

Elecraft K3 Schematics

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

This is a preliminary document, and will be superseded by the Schematics section of the Service Manual, when published.

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

BLOCK DIAGRAM

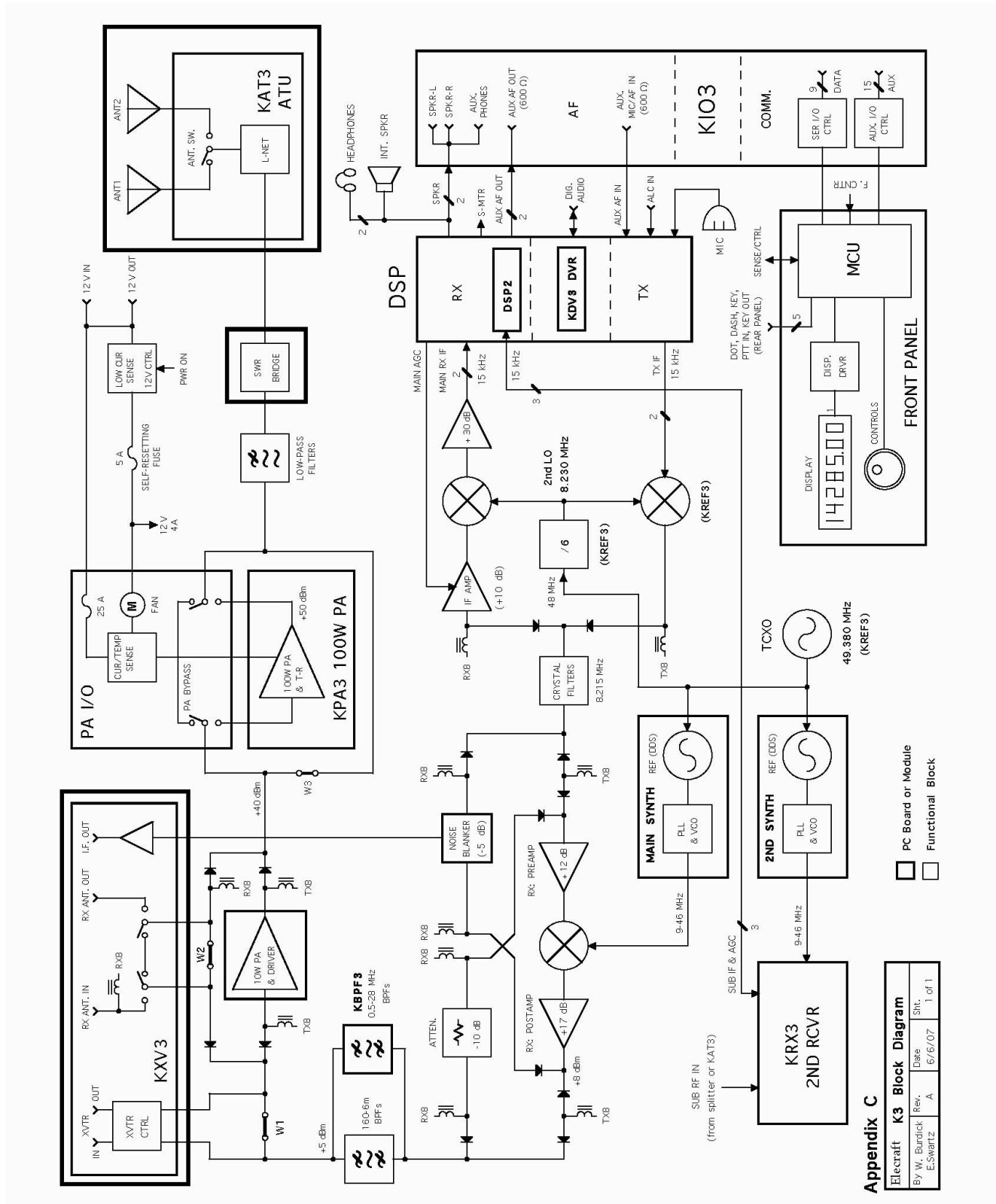
K3/10

- RF Board
- Band Stop Filter
- Mixer
- Crystal Filter
- KIO3
- KANT3
- KNB3
- KREF3
- KSYN3
- Front Panel
- DSP
- 10-watt PA

OPTIONS

KBPF3	General Coverage Receiver Bandpass Filters
KXV3	Transverter Interface and Receive Antenna Switching
KAT3	100-watt Antenna Tuner
DVR	Digital Voice Record/Playback
KPAIO3	Part of 100-watt PA
KPA3	Part of 100-watt PA

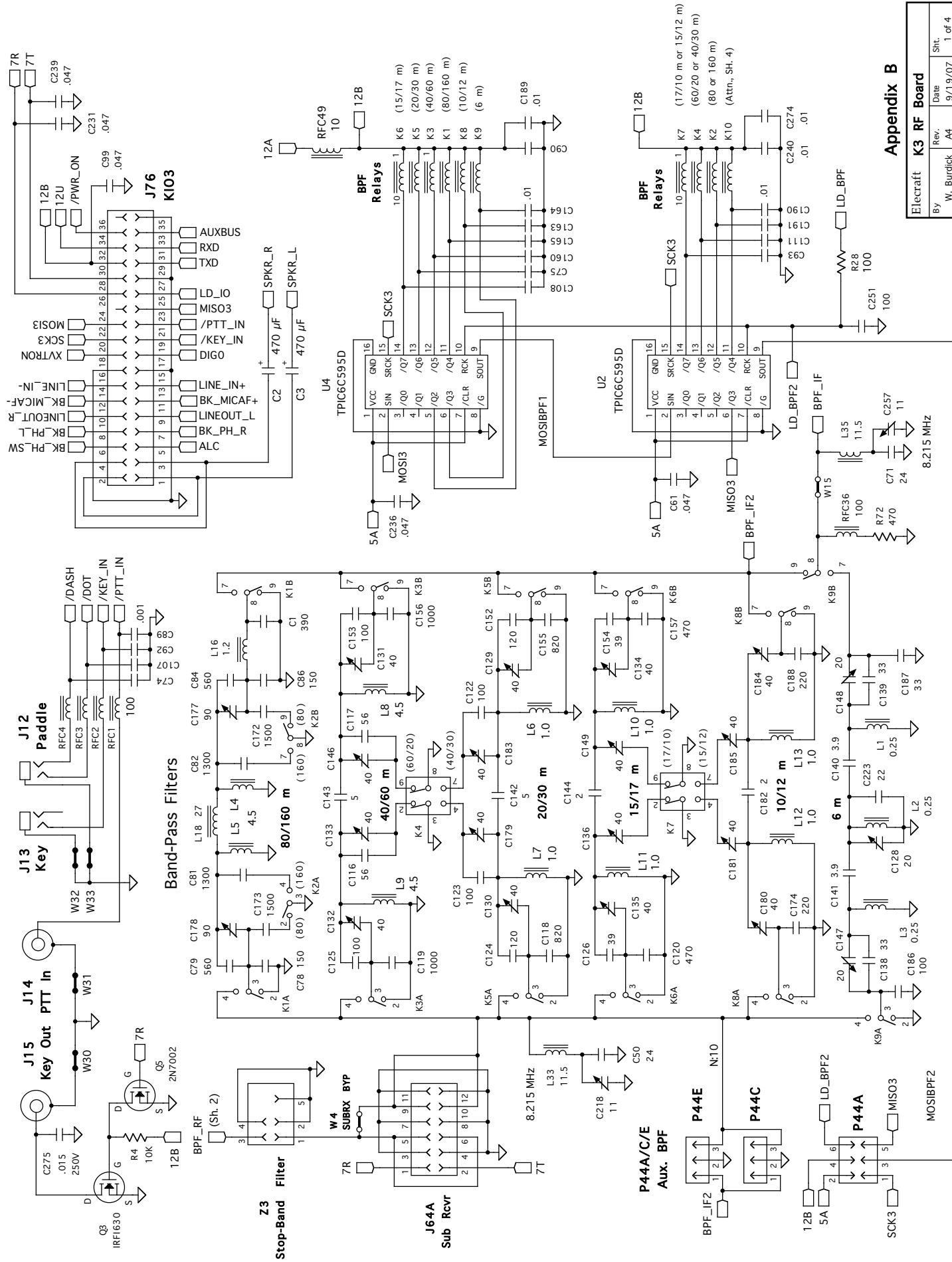
K3 Block Diagram



Appendix C

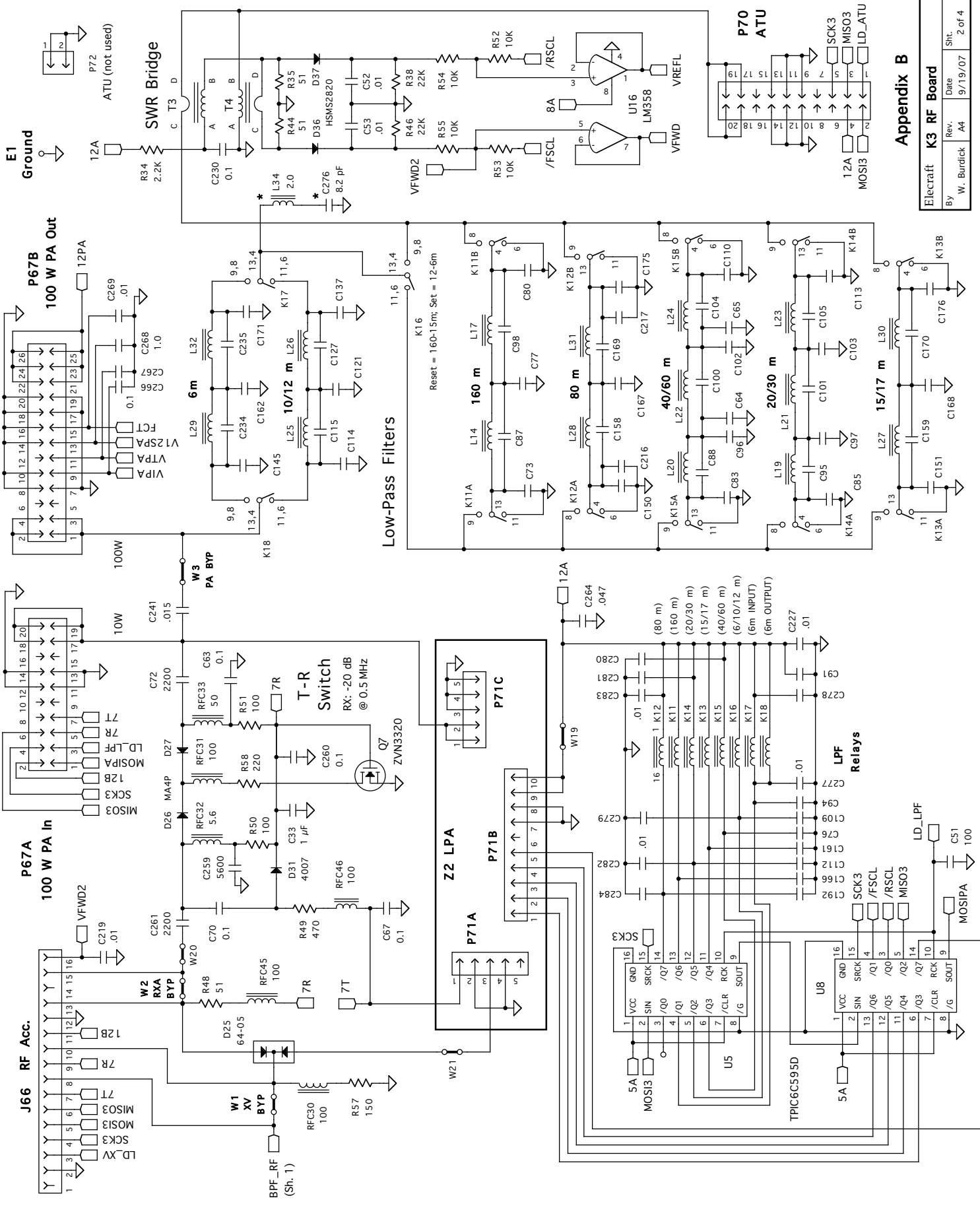
Elecraft K3 Block Diagram		
By	Date	Shr.
W. Burdick	6/6/07	1 of 1
E. Swartz	A	

- PC Board or Module
- Functional Block



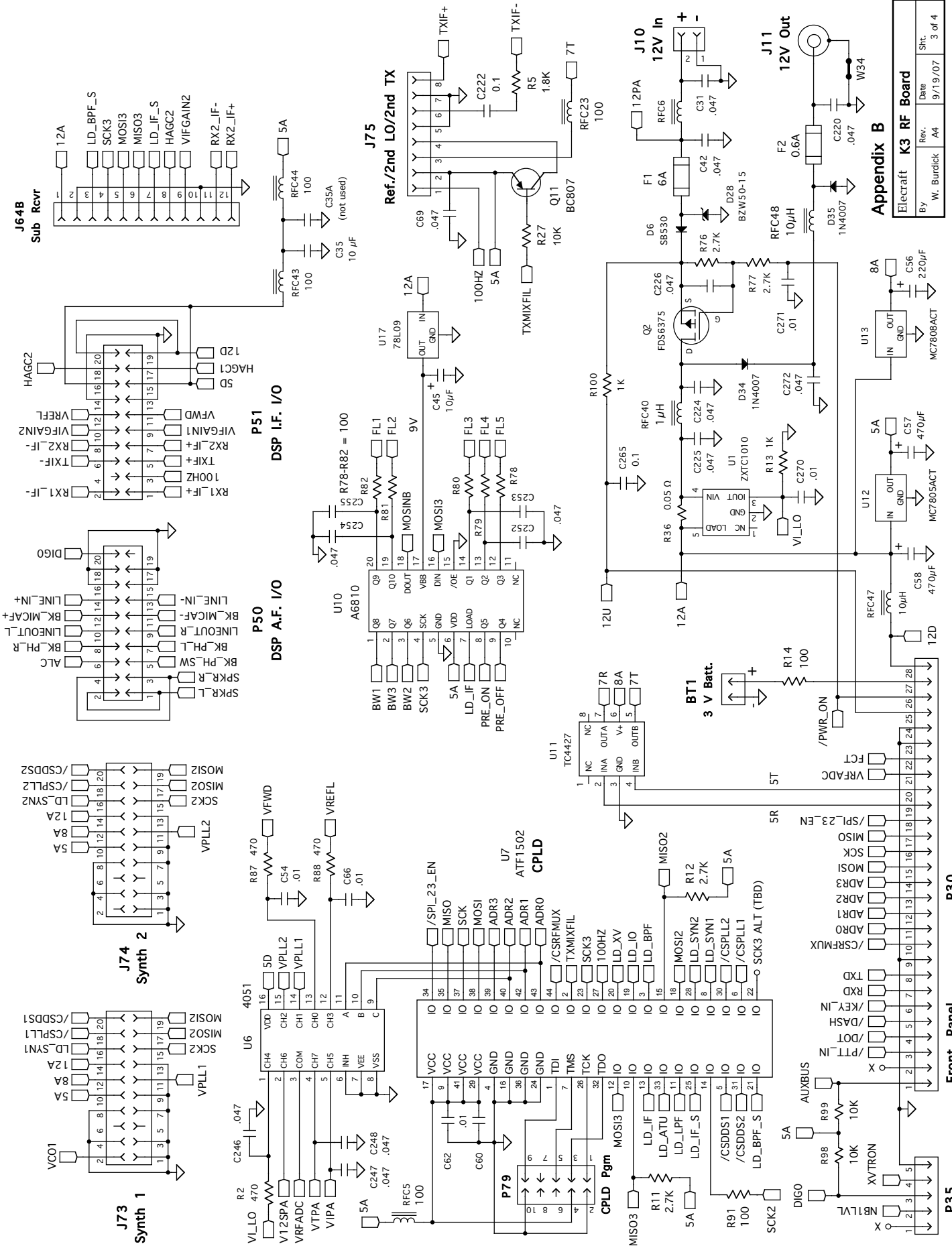
Appendix B

Electcraft K3 RF Board		
By	Rev.	Date
W. Burdick	A4	9/19/07
		Sht.
		1 of 4



Appendix B

Elecraft	K3 RF Board
By	W. Burdick
Rev.	A4
Date	9/19/07
Shit.	2 of 4



Appendix B

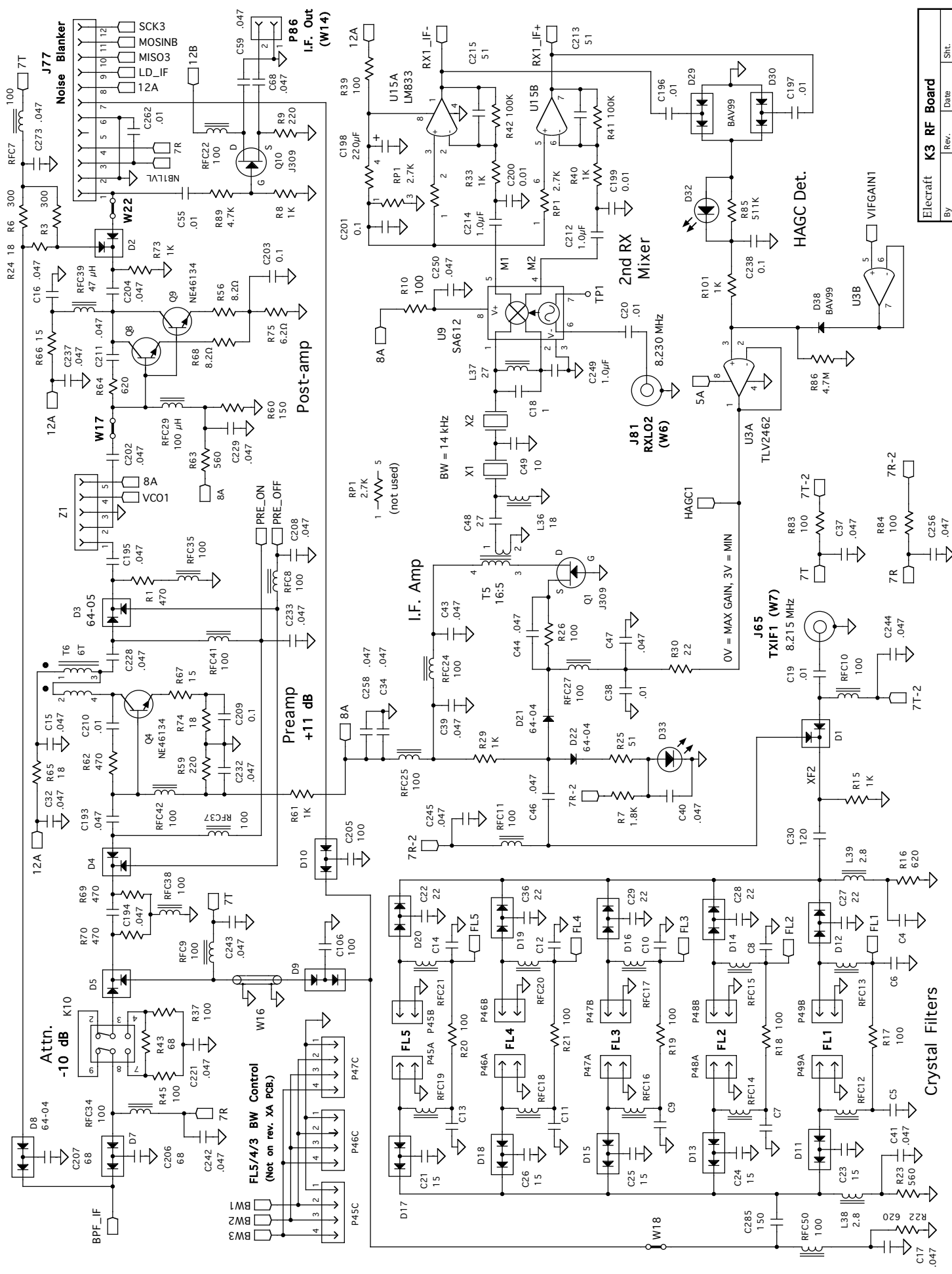
Rev.	Date	Sheet
W. Burdick A4	9/19/07	3 of 4

Elecraft K3 RF Board

Front Panel

P30

P35

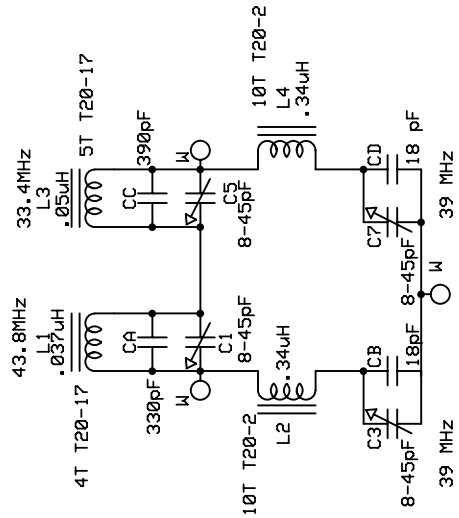


Electcraft K3 RF Board			
By	Rev.	Date	Sht.
W. Burdick	A4	9/19/07	4 of 4

Appendix B

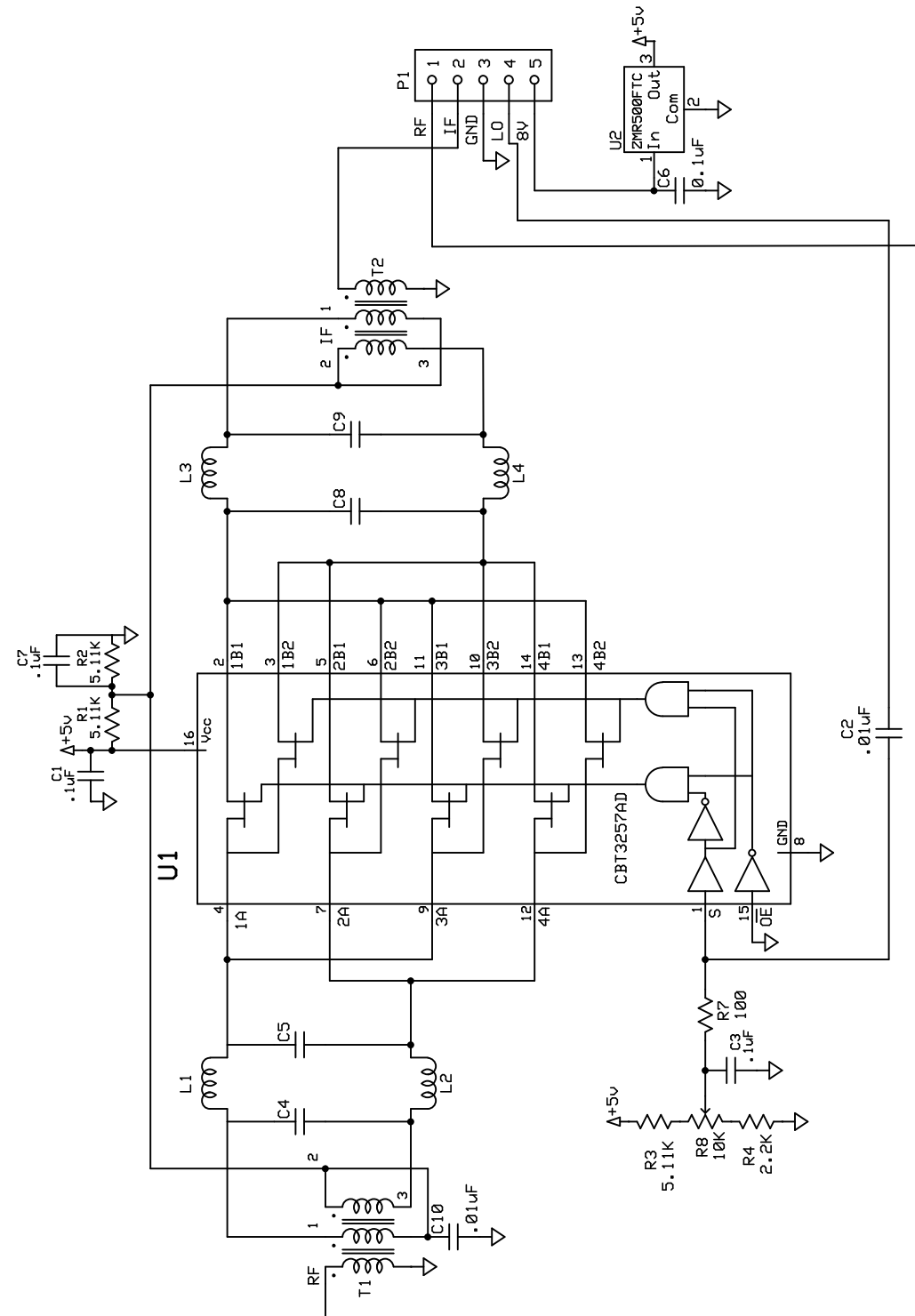
RFC12-RFC21 = 100 μH C4-C14 = .047 μF

Crystal Filters

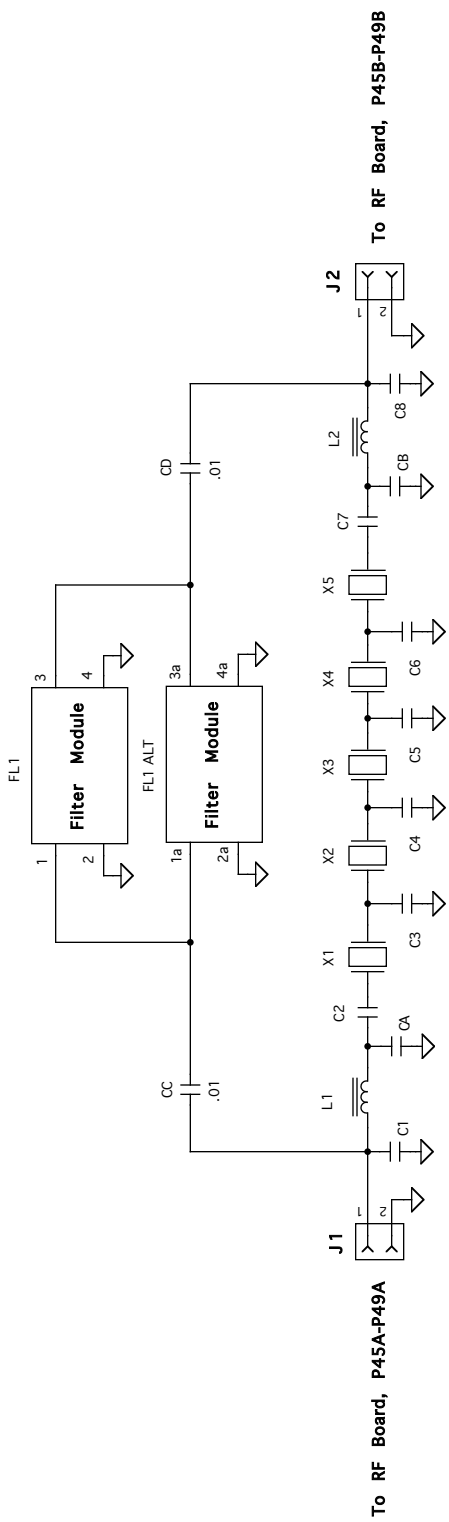


Elecraft

Bandstop Filter



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

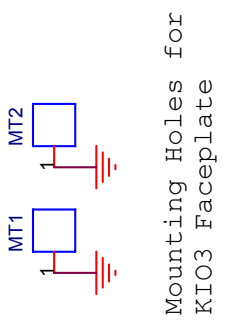
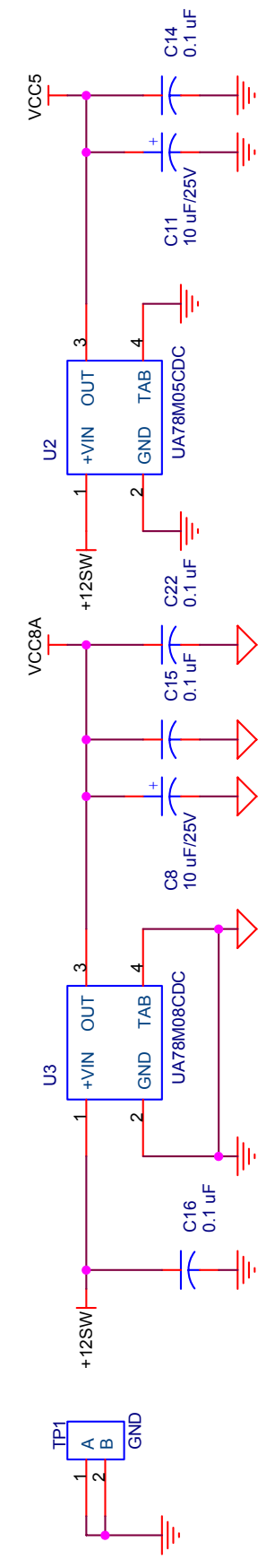
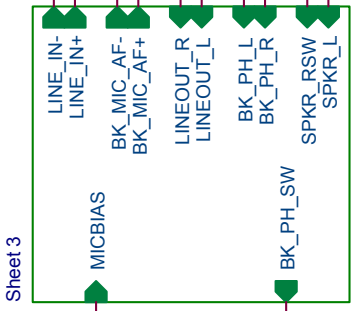
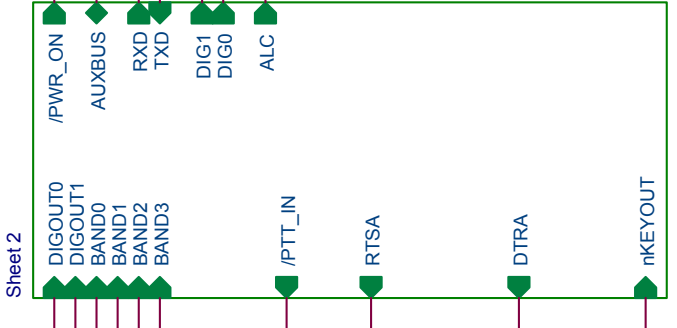
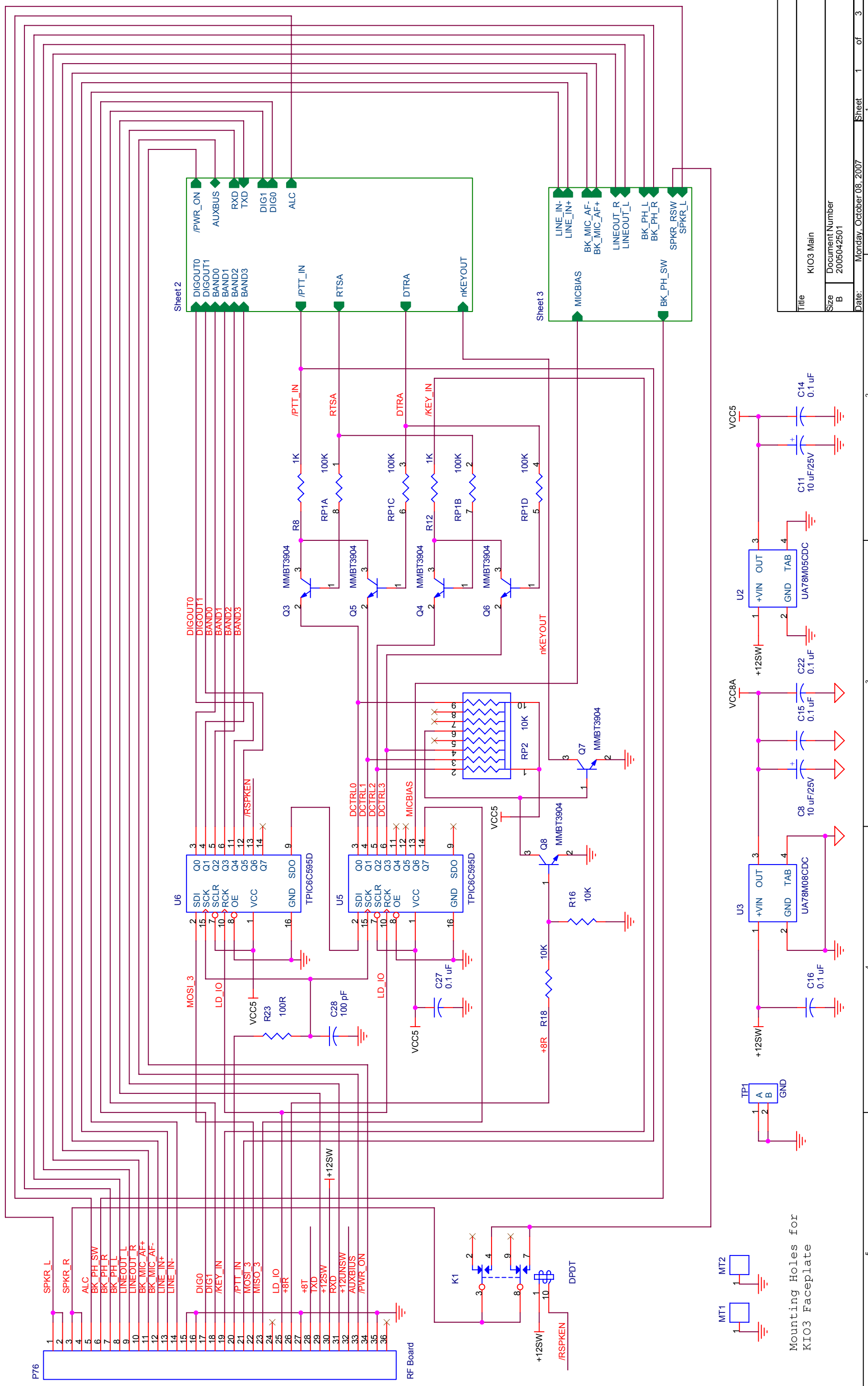


NOTES:

1. This PCB can be used to assemble a discrete 5-pole crystal filter, or as a carrier for filter modules (INRAD, etc.).
Install filter module at FL1 or FL1 ALT as required.
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.

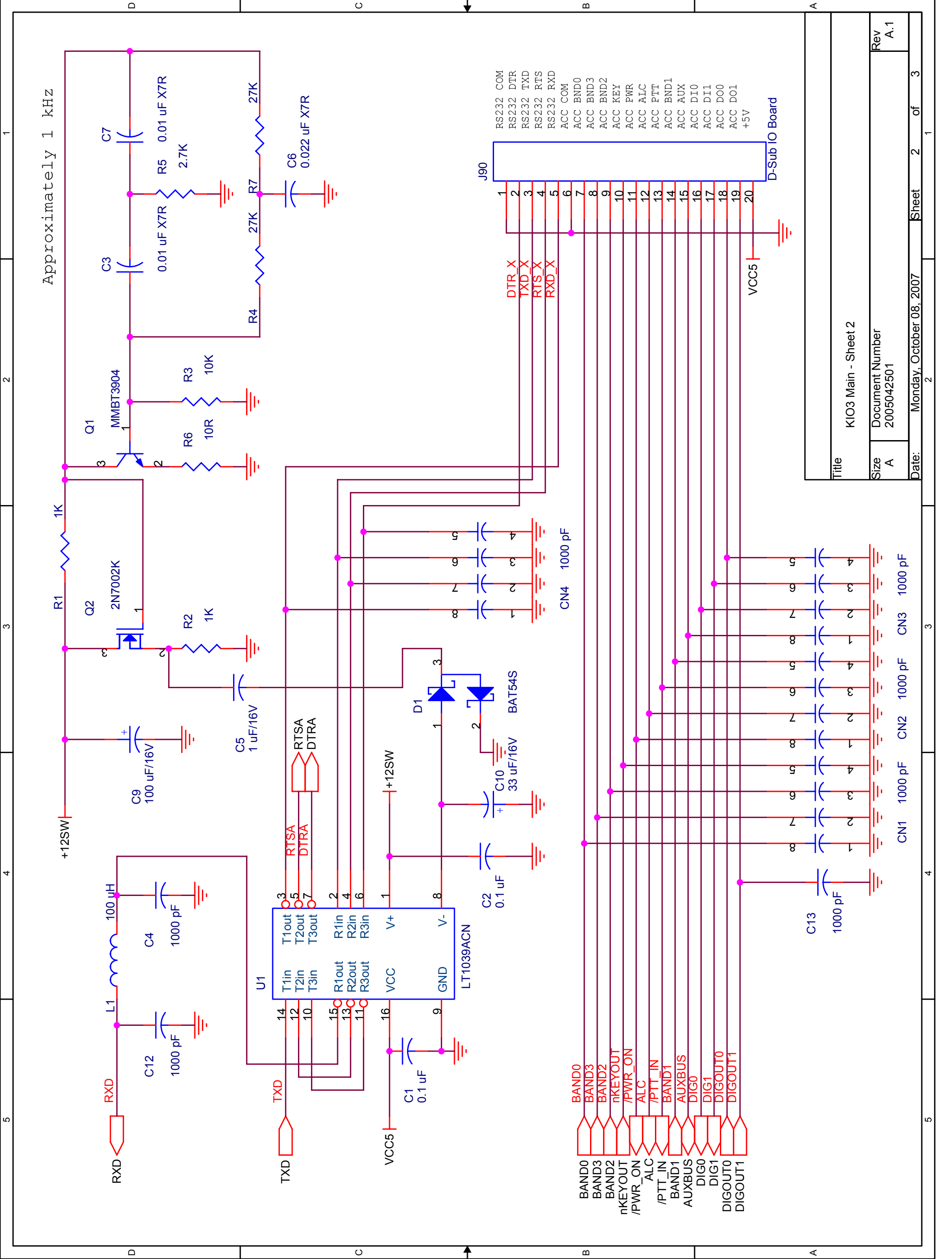
Fc	Zin/out	BW @ -6 dB	C1,C8	C2	C3	C4	C5	C6	C7	CA,CB	L1, L2	Crystal p/r/n, Inductor Windings, Notes
8.215 MHz	500 Ω	200 Hz	120 pF	2700 pF	620 pF	1000 pF	1000 pF	620 pF	2700 pF	0 pF	2.8 μH	E660027
8.215 MHz	500 Ω	250 Hz	150 pF	750 pF	750 pF	750 pF	750 pF	750 pF	750 pF	0 pF	2.3 μH	E660027
8.215 MHz	500 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/1 dB 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
 X1-X5 must be matched to within +/- 10 Hz.



Mounting Holes for KIO3 Faceplate

Title	KIO3 Main
Size	B
Document Number	2005042501
Date:	Monday, October 08, 2007
Sheet	1 of 3
Rev	A.1

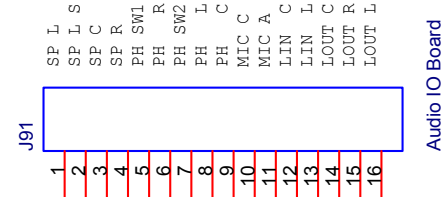
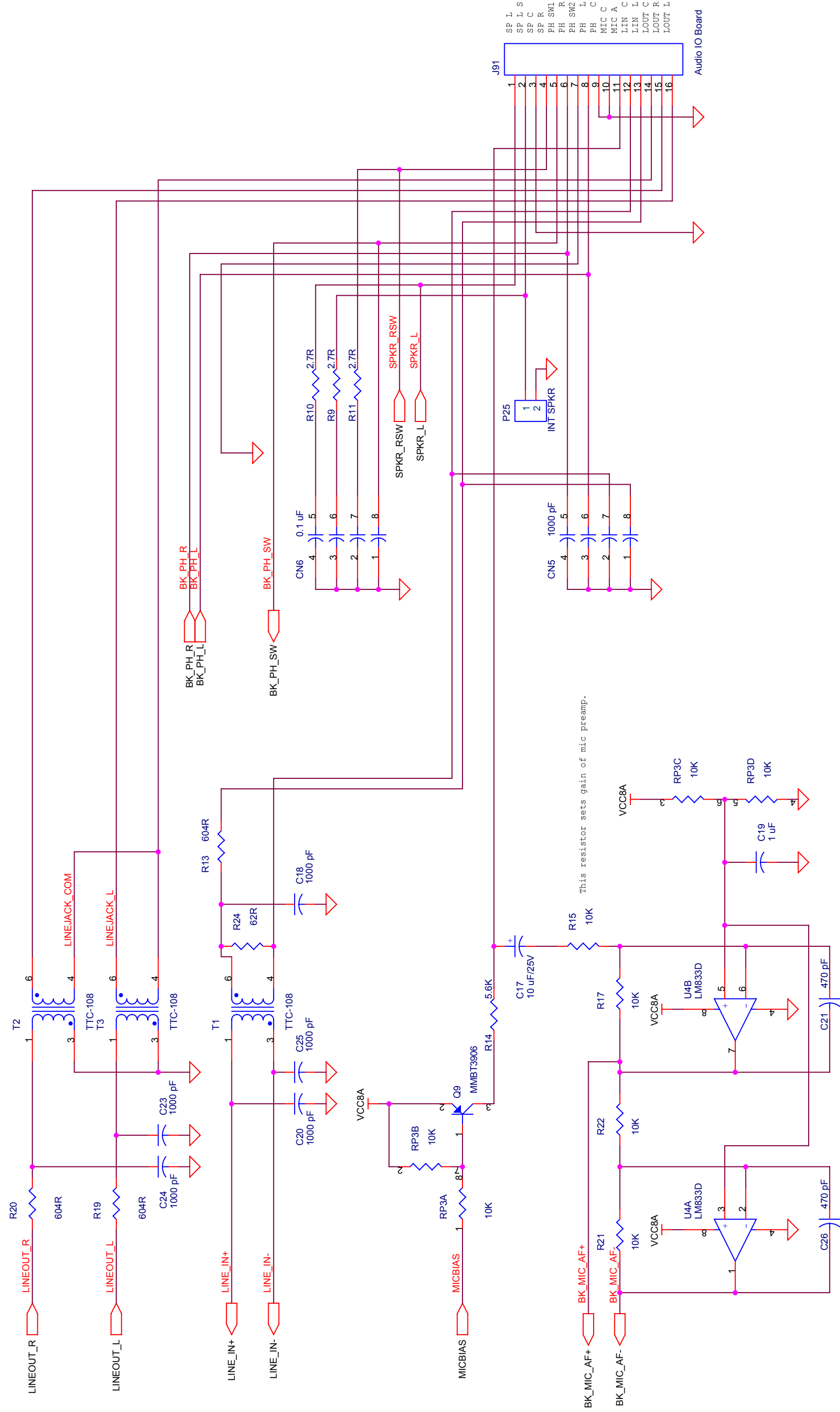


Approximately 1 kHz

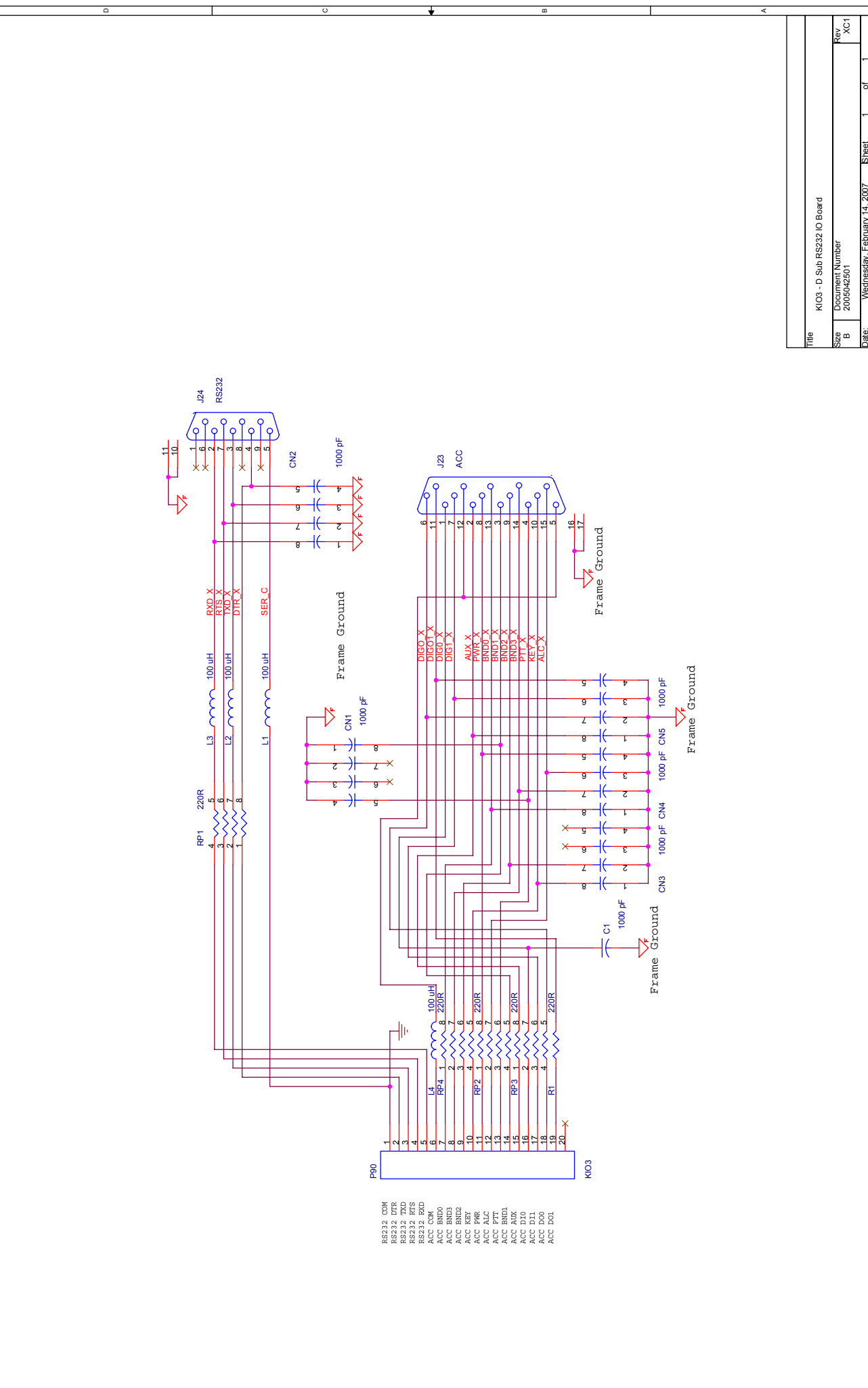
Title		KIO3 Main - Sheet 2	
Size	A	Document Number	2005042501
Rev	A.1	Date:	Monday, October 08, 2007
		Sheet	2 of 3

- BAND0
- BAND3
- BAND2
- nKEYOUT
- /PWR_ON
- ALC
- /PTT_IN
- BAND1
- AUXBUS
- DIG0
- DIG1
- DIGOUT0
- DIGOUT1

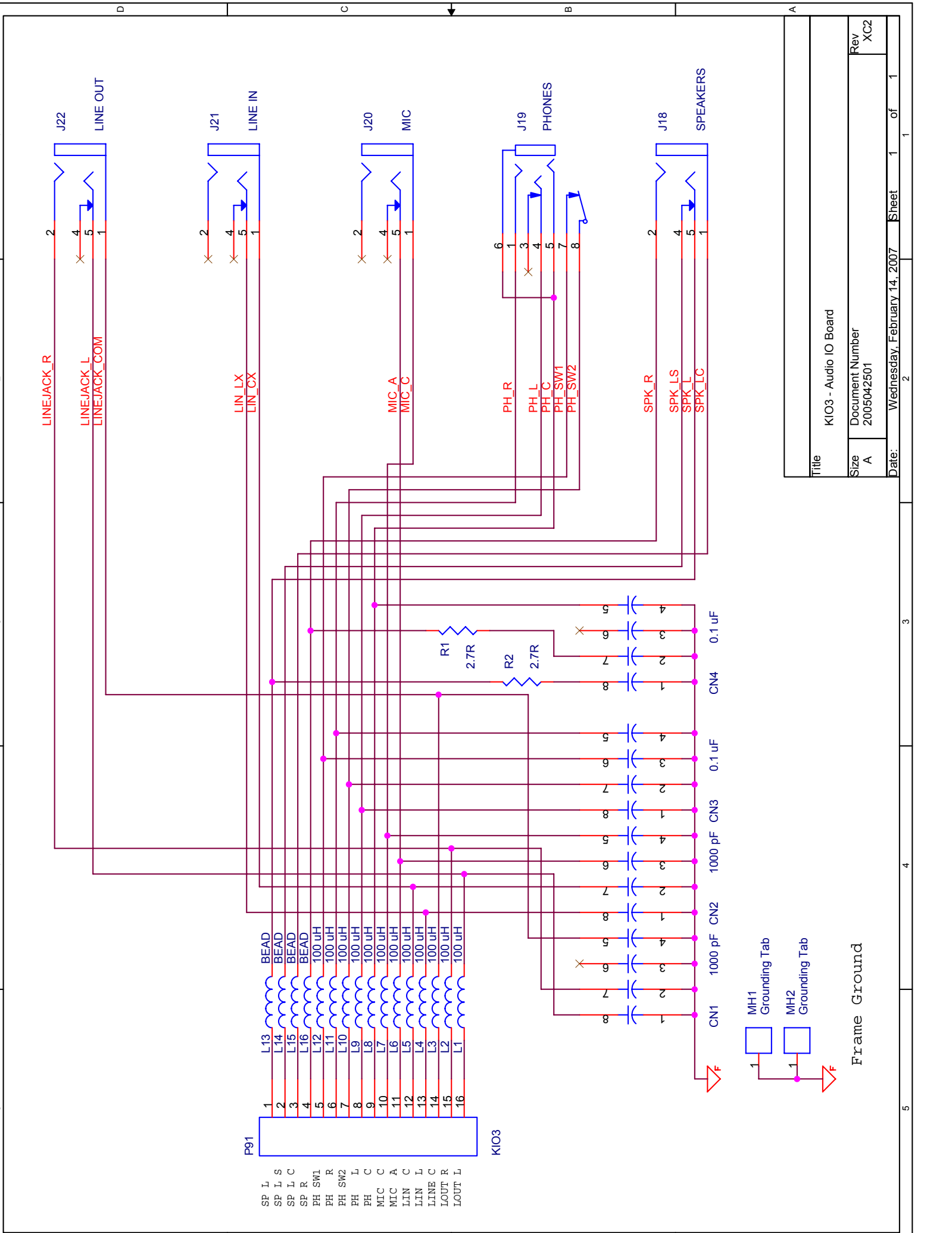
- DTR_X
- TXD_X
- RTS_X
- RXD_X
- ACC COM
- ACC BND0
- ACC BND3
- ACC BND2
- ACC KEY
- ACC PWR
- ACC ALC
- ACC PTT
- ACC BND1
- ACC AUX
- ACC DI0
- ACC DI1
- ACC DO0
- ACC DO1
- +5V



Title		KIO3 Main - Sheet 3
Size	Document Number	2005042501
B	Rev	A.1
Date:	Monday, October 08, 2007	Sheet 3 of 3

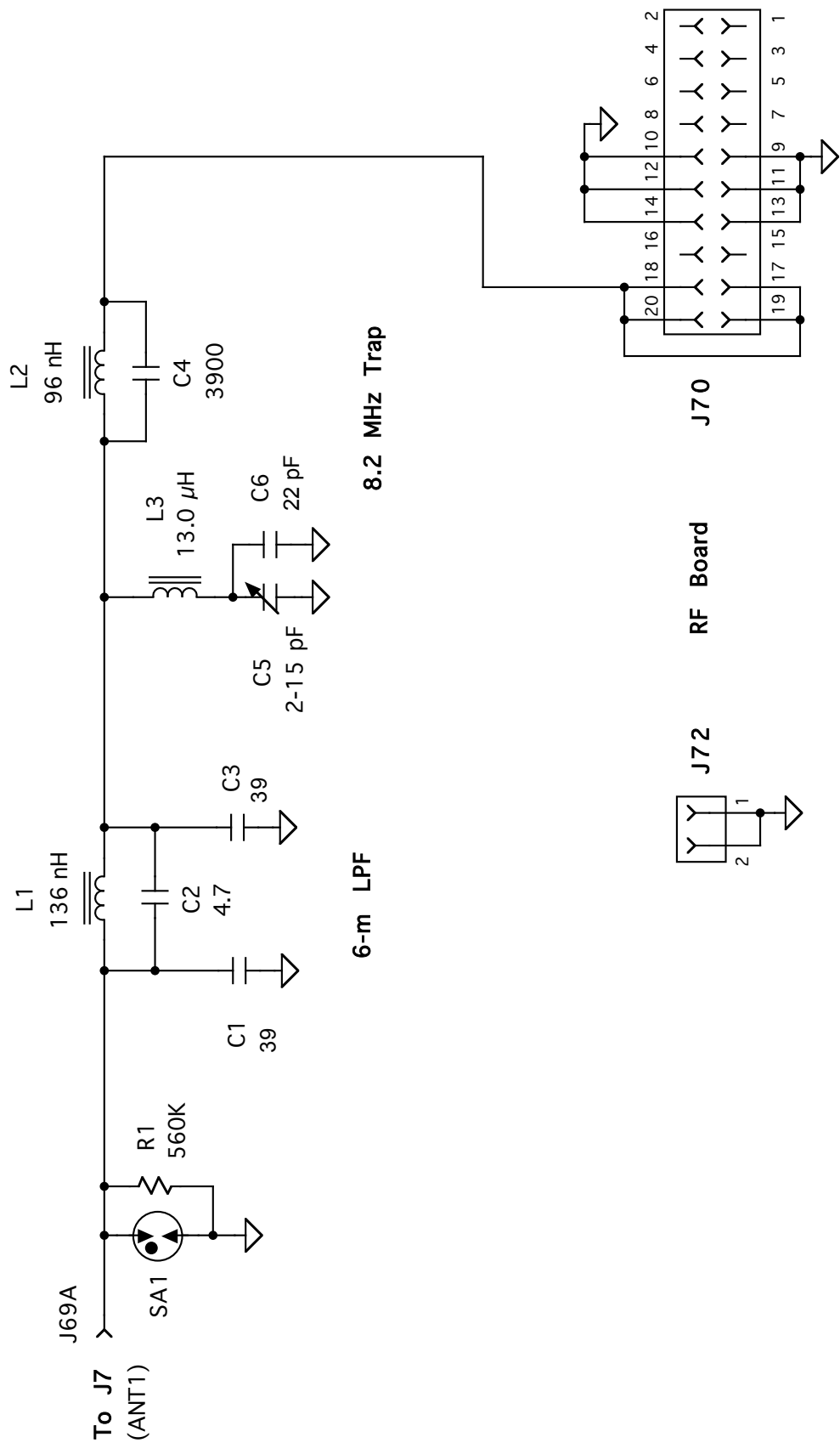



Title	KIOS - D Sub RS232 IO Board		
Size	Document Number	Rev	XC1
B	2005042501		
Date:	Wednesday, February 14, 2007	Sheet	1 of 1



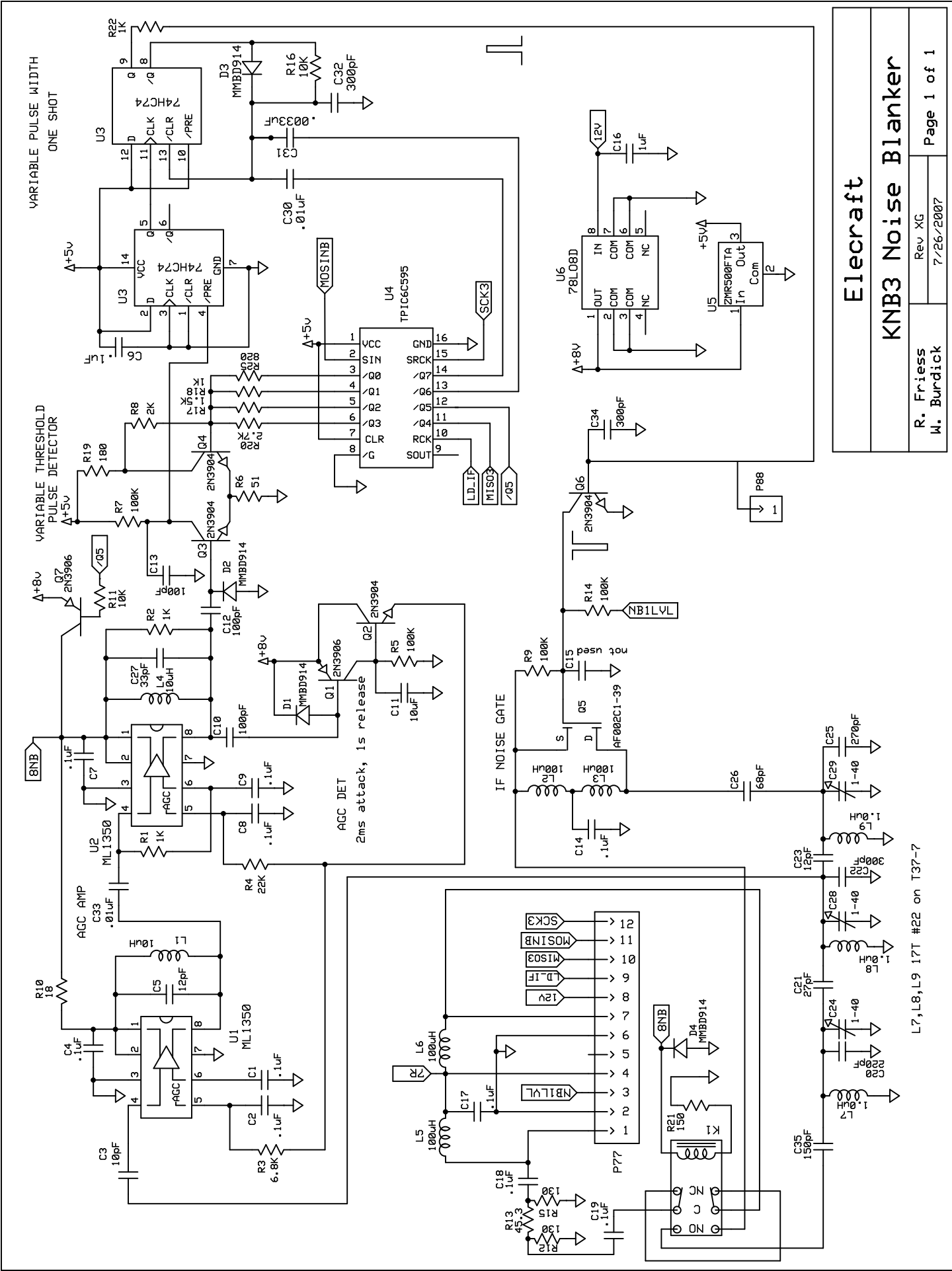
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Size	A	Document Number	2005042501
Date:	Wednesday, February 14, 2007	Sheet	1 of 1
Rev	XC2		

Frame Ground

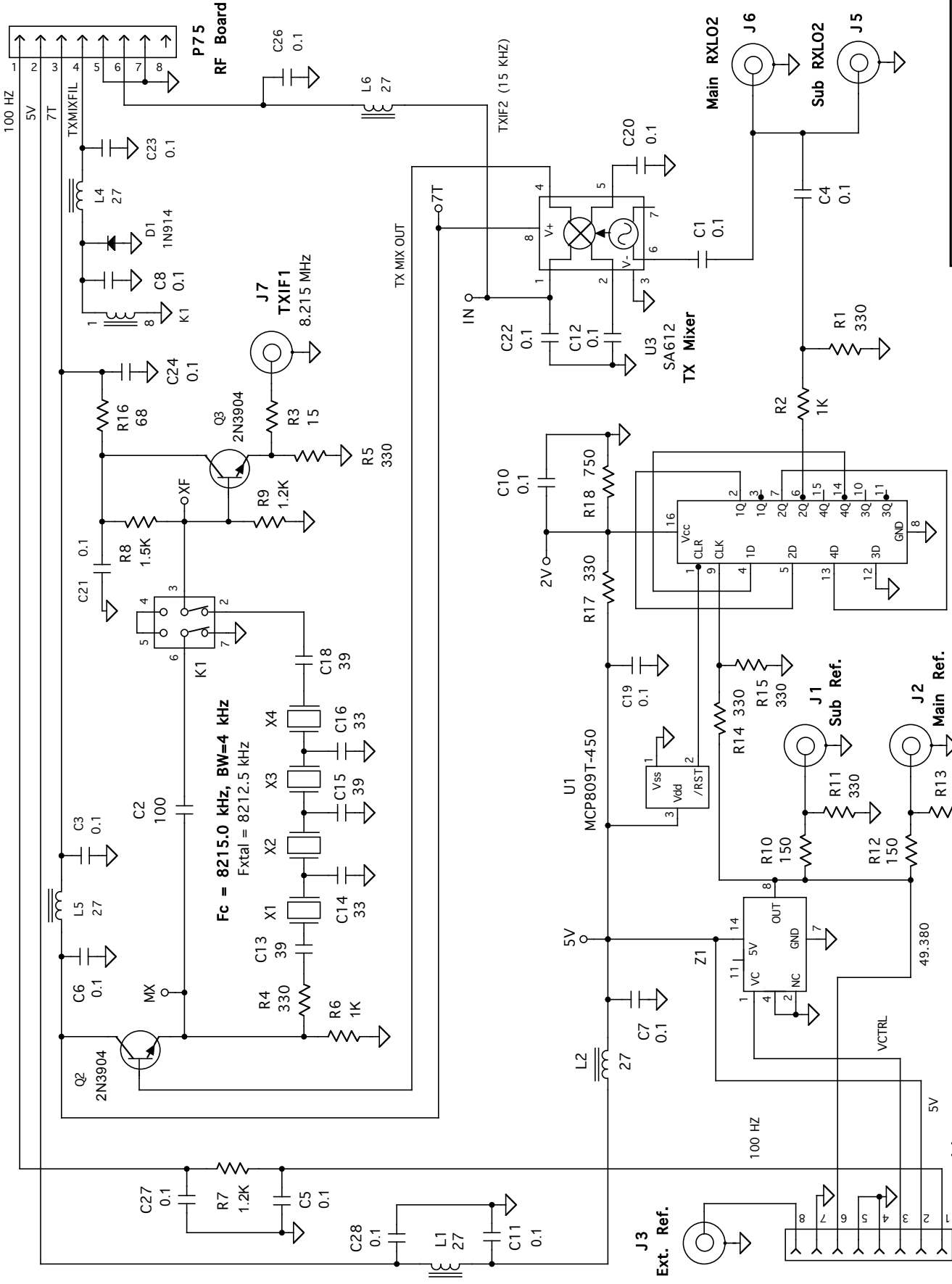


- NOTES:**
1. All parts are through-hole.
 2. Adjust L2 and C5 for minimum 8.215-MHz leakthrough.
 3.  = mounted on bottom side of PCB.

Elecraft KANT3 Ant. Input Module			
By W. Burdick	Rev.	Date	Sht.
R. Friess	XB5	1/21/07	1 of 1



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

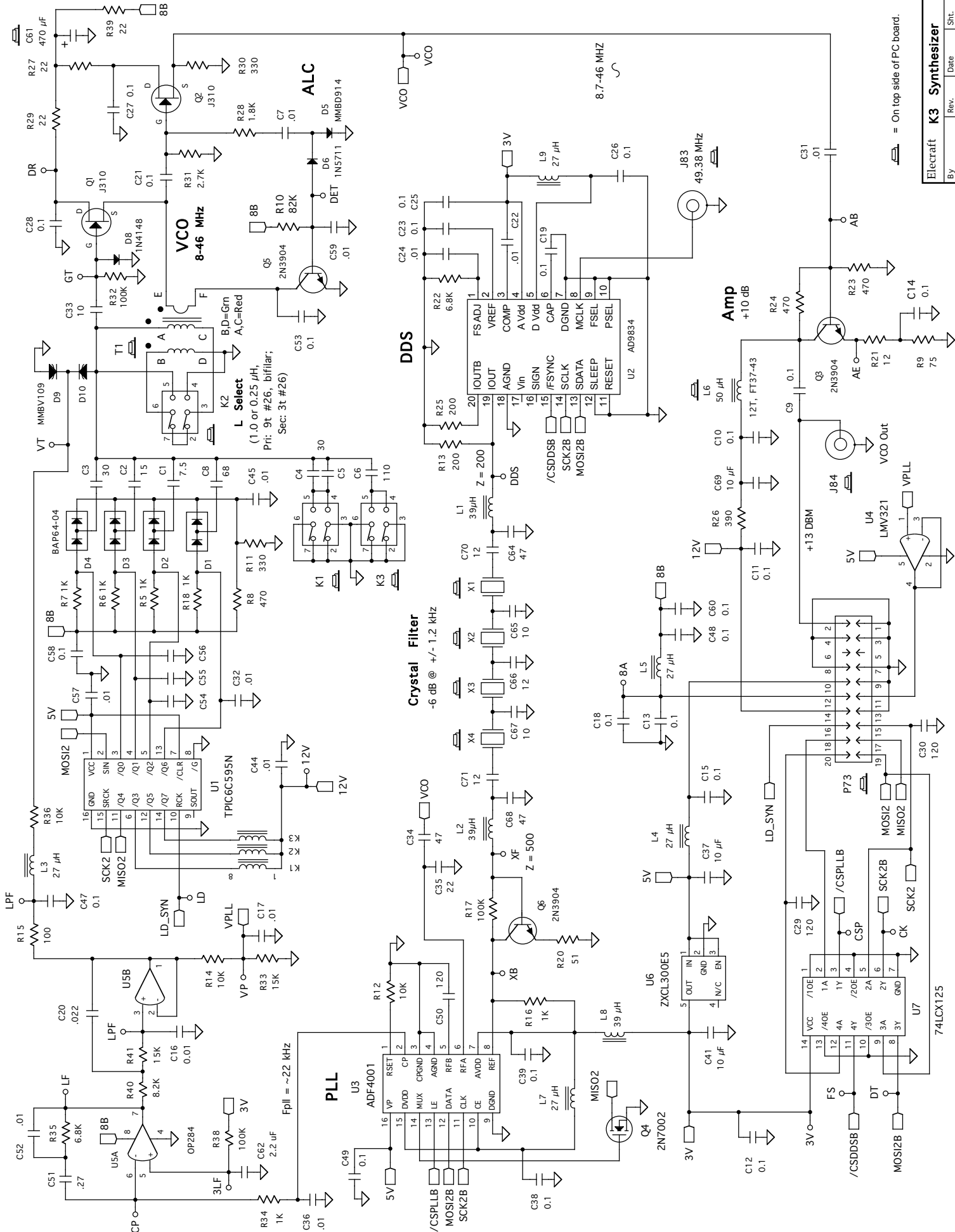


$$F_c = 8215.0 \text{ kHz}, \text{ BW} = 4 \text{ kHz}$$

$$F_{\text{xtal}} = 8212.5 \text{ kHz}$$

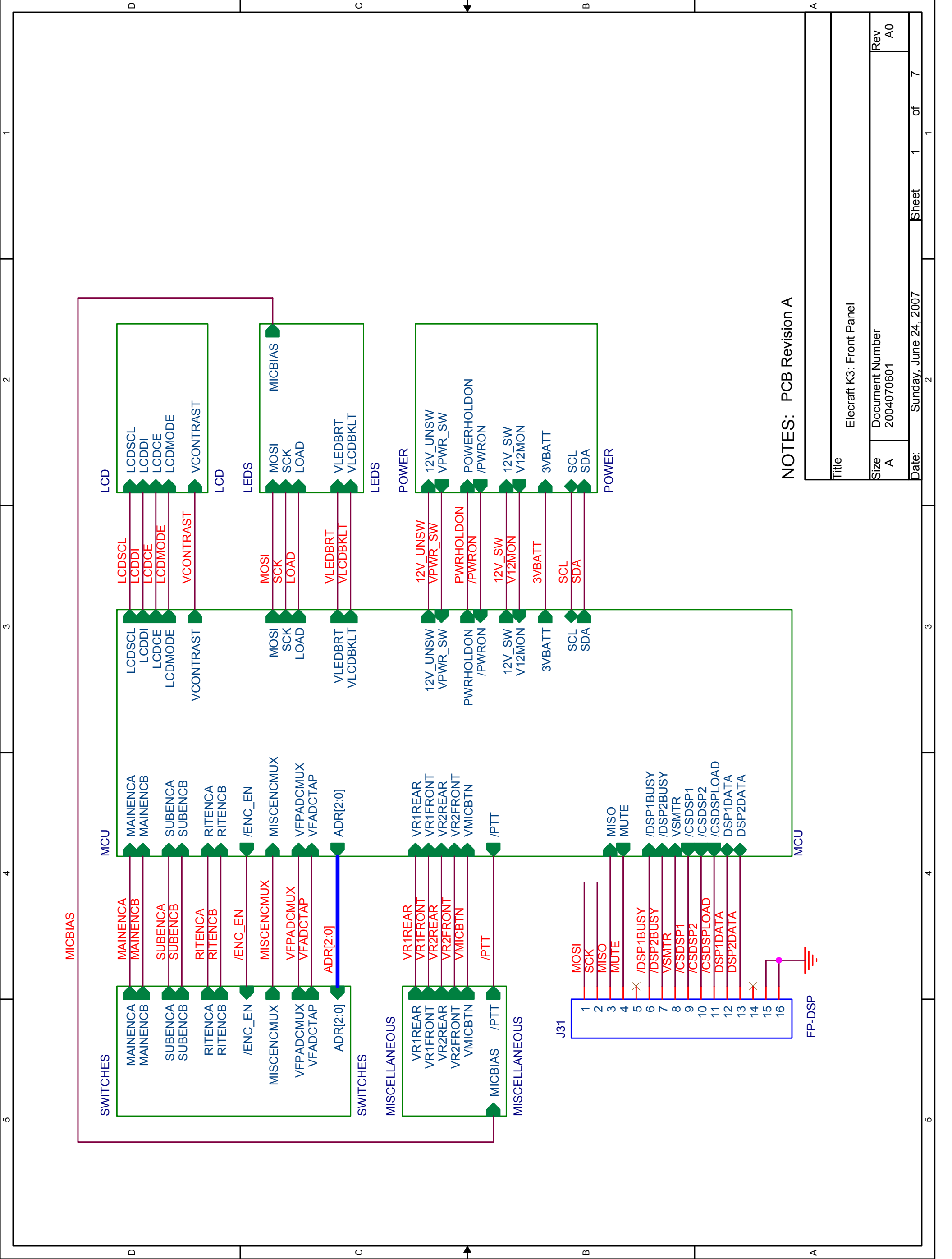
Electcraft KREF3 REF/2ND TX IF			
By	Rev.	Date	Sht.
W. Burdick	XD	3/3/07	1 of 1

U2
74VHC175
Divide by 6
CUT J4-6 to U2-9



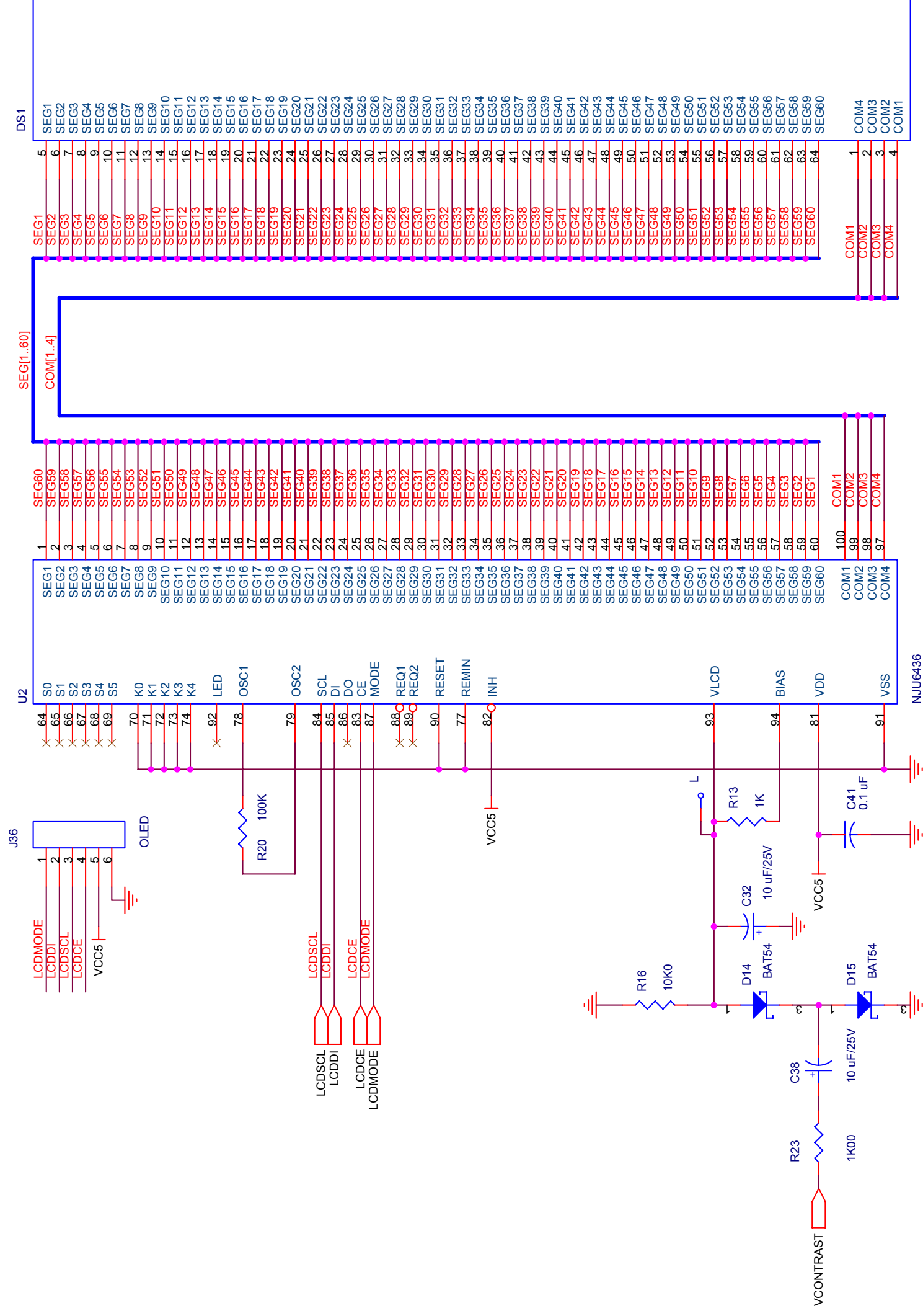
⏏ = On top side of PC board.

Elecraft K3 Synthesizer			
By	Rev.	Date	Sheet
W. Burdick	A2	7/25/07	1 of 1



NOTES: PCB Revision A

Title		Elecraft K3: Front Panel	
Size	A	Document Number	2004070601
Date:	Sunday, June 24, 2007	Sheet	1 of 7
Rev		A0	



PCB Revision A

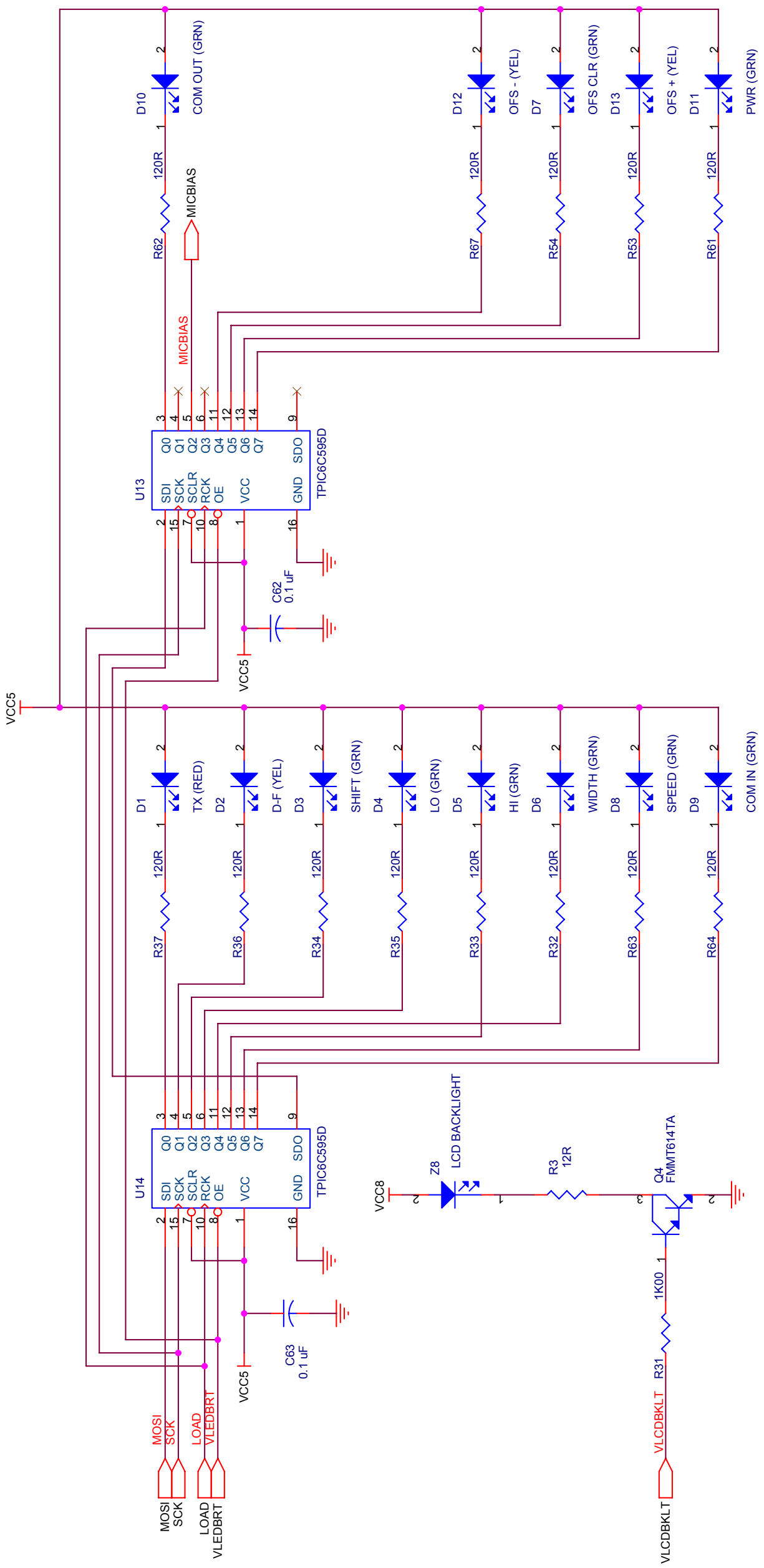
U2 K[0..4] to use separable vias to ground for debug/development.

LCD pinout is Rev F.

R54 sets LCD driver current.

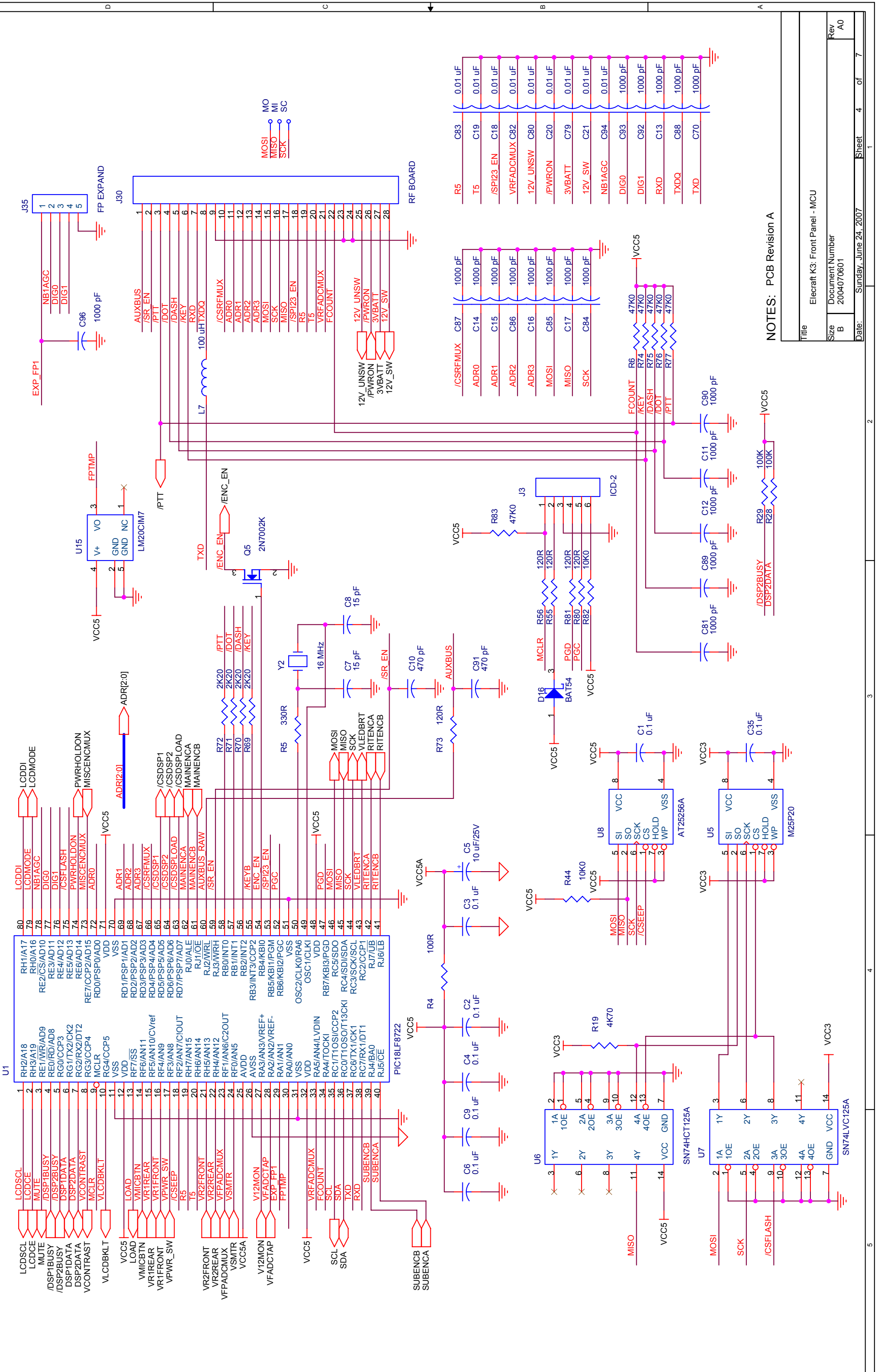
NOTES: R57 sets LCD drive frequency.

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Size	B	Document Number	2004070601
Date:	Sunday, June 24, 2007	Sheet	2 of 7
Rev	A0		



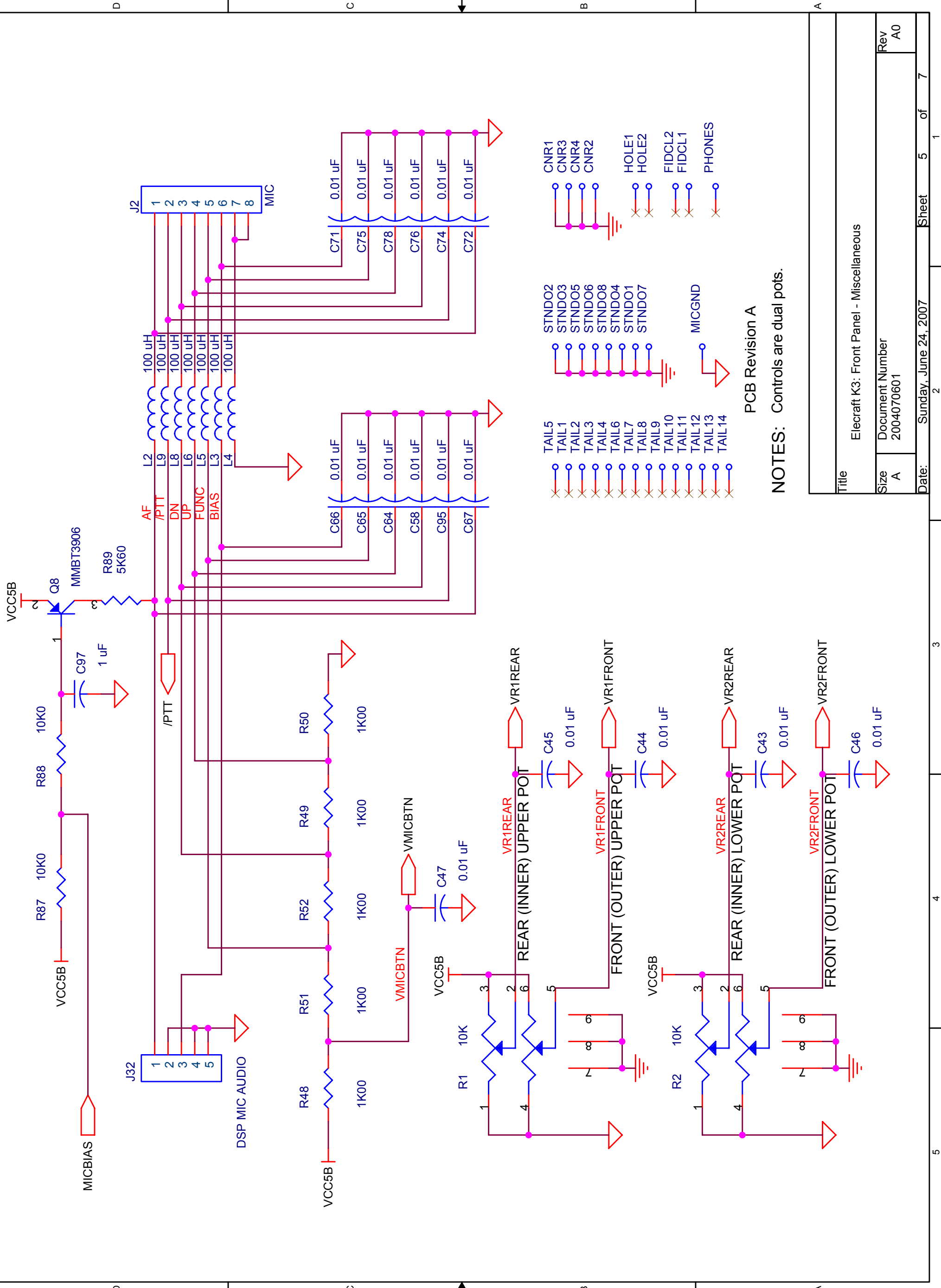
NOTES: PCB Revision A

Title		Elecraft K3: Front Panel - LEDs	
Size	B	Document Number	2004070601
Date:	Sunday, June 24, 2007	Sheet	3 of 7
Rev	A0		



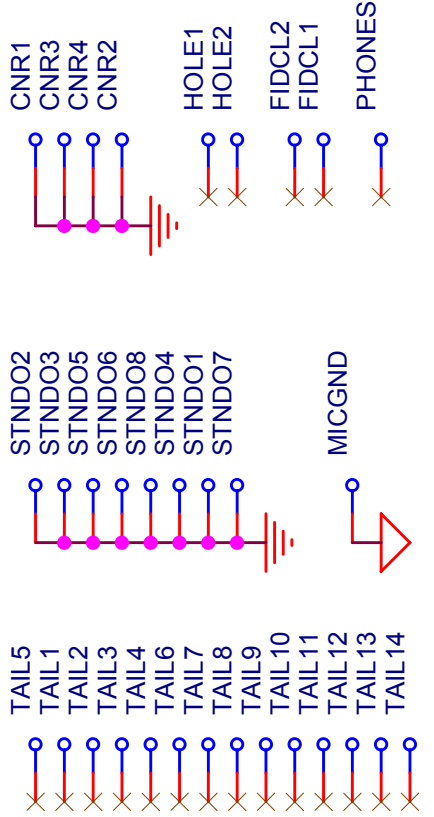
NOTES: PCB Revision A

Title		Elecraft K3: Front Panel - MCU	
Size	B	Document Number	2004070601
Date:	Sunday, June 24, 2007	Sheet	4 of 7
Rev	A0		

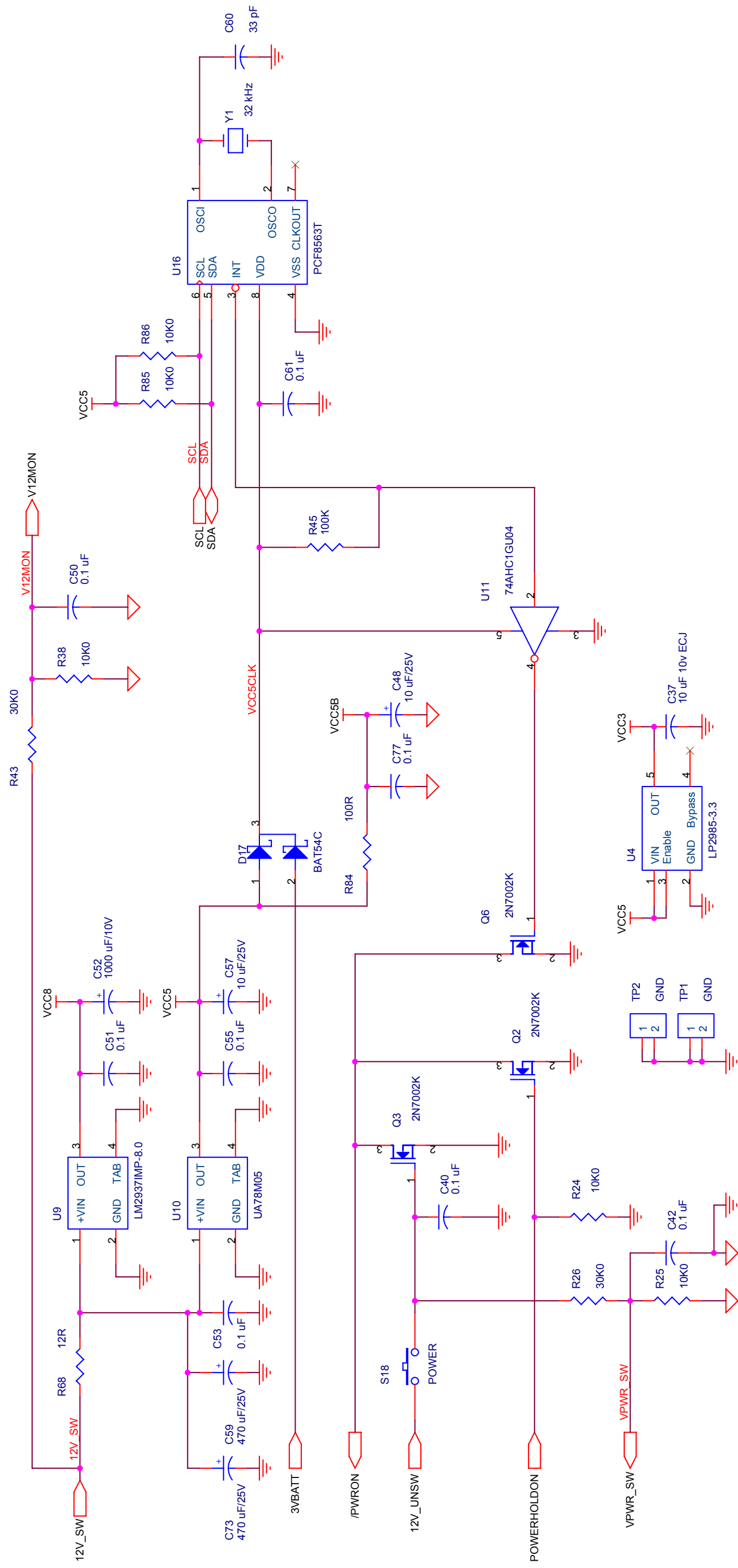


PCB Revision A

NOTES: Controls are dual pots.



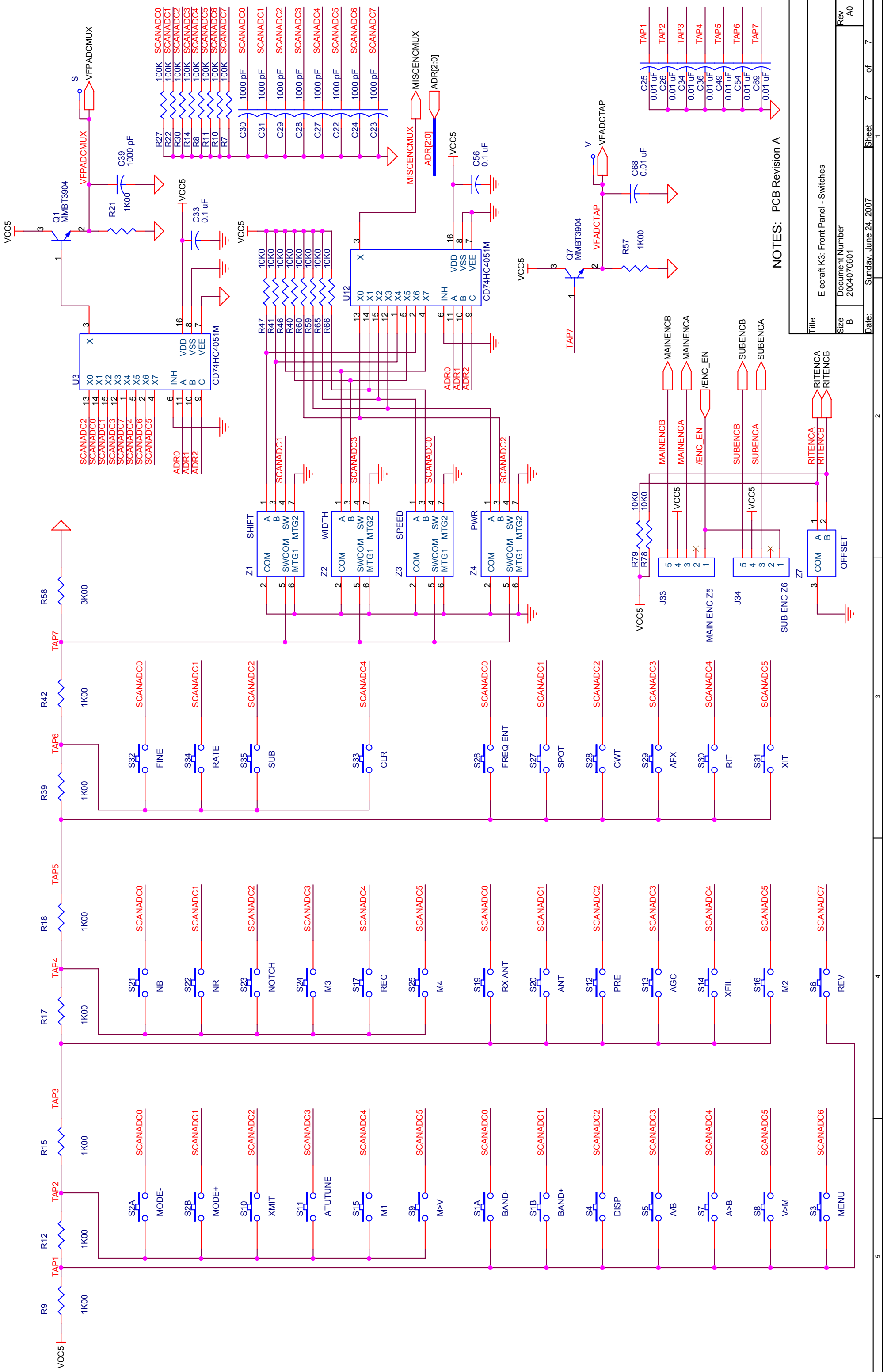
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Size	A	Document Number	2004070601
Date:	Sunday, June 24, 2007	Sheet	5 of 7



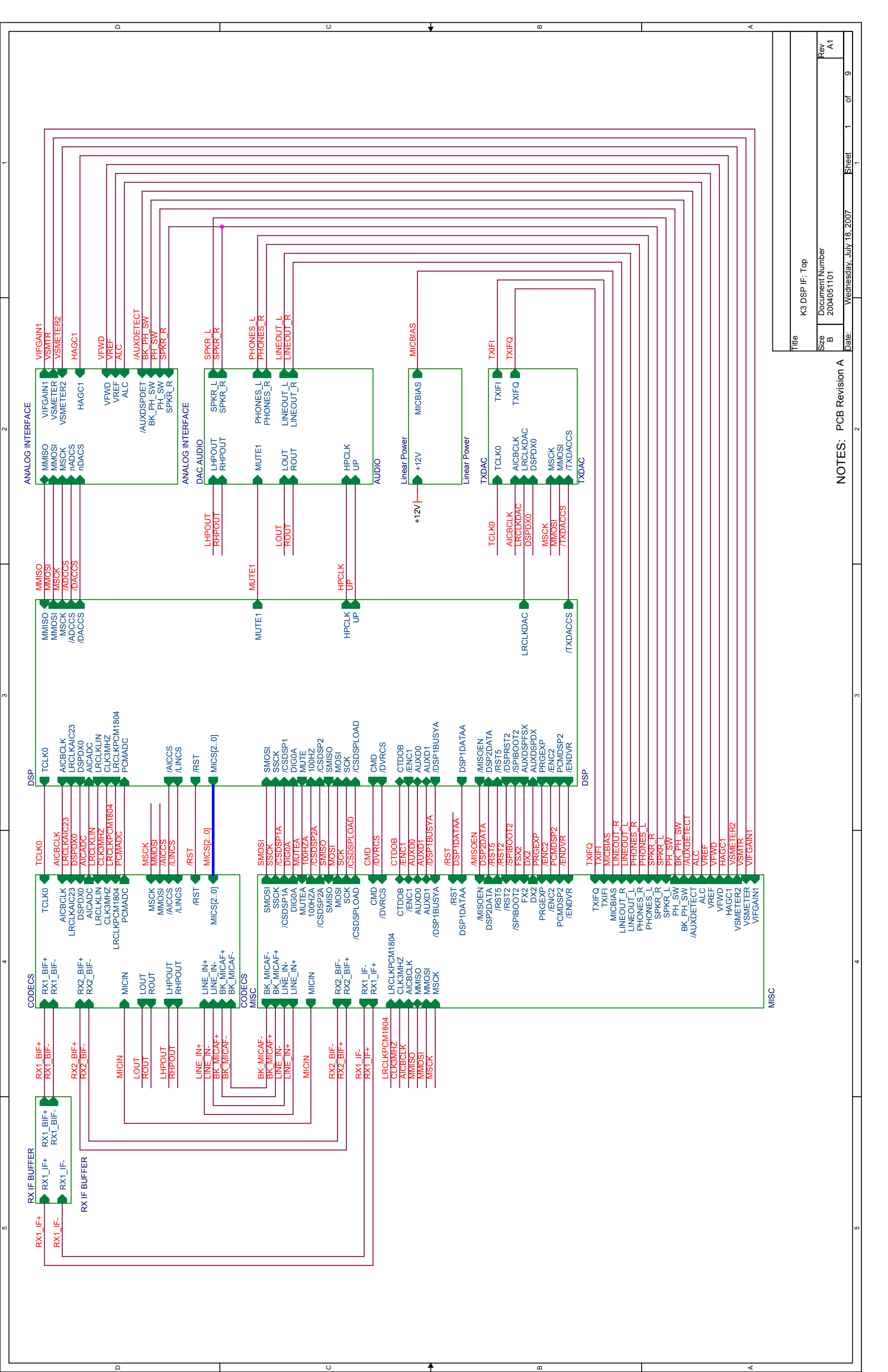
PCB Revision A

NOTES: Regulators U3 and U5 SOT-223.

Title		Elecraft K3: Front Panel - Power and RTC	
Size	B	Document Number	2004070601
Date:	Sunday, June 24, 2007	Sheet	6 of 7
Rev	A0		



Title	Elecraft K3: Front Panel - Switches
Size	B
Document Number	2004070601
Date:	Sunday, June 24, 2007
Sheet	7 of 7
Rev	A0



ANALOG INTERFACE

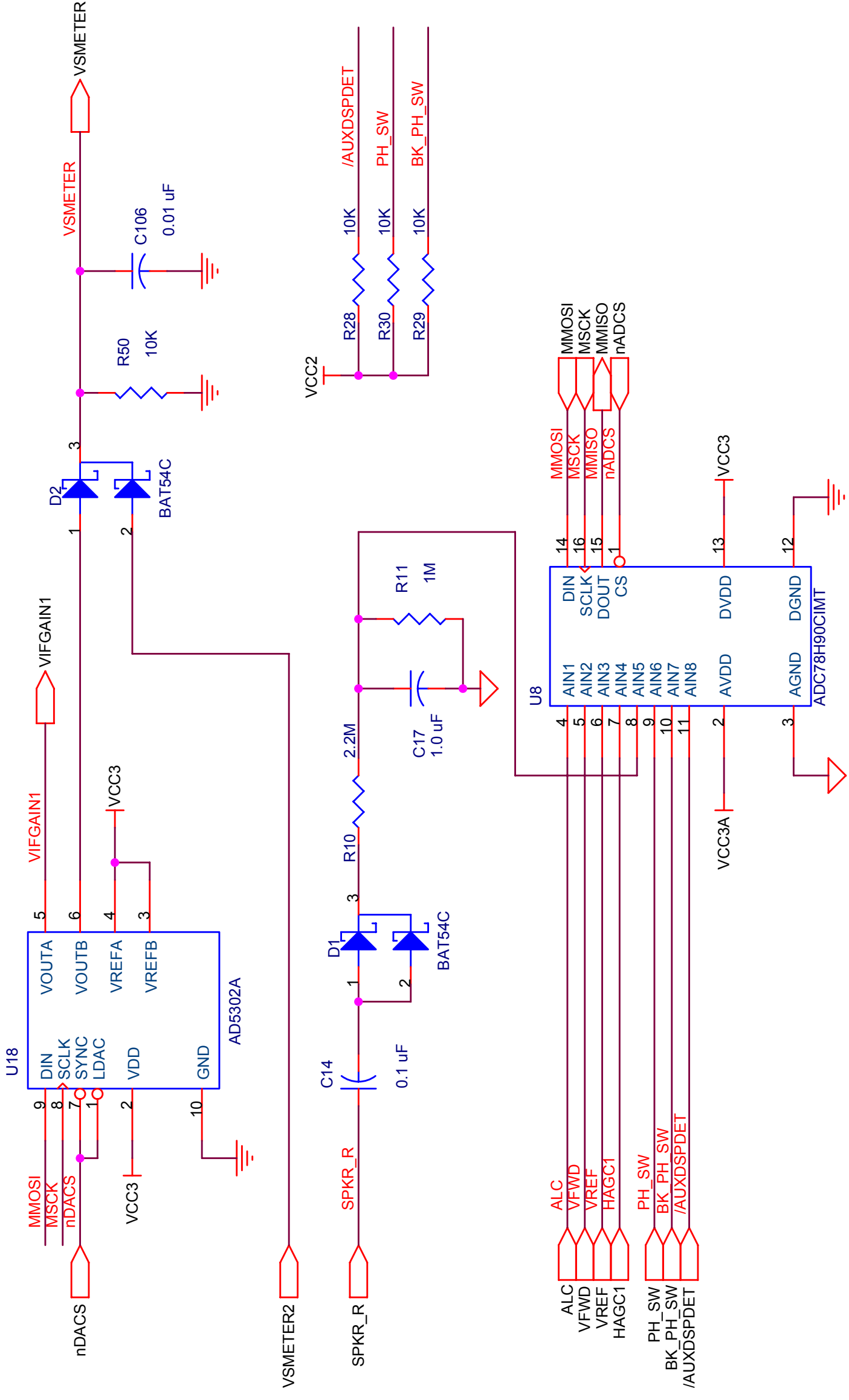
DSP

CODECS

RX IF BUFFER

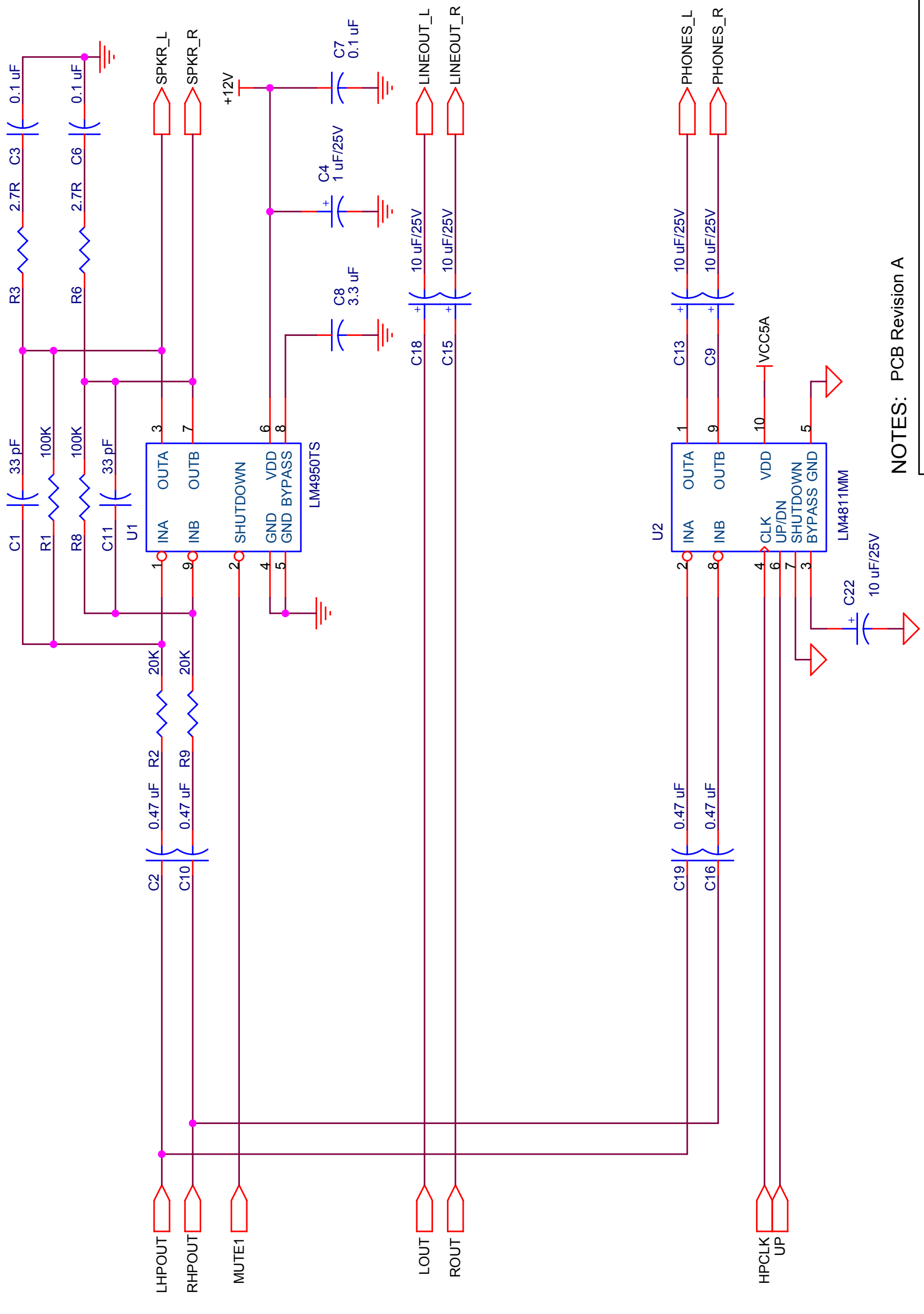
NOTES: PCB Revision A

Title		K3 DSP IF: Top	
Size	B	Document Number	2004051101
Date:	Wednesday, July 18, 2007	Sheet	1 of 9
Rev	A1		



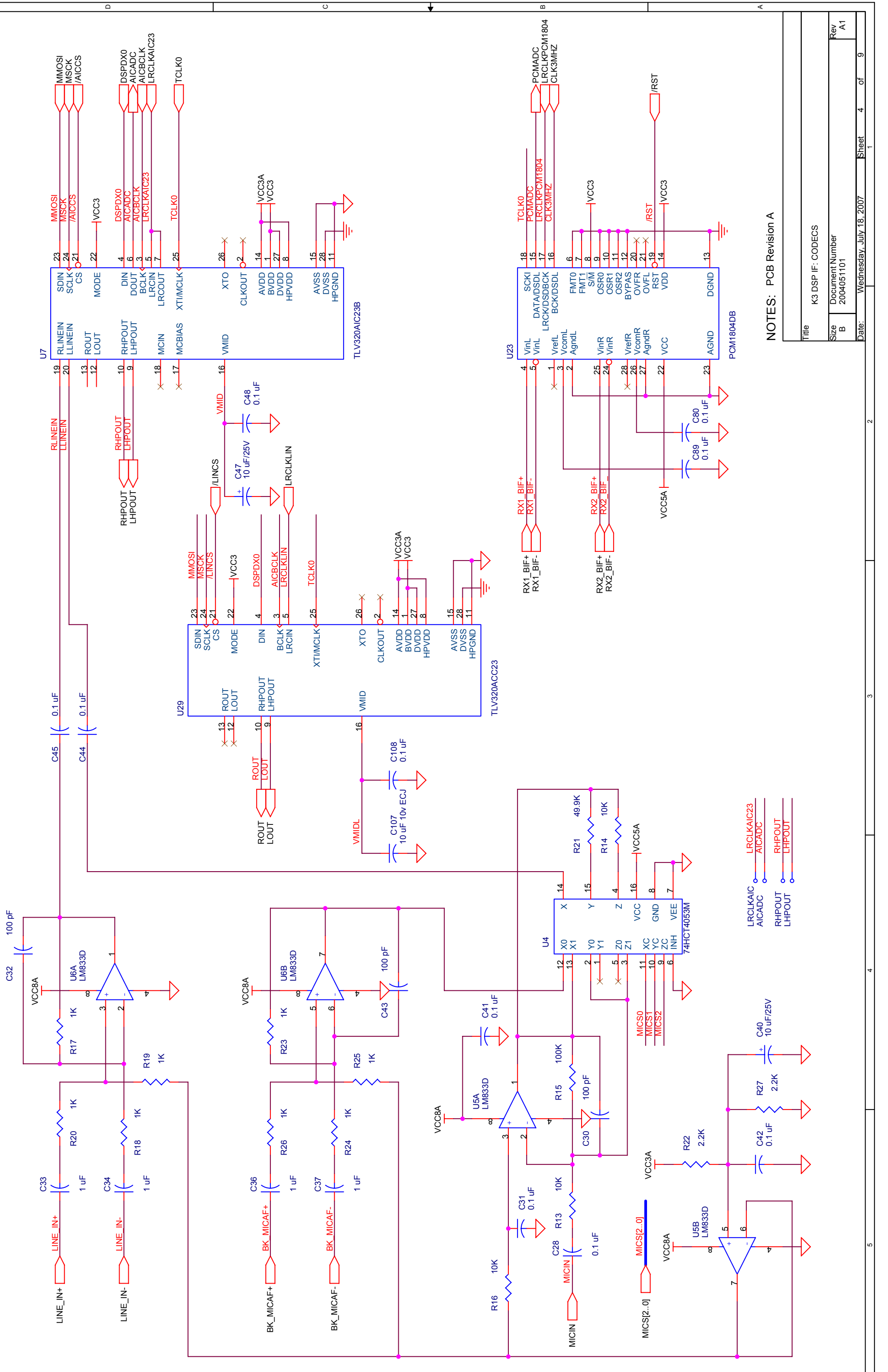
NOTES: PCB Revision A

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Size	Document Number	Rev	
A	2004051101	A1	
Date:	Wednesday, July 18, 2007	Sheet	2 of 9



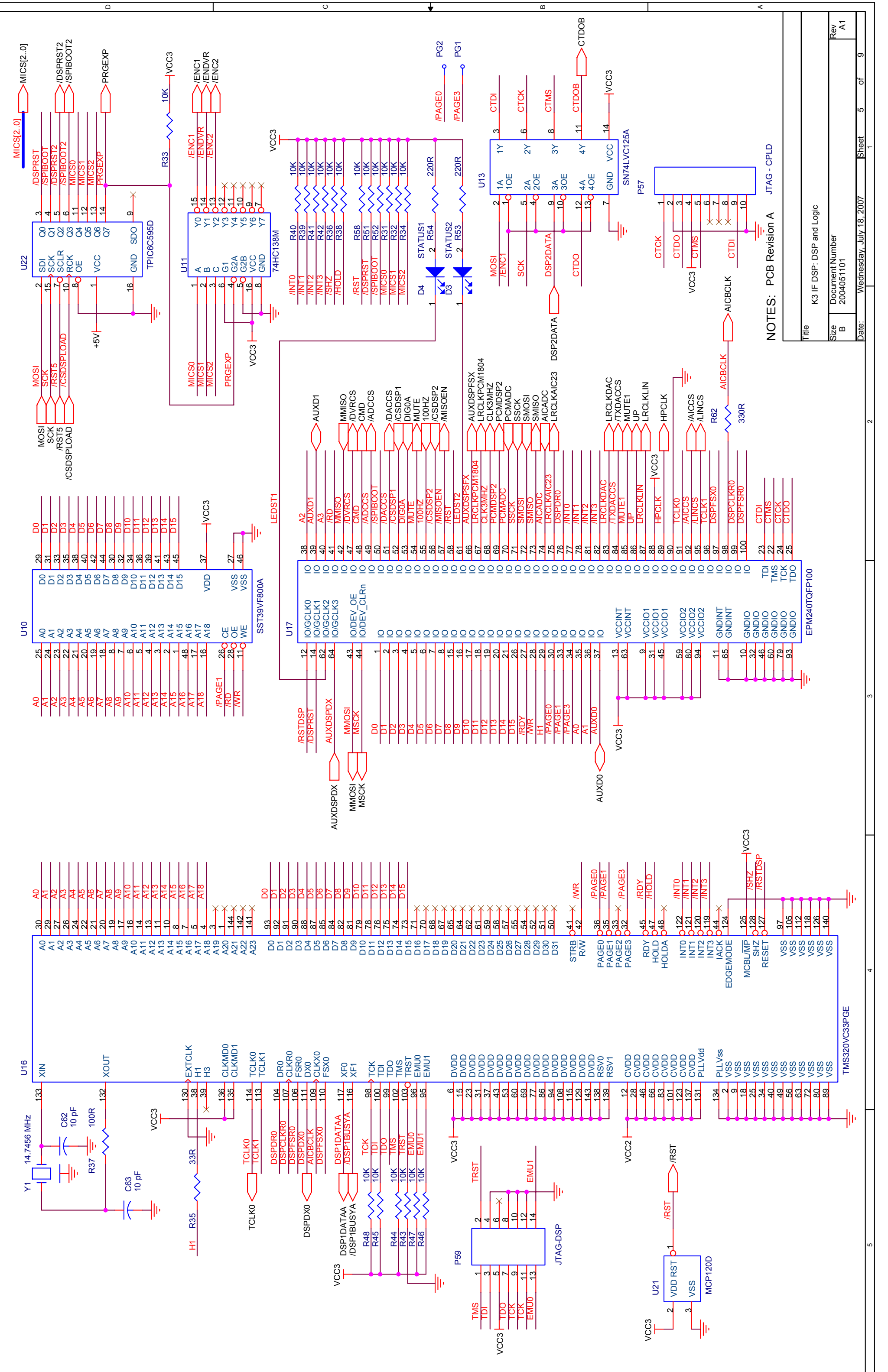
NOTES: PCB Revision A

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Size	A	Document Number	2004051101
Rev	A1	Date:	Wednesday, July 18, 2007
		Sheet	3 of 9



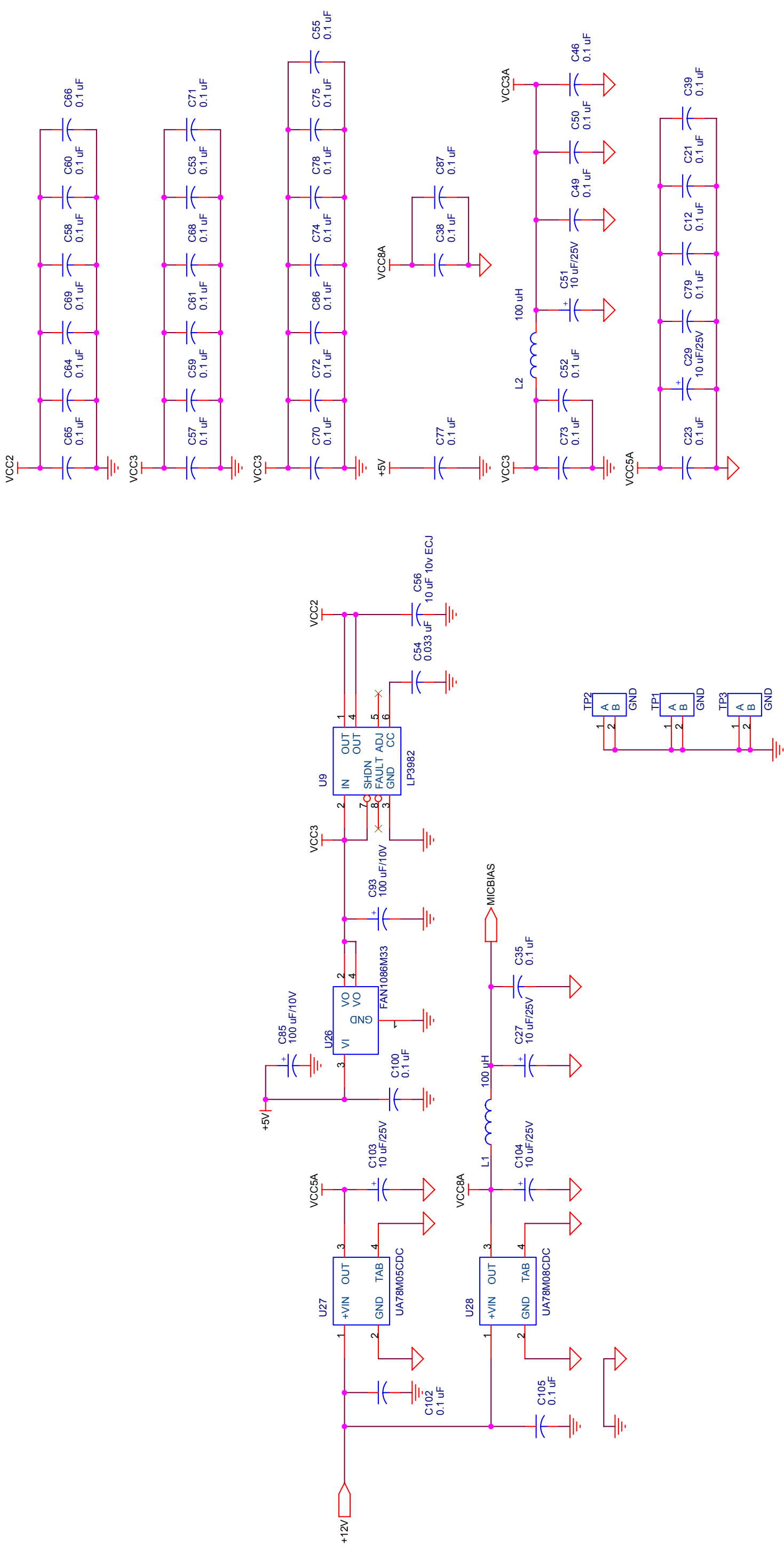
NOTES: PCB Revision A

Title		K3 DSP IF: CODECS	
Size	B	Document Number	2004051101
Date:	Wednesday, July 18, 2007	Sheet	4 of 9
Rev	A1		



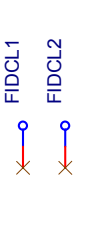
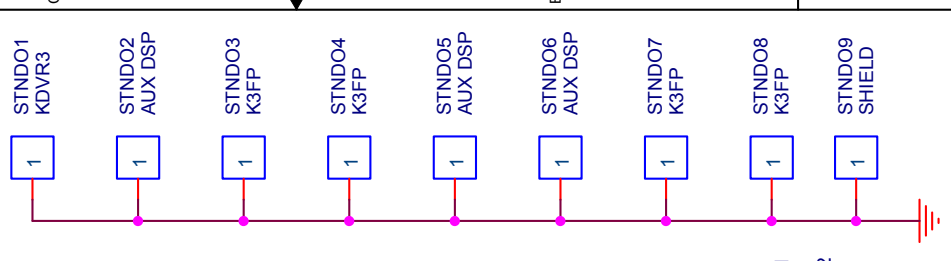
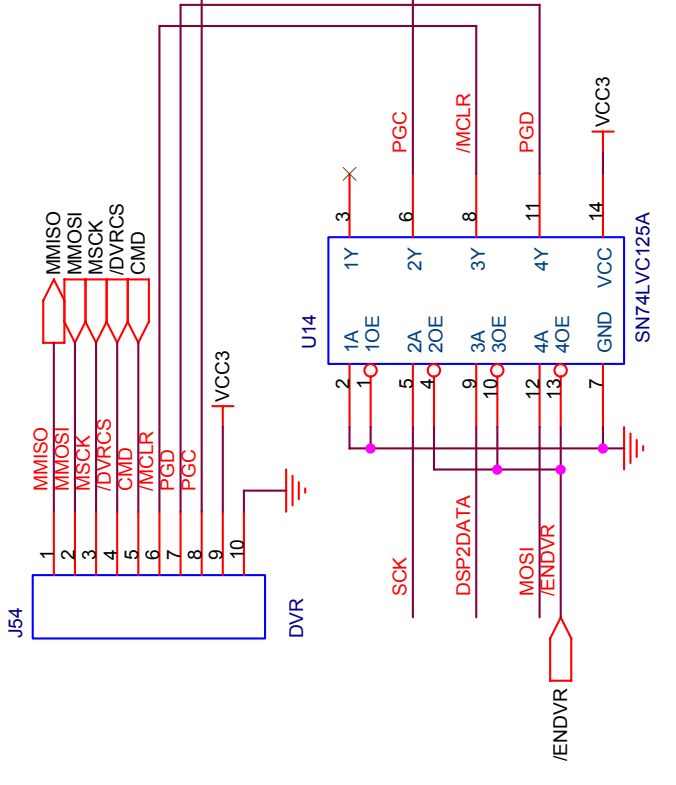
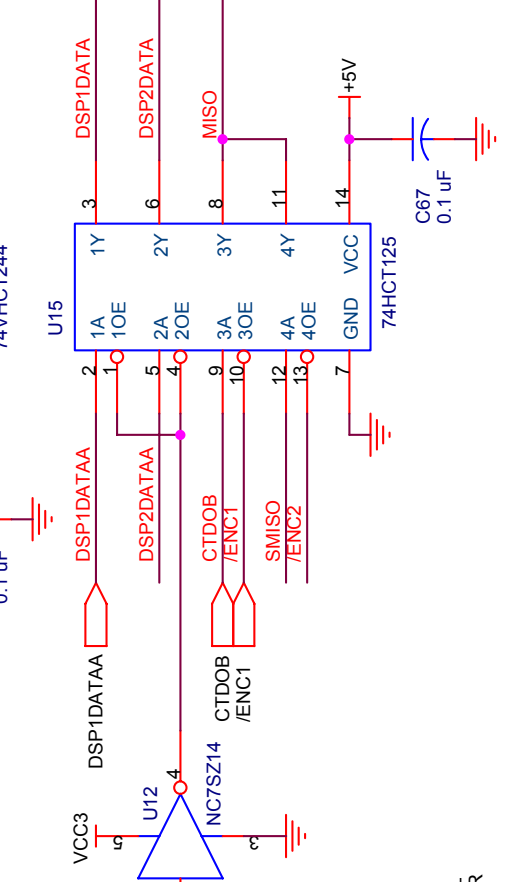
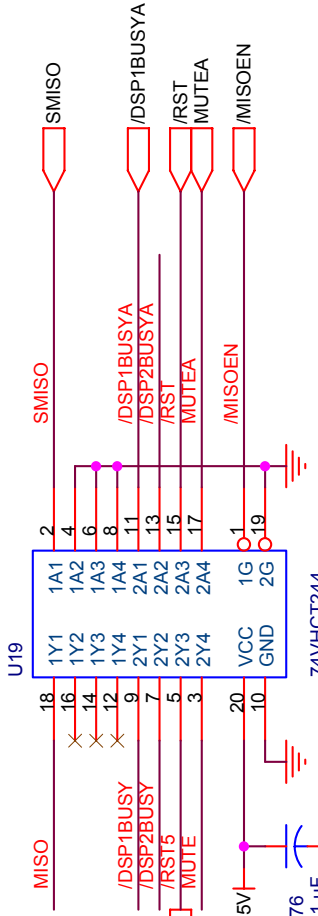
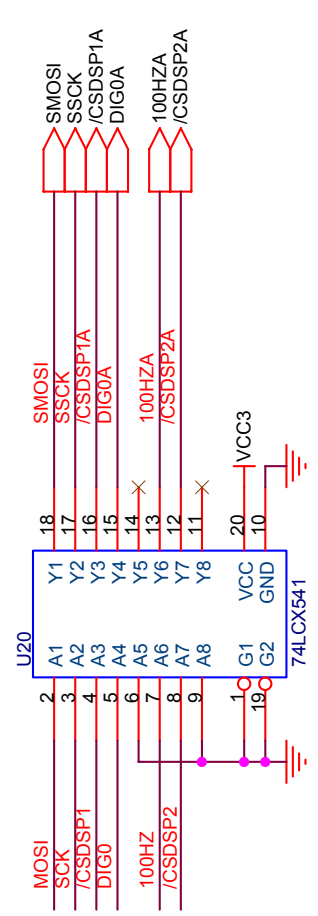
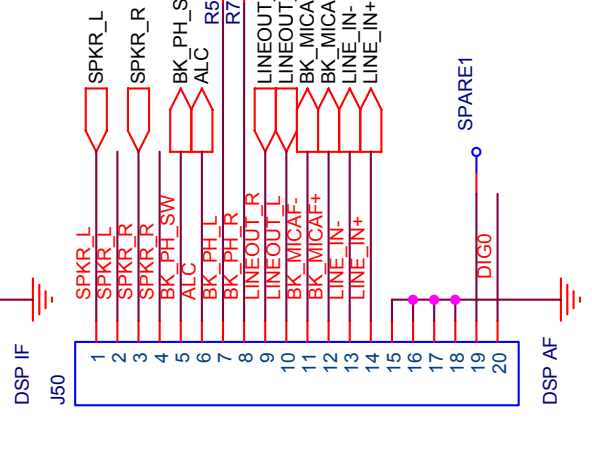
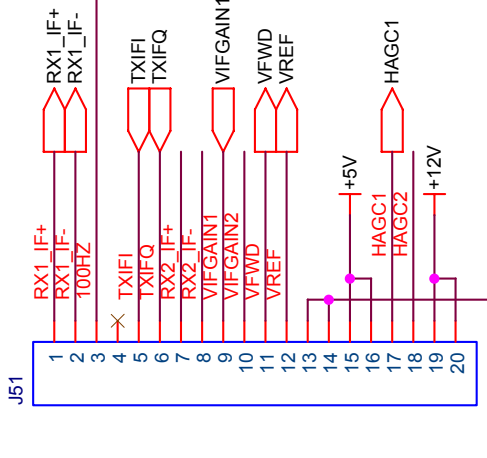
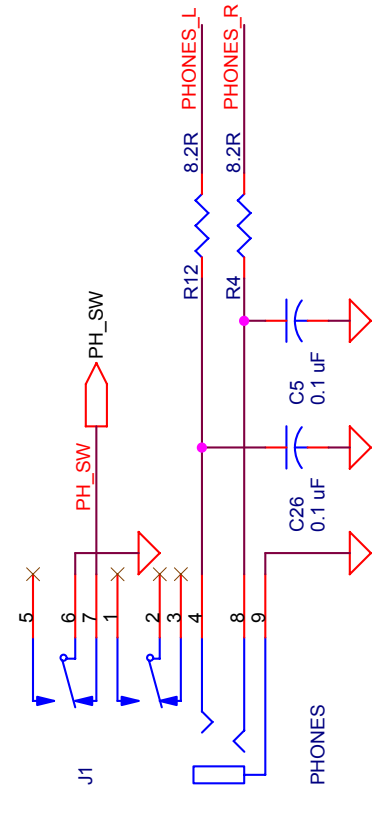
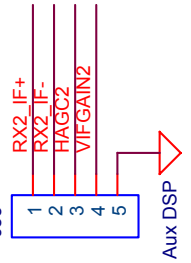
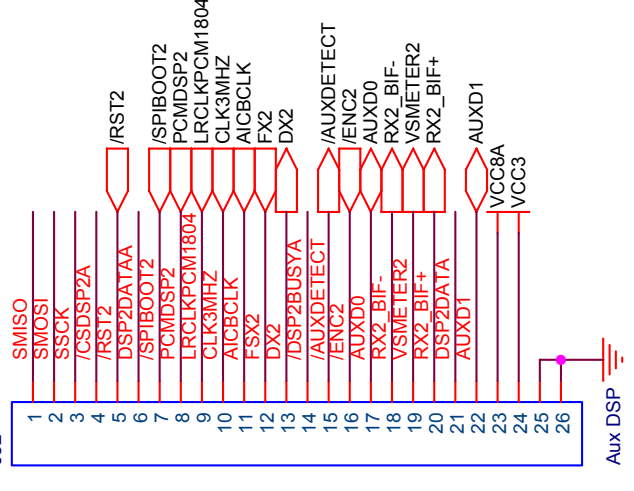
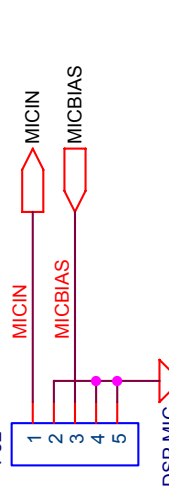
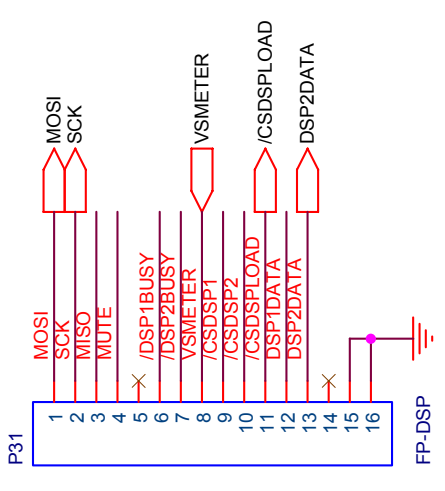
NOTES: PCB Revision A JTAG - CPLD

Title	K3 IF DSP: DSP and Logic
Size	Document Number
B	2004051101
Date:	Wednesday, July 18, 2007
Sheet	5 of 9
Rev	A1



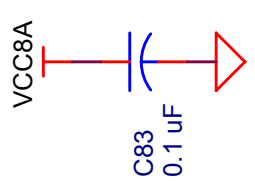
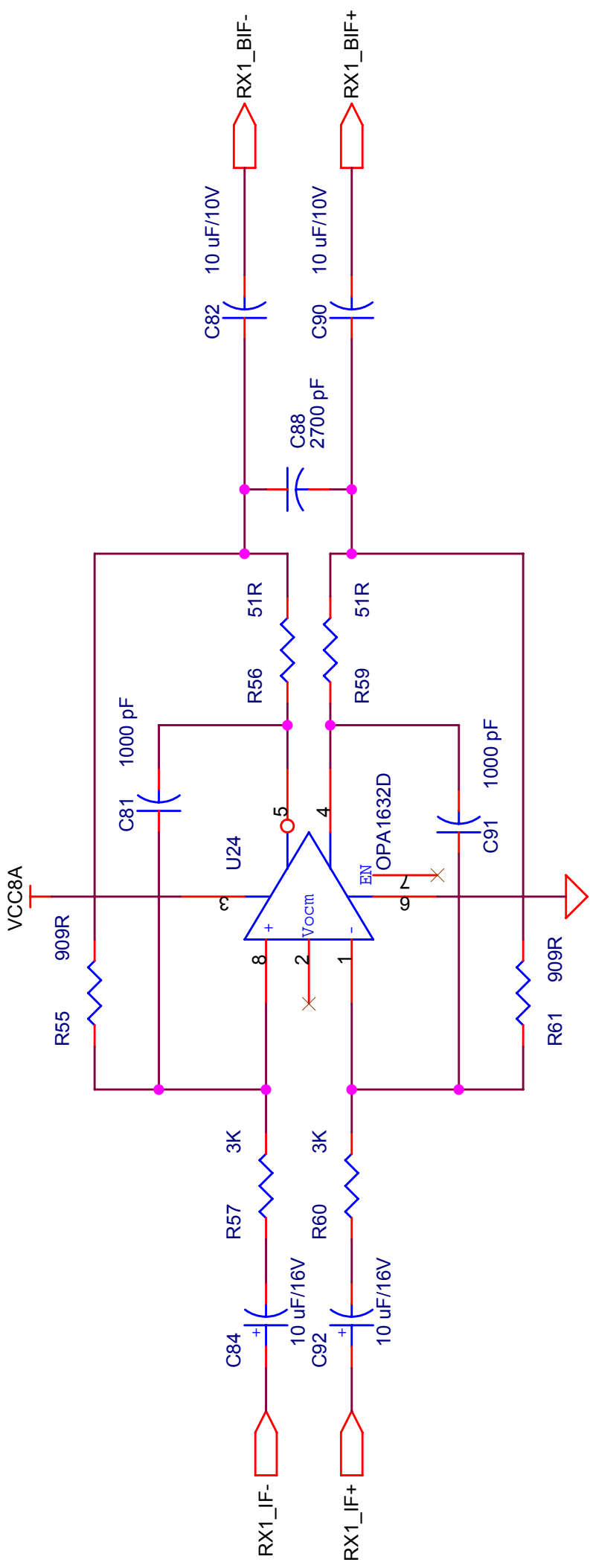
NOTES: PCB Revision A

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Size	B	Document Number	2004051101
Date:	Wednesday, July 18, 2007	Sheet	6 of 9
Rev	A1		



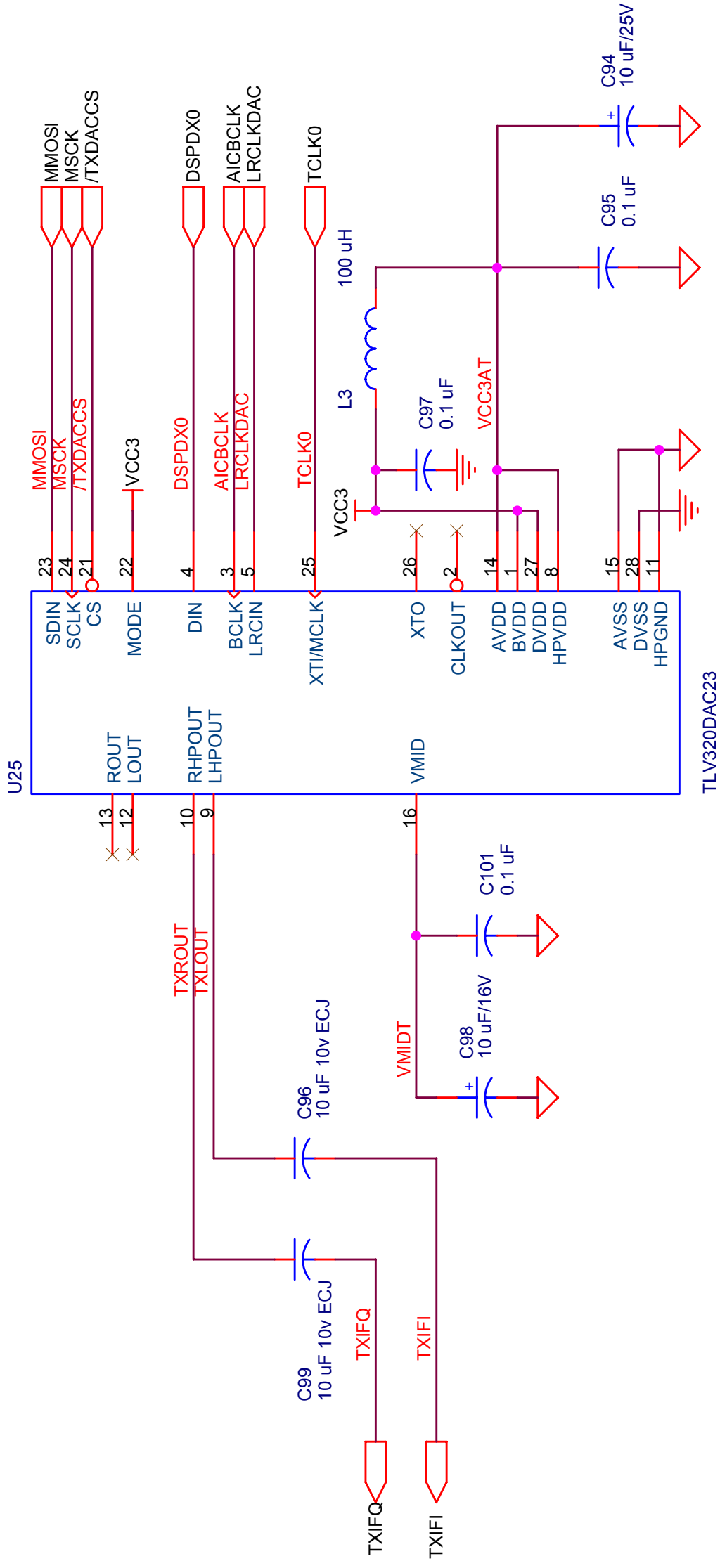
NOTES: PCB Revision A

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Size	B	Document Number	2004051101
Date:	Wednesday, July 18, 2007	Sheet	7 of 9
Rev	A1		



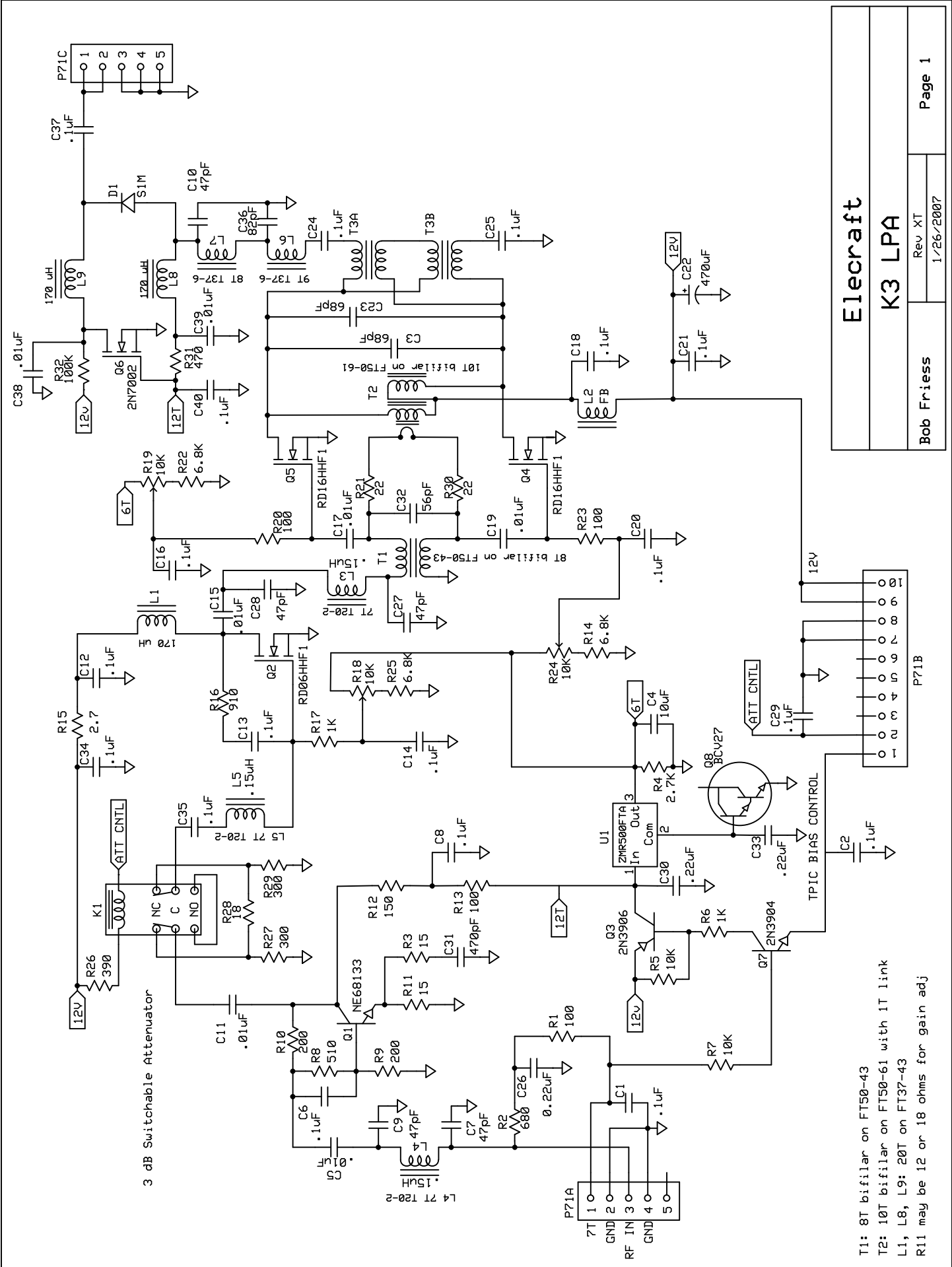
NOTES: PCB Revision A

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Size	Document Number	Rev	A1
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Date:	Wednesday, July 18, 2007	Sheet	8 of 9

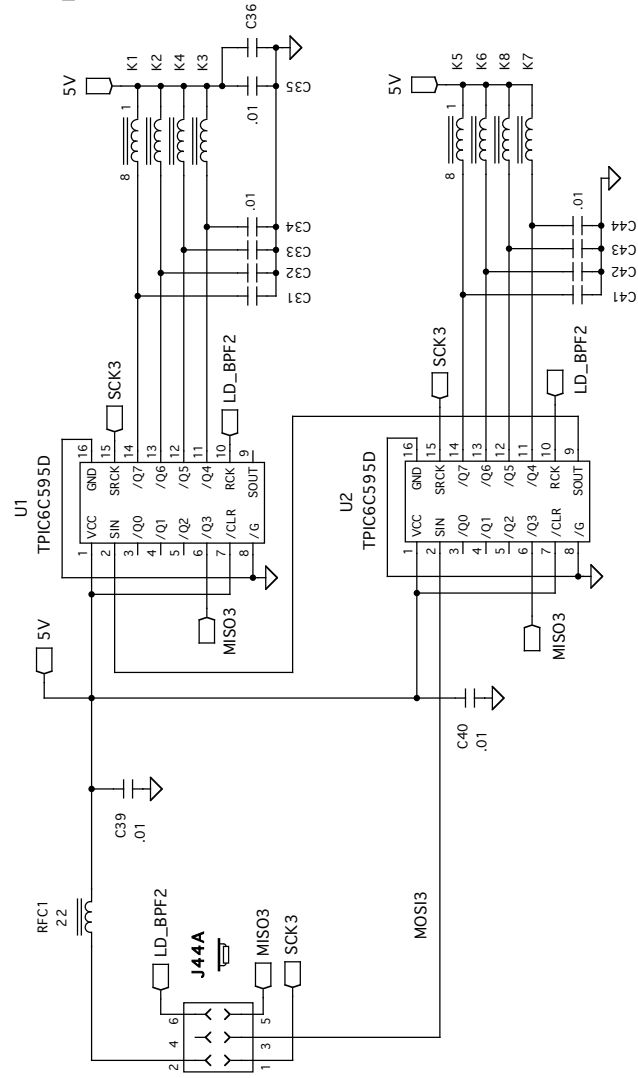
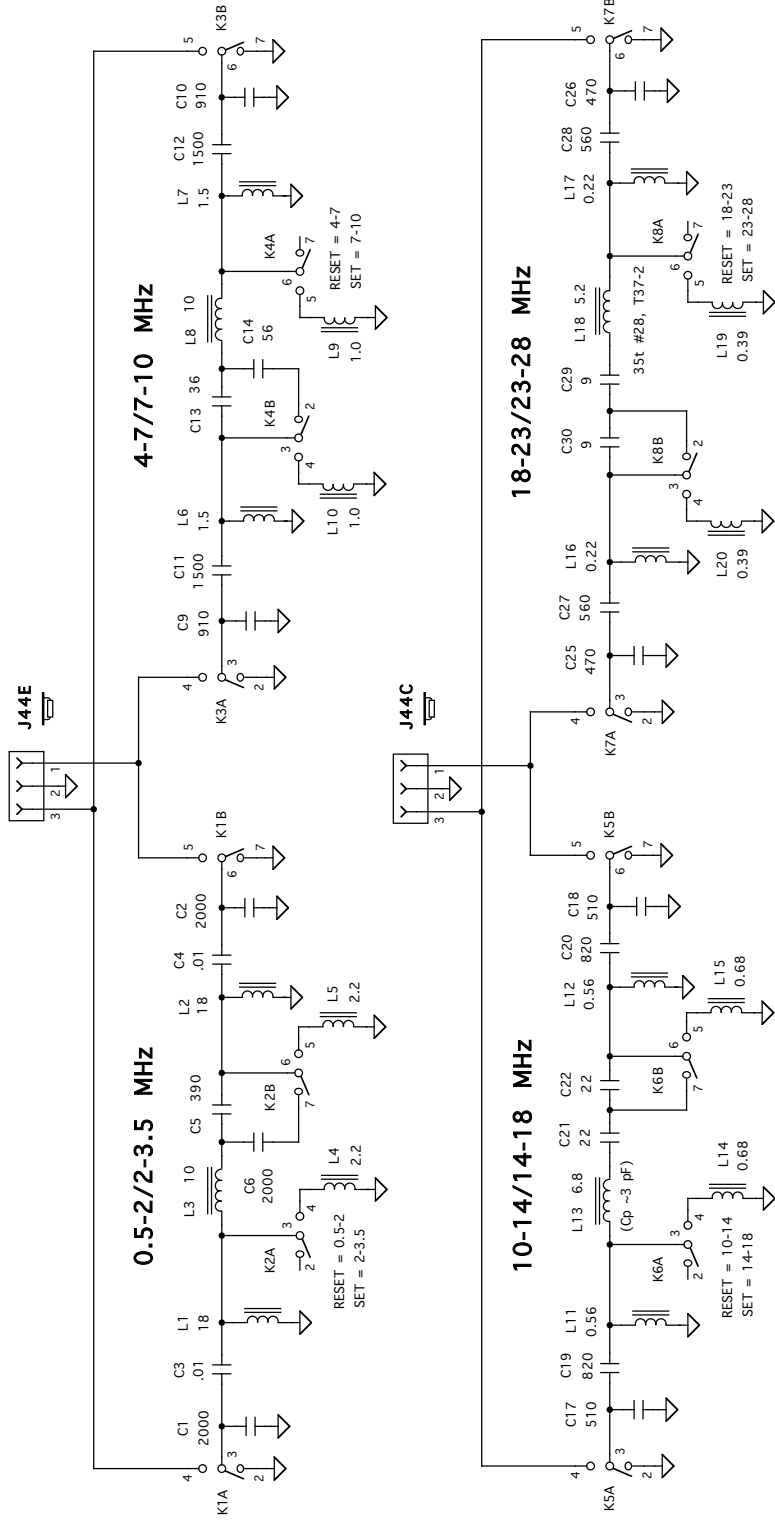


NOTES: PCB Revision A

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Size	Document Number	Rev	A1
A	2004051101		
Date:	Wednesday, July 18, 2007	Sheet	9 of 9



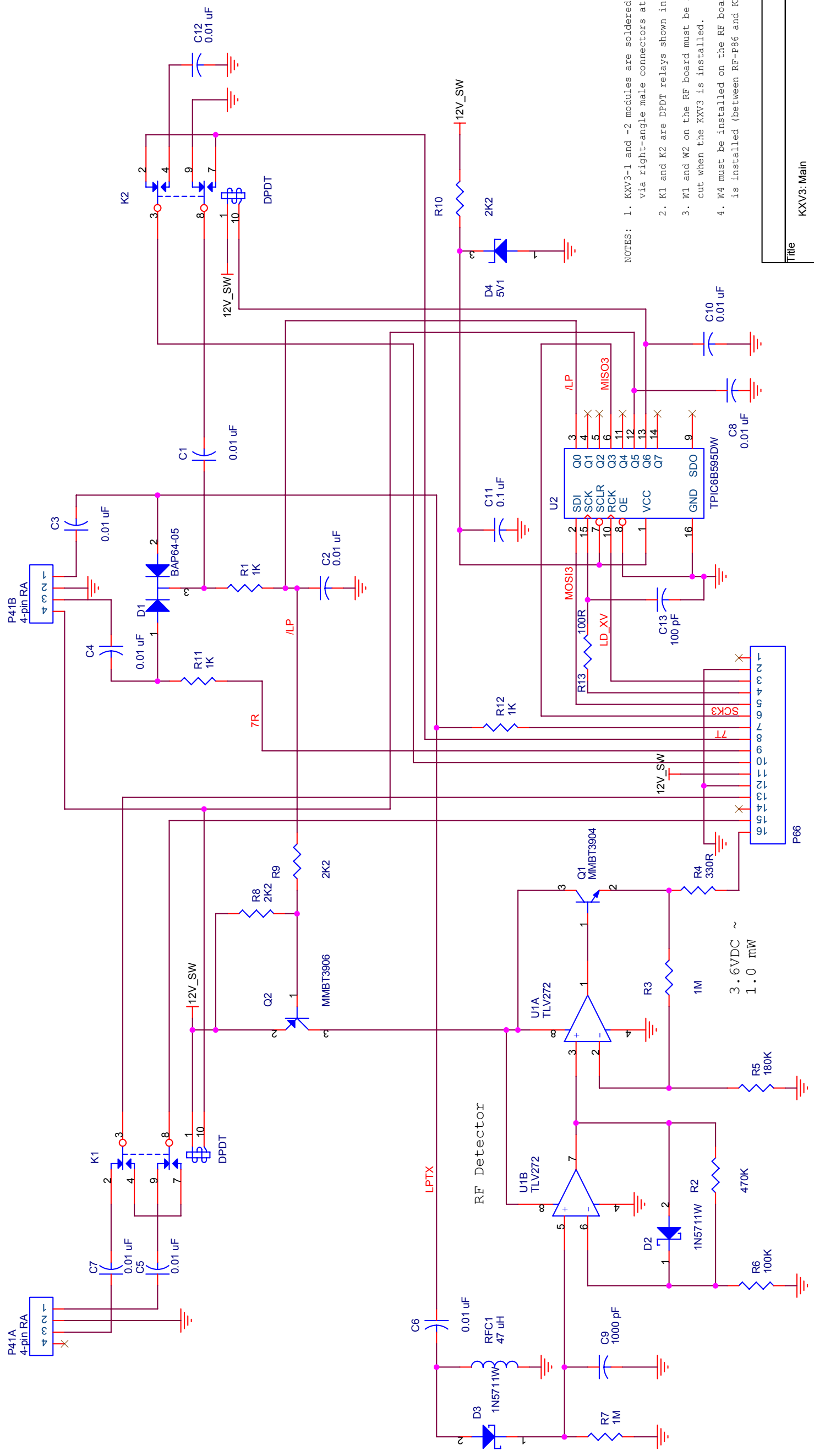
T1: 8T bifilar on FT50-43
T2: 10T bifilar on FT50-61 with 1T link
L1, L8, L9: 20T on FT37-43
R11 may be 12 or 18 ohms for gain adj



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

Appendix B

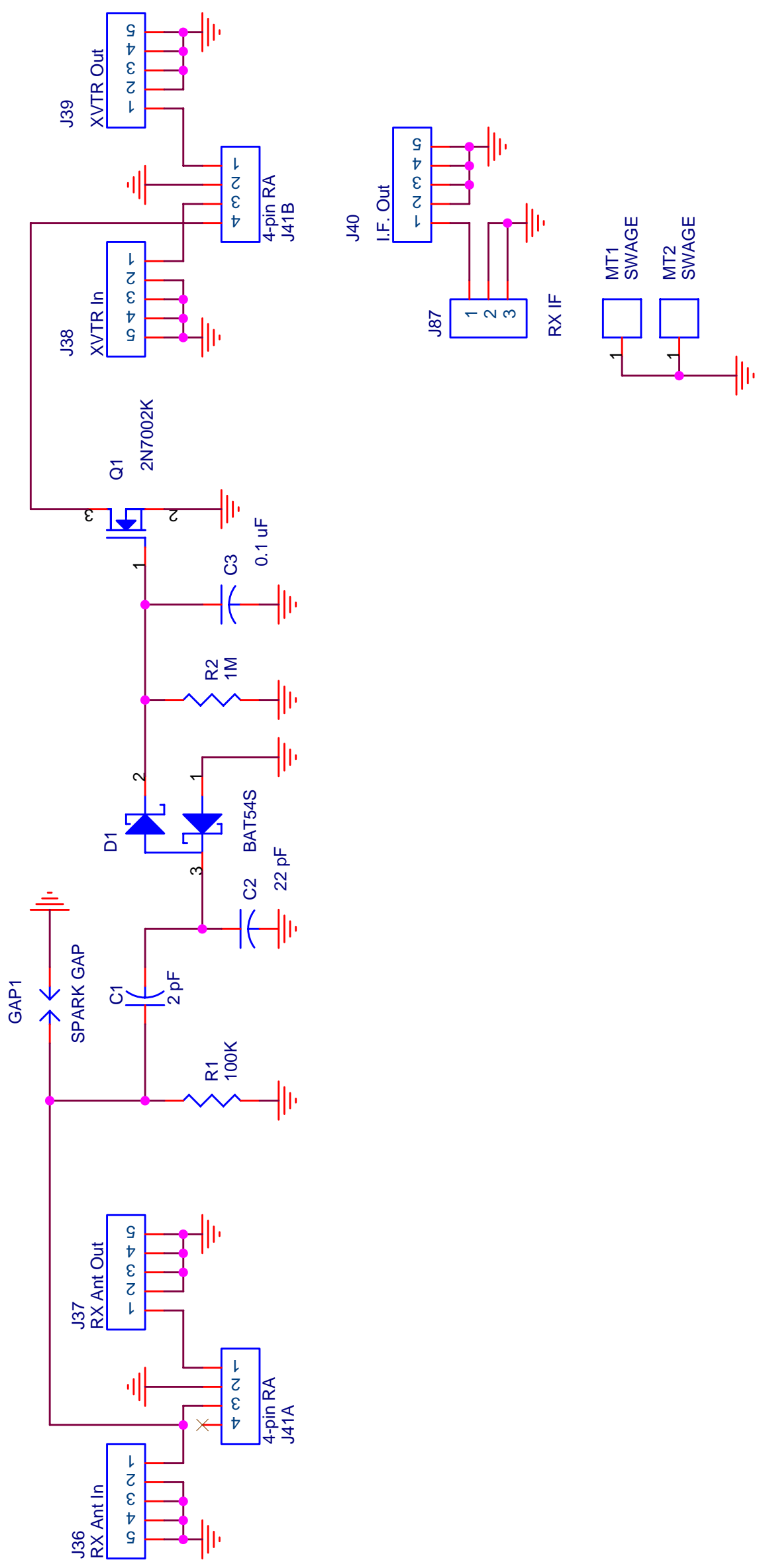
Elecraft	KBPF3	Date	Sht.
By	W. Burdick	Rev.	A
		6/29/07	1 of 4



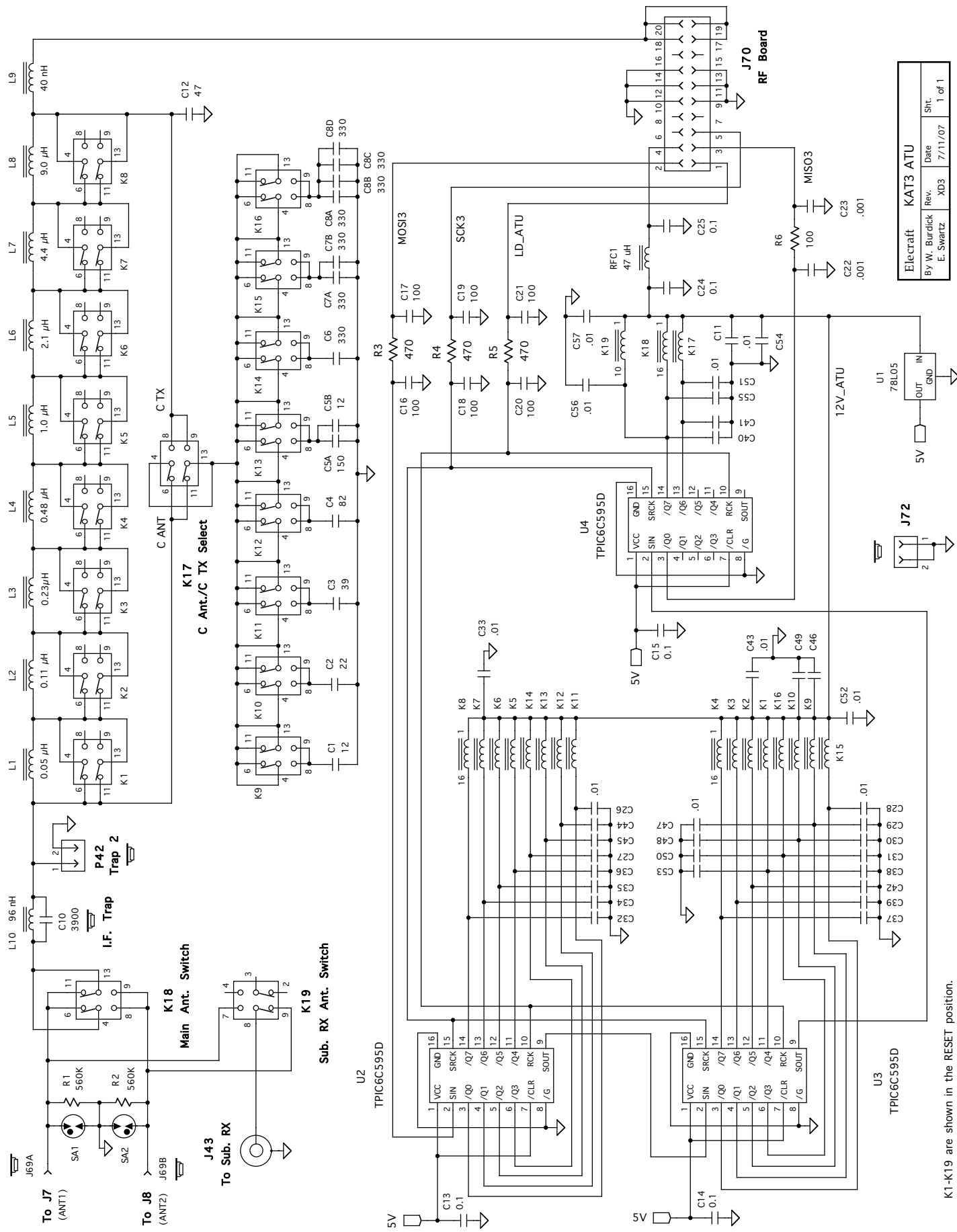
- NOTES:
1. KXV3-1 and -2 modules are soldered together via right-angle male connectors at J/P41A/C.
 2. K1 and K2 are DPDT relays shown in RESET position.
 3. W1 and W2 on the RF board must be removed or cut when the KXV3 is installed.
 4. W4 must be installed on the RF board when the KXV3 is installed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

Title		KXV3: Main	
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K3 RF Board

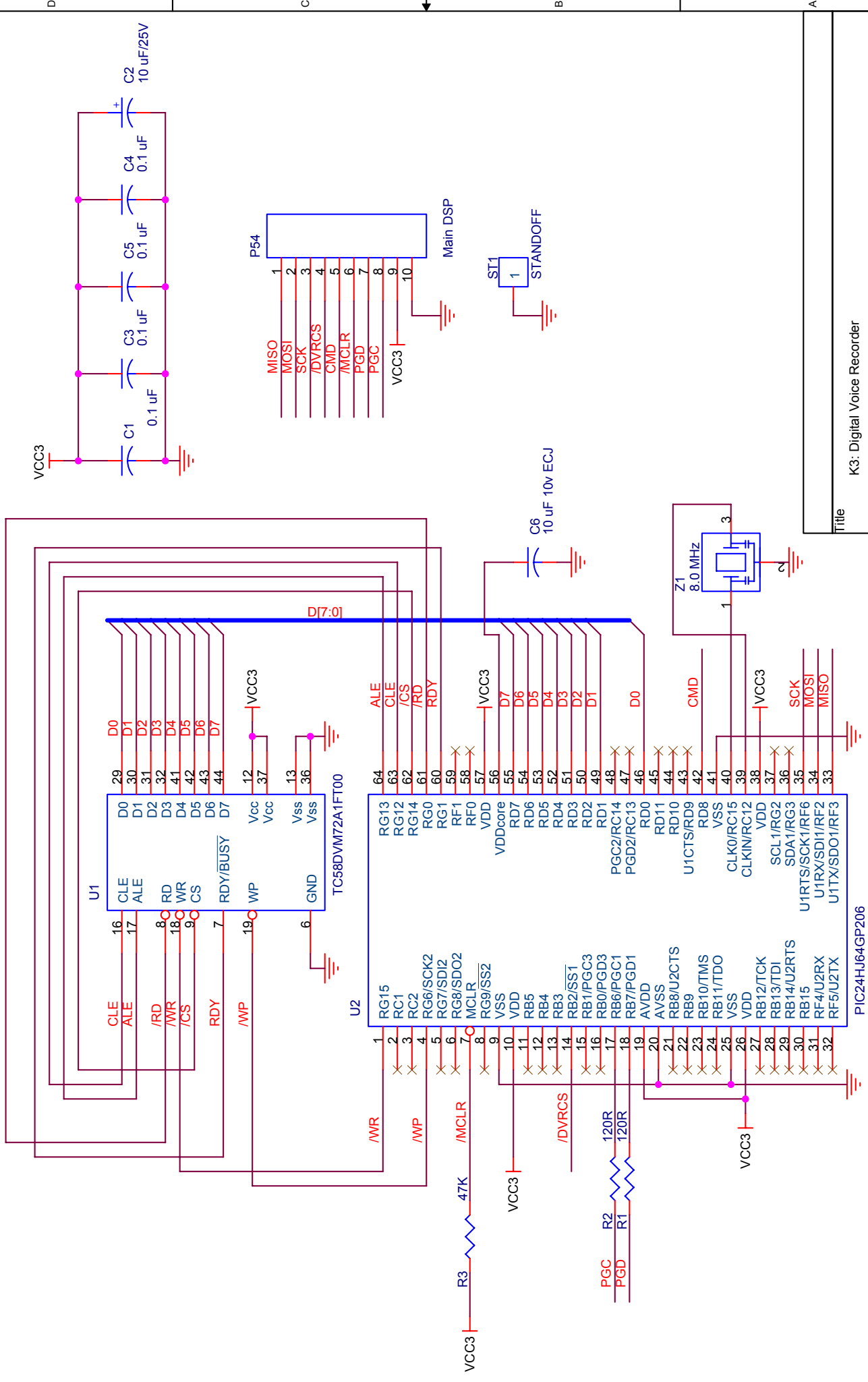


Title		KXV3: Connector	
Size	A	Document Number	2006030602
Date:	Friday, June 22, 2007	Sheet	1 of 1

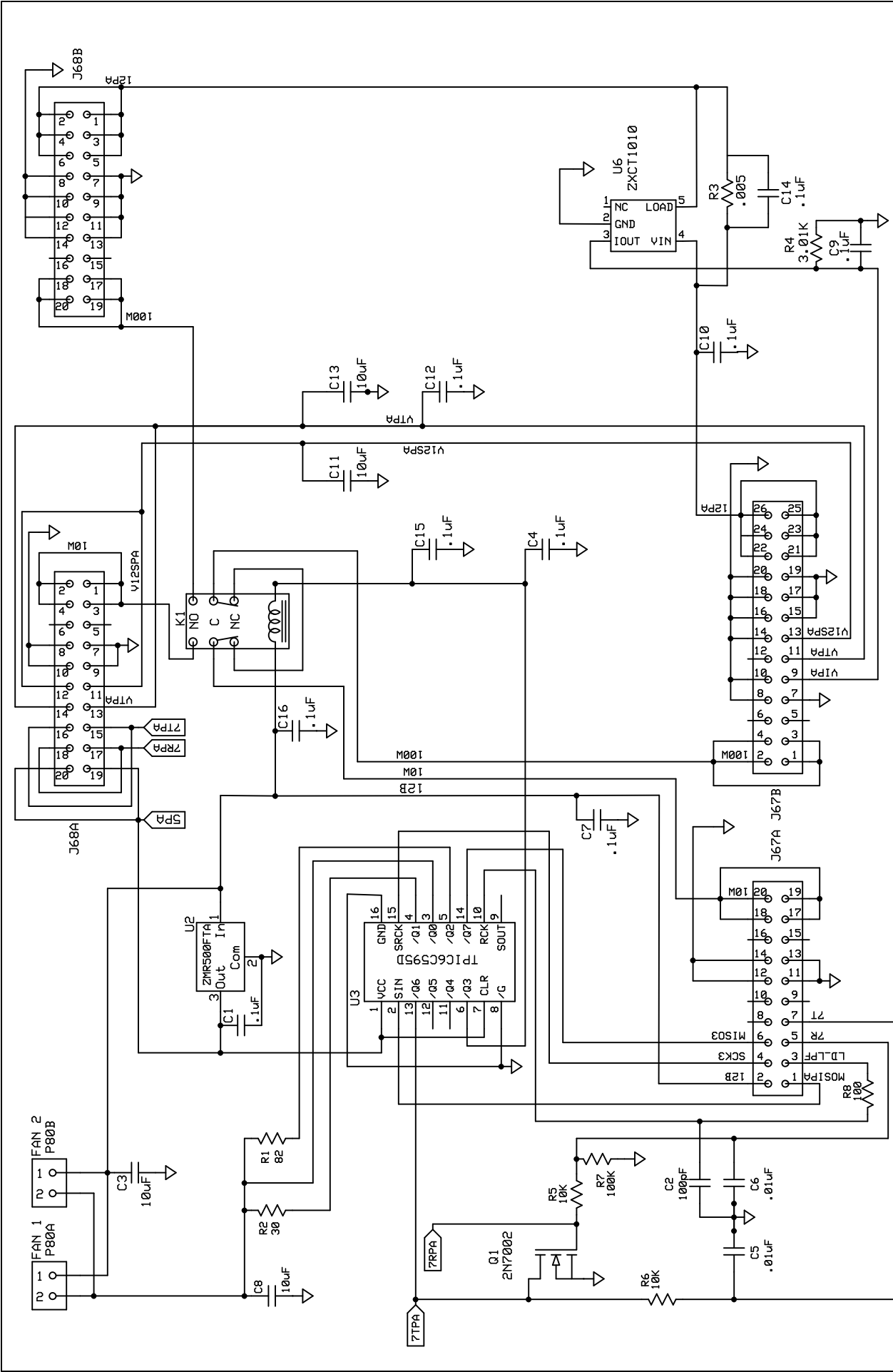


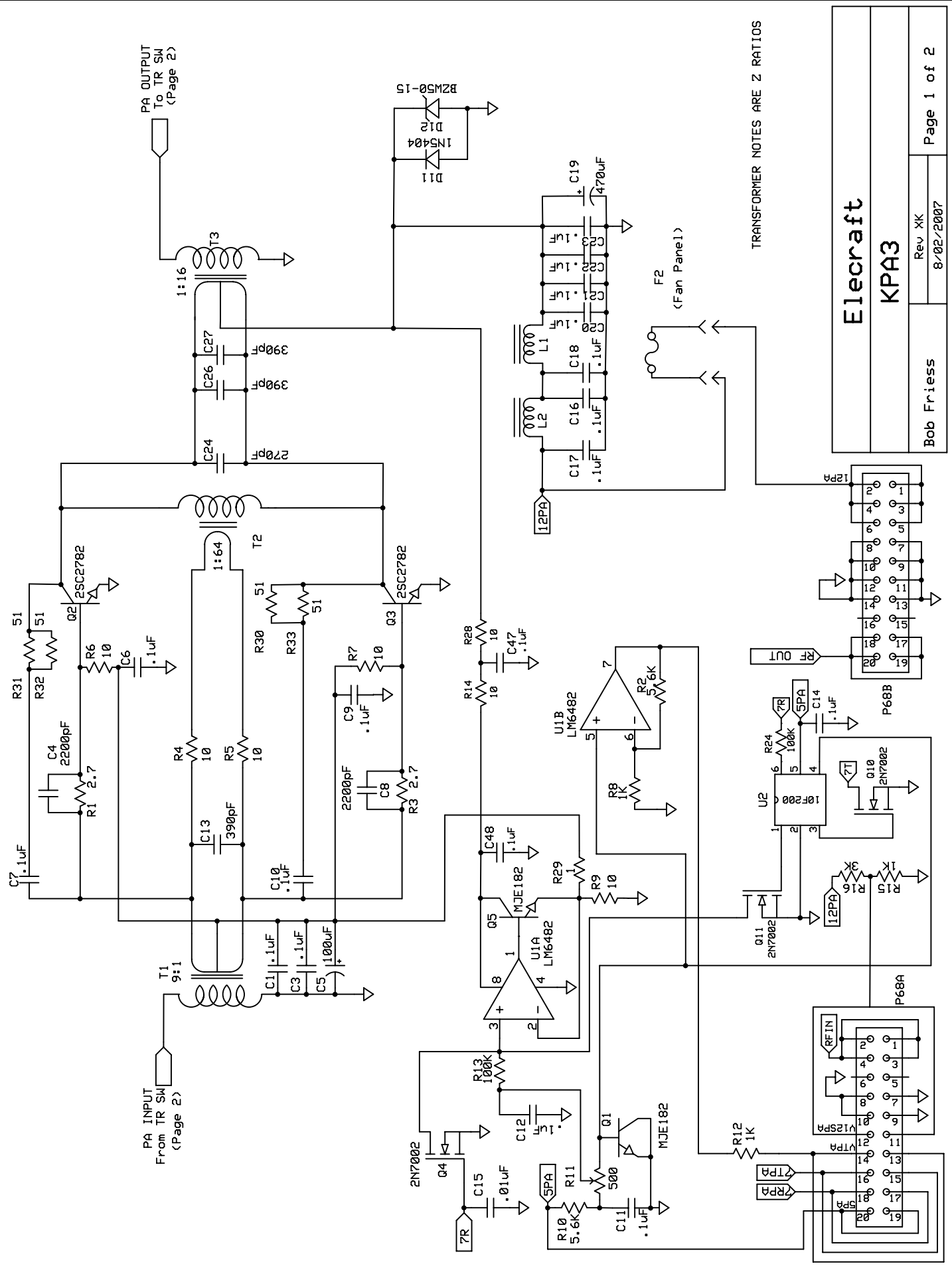
Electcraft	KAT3 ATU	Date	7/11/07	Shit.	1 of 1
By W. Burdick		Rev.	XD3		
E. Swartz					

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.



Title		K3: Digital Voice Recorder	
Size	A	Document Number	20040901001
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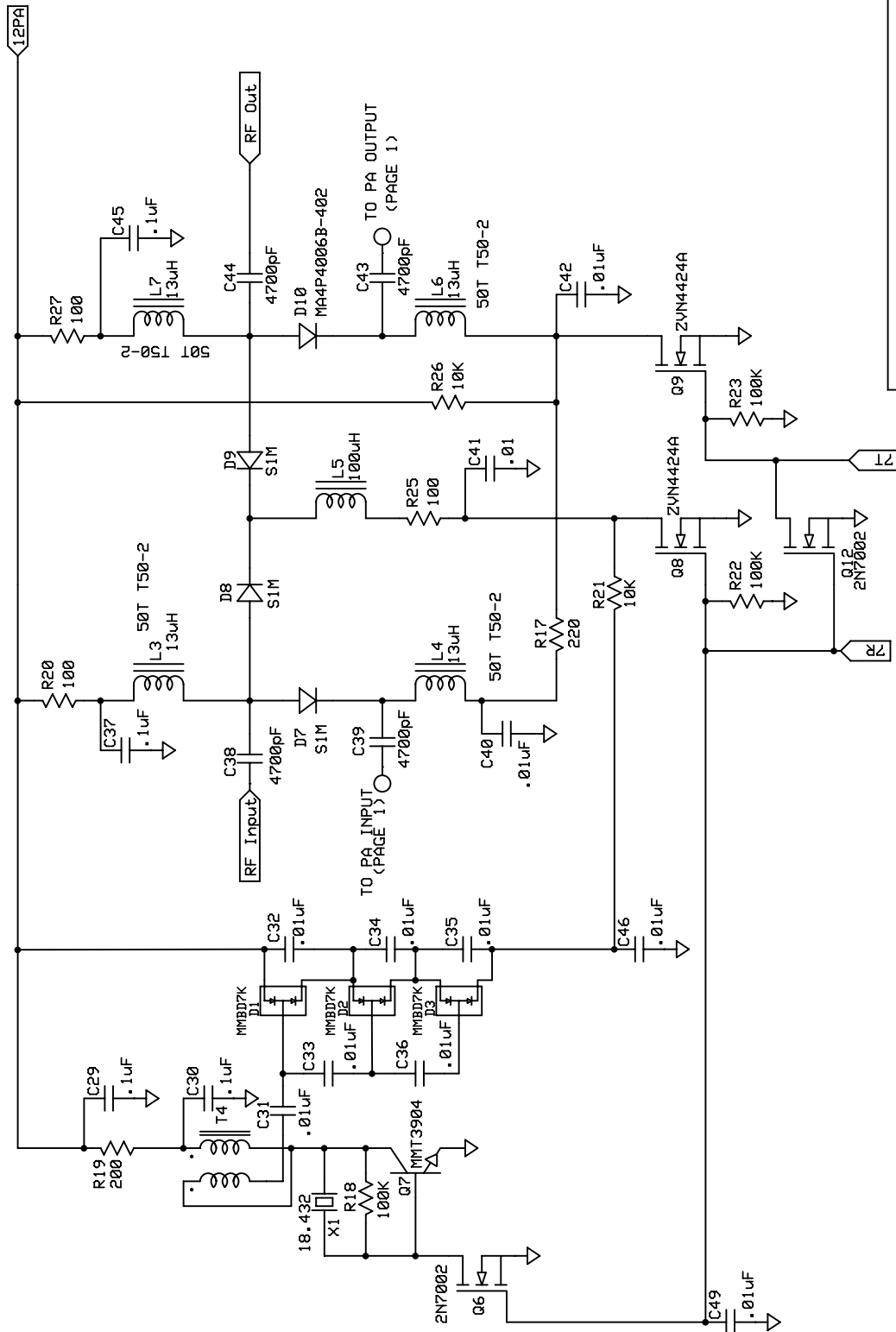




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