



K3S Schematic Files  
E740323, Rev A  
Release Date: July 24, 2017

# Elecraft K3S Schematics

This document contains the schematics for the Elecraft K3S Transceiver and its internal options. The schematics are preceded by a Block Diagram for context.

The schematics are ordered as the basic K3S/10, then various options.

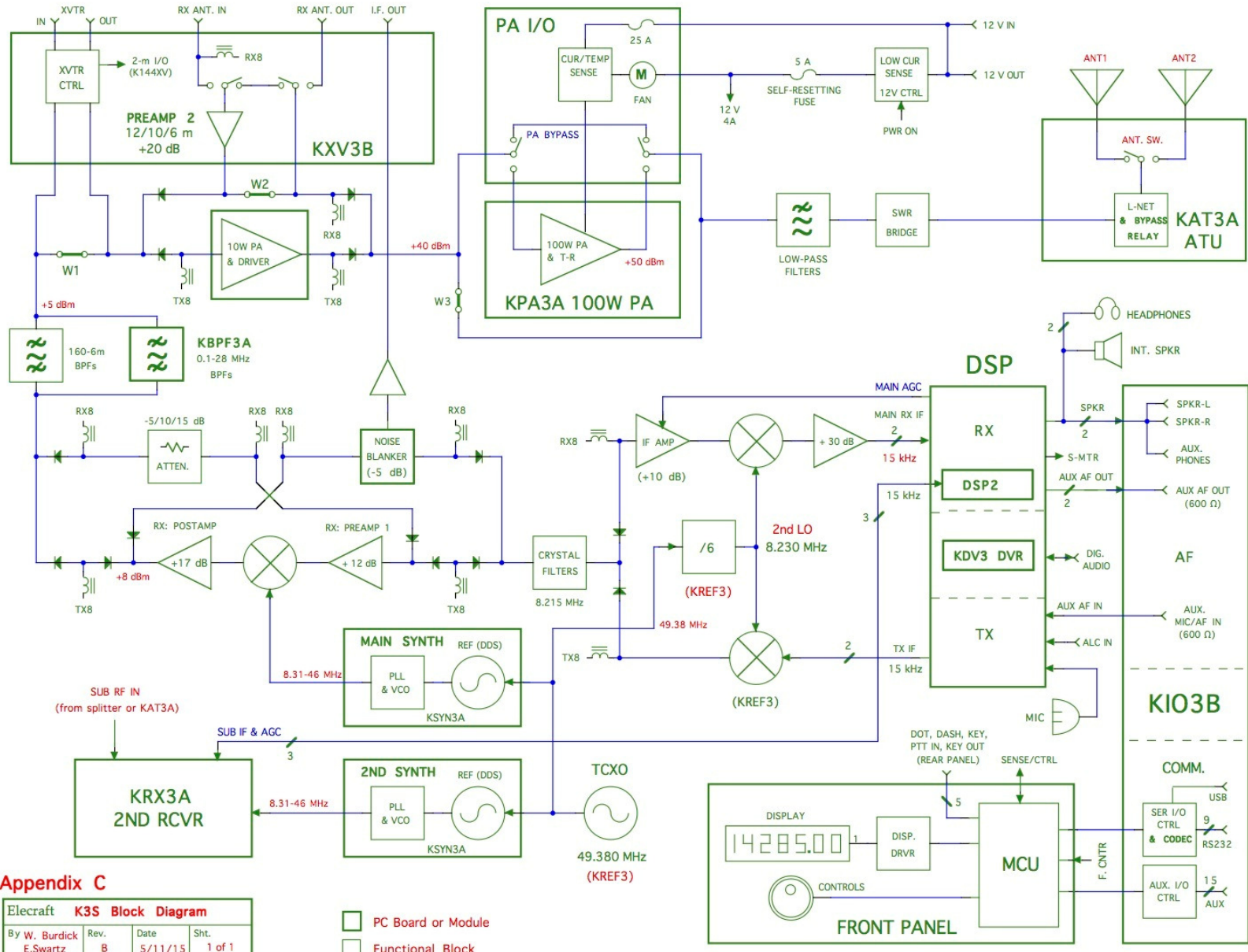
## BLOCK DIAGRAM

### K3S/10

RF Board	Main module
Mixer	High dynamic range 1 <sup>st</sup> mixer
Crystal Filter	Roofing filter
KIO3B	I/O module with USB
KXV3B	Transverter Interface, 12m-6m Preamp, Rx Ant Switch w/K144XV Support
KANT3	Antenna Connector if no KAT3 installed
KNB3	Pre-IF Noise Blanker
KREF3	Reference oscillator, Tx mixer/Filter, Rx 2 <sup>nd</sup> Mixer
KSYN3A	High-Performance Synthesizer
Front Panel	Control logic
DSP	Digital Signal Processing
10-watt PA	Low power amplifier

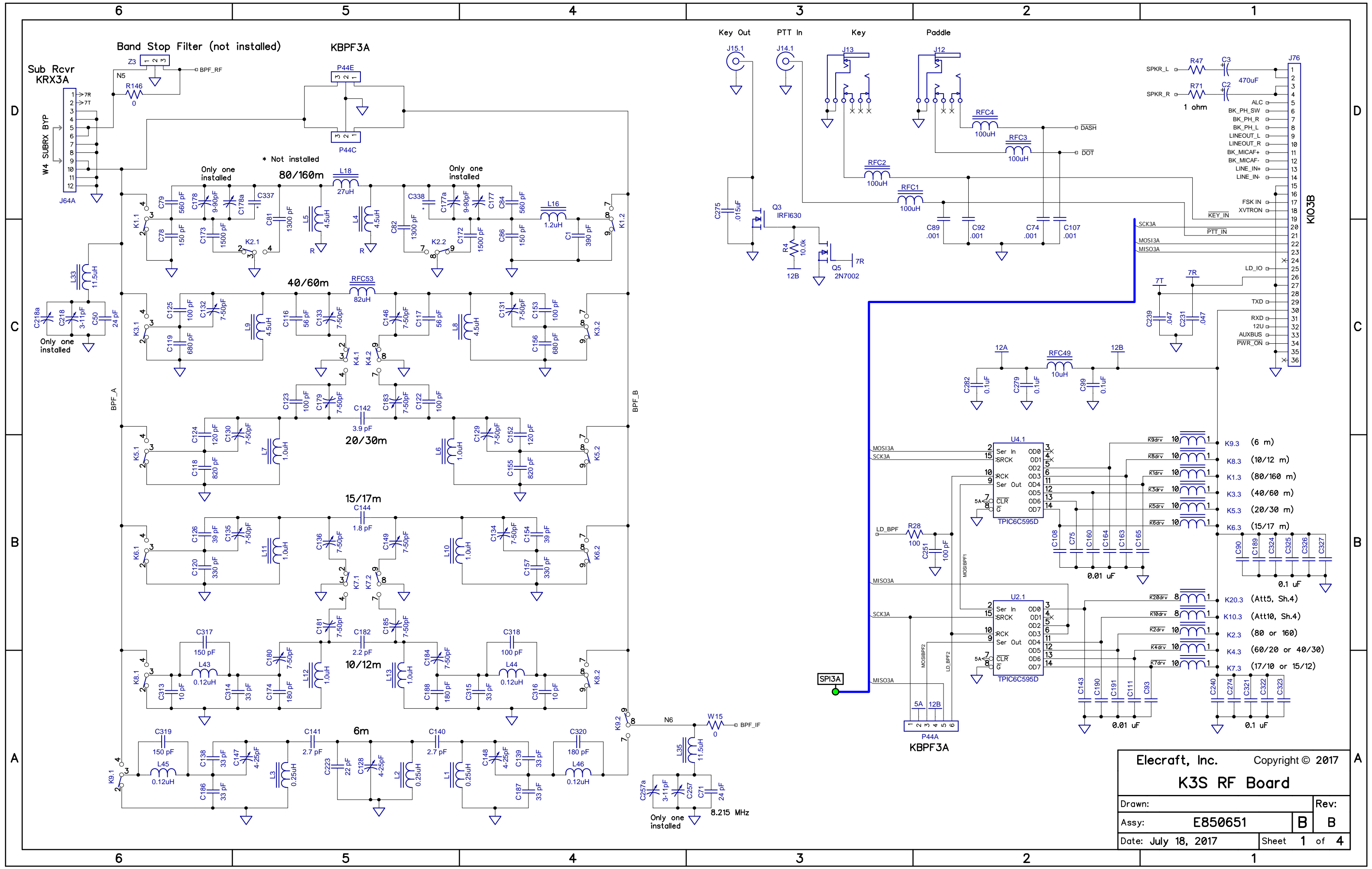
### OPTIONS

KBPF3A	General Coverage Receiver Bandpass Filters
KAT3A	100-watt Antenna Tuner
DVR	Digital Voice Record/Playback
KPAIO3 A	Part of 100-watt PA
KPA3A	Part of 100-watt PA (MOSFET)
AuxDSP	Part of KRX3 Second Receiver
KRX3A	Part of KRX3 Second Receiver
K3EXREF	Frequency Locking for Reference Oscillator
K144XV	Internal 2m Module
K144RFLK	Frequency Locking for K144XV

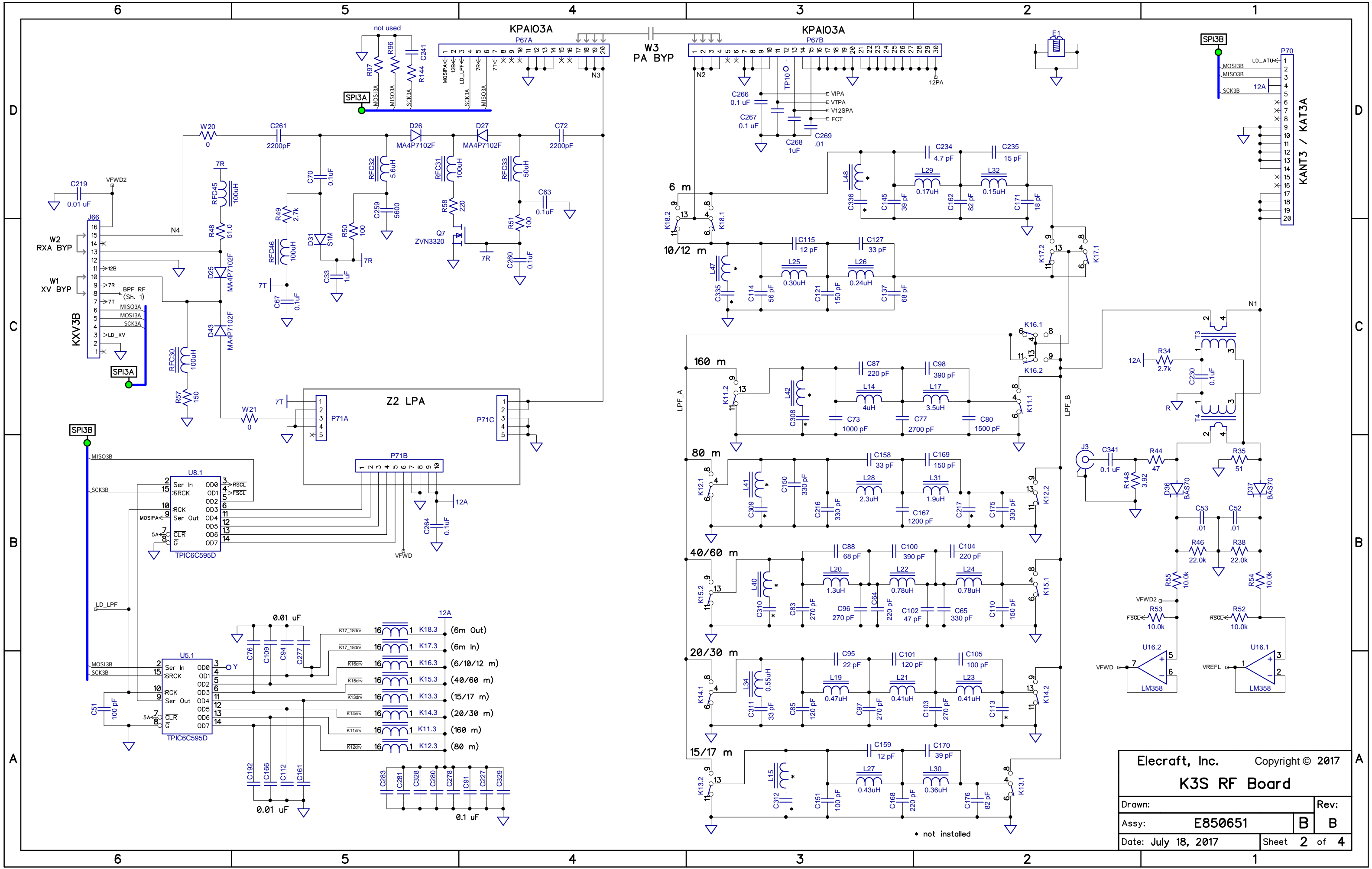


Elecraft K3S Block Diagram			
By W. Burdick	Rev. B	Date 5/11/15	Sht. 1 of 1
E.Swartz			

- PC Board or Module
- Functional Block



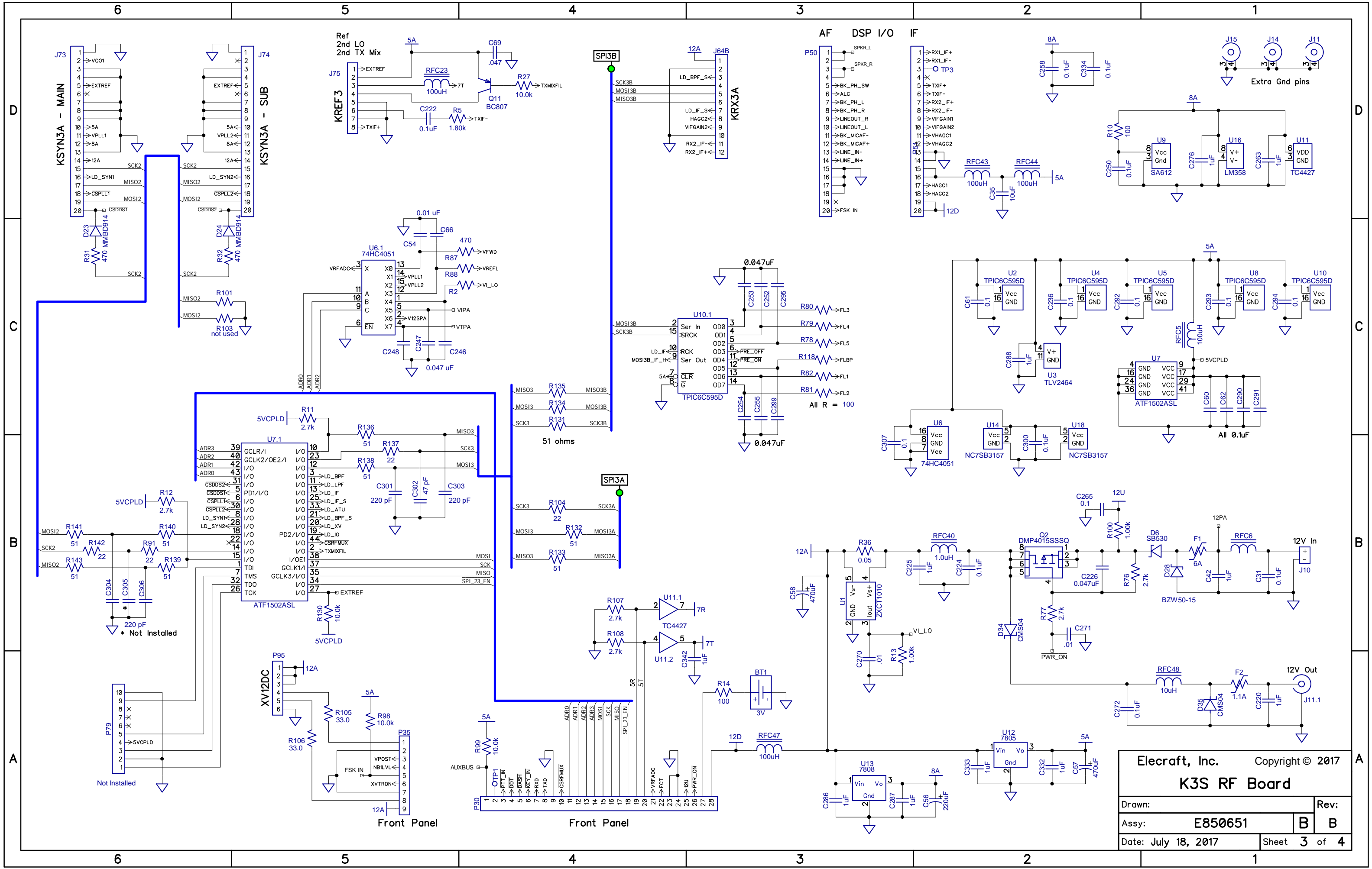
Elecraft, Inc. Copyright © 2017  
**K3S RF Board**  
 Drawn: \_\_\_\_\_ Rev: \_\_\_\_\_  
 Assy: **E850651** **B** **B**  
 Date: July 18, 2017 Sheet 1 of 4



Elecraft, Inc. Copyright © 2017  
**K3S RF Board**

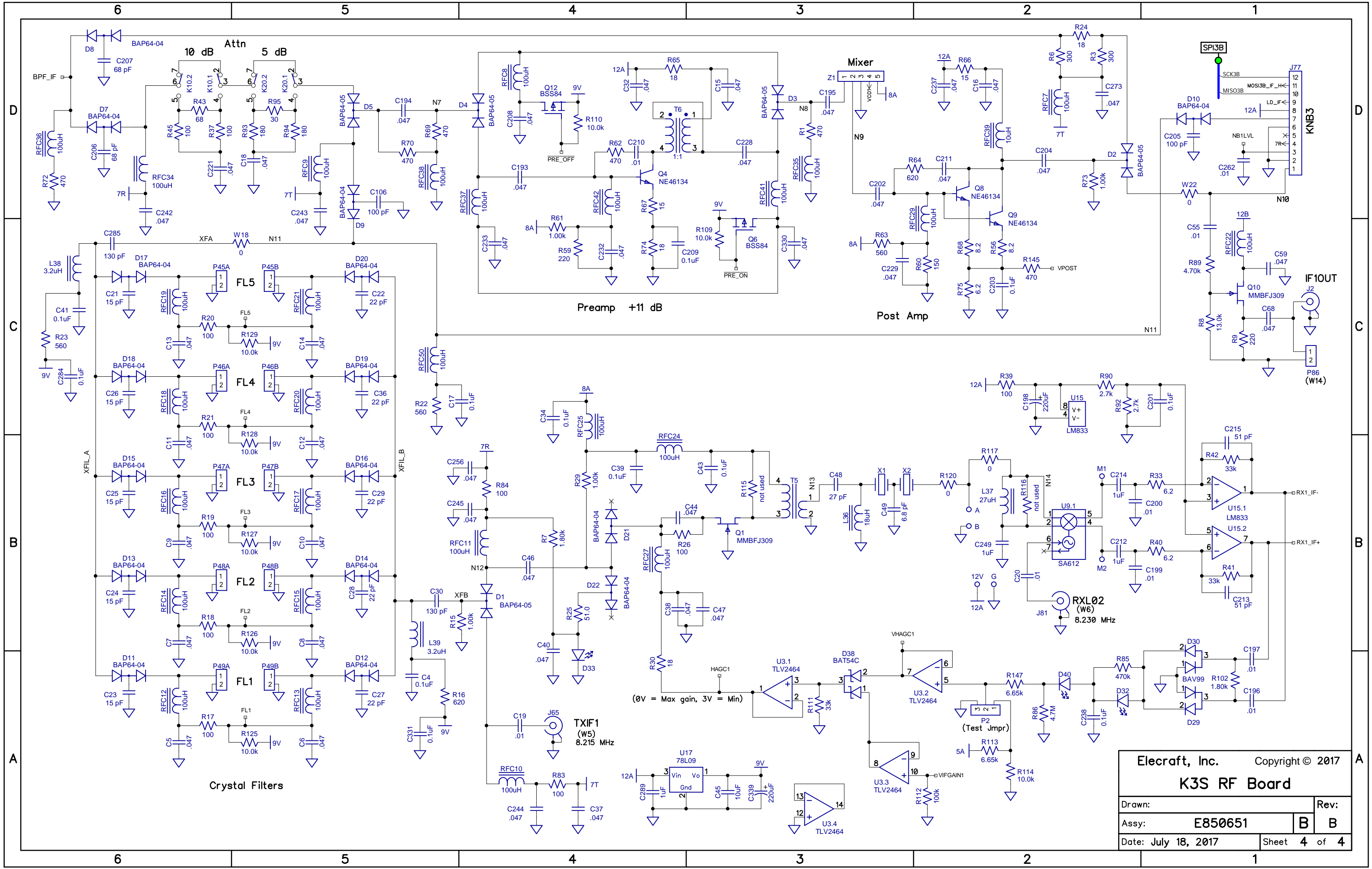
Drawn:		Rev:	
Assy:	<b>E850651</b>	<b>B</b>	<b>B</b>
Date: July 18, 2017		Sheet	2 of 4

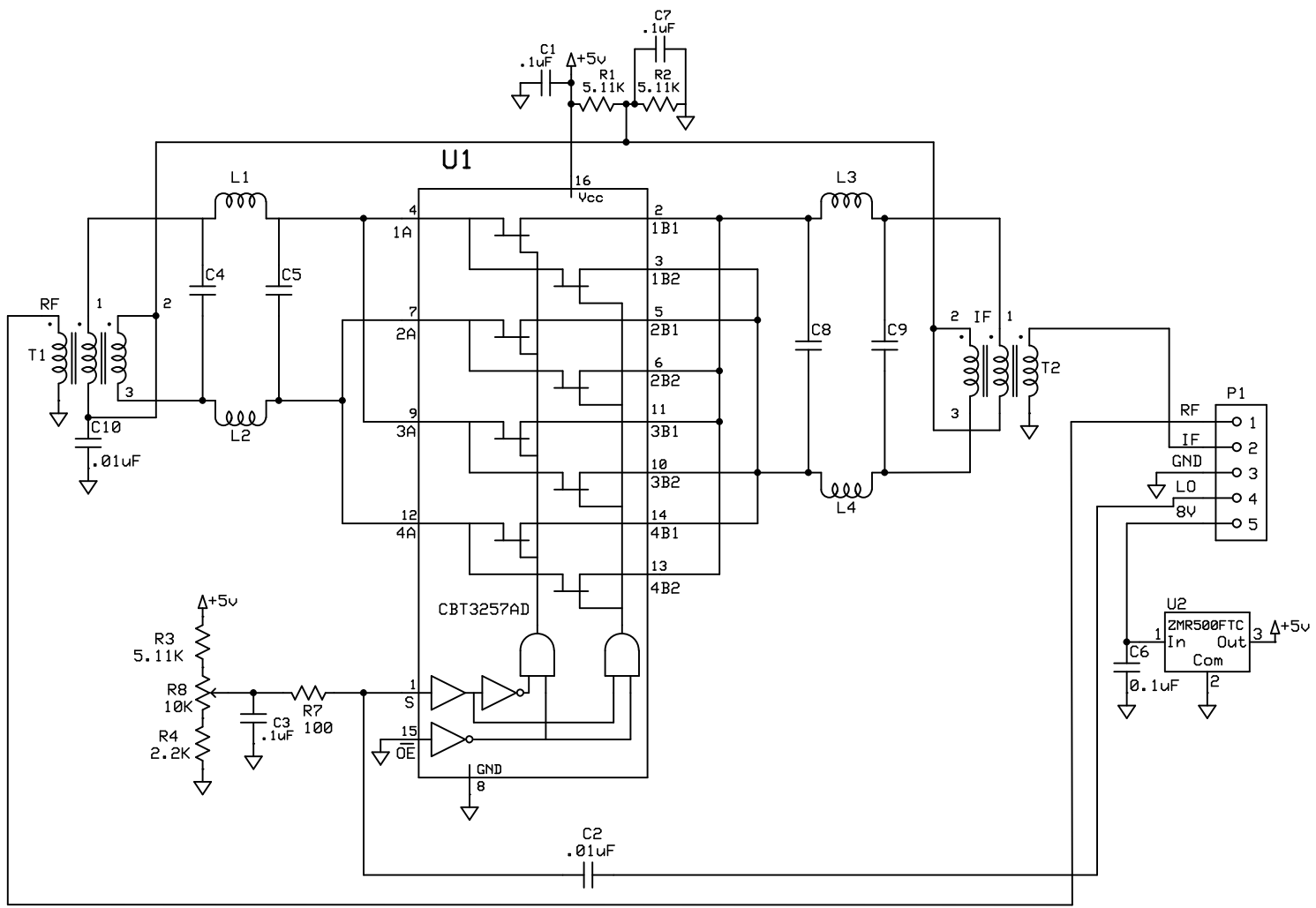
\* not installed



Elecraft, Inc. Copyright © 2017  
**K3S RF Board**  
 Drawn: \_\_\_\_\_ Rev: \_\_\_\_\_  
 Assy: **E850651** **B** **B**  
 Date: July 18, 2017 Sheet **3** of **4**

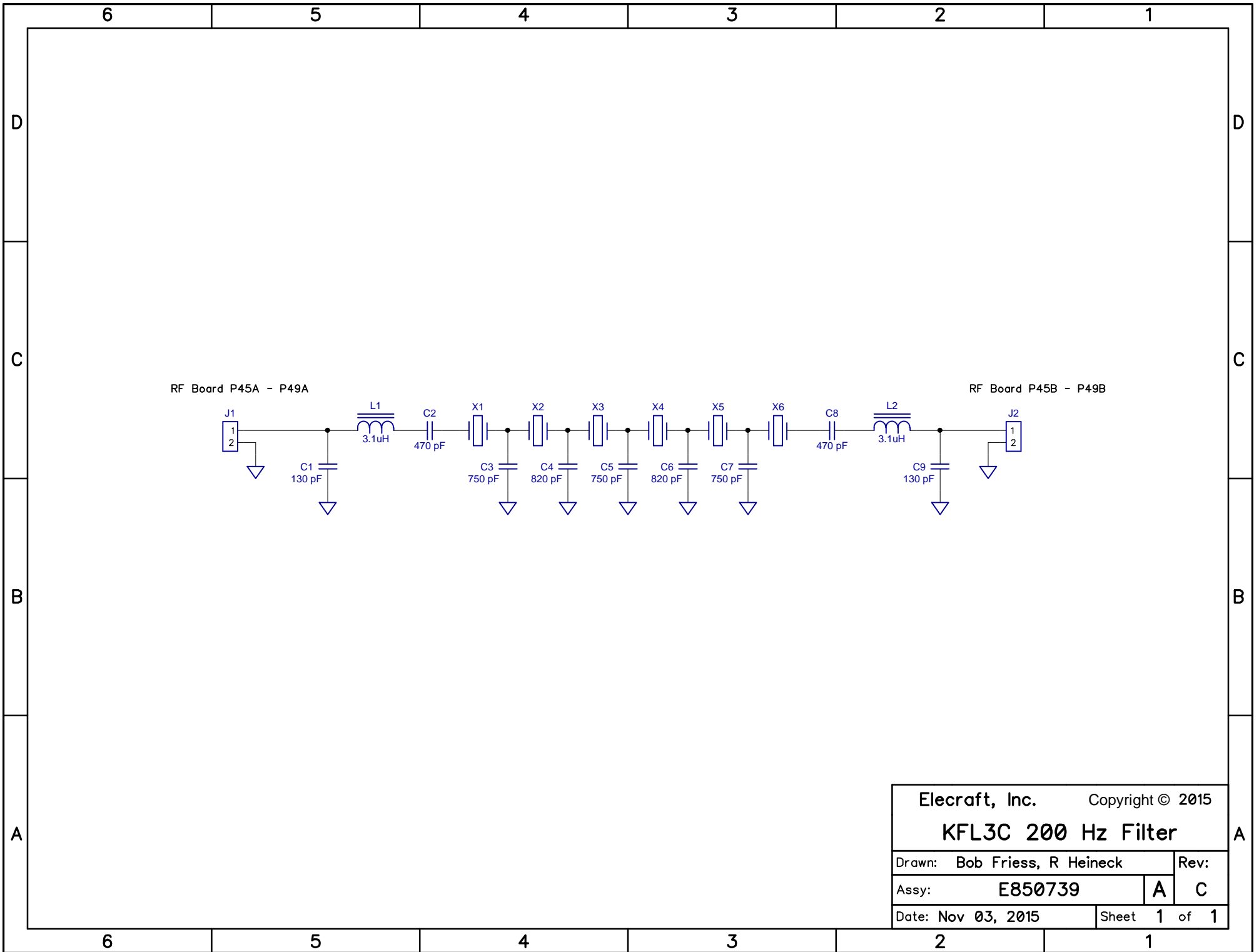






<b>Elecraft</b>		
<b>KR MIXER</b>		
W. Burdick	Rev XC	Page 1 of 1
	2/11/2007	

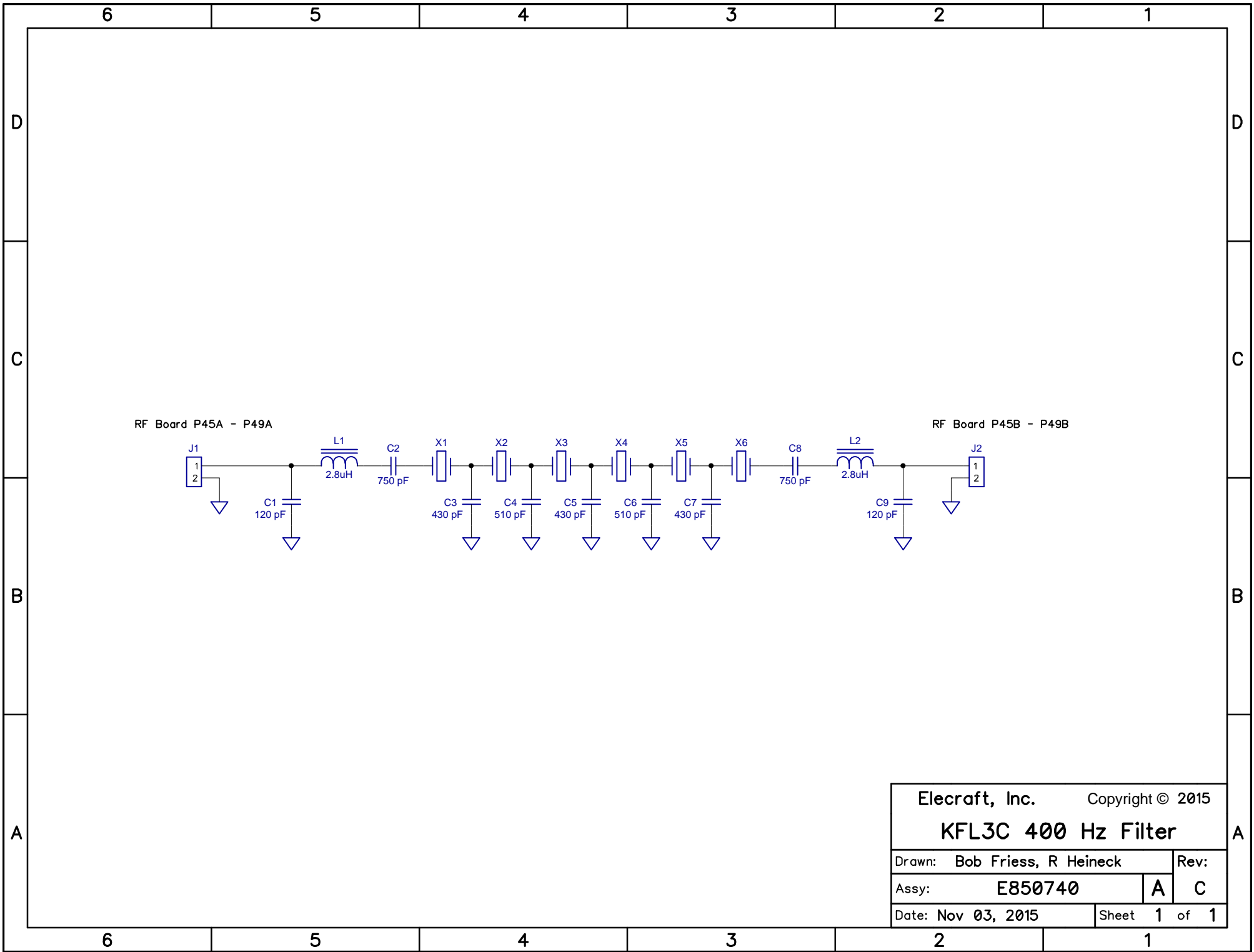




Elecraft, Inc. Copyright © 2015

**KFL3C 200 Hz Filter**

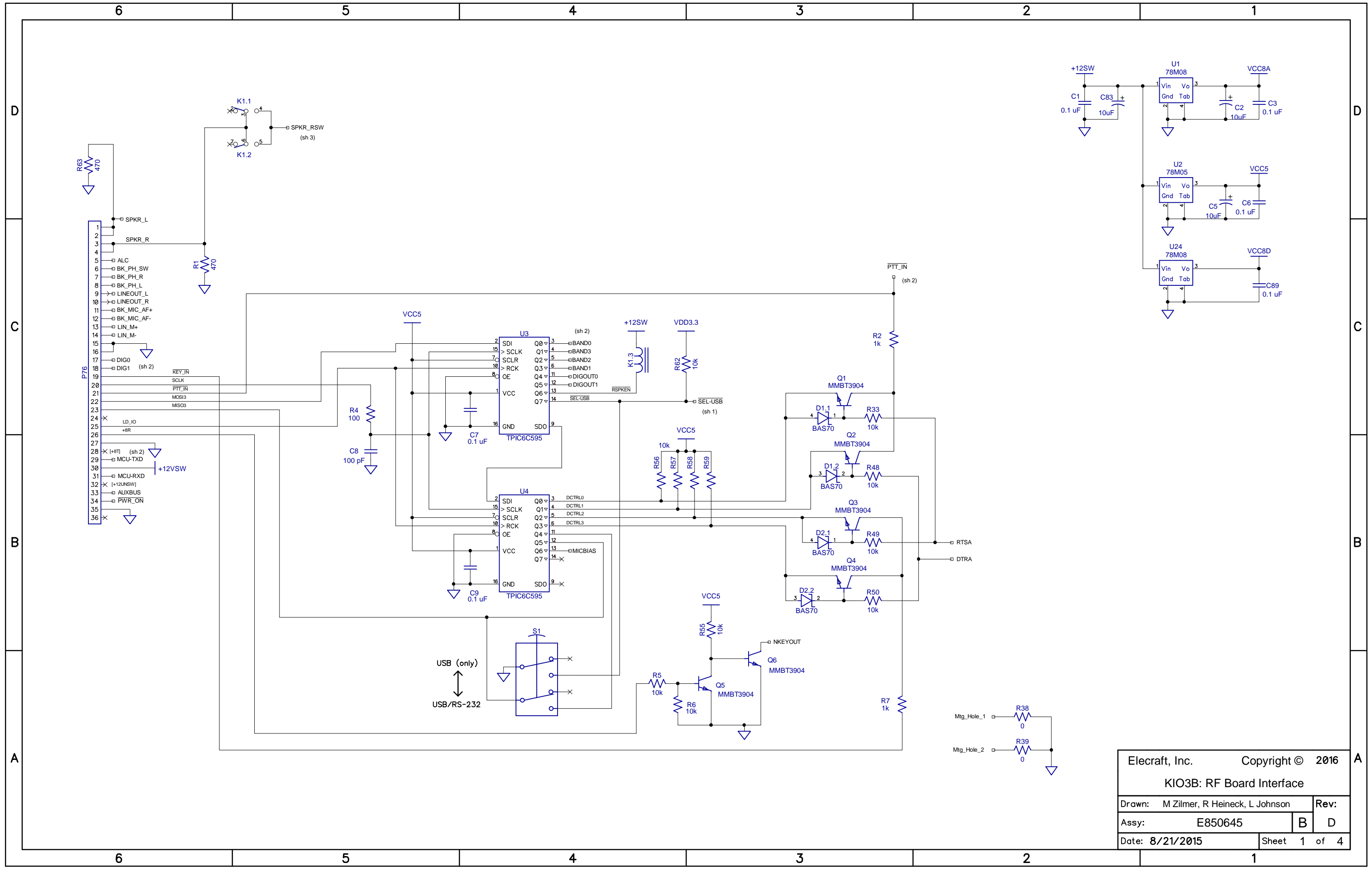
Drawn: Bob Friess, R Heineck		Rev:	
Assy: E850739		A	C
Date: Nov 03, 2015		Sheet 1 of 1	



Elecraft, Inc. Copyright © 2015

**KFL3C 400 Hz Filter**

Drawn: Bob Friess, R Heineck		Rev:	
Assy: E850740		A	C
Date: Nov 03, 2015		Sheet 1 of 1	



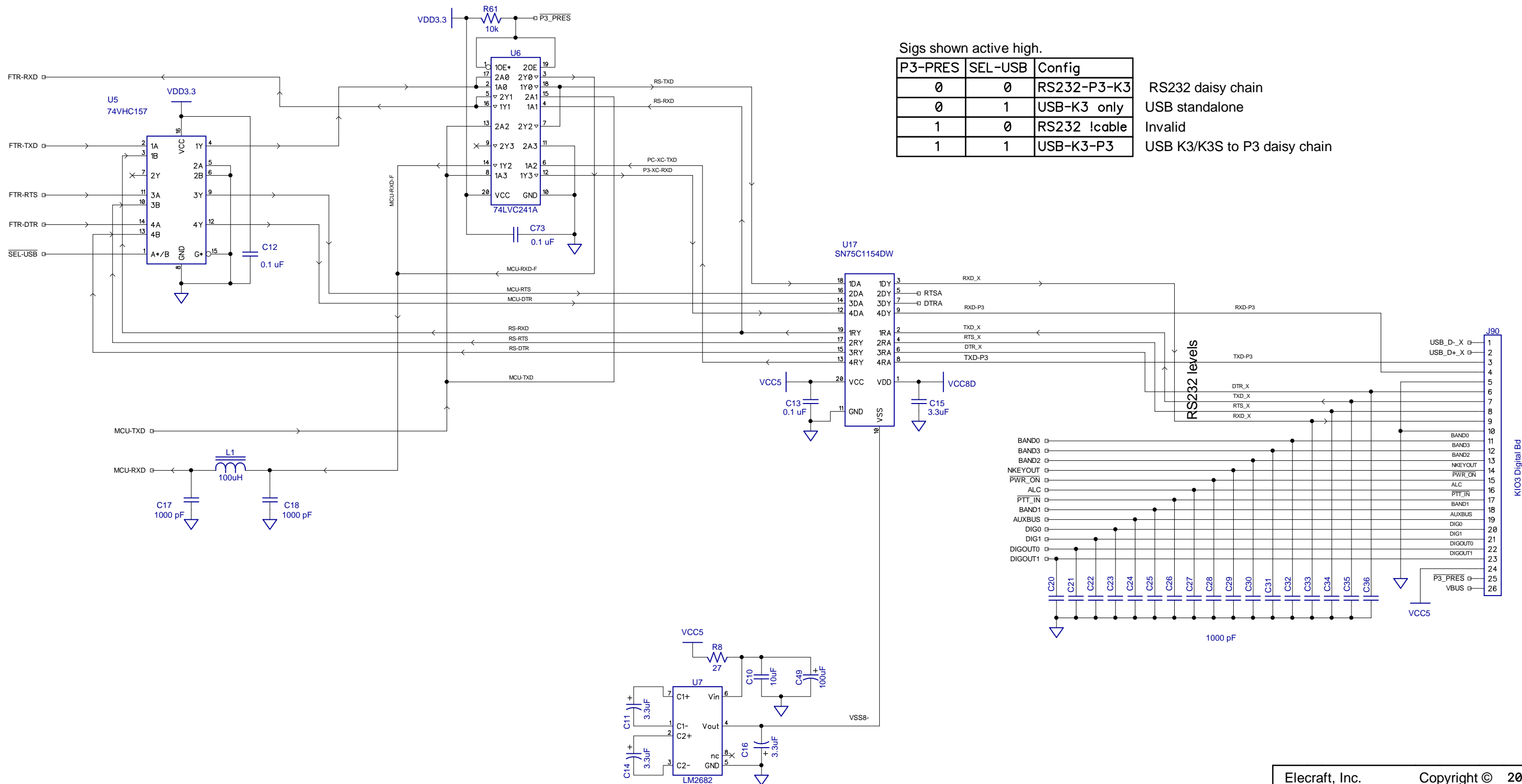
Elecrafit, Inc. Copyright © 2016	
KIO3B: RF Board Interface	
Drawn: M Zilmer, R Heineck, L Johnson	Rev:
Assy: E850645	B D
Date: 8/21/2015	Sheet 1 of 4

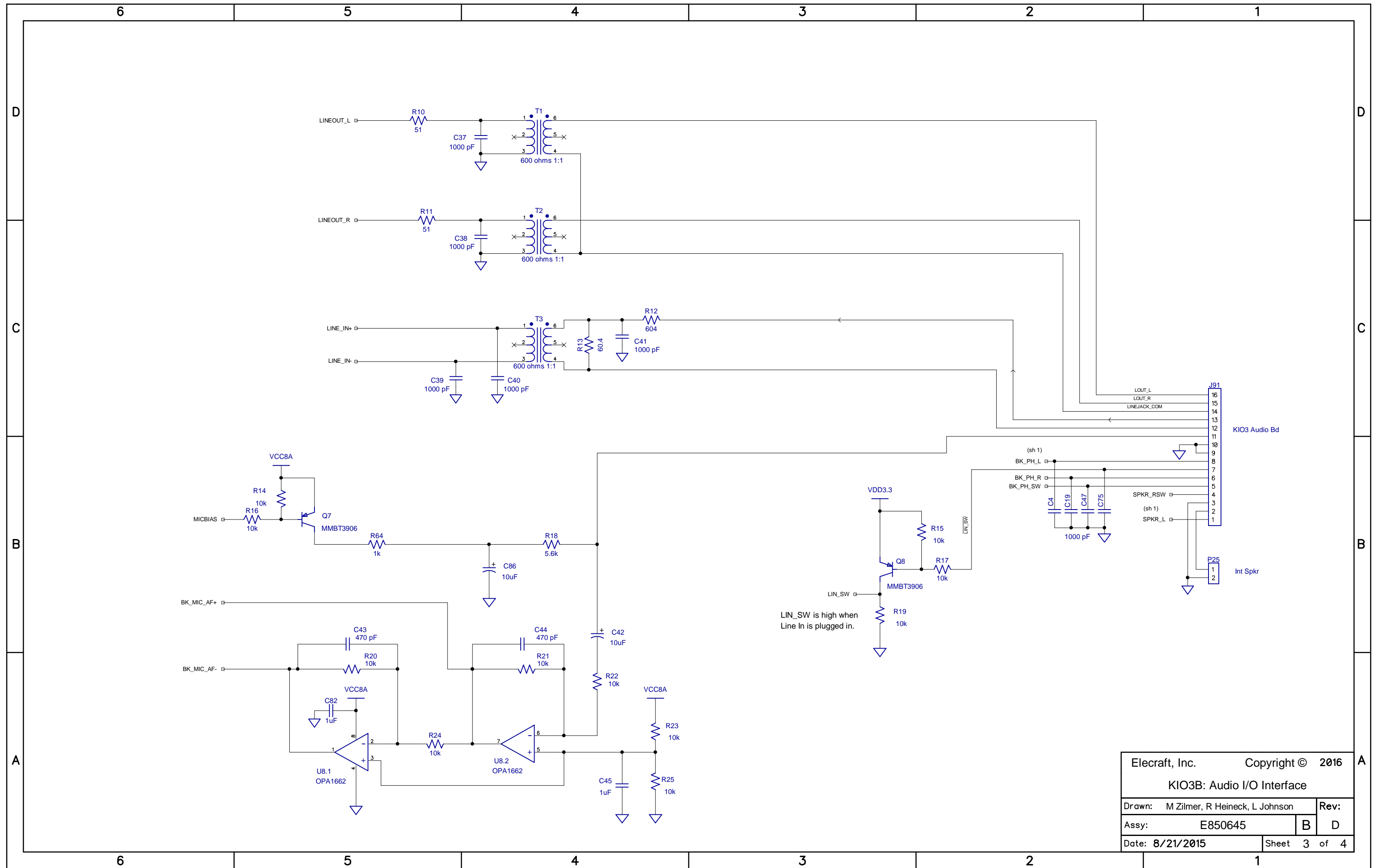
MCU-TXD drives both FT232R and RS232  
only if P3-PRES == 1. Else MCU-TXD drives only FT232R.

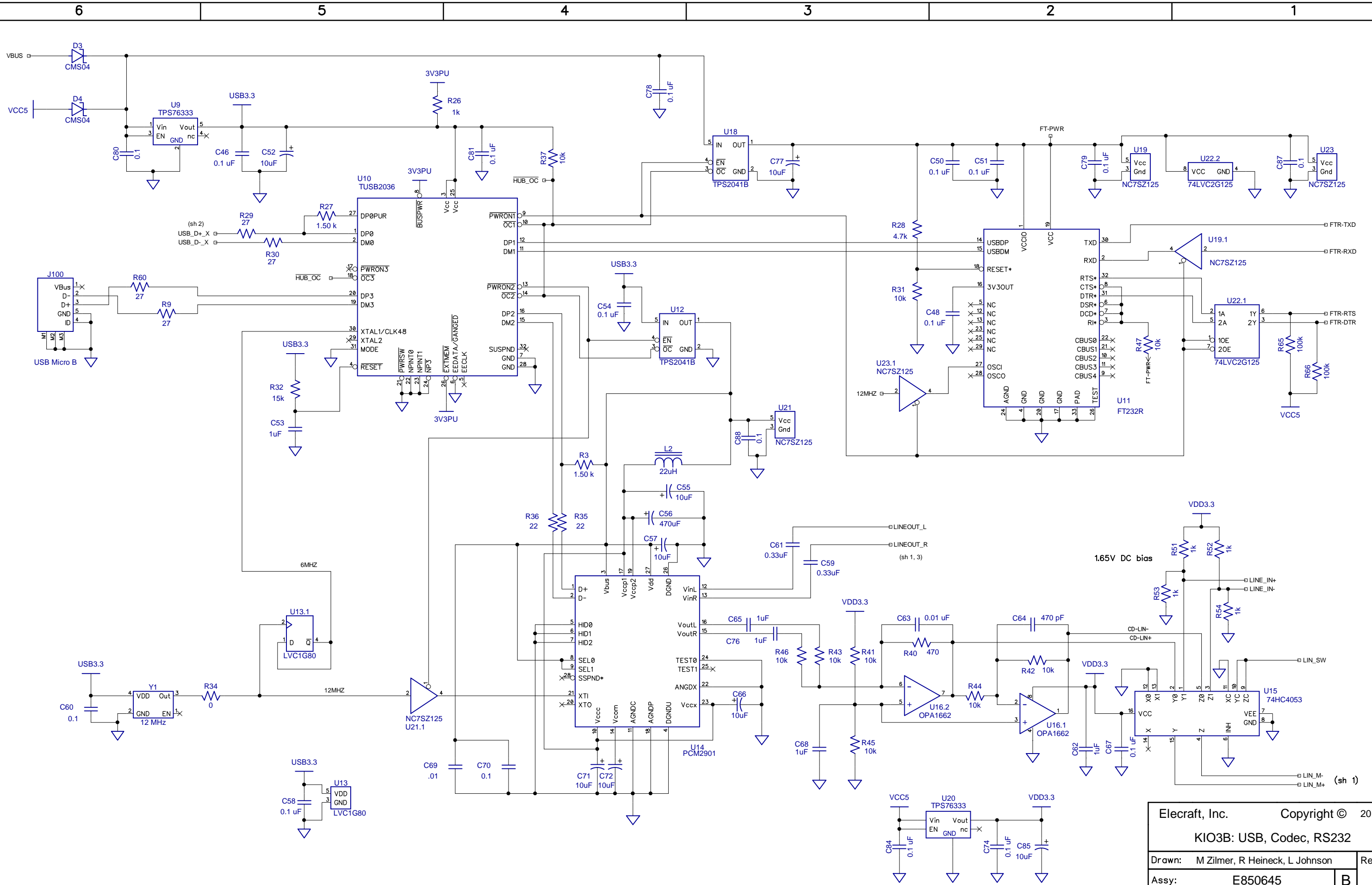
Sigs shown active high.

P3-PRES	SEL-USB	Config
0	0	RS232-P3-K3
0	1	USB-K3 only
1	0	RS232 l cable
1	1	USB-K3-P3

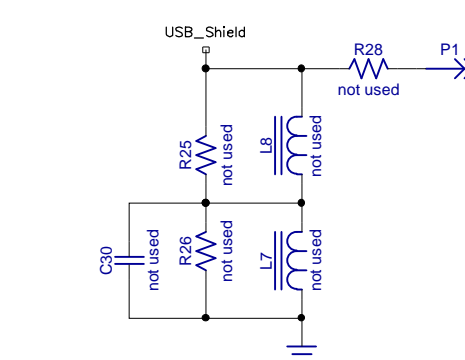
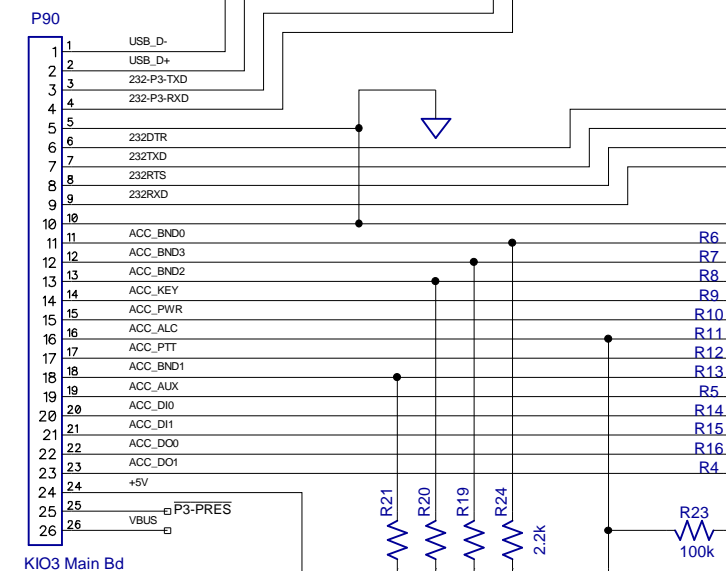
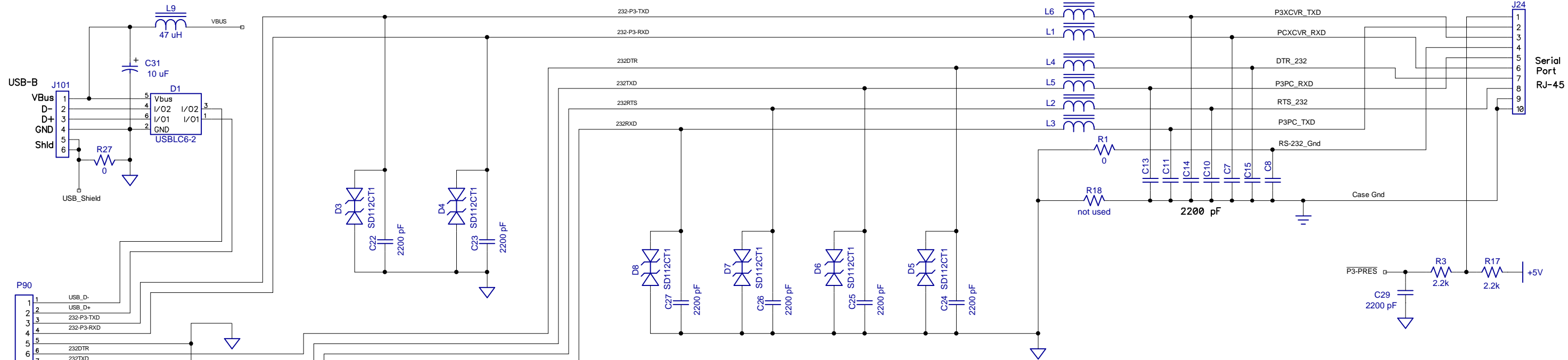
RS232 daisy chain  
USB standalone  
Invalid  
USB K3/K3S to P3 daisy chain







Elecraft, Inc. Copyright © 2016  
**KIO3B: USB, Codec, RS232**  
 Drawn: M Zilmer, R Heineck, L Johnson Rev:  
 Assy: E850645 B D  
 Date: 8/21/2015 Sheet 4 of 4



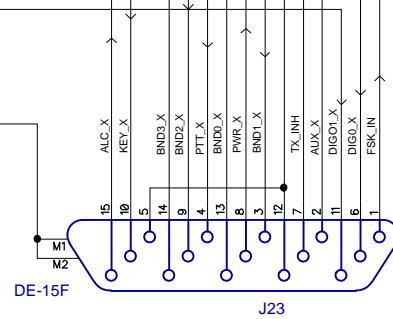
J24 Connection to P3 using P3 Cable (PC via USB)

Pin	Function	Direction
1	P3 Present	Grounded in cable
2	PC TXD	Out to P3/PC-3
3	K3S RX	In From P3/XCVR-3
4	Signal Ground	
5	PC RXD	In From P3/PC-2
6	K3S TX	Out to P3/XCVR-2
7	DTR	n.c.
8	RTS	n.c.

J24 Connection to PC RS-232 using Std Cable

Pin	Function	Direction
1	P3 Present	n.c.
2	K3S TX	Out to PC
3		n.c.
4	Signal Ground	
5	K3S RX	In From PC
6		n.c.
7	DTR	In From PC
8	RTS	In From PC

ACC Pin	Function	Direction
1	FSK In	In
2	Aux Bus	In / Out
3	Band Out 1	Out
4	PTT In	Out
5	Common	
6	Dig Out 0	Out
7	K3 On / TX INH	Out / In
8	Power On	In
9	Band Out 2	Out
10	Key Out LP	Out
11	Dig Out 1	Out
12	Common	
13	Band Out 0	Out
14	Band Out 3	Out
15	ALC In	In



**Elecraft, Inc.** Copyright © 2015

**KIO3B Digital I/O Module**

Drawn: M Zilmer, R Heineck      Rev:

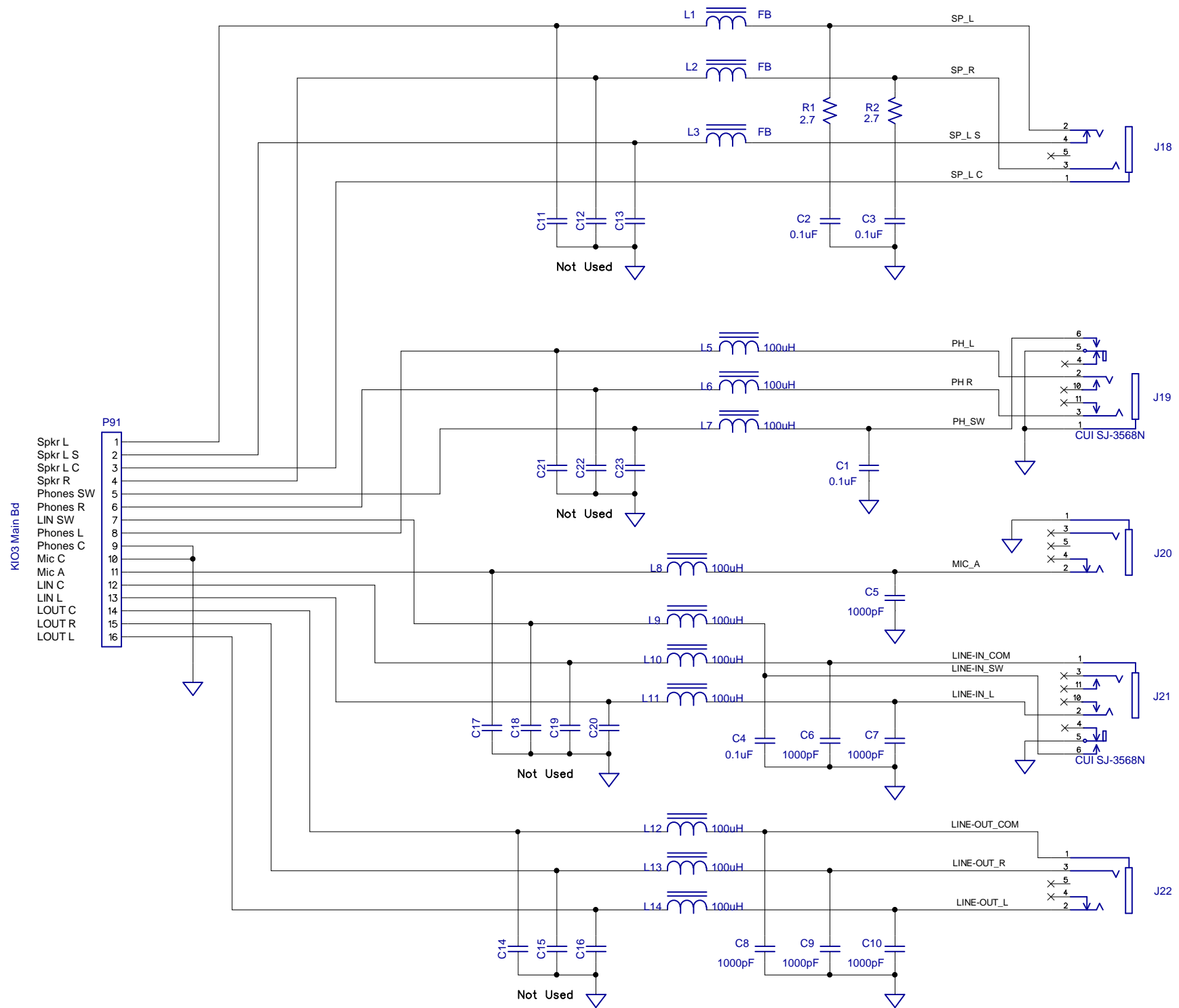
Assy: **E850646**      B      B

Date: 05/15/2015      Sheet 1 of 1

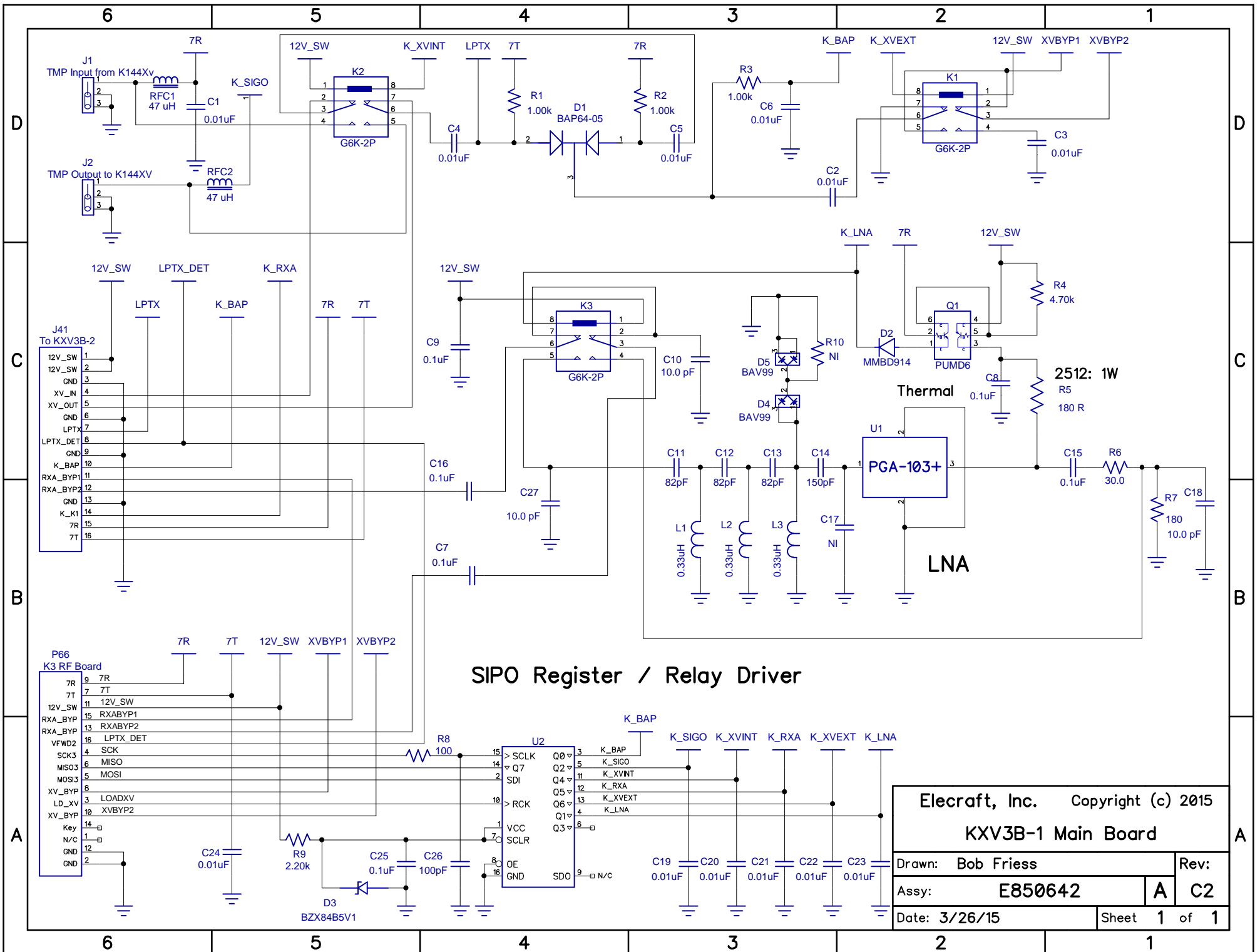


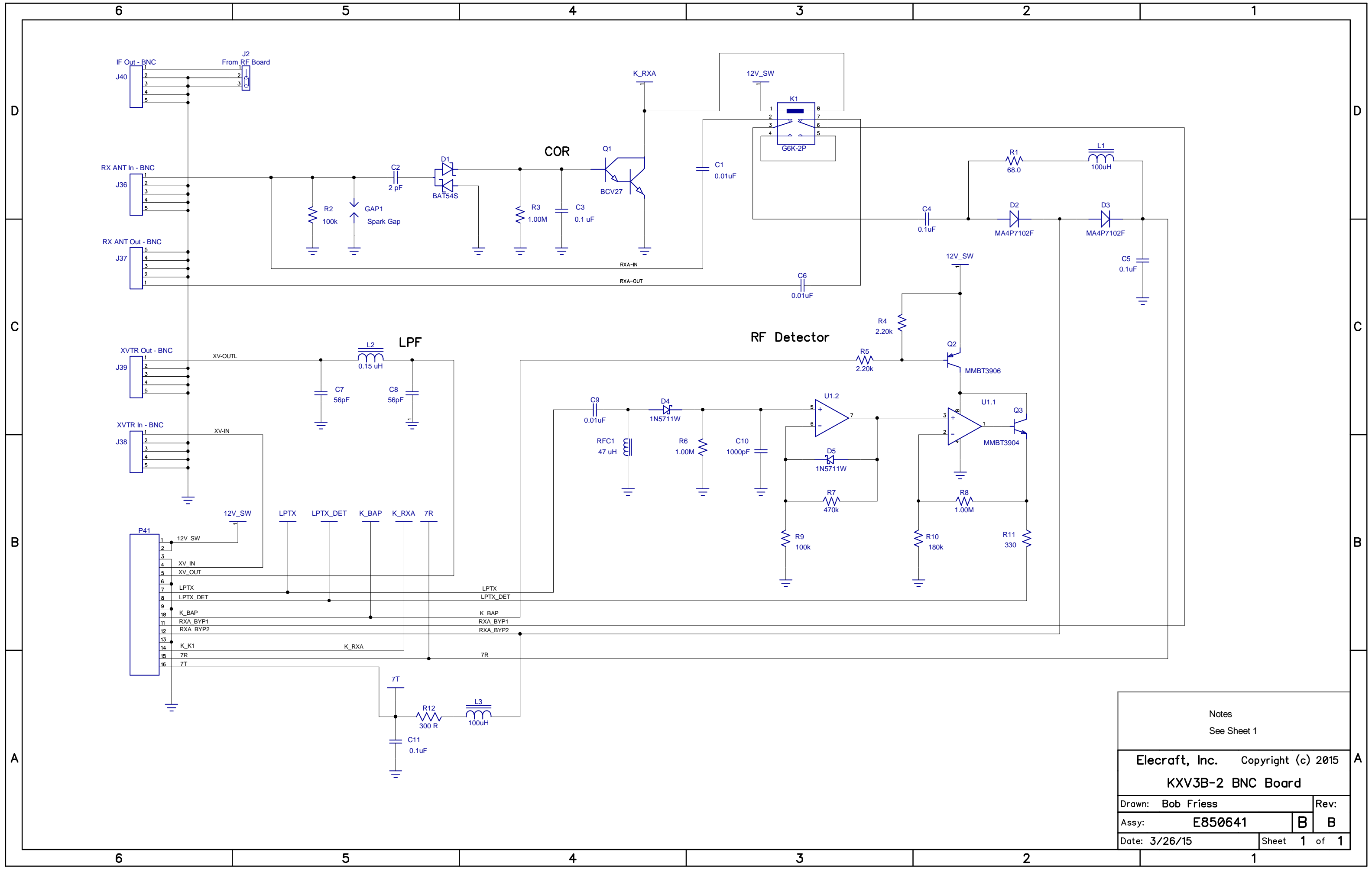
KIO3B Main Bd

1	Spkr L
2	Spkr L S
3	Spkr L C
4	Spkr R
5	Phones SW
6	Phones R
7	LIN SW
8	Phones L
9	Phones C
10	Mic C
11	Mic A
12	LIN C
13	LIN L
14	LOUT C
15	LOUT R
16	LOUT L

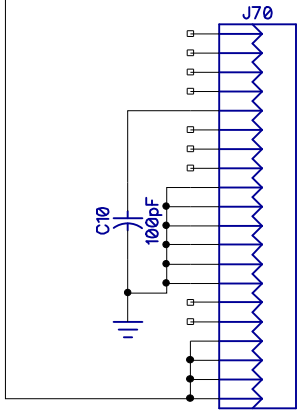


Elecraft, Inc. Copyright © 2015	
KIO3B Audio I/O Module	
Drawn: M Zilmer, R Heineck	Rev: B B
Assy: E850647	
Date: 5/21/2015	Sheet 1 of 1

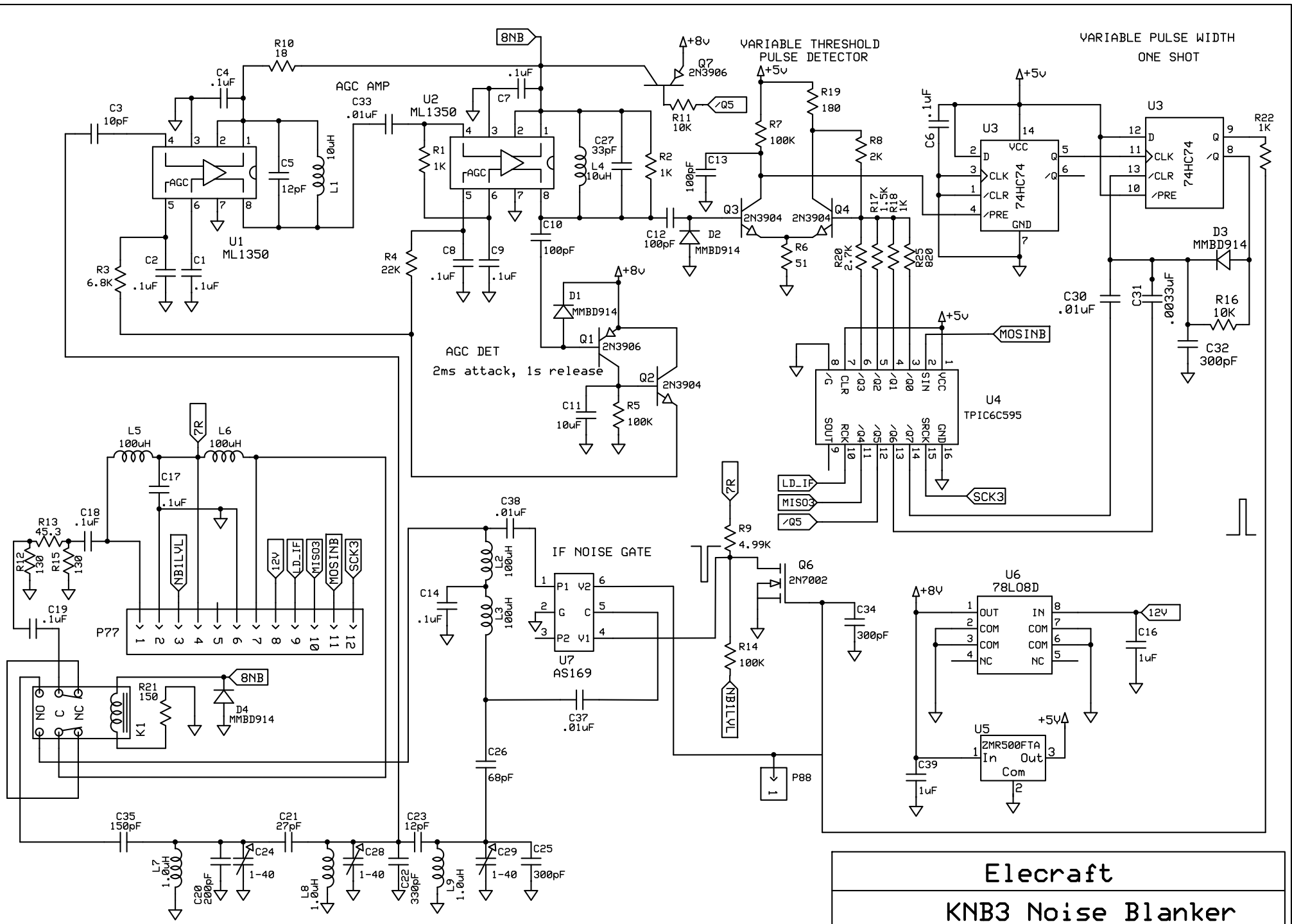




Notes See Sheet 1	
Elecraft, Inc. Copyright (c) 2015	
KXV3B-2 BNC Board	
Drawn: Bob Friess	Rev:
Assy: E850641	B B
Date: 3/26/15	Sheet 1 of 1

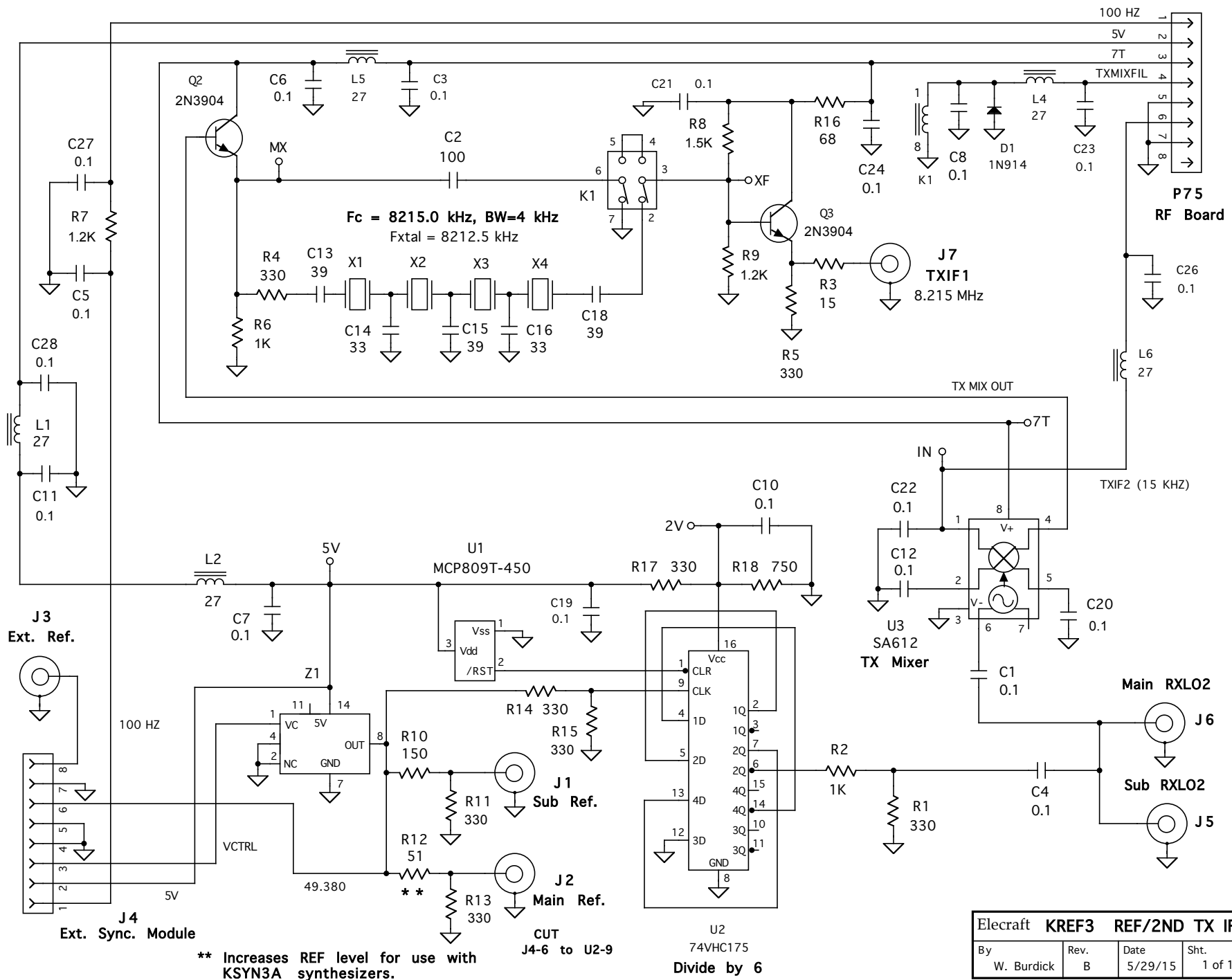


Elecrafft, Inc. Copyright (c) 2014	
<b>KANT3</b>	
Drawn: Bob Friess	Rev:
Assy: E850248	<b>A A3</b>
Date: 6/9/15	Sheet: 1 of 1

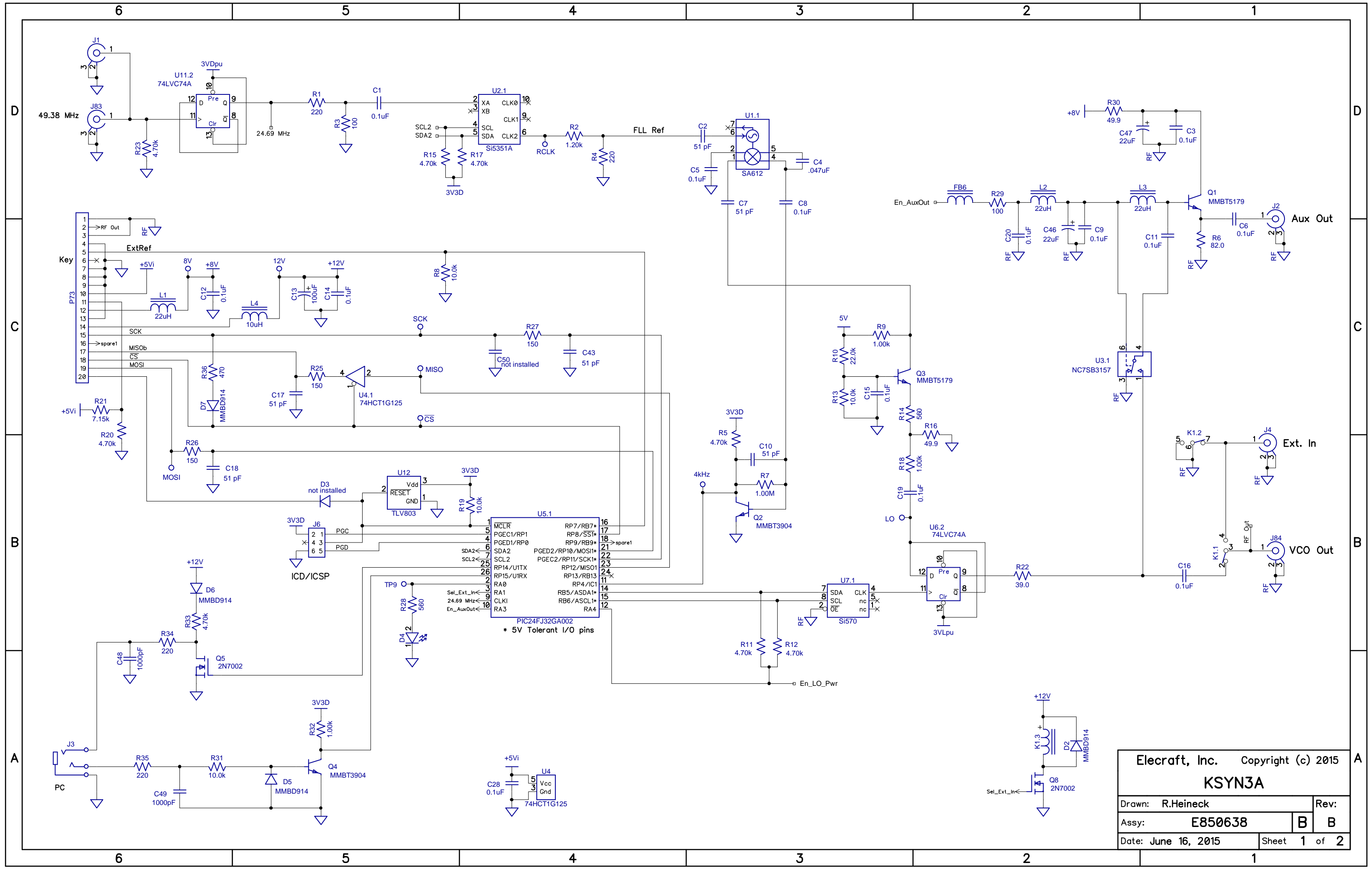


L7,L8,L9 17T #22 on T37-7

<b>Elecraft</b>		
<b>KNB3 Noise Blanker</b>		
R. Friess W. Burdick	Rev D2 4/27/2016	Page 1 of 1

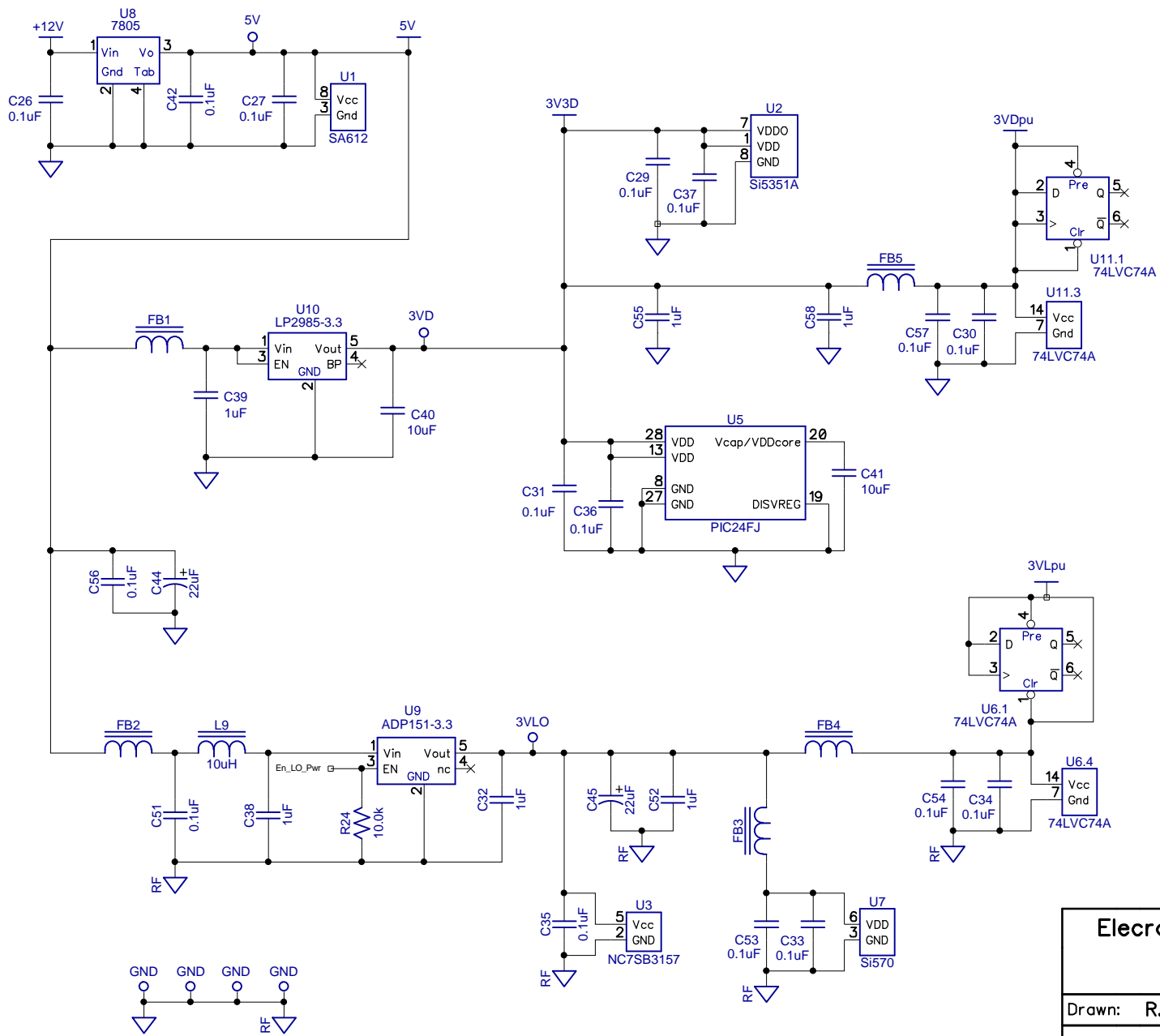


Elecraft <b>KREF3 REF/2ND TX IF</b>			
By W. Burdick	Rev. B	Date 5/29/15	Sht. 1 of 1



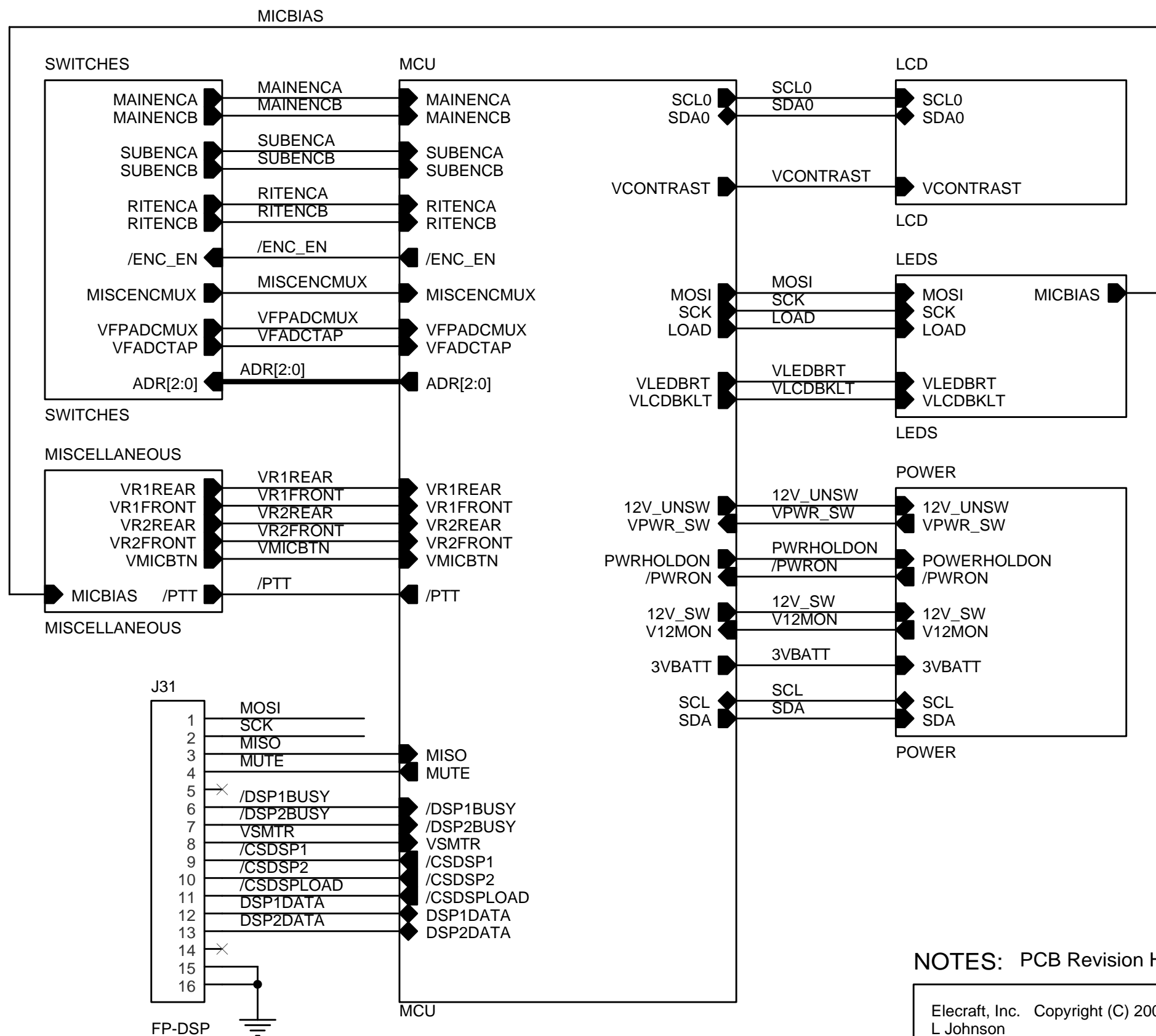
Elecraft, Inc. Copyright (c) 2015  
**KSYN3A**  
 Drawn: R.Heineck Rev:  
 Assy: **E850638** B B  
 Date: June 16, 2015 Sheet 1 of 2





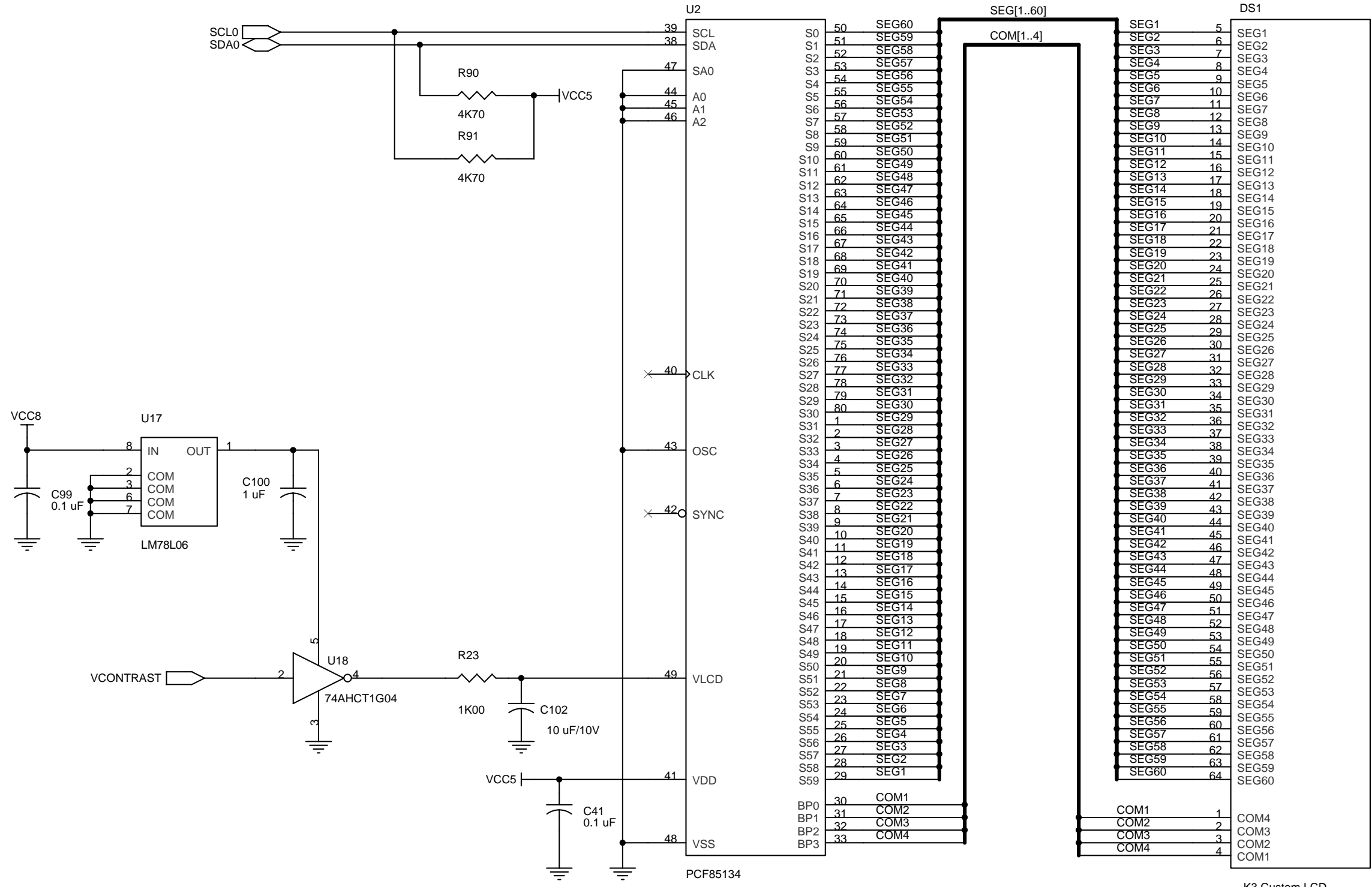
Elecraft, Inc. Copyright (c) 2014  
**KSYN3A**

Drawn: R.Heineck		Rev:	
Assy: E850638		A	B
Date: September 4, 2014		Sheet 2 of 2	

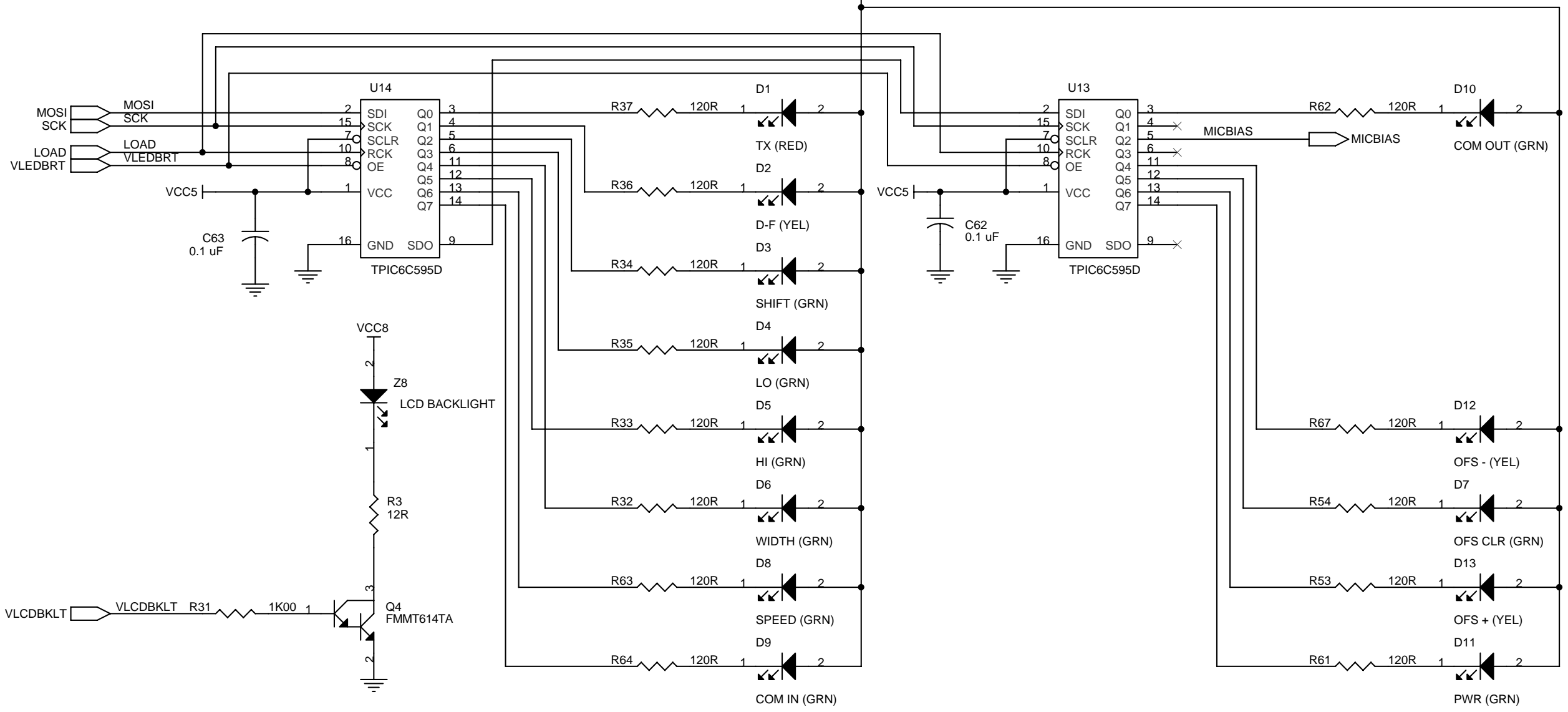


**NOTES:** PCB Revision H

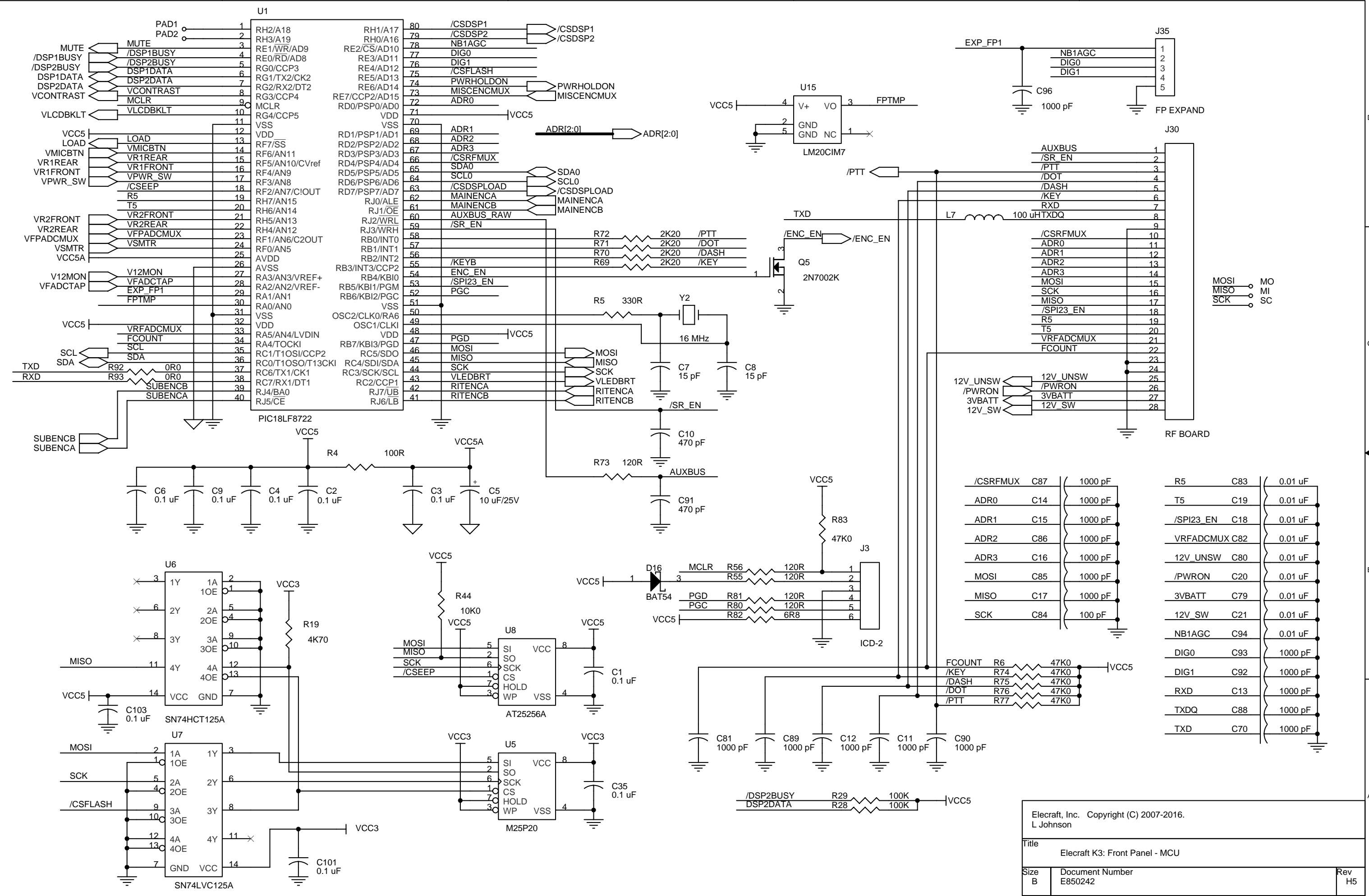
Elecraft, Inc. Copyright (C) 2007-2016. L Johnson		
Title Elecraft K3: Front Panel		
Size A	Document Number E850242	Rev H5
Date:	Tuesday, April 26, 2016	Sheet 1 of 7



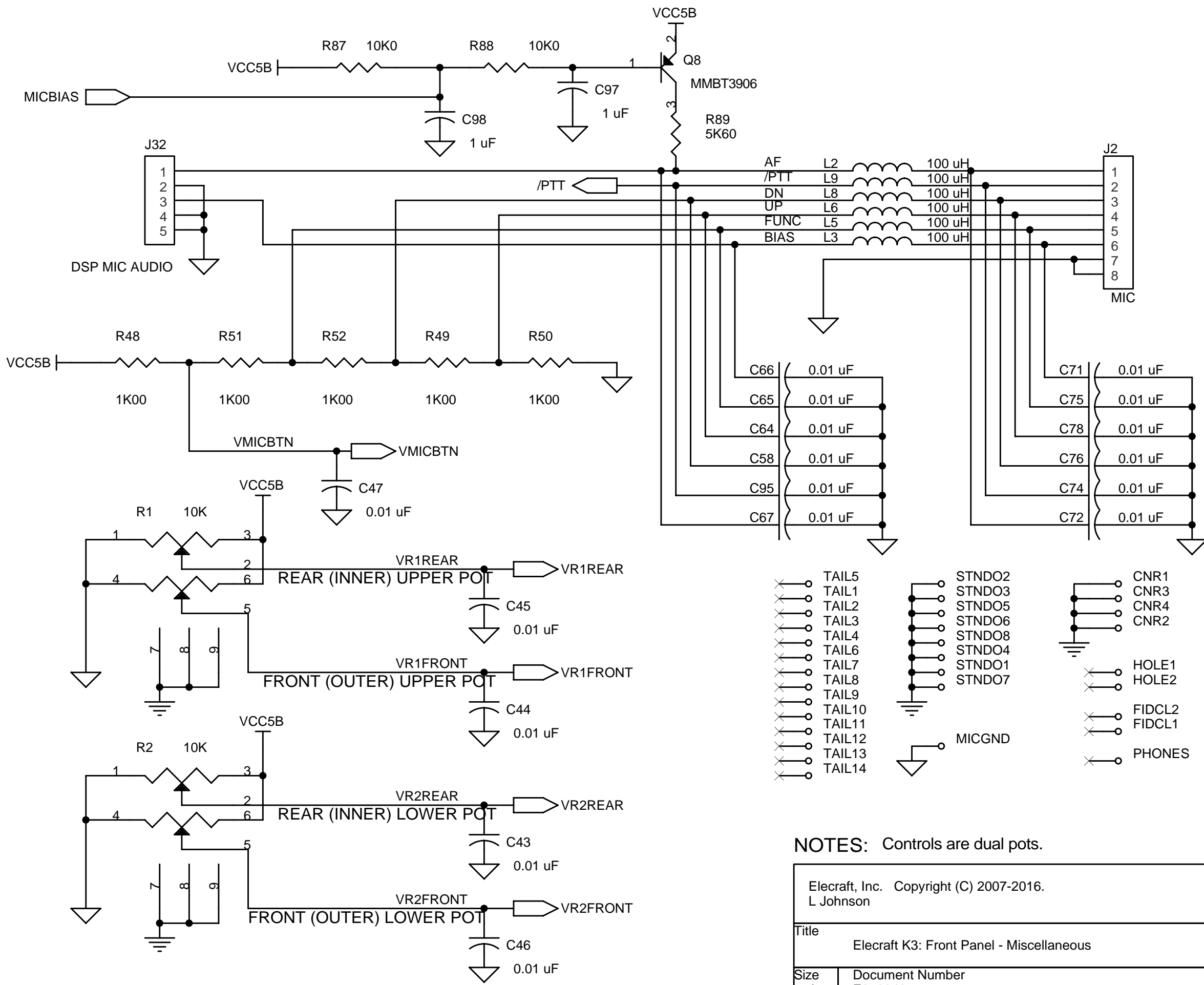
U2	SEG[1..60]	DS1
S0	50	SEG1
S1	51	SEG2
S2	52	SEG3
S3	53	SEG4
S4	54	SEG5
S5	55	SEG6
S6	56	SEG7
S7	57	SEG8
S8	58	SEG9
S9	59	SEG10
S10	60	SEG11
S11	61	SEG12
S12	62	SEG13
S13	63	SEG14
S14	64	SEG15
S15	65	SEG16
S16	66	SEG17
S17	67	SEG18
S18	68	SEG19
S19	69	SEG20
S20	70	SEG21
S21	71	SEG22
S22	72	SEG23
S23	73	SEG24
S24	74	SEG25
S25	75	SEG26
S26	76	SEG27
S27	77	SEG28
S28	78	SEG29
S29	79	SEG30
S30	80	SEG31
S31	1	SEG32
S32	2	SEG33
S33	3	SEG34
S34	4	SEG35
S35	5	SEG36
S36	6	SEG37
S37	7	SEG38
S38	8	SEG39
S39	9	SEG40
S40	10	SEG41
S41	11	SEG42
S42	12	SEG43
S43	13	SEG44
S44	14	SEG45
S45	15	SEG46
S46	16	SEG47
S47	17	SEG48
S48	18	SEG49
S49	19	SEG50
S50	20	SEG51
S51	21	SEG52
S52	22	SEG53
S53	23	SEG54
S54	24	SEG55
S55	25	SEG56
S56	26	SEG57
S57	27	SEG58
S58	28	SEG59
S59	29	SEG60
BP0	30	COM1
BP1	31	COM2
BP2	32	COM3
BP3	33	COM4
		COM1
		COM2
		COM3
		COM4



Elecraft, Inc. Copyright (C) 2007-2016. L Johnson		
Title Elecraft K3: Front Panel - LEDs		
Size B	Document Number E850242	Rev H5
Date: Tuesday, April 26, 2016	Sheet 3	of 7



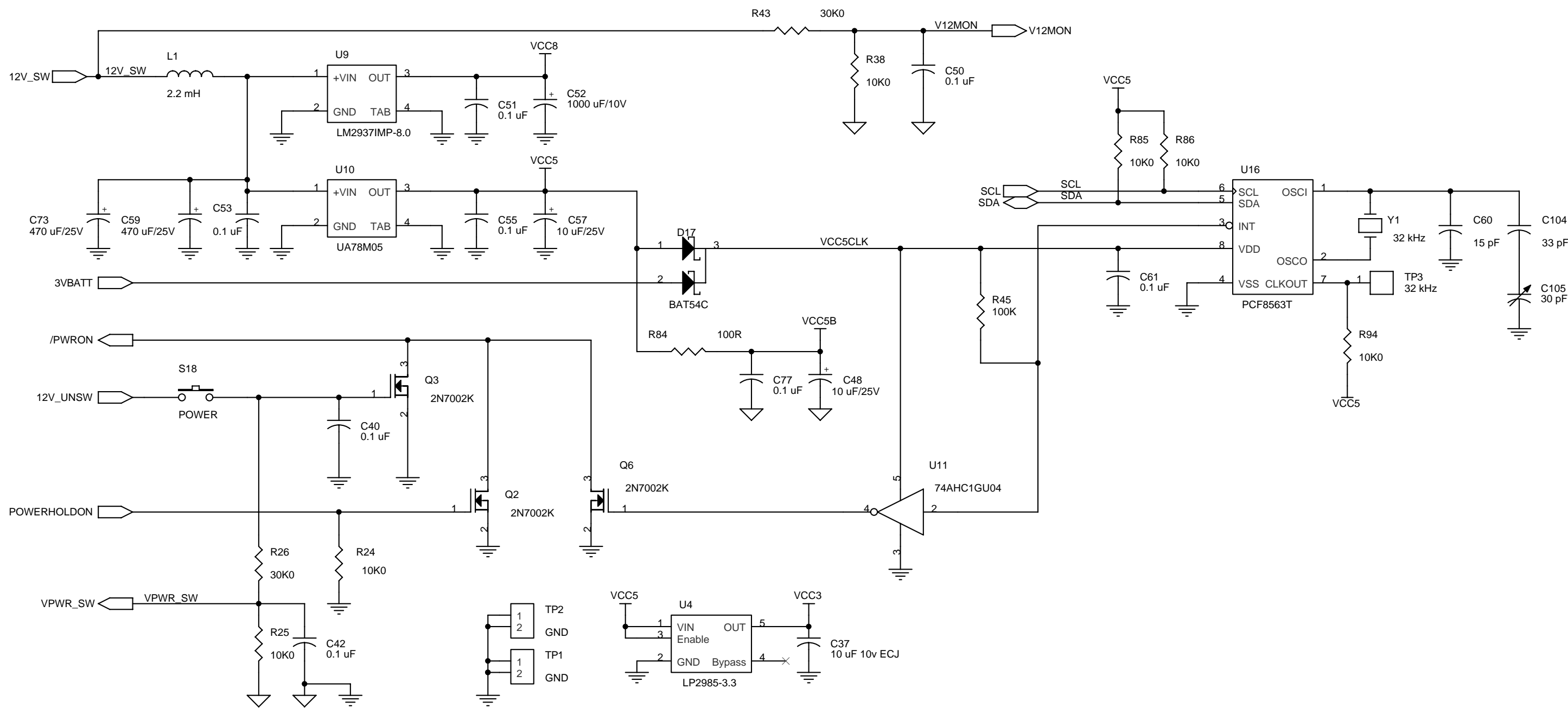
/CSRFXMUX	C87	1000 pF	R5	C83	0.01 uF
ADR0	C14	1000 pF	T5	C19	0.01 uF
ADR1	C15	1000 pF	/SPI23_EN	C18	0.01 uF
ADR2	C86	1000 pF	VRFADCMUX	C82	0.01 uF
ADR3	C16	1000 pF	12V_UNSW	C80	0.01 uF
MOSI	C85	1000 pF	/PWRON	C20	0.01 uF
MISO	C17	1000 pF	3VBATT	C79	0.01 uF
SCK	C84	100 pF	12V_SW	C21	0.01 uF
			NB1AGC	C94	0.01 uF
			DIG0	C93	1000 pF
			DIG1	C92	1000 pF
			RXD	C13	1000 pF
			TXDQ	C88	1000 pF
			TXD	C70	1000 pF



- ✕ TAIL5
  - ✕ TAIL1
  - ✕ TAIL2
  - ✕ TAIL3
  - ✕ TAIL4
  - ✕ TAIL6
  - ✕ TAIL7
  - ✕ TAIL8
  - ✕ TAIL9
  - ✕ TAIL10
  - ✕ TAIL11
  - ✕ TAIL12
  - ✕ TAIL13
  - ✕ TAIL14
- STNDO2
  - STNDO3
  - STNDO5
  - STNDO6
  - STNDO8
  - STNDO4
  - STNDO1
  - STNDO7
- CNR1
  - CNR3
  - CNR4
  - CNR2
- ✕ HOLE1
  - ✕ HOLE2
- FIDCL2
  - FIDCL1
- ✕ PHONES

**NOTES:** Controls are dual pots.

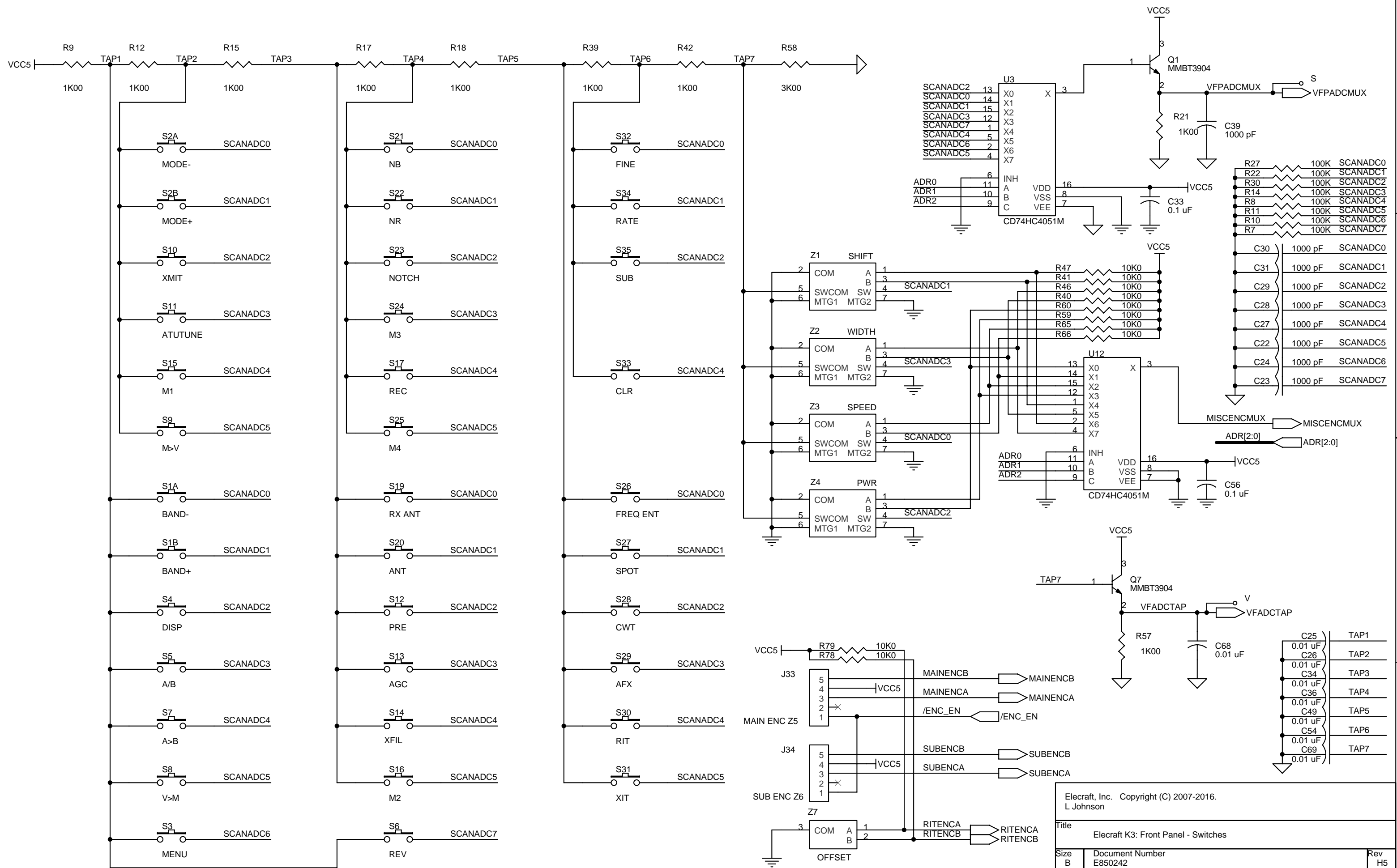
Elecraft, Inc. Copyright (C) 2007-2016. L Johnson		
Title Elecraft K3: Front Panel - Miscellaneous		
Size A	Document Number E850242	Rev H5
Date: Tuesday, April 26, 2016	Sheet 5	of 7



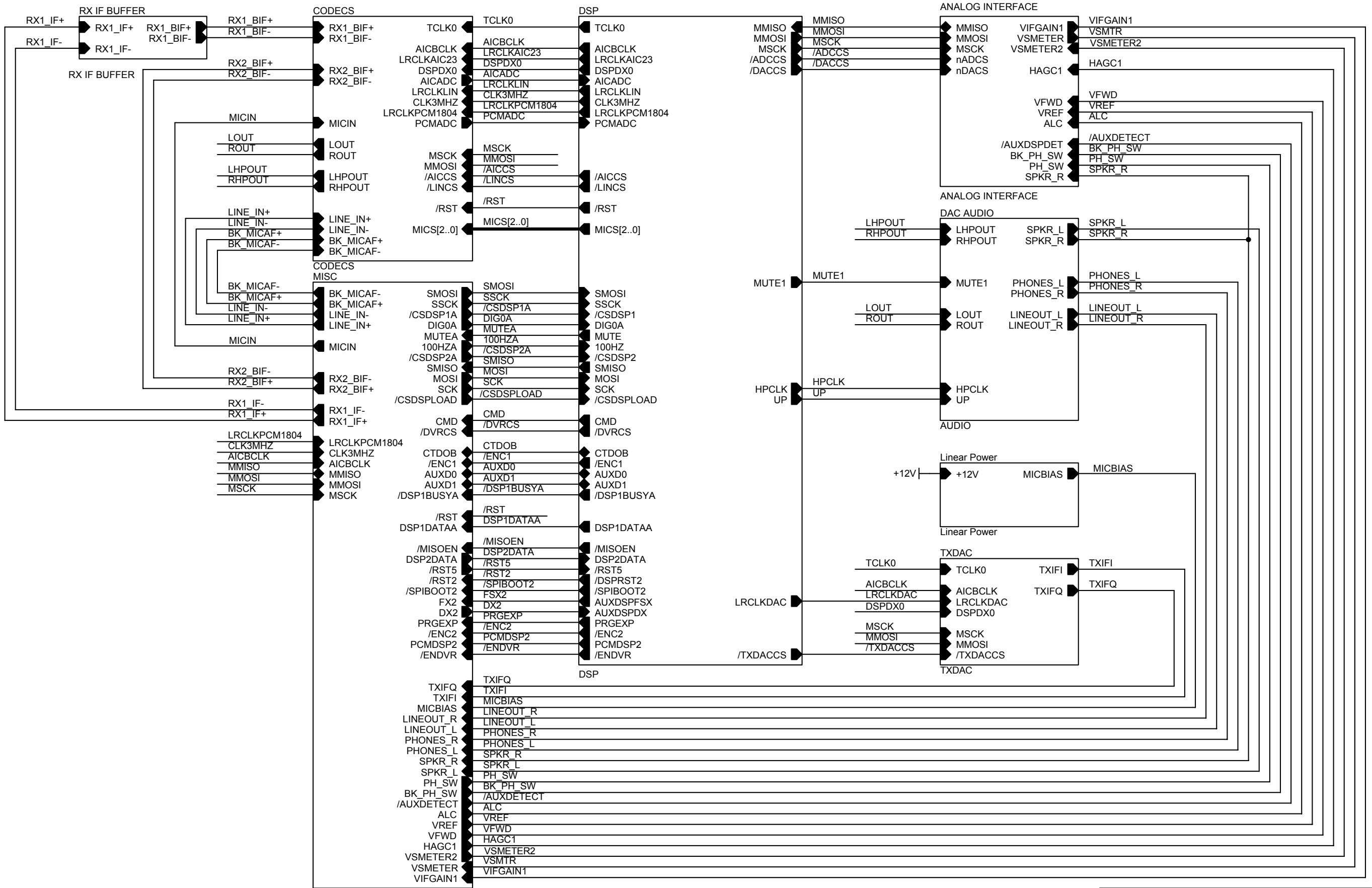
NOTES: Regulators U3 and U5 SOT-223.

Elecraft, Inc. Copyright (C) 2007-2016. L Johnson		
Title Elecraft K3: Front Panel - Power and RTC		
Size B	Document Number E850242	Rev H5
Date: Tuesday, April 26, 2016	Sheet 6	of 7



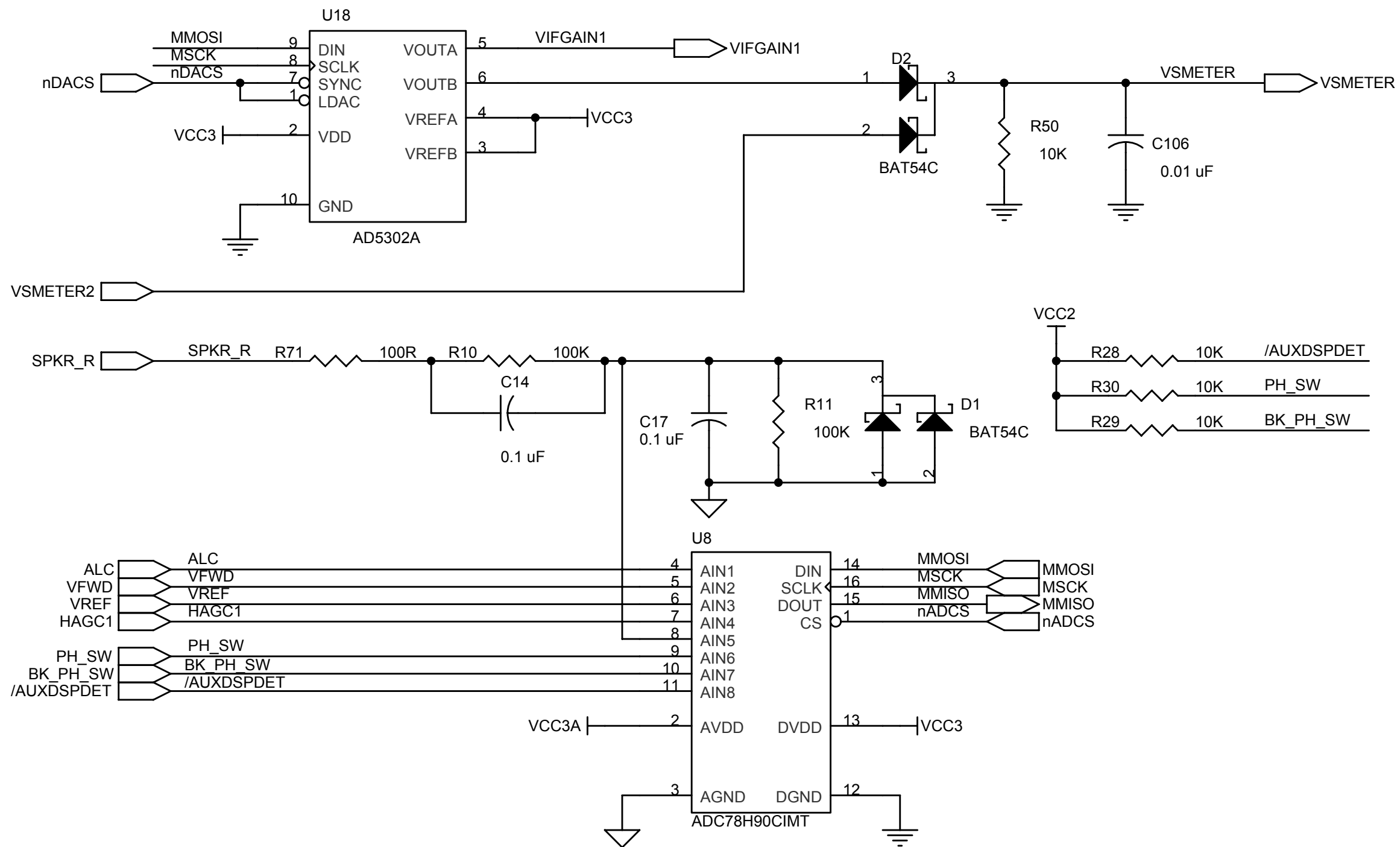


Elecraft, Inc. Copyright (C) 2007-2016. L. Johnson		
Title Elecraft K3: Front Panel - Switches		
Size B	Document Number E850242	Rev H5
Date: Tuesday, April 26, 2016	Sheet 7 of 7	



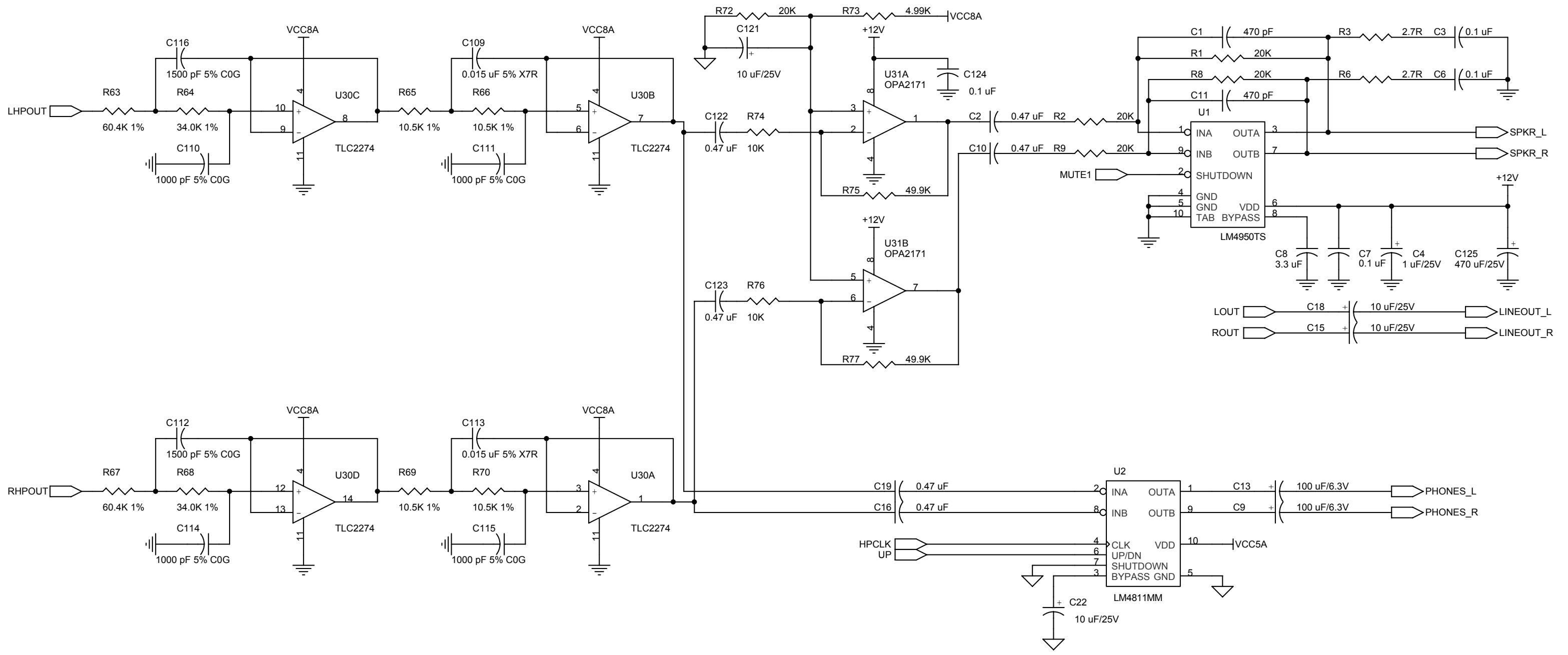
Elecrcraft, Inc. Copyright 2007 - 2015. L Johnson		
Title K3 DSP: Top Level		
Size B	Document Number E850233	Rev E1
Date: Friday, July 31, 2015	Sheet 1	of 9

NOTES: PCB Revision E



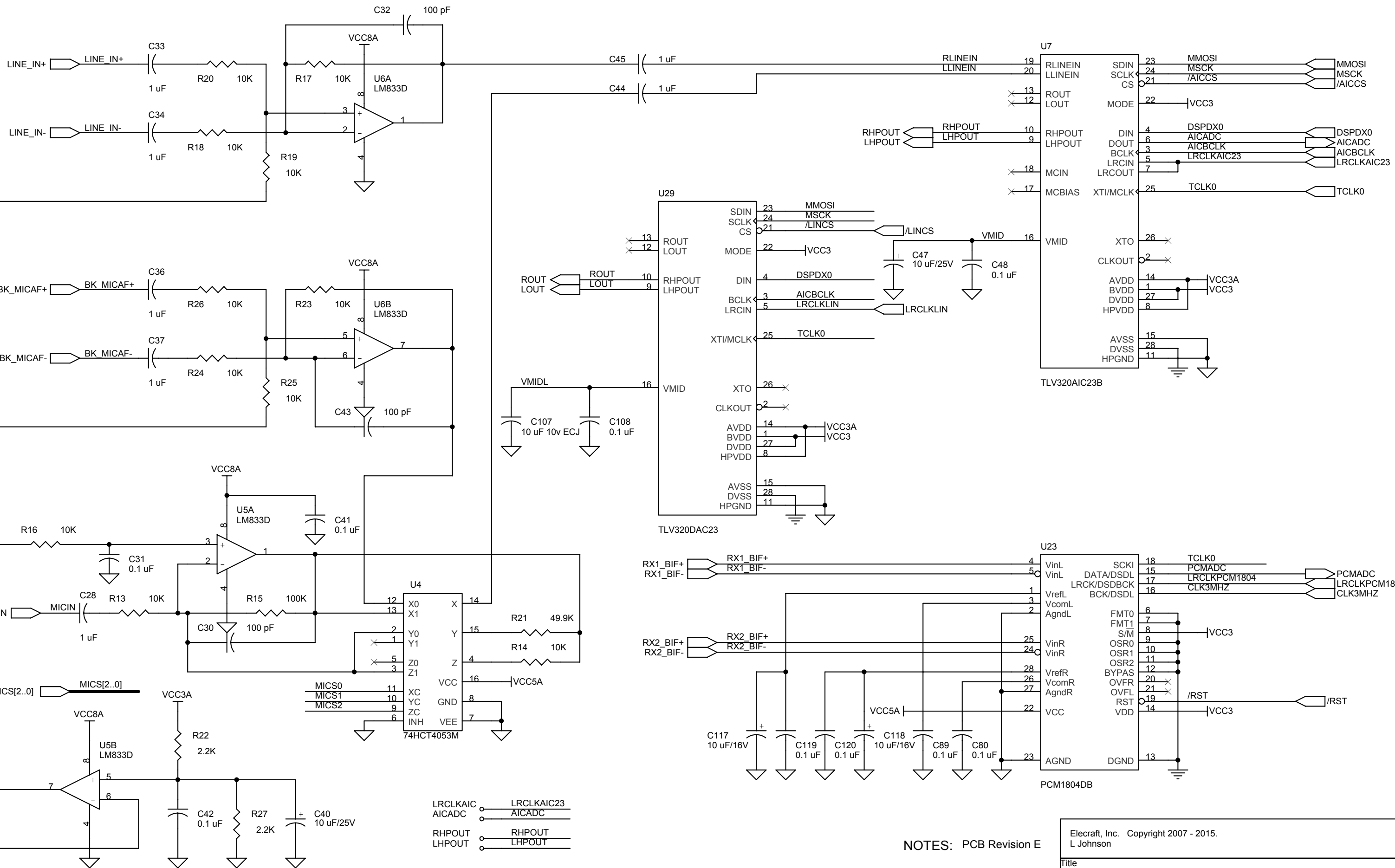
NOTES: PCB Revision E

Elecraft, Inc. Copyright 2007 - 2015. L Johnson		
Title K3 DSP: Analog Interface		
Size A	Document Number E850233	Rev E1
Date: Friday, July 31, 2015	Sheet 2	of 9



NOTES: PCB Revision E

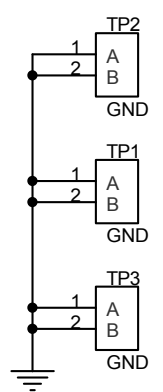
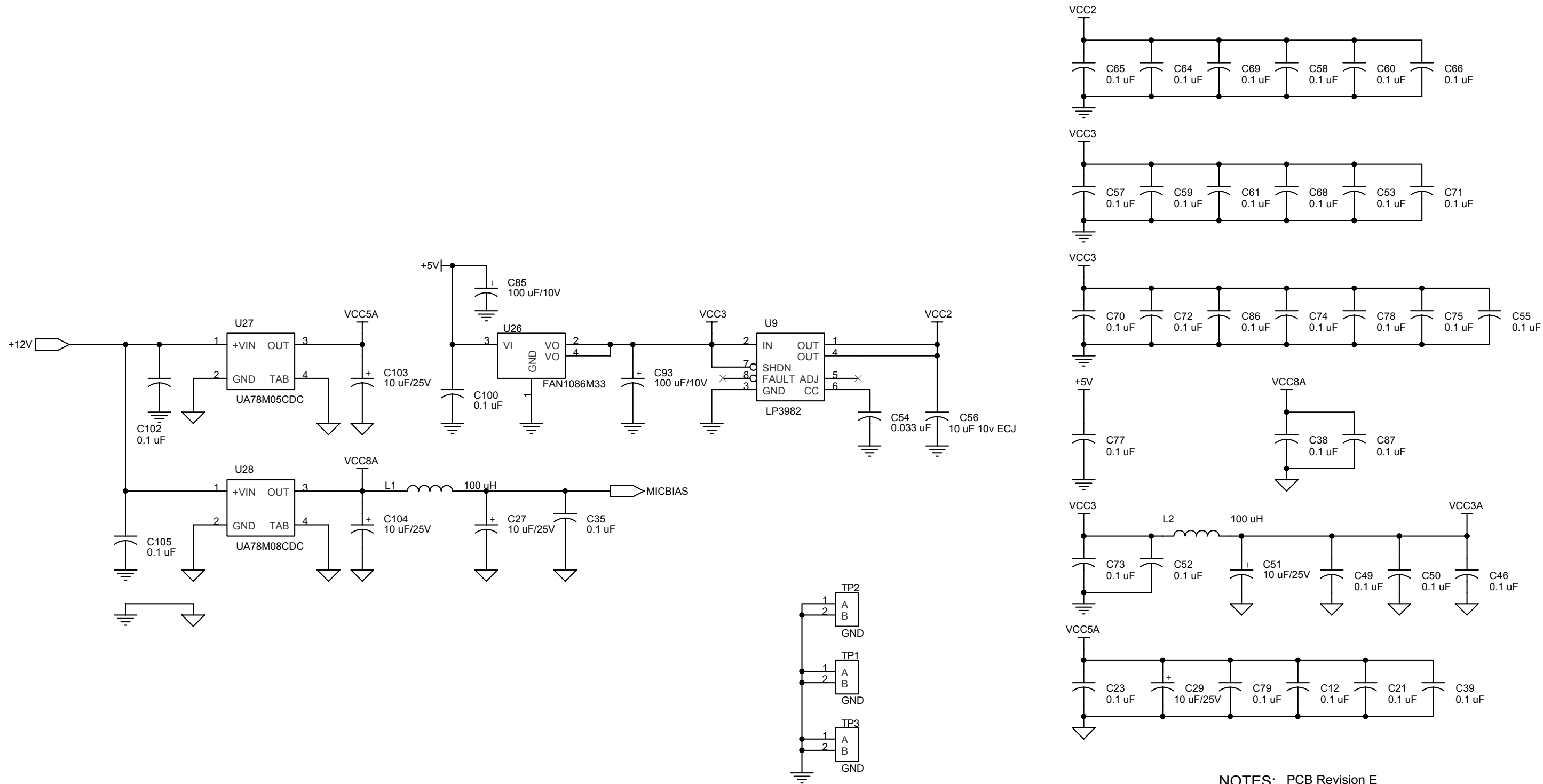
Elecrafit, Inc. Copyright 2007 - 2015. L Johnson		
Title K3 DSP: DAC Audio		
Size B	Document Number E850233	Rev E1
Date: Friday, July 31, 2015	Sheet 3	of 9



NOTES: PCB Revision E

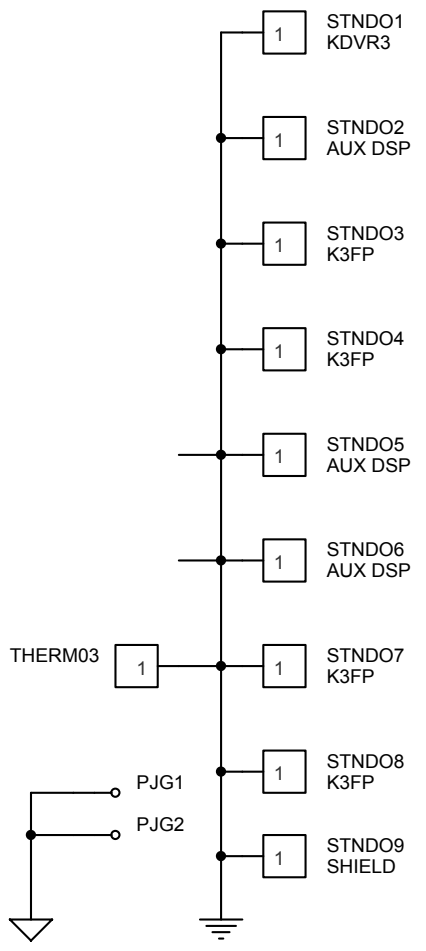
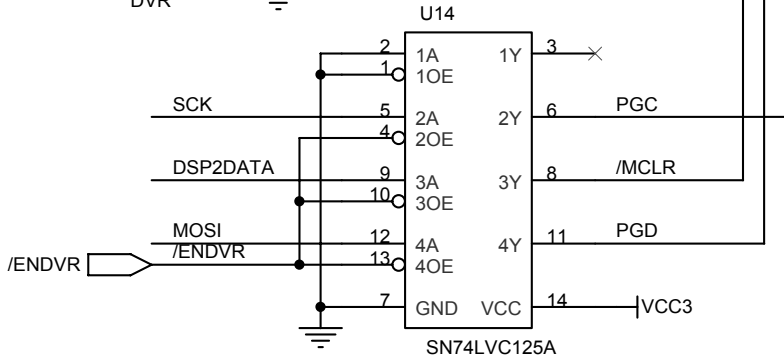
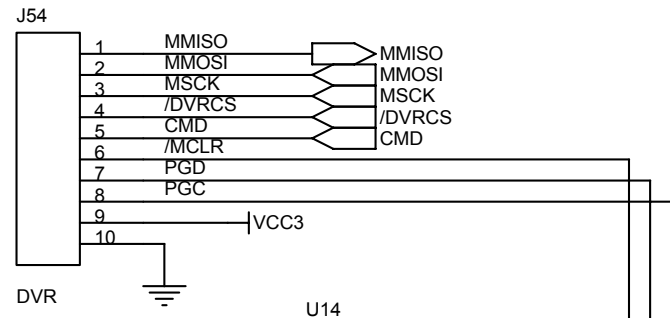
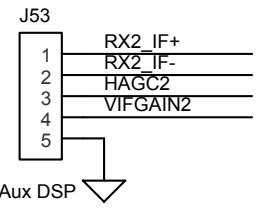
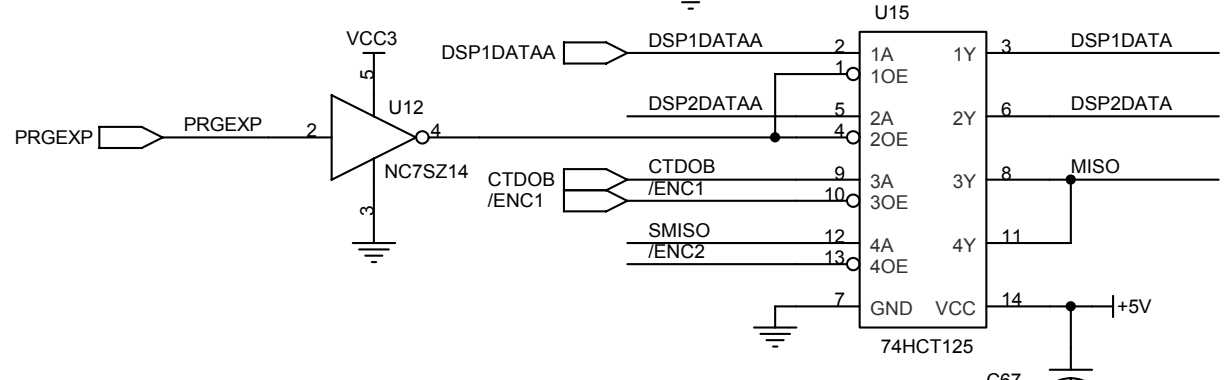
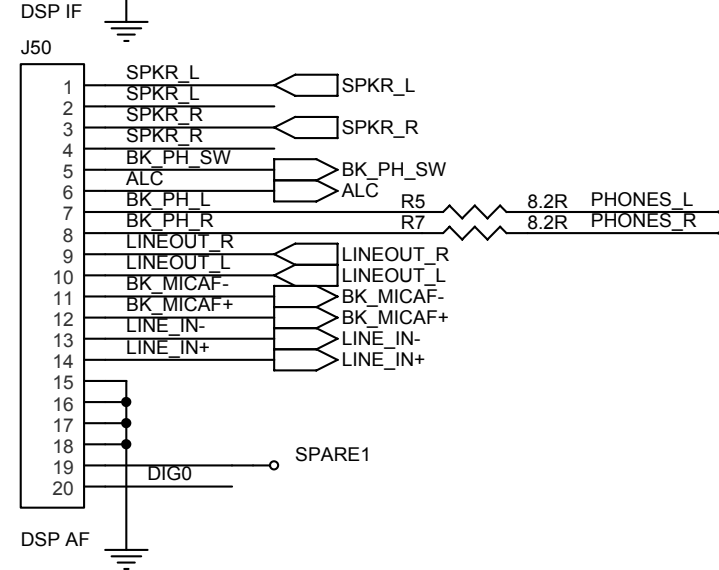
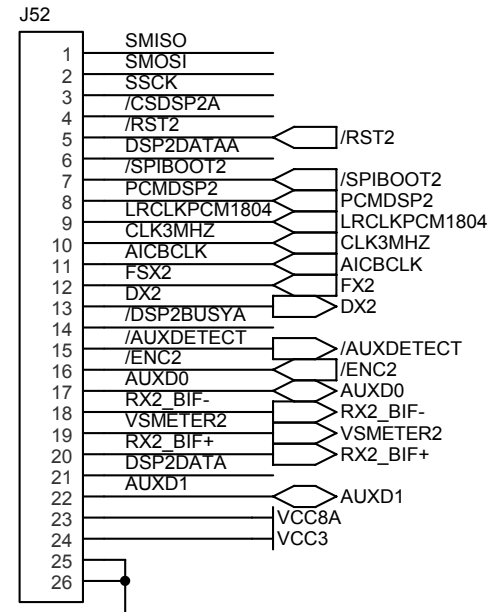
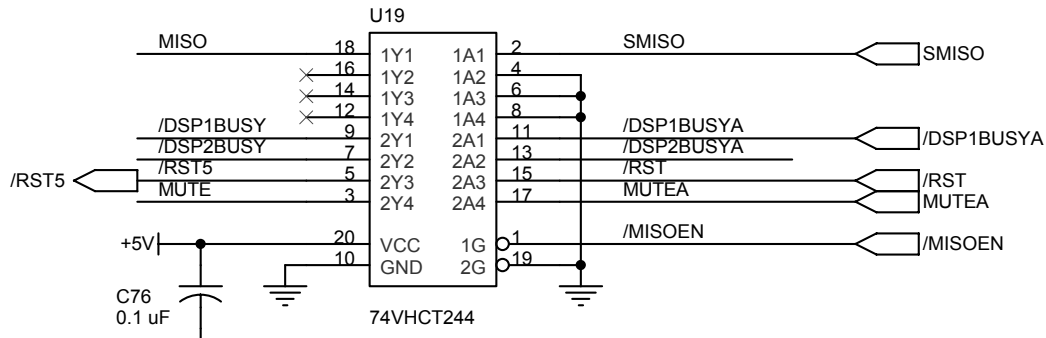
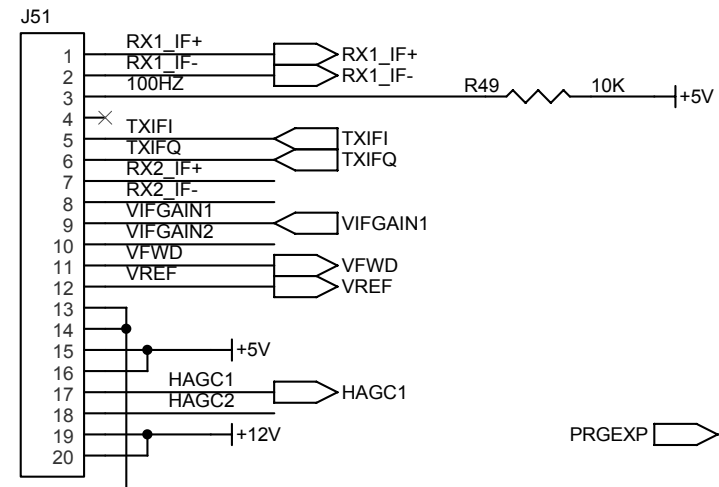
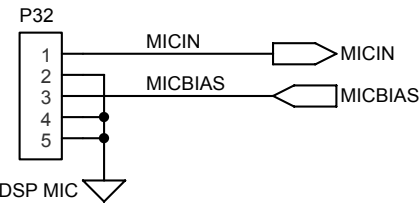
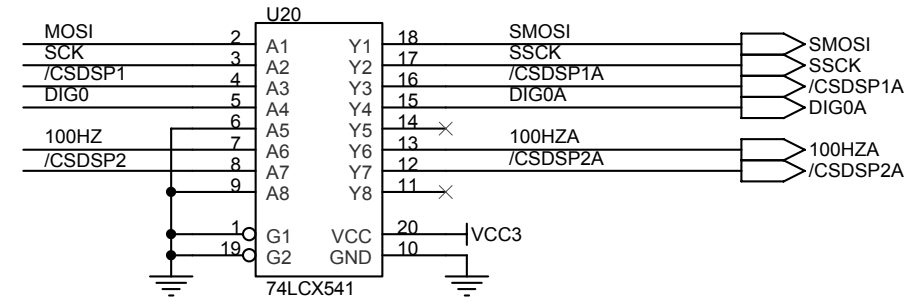
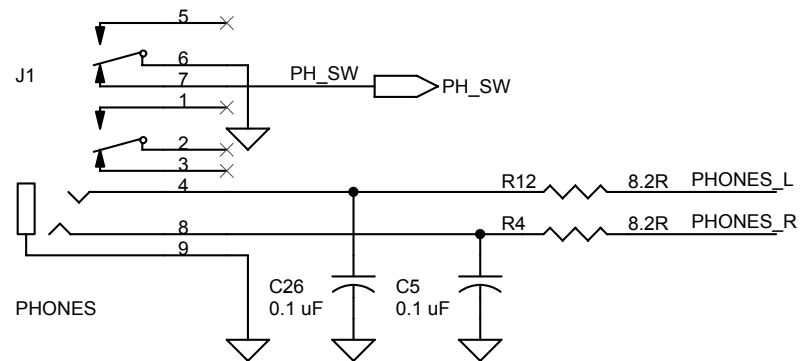
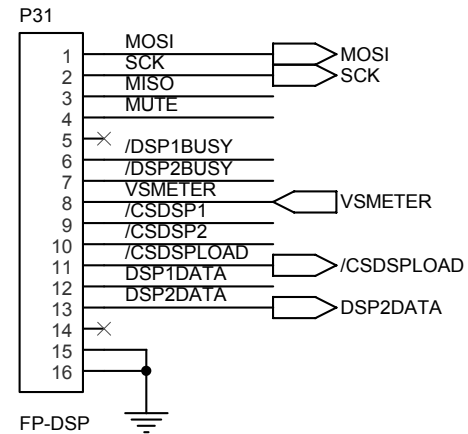
Elecrafit, Inc. Copyright 2007 - 2015. L Johnson		
Title K3 DSP: CODECS		
Size B	Document Number E850233	Rev E1
Date: Friday, July 31, 2015	Sheet 4 of 9	





NOTES: PCB Revision E

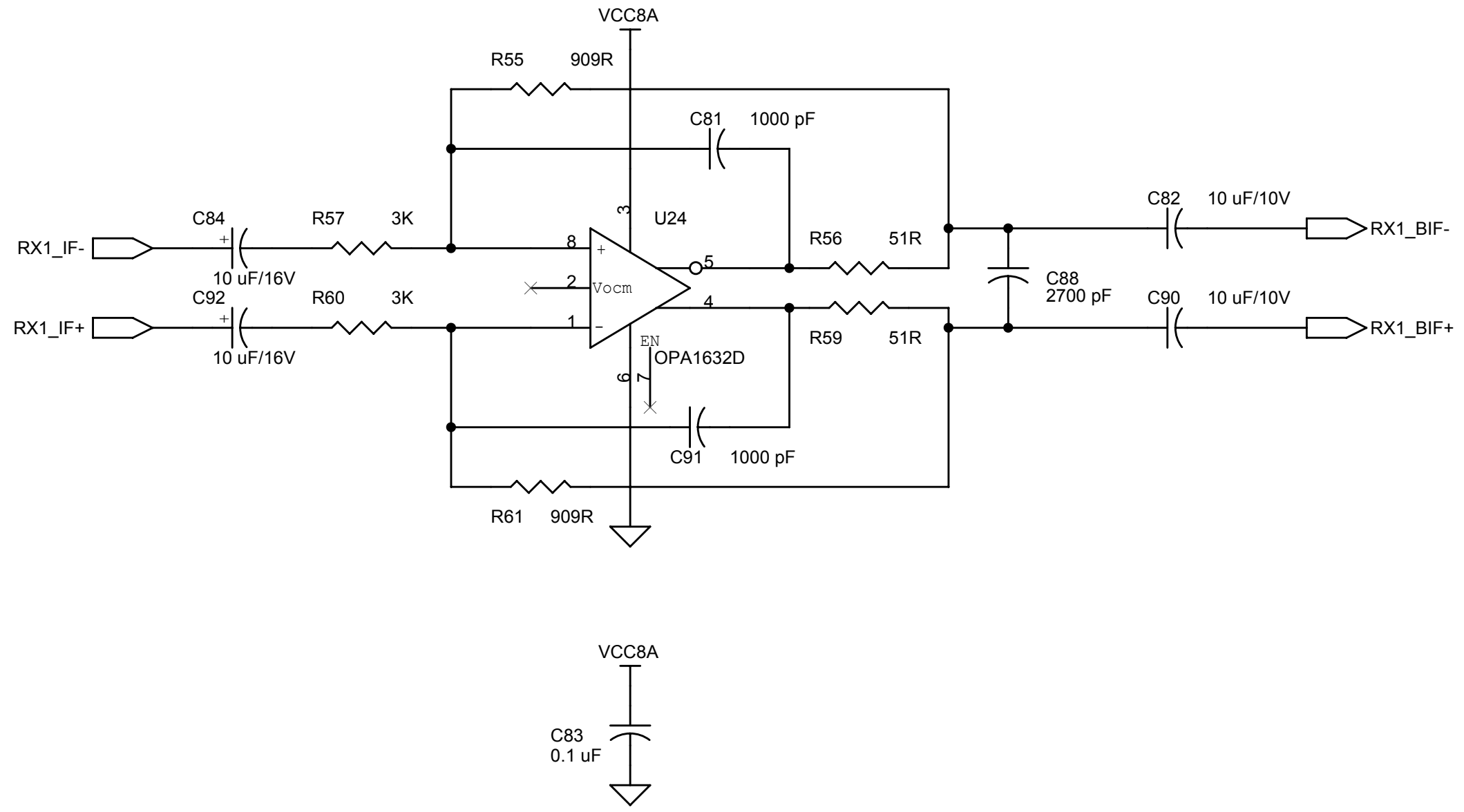
Elecrafit, Inc. Copyright 2007 - 2015. L Johnson		
Title K3 DSP: Power Supply		
Size B	Document Number E850233	Rev E1
Date: Friday, July 31, 2015	Sheet 6	of 9



NOTES: PCB Revision E

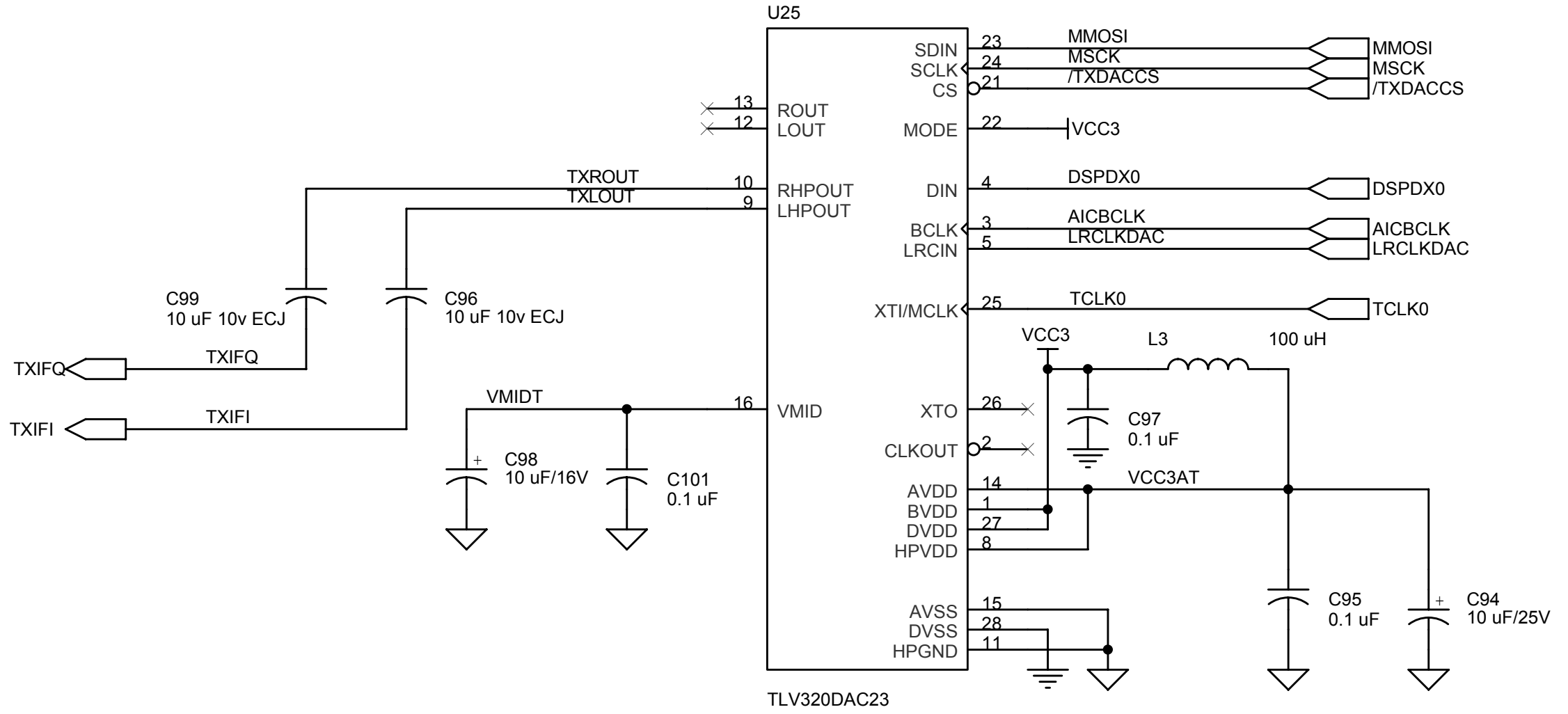
Elecrafit, Inc. Copyright 2007 - 2015. L Johnson		
Title K3 DSP: INTERCONNECTS AND MISCELLANEOUS		
Size B	Document Number E850233	Rev E1
Date: Friday, July 31, 2015	Sheet 7	of 9





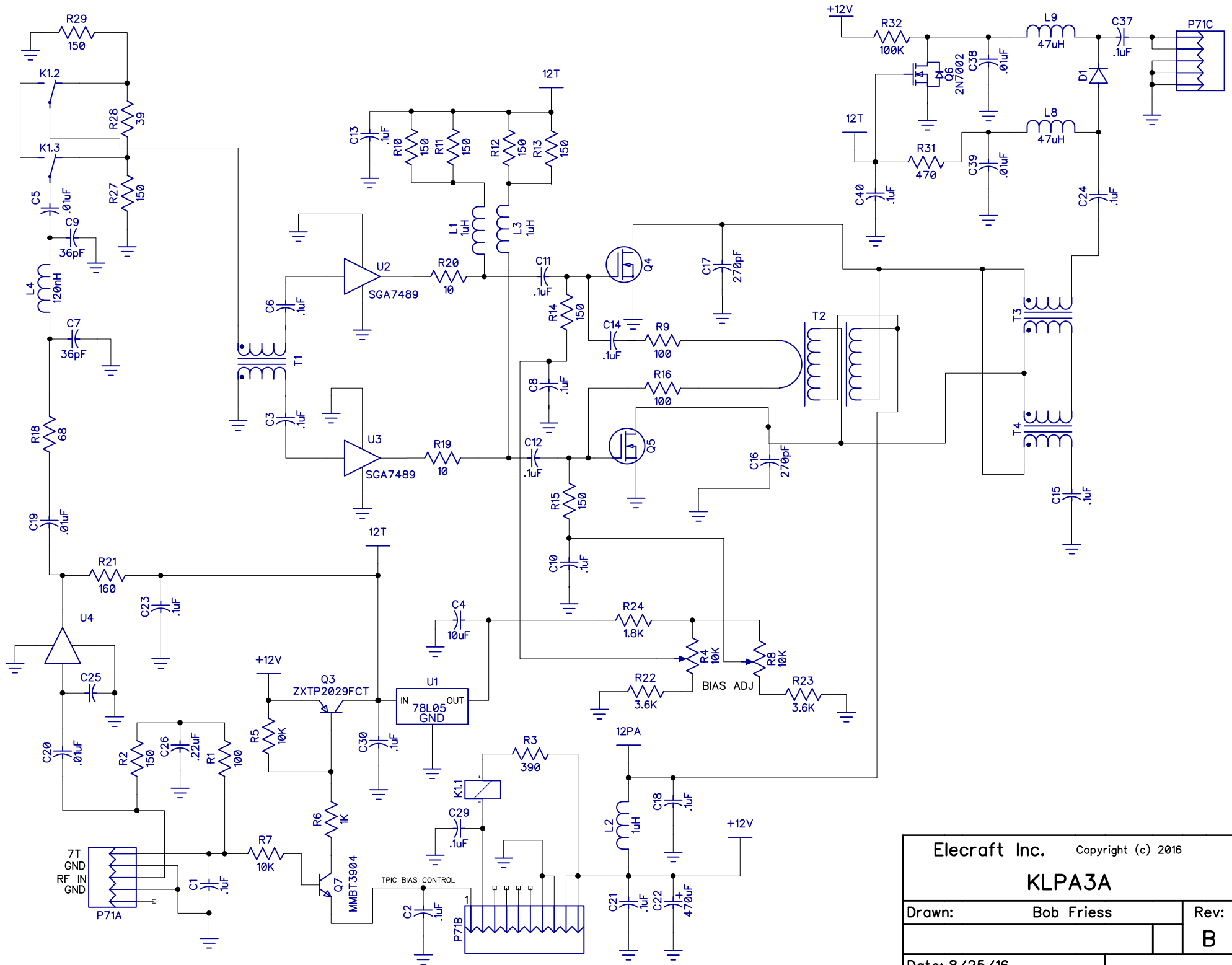
**NOTES:** PCB Revision E

Elecraft, Inc. Copyright 2007 - 2015. L Johnson		
Title K3 DSP: RX IF BUFFER		
Size A	Document Number E850233	Rev E1
Date:	Friday, July 31, 2015	Sheet 8 of 9

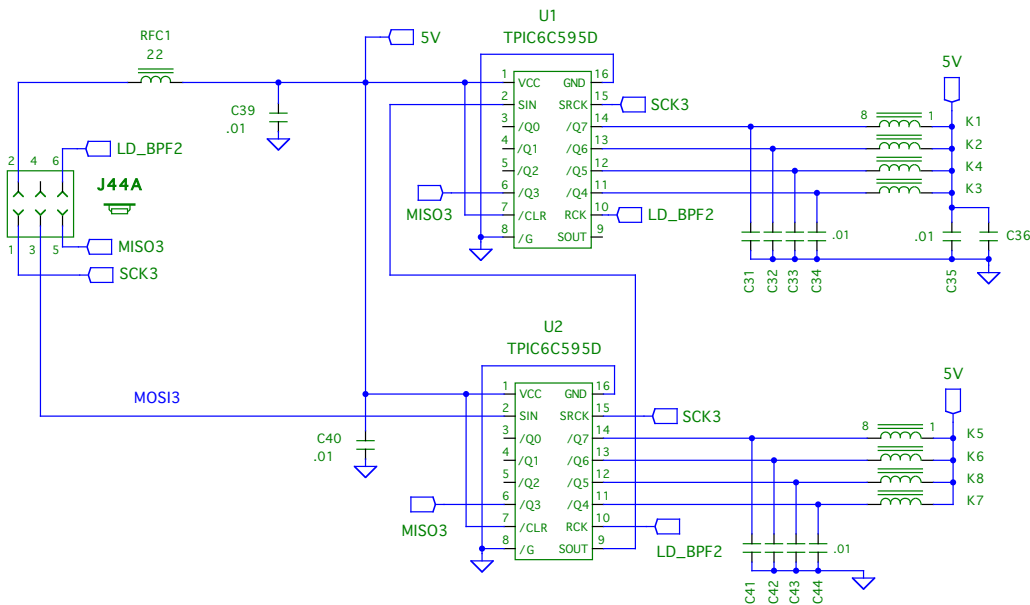
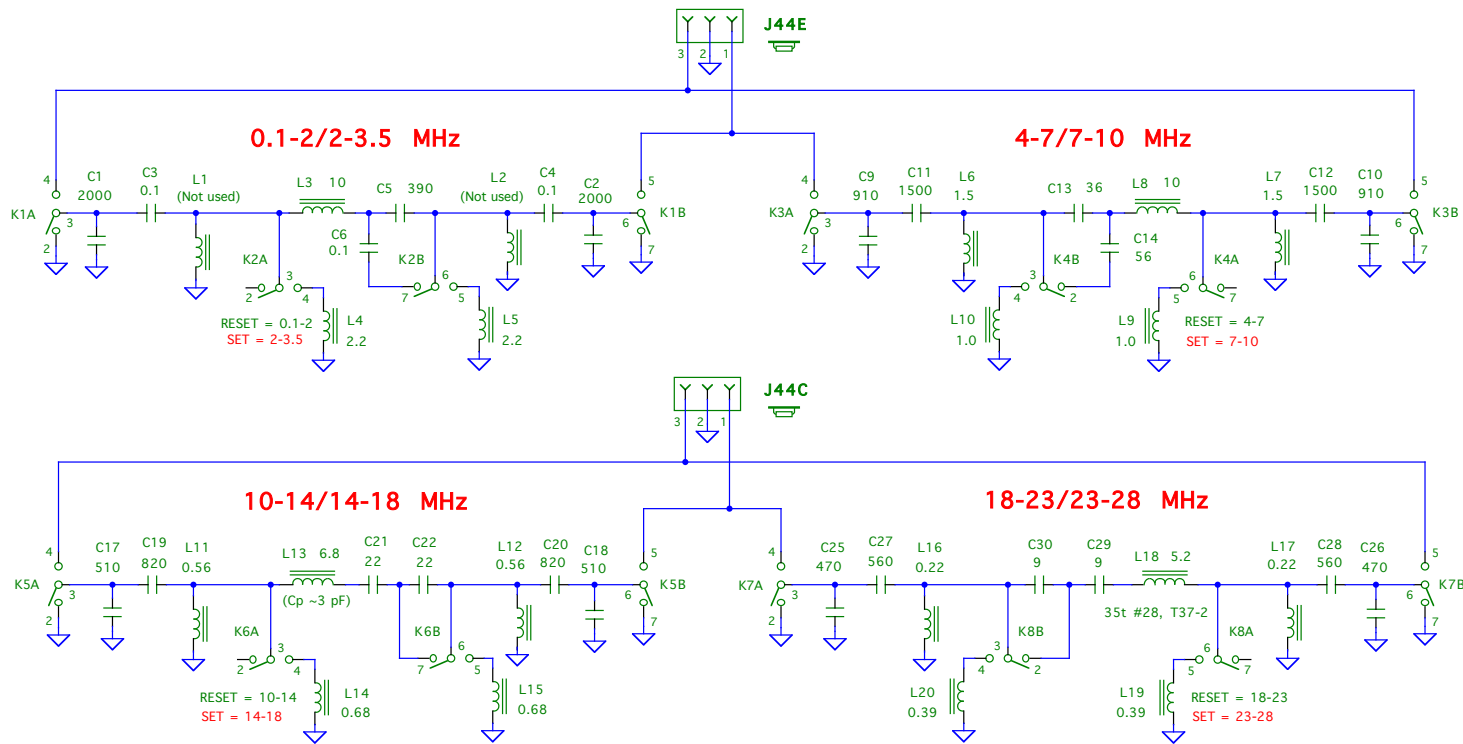


NOTES: PCB Revision E

Elecraft, Inc. Copyright 2007 - 2015. L Johnson		
Title K3 DSP: TX DAC		
Size A	Document Number E850233	Rev E1
Date:	Friday, July 31, 2015	Sheet 9 of 9

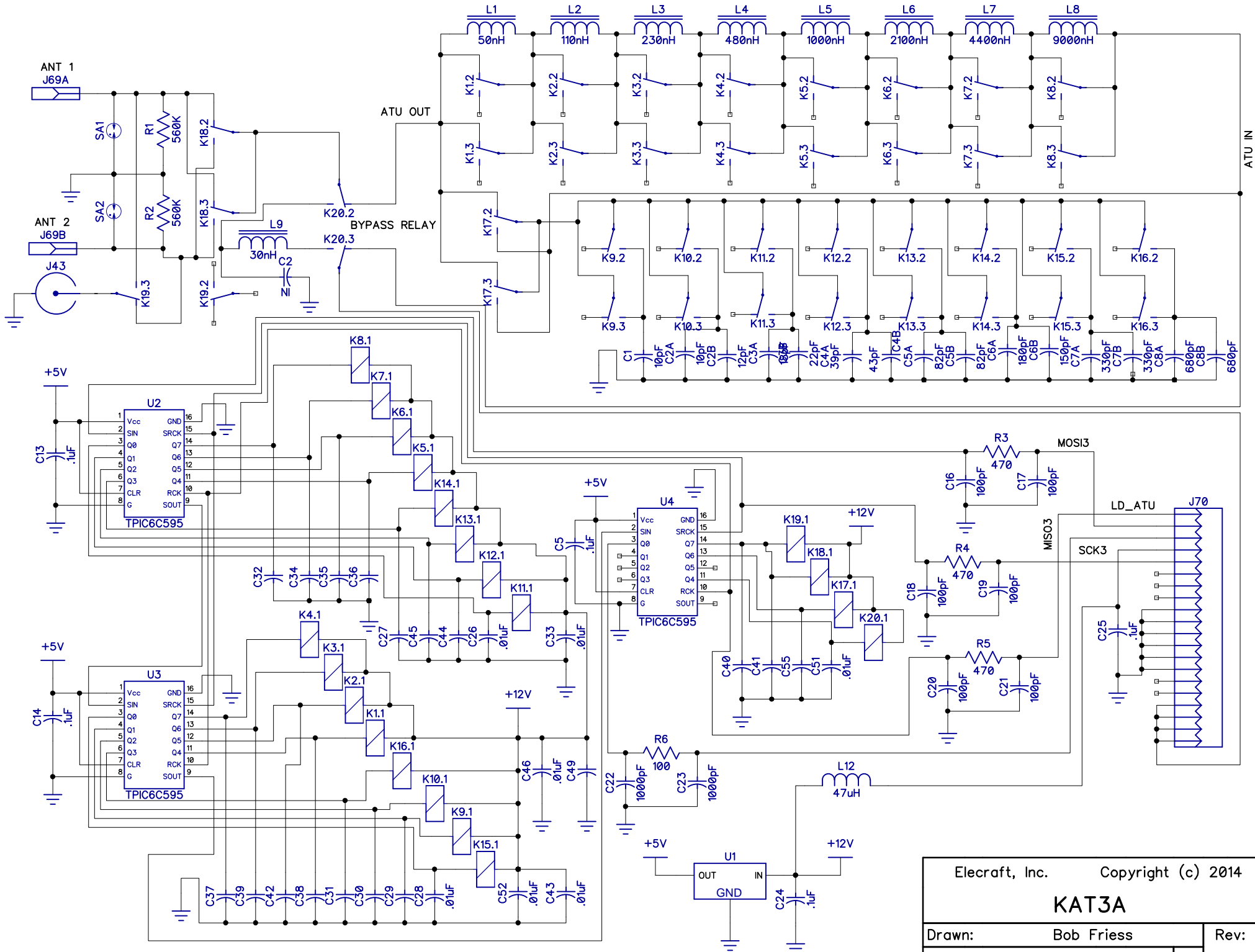


Elecrafit Inc. Copyright (c) 2016		
<b>KLPA3A</b>		
Drawn:	Bob Friess	Rev:
		<b>B</b>
Date: 8/25/16		

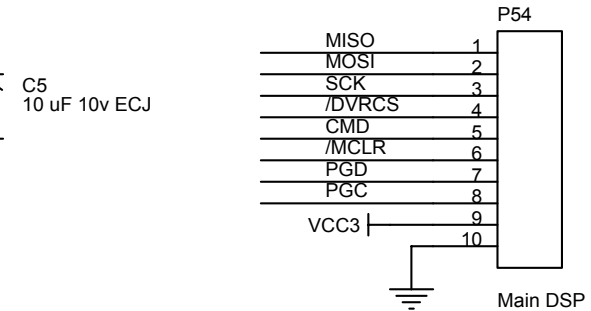
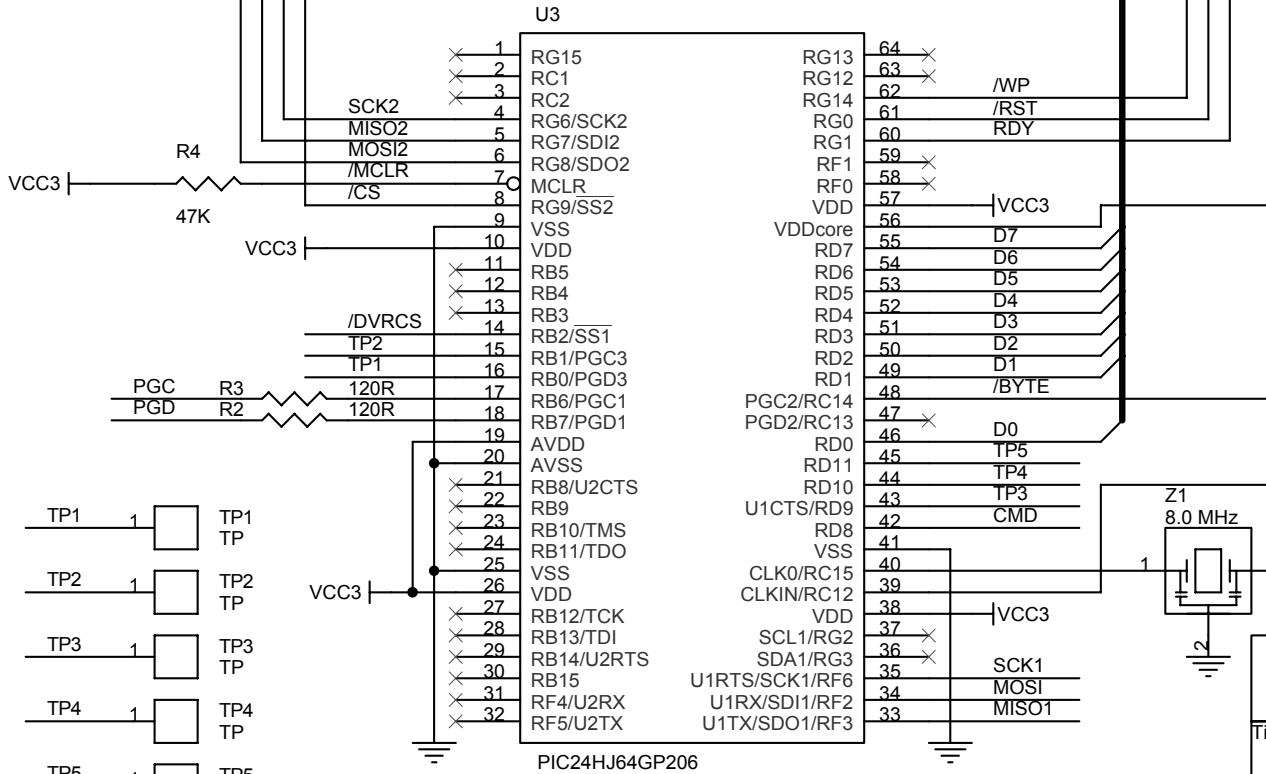
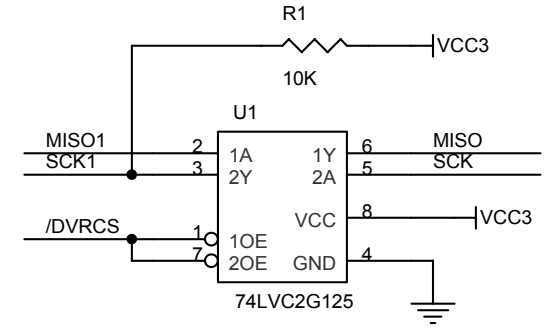
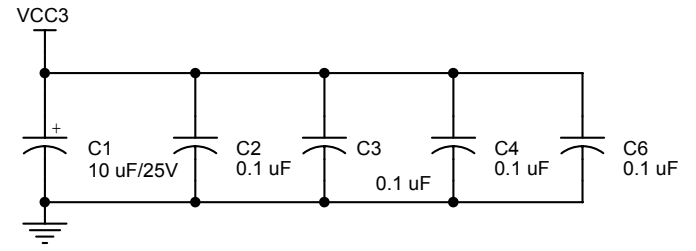
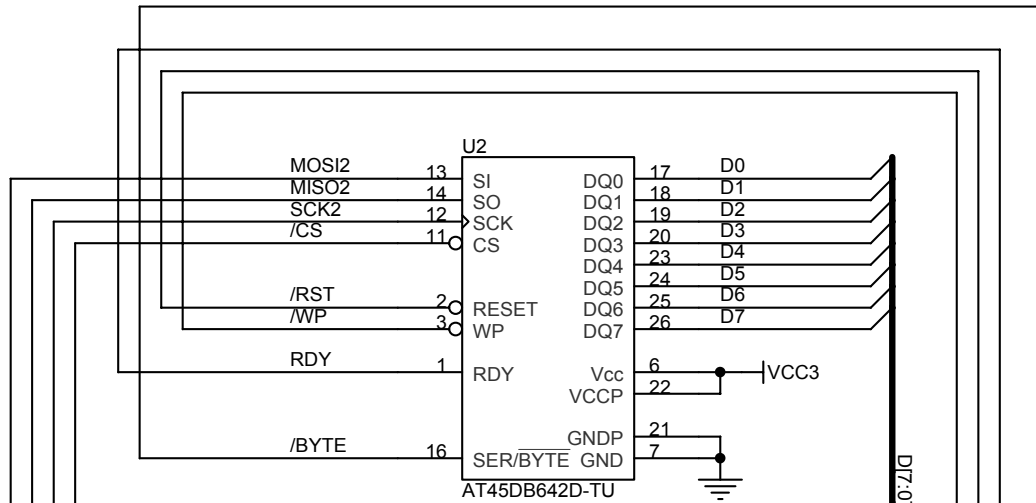
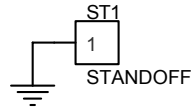


**Appendix B**

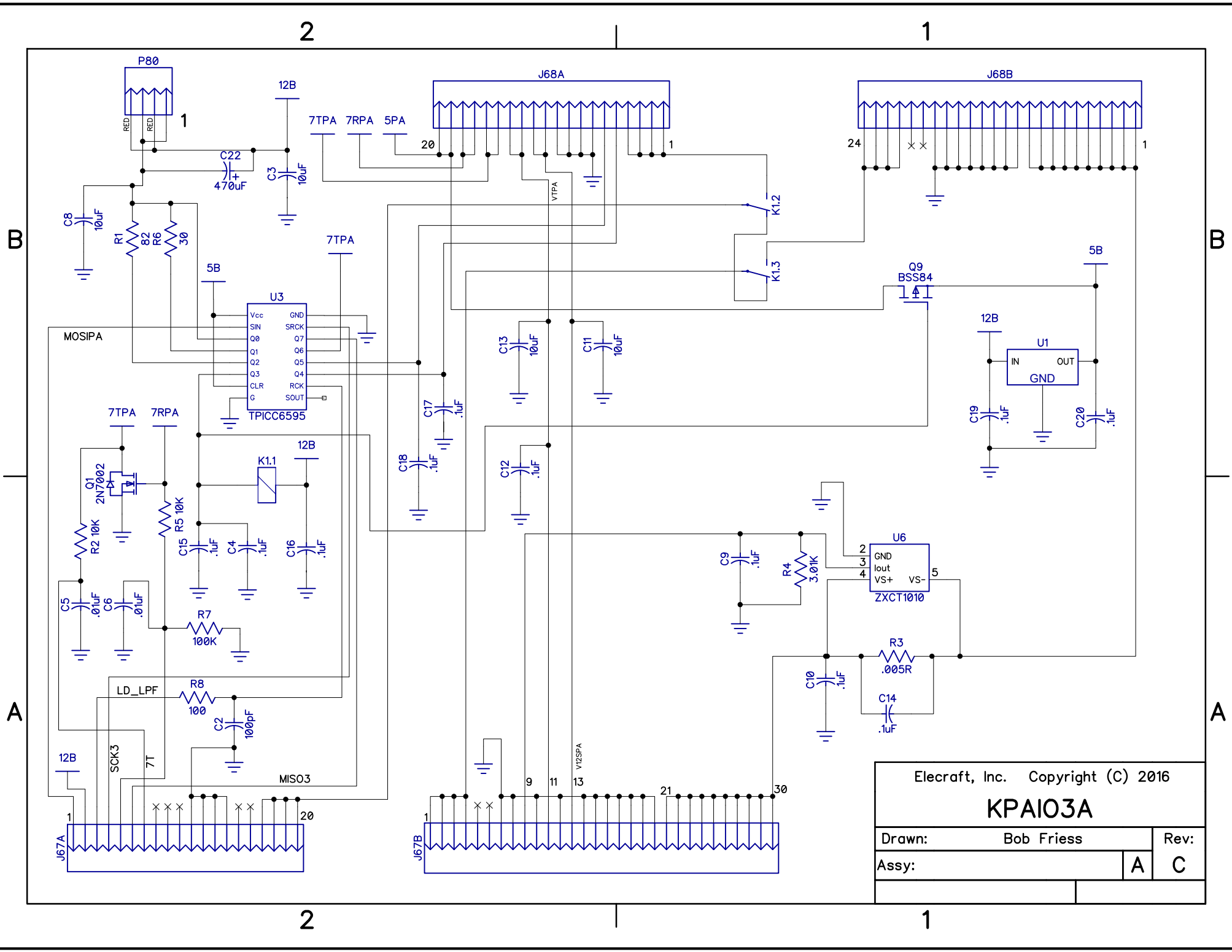
Elecrafit		<b>KBPF3A</b>	
By	Rev.	Date	Sht.
W. Burdick	C	5/4/15	1 of 1



Elecraft, Inc. Copyright (c) 2014	
<b>KAT3A</b>	
Drawn: Bob Friess	Rev: A C
Assy:	
Date: 3/18/15	Sheet: 1 of 1



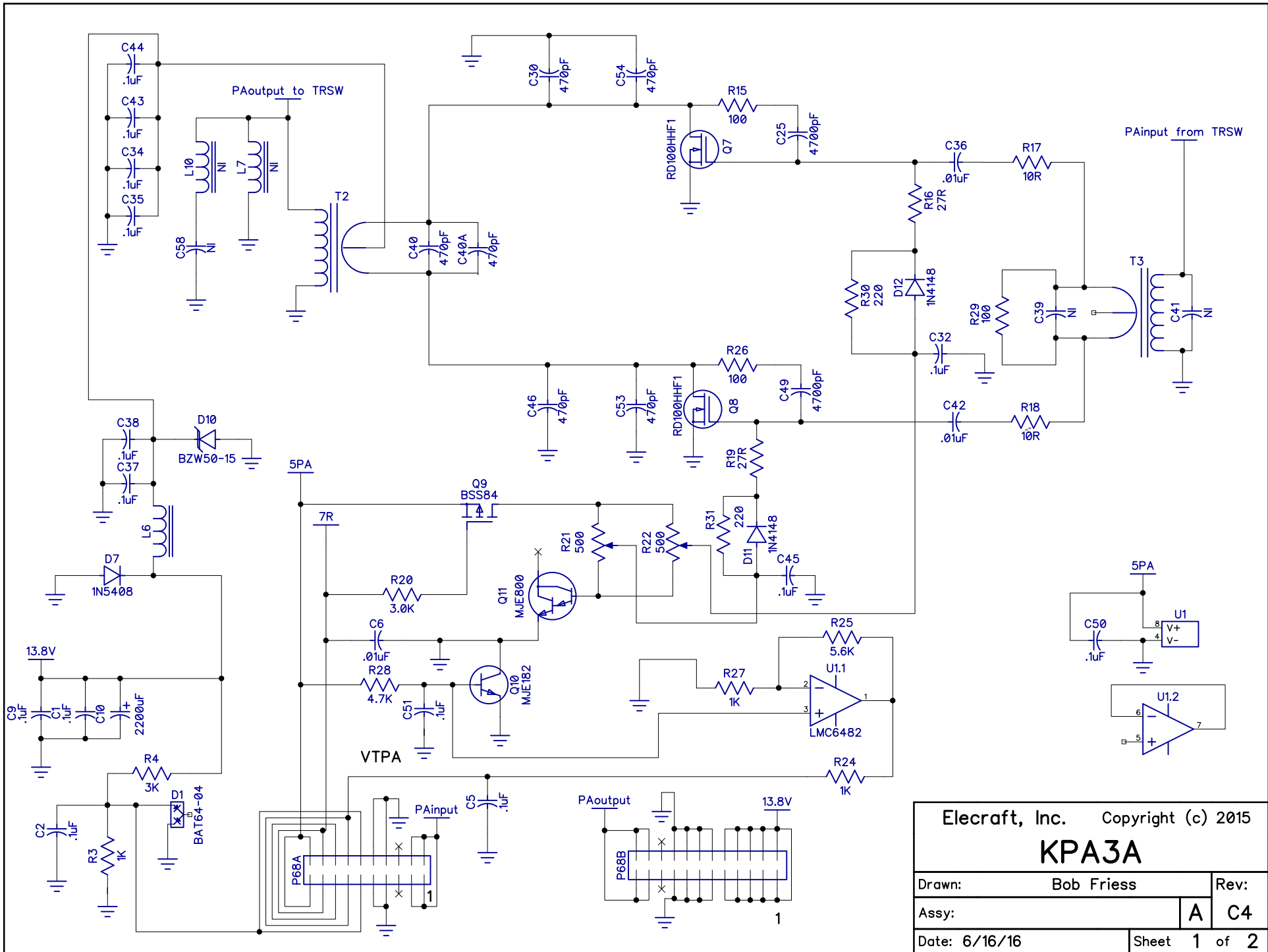
Elecraft, Inc. Copyright (C) 2008 - 2010. L Johnson		
Title K3: Digital Voice Recorder		
Size A	Document Number 2004090101	Rev XG
Date: Wednesday, June 16, 2010	Sheet 1	of 1



Elecraft, Inc. Copyright (C) 2016

# KPA103A

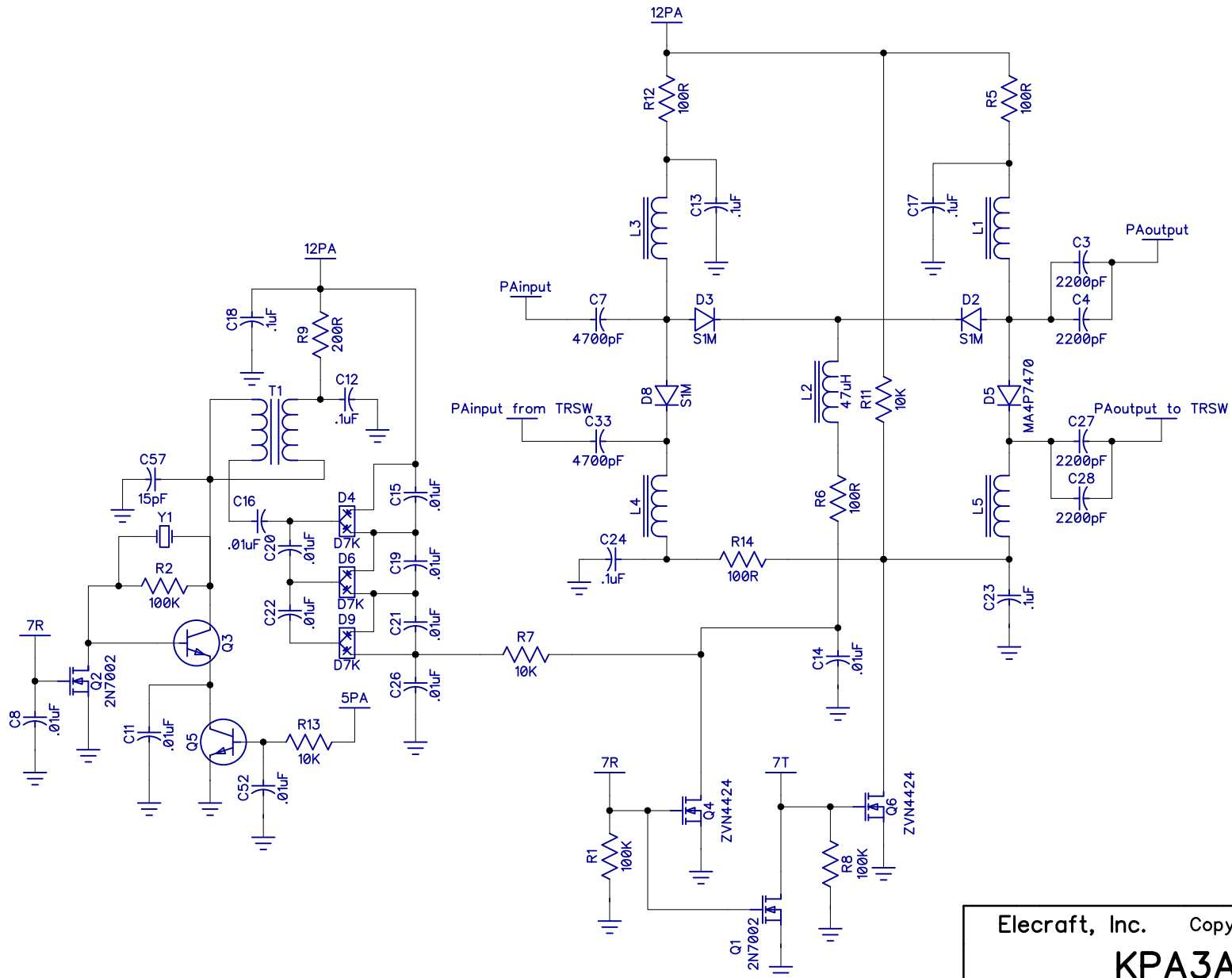
Drawn:	Bob Friess	Rev:	
Assy:		A	C



Elecraft, Inc. Copyright (c) 2015  
**KPA3A**

Drawn:	Bob Friess	Rev:	
Assy:		A	C4
Date: 6/16/16	Sheet	1	of 2

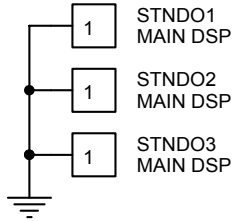
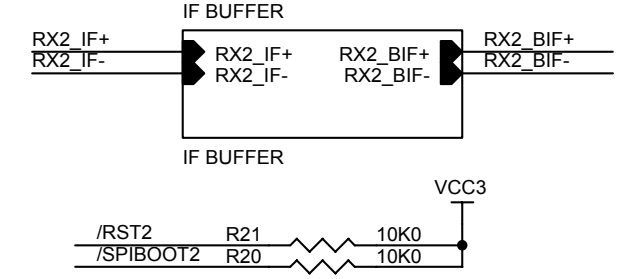
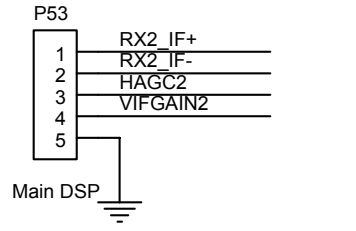
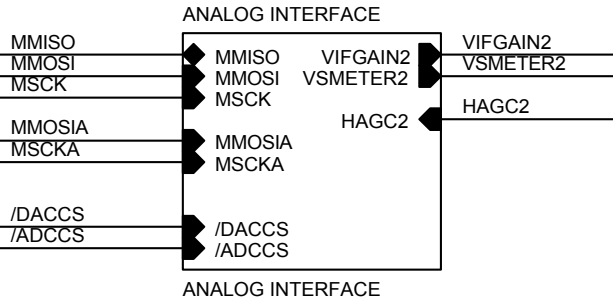
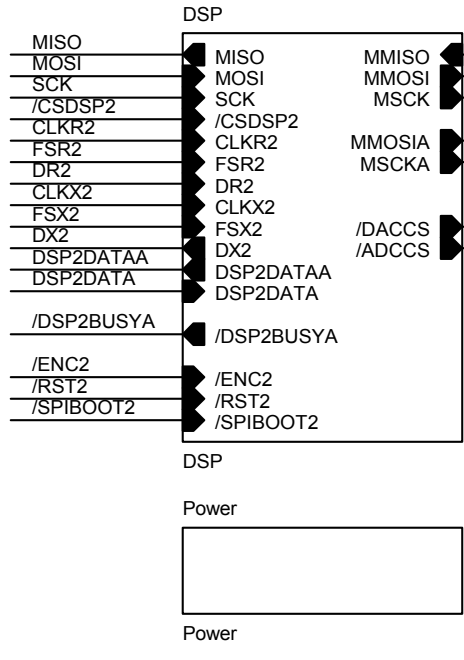
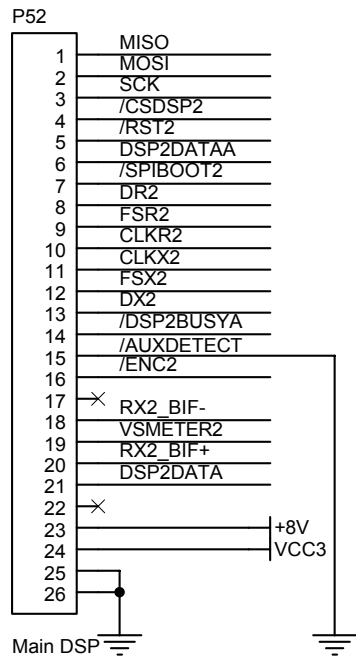




Elecraft, Inc. Copyright (c) 2015

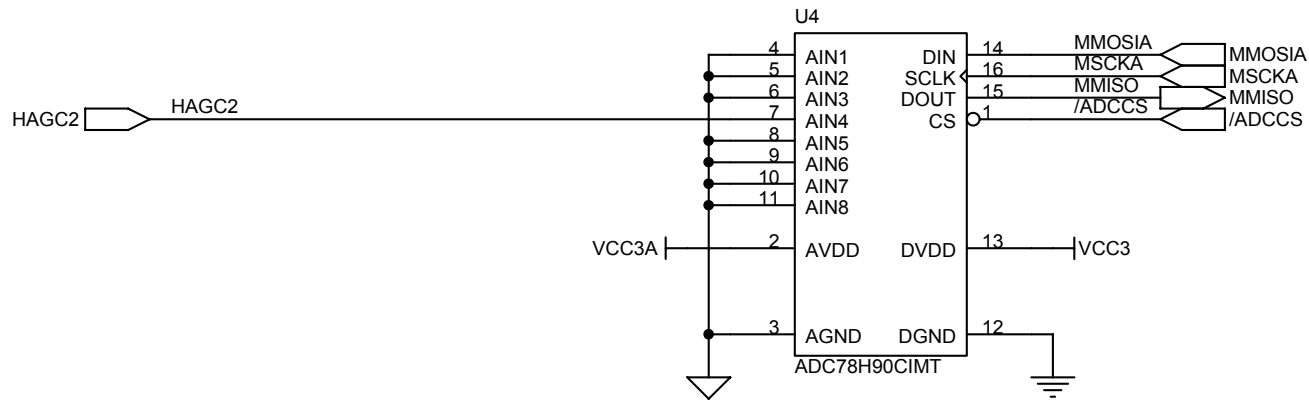
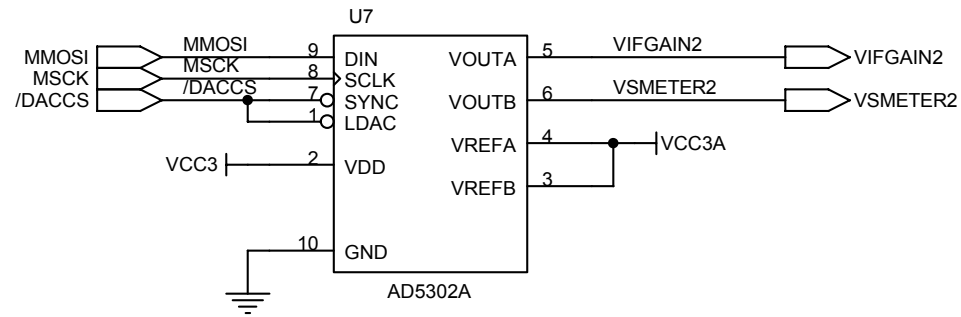
# KPA3A

Drawn:	Bob Friess	Rev:
Assy:		B C4
Date: 6/16/16	Sheet 2	of 2



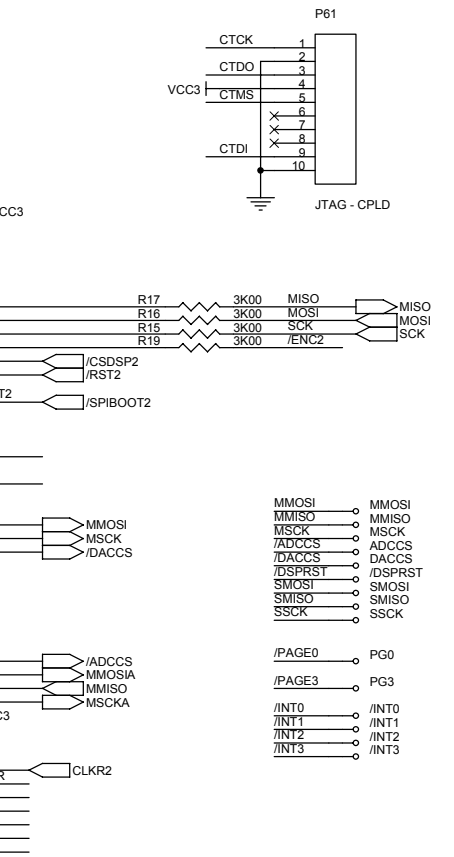
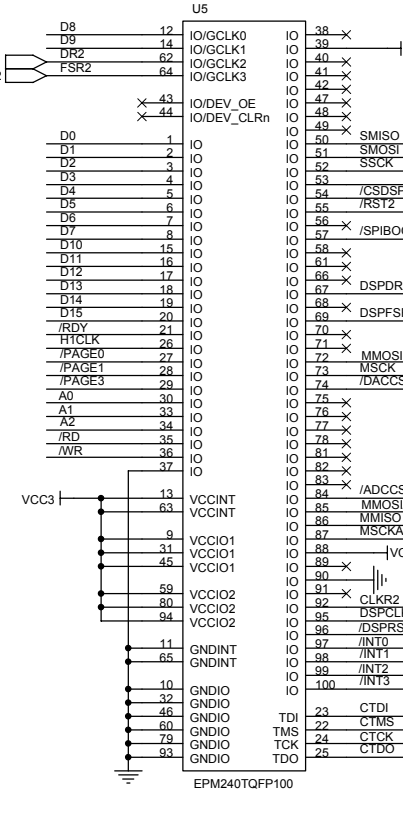
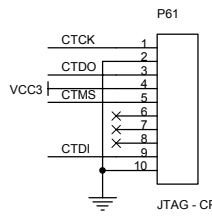
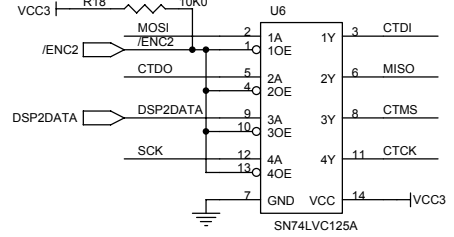
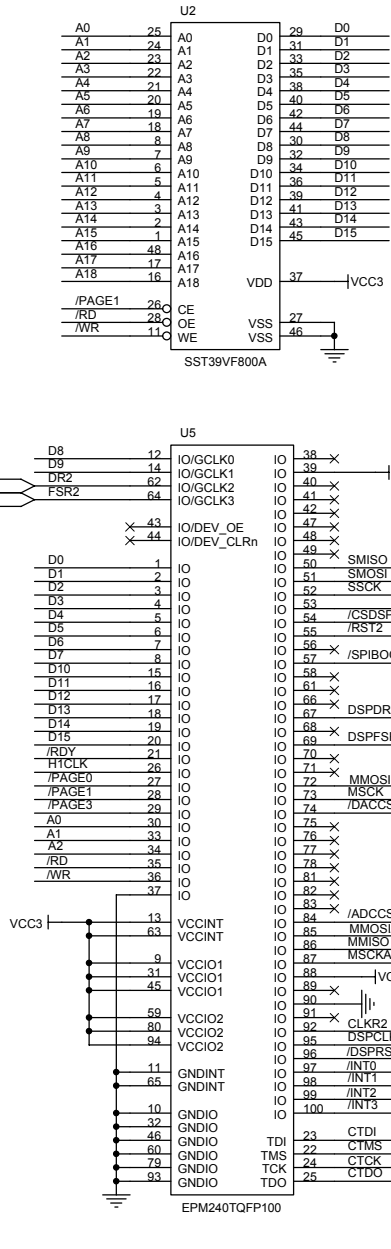
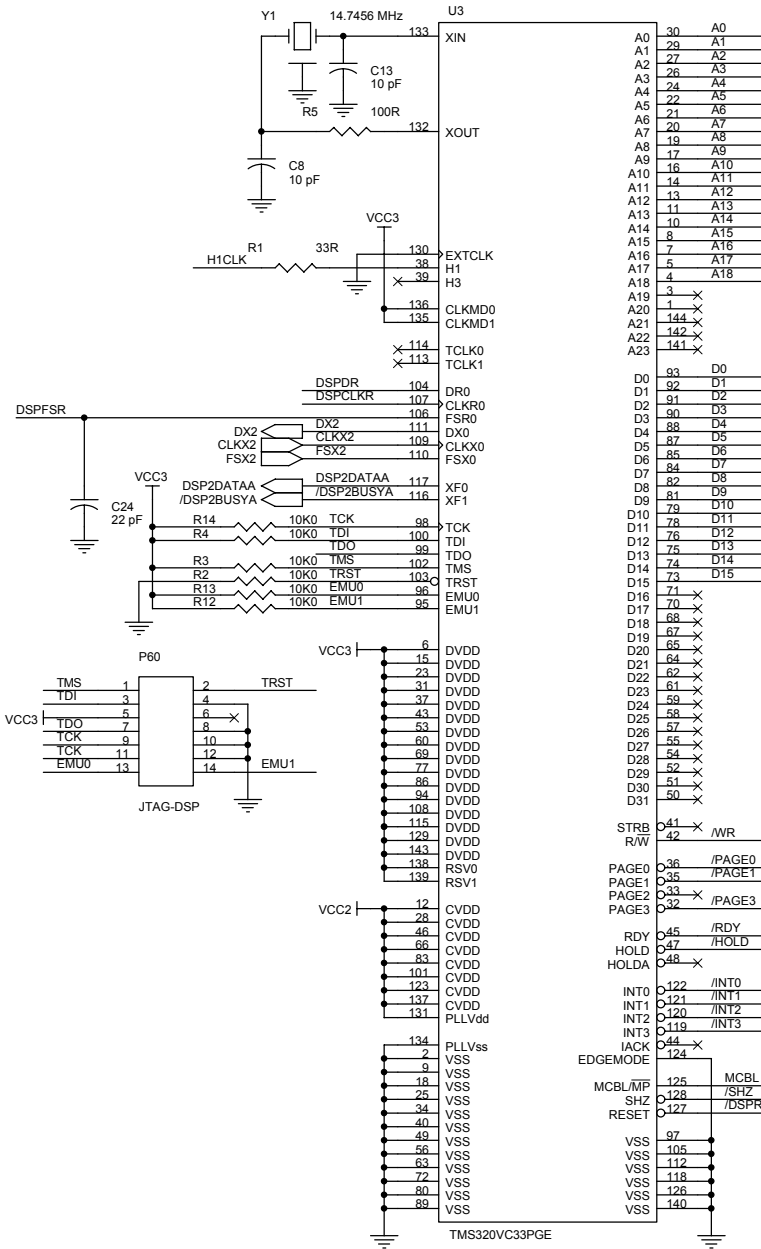
NOTES: PCB Revision XC

Title		
K3 AUX DSP: Top Level		
Size	Document Number	Rev
A	2004051101	XC
Date:	Monday, July 17, 2017	Sheet 1 of 5



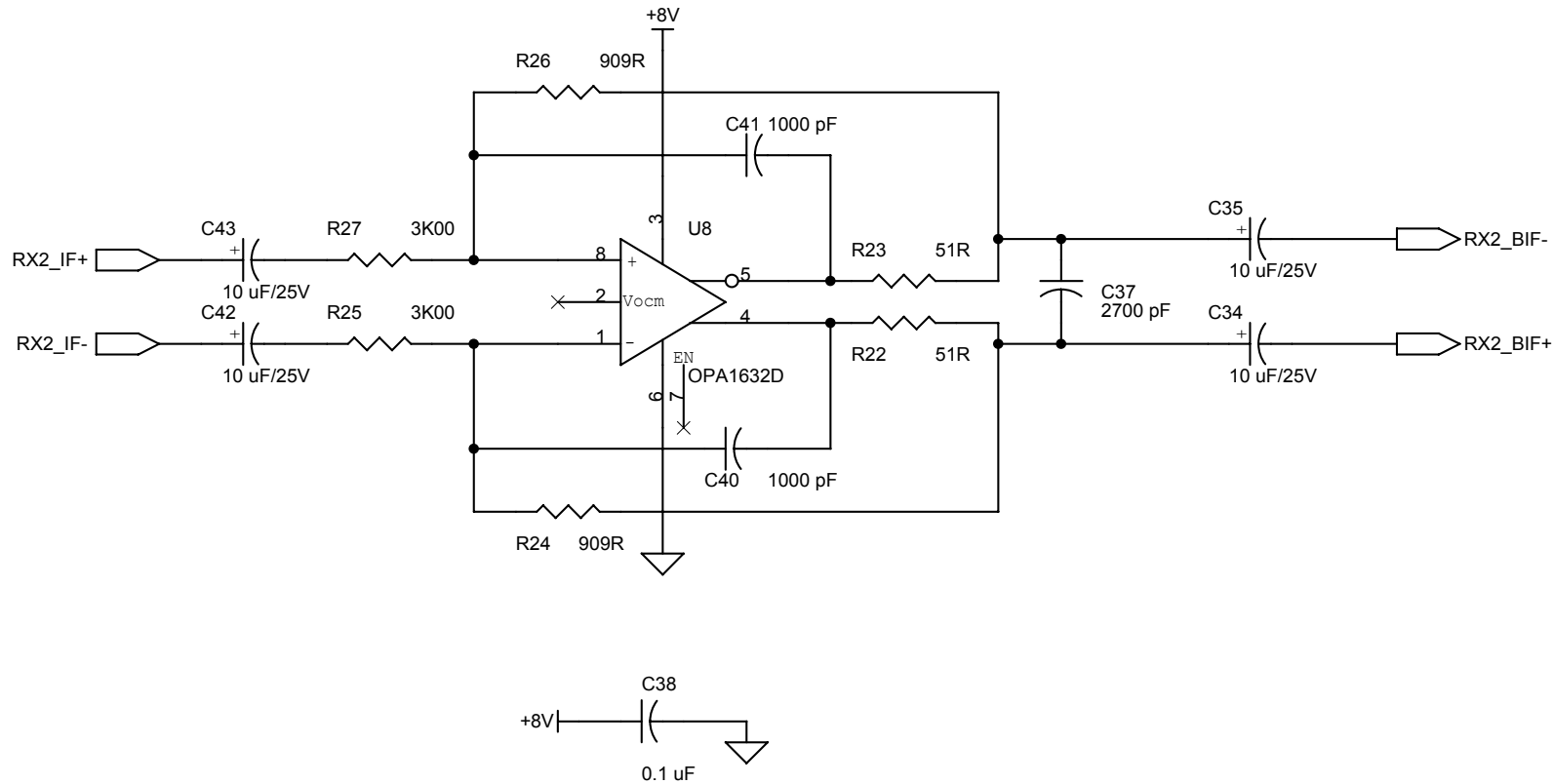
NOTES: PCB Revision XC

Title		
K3 AUX DSP: Analog Interface		
Size	Document Number	Rev
A	2004051101	XC
Date:	Monday, July 17, 2017	Sheet 2 of 5



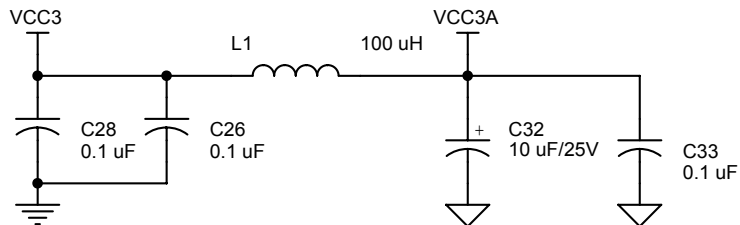
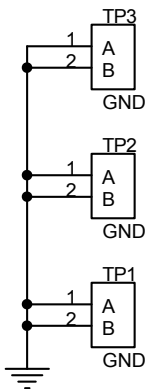
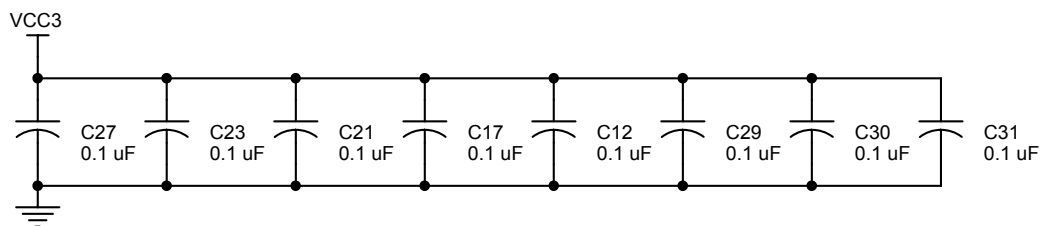
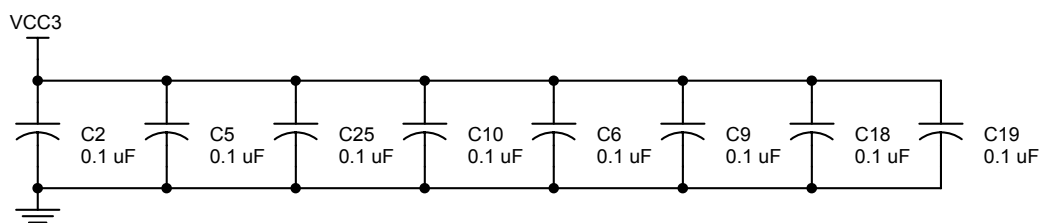
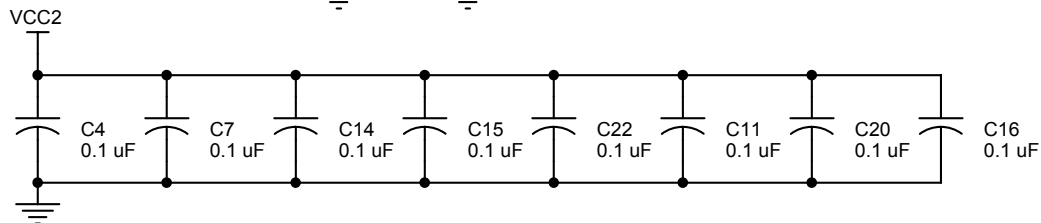
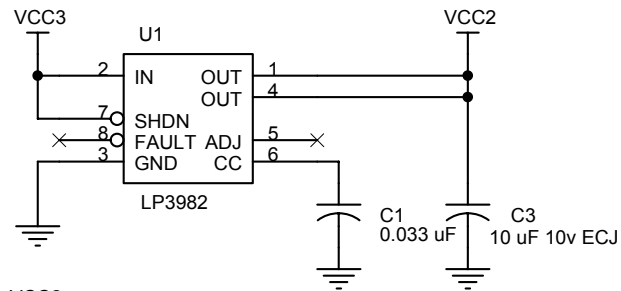
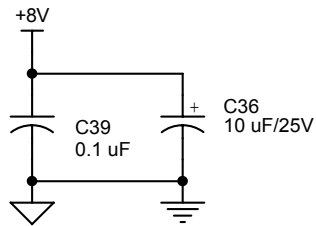
NOTES: PCB Revision XC

Title K3 AUX DSP: DSP and Logic		
Size B	Document Number 2004051101	Rev XC
Date: Monday, July 17, 2017	Sheet 3	of 5



NOTES: PCB Revision XC

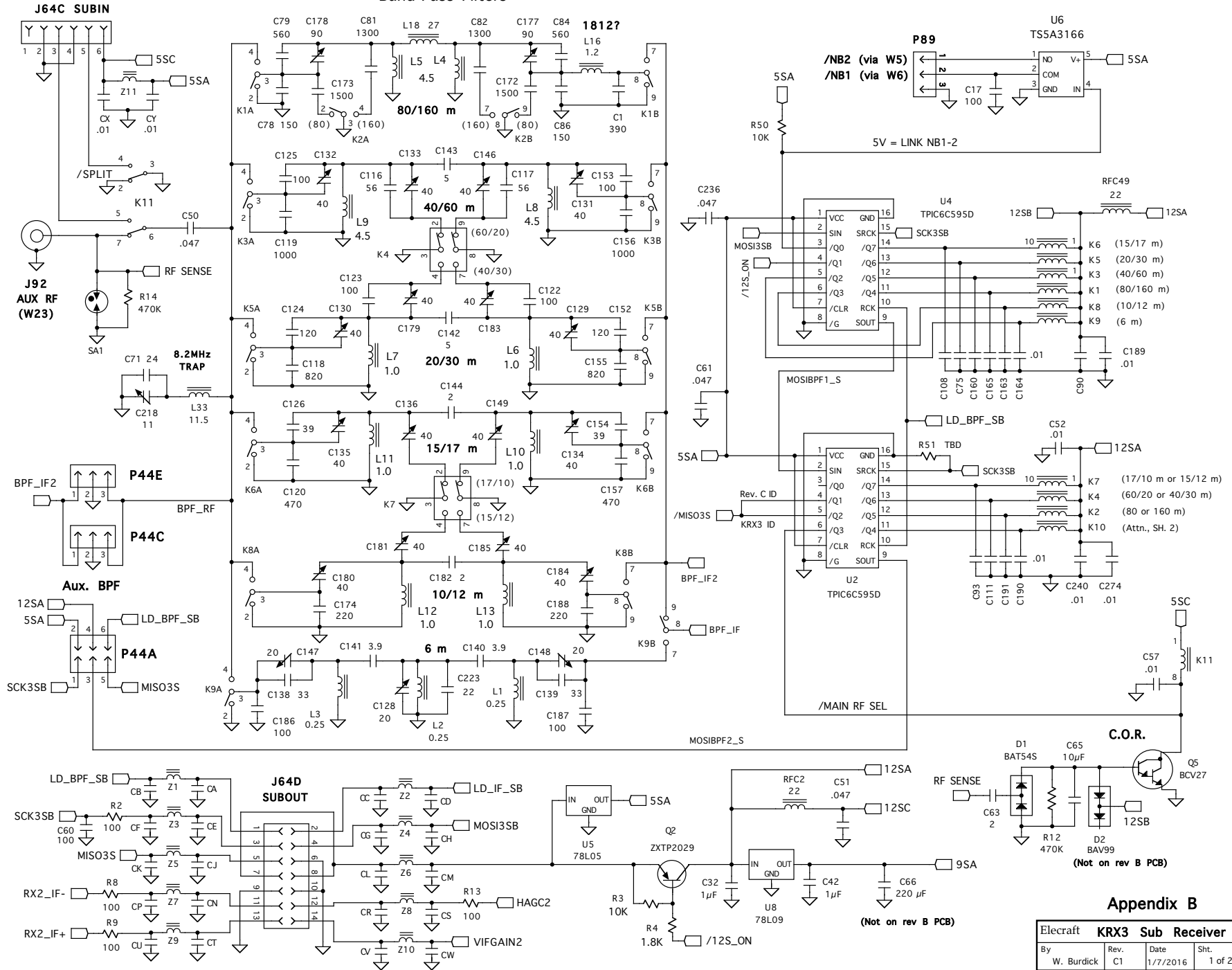
Title		
K3 AUX DSP: IF BUFFER		
Size	Document Number	Rev
A	2004051101	XC
Date:	Monday, July 17, 2017	Sheet 4 of 5



NOTES: PCB Revision XC

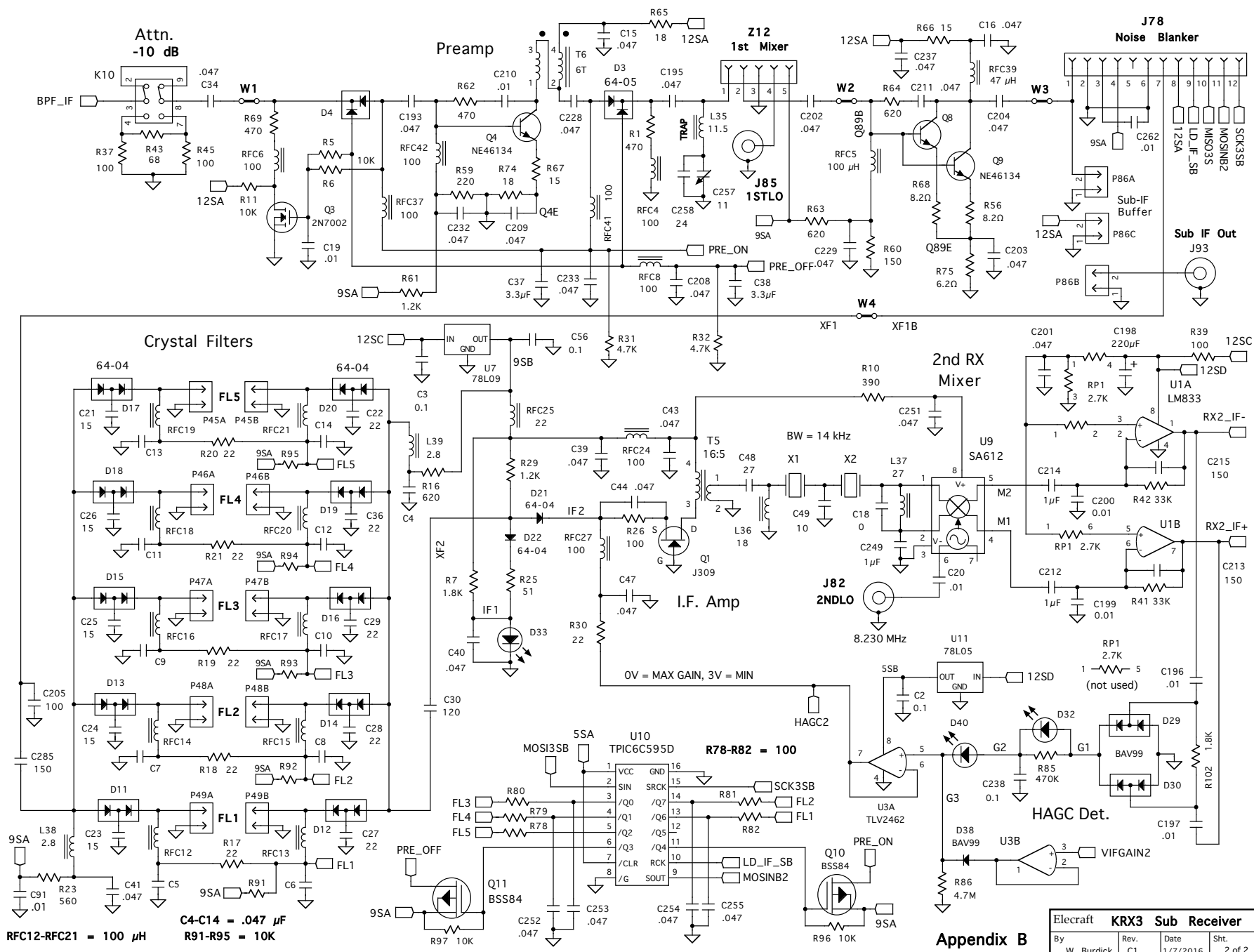
Title		
K3 AUX DSP: Power		
Size	Document Number	Rev
A	2004051101	XC
Date:	Monday, July 17, 2017	Sheet 5 of 5

### Band-Pass Filters



### Appendix B

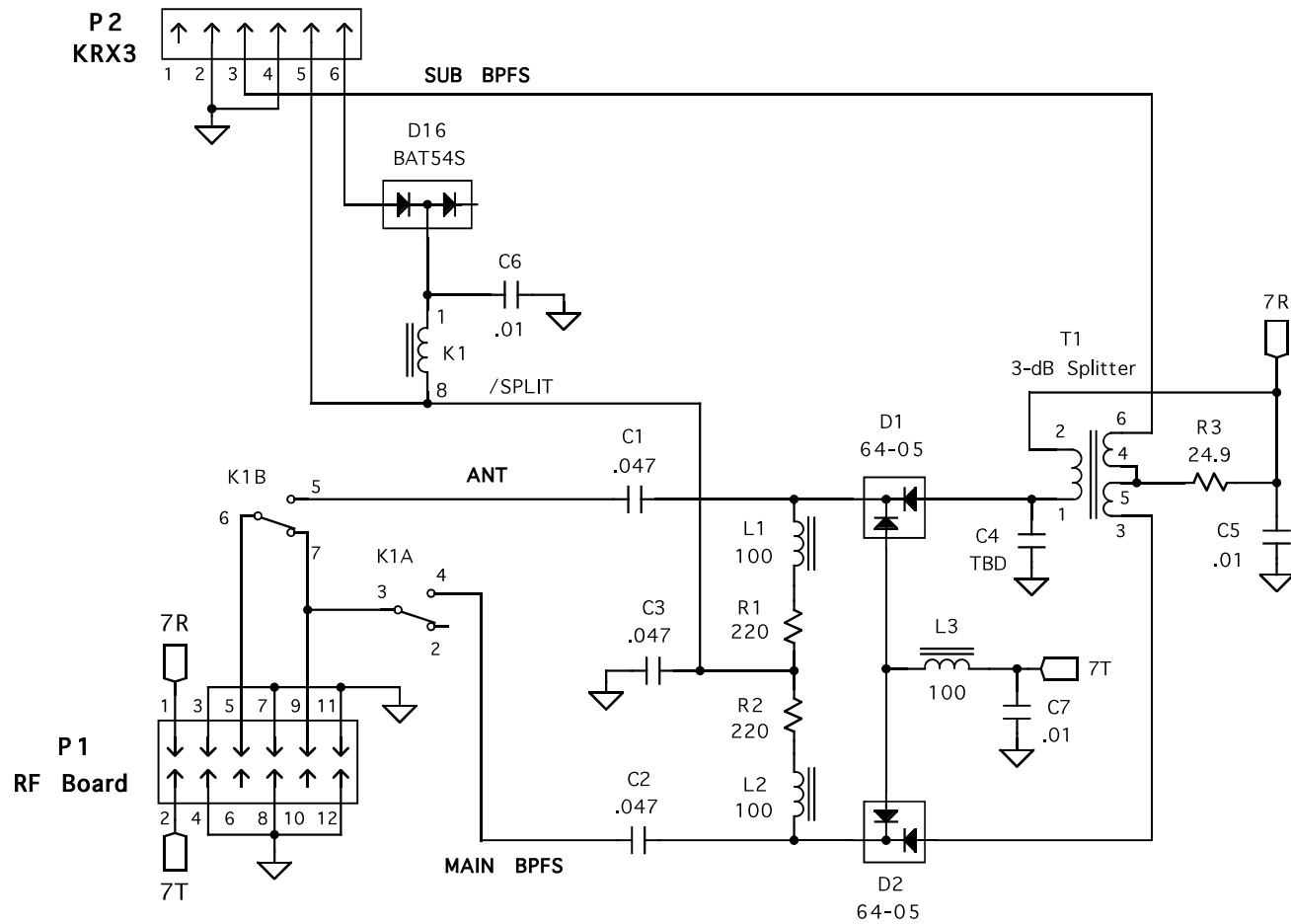
ElecRAFT KRX3 Sub Receiver			
By	Rev.	Date	Sht.
W. Burdick	C1	1/7/2016	1 of 2



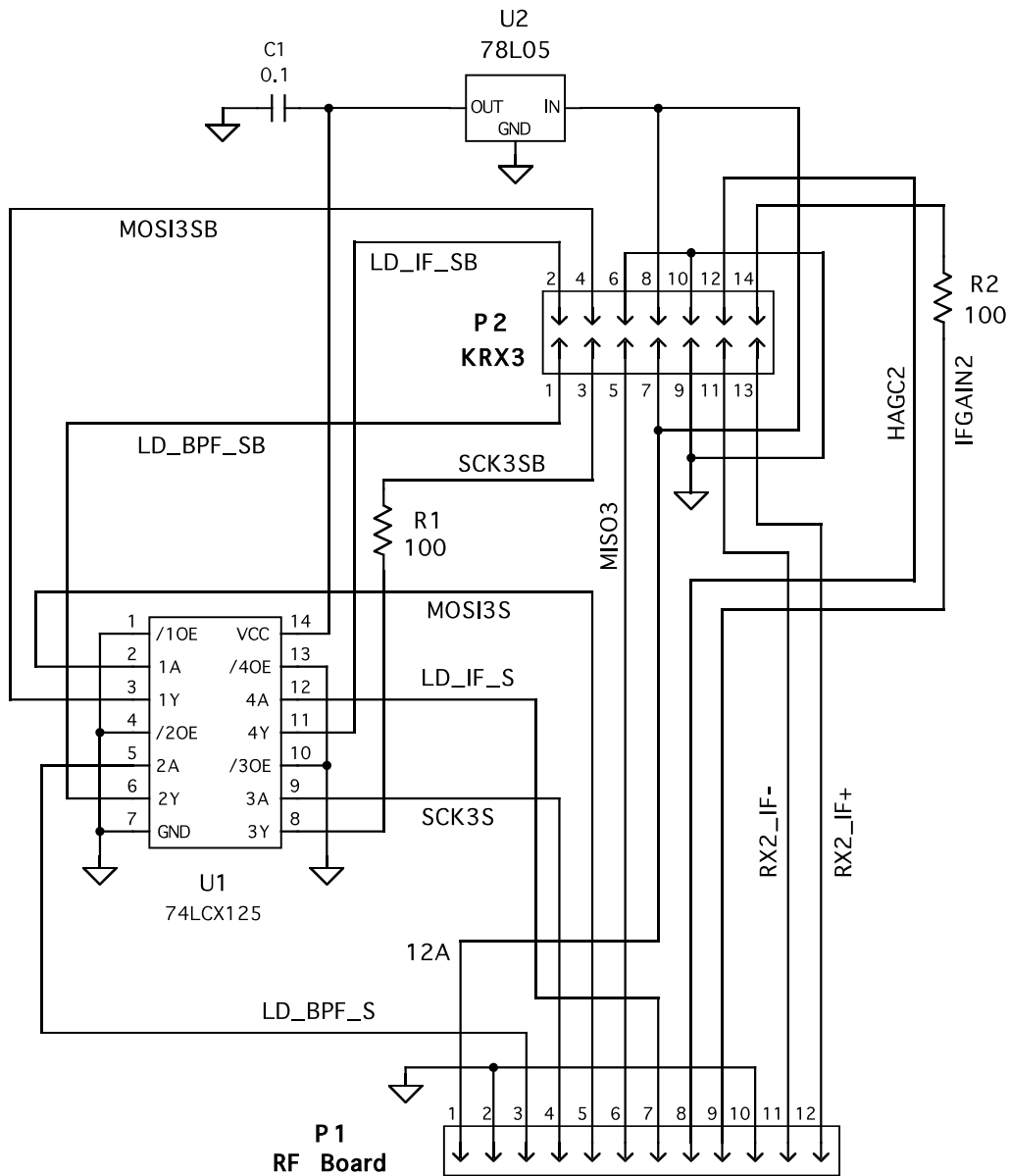
**Appendix B**

Elecraft KRX3 Sub Receiver			
By W. Burdick	Rev. C1	Date 1/7/2016	Sht. 2 of 2

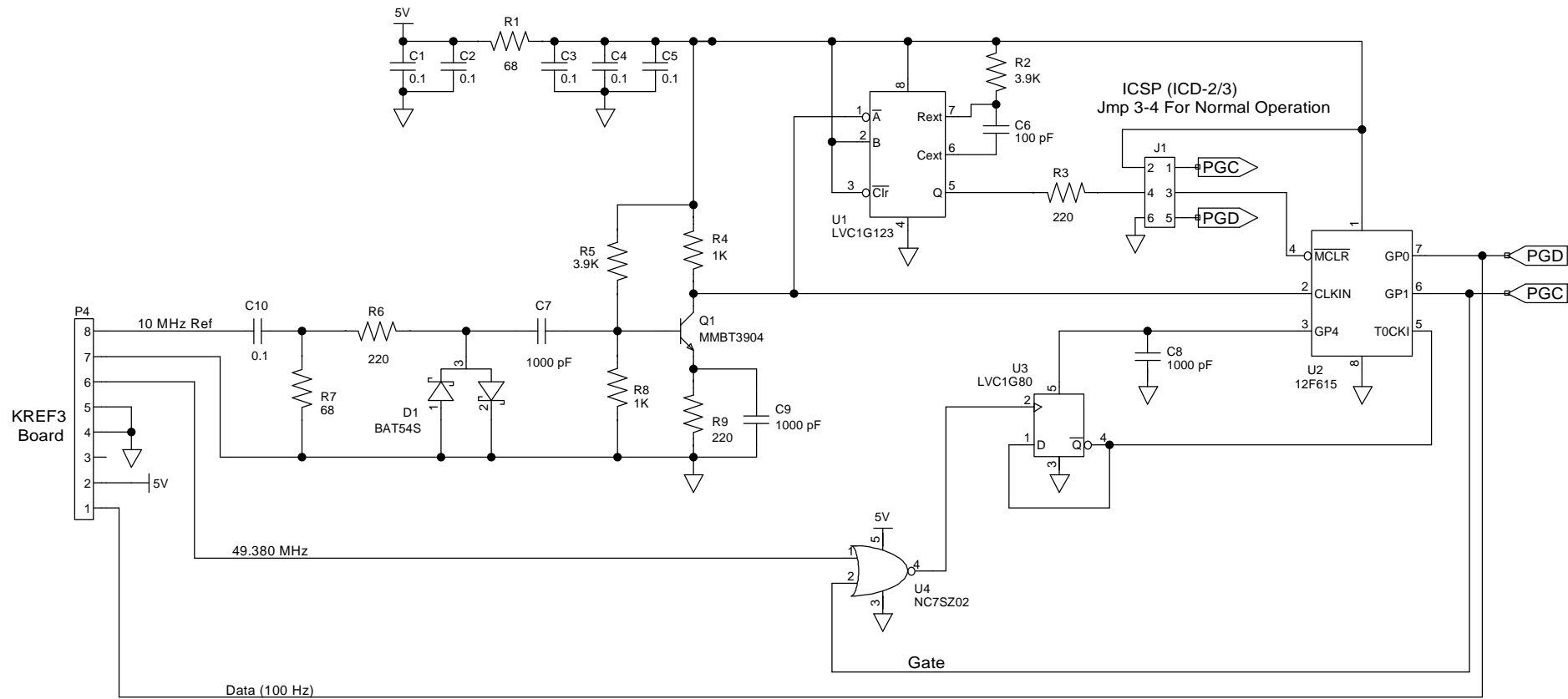


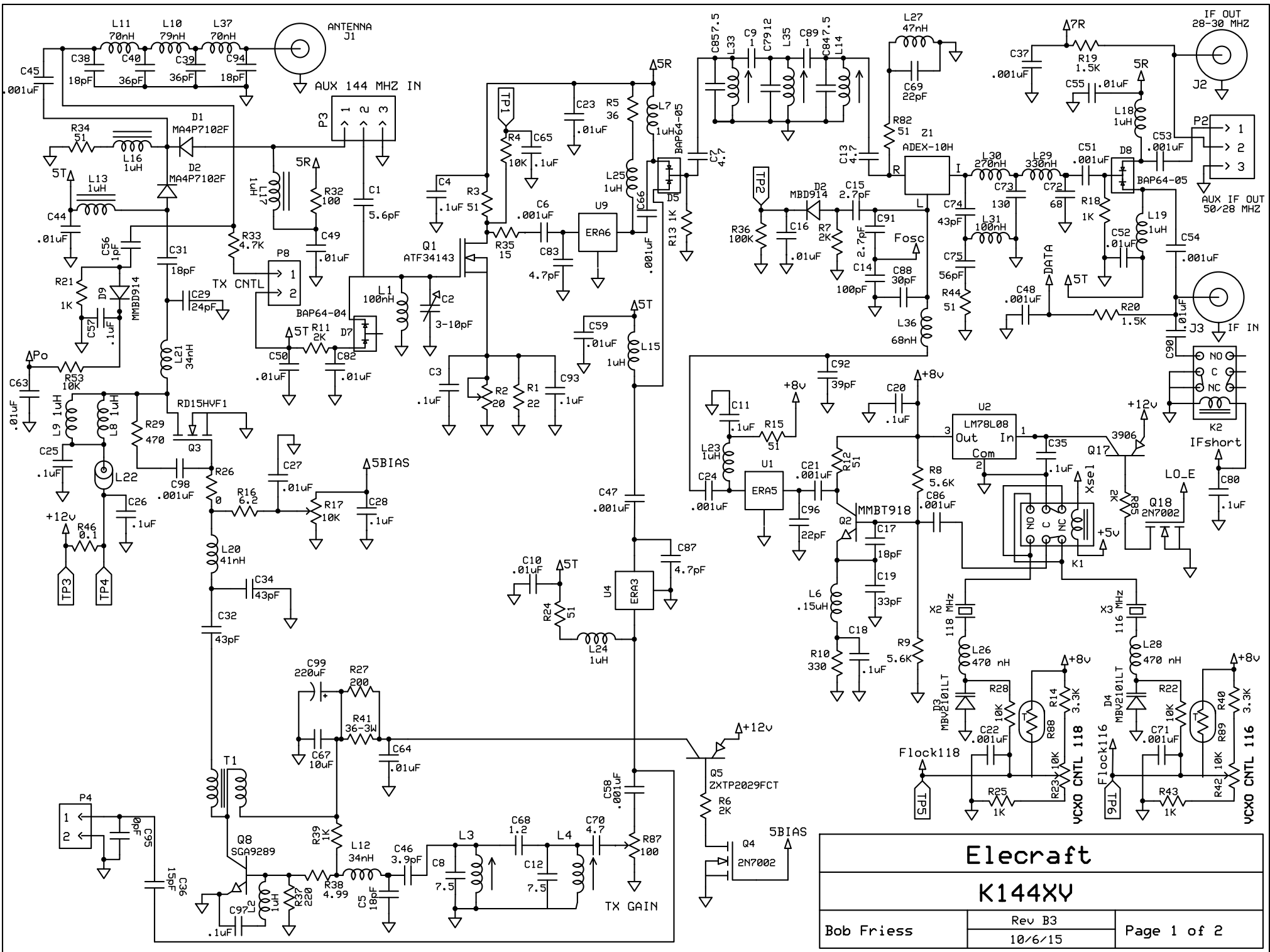


Elecraft SUBIN Module			
By W. Burdick	Rev. B2	Date 9/18/08	Sht. 2 of 2

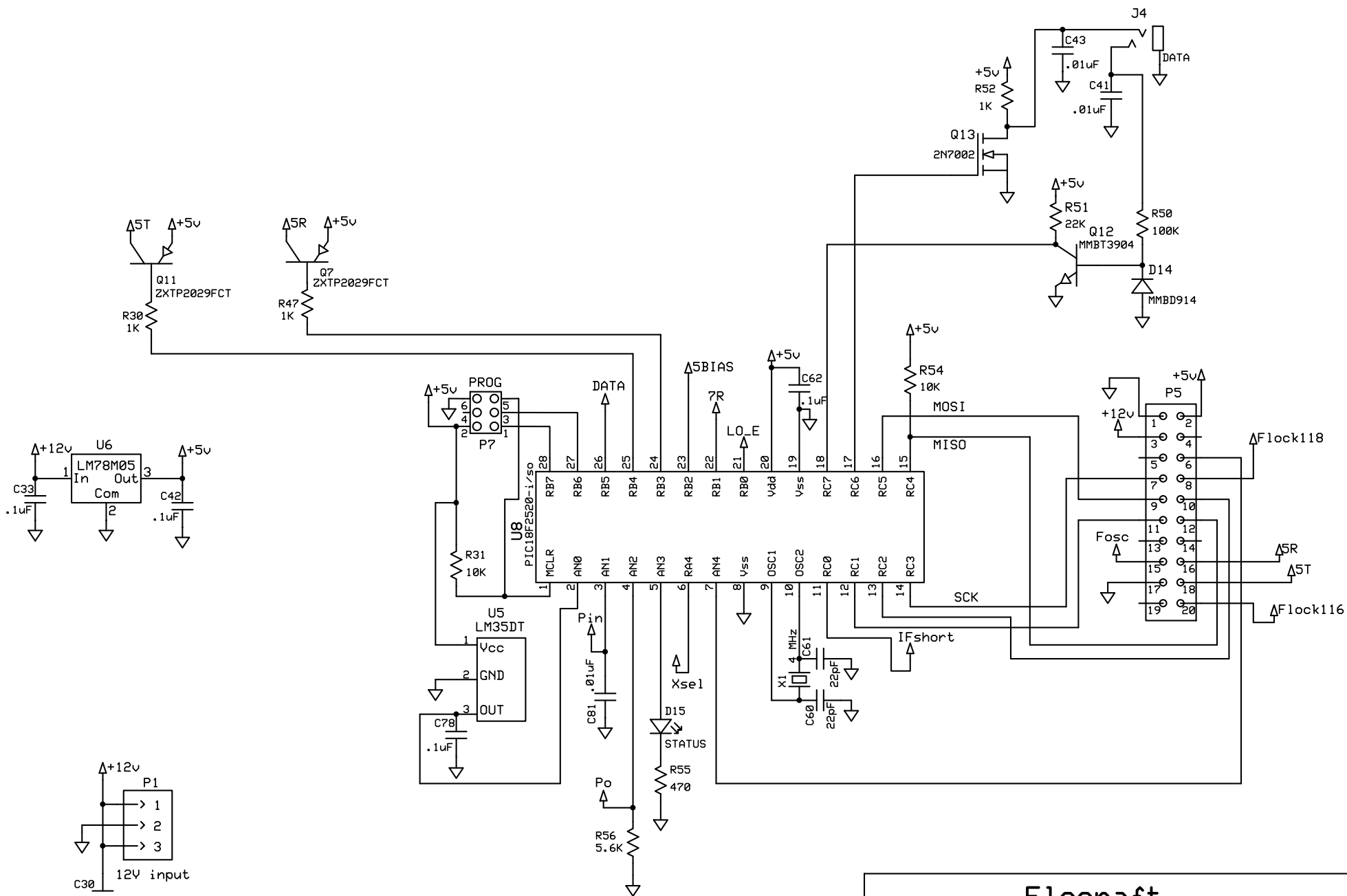


Elecraft SUBOUT Module			
By	Rev.	Date	Sht.
W. Burdick	B2	8/18/08	2 of 2





<b>Elecraft</b>		
<b>K144XV</b>		
Bob Friess	Rev B3 10/6/15	Page 1 of 2



Update history  
 B3 10/6/15 By Vic Linderholm

<b>Elecraft</b>		
<b>K144XV</b>		
Bob Friess	Rev B2	Page 2 of 2
	10/6/15	

