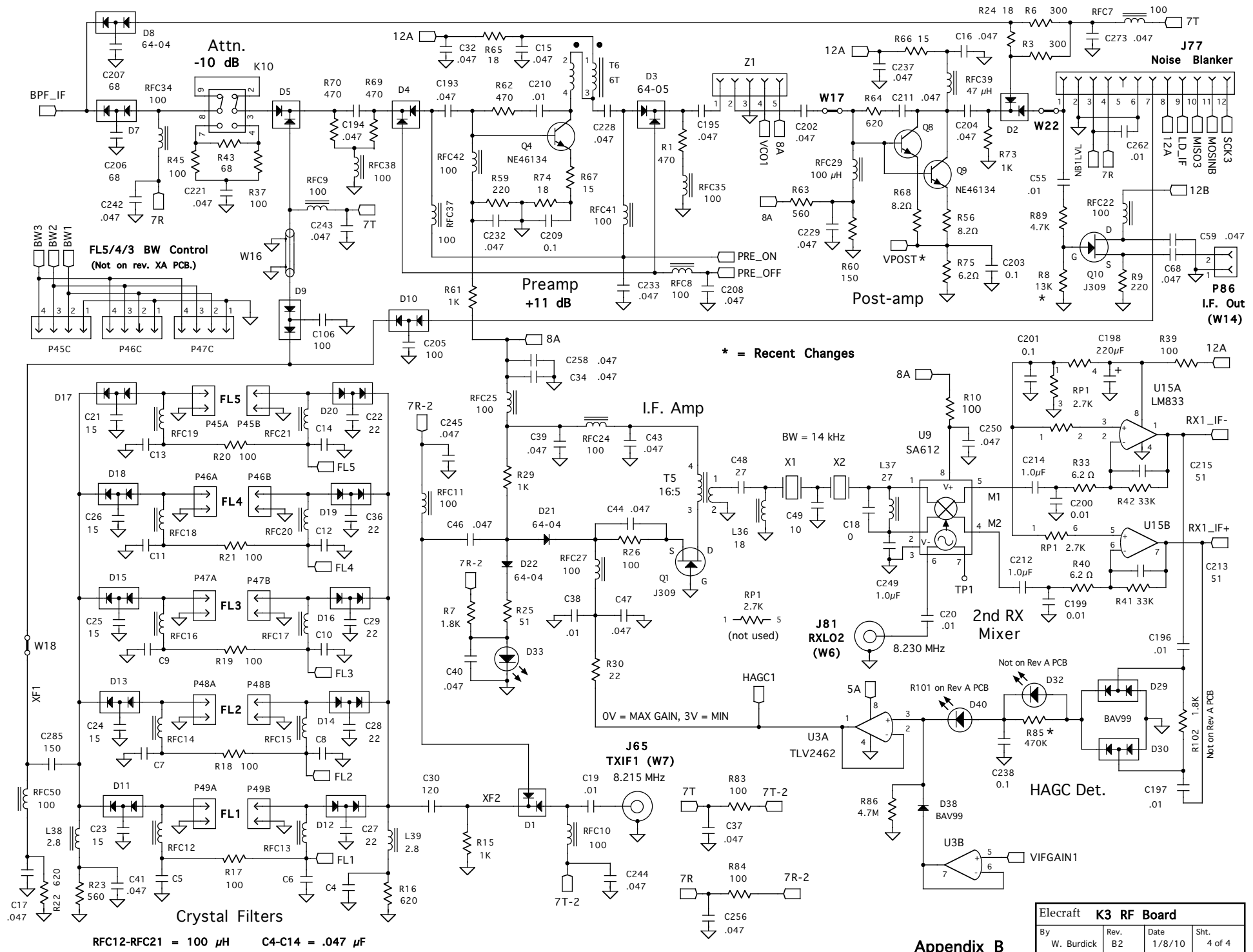
RF CHOKE RFC53 & C143 MOD



* = Recent Changes

Appendix B

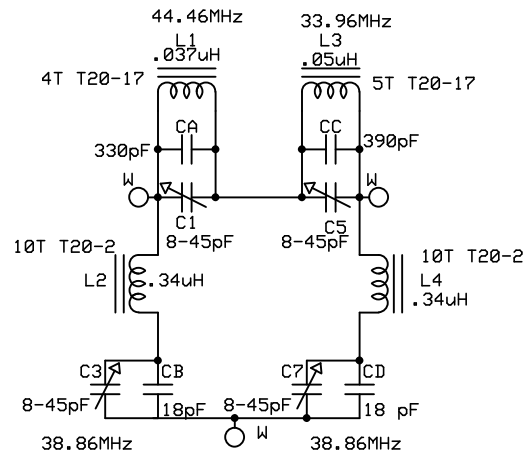
Elecraft K3 RF Board			
By W. Burdick	Rev. B2	Date 1/8/10	Sht. 1 of 4



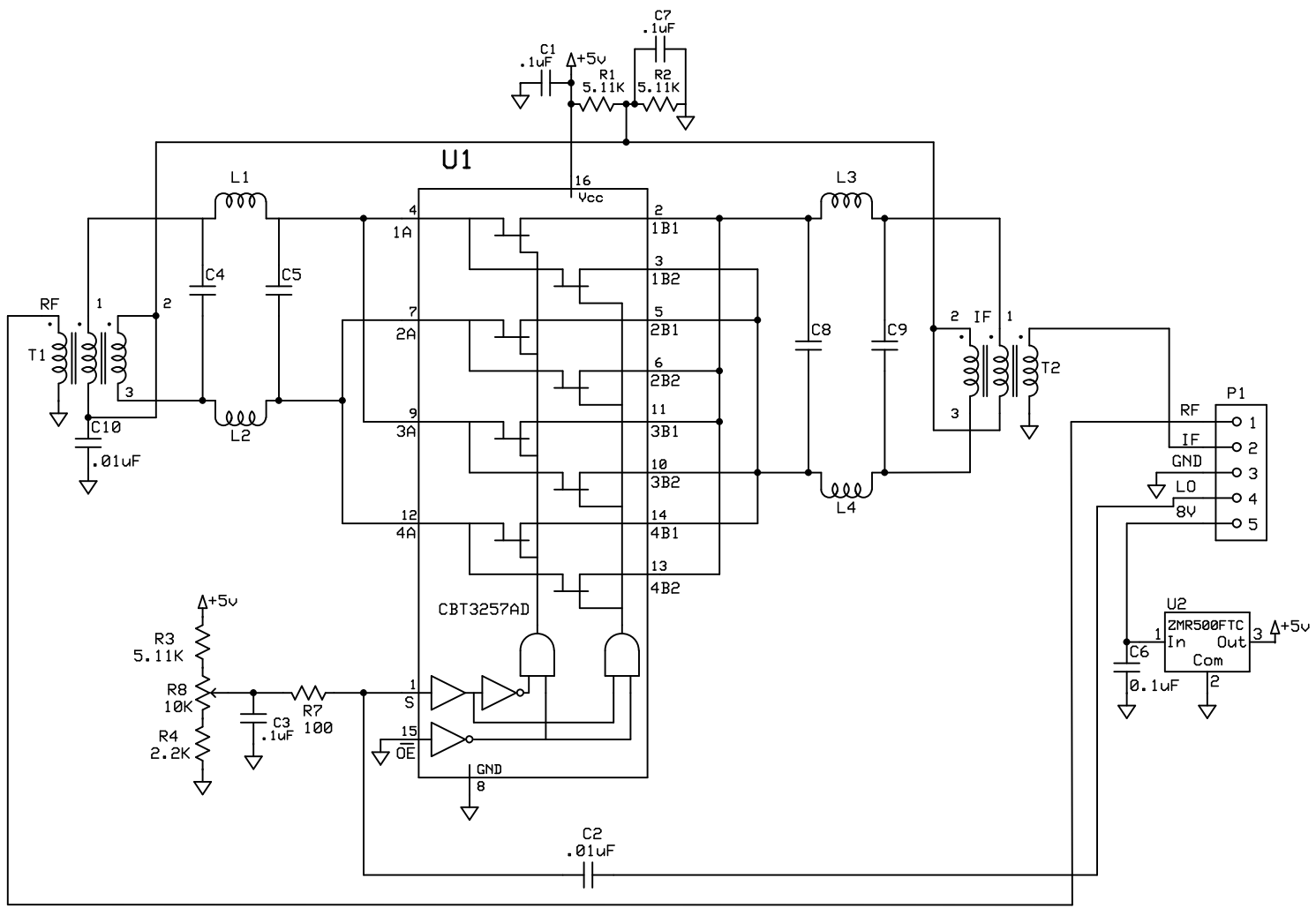
RFC12-RFC21 = 100 μH C4-C14 = .047 μF

Appendix B

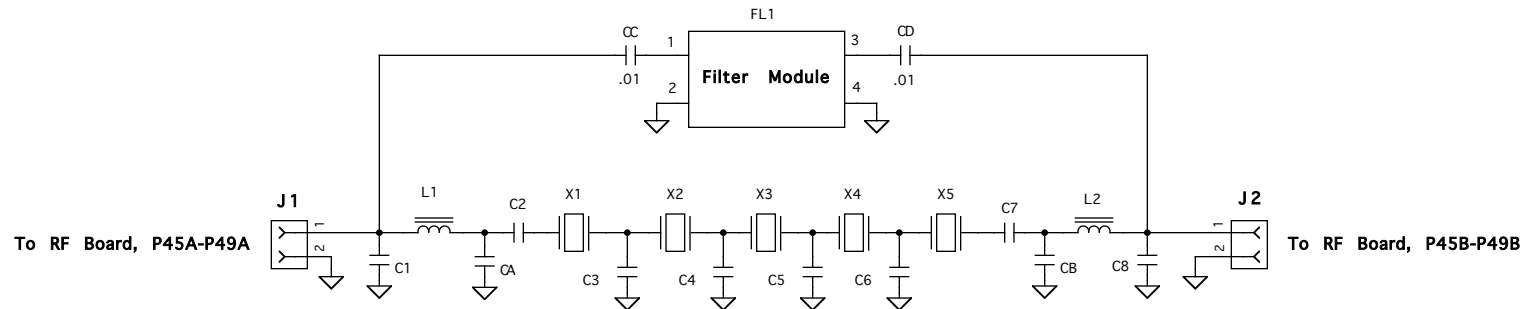
Elecraft K3 RF Board			
By	Rev.	Date	Sht.
W. Burdick	B2	1/8/10	4 of 4



Elecraft		
Bandstop Filter		
Bob Friess	Rev XA	Page 1 of 1
	1/25/2007	



Elecraft		
KR MIXER		
W. Burdick	Rev XC	Page 1 of 1
	2/11/2007	

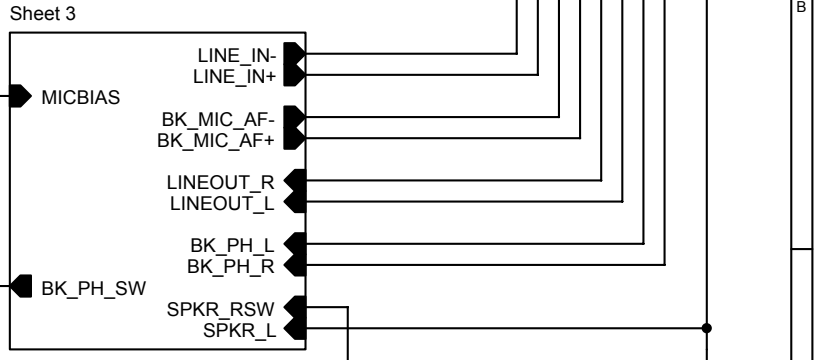
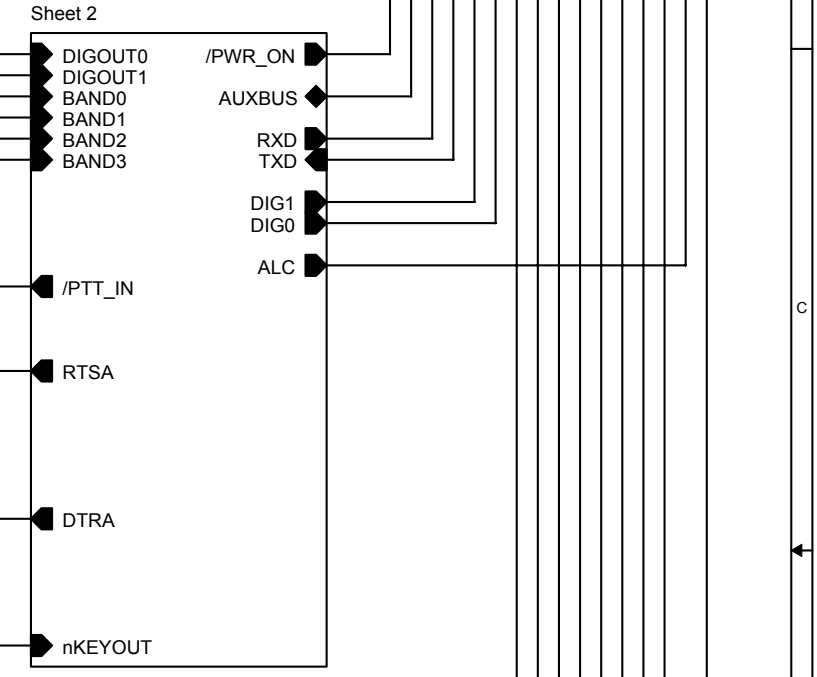
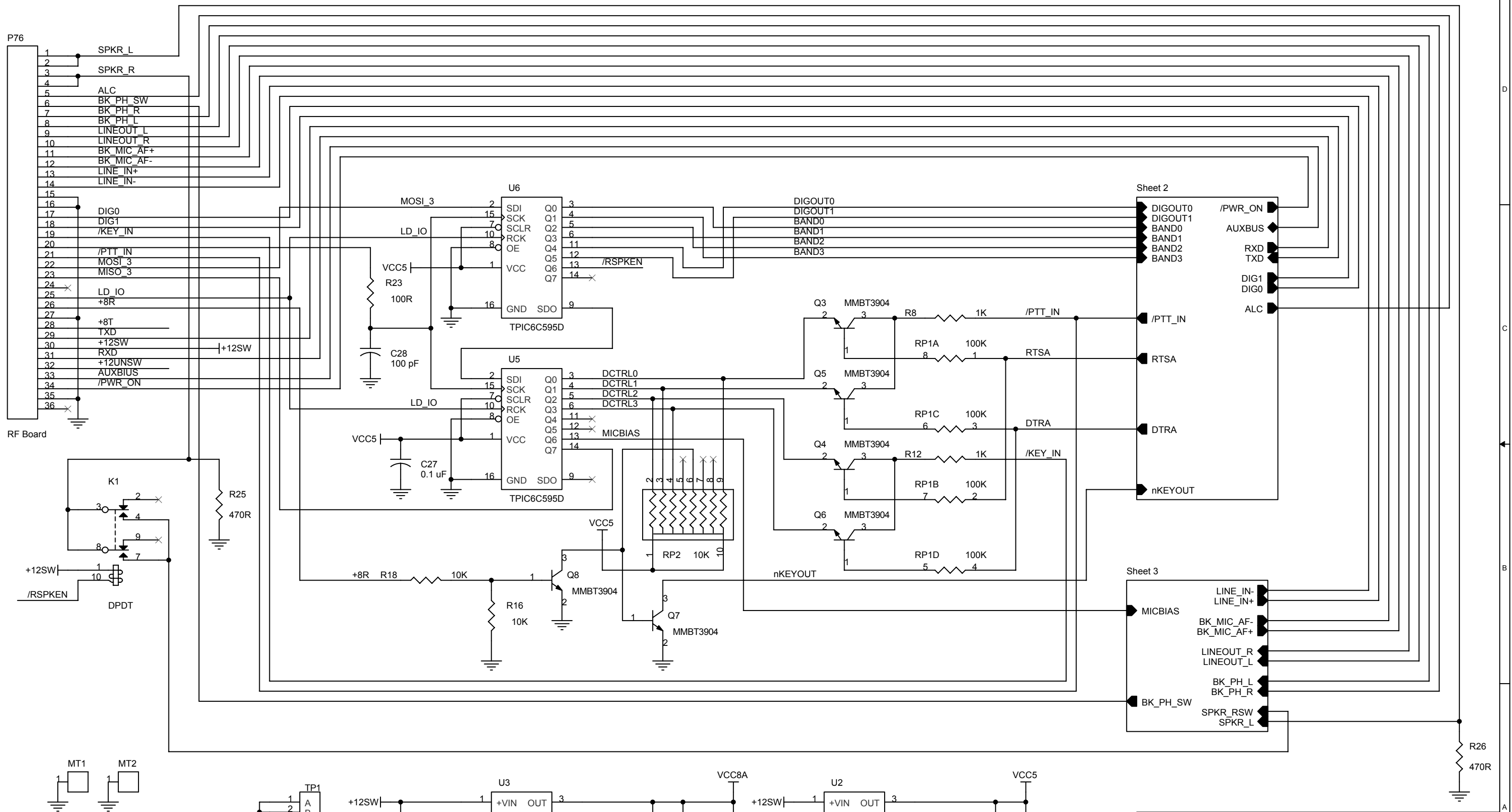


NOTES:

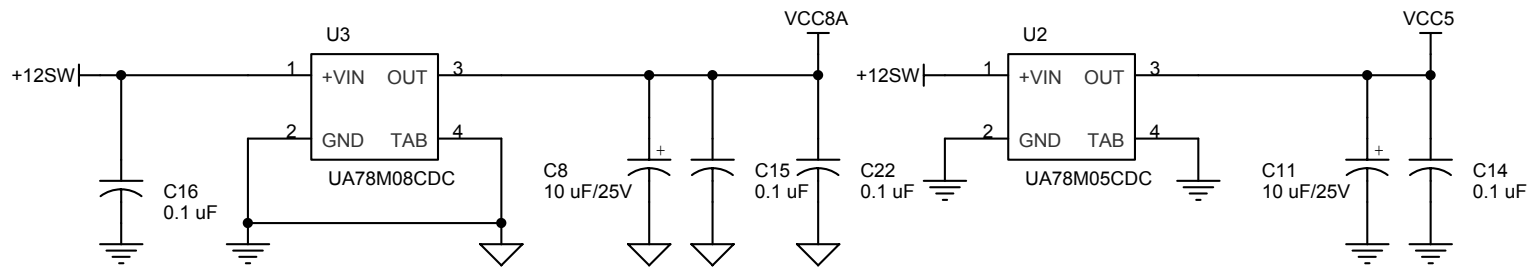
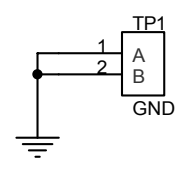
1. This PCB can be used to assemble a discrete 5-pole crystal filter, or as a carrier for filter modules (INRAD, etc.).
2. CC and CD are used with a filter module (FL1). All other components are only used for constructing a discrete filter.
3. X1-X5 can be either 2- or 3-lead HC49/U types. Grounding pads are provided for both.

Fc	Zin/out	BW @ -6 dB	C1,C8	C2	C3	C4	C5	C6	C7	CA,CB	L1, L2	Crystal p/n, Inductor Windings, Notes
8.215 MHz	500 Ω	200 Hz	120 pF	2700 pF	620 pF	1000 pF	1000 pF	620 pF	2700 pF	0 pF	2.8 μH	E660027
8.215 MHz	500 Ω	250 Hz	150 pF	750 pF	750 pF	750 pF	750 pF	750 pF	750 pF	0 pF	2.3 μH	E660027
8.215 MHz	500 Ω	500 Hz	120 pF	470 pF	390 pF	470 pF	390 pF	470 pF	390 pF	0 pF	2.8 μH	E660027; L1, L2 = 24 T #28 on T30-2
8.215 MHz	500 Ω	1000 Hz	63 pF	180 pF	240 pF	180 pF	240 pF	180 pF	240 pF	0 pF	3.9 μH	E660027
8.215 MHz	500 Ω	2700 Hz	0 pF	110 pF	47 pF	68 pF	68 pF	51 pF	68 pF	0 pF	short	E660032
8.215 MHz	500 Ω	3000 Hz	0 pF	51 pF	51 pF	51 pF	51 pF	short	51 pF	0 pF	short	E660032 (4-crystal filter w/1dB ripple; X5 = short)
8.215 MHz	500 Ω	3000 Hz	0 pF	62 pF	47 pF	62 pF	47 pF	short	62 pF	0 pF	short	E660032 (4-crystal filter w/0.5 dB ripple; X5 = short)
8.215 MHz	500 Ω	6000 Hz	0 pF	62 pF	47 pF	62 pF	47 pF	short	62 pF	10 pF	16 μH	X1, X3, X5 = E660027; X2, X4 = E660032

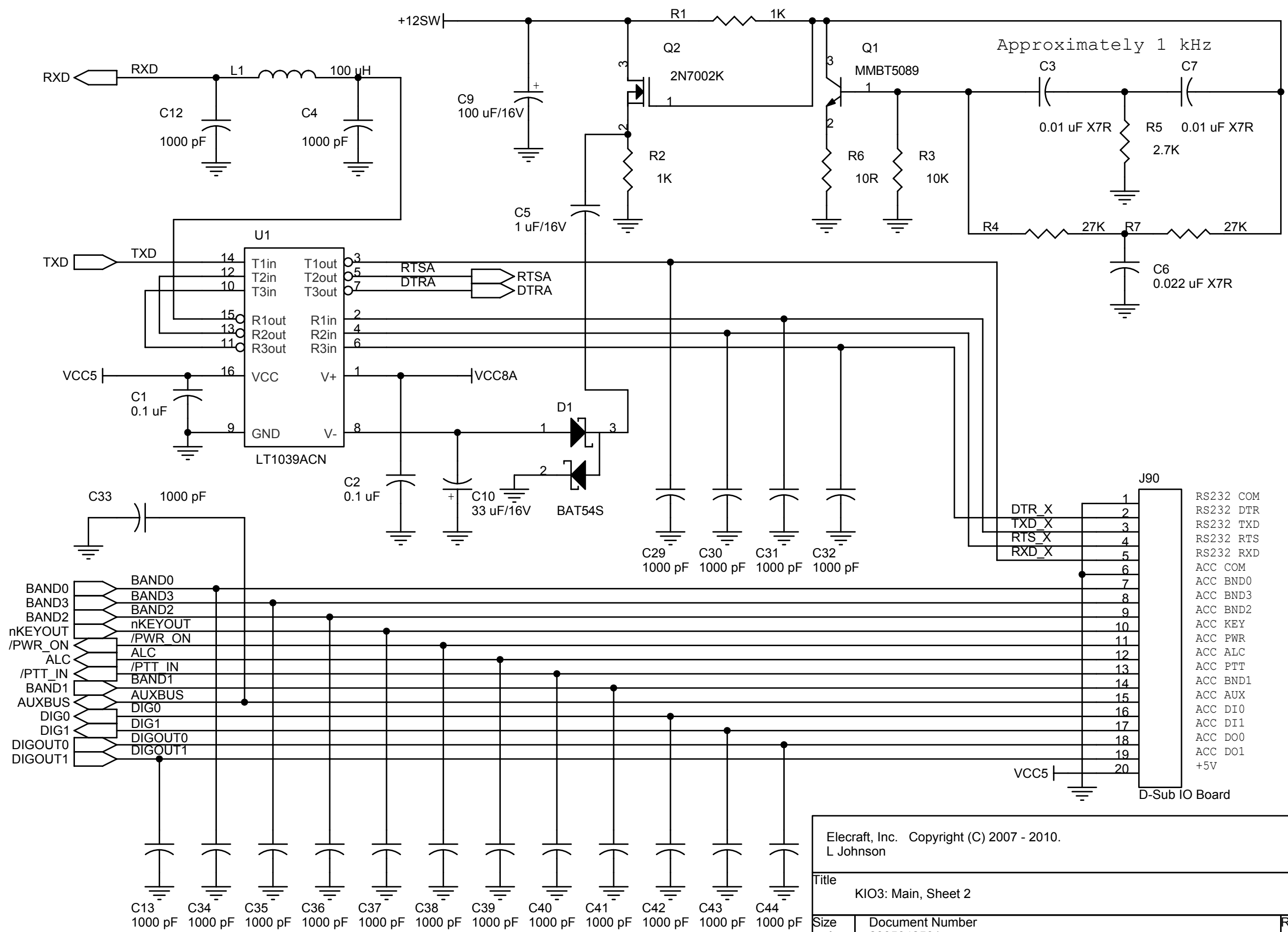
* E660027: 8.214 MHz +/- 200 Hz; Lm = 25 mH +/- 2 mH, Co < 4 pF, Q > 100 K
 E660032: 8.2125 MHz +/- 200 Hz; Lm = 25 mH +/- 2 mH, Co < 4 pF, Q > 100 K
 For CW bandwidths, X1-X5 must be hand-selected to 10 Hz, and for SSB bandwidths, 50 Hz.



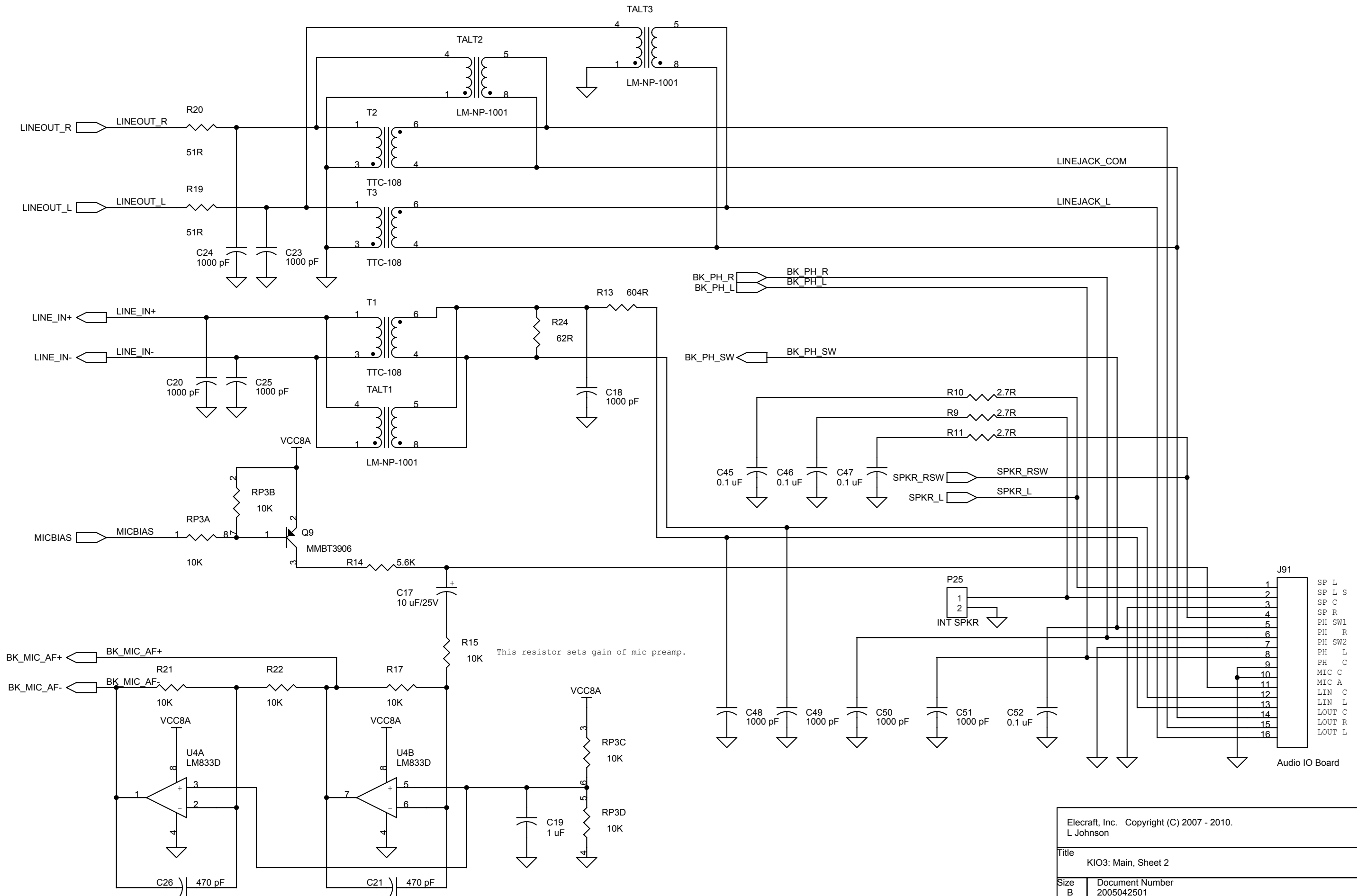
Mounting Holes for KIO3 Faceplate



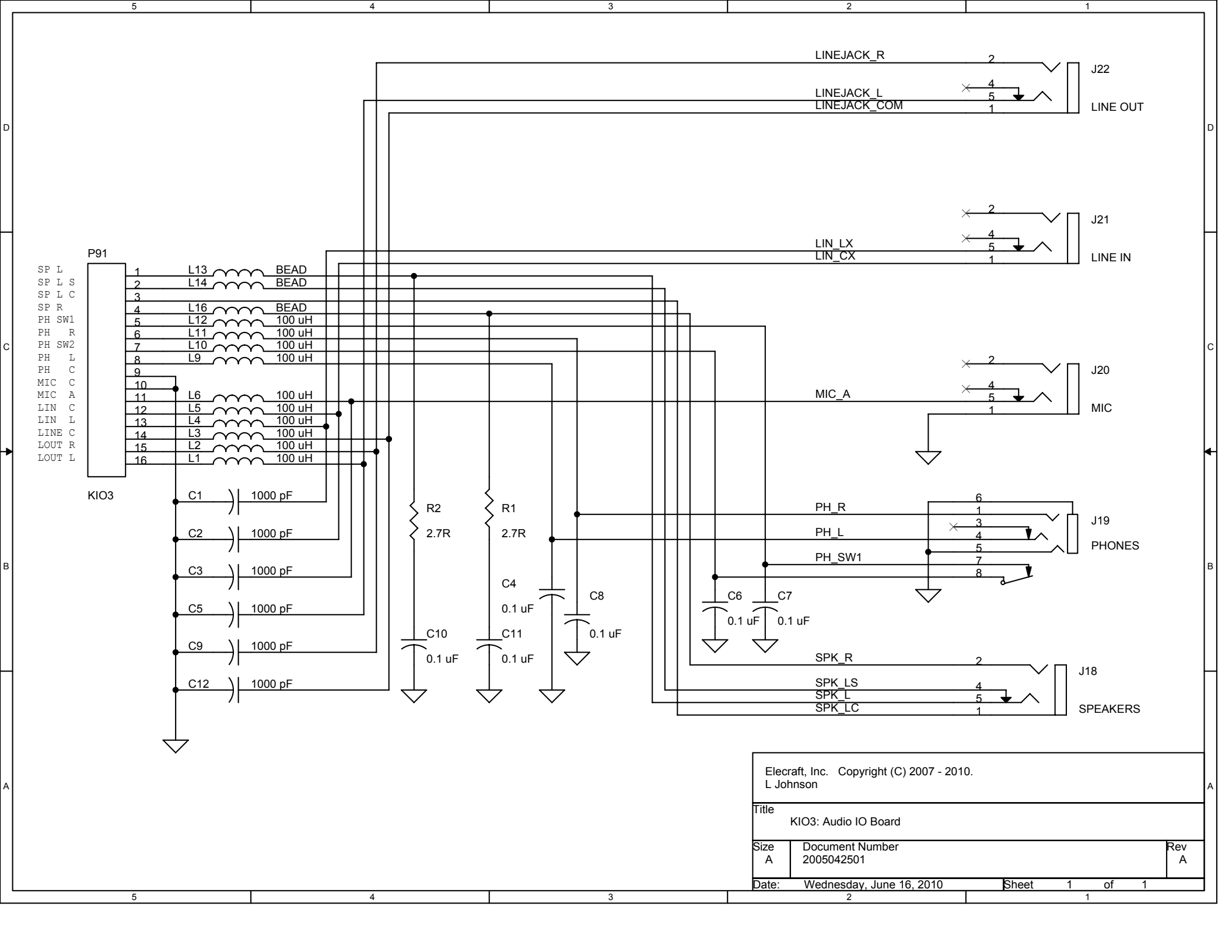
Elecrcraft, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title KIO3 Main		
Size B	Document Number 2005042501	Rev C
Date: Wednesday, June 16, 2010	Sheet 1 of 3	



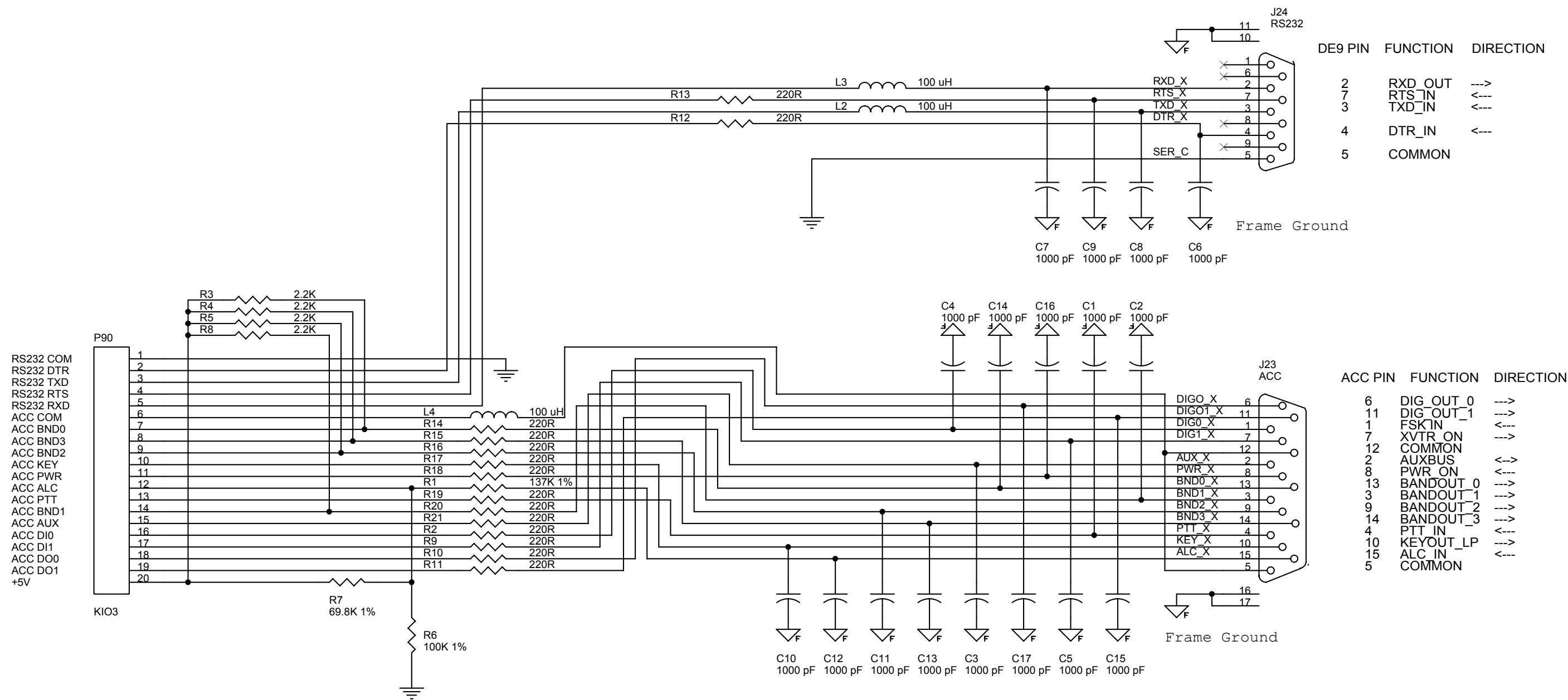
Elecraft, Inc. Copyright (C) 2007 - 2010.
 L Johnson
 Title
 KIO3: Main, Sheet 2
 Size A Document Number 2005042501 Rev C
 Date: Wednesday, June 16, 2010 Sheet 2 of 3



Elecrafc, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title KIO3: Main, Sheet 2		
Size B	Document Number 2005042501	Rev C
Date: Wednesday, June 16, 2010	Sheet 3	of 3

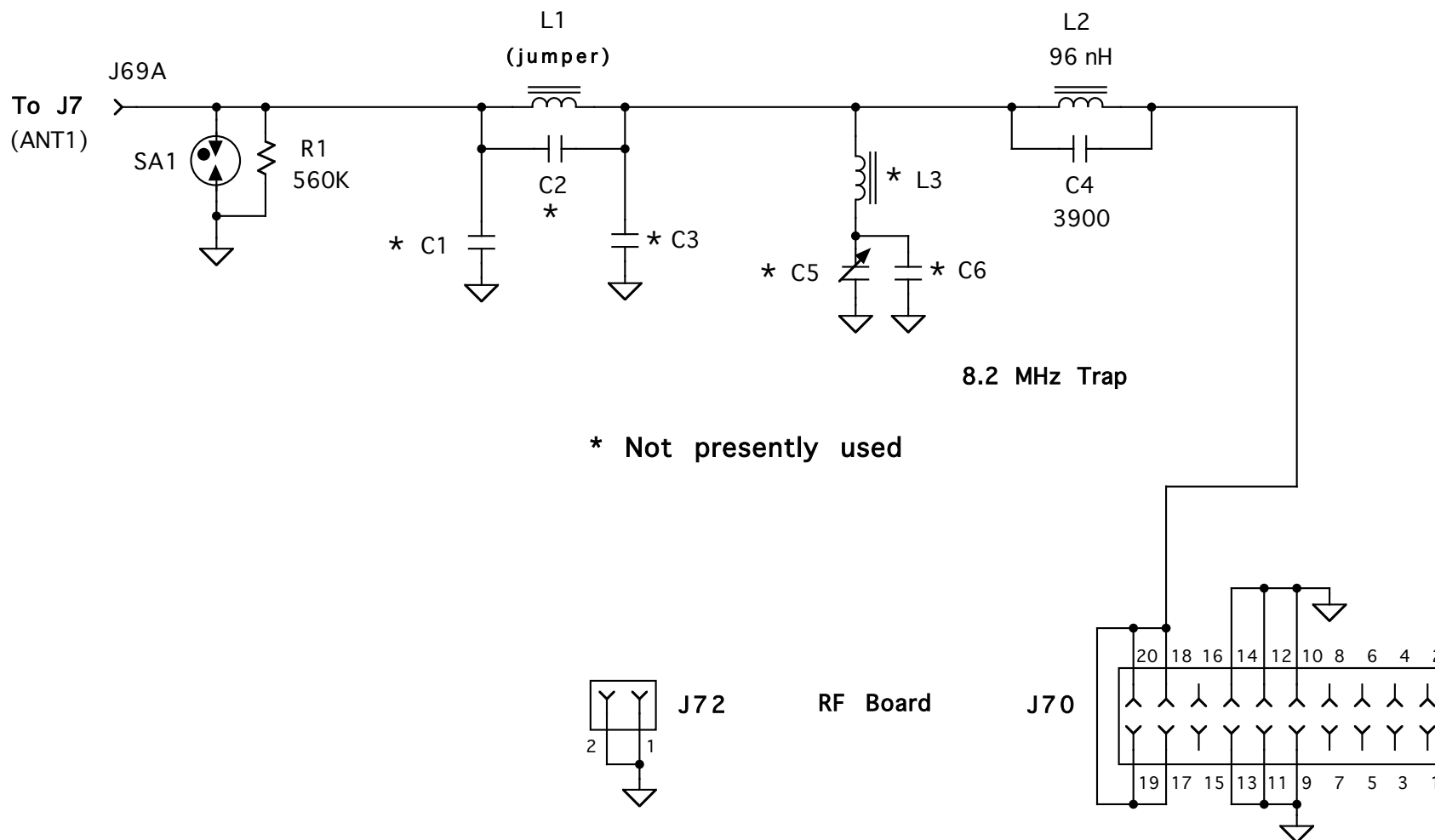


Elecraft, Inc. Copyright (C) 2007 - 2010. L Johnson		
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Size A	Document Number 2005042501	Rev A
Date: Wednesday, June 16, 2010		Sheet 1 of 1



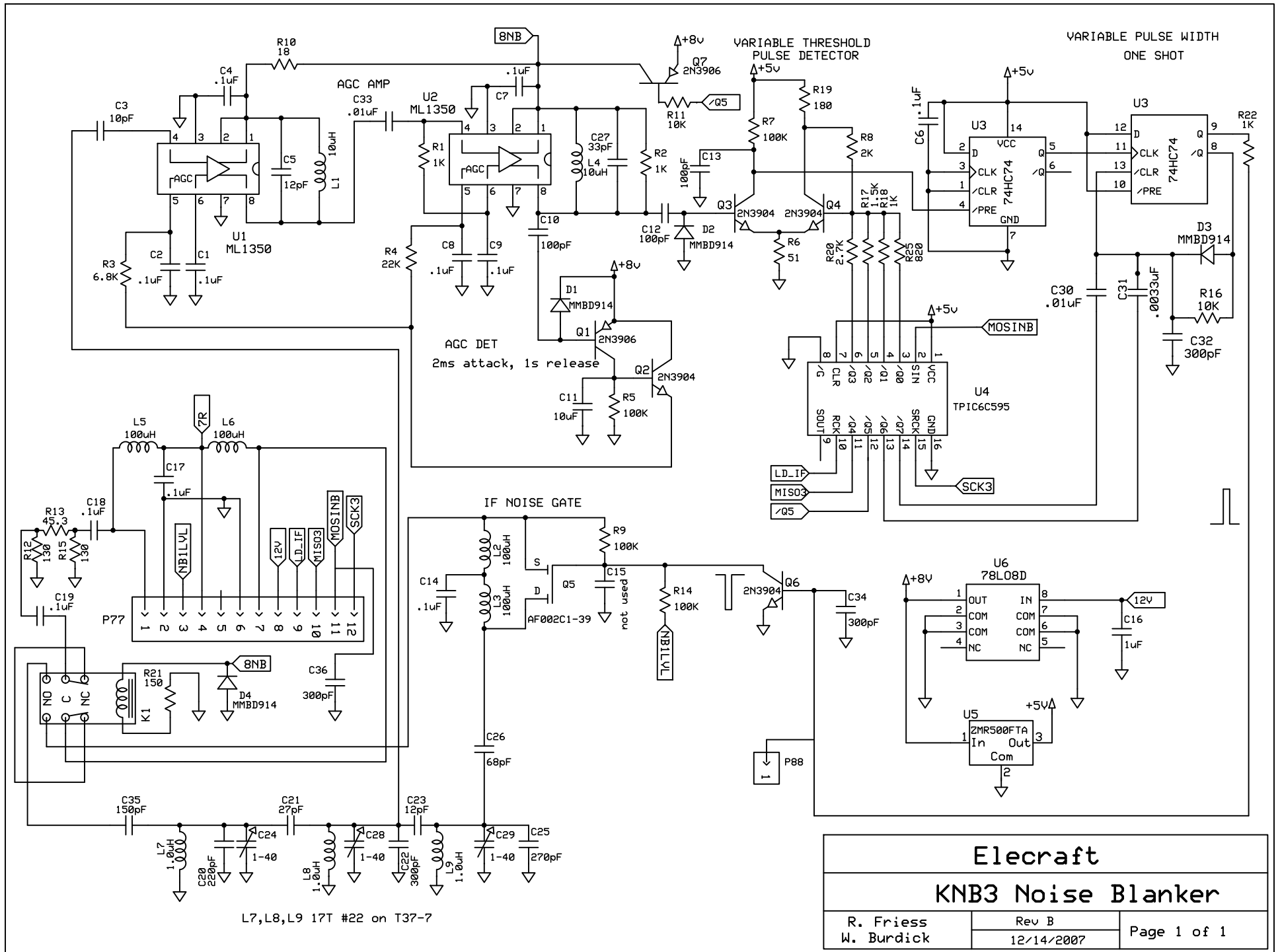
DE9 PIN	FUNCTION	DIRECTION
2	RXD_OUT	--->
7	RTS_IN	<---
3	TXD_IN	<---
4	DTR_IN	<---
5	COMMON	

ACC PIN	FUNCTION	DIRECTION
6	DIG_OUT_0	--->
11	DIG_OUT_1	--->
1	FSK_IN	<---
7	XVTR_ON	--->
12	COMMON	
2	AUXBUS	<---
8	PWR_ON	<---
13	BANDOUT_0	--->
3	BANDOUT_1	--->
9	BANDOUT_2	--->
14	BANDOUT_3	--->
4	PTT_IN	<---
10	KEYOUT_LP	--->
15	ALC_IN	<---
5	COMMON	

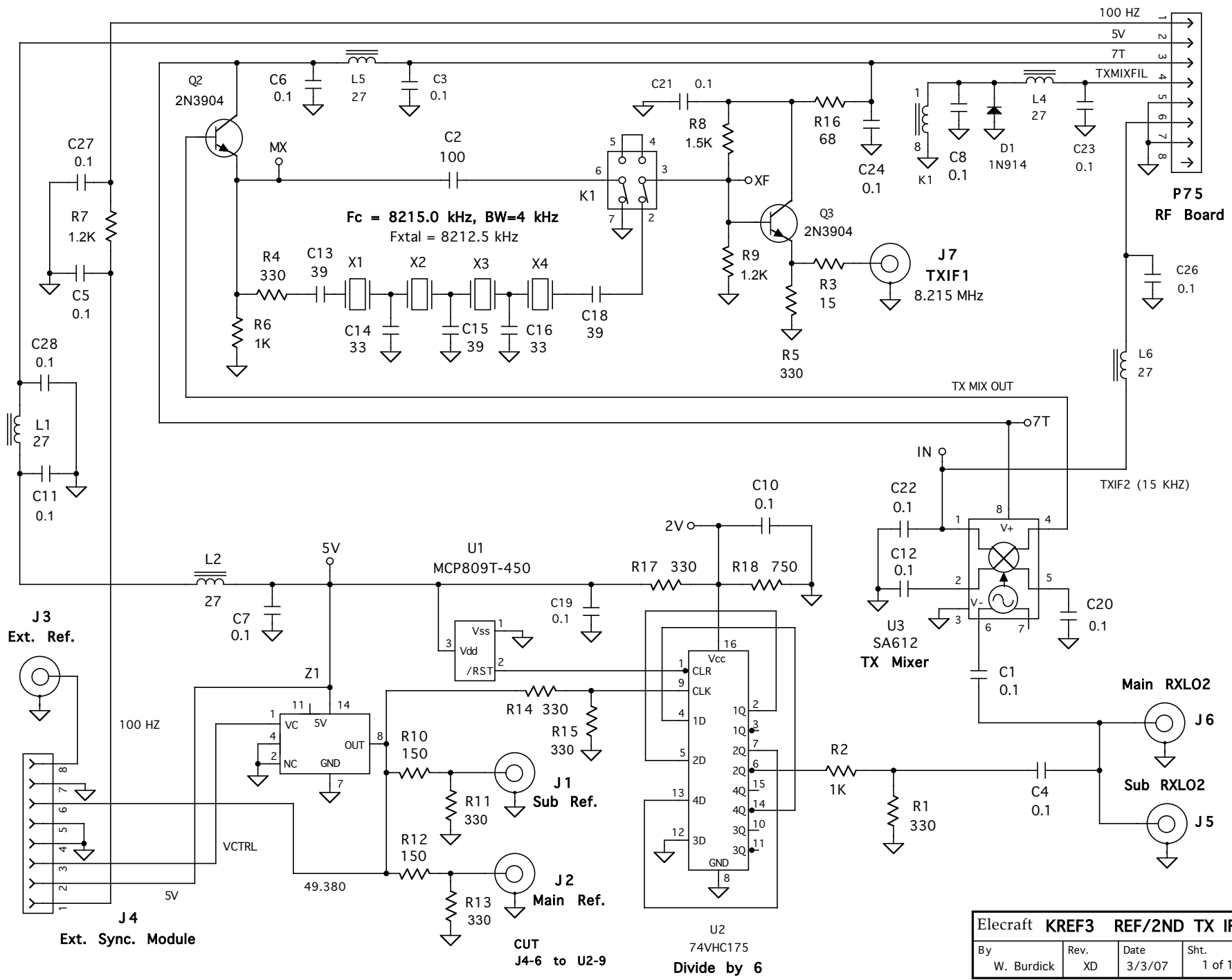


- NOTES:
1. All parts are through-hole.
 2. Adjust L2 and C5 for minimum 8.215-MHz leakthrough.
 3. = mounted on bottom side of PCB.

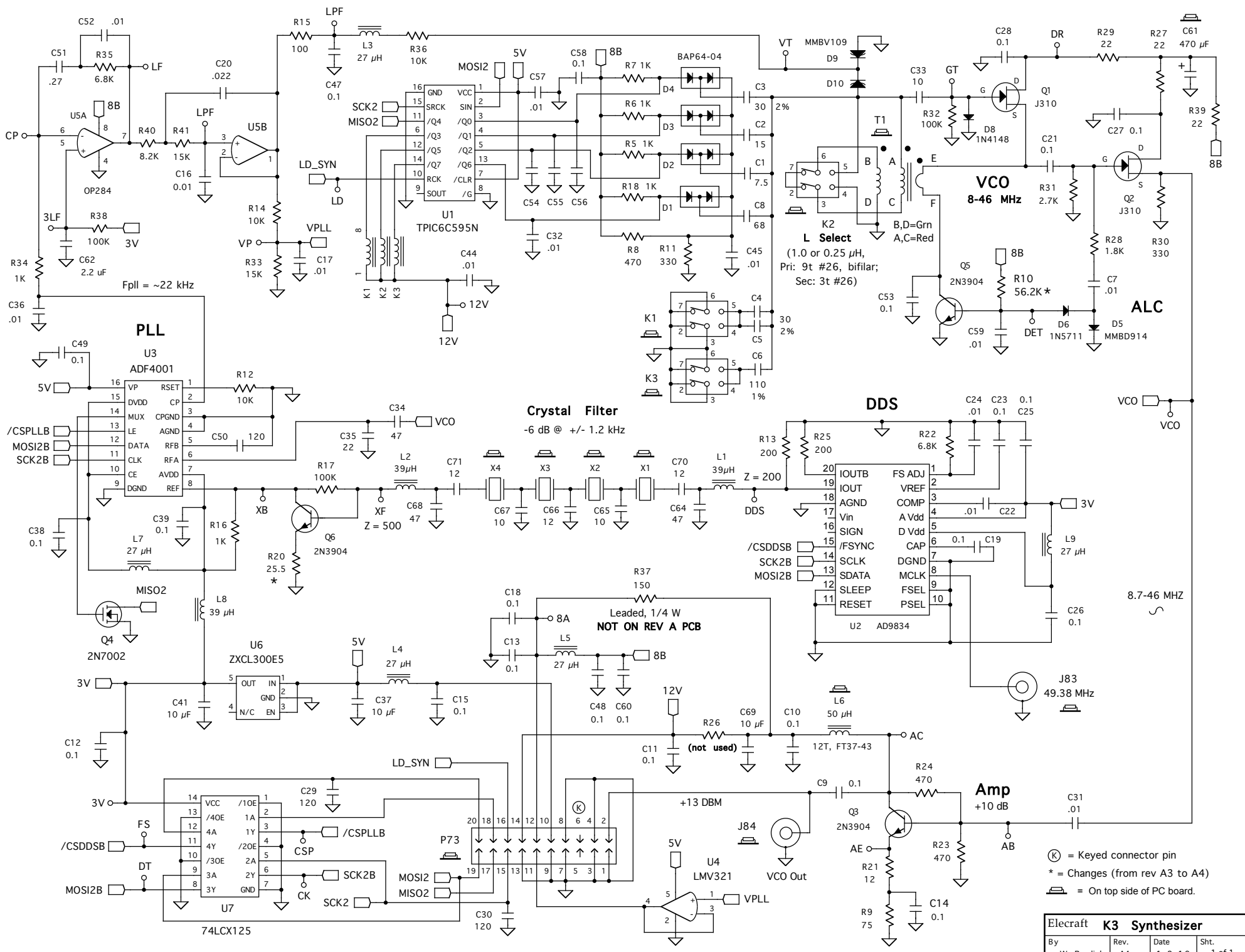
Elecraft KANT3 Ant. Input Module			
By W. Burdick R. Friess	Rev. XC	Date 10/13/08	Sht. 1 of 1



Elecraft		
KNB3 Noise Blanker		
R. Friess W. Burdick	Rev B 12/14/2007	Page 1 of 1

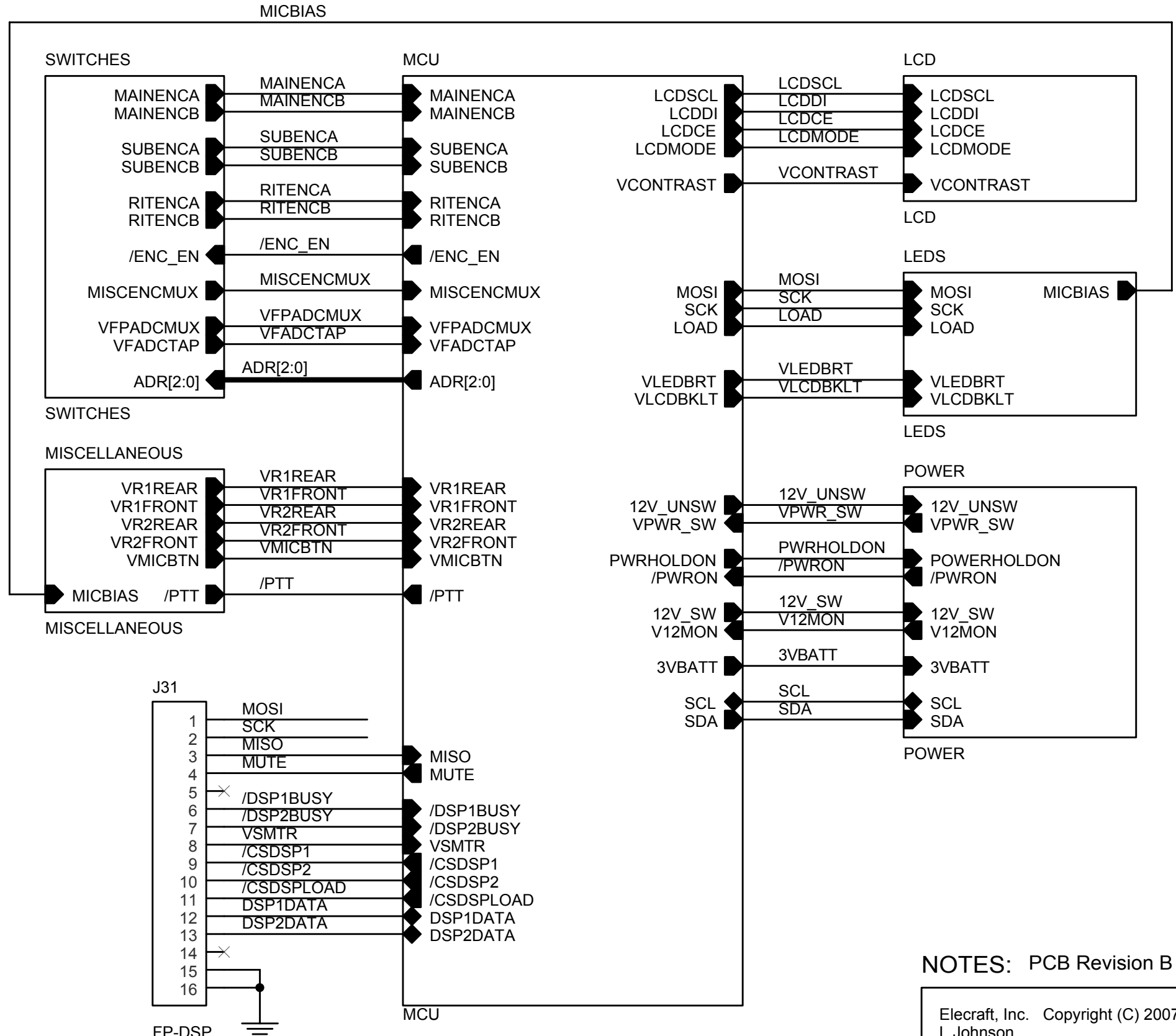


Elecraft KREF3 REF/2ND TX IF			
By W. Burdick	Rev. XD	Date 3/3/07	Sht. 1 of 1



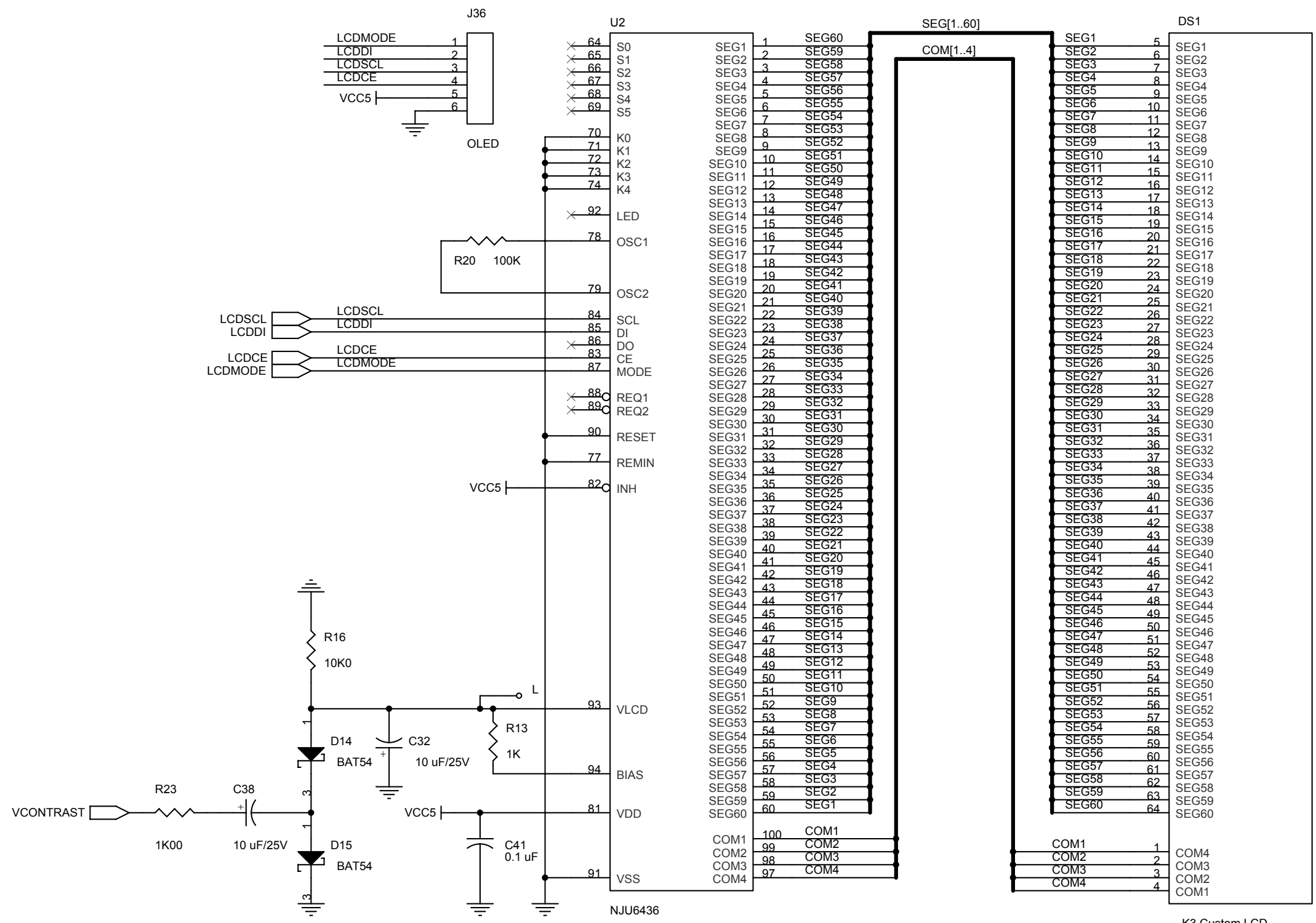
Ⓚ = Keyed connector pin
 * = Changes (from rev A3 to A4)
 ☒ = On top side of PC board.

Elecraft K3 Synthesizer			
By W. Burdick	Rev. A4	Date 1-8-10	Sht. 1 of 1



NOTES: PCB Revision B

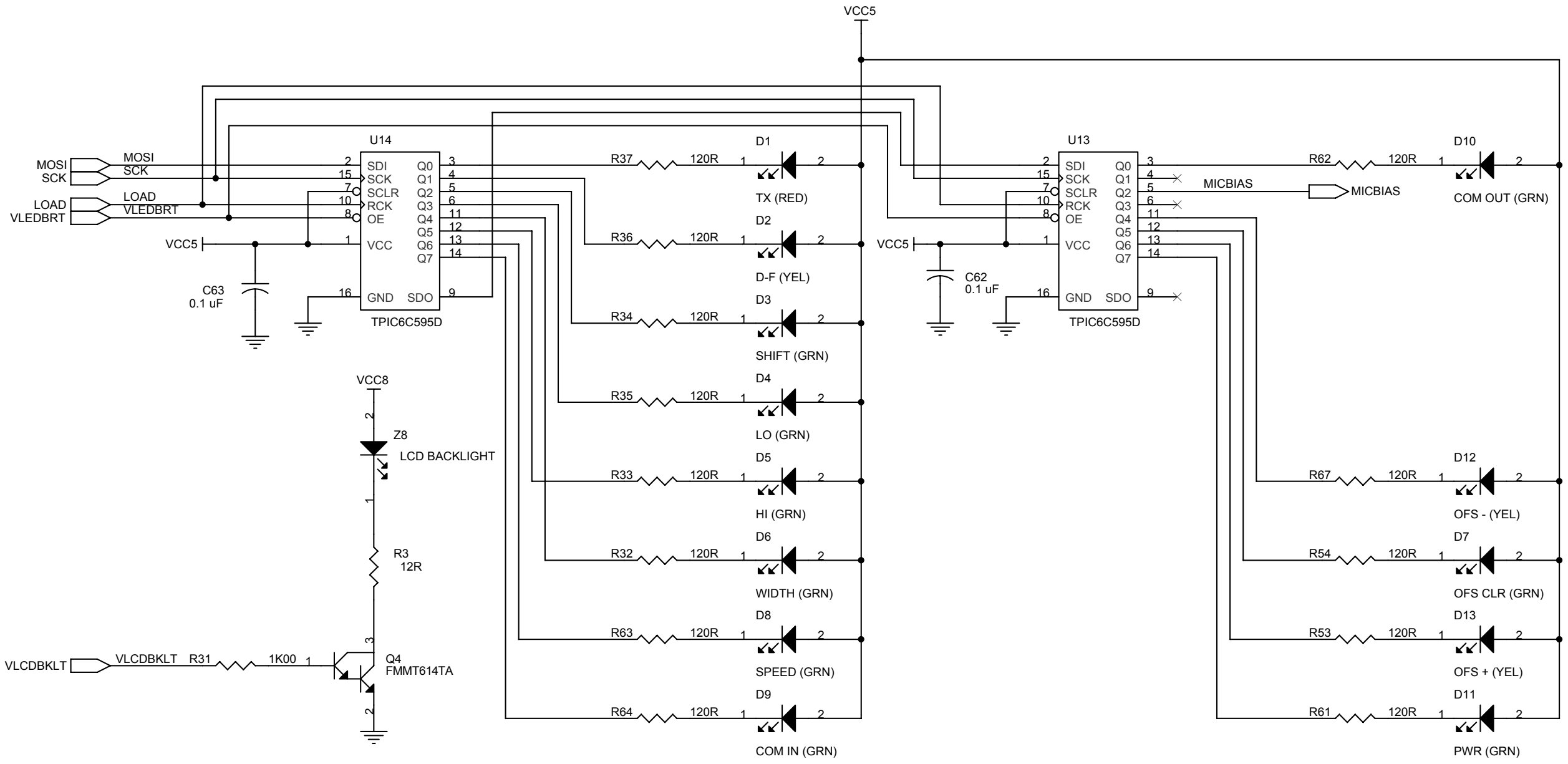
Elecraft, Inc. Copyright (C) 2007. L Johnson		
Title Elecraft K3: Front Panel		
Size A	Document Number 2004070601	Rev B,1
Date:	Tuesday, November 24, 2009	Sheet 1 of 7



PCB Revision B
 U2 K[0..4] to use separable vias to ground for debug/development.
 LCD pinout is Rev F.
 R54 sets LCD driver current.

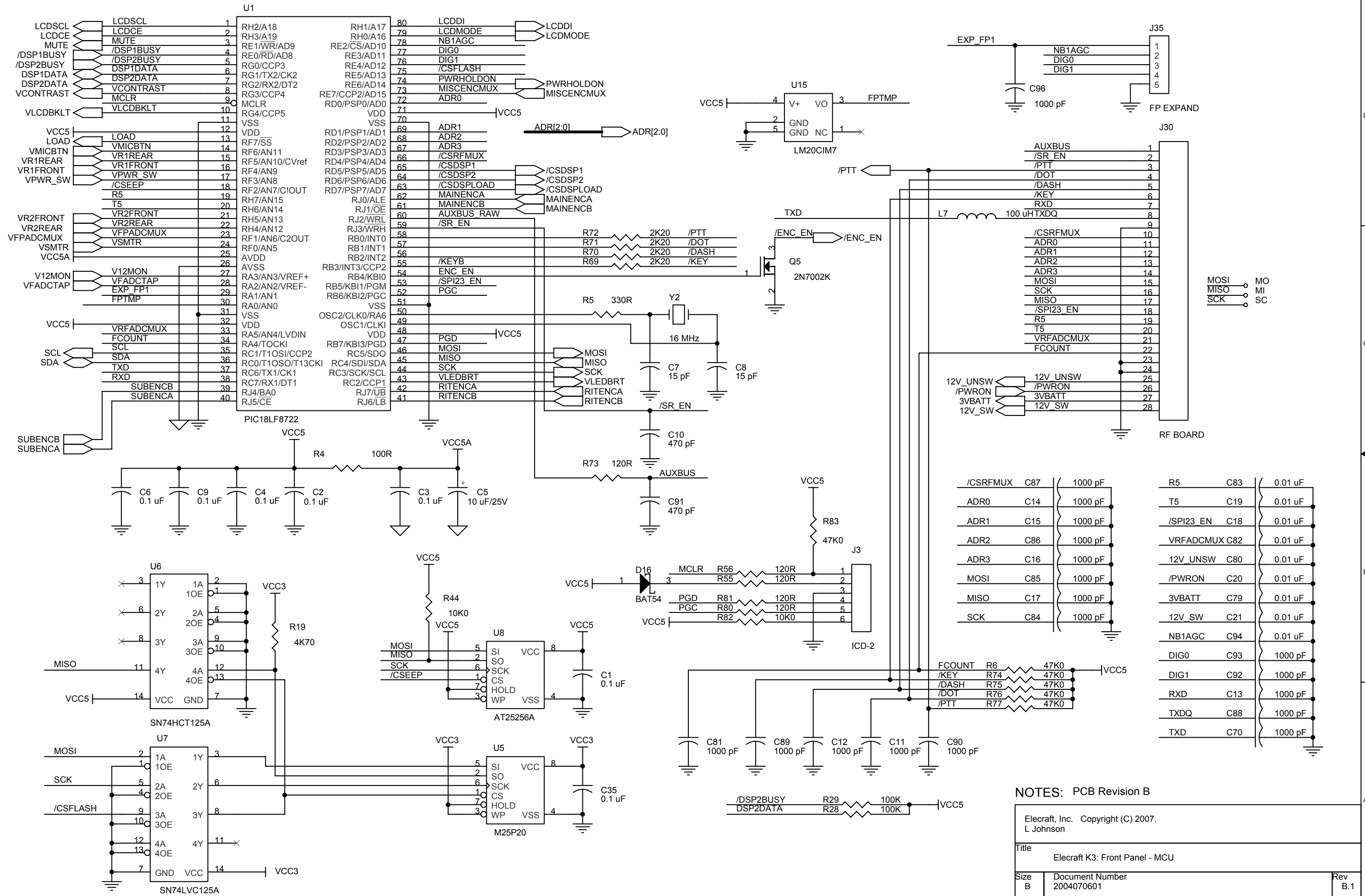
NOTES: R57 sets LCD drive frequency.

Elecrafft, Inc. Copyright (C) 2007. L. Johnson		
Title Elecrafft K3: Front Panel - LCD		
Size B	Document Number 2004070601	Rev B.1
Date:	Tuesday, November 24, 2009	Sheet 2 of 7



NOTES: PCB Revision B

Elecrafft, Inc. Copyright (C) 2007. L Johnson		
Title Elecrafft K3: Front Panel - LEDs		
Size B	Document Number 2004070601	Rev B.1
Date: Tuesday, November 24, 2009	Sheet 3	of 7



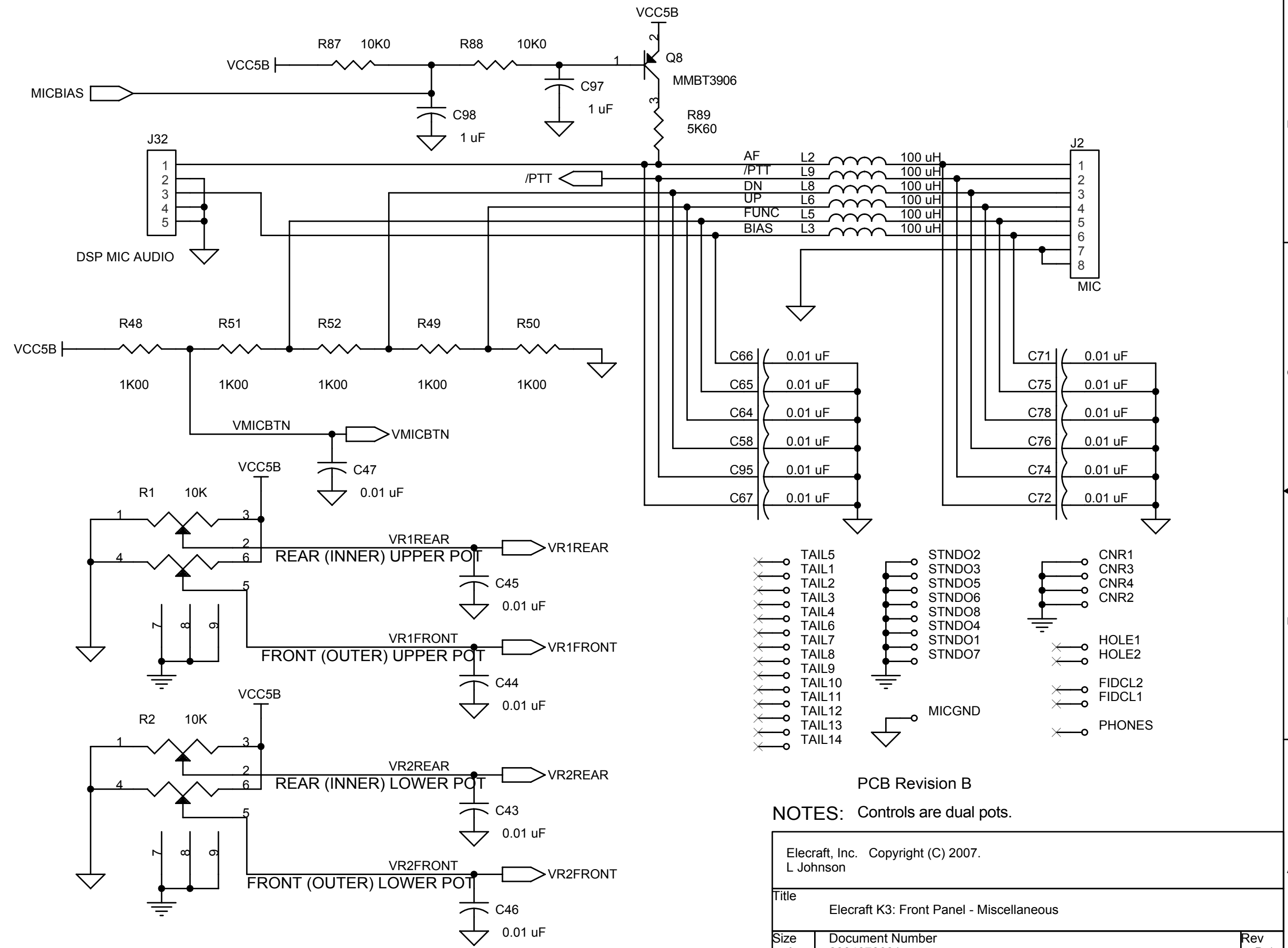
NOTES: PCB Revision B

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L Johnson

Title: Elecraft K3: Front Panel - MCU

Size B	Document Number 2004070601	Rev B.1
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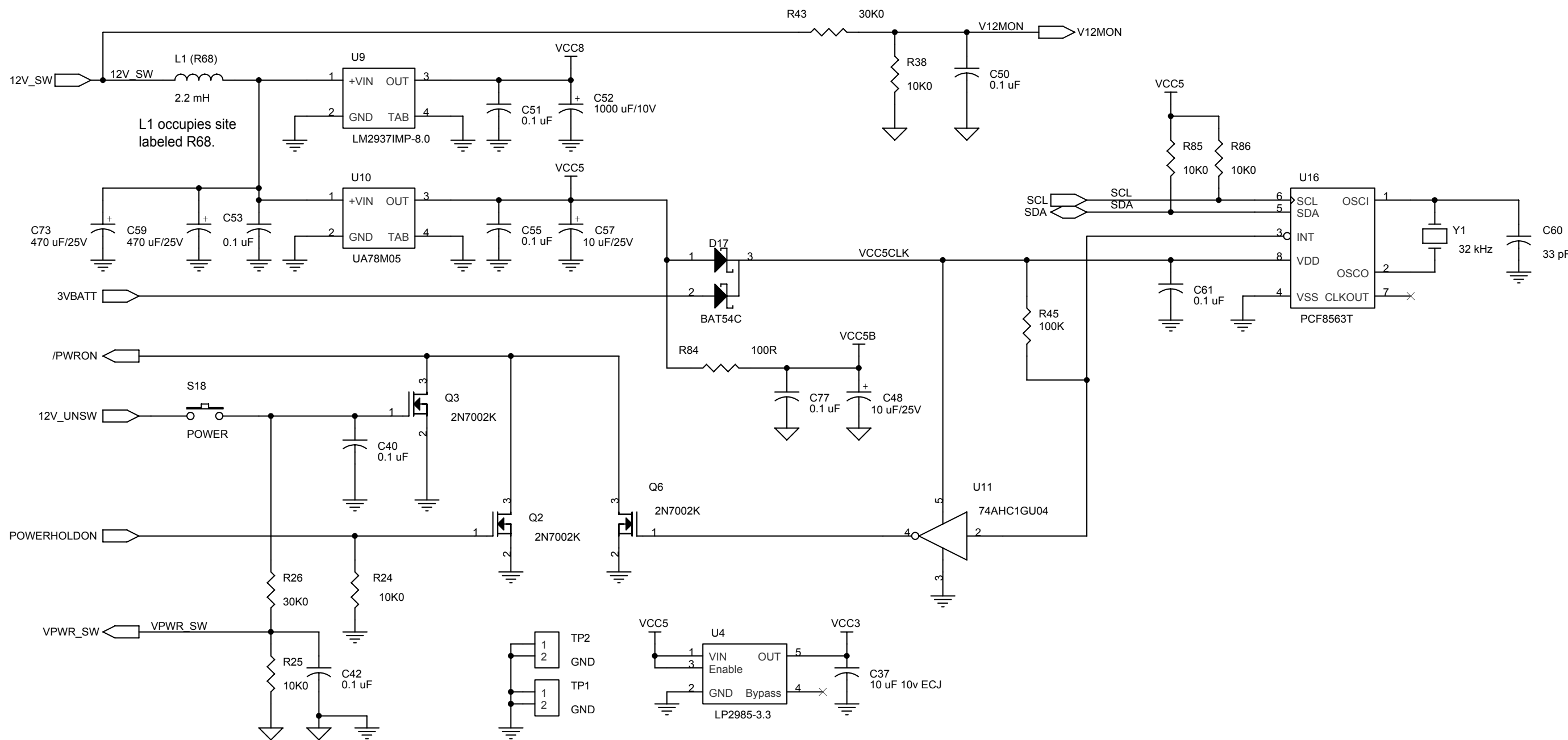
Date: Tuesday, November 24, 2009 Sheet 4 of 7



PCB Revision B

NOTES: Controls are dual pots.

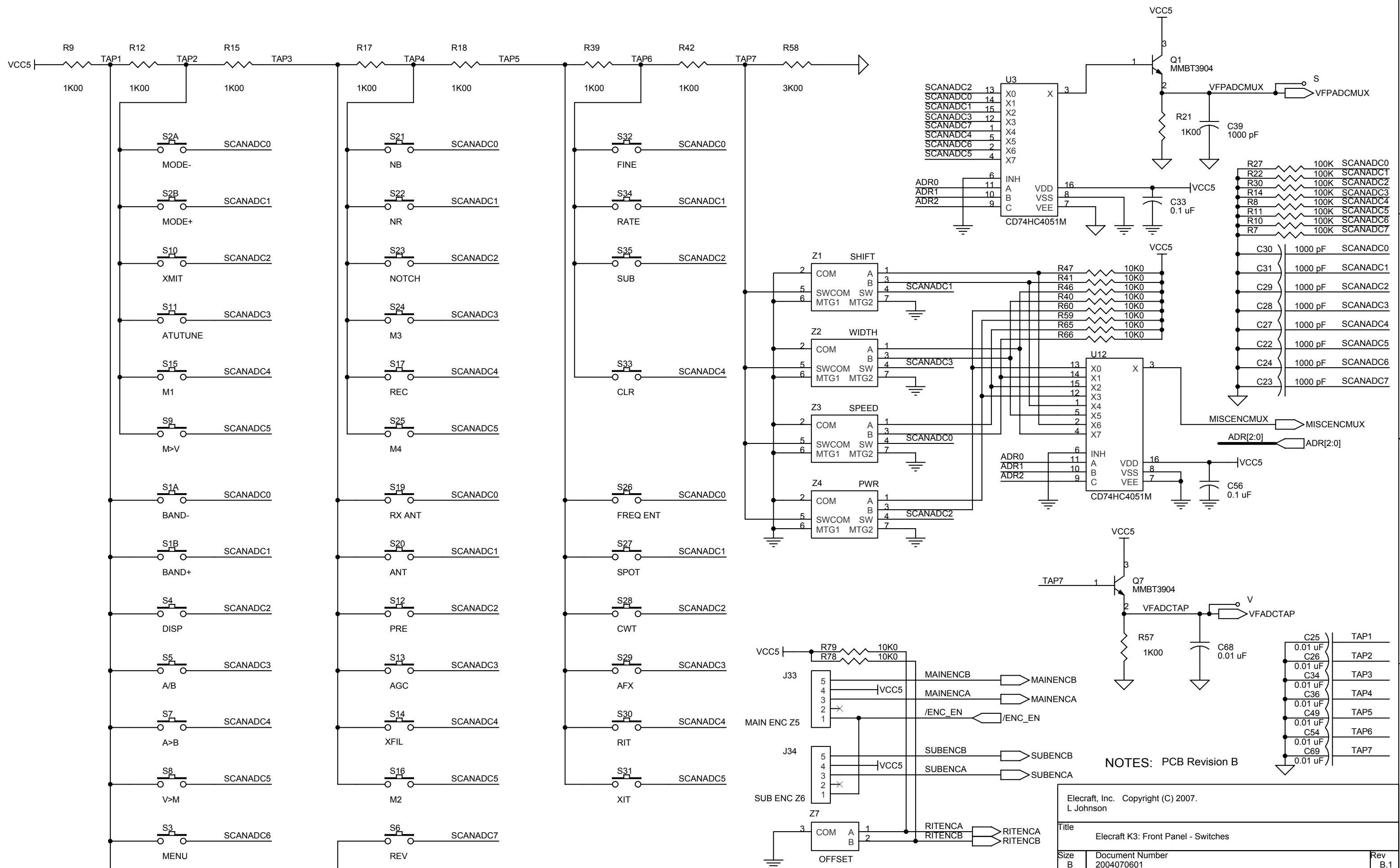
Elecraft, Inc. Copyright (C) 2007. L Johnson		
Title Elecraft K3: Front Panel - Miscellaneous		
Size A	Document Number 2004070601	Rev B.1
Date: Tuesday, November 24, 2009	Sheet 5	of 7



L1 occupies site labeled R68.

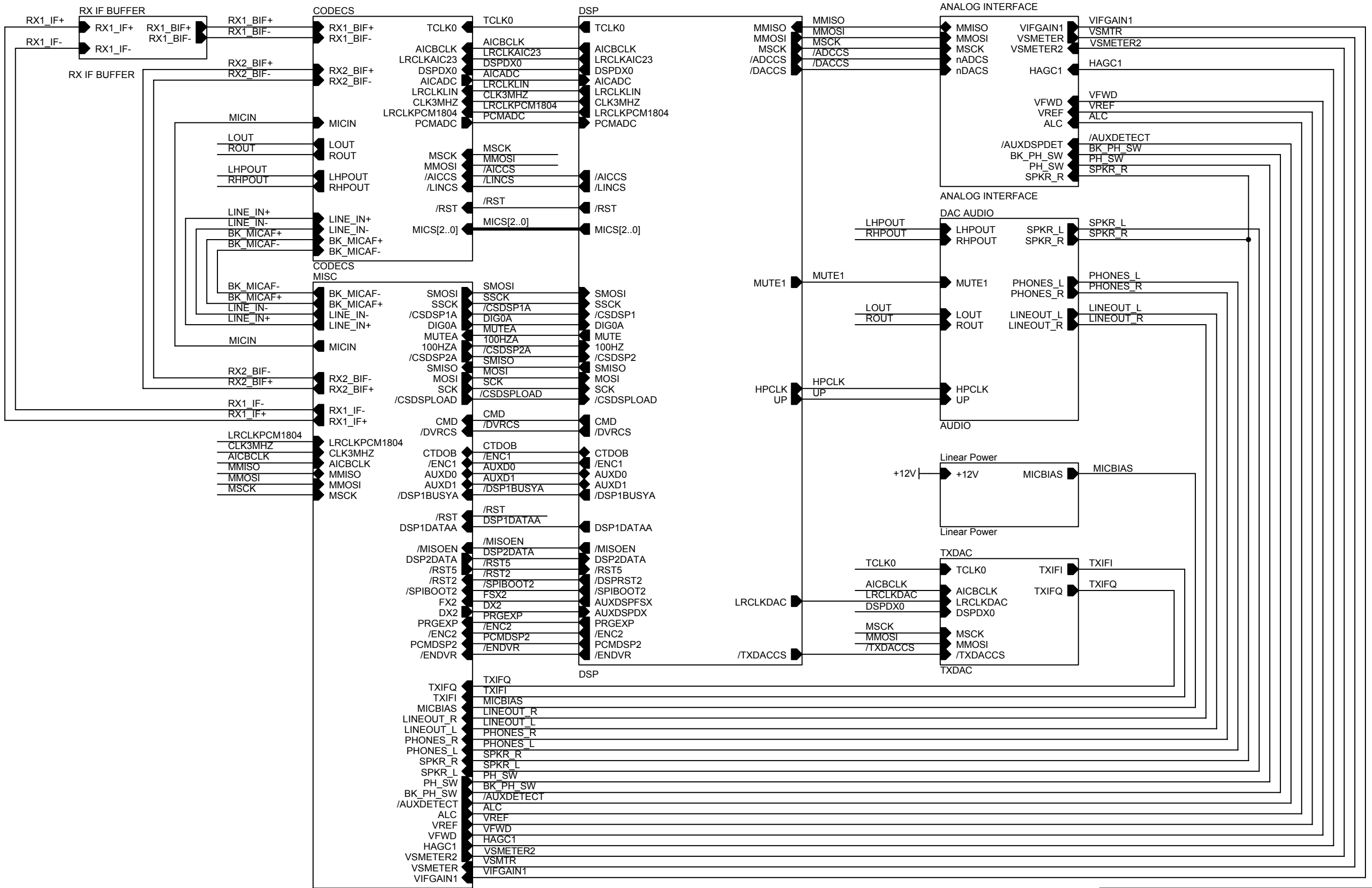
PCB Revision B
 NOTES: Regulators U3 and U5 SOT-223.

Elecrcraft, Inc. Copyright (C) 2007. L Johnson		
Title Elecrcraft K3: Front Panel - Power and RTC		
Size B	Document Number 2004070601	Rev B.1
Date: Tuesday, November 24, 2009	Sheet 6	of 7



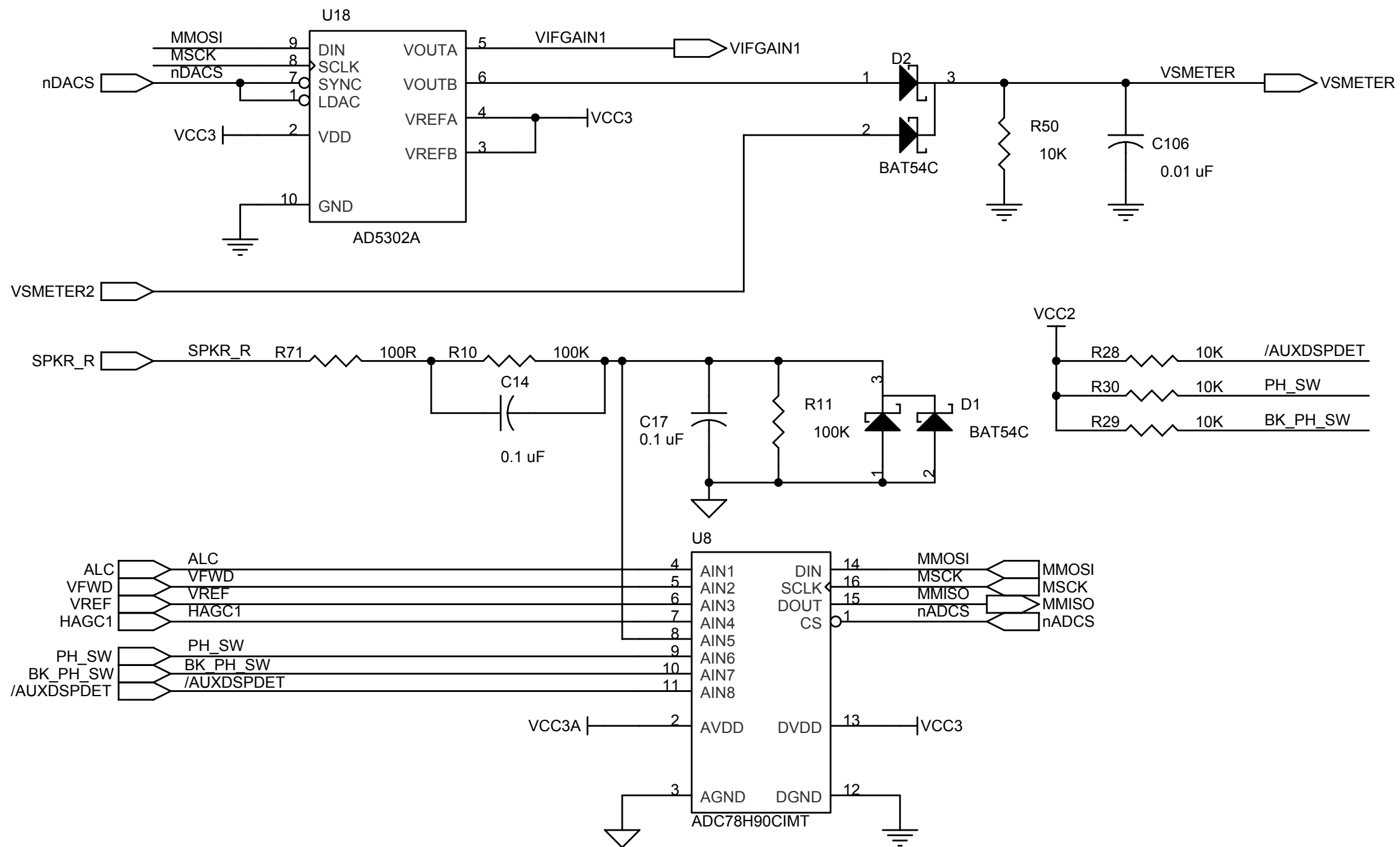
NOTES: PCB Revision B

Elecraft, Inc. Copyright (C) 2007. L. Johnson		
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Size B	Document Number 2004070601	Rev B.1
Date: Tuesday, November 24, 2009	Sheet 7	of 7



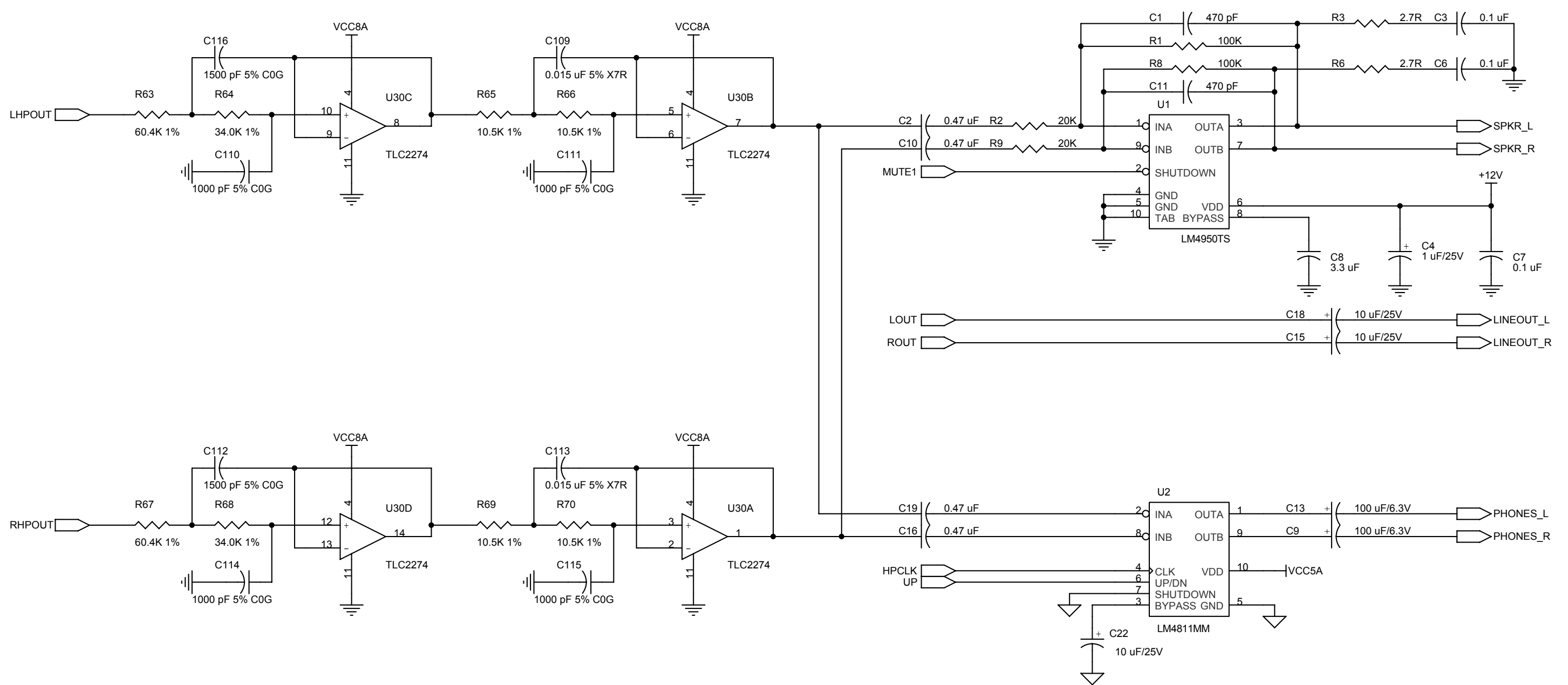
Elecraft, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title K3 DSP: Top Level		
Size B	Document Number 2004051101	Rev C
Date: Wednesday, June 16, 2010	Sheet 1	of 9

NOTES: PCB Revision C



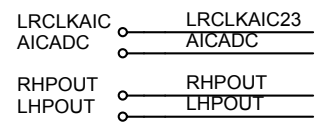
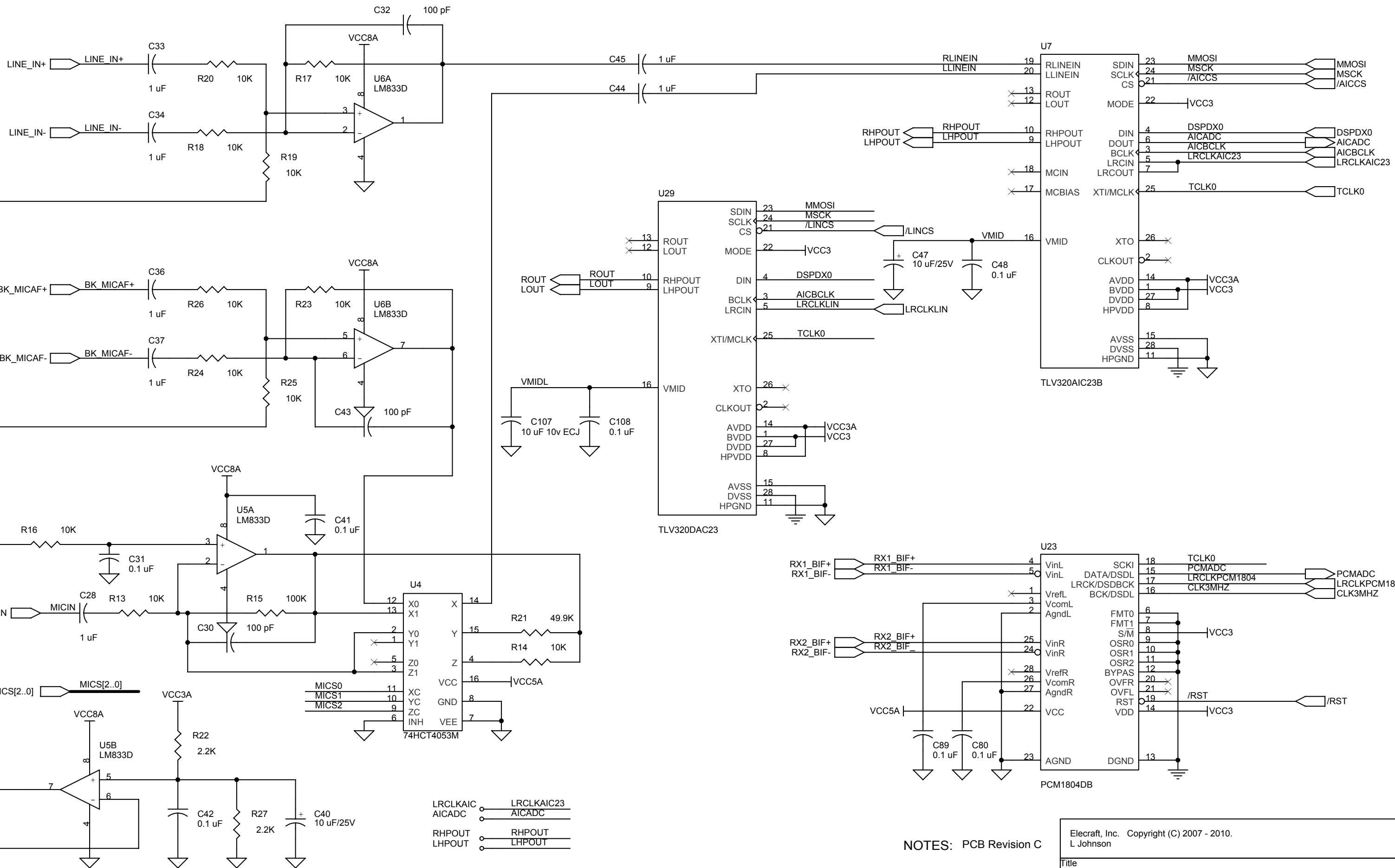
NOTES: PCB Revision C

Elecrcraft, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title K3 DSP: Analog Interface		
Size A	Document Number 2004051101	Rev C
Date:	Wednesday, June 16, 2010	Sheet 2 of 9



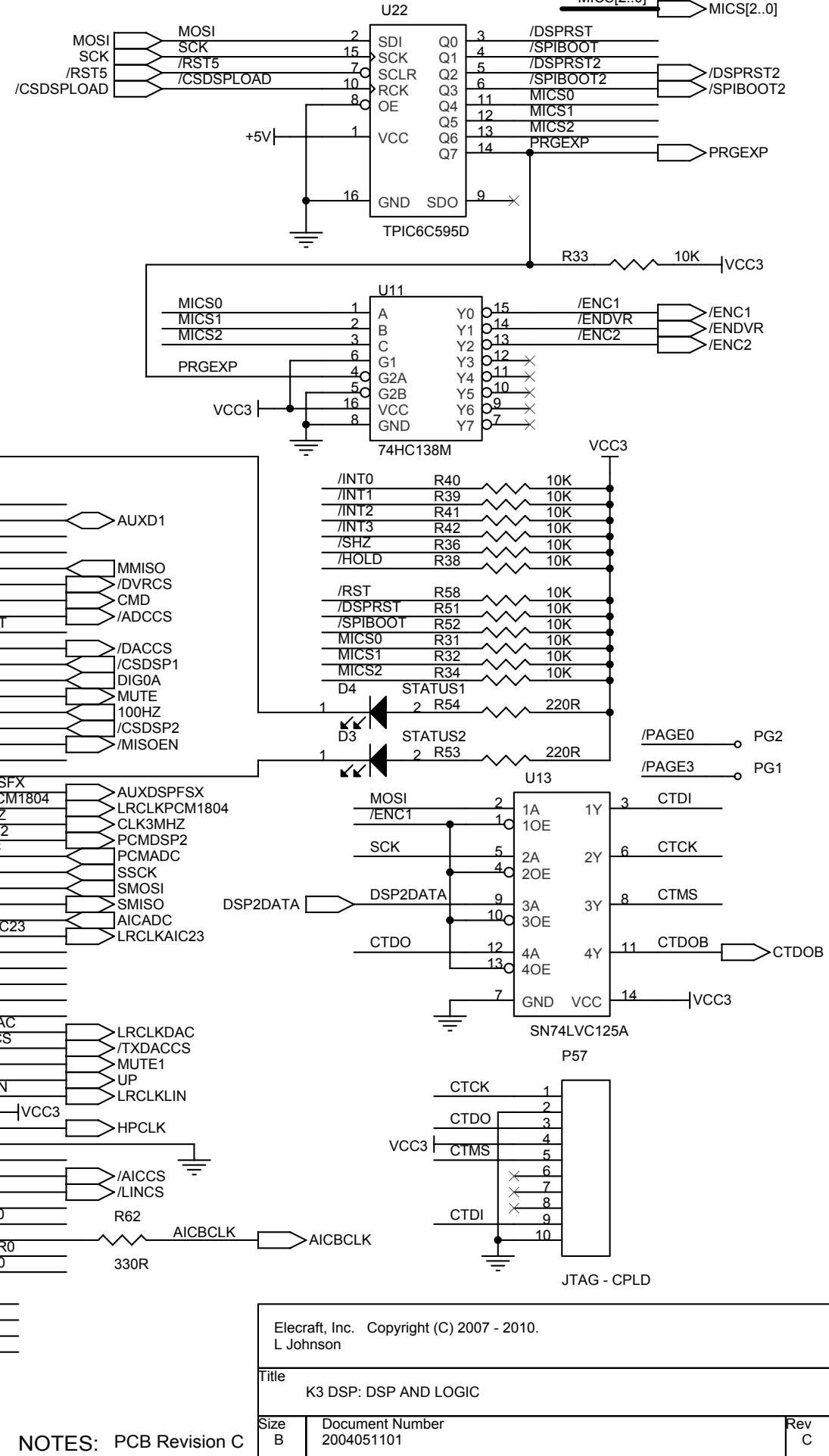
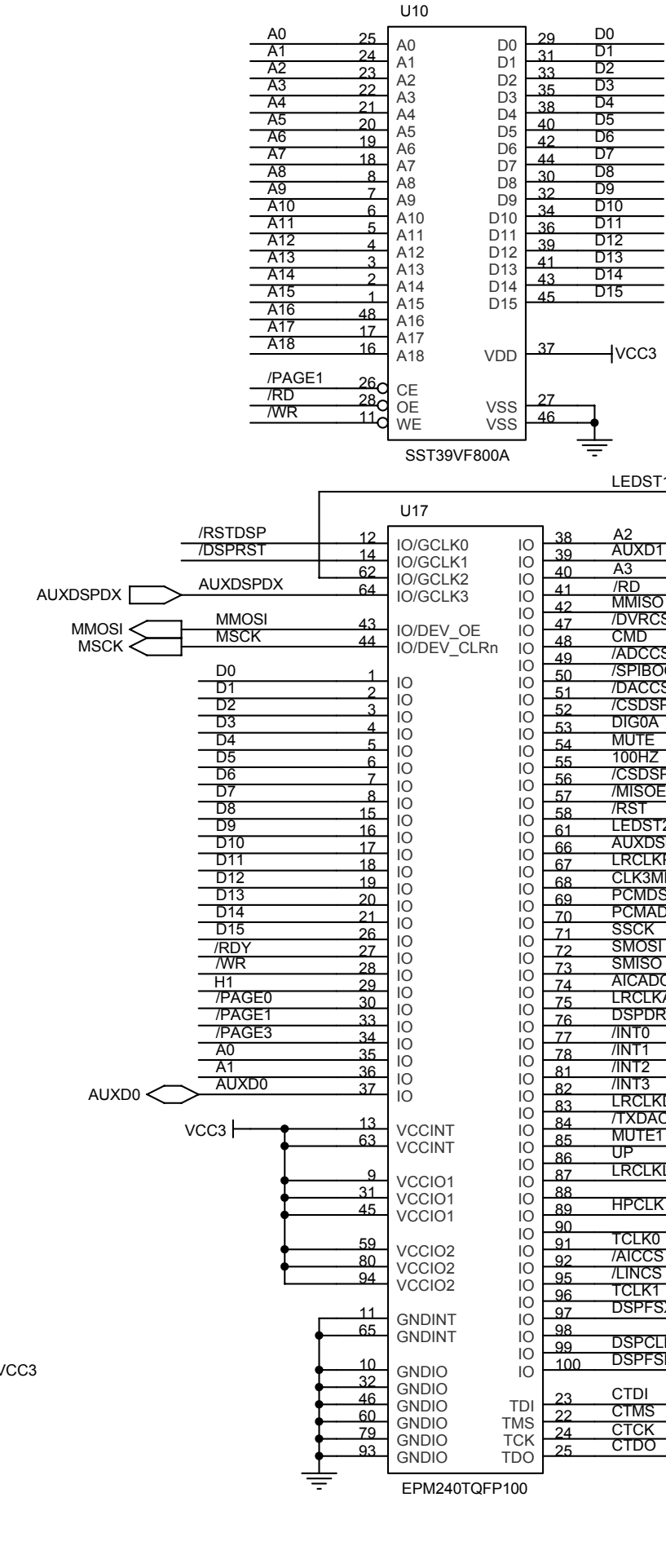
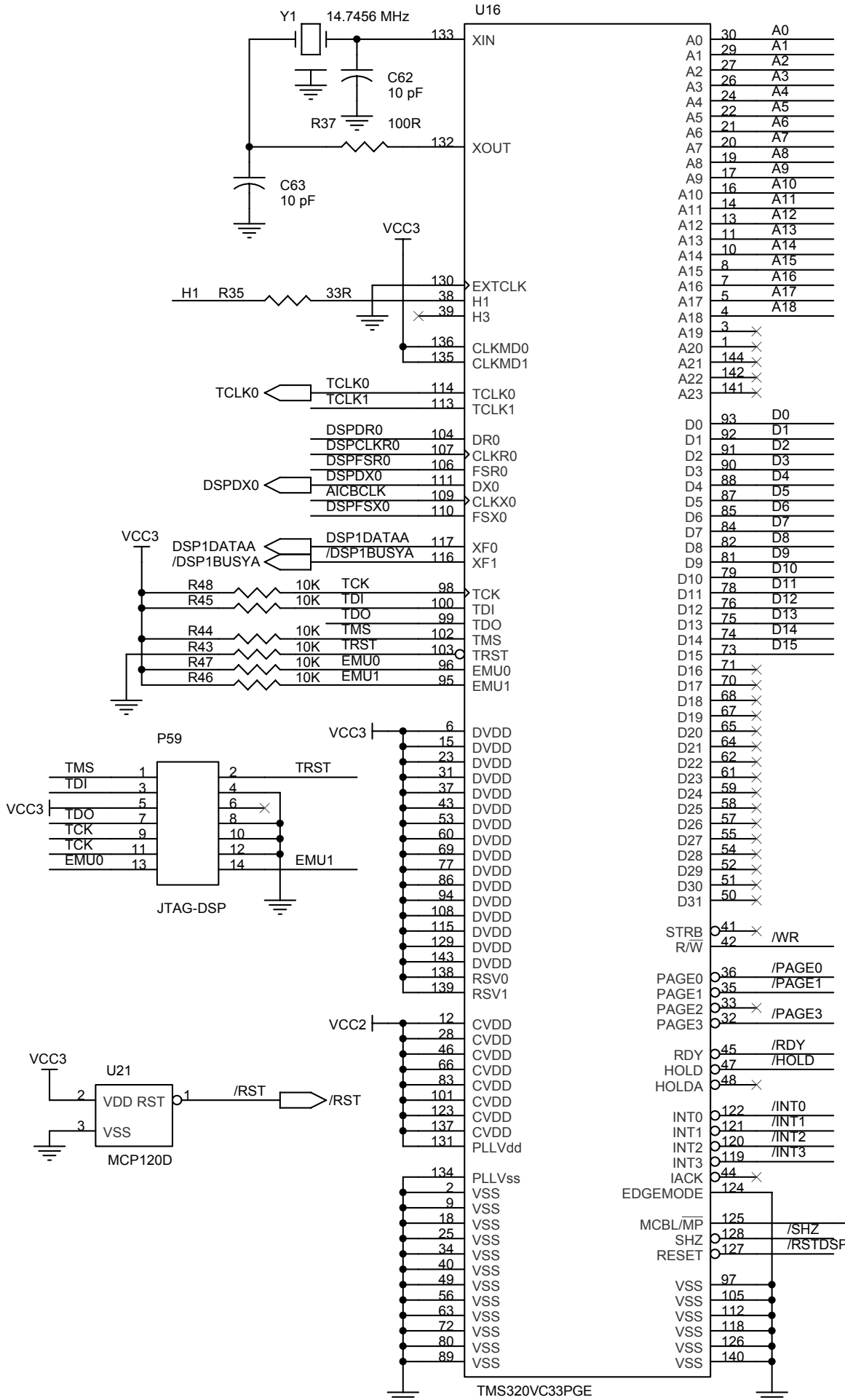
NOTES: PCB Revision C

Elecrafit, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title K3 DSP: DAC Audio		
Size B	Document Number 2004051101	Rev C
Date:	Wednesday, June 16, 2010	Sheet 3 of 9



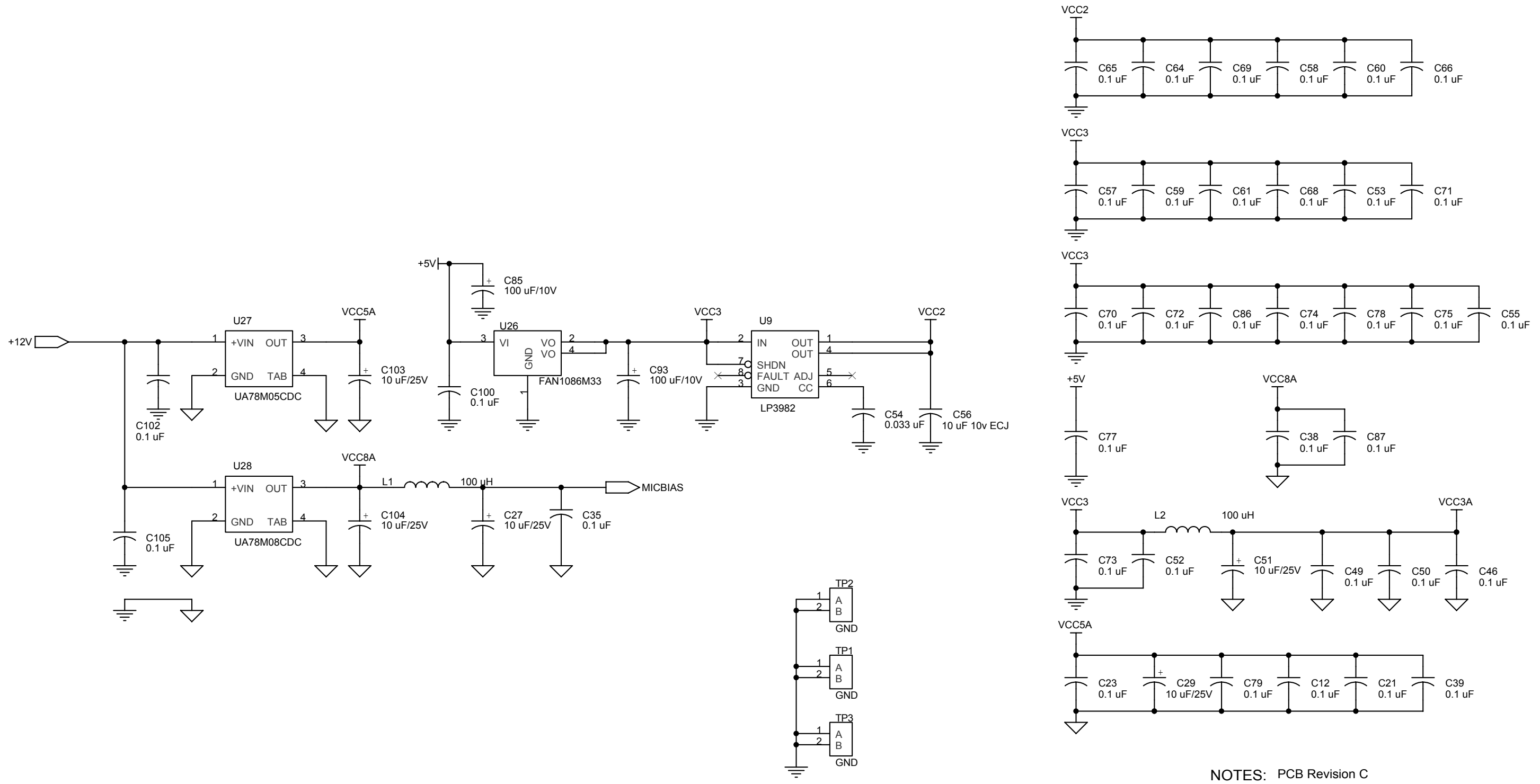
NOTES: PCB Revision C

Elecraft, Inc. Copyright (C) 2007 - 2010. L Johnson		
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Size B	Document Number 2004051101	Rev C
Date: Wednesday, June 16, 2010	Sheet 4	of 9



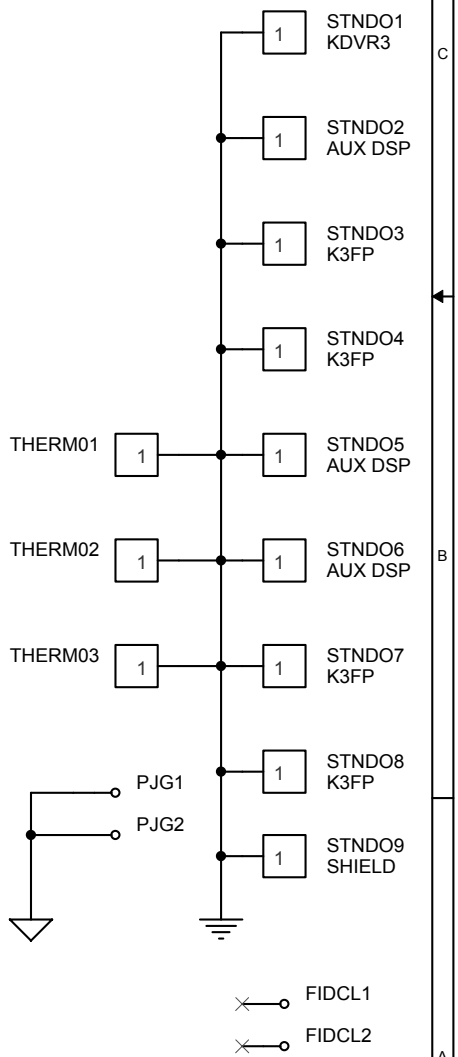
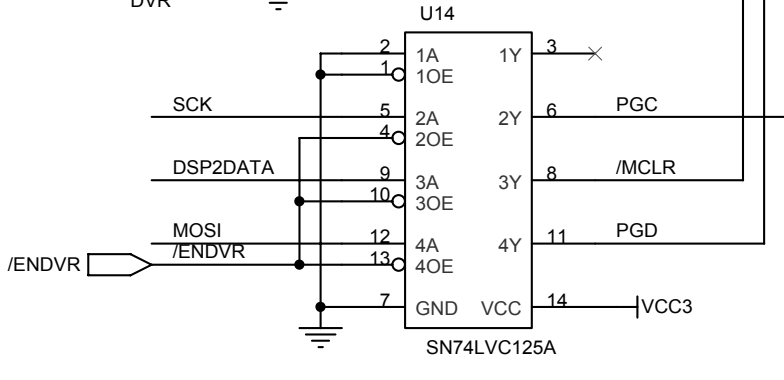
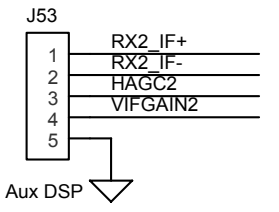
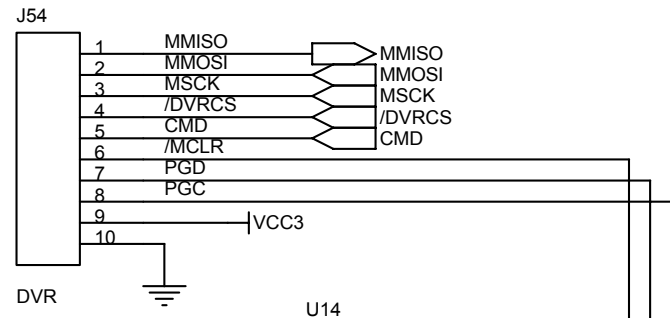
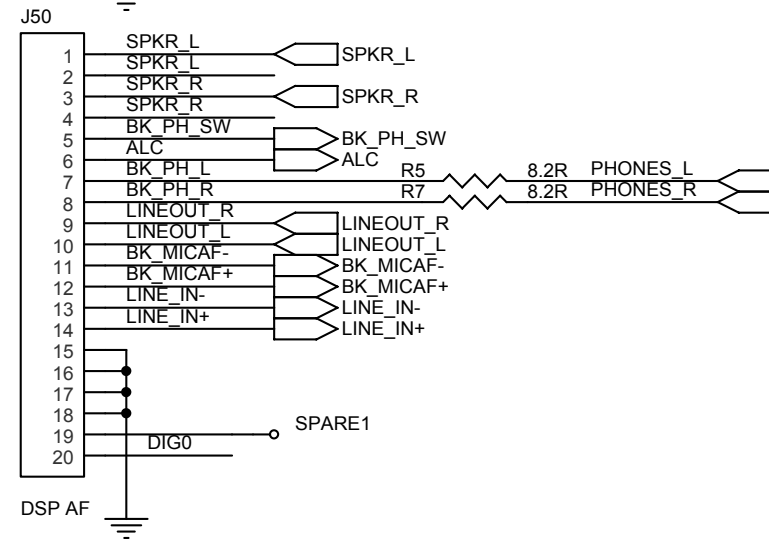
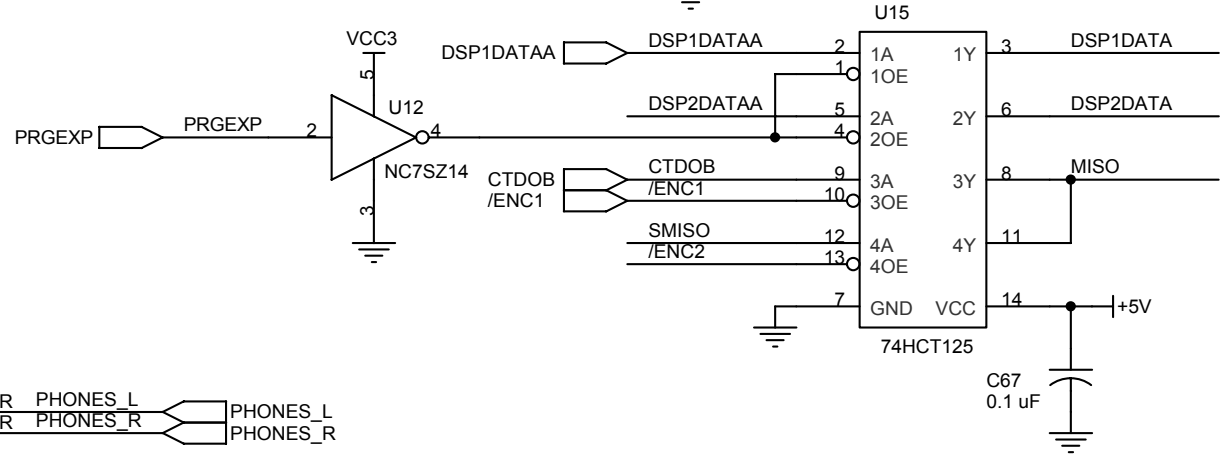
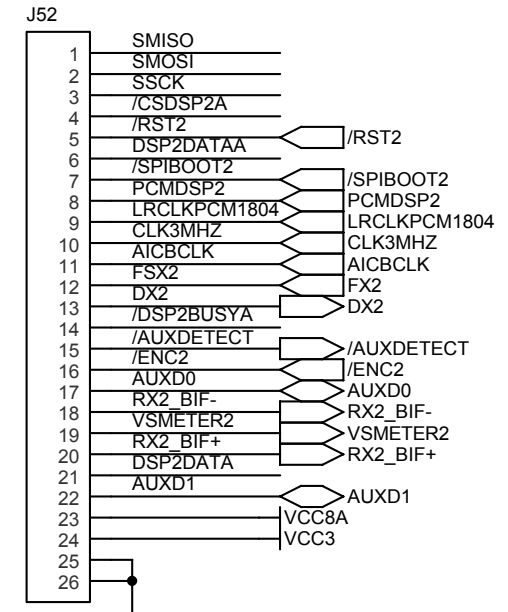
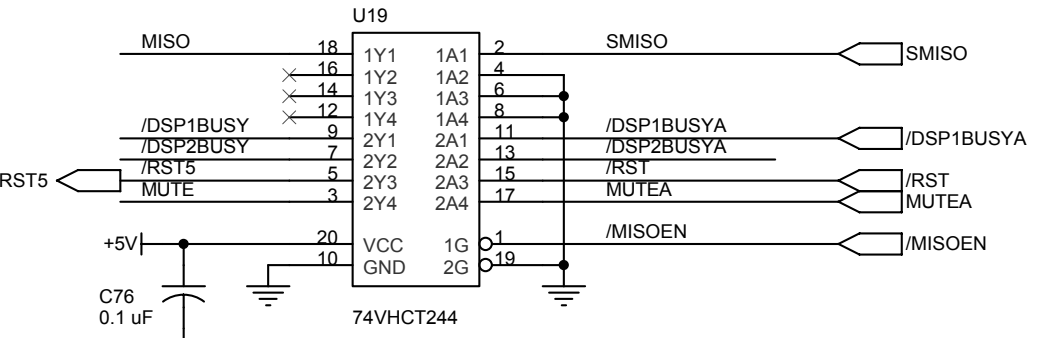
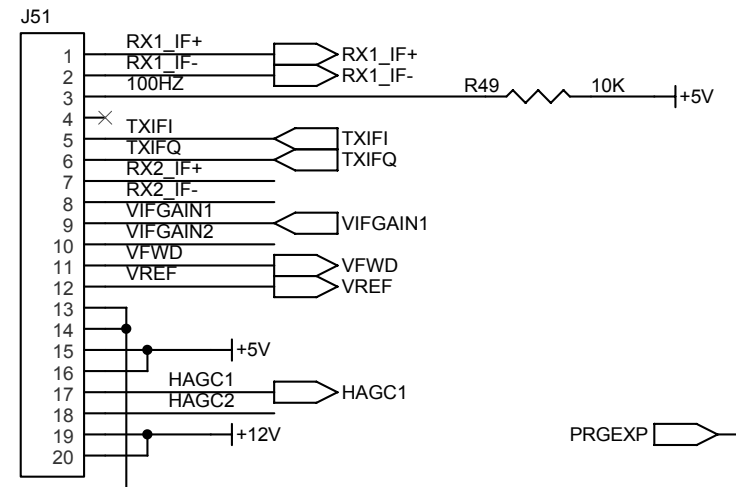
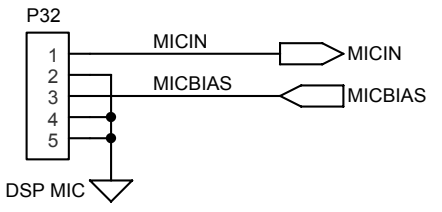
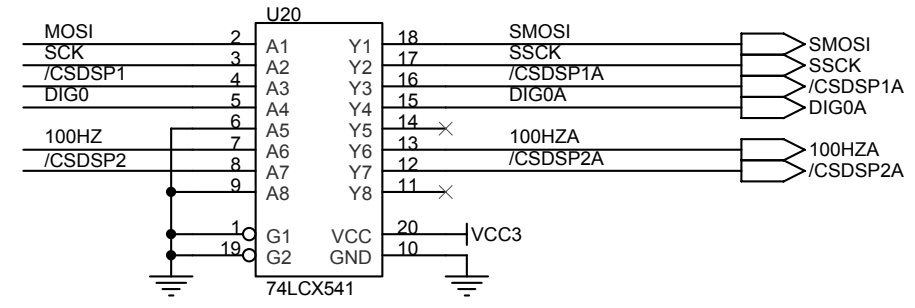
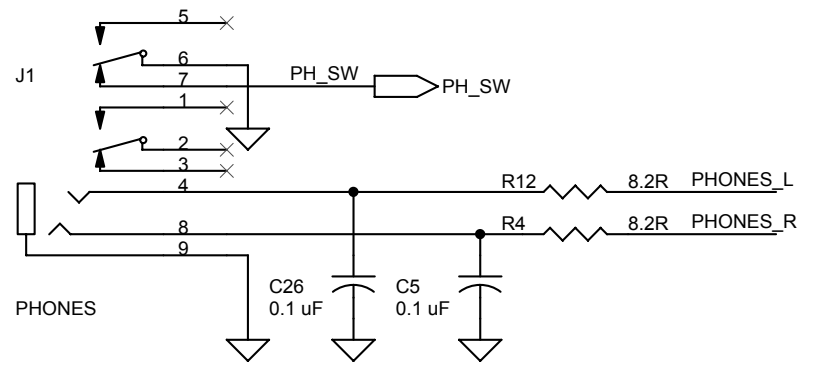
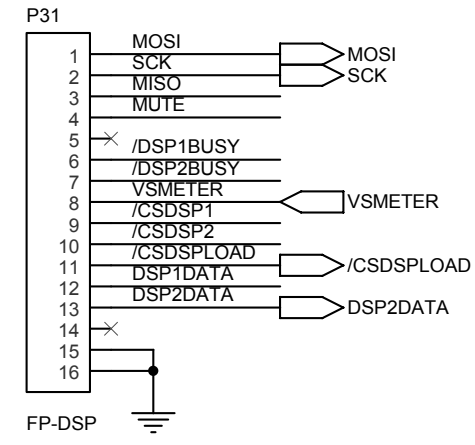
NOTES: PCB Revision C

Elecrafc, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title K3 DSP: DSP AND LOGIC		
Size B	Document Number 2004051101	Rev C
Date: Wednesday, June 16, 2010	Sheet 5	of 9



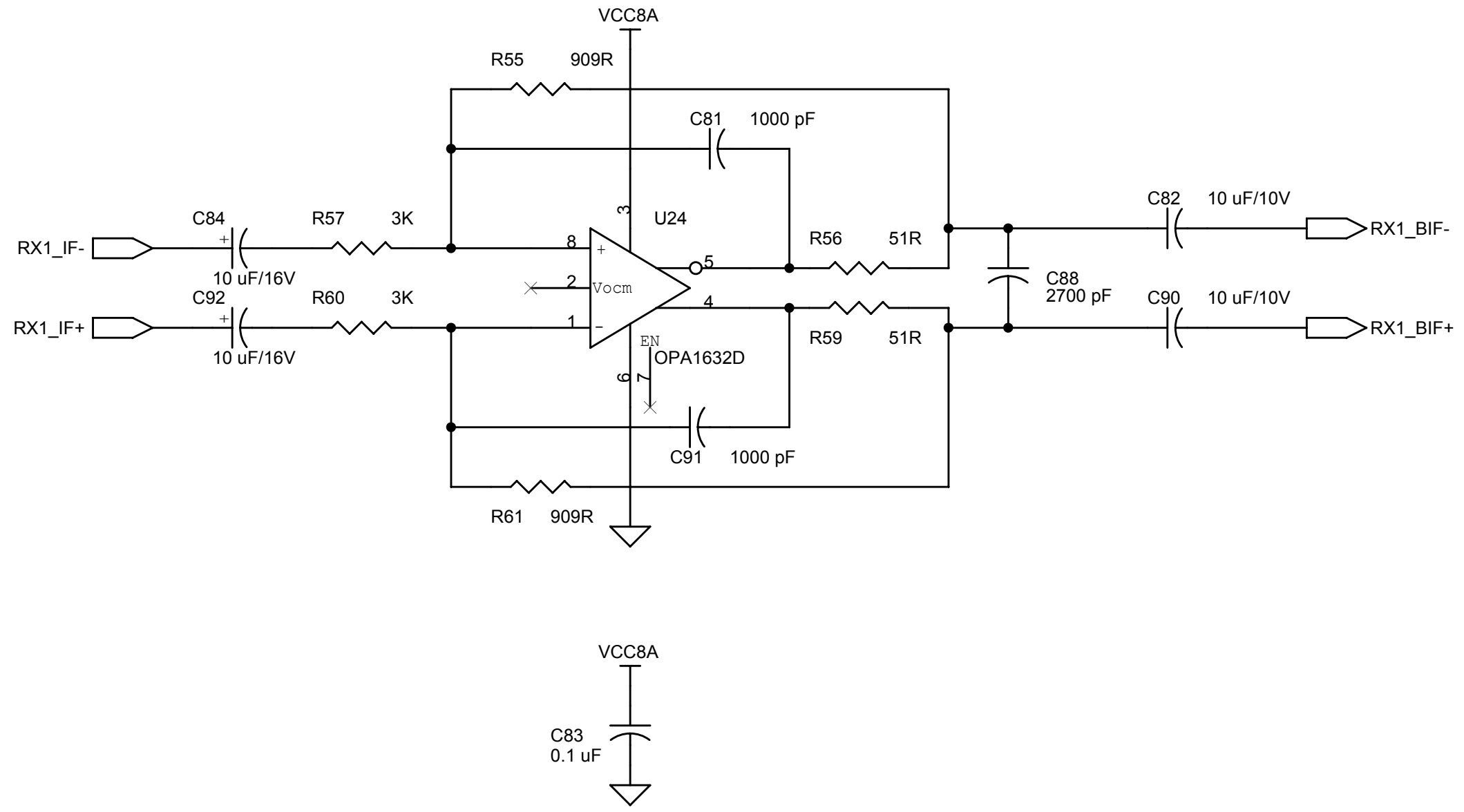
NOTES: PCB Revision C

Elecrafit, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title K3 DSP: Power Supply		
Size B	Document Number 2004051101	Rev C
Date: Wednesday, June 16, 2010	Sheet 6	of 9



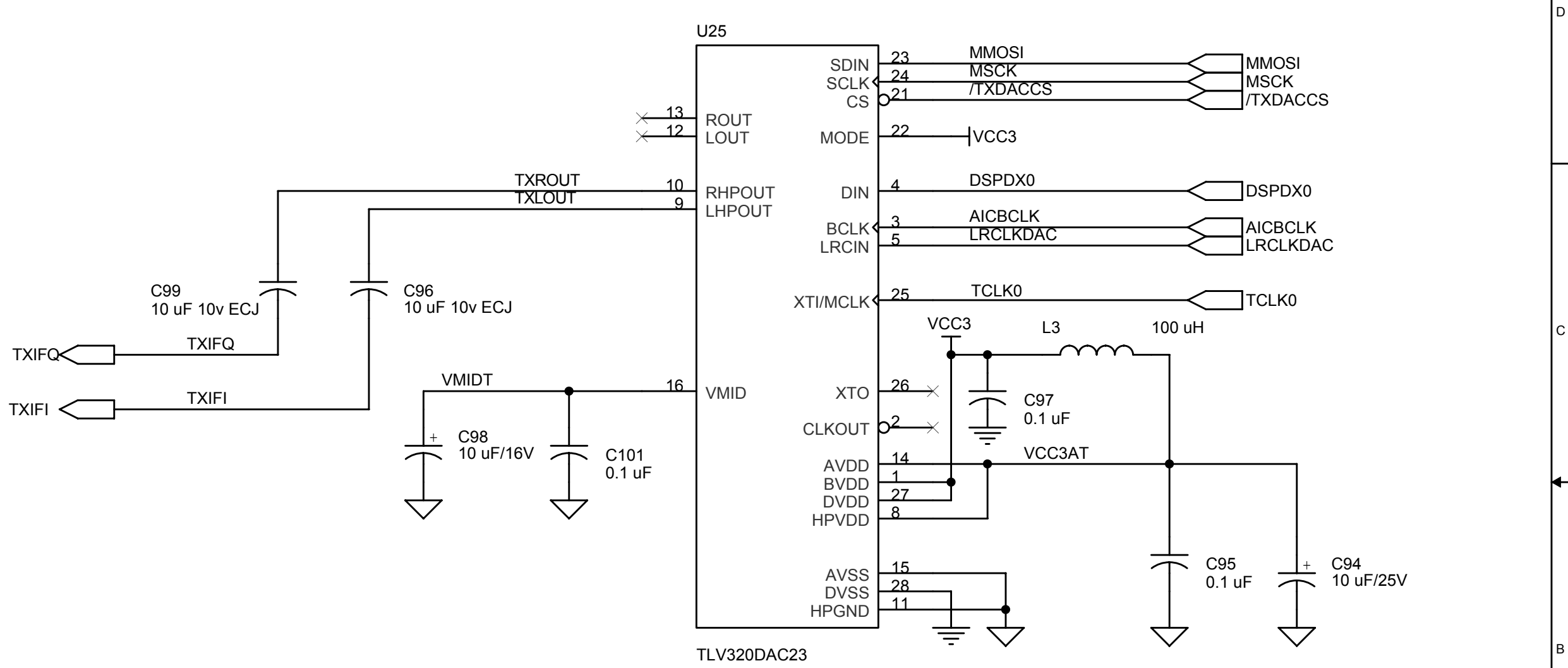
NOTES: PCB Revision C

Elecrafit, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title K3 DSP: INTERCONNECTS AND MISCELLANEOUS		
Size B	Document Number 2004051101	Rev C
Date: Wednesday, June 16, 2010	Sheet 7	of 9



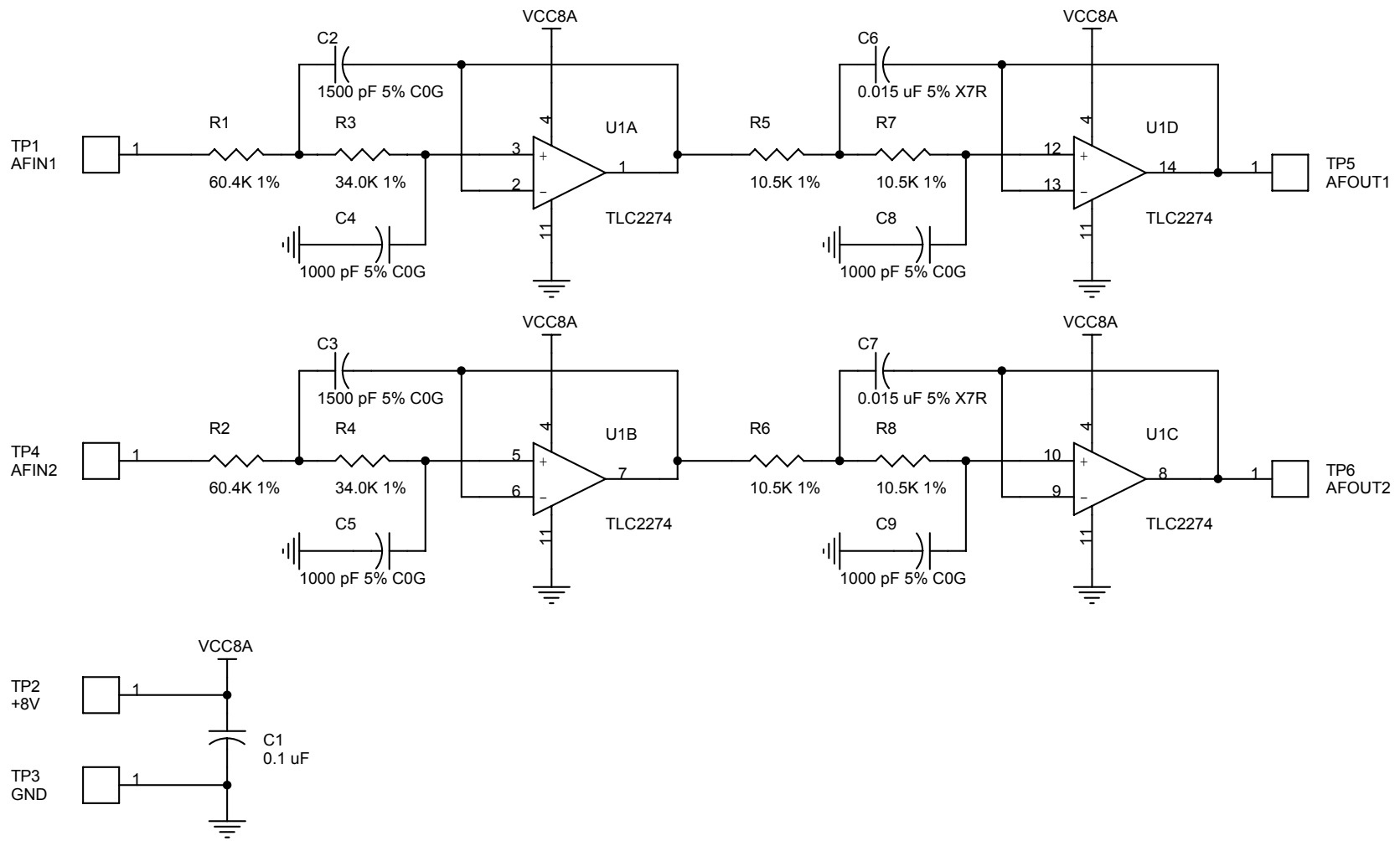
NOTES: PCB Revision C

Elecraft, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title K3 DSP: RX IF BUFFER		
Size A	Document Number 2004051101	Rev C
Date:	Wednesday, June 16, 2010	Sheet 8 of 9

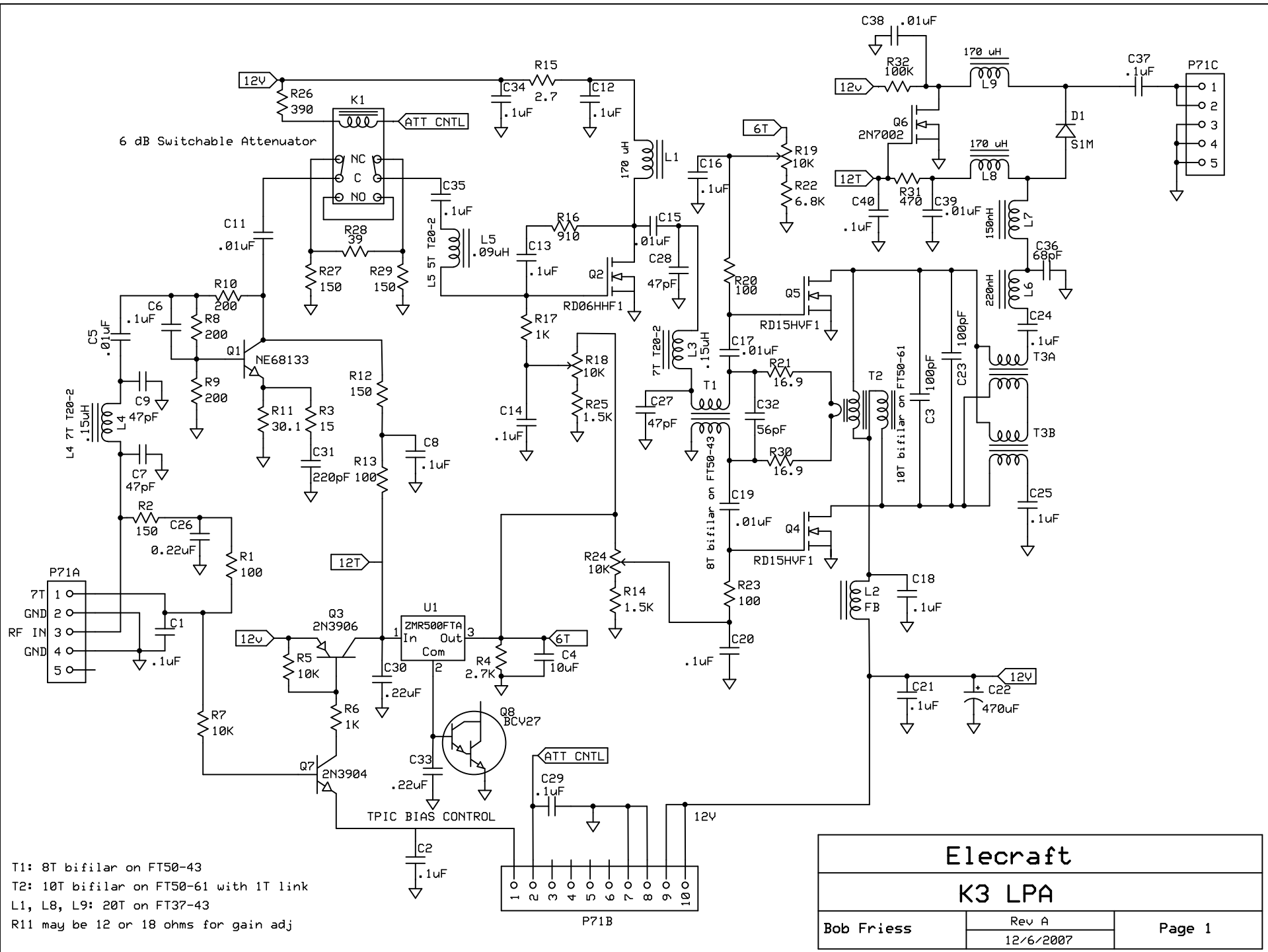


NOTES: PCB Revision C

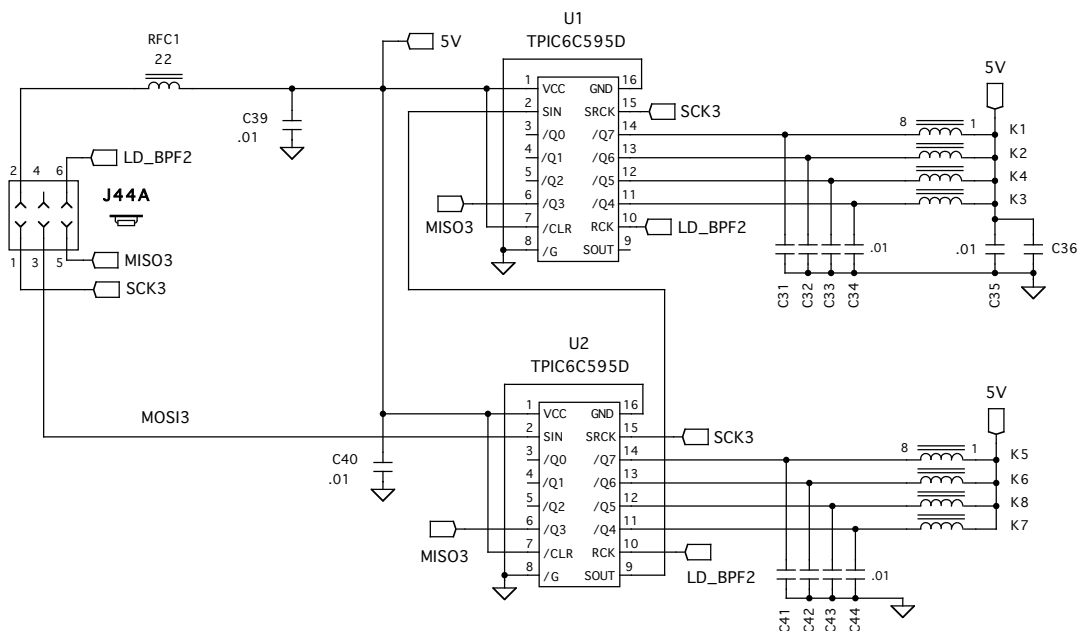
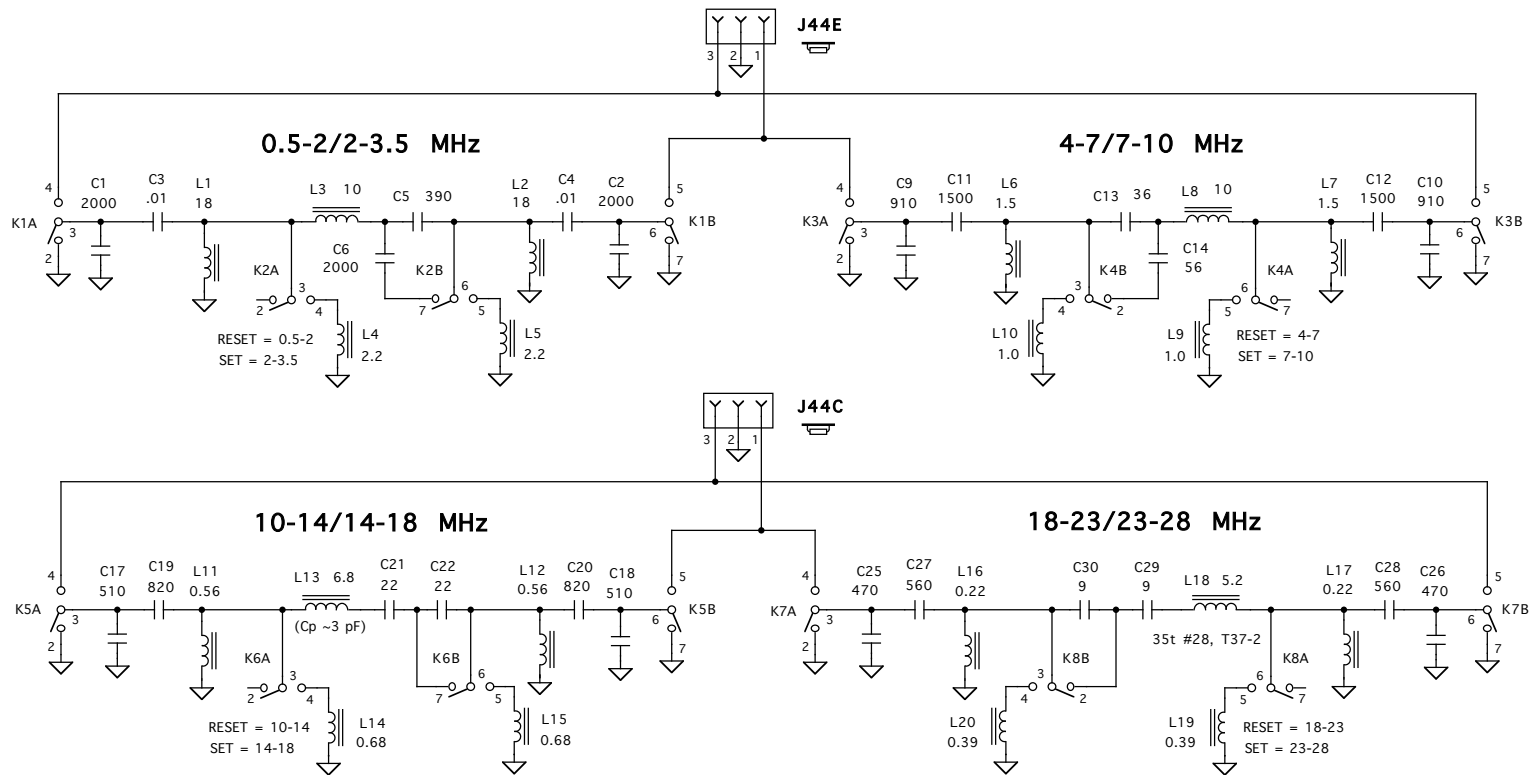
Elecraft, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title K3 DSP: TX DAC		
Size A	Document Number 2004051101	Rev C
Date:	Wednesday, June 16, 2010	Sheet 9 of 9



Elecraft, Inc. Copyright (C) 2009 - 2010. L Johnson		
Title K3: AF Filter		
Size A	Document Number E2008090801	Rev A
Date: Wednesday, June 16, 2010	Sheet 1	of 1



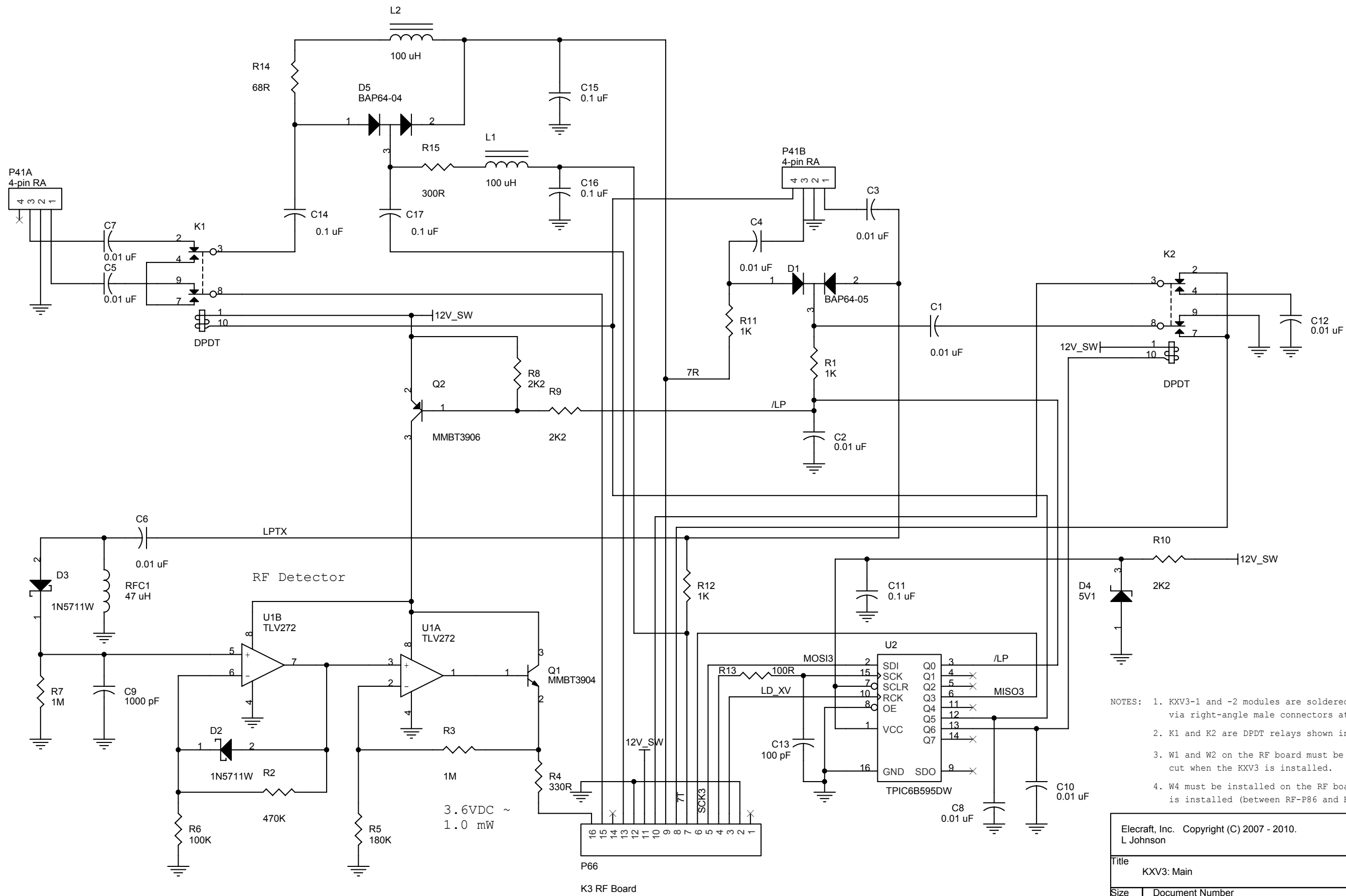
Elecraft		
K3 LPA		
Bob Friess	Rev A	Page 1
	12/6/2007	



NOTE: K1-K8 are shown in the RESET position.
 All relays are mounted on the back side of the PCB.

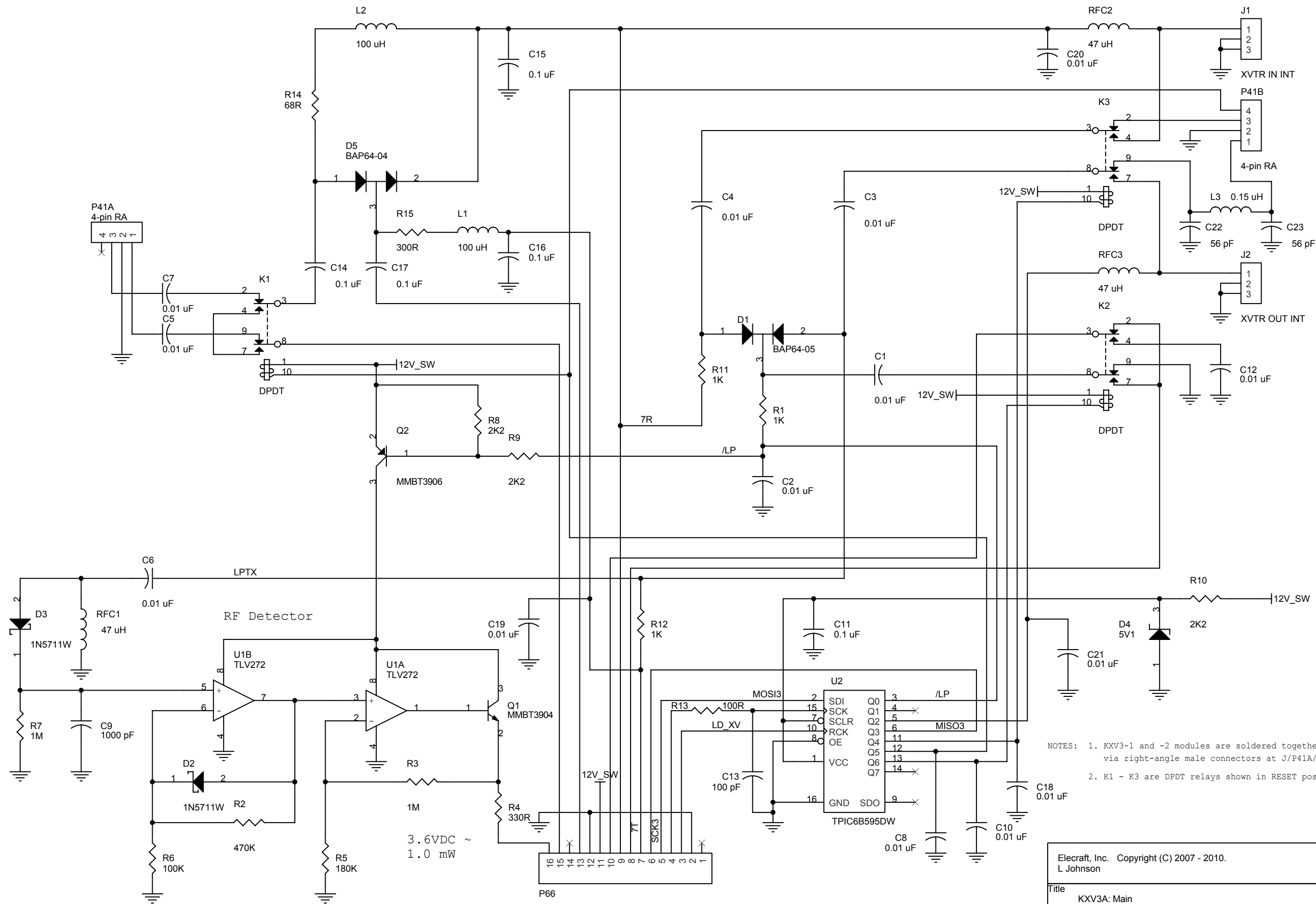
Appendix B

Elecrafft		KBPF3	
By	Rev.	Date	Sht.
W. Burdick	A	6/29/07	1 of 4



- NOTES:
1. KXV3-1 and -2 modules are soldered together via right-angle male connectors at J/P41A/C.
 2. K1 and K2 are DPDT relays shown in RESET position.
 3. W1 and W2 on the RF board must be removed or cut when the KXV3 is installed.
 4. W4 must be installed on the RF board when the KXV3 is installed (between RF-P86 and KXV3-P87).

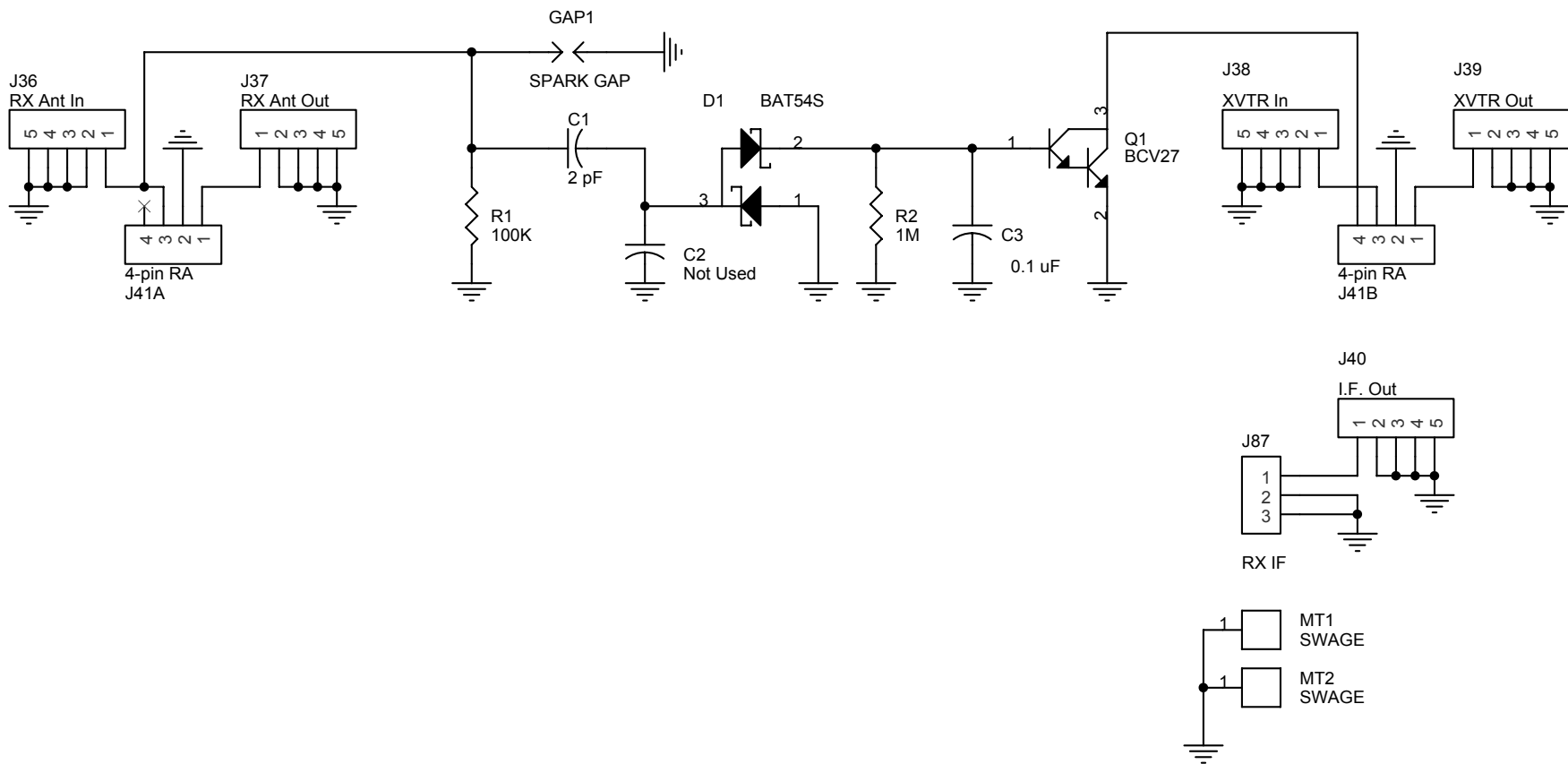
Elecrafft, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title KXV3: Main		
Size B	Document Number 2006030602	Rev B1
Date: Wednesday, June 16, 2010	Sheet 1	of 1



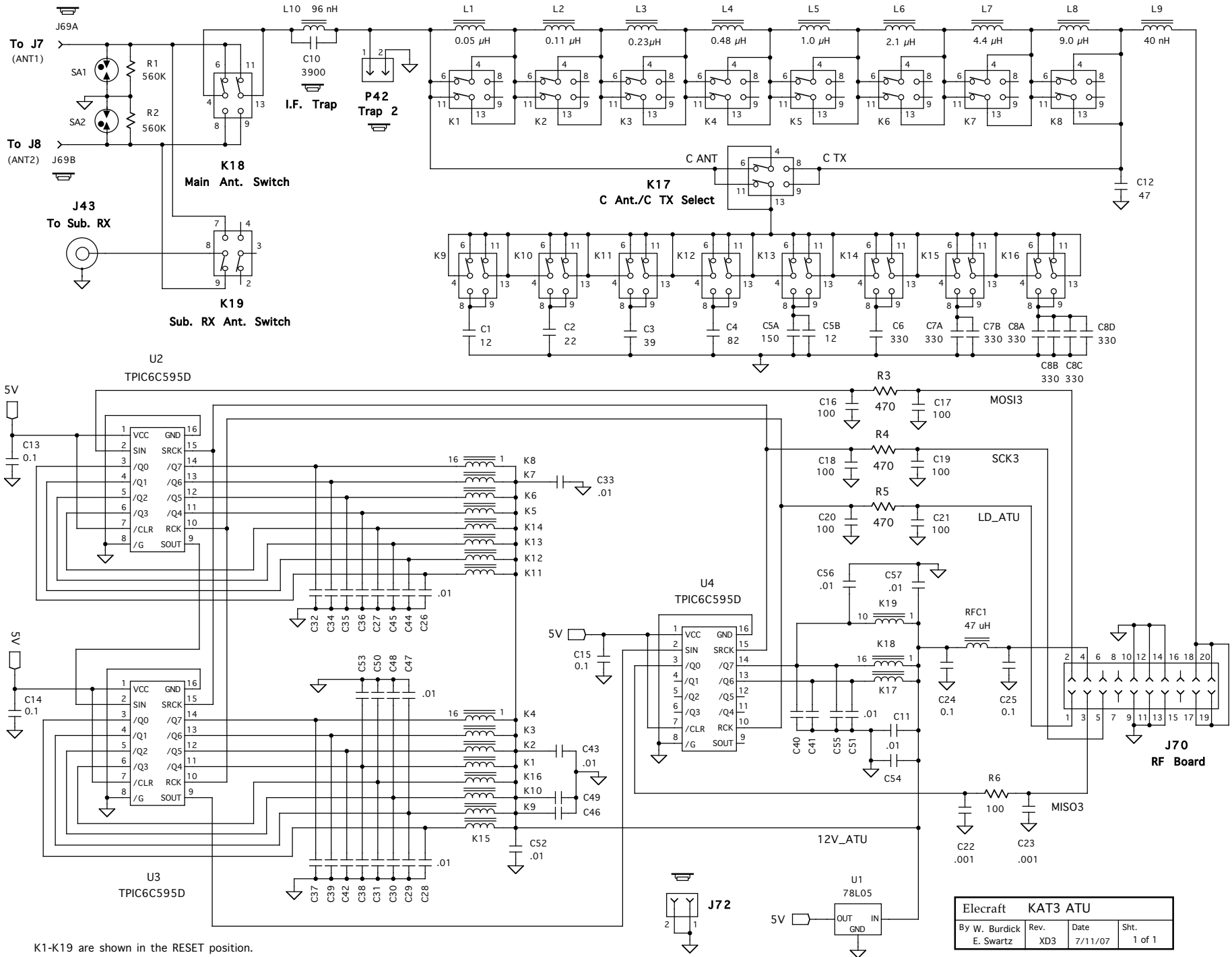
NOTES: 1. KXV3-1 and -2 modules are soldered together via right-angle male connectors at J/P41A/C.
 2. K1 - K3 are DPDT relays shown in RESET position.

Elecrafit, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title KXV3A: Main		
Size B	Document Number 2006030602	Rev D
Date: Wednesday, June 16, 2010	Sheet 1	of 1

K3 RF Board



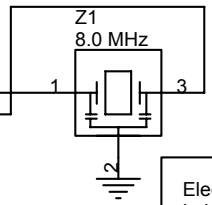
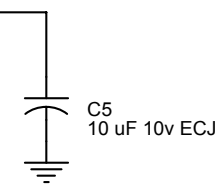
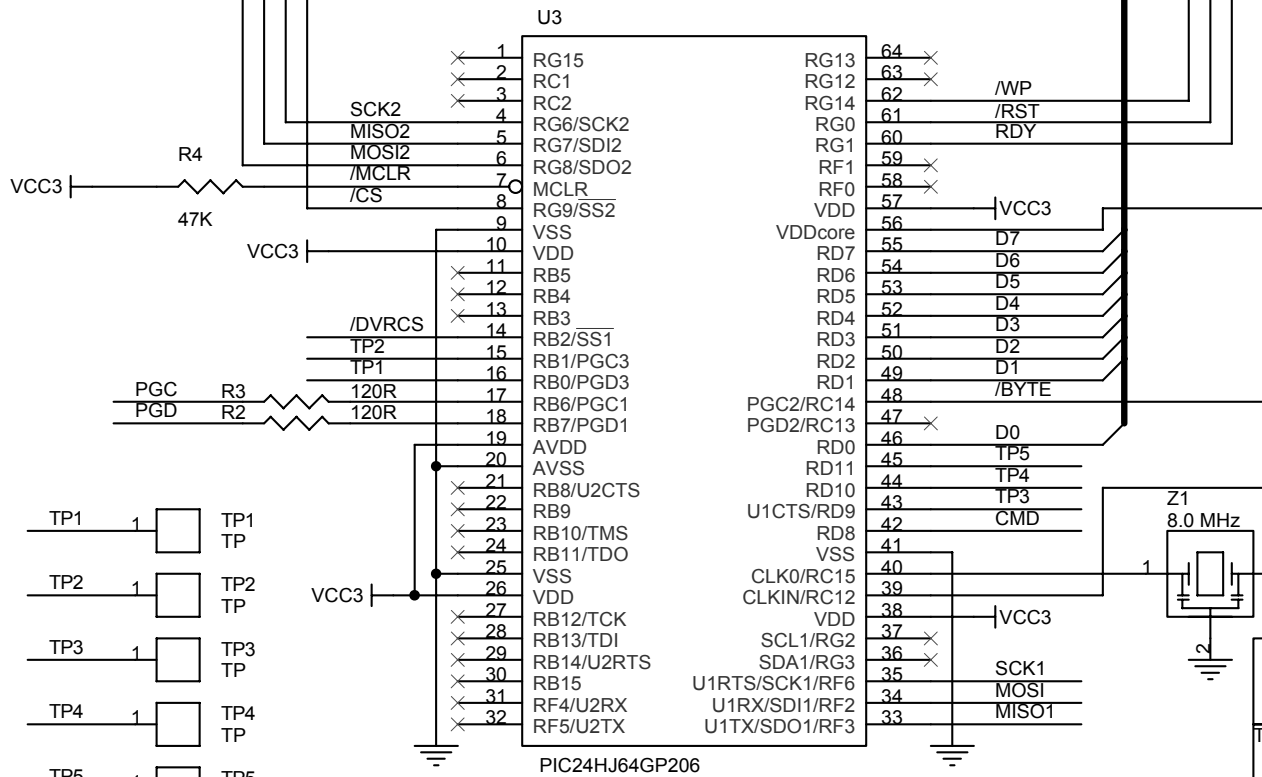
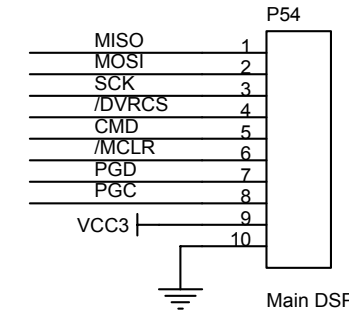
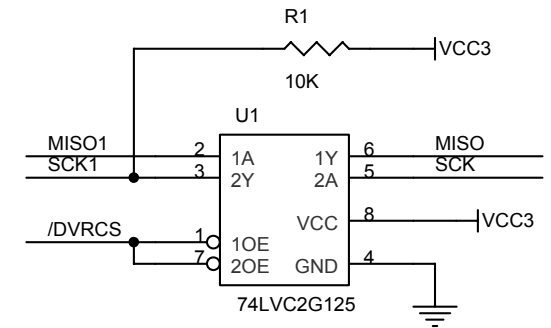
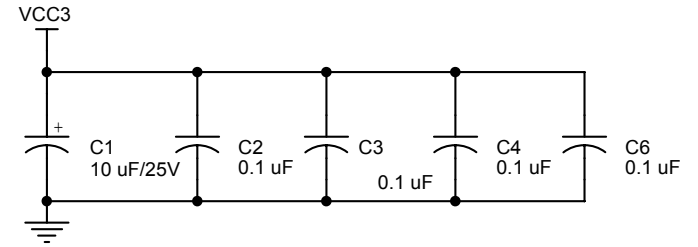
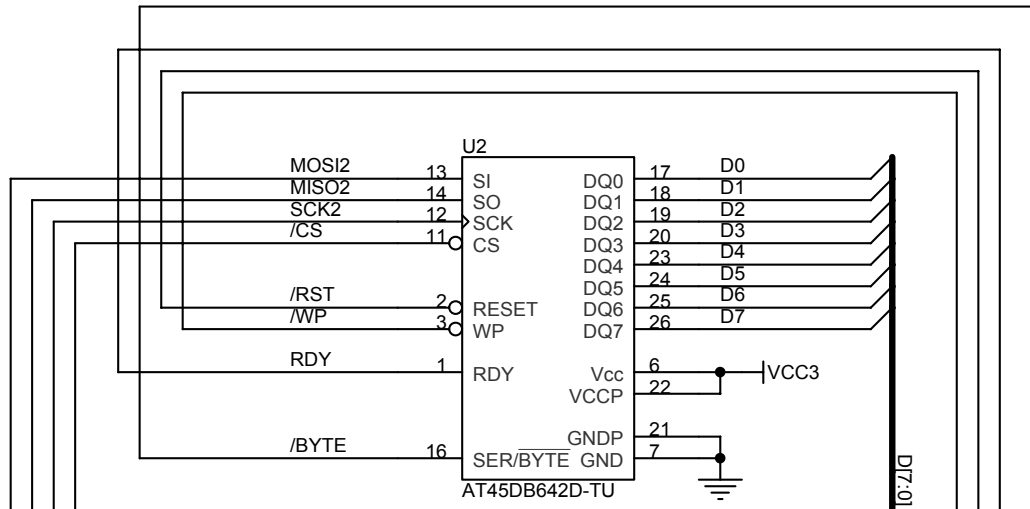
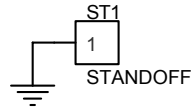
Elecraft, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title KXV3: Connector		
Size A	Document Number 2006030602	Rev A1
Date: Wednesday, June 16, 2010	Sheet 1	of 1



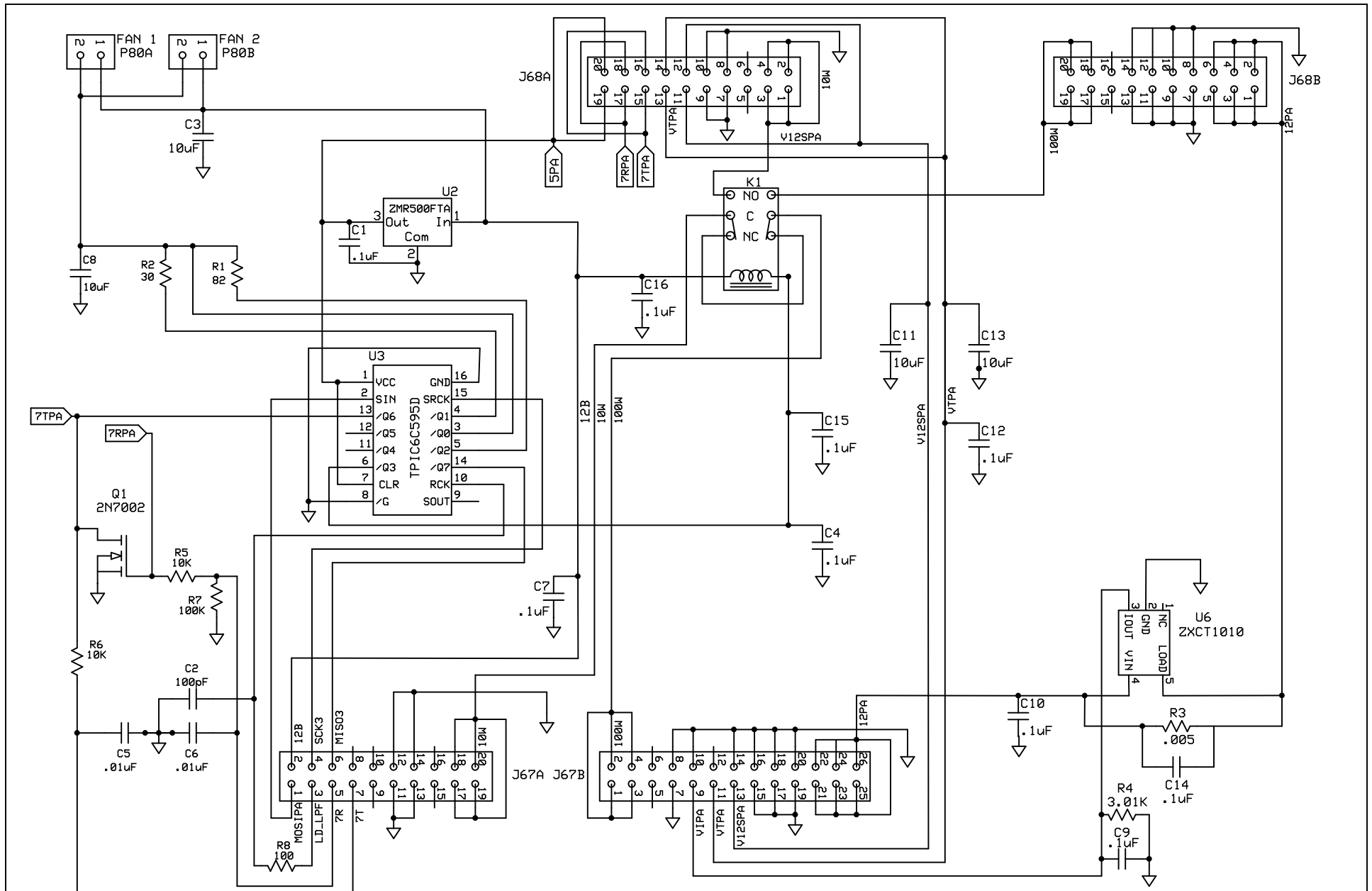
K1-K19 are shown in the RESET position.

⏚ = Parts mounted on the bottom of the PC board. In addition to these, all relays are on the bottom.

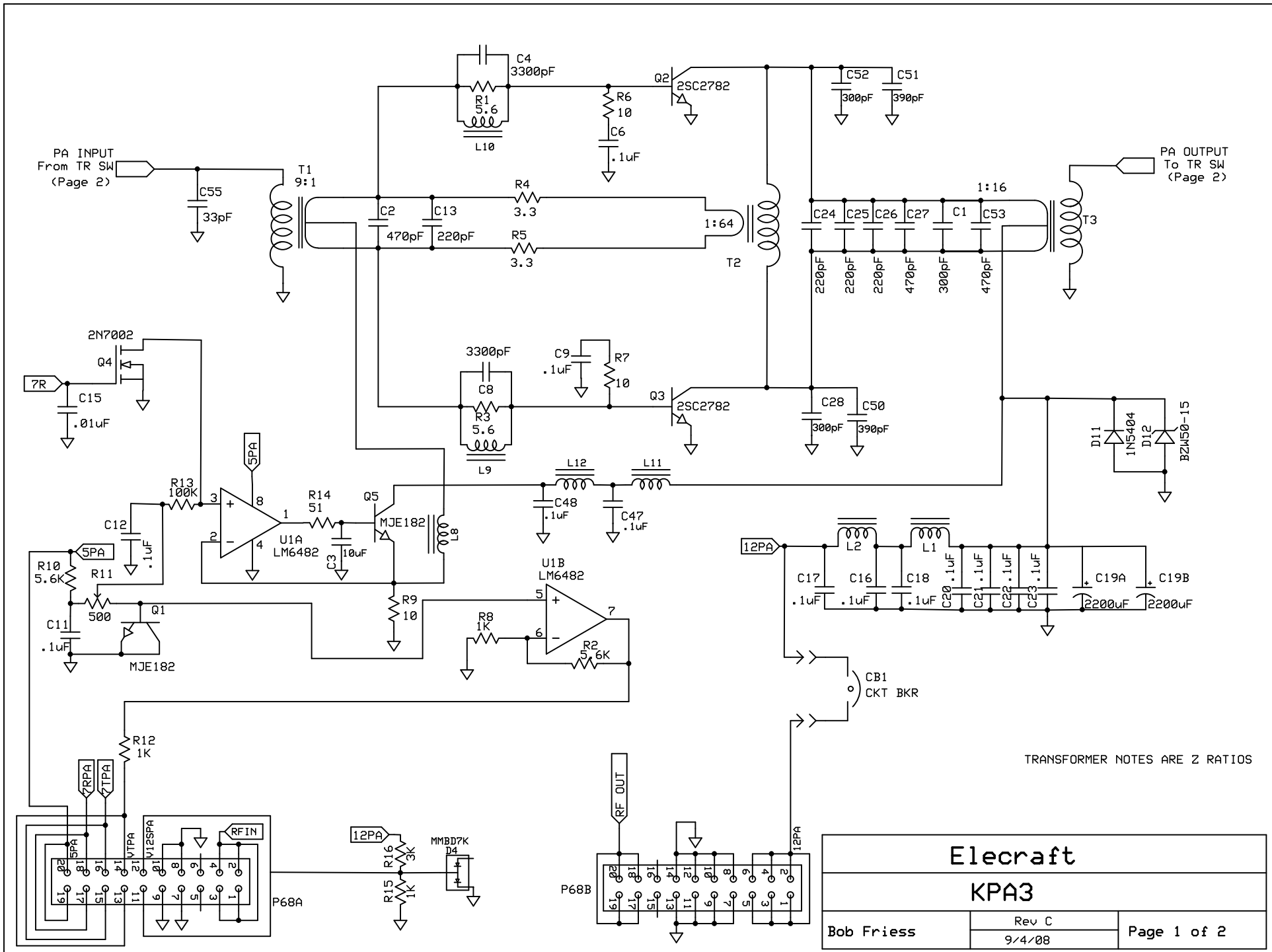
Elecraft KAT3 ATU			
By W. Burdick	Rev. XD3	Date 7/11/07	Sht. 1 of 1
E. Swartz			



Elecraft, Inc. Copyright (C) 2008 - 2010. L Johnson		
Title K3: Digital Voice Recorder		
Size A	Document Number 2004090101	Rev XG
Date: Wednesday, June 16, 2010	Sheet 1	of 1

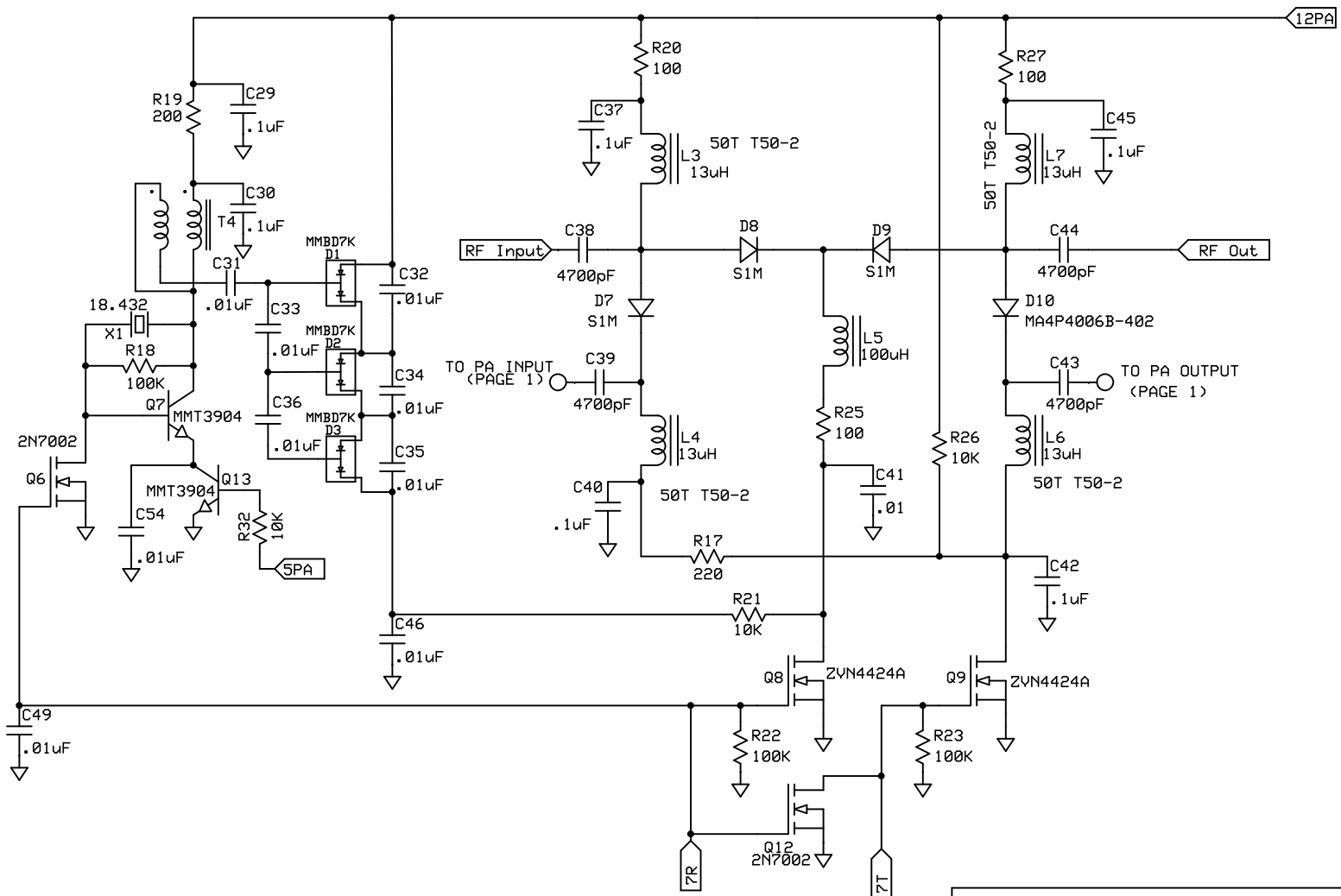


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Bob Friess	Rev XI 3/26/2007
Page 1	

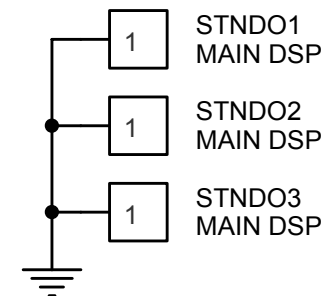
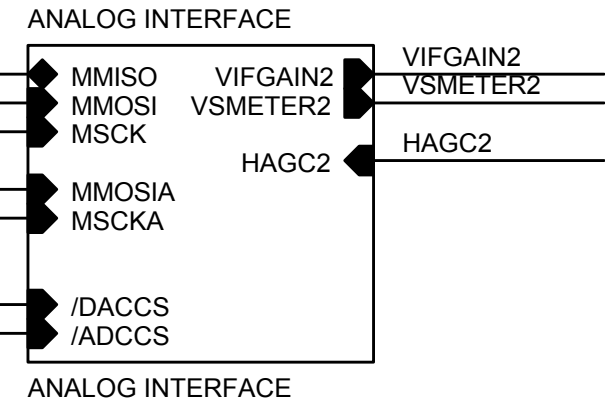
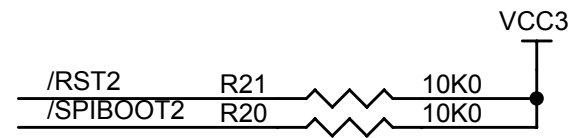
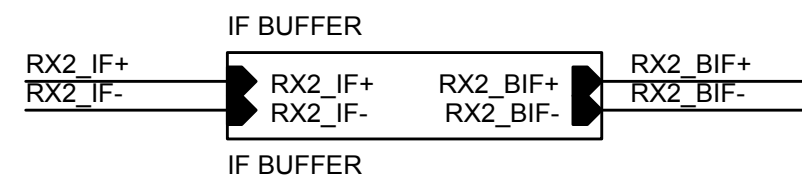
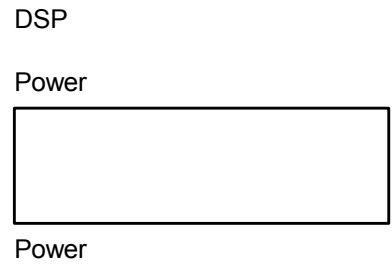
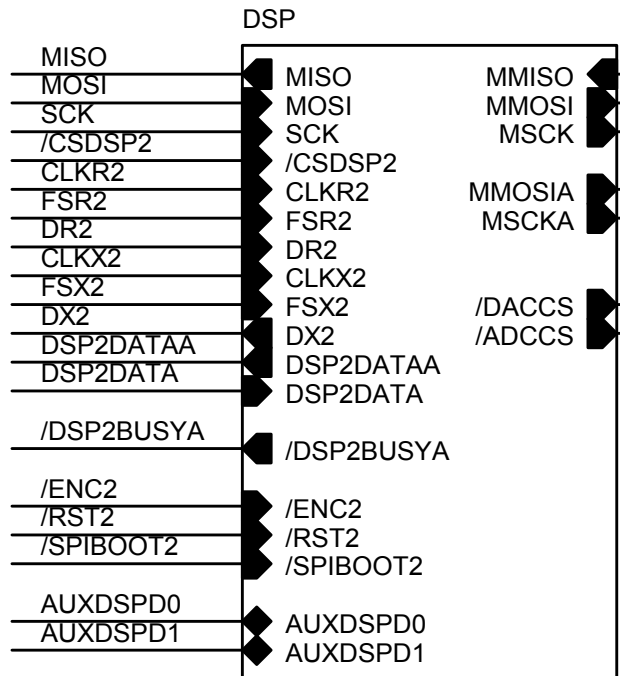
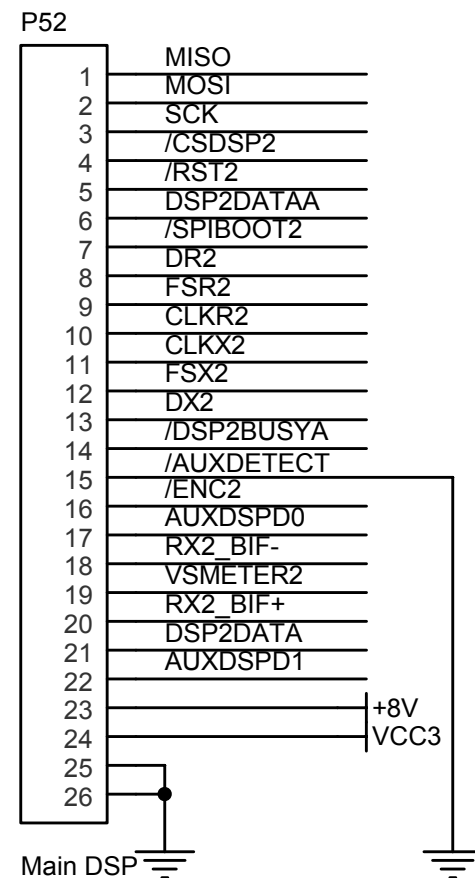


TRANSFORMER NOTES ARE Z RATIOS

Elecraft	
KPA3	
Bob Friess	Rev C 9/4/08
Page 1 of 2	

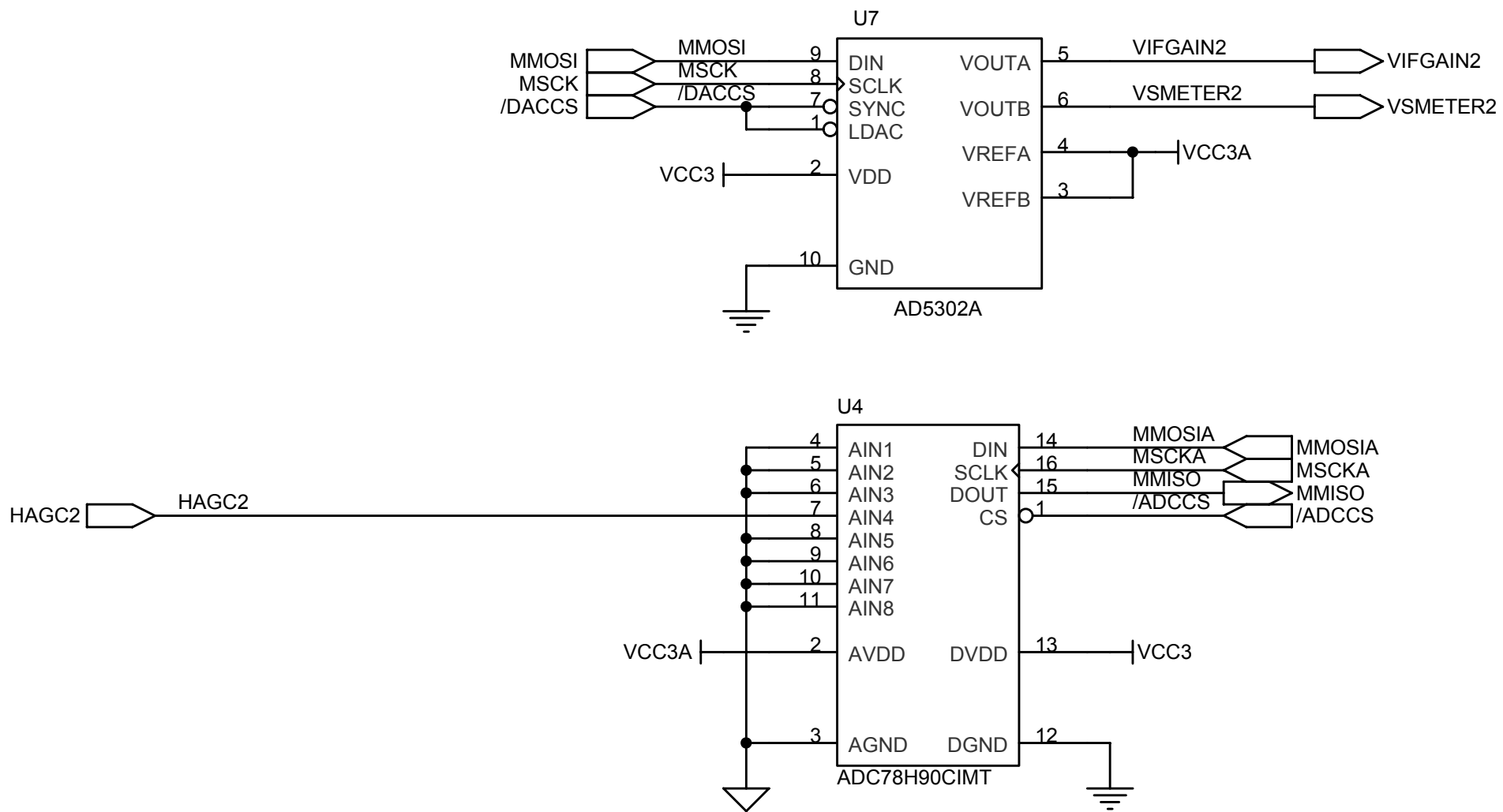


Elecraft	
KPA3	
Bob Friess	Rev C 9/4/2008
Page 2 of 2	



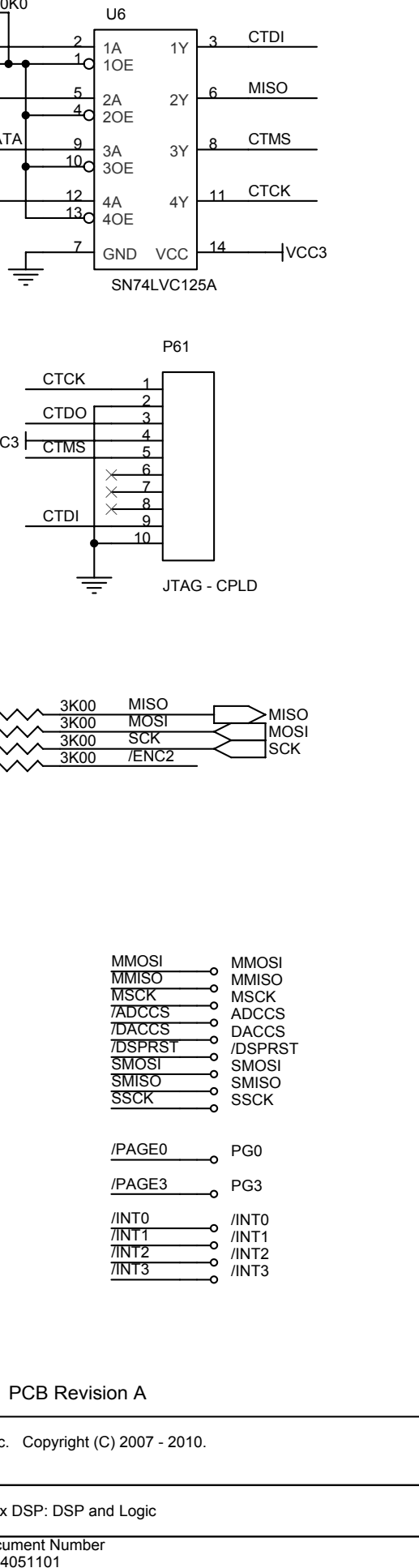
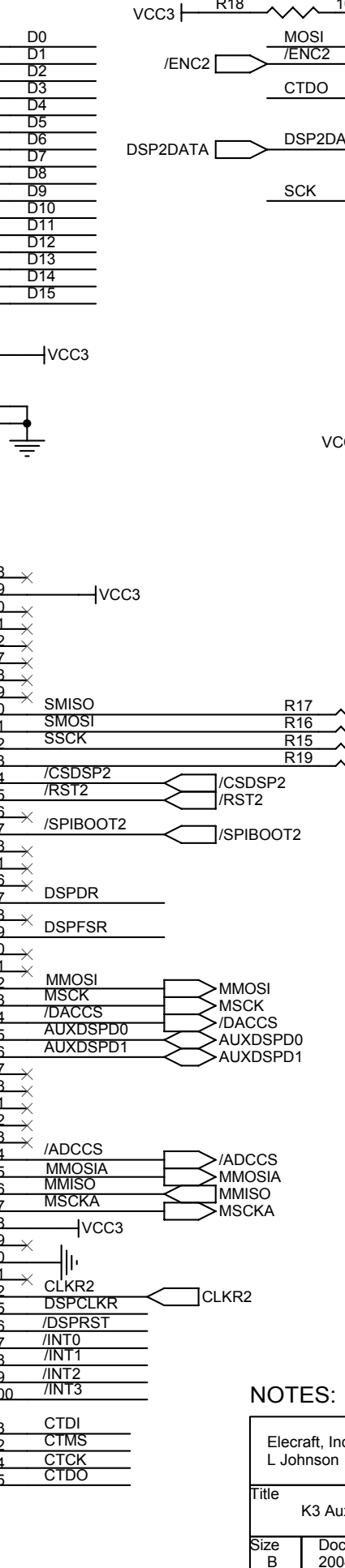
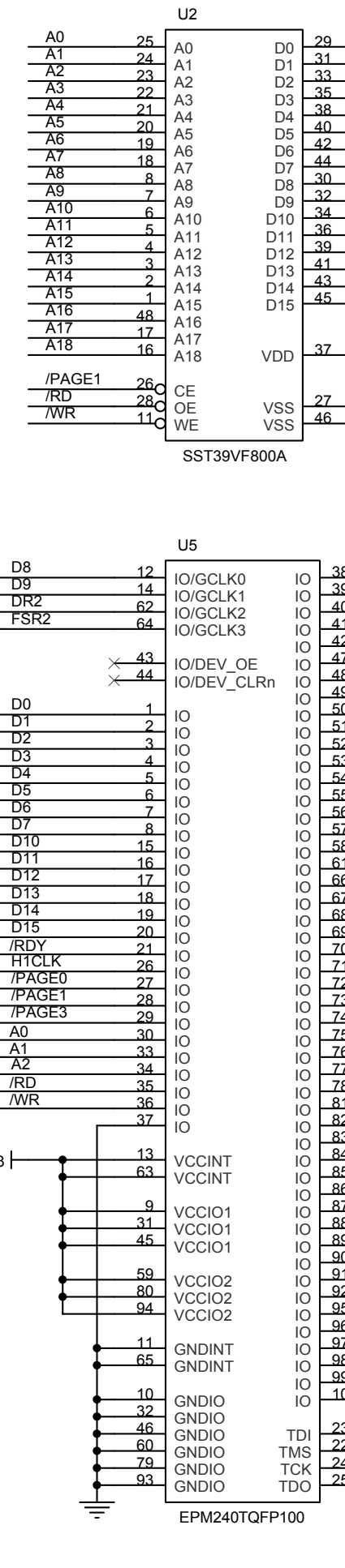
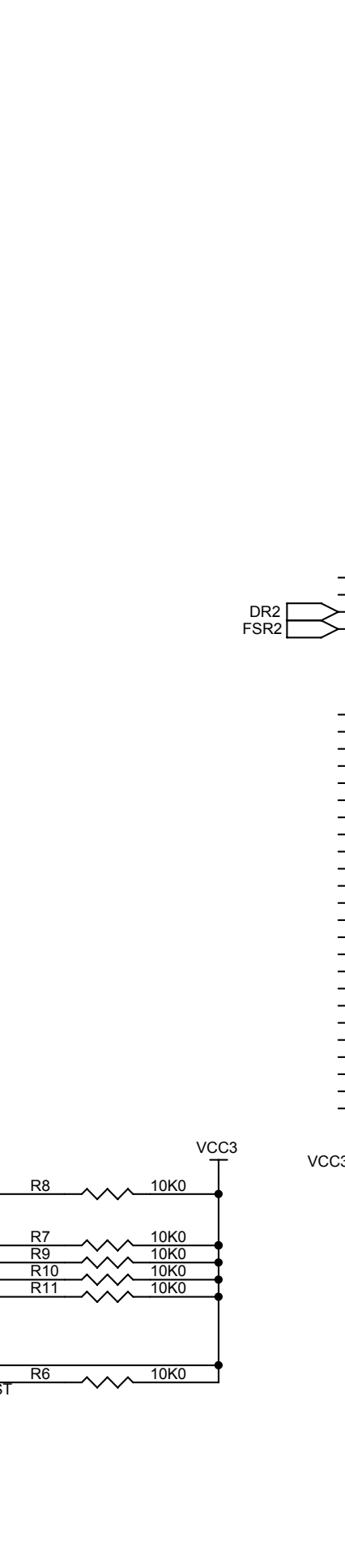
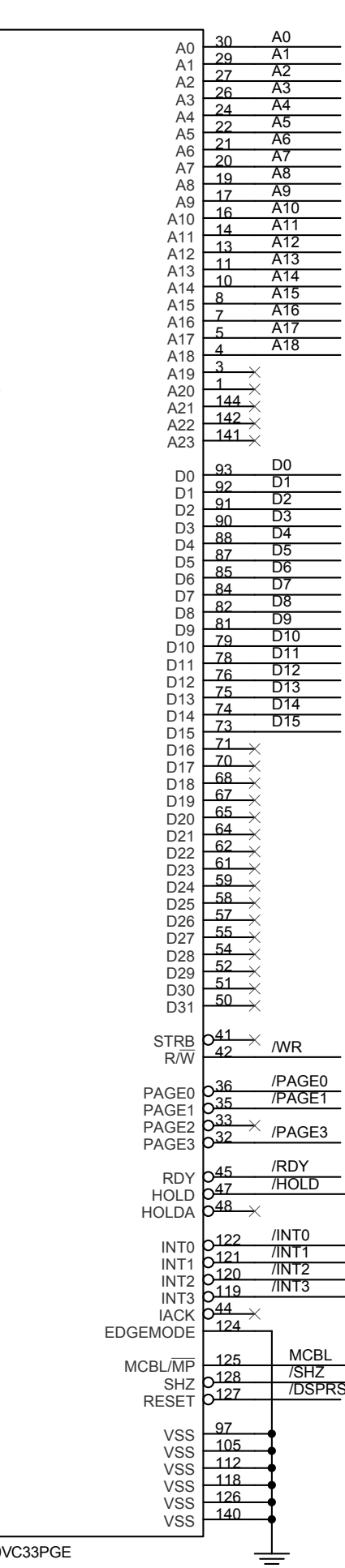
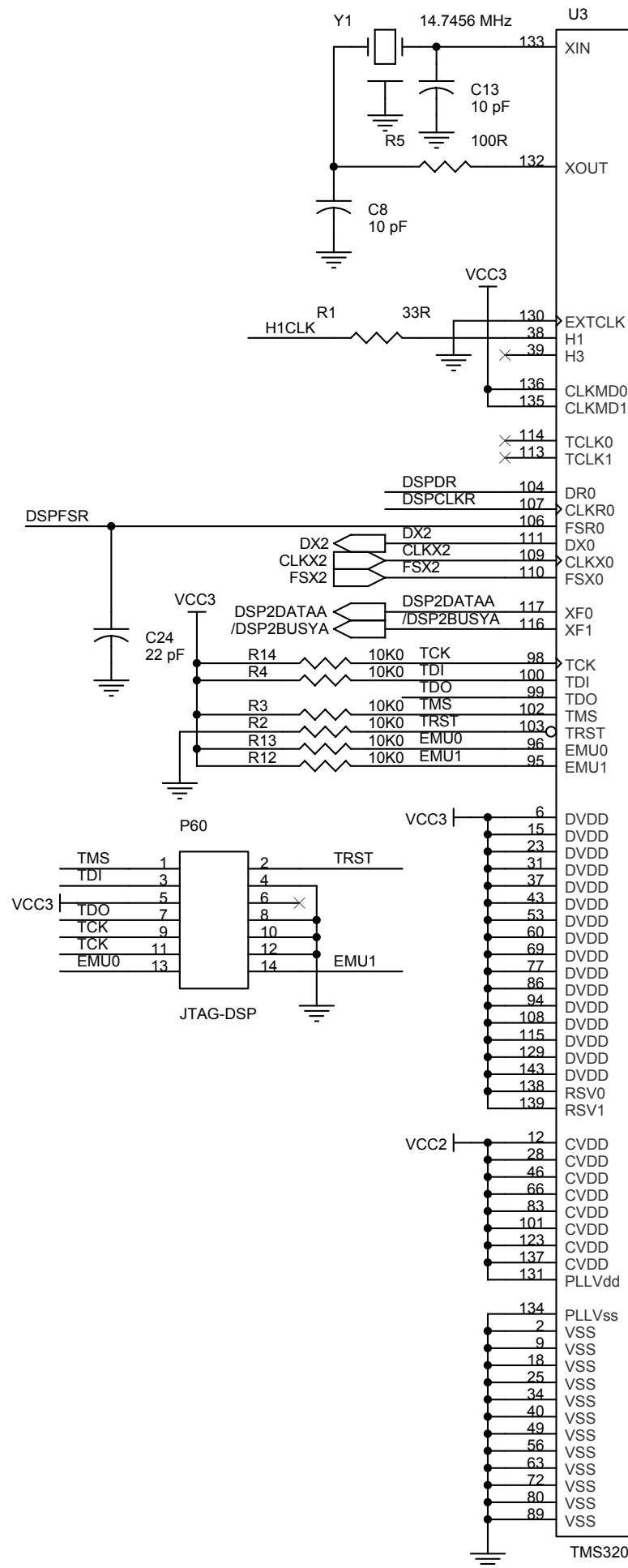
NOTES: PCB Revision A

Elecraft, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title K3 Aux DSP: Top Level		
Size A	Document Number 2004051101	Rev A0
Date:	Wednesday, June 16, 2010	Sheet 1 of 5



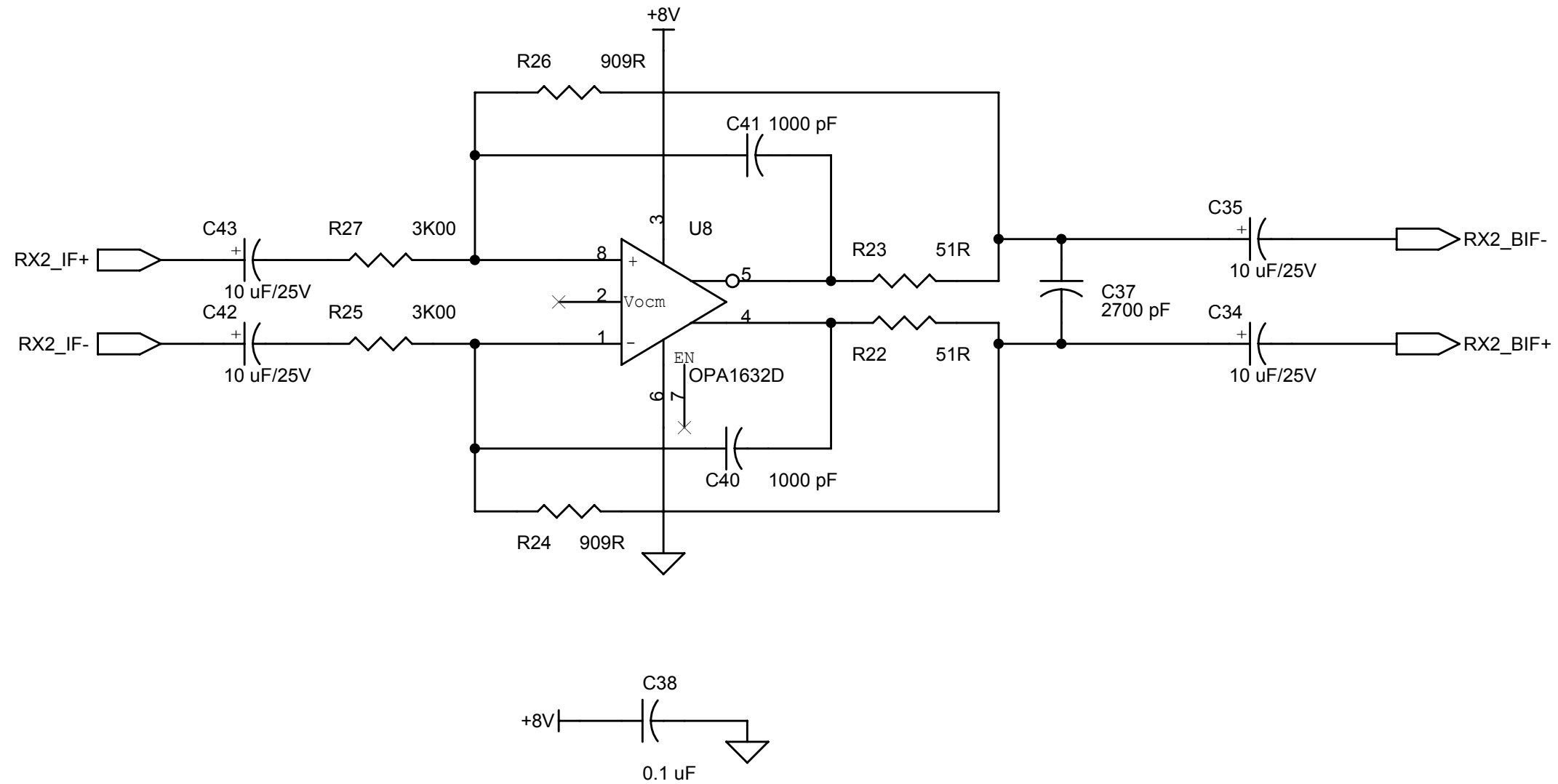
NOTES: PCB Revision A

Elecraft, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title K3 Aux DSP: Analog Interface		
Size A	Document Number 2004051101	Rev A0
Date:	Wednesday, June 16, 2010	Sheet 2 of 5



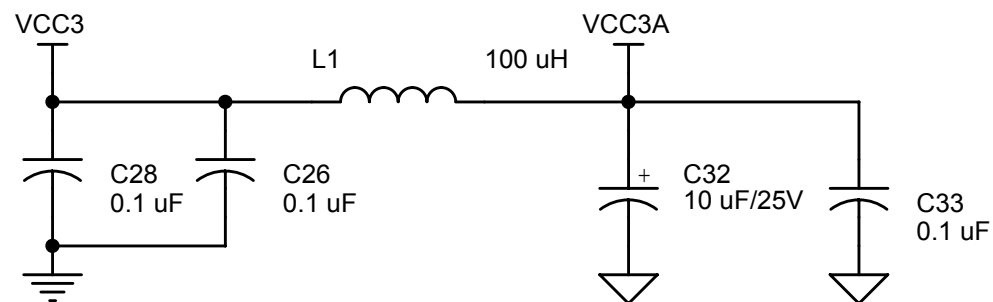
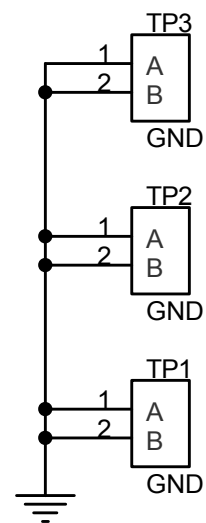
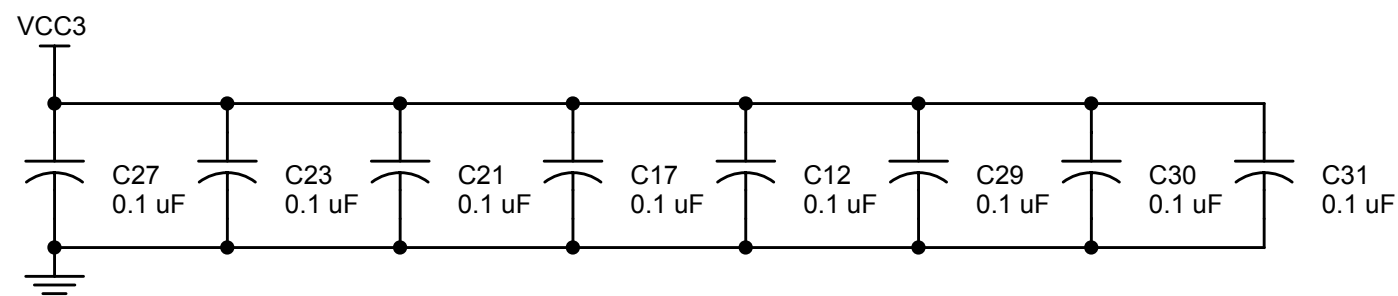
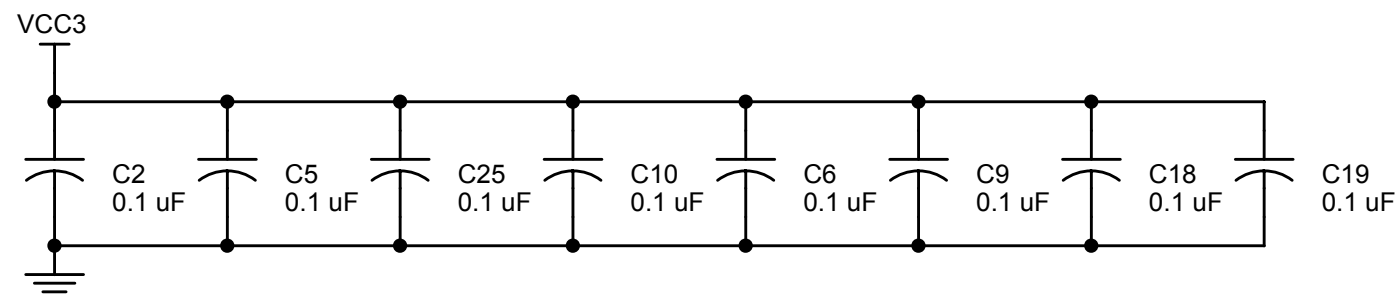
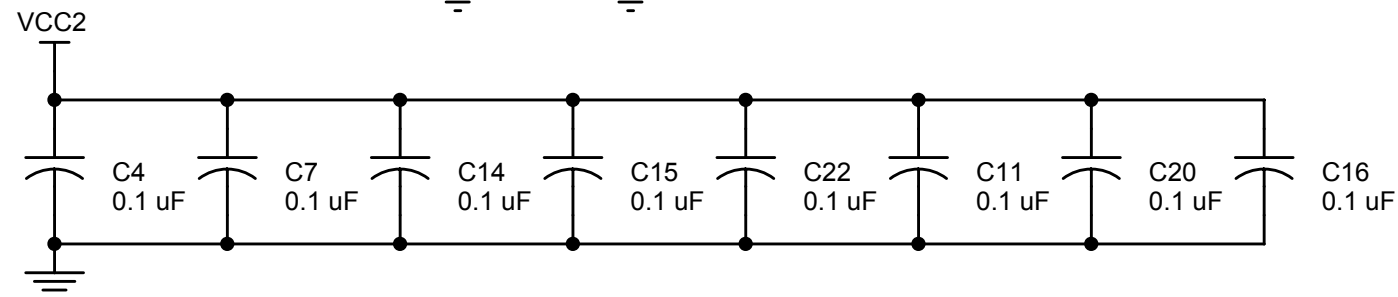
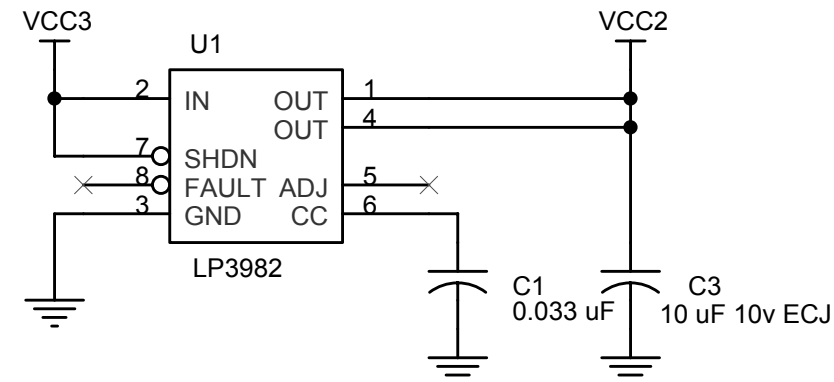
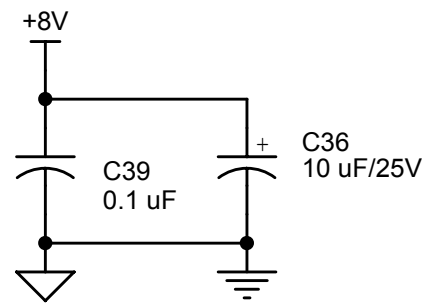
NOTES: PCB Revision A

Elecrafc, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title K3 Aux DSP: DSP and Logic		
Size B	Document Number 2004051101	Rev A0
Date: Wednesday, June 16, 2010	Sheet 3	of 5



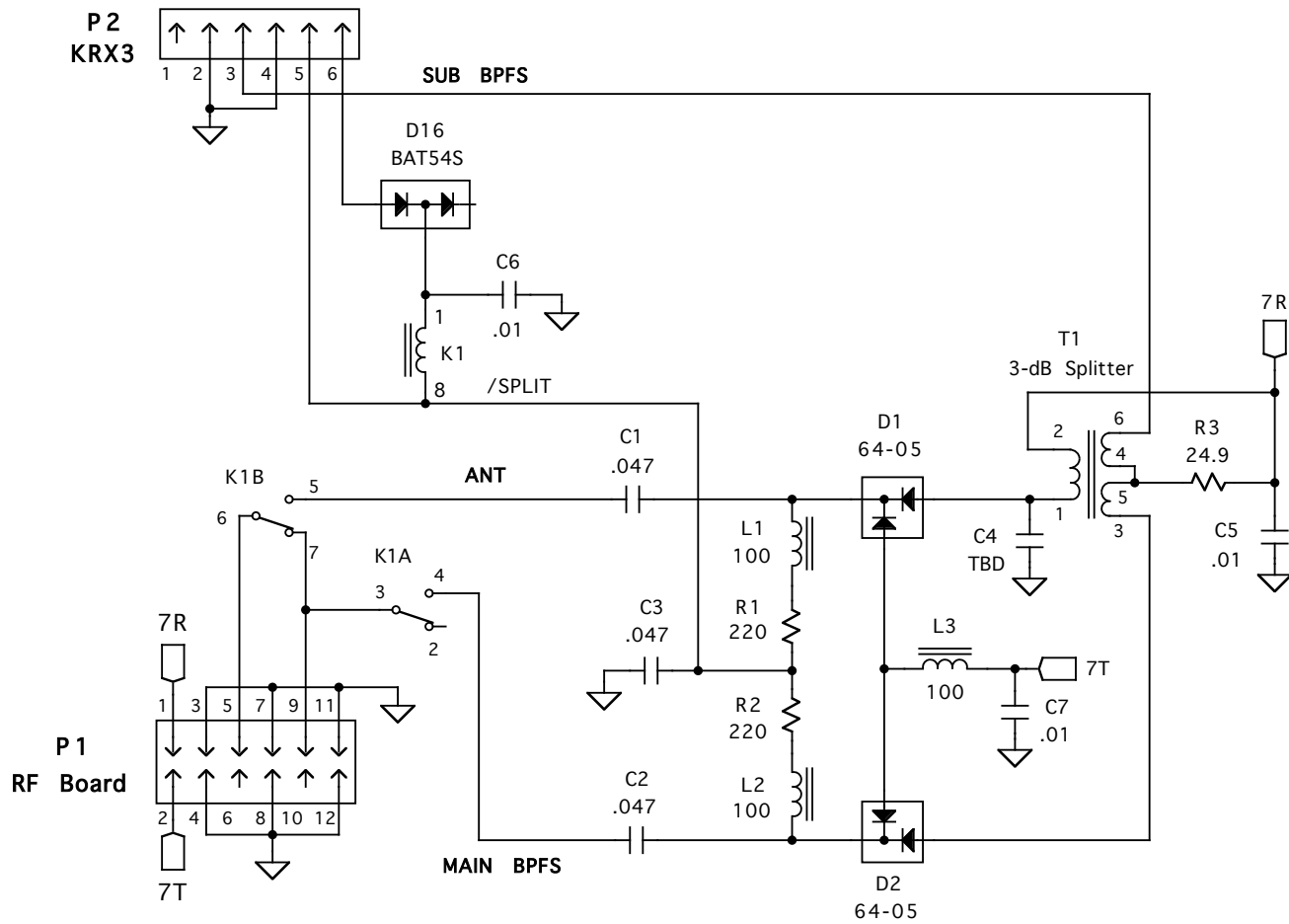
NOTES: PCB Revision A

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Title K3 Aux DSP: IF Buffer		
Size A	Document Number 2004051101	Rev A0
Date:	Wednesday, June 16, 2010	Sheet 4 of 5

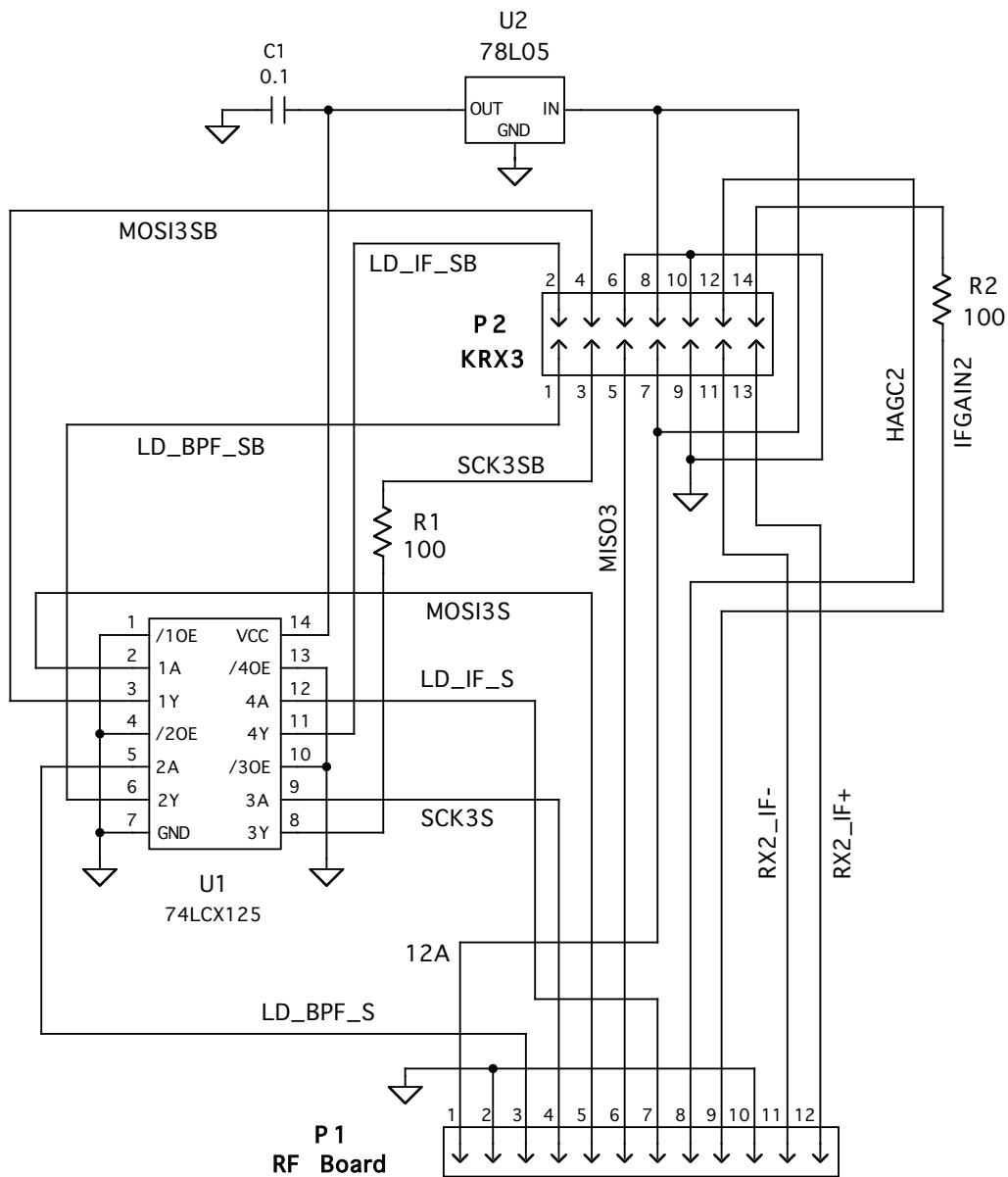


NOTES: PCB Revision A

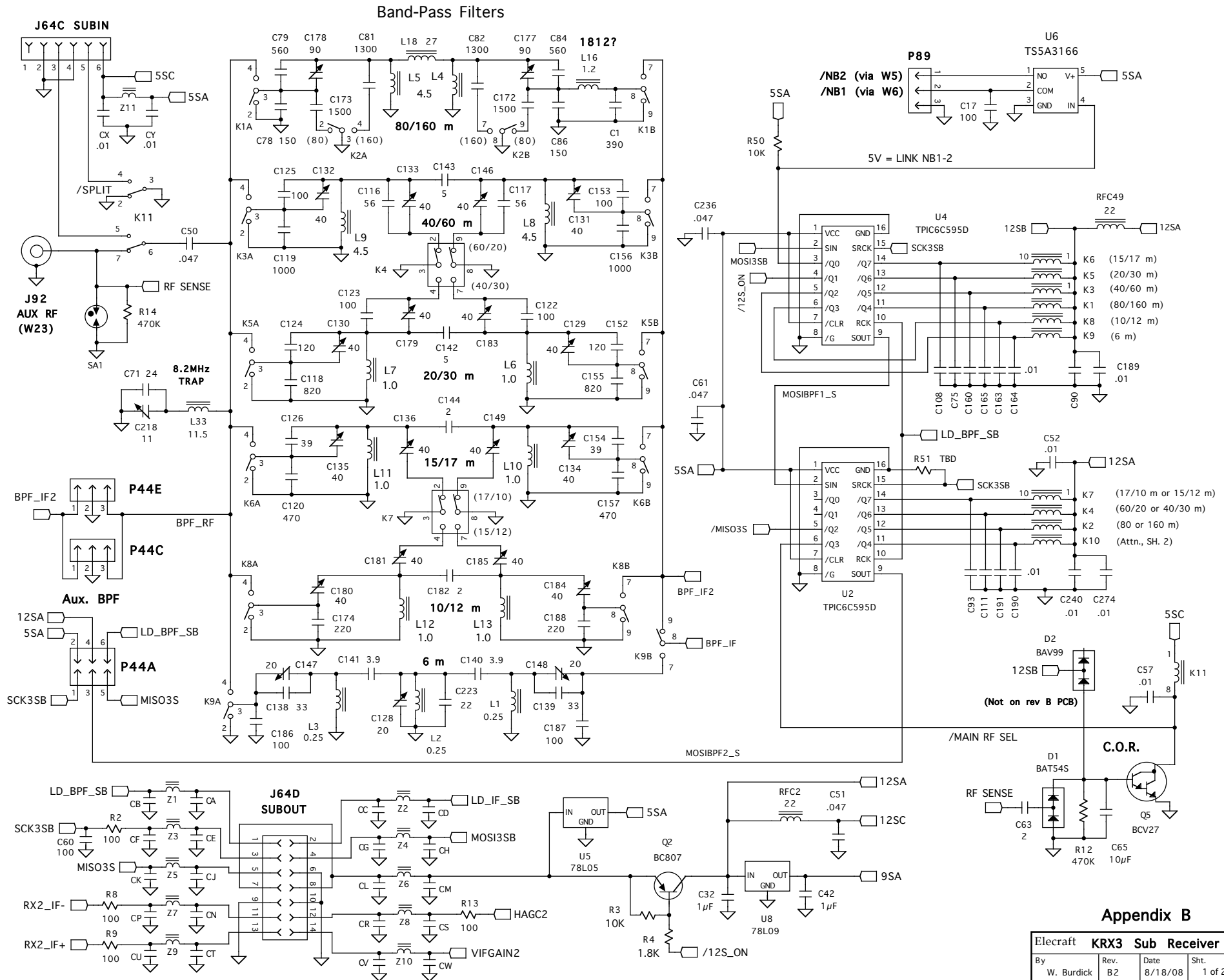
Elecraft, Inc. Copyright (C) 2007 - 2010. L Johnson		
Title K3 Aux DSP: Power		
Size A	Document Number 2004051101	Rev A0
Date:	Wednesday, June 16, 2010	Sheet 5 of 5



Elecraft SUBIN Module			
By W. Burdick	Rev. B2	Date 9/18/08	Sht. 2 of 2

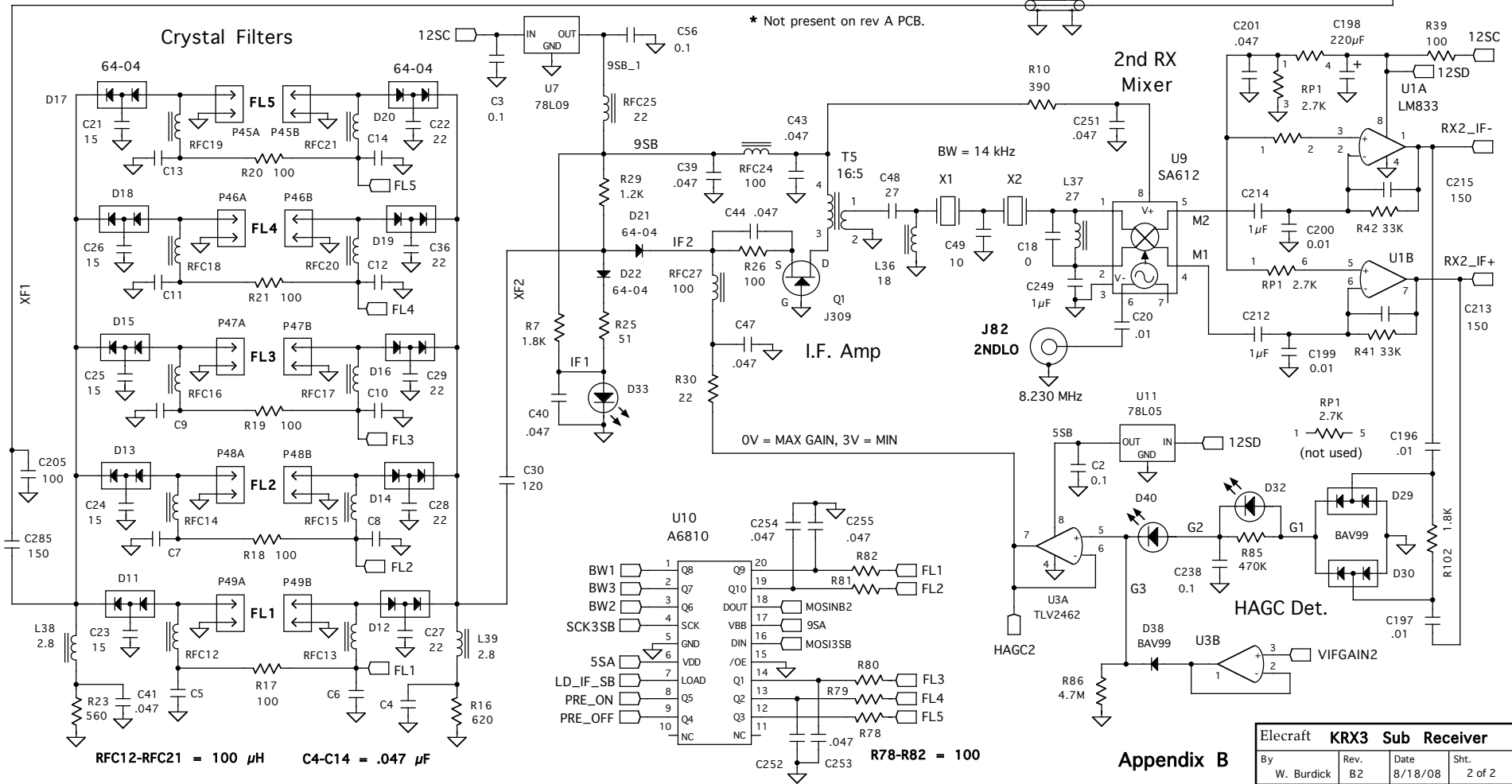
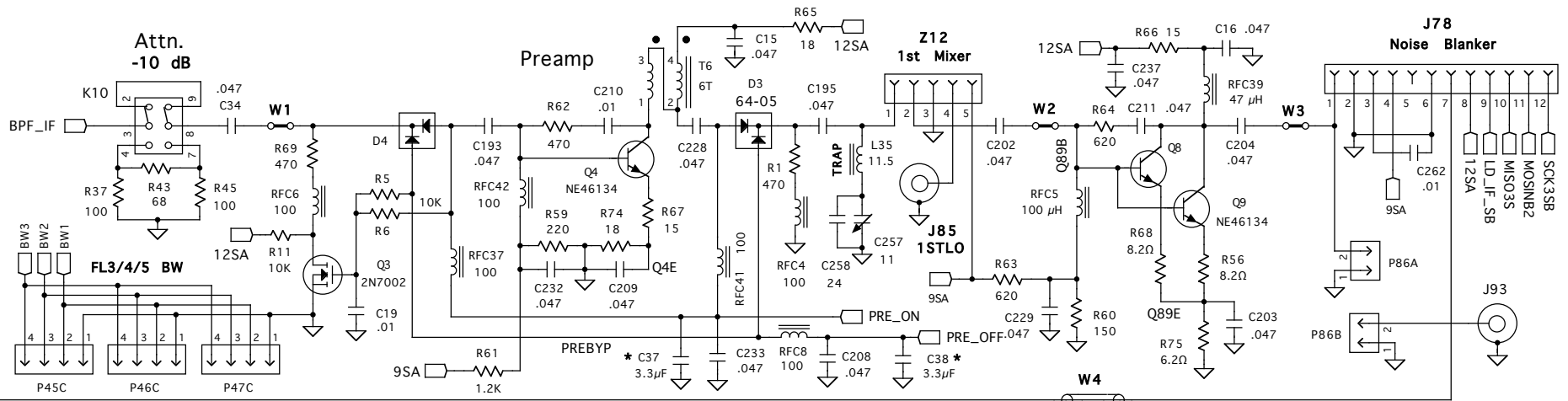


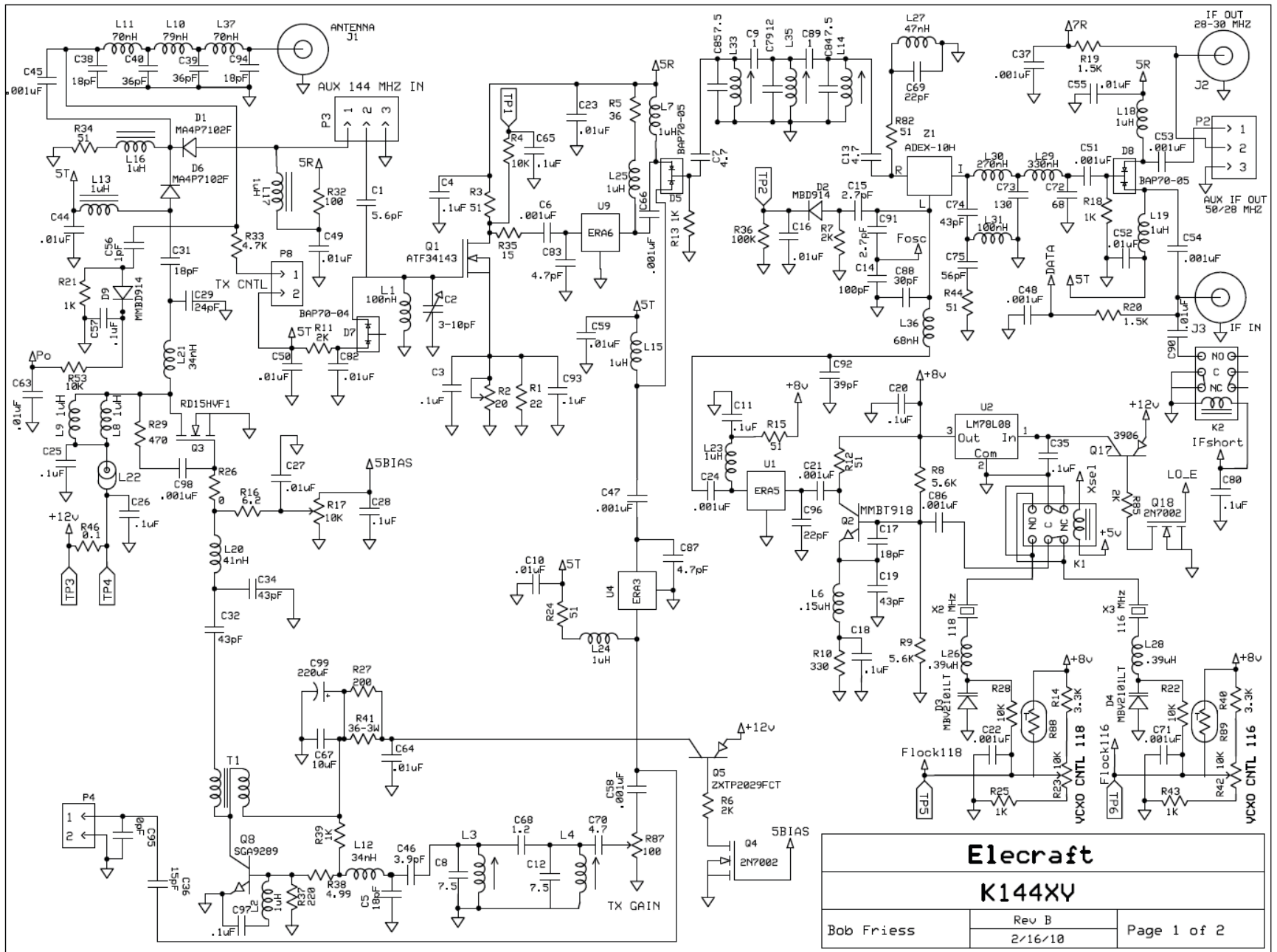
Elecraft SUBOUT Module			
By	Rev.	Date	Sht.
W. Burdick	B2	8/18/08	2 of 2



Appendix B

Elecraft KRX3 Sub Receiver			
By	Rev.	Date	Sht.
W. Burdick	B2	8/18/08	1 of 2





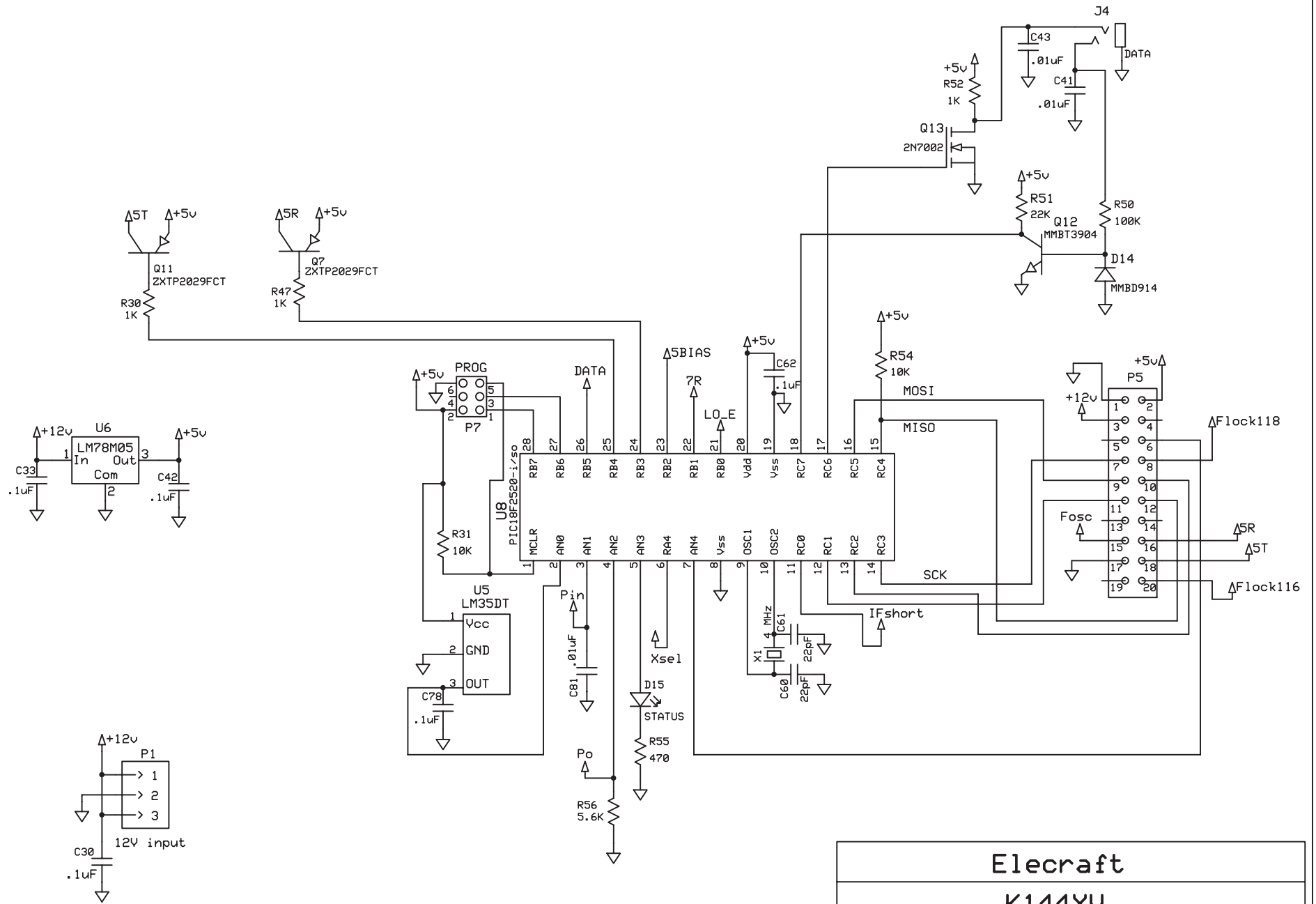
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K144XY

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