ALEX

Version P1-4.0

Schematics, Board Layout,

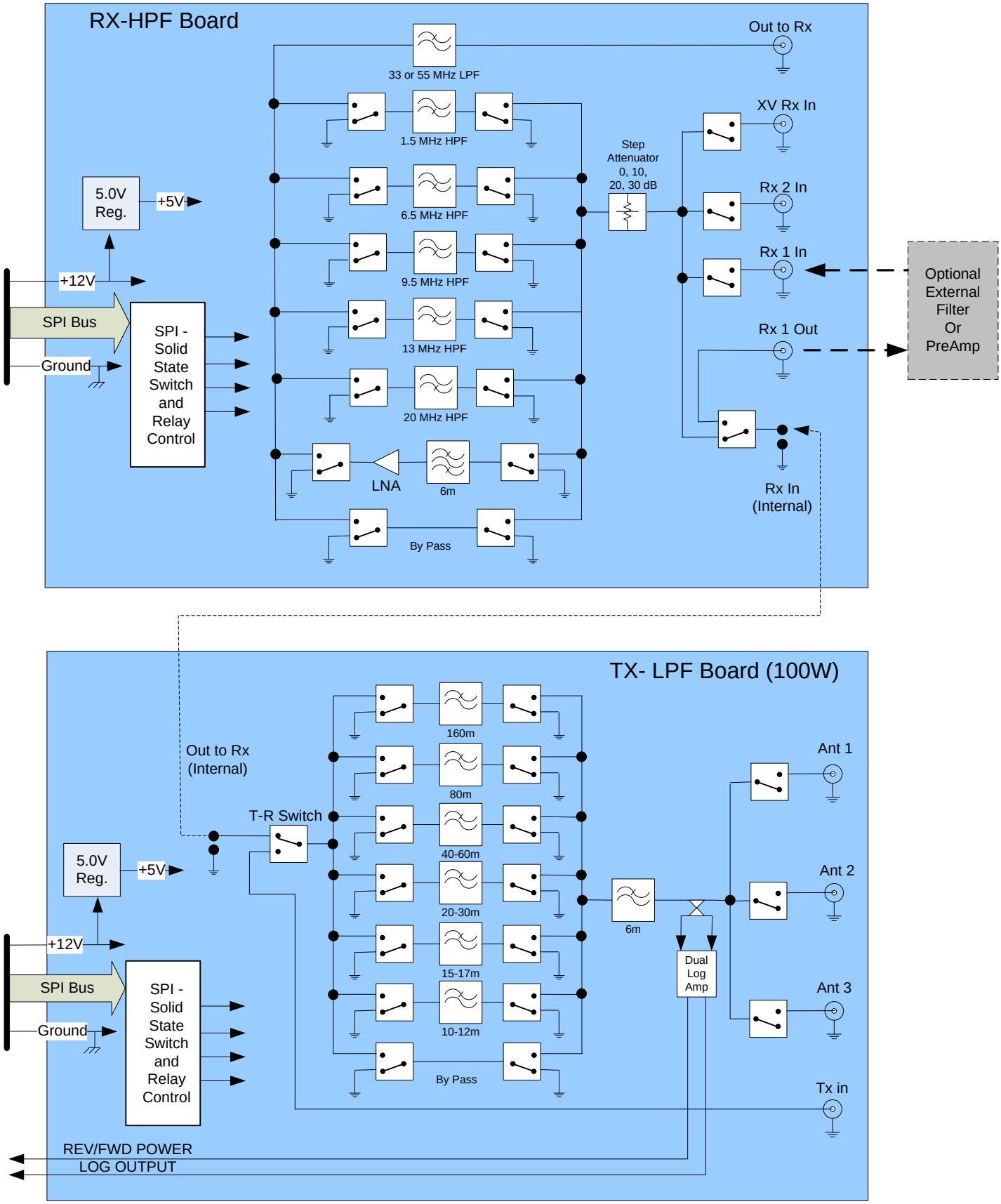
Notes, Bill of Materials

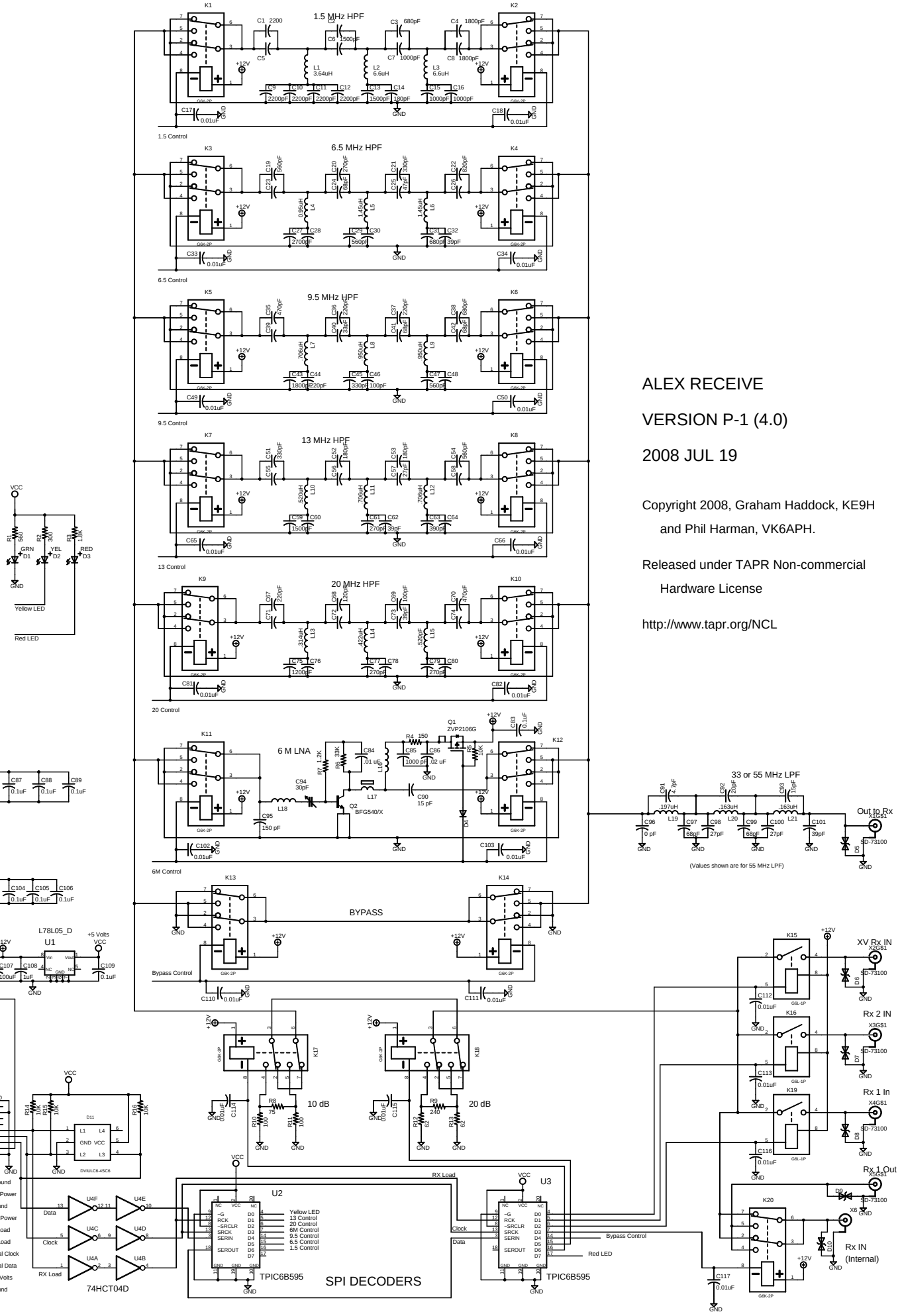
Document Version – P1

06 August 2008

Graham / KE9H

Alexiares (ALEX) – Block Diagram

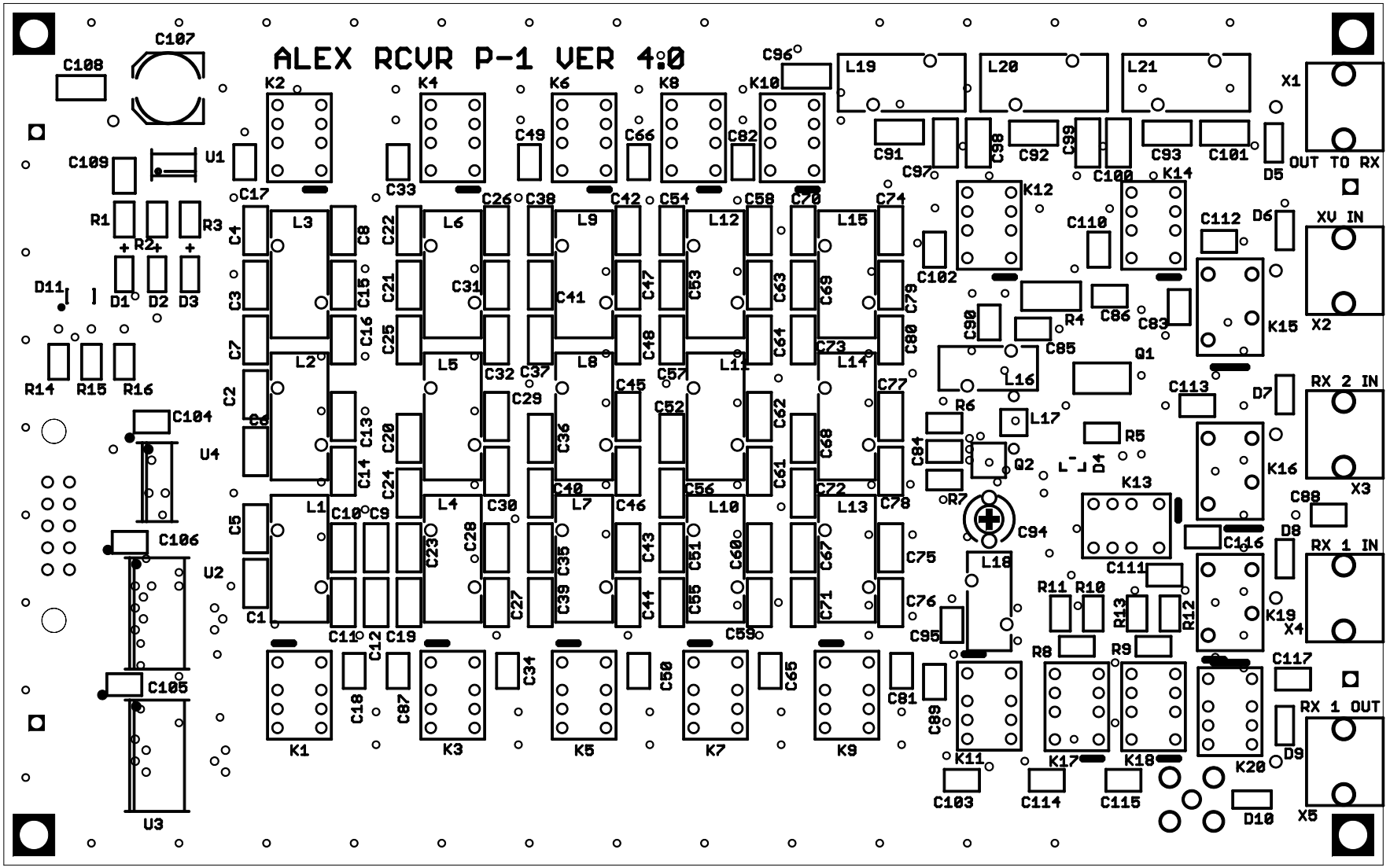


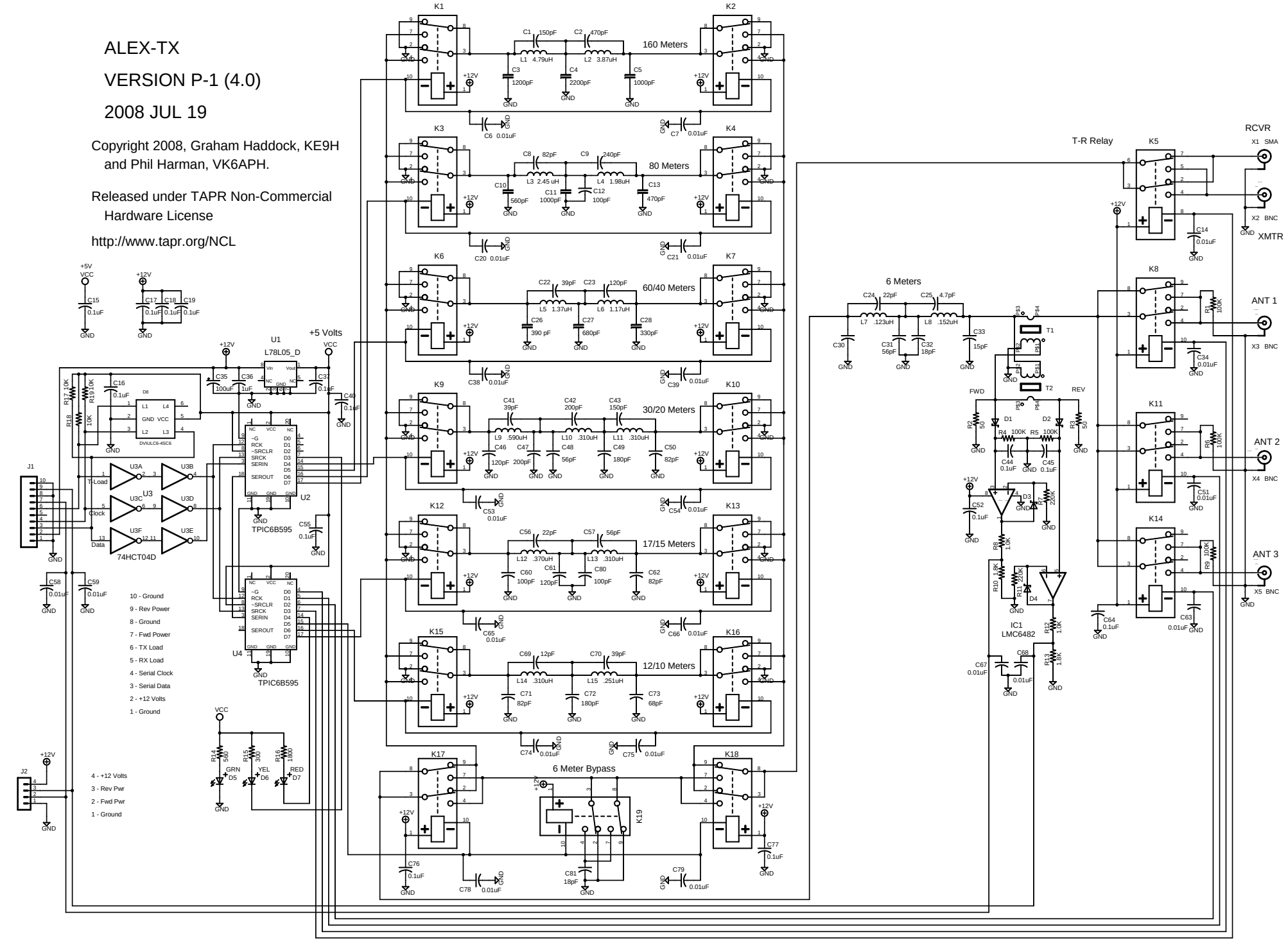


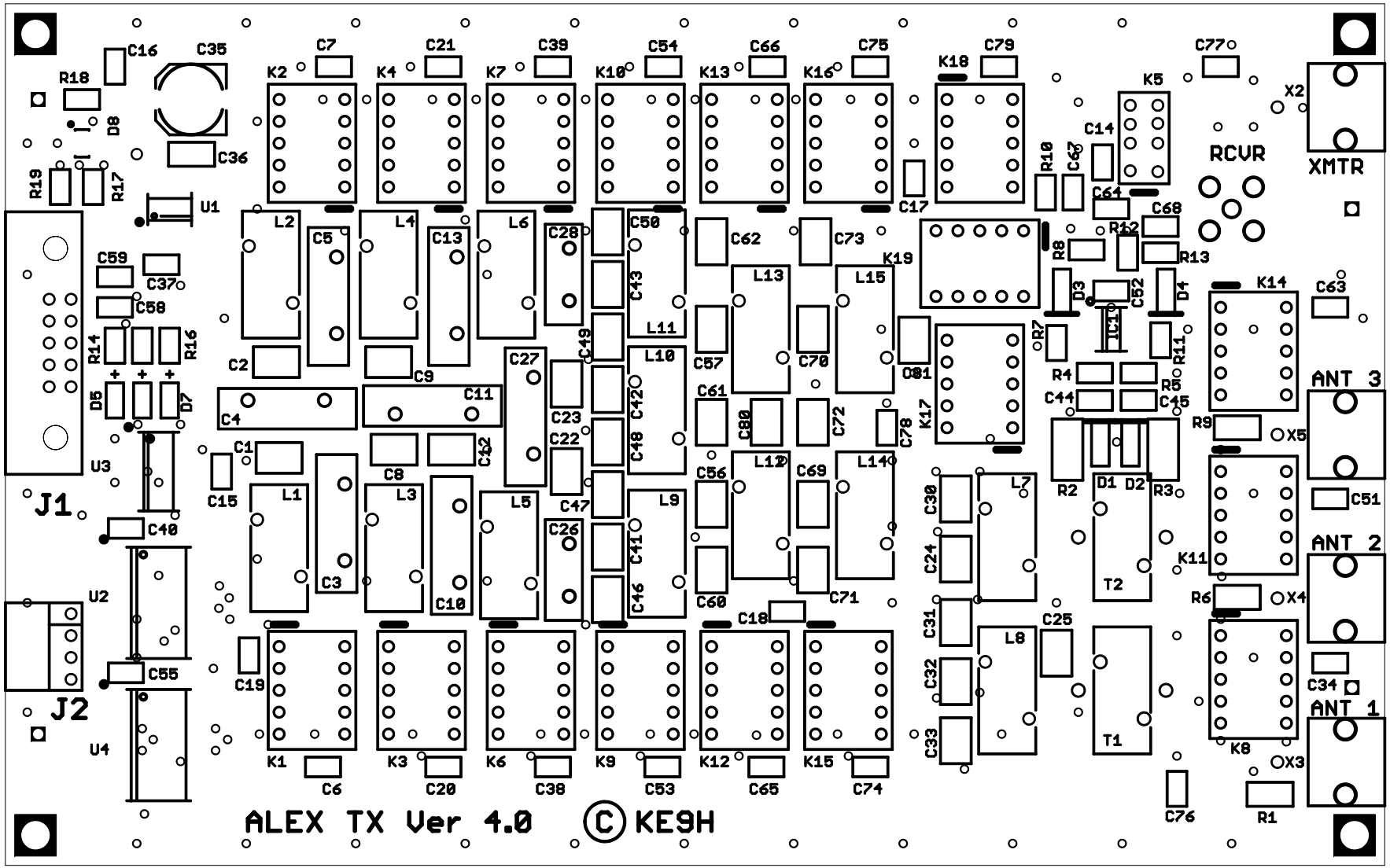
ALEX RECEIVE

VERSION P-1 (4.0)

2008 JUL 19


ALEX RCVR P-1 VER 4.0
C107
C108
C109
U1
R1
R2
R3
D11
D1
D2
D3
R14
R15
R16
C104
U4
C106
U2
C105
U3
K2
K4
K6
K8
K10
C96
L19
L20
L21
X1
C91
C97
C98
C92
C99
C100
C93
C101
D5
OUT TO RX
K12
K14
C110
C112
D6
XV IN
C102
C90
R4
C86
C83
K15
X2
C85
Q1
L16
C113
D7
RX 2 IN
R6
L17
R5
C84
Q2
D4
K16
X3
K13
C88
C94
C111
C116
D8
RX 1 IN
L18
R11
R10
R13
R12
K19
X4
C95
R8
R9
C117
C89
K11
K17
K18
K20
RX 1 OUT
D9
C103
C114
C115
D10
X5
C17
C33
C49
C66
C82
C26
C38
C42
C54
C58
C70
C74
L3
L6
L9
L12
L15
L2
L5
L8
L11
L14
L1
L4
L7
L10
L13
C1
C11
C19
C34
C50
C65
C81
K1
K3
K5
K7
K9


ALEX-TX
VERSION P-1 (4.0)
2008 JUL 19
Copyright 2008, Graham Haddock, KE9H and Phil Harman, VK6APH.
Released under TAPR Non-Commercial Hardware License
http://www.tapr.org/NCL
160 Meters
80 Meters
60/40 Meters
30/20 Meters
17/15 Meters
12/10 Meters
6 Meter Bypass
6 Meters
T-R Relay
RCVR
XMTR
ANT 1
ANT 2
ANT 3
+5 Volts
U1
L78L05_D
U2
TPIC6B595
U3
74HCT04D
U4
TPIC6B595
IC1
LMC6482
10 - Ground
9 - Rev Power
8 - Ground
7 - Fwd Power
6 - TX Load
5 - RX Load
4 - Serial Clock
3 - Serial Data
2 - +12 Volts
1 - Ground
4 - +12 Volts
3 - Rev Pwr
2 - Fwd Pwr
1 - Ground


ALEX TX Ver 4.0 © KE9H
J1
J2
RCVR
XMTR
ANT 1
ANT 2
ANT 3
T1
T2

; **
ALEX Control Description (P1) (Ver.4.0) GGH Ver. - 08/05/2008

REVISED 05 AUG 2008 -- Minor edit regarding LED bits on RX board.
REVISED 26 APR 2008 -- Modified for Alpha-3 connector change
; **

Control Documentation

The ALEX-TX and ALEX-RX SPI control lines are compatible with either
a 3 volt CMOS, or 5 volt TTL, or 5 volt CMOS logic level control inputs.
They also include 10K pull-up resistors to +5 Volts, so they can also
be driven with open collector inputs, provided that the open collector
can tolerate +5 volts isolated by a 10K resistor.

The serial data and clock lines for the Transmit and Receive Boards
are common.

There are separate TX and RX board "Load Strobe" lines for ALEX.

The data is sent to both boards in parallel, but is only loaded
into the intended board by use of the appropriate "Load Strobe."

Unless otherwise noted, control functions are positive logic,
that is, they are active "High = 1 = ON"

; **

ALEX TRANSMIT BOARD

The TX Board is controlled by a 16 bit word sent over the SPI
bus. Bit 00 is the first bit sent, Bit 15 is the last bit sent. It
is up to the programmer to understand the sent bit order (that is,
most significant bit first or least significant bit first) of his
SPI controller and deal with the control word/bytes/bits accordingly.

There are not necessarily standard conventions across multiple suppliers
of SPI bus controller hardware or software implementations of transmitted
bit and byte order.

(The Relay driver ICs map most significant bit as first received.)

Two LEDs, one controlled by each relay driver IC have been
provided as a visual debug aid, as well as a way to indicate
to the end user that the ALEX is under active control.

Bit 15 - N.C.	U2 - D0	All are active "High"
Bit 14 - N.C.	U2 - D1	
Bit 13 - N.C.	U2 - D2	
Bit 12 - YELLOW LED	U2 - D3	
Bit 11 - 30/20 Meters	U2 - D4	
Bit 10 - 60/40 Meters	U2 - D5	
Bit 09 - 80 Meters	U2 - D6	
Bit 08 - 160 Meters	U2 - D7	
Bit 07 - ANT #1	U4 - D0	
Bit 06 - ANT #2	U4 - D1	

Bit 05 - ANT #3	U4 - D2	
Bit 04 - T/R Relay	U4 - D3	Transmit is high, Rec Low
Bit 03 - RED LED	U4 - D4	
Bit 02 - 6 Meters (Bypass)	U4 - D5	
Bit 01 - 12/10 Meters	U4 - D6	
Bit 00 - 17/15 Meters	U4 - D7	

Suggested uses for the ALEX-TX RED and YELLOW LEDs.

The GREEN LED is on, whenever there is +5 volts present on the board. Since the +5 is derived from +12 on board, it implies that the board is fully powered up.

Both the RED and YELLOW LEDs are controlled by their own dedicated bits on the SPI bus.

I suggest that the YELLOW LED be lighted (bit 12 = high) on all SPI packets sent, so that a YELLOW LED means that the board is seeing, or at least has seen, valid SPI packets.

I suggest the RED LED be lighted whenever the TRANSMIT-RECEIVE antenna relay is in the active TRANSMIT mode. That is, the RED LED (bit 3) is active whenever bit 4 is active.

; **

ALEX RECEIVE BOARD

The RX Board is controlled by a 16 bit word sent over the SPI bus. Bit 00 is the first bit sent, Bit 15 is the last bit sent. It is up to the programmer to understand the sent bit order (that is, most significant bit first or least significant bit first) of his SPI controller and deal with the control word/bytes/bits accordingly.

There are not necessarily standard conventions across multiple suppliers of SPI bus controller hardware or software implementations of transmitted bit and byte order.

Two LEDs, one controlled by each SPI decoder IC have been provided as a visual debug aid, as well as a way to indicate to the end user that the ALEX is under active control.

Bit	Function	I.C. Output	
Bit 15 -	YELLOW LED	U2 - D0	All are active "High"
Bit 14 -	13 MHz HPF	U2 - D1	
Bit 13 -	20 MHz HPF	U2 - D2	
Bit 12 -	6M Preamp	U2 - D3	
Bit 11 -	9.5 MHz HPF	U2 - D4	
Bit 10 -	6.5 MHz HPF	U2 - D5	
Bit 09 -	1.5 MHz HPF	U2 - D6	
Bit 08 -	N.C.	U2 - D7	
Bit 07 -	Transverter RX In (Note 1)	U3 - D0	
Bit 06 -	RX 2 In (Note 1)	U3 - D1	

```
Bit 05 - RX 1 In        (Note 1)        U3 - D2
Bit 04 - RX 1 Out       (Note 1)        U3 - D3   Low = Default Receive Path
Bit 03 - Bypass                         U3 - D4
Bit 02 - 20 dB Atten.                   U3 - D5
Bit 01 - 10 dB Atten.                   U3 - D6
Bit 00 - RED LED                        U3 - D7
```

Note 1.) The RX 1 OUT switch also controls the default input path for the normal receive function (that is, receiving from the same antenna port as you are transmitting on.) In the event that it is desired to receive through XV IN, RX 2 IN, or RX 1 IN, then RX 1 OUT should be turned ON, so as to disconnect the normal (default) receive path from the transmit antenna port. If an external filter is to be placed in the normal receive path, then both RX 1 OUT and RX 1 IN should be turned on, and the filter connected between the RX 1 OUT and RX 1 IN BNC connectors.

==

Suggested uses for the ALEX-RX RED and YELLOW LEDs.

The GREEN LED is on, whenever there is +5 volts present on the board. Since the +5 is derived from +12 on board, it implies that the board is fully powered up.

Both the RED and YELLOW LEDs are controlled by their own dedicated bits on the SPI bus from different ICs. The programmer is free to use them for any purpose.

I suggest that the YELLOW LED be lighted (bit 15 = high) on all SPI packets sent, so that a YELLOW LED means that the board is seeing, or at least has recently seen, valid SPI packets.

I suggest that the RED LED be lighted whenever the 6M Preamp is turned on. That is, Bit 00 is active whenever Bit 12 is active.

; **********

SPI Bus operation

There are separate TX and RX board "Load Strobe" lines for ALEX. The data is sent to both boards in parallel, but is only loaded into the intended board by use of the appropriate "Load Strobe."

Unless otherwise noted, control functions are active "High."

The first bit of data is set up on the data line. High = 1, Low = 0.
The clock line is raised then lowered.
The second bit of data is set up on the data line.
The clock line is raised then lowered.

Repeat until all 16 bits have been entered.

Raise then lower the "TX Load Strobe" or "RX Load Strobe", to make the entire control word active on the intended board.

Data bits are loaded on the rising edge of the SPI clock.

The entire control word becomes active on the rising edge of the "load strobe."

The ALEX SPI bus is totally asynchronous, and no regular timing is assumed. I normally run at a bit transfer rate of 1.25 mega-bits per second. The parts specs would indicate a transfer rate in excess of 5 mega-bits per second, but I have not found this to be the case with controllers and decoders on separate boards, and signals transferred through multi-wire cables with uncontrolled impedance and shielding.

The data clock is not a continuously running clock. It should only transition when entering data into ALEX. Therefore, the ALEX SPI control bus should be dedicated to ALEX, and not have its data and clock lines in parallel with other functions, to prevent injecting noise onto the ALEX boards except when specifically changing data inside ALEX.

If you need specific set-up and timing specifications, refer to the spec sheets for

TPIC6B595 (Texas Instruments) relay driver.

But if you allow at least 0.4 us set up times and transfer data at or below 1.25 megabits per second, everything will be quite robust.

; **

ALEX Control Connector Pin Outs - for Alpha-3 Version

-- Polarized 10 pin, 3M # 3793-5002RB (Mouser 517-N3793-5002RB)
0.1 inch on centers, 0.025 square pins, two rows of 5 pins each
Pin #1 as defined by manufacturer drawing, then in ribbon wire order

Pin	Name	Description/Function
1	Ground	Ground
2	+12V	+12 Volt Power
3	SPI SDO	SPI Serial DATA
4	SPI SCK	SPI CLOCK
5	SPI RX Load Strobe	SPI RX Board Load Strobe
6	SPI TX Load Strobe	SPI TX Board Load Strobe
7	Analog Fwd Pwr	0-3 Volt Analog Output
8	Ground	Ground
9	Analog Rev Pwr	0-3 Volt Analog Output
10	Ground	Ground

; **

==

Version 4.0 Production Release
Date: August 5, 2008

by: Graham --- KE9H

Notes:

Recommended Hand Assembly Order
The general order is small to large, center to outside, surface mount first, then thru hole last.
Specifically, this is the recommended order:
1.) Small common parts - bypass caps
2.) Other small C, R, diodes, and LEDs surface mount.
3.) Surface Mount Ics
4.) Misc surface mount (Electrolytics)
5.) Toroids
6.) Relays
7.) Connectors

Special Notes:
Installation of the relays is position critical. Observe the position mark on both the relay housing and the board silkscreen for proper orientation. In particular, the transmit board relays can be installed in two directions, one of which won't work, and they are extremely hard to unsolder without an oven.

The LEDs are polarity sensitive, and the RED LED has opposite mechanical polarity to the GREEN and YELLOW LEDs. For Green and Yellow LEDs, the two green dots which are on either side of the LED die are on the negative end. For Red LEDs, the two green dots, which are either side of the die, are on the positive end. Builder Beware!

The right angle SMB connectors are installed on the BACK SIDE of the PC Boards.

The Receive board ribbon cable is to be installed on the BACK SIDE of the PC board.
The Transmit board ribbon cable is to be installed on the FRONT SIDE of the PC board.
The Transmit board auxilliary 4 pin connector goes on the top side of the board.
OBSERVE THE SILKSCREEN FOR POSITIONS OF THESE CONNECTORS.

The electrical values for the inductors are measured…
at 4 MHz for RED cores, at 10 MHz for BLACK cores, and 20 MHz for YELLOW cores.
Expected tolarance is +/- 5 percent for the BLACK cores
and +/- 10 percent for the RED and YELLOW cores.

ALEX-P1-RX BOM **Version** **8/6/2008**

Part	Value	Description	Footprint/ Package	Library	Manu	Part No.	Vendor	Part No.	Notes
C001	2200pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C222J5GACTU	Mouser	80-C1206C222J5G	Must be NPO/C0G
C002	- - - -	- - - - - - - -	C1206	0G_RCL	- - - -	- - - - - - - -	- - - -	- - - - - - - -	Position Not Used
C003	680pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C681J5GACTU	Mouser	80-C1206C681J5G	Must be NPO/C0G
C004	1800pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C182J5GACTU	Mouser	80-C1206C182J5G	Must be NPO/C0G
C005									
C006	1500pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C152J5GACTU	Mouser	80-C1206C152J5G	Must be NPO/C0G
C007	1000pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C102J5GACTU	Mouser	80-C1206C102J5G	Must be NPO/C0G
C008	1800pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C182J5GACTU	Mouser	80-C1206C182J5G	Must be NPO/C0G
C009	2200pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C222J5GACTU	Mouser	80-C1206C222J5G	Must be NPO/C0G
C010	2200pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C222J5GACTU	Mouser	80-C1206C222J5G	Must be NPO/C0G
C011	2200pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C222J5GACTU	Mouser	80-C1206C222J5G	Must be NPO/C0G
C012	2200pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C182J5GACTU	Mouser	80-C1206C182J5G	Must be NPO/C0G
C013	1500pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C152J5GACTU	Mouser	80-C1206C152J5G	Must be NPO/C0G
C014	180pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C102J5GACTU	Mouser	80-C1206C102J5G	Must be NPO/C0G
C015	1000pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C102J5GACTU	Mouser	80-C1206C102J5G	Must be NPO/C0G
C016	1000pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C102J5GACTU	Mouser	80-C1206C102J5G	
C017	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C018	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C019	560pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C561J5GACTU	Mouser	80-C1206C561J5G	Must be NPO/C0G
C020	270pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C271J5GACTU	Mouser	80-C1206C271J5G	Must be NPO/C0G
C021	330pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C331J5GACTU	Mouser	80-C1206C331J5G	Must be NPO/C0G
C022	820pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C821J5GACTU	Mouser	80-C1206C821J5G	Must be NPO/C0G
C023	- - - -	- - - - - - - -	C1206	0G_RCL	- - - -	- - - - - - - -	- - - -	- - - - - - - -	Position Not Used
C024	68pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C680J5GACTU	Mouser	80-C1206C680J5G	Must be NPO/C0G
C025	47pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C470J5GACTU	Mouser	80-C1206C470J5G	Must be NPO/C0G
C026	- - - -	- - - - - - - -	C1206	0G_RCL	- - - -	- - - - - - - -	- - - -	- - - - - - - -	Position Not Used
C027	2700pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C272J5GACTU	Mouser	80-C1206C272J5G	Must be NPO/C0G
C028	- - - -	- - - - - - - -	C1206	0G_RCL	- - - -	- - - - - - - -	- - - -	- - - - - - - -	Position Not Used
C029	560pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C561J5GACTU	Mouser	80-C1206C561J5G	Must be NPO/C0G
C030	- - - -	- - - - - - - -	C1206	0G_RCL	- - - -	- - - - - - - -	- - - -	- - - - - - - -	Position Not Used
C031	680pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C681J5GACTU	Mouser	80-C1206C681J5G	Must be NPO/C0G
C032	39pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C390J5GACTU	Mouser	80-C1206C390J5G	Must be NPO/C0G
C033	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C034	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C035	470pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C471J5GACTU	Mouser	80-C1206C471J5G	Must be NPO/C0G
C036	220pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C221J5GACTU	Mouser	80-C1206C221J5G	Must be NPO/C0G
C037	220pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C221J5GACTU	Mouser	80-C1206C221J5G	Must be NPO/C0G
C038	680pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C681J5GACTU	Mouser	80-C1206C681J5G	Must be NPO/C0G
C039	- - - -	- - - - - - - -	C1206	0G_RCL	- - - -	- - - - - - - -	- - - -	- - - - - - - -	Position Not Used
C040	33pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C330J5GACTU	Mouser	80-C1206C330J5G	Must be NPO/C0G
C041	68pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C680J5GACTU	Mouser	80-C1206C680J5G	Must be NPO/C0G
C042	68pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C680J5GACTU	Mouser	80-C1206C680J5G	Must be NPO/C0G
C043	1800pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C182J5GACTU	Mouser	80-C1206C182J5G	Must be NPO/C0G
C044	220pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C221J5GACTU	Mouser	80-C1206C221J5G	Must be NPO/C0G
C045	330pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C331J5GACTU	Mouser	80-C1206C331J5G	Must be NPO/C0G
C046	100pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C101J5GACTU	Mouser	80-C1206C101J5G	Must be NPO/C0G
C047	560pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C561J5GACTU	Mouser	80-C1206C561J5G	Must be NPO/C0G

C048	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C049	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C050	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C051	330pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C331J5GACTU	Mouser	80-C1206C331J5G	Must be NPO/C0G
C052	180pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C181J5GACTU	Mouser	80-C1206C181J5G	Must be NPO/C0G
C053	180pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C181J5GACTU	Mouser	80-C1206C181J5G	Must be NPO/C0G
C054	560pf	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C561J5GACTU	Mouser	80-C1206C561J5G	Must be NPO/C0G
C055	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C056	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C057	27pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C270J5GACTU	Mouser	80-C1206C270J5G	Must be NPO/C0G
C058	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C059	1500pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C152J5GACTU	Mouser	80-C1206C152J5G	Must be NPO/C0G
C060	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C061	270pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C271J5GACTU	Mouser	80-C1206C271J5G	Must be NPO/C0G
C062	39pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C390J5GACTU	Mouser	80-C1206C390J5G	Must be NPO/C0G
C063	390pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C391J5GACTU	Mouser	80-C1206C391J5G	Must be NPO/C0G
C064	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C065	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C066	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C067	220pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C221J5GACTU	Mouser	80-C1206C221J5G	Must be NPO/C0G
C068	120pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C121J5GACTU	Mouser	80-C1206C121J5G	Must be NPO/C0G
C069	100pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C101J5GACTU	Mouser	80-C1206C101J5G	Must be NPO/C0G
C070	470pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C471J5GACTU	Mouser	80-C1206C471J5G	Must be NPO/C0G
C071	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C072	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C073	39pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C390J5GACTU	Mouser	80-C1206C390J5G	Must be NPO/C0G
C074	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C075	1200pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C122J5GACTU	Mouser	80-C1206C122J5G	Must be NPO/C0G
C076	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C077	270pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C271J5GACTU	Mouser	80-C1206C271J5G	Must be NPO/C0G
C078	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C079	270pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C271J5GACTU	Mouser	80-C1206C271J5G	Must be NPO/C0G
C080	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C081	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C082	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C083	0.1uF	Chip Cap C0805	C0805	0G_RCL	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	25volts X7R
C084	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C085	1000pF	Chip Cap C0805	C0805	0G_RCL	Kemet	C0805C102J5GACTU	Mouser	80-C0805C102J5G	Must be NPO/C0G
C086	0.022uF	Chip Cap C0805	C0805	0G_RCL	Kemet	C0805C223K5RACTU	Mouser	80-C0805C223K5R	50volts X7R
C087	0.1uF	Chip Cap C0805	C0805	0G_RCL	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	25volts X7R
C088	0.1uF	Chip Cap C0805	C0805	0G_RCL	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	25volts X7R
C089	0.1uF	Chip Cap C0805	C0805	0G_RCL	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	25volts X7R
C090	15pF	Chip Cap C0805	C0805	0G_RCL	Kemet	C0805C150J5GACTU	Mouser	80-C0805C150J5G	Must be NPO/C0G
C091	4.7pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C479K5GACTU	Mouser	80-C1206C479K5G	Must be NPO/C0G
C092	20pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C200J5GACTU	Mouser	80-C1206C200J5G	Must be NPO/C0G
C093	15pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C0805C150J5GACTU	Mouser	80-C0805C150J5G	Must be NPO/C0G
C094	6.5-30pF	Trimmer Cap	˜RIM_GKG_	0G_RCL	Sprague	GKG30015	Mouser	659-GKG30015	
C095	150 pF	Chip Cap C0805	C0805	0G_RCL	Kemet	C0805C151J5GACTU	Mouser	80-C0805C151J5G	Must be NPO/C0G
C096	----	--------	C1206	0G_RCL	----	--------	----	--------	Position Not Used
C097	68pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C680J5GACTU	Mouser	80-C1206C680J5G	Must be NPO/C0G
C098	27pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C270J5GACTU	Mouser	80-C1206C270J5G	Must be NPO/C0G
C099	68pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C680J5GACTU	Mouser	80-C1206C680J5G	Must be NPO/C0G
C100	27pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C270J5GACTU	Mouser	80-C1206C270J5G	Must be NPO/C0G

C101	39pF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C390J5GACTU	Mouser	80-C1206C390J5G	Must be NPO/C0G
C102	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C103	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C104	0.1uF	Chip Cap C0805	C0805	0G_RCL	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	25volts X7R
C105	0.1uF	Chip Cap C0805	C0805	0G_RCL	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	25volts X7R
C106	0.1uF	Chip Cap C0805	C0805	0G_RCL	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	25volts X7R
C107	100uF	CPOL-USF	ANASONIC_	0G_RCL	United CC	EMKA250ADA101MHA0G	Mouser	661-MKA25VC101M	Electrolytic
C108	1uF	Chip Cap C1206	C1206	0G_RCL	Kemet	C1206C105K3RACTU	Mouser	80-C1206C105K3R	X7R Dialectric
C109	0.1uF	Chip Cap C0805	C0805	0G_RCL	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	25volts X7R
C110	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C111	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C112	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C113	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C114	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C115	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C116	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C117	0.01uF	Chip Cap C0805	C0805	0G_RCL	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
D01	Green	GRN LED	LED0805	0G_LED_TVS	Lite-On	LTST-C170GKT	Mouser	859-LTST-C170GKT	See Special Assembly Note
D02	Yellow	YEL LED	LED0805	0G_LED_TVS	Lite-On	LTST-C170YKT	Mouser	859-LTST-C170YKT	See Special Assembly Note
D03	Red	RED LED	LED0805	0G_LED_TVS	Lite-On	LTST-C170CKT	Mouser	859-LTST-C170CKT	See Special Assembly Note
D04	Diode	1N4148A	SOT23	0G_Regulators					
D05	GBLC03C	3.3 Volt TVS	SOD323	0G_LED_TVS	ProTek	GBLC03C	ProTek	GBLC03C	Transient Voltage Supressor
D06	GBLC03C	3.3 Volt TVS	SOD323	0G_LED_TVS	ProTek	GBLC03C	ProTek	GBLC03C	Transient Voltage Supressor
D07	GBLC03C	3.3 Volt TVS	SOD323	0G_LED_TVS	ProTek	GBLC03C	ProTek	GBLC03C	Transient Voltage Supressor
D08	GBLC03C	3.3 Volt TVS	SOD323	0G_LED_TVS	ProTek	GBLC03C	ProTek	GBLC03C	Transient Voltage Supressor
D09	GBLC03C	3.3 Volt TVS	SOD323	0G_LED_TVS	ProTek	GBLC03C	ProTek	GBLC03C	Transient Voltage Supressor
D10	GBLC03C	3.3 Volt TVS	SOD323	0G_LED_TVS	ProTek	GBLC03C	ProTek	GBLC03C	Transient Voltage Supressor
D11		Voltage Clamp	SOT23-6L	0G_LED_TVS	STM	DVIVLC6-4SC6	Mouser	511-DVIULC6-4SC6	4 Way Transient Voltage Clamp
J1	10 Pin	Polarized 0.1 inch		0G_Connectors	3M	3793-5002RB	Mouser	517-N3793-5002RB	See Special Assembly Note
J1A	Extractors	Extractors & Pins	--	--	3M	3505-3	Mouser	517-3505-3	
J1B	Extractors	Extractors & Pins	--	--	3M	3505-3	Mouser	517-3505-3	
K1	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K2	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K3	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K4	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K5	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K6	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K7	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K8	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K9	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K10	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K11	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K12	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K13	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K14	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K15	SPST	G6L-1P	G6L-1P	0G_RELAYS	Omron	G6L-1P-DC12	Digikey	Z1229-ND	
K16	SPST	G6L-1P	G6L-1P	0G_RELAYS	Omron	G6L-1P-DC12	Digikey	Z1229-ND	
K17	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
K18	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	

K19	SPST	G6L-1P	G6L-1P	0G_RELAYS	Omron	G6L-1P-DC12	Digikey	Z1229-ND	
K20	DPDT	G6K-2P-Y	G6K-2P-Y	0G_RELAYS	Omron	G6K-2P-Y-DC12	Mouser	653-G6K-2P-Y-DC12	
L1	3.64uH	T50-2 27T	T50-1W	0G_RF_Magnetics	Micrometals	T50-2	Toroid King	T50-2	27 Turns # 24
L2	6.6uH	T50-2 36T	T50-1W	0G_RF_Magnetics	Micrometals	T50-2	Toroid King	T50-2	36 Turns # 24
L3	6.6uH	T50-2 36T	T50-1W	0G_RF_Magnetics	Micrometals	T50-2	Toroid King	T50-2	36 Turns # 24
L4	0.95uH	T50-10 17T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	17 Turns #22
L5	1.45uH	T50-10 21T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	21 Turns #22
L6	1.45uH	T50-10 21T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	21 Turns #22
L7	.706uH	T50-10 14T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	14 Turns #22
L8	.950uH	T50-10 17T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	17 Turns #22
L9	.950uH	T50-10 17T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	17 Turns #22
L10	.520uH	T50-10 12T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	12 Turns #22
L11	.706uH	T50-10 14T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	14 Turns #22
L12	.706uH	T50-10 14T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	14 Turns #22
L13	.314uH	T50-10 9T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	9 Turns #22
L14	.422uH	T50-10 11T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	11 Turns #22
L15	.520uH	T50-10 12T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	12 Turns #22
L16		T37-6 10T	T37-1W	0G_RF_Magnetics	Micrometals	T37-6	Toroid King	T37-6	12 Turns #24
L17	Bead	FB-61-101	LP-CHOKE	0G_RF_Magnetics	Fairite	FB-61-101	Amidon	FB-61-101	1 pass thru center #22
L18	.785uH	T37-6 15T	T37-1W	0G_RF_Magnetics	Micrometals	T37-6	Toroid King	T37-6	15 Turns #24
L19	.197uH	T50-10 7T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	(55 MHz) 7 Turns #22
L20	.163uH	T50-10 6T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	(55 MHz) 6 Turns #22
L21	.163uH	T50-10 6T	T50-1W	0G_RF_Magnetics	Micrometals	T50-10	Toroid King	T50-10	(55 MHz) 6 Turns #22
Q1	ZVP2106G	FET Transistor	SOT223	0G_Transistors	Zetex	ZVP2106GTA	Mouser	522-ZVP2106GTA	
Q2	BFG540/X	BFG540/X	SOT143B	0G_Transistors	NXP	BFG540/X T/R	Digikey	568-1983-1-ND	
R01	560	Chip Res R0805	R0805	0G_Passives	Xicon	260-560-RC	Mouser	260-560-RC	
R02	300	Chip Res R0805	R0805	0G_Passives	Xicon	260-300-RC	Mouser	260-300-RC	
R03	1.8K	Chip Res R0805	R0805	0G_Passives	Xicon	260-1.8K-RC	Mouser	260-1.8K-RC	
R04	150	Chip Res R2010	R2010	0G_RCL	Vishay/Dale	CRCW2010-150-E3	Mouser	71-CRCW2010-150-E3	1/2 Watt
R05	10K	Chip Res R0805	R0805	0G_Passives	Xicon	260-10K-RC	Mouser	260-10K-RC	
R06	33K	Chip Res R0805	R0805	0G_Passives	Xicon	260-33K-RC	Mouser	260-33K-RC	
R07	1.2K	Chip Res R0805	R0805	0G_Passives	Xicon	260-1.2K-RC	Mouser	260-1.2K-RC	
R08	75	Chip Res R0805	R0805	0G_Passives	Xicon	260-75-RC	Mouser	260-75-RC	
R09	240	Chip Res R0805	R0805	0G_Passives	Xicon	260-240-RC	Mouser	260-240-RC	
R10	100	Chip Res R0805	R0805	0G_Passives	Xicon	260-100-RC	Mouser	260-100-RC	
R11	100	Chip Res R0805	R0805	0G_Passives	Xicon	260-100-RC	Mouser	260-100-RC	
R12	61.9	Chip Res R0805	R0805	0G_Passives	KOA Speer	RK73H2ATTD61R9F	Mouser	660-RK73H2ATTD61R9F	62 Ohms, ok to sub 61.9
R13	61.9	Chip Res R0805	R0805	0G_Passives	KOA Speer	RK73H2ATTD61R9F	Mouser	660-RK73H2ATTD61R9F	62 Ohms, ok to sub 61.9
R14	10K	Chip Res R0805	R0805	0G_Passives	Xicon	260-10K-RC	Mouser	260-10K-RC	
R15	10K	Chip Res R0805	R0805	0G_Passives	Xicon	260-10K-RC	Mouser	260-10K-RC	
R16	10K	Chip Res R0805	R0805	0G_Passives	Xicon	260-10K-RC	Mouser	260-10K-RC	
U01	5 Volts	5 V Regulator	SO08	0G_Regulators	STM	L78L05ACD	Mouser	511-L78L05ACD	
U02	6B595	Relay Driver	SO20W	0G_Regulators	TI	TPIC6B595DW	Mouser	595-TPIC6B595DW	
U03	6B595	Relay Driver	SO20W	0G_Regulators	TI	TPIC6B595DW	Mouser	595-TPIC6B595DW	

U04	74HCT04D	Hex Inverter	SO14	0G_Logic	Fairchild	MM74HCT04M	Mouser	512-MM74HCT04M	Do not substitute 74HC04D
X1	BNC	BNC Connector	SD-73100	0G_Connectors	Molex	73100-0105	Mouser	538-73100-0105	
X2	BNC	BNC Connector	SD-73100	0G_Connectors	Molex	73100-0105	Mouser	538-73100-0105	
X3	BNC	BNC Connector	SD-73100	0G_Connectors	Molex	73100-0105	Mouser	538-73100-0105	
X4	BNC	BNC Connector	SD-73100	0G_Connectors	Molex	73100-0105	Mouser	538-73100-0105	
X5	BNC	BNC Connector	SD-73100	0G_Connectors	Molex	73100-0105	Mouser	538-73100-0105	
X6	SMB	SMB Connector	BU-SMA-V	0G_DDS-Controller	Molex	73100-0103	Mouser	538-73100-0103	See Special Assembly Note
PCB-RX		RX-HPF PCB							

ALEX P1-TX BOM **Version** **8/6/2008**

Part	Value	Description	Footprint/ Package	Library	Manu	Part No.	Vendor	Part No.	Notes
C01	150pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB9M151JAJME	Digikey	478-2653-1-ND	Must be NPO/C0G
C02	470pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB2M471JAJME	Digikey	478-2662-1-ND	Must be NPO/C0G
C03	1200pF	Silver Mica CD19	CD19	0G_Passives	Cornell Dubilier	FD122J03	Mouser	5982-19-500V1200	Silver Mica
C04	2200pF	Silver Mica CD19	CD19	0G_Passives	Cornell Dubilier	FD222J03	Mouser	5982-19-500V2200	Silver Mica
C05	1000pF	Silver Mica CD19	CD19	0G_Passives	Cornell Dubilier	FD102J03	Mouser	5982-19-500V1000	Silver Mica
C06	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C07	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C08	82pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M820JAJME	Digikey	478-2650-1-ND	Must be NPO/C0G
C09	240pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB2M241JAJME	Digikey	478-2657-1-ND	Must be NPO/C0G
C10	560pF	Silver Mica CD19	CD19	0G_Passives	Cornell Dubilier	FD561J03	Mouser	5982-19-500V560	Silver Mica
C11	1000pF	Silver Mica CD19	CD19	0G_Passives	Cornell Dubilier	FD102J03	Mouser	5982-19-500V1000	Silver Mica
C12	100pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M101JAJME	Digikey	478-2651-1-ND	Must be NPO/C0G
C13	470pF	Silver Mica CD19	CD19	0G_Passives	Cornell Dubilier	FD471J03	Mouser	5982-19-500V470	Silver Mica
C14	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C15	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C16	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C17	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C18	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C19	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C20	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C21	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C22	39pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M390JAJME	Digikey	478-2646-1-ND	Must be NPO/C0G
C23	120pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB9M121JAJME	Digikey	478-2652-1-ND	Must be NPO/C0G
C24	22pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M180JAJME	Digikey	478-2639-1-ND	Must be NPO/C0G
C25	4.7pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M4R7CAJME	Digikey	478-2632-1-ND	Must be NPO/C0G
C26	390pF	Silver Mica CD15	CD15	0G_Passives	Cornell Dubilier	FD391J03	Mouser	5982-15-500V390	Silver Mica
C27	680pF	Silver Mica CD19	CD19	0G_Passives	Cornell Dubilier	FD681J03	Mouser	5982-19-500V680	Silver Mica
C28	330pF	Silver Mica CD15	CD15	0G_Passives	Cornell Dubilier	FD331J03	Mouser	5982-15-500V330	Silver Mica
C29	-------	-------	-------	-------	-------	-------	-------	-------	Number not used
C30	-------	Chip Cap C1210	C1210	0G_Passives	-------	-------	-------	-------	Position not used
C31	56pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M560JAJME	Digikey	478-2648-1-ND	Must be NPO/C0G
C32	18pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M180JAJME	Digikey	478-2639-1-ND	Must be NPO/C0G
C33	15pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M150JAJME	Digikey	478-2638-1-ND	Must be NPO/C0G
C34	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C35	100uF	Electrolytic SMT	PANASONIC	0G_RCL	United CC	EMKA250ADA101MHA0G	Mouser	661-MKA25VC101M	
C36	1uF	Chip Cap C1206	C1206	0G_Passives	Kemet	C1206C105K3RACTU	Mouser	80-C1206C105K3R	
C37	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C38	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C39	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C40	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C41	39pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M390JAJME	Digikey	478-2646-1-ND	Must be NPO/C0G
C42	200pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB9M201JAJME	Digikey	478-2655-1-ND	Must be NPO/C0G
C43	150pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB9M151JAJME	Digikey	478-2653-1-ND	Must be NPO/C0G
C44	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C45	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C46	120pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB9M121JAJME	Digikey	478-2652-1-ND	Must be NPO/C0G
C47	200pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB9M201JAJME	Digikey	478-2655-1-ND	Must be NPO/C0G

C48	56pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M560JAJME	Digikey	478-2648-1-ND	Must be NPO/C0G
C49	180pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB9M181JAJME	Digikey	478-2654-1-ND	Must be NPO/C0G
C50	82pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M820JAJME	Digikey	478-2650-1-ND	Must be NPO/C0G
C51	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C52	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C53	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C54	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C55	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C56	22pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M220JAJME	Digikey	478-2641-1-ND	Must be NPO/C0G
C57	56pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M560JAJME	Digikey	478-2648-1-ND	Must be NPO/C0G
C58	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C59	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C60	100pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M101JAJME	Digikey	478-2651-1-ND	Must be NPO/C0G
C61	120pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB9M121JAJME	Digikey	478-2652-1-ND	Must be NPO/C0G
C62	82pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M820JAJME	Digikey	478-2650-1-ND	Must be NPO/C0G
C63	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C64	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C65	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C66	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C67	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C68	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C69	12pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M120JAJME	Digikey	478-2637-1-ND	Must be NPO/C0G
C70	39pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M390JAJME	Digikey	478-2646-1-ND	Must be NPO/C0G
C71	82pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M820JAJME	Digikey	478-2650-1-ND	Must be NPO/C0G
C72	180pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB9M181JAJME	Digikey	478-2654-1-ND	Must be NPO/C0G
C73	68pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M680JAJME	Digikey	478-2649-1-ND	Must be NPO/C0G
C74	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C75	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C76	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C77	0.1uF	Chip Cap C0805	C0805	0G_Passives	Kemet	C0805C104K3RACTU	Mouser	80-C0805C104K3R	
C78	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C79	0.01uF	Chip Cap C0805	C0805	0G_Passives	Murata	GRM216F51H103ZA01D	Mouser	81-GRM40Y103Z50D	Must be 50 V or higher rating
C80	100pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M101JAJME	Digikey	478-2651-1-ND	Must be NPO/C0G
C81	18pF	Chip Cap C1210	C1210	0G_Passives	AVX	SQCB7M180JAJME	Digikey	478-2639-1-ND	Must be NPO/C0G
D1		Schottky Diode	SOD-123	0G_LED_TVS	Diodes, Inc.	1N5711W-7-F	Mouser	621-1N5711W-F	
D2		Schottky Diode	SOD-123	0G_LED_TVS	Diodes, Inc.	1N5711W-7-F	Mouser	621-1N5711W-F	
D3		Schottky Diode	SOD-123	0G_LED_TVS	Diodes, Inc.	1N5711W-7-F	Mouser	621-1N5711W-F	
D4		Schottky Diode	SOD-123	0G_LED_TVS	Diodes, Inc.	1N5711W-7-F	Mouser	621-1N5711W-F	
D5	Green	GRN LED SMT	LED0805	0G_LED_TVS	Lite-On	LTST-C170GKT	Mouser	859-LTST-C170GKT	See Special Assembly Note
D6	Yellow	YEL LED SMT	LED0805	0G_LED_TVS	Lite-On	LTST-C170YKT	Mouser	859-LTST-C170YKT	See Special Assembly Note
D7	Red	RED LED SMT	LED0805	0G_LED_TVS	Lite-On	LTST-C170CKT	Mouser	859-LTST-C170CKT	See Special Assembly Note
D8		Voltage Clamp	SOT23-6L	0G_LED_TVS	STM	DVIVLC6-4SC6	Mouser	511-DVIULC6-4SC6	4 Way Transient Voltage Clamp
IC1		Dual Op Amp	SO8	0G_Analog_ICs	National Semi	LMC6482IM/NOPB	Digikey	LMC6482IM-ND	
J1	10 Pin	Polarized 0.1 inch	--	0G_Connectors	3M	3793-5002RB	Mouser	517-N3793-5002RB	See Special Assembly Note
J1A	Extractors	Extractors & Pins	--	--	3M	3505-3	Mouser	517-3505-3	
J1B	Extractors	Extractors & Pins	--	--	3M	3505-3	Mouser	517-3505-3	
J2	4 Pin	Polarized 0.1 inch	--	0G_Connectors	Molex	22-12-2044	Mouser	538-22-12-2044	See Special Assembly Note

K01	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K02	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K03	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K04	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K05	DPDT	T-R Relay	G6J-2P-Y	0G_RELAYS	Omron	G6J-2P-Y-DC12	Mouser	653-G6J-2P-Y-DC12	See Special Assembly Note
K06	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K07	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K08	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K09	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K10	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K11	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K12	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K13	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K14	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K15	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K16	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K17	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K18	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note
K19	DPDT	G6H-2 Relay	G6H	0G_RELAYS	Omron	G6H-2-DC12	Mouser	653-G6H-2-DC12	See Special Assembly Note

L01	4.79uH	T50-2 31T	T50-1W	0G_RF_Magnet	Micrometals	T50-2	Toroid King	T50-2	31T #24
L02	3.87uH	T50-2 28T	T50-1W	0G_RF_Magnet	Micrometals	T50-2	Toroid King	T50-2	28T #24
L03	2.45uH	T50-2 22T	T50-1W	0G_RF_Magnet	Micrometals	T50-2	Toroid King	T50-2	22T #22
L04	1.98uH	T50-2 20T	T50-1W	0G_RF_Magnet	Micrometals	T50-2	Toroid King	T50-2	20T #22
L05	1.37uH	T50-10 20T	T50-1W	0G_RF_Magnet	Micrometals	T50-10	Toroid King	T50-10	20T #22
L06	1.17uH	T50-10 19T	T50-1W	0G_RF_Magnet	Micrometals	T50-10	Toroid King	T50-10	19T #22
L07	0.123uH	T50-10 5T	T50-1W	0G_RF_Magnet	Micrometals	T50-10	Toroid King	T50-10	5T #22
L08	0.152uH	T50-10 6T	T50-1W	0G_RF_Magnet	Micrometals	T50-10	Toroid King	T50-10	6T #22
L09	0.590uH	T50-10 13T	T50-1W	0G_RF_Magnet	Micrometals	T50-10	Toroid King	T50-10	13T #22
L10	0.310uH	T50-10 9T	T50-1W	0G_RF_Magnet	Micrometals	T50-10	Toroid King	T50-10	9T #22
L11	0.310uH	T50-10 9T	T50-1W	0G_RF_Magnet	Micrometals	T50-10	Toroid King	T50-10	9T #22
L12	0.370uH	T50-10 10T	T50-1W	0G_RF_Magnet	Micrometals	T50-10	Toroid King	T50-10	10T #22
L13	0.310uH	T50-10 9T	T50-1W	0G_RF_Magnet	Micrometals	T50-10	Toroid King	T50-10	9T #22
L14	0.310uH	T50-10 9T	T50-1W	0G_RF_Magnet	Micrometals	T50-10	Toroid King	T50-10	9T #22
L15	0.251uH	T50-10 8T	T50-1W	0G_RF_Magnet	Micrometals	T50-10	Toroid King	T50-10	8T #22

R1	100K	Chip Res R1206	R1206	0G_Passives	Xicon	263-100K-RC	Mouser	263-100K-RC
R2	50	Chip Res R2010	R2010	0G_Passives	Vishay/Dale	CRCW201051.1-E3	Mouser	71-CRCW201051.1-E3
R3	50	Chip Res R2010	R2010	0G_Passives	Vishay/Dale	CRCW201051.1-E3	Mouser	71-CRCW201051.1-E3
R4	100K	Chip Res R0805	R0805	0G_Passives	Xicon	260-100K-RC	Mouser	260-100K-RC
R5	100K	Chip Res R0805	R0805	0G_Passives	Xicon	260-100K-RC	Mouser	260-100K-RC
R6	100K	Chip Res R1206	R1206	0G_Passives	Xicon	263-100K-RC	Mouser	263-100K-RC
R7	220K	Chip Res R0805	R0805	0G_Passives	Xicon	260-220K-RC	Mouser	260-220K-RC
R8	1.0K	Chip Res R0805	R0805	0G_Passives	Xicon	260-1.0K-RC	Mouser	260-1.0K-RC
R9	100K	Chip Res R1206	R1206	0G_Passives	Xicon	263-100K-RC	Mouser	263-100K-RC
R10	1.8K	Chip Res R0805	R0805	0G_Passives	Xicon	260-1.8K-RC	Mouser	260-1.8K-RC
R11	220K	Chip Res R0805	R0805	0G_Passives	Xicon	260-220K-RC	Mouser	260-220K-RC
R12	1.0K	Chip Res R0805	R0805	0G_Passives	Xicon	260-1.0K-RC	Mouser	260-1.0K-RC
R13	1.8K	Chip Res R0805	R0805	0G_Passives	Xicon	260-1.8K-RC	Mouser	260-1.8K-RC
R14	560	Chip Res R0805	R0805	0G_Passives	Xicon	260-560-RC	Mouser	260-560-RC
R15	300	Chip Res R0805	R0805	0G_Passives	Xicon	260-300-RC	Mouser	260-300-RC

R16	1800	Chip Res R0805	R0805	0G_Passives	Xicon	260-1.8K-RC	Mouser	260-1.8K-RC	
R17	10K	Chip Res R0805	R0805	0G_Passives	Xicon	260-10K-RC	Mouser	260-10K-RC	
R18	10K	Chip Res R0805	R0805	0G_Passives	Xicon	260-10K-RC	Mouser	260-10K-RC	
R19	10K	Chip Res R0805	R0805	0G_Passives	Xicon	260-10K-RC	Mouser	260-10K-RC	
T1		FT50-43 20T #22	T50-2W-DC	0G_RF_Magnet	Fair-Rite	FT50-43	Toroid King	FT50-43	
T2		FT50-43 20T #22	T50-2W-DC	0G_RF_Magnet	Fair-Rite	FT50-43	Toroid King	FT50-43	
U1	5 Volts	5 V Regulator	SO08	0G_Regulators	STM	L78L05ACD	Mouser	511-L78L05ACD	
U2	6B595	Relay Driver	SO20W	0G_Regulators	TI	TPIC6B595DW	Mouser	595-TPIC6B595DW	
U3	74HCT04	Hex Inverter	SO14	0G_Logic	Fairchild	MM74HCT04M	Mouser	512-MM74HCT04M	
U4	6B595	Relay Driver	SO20W	0G_Regulators	TI	TPIC6B595DW	Mouser	595-TPIC6B595DW	
X1	SMB	SMB Connector	BU-SMA-V	0G_DDS-Contr	Molex	73100-0103	Mouser	538-73100-0103	See Special Assembly Note
X2	BNC	BNC Connector	SD-73100	0G_Connectors	Molex	73100-0105	Mouser	538-73100-0105	
X3	BNC	BNC Connector	SD-73100	0G_Connectors	Molex	73100-0105	Mouser	538-73100-0105	
X4	BNC	BNC Connector	SD-73100	0G_Connectors	Molex	73100-0105	Mouser	538-73100-0105	
X5	BNC	BNC Connector	SD-73100	0G_Connectors	Molex	73100-0105	Mouser	538-73100-0105	
PCB-TX		TX-LPF PCB							

ALEX Mechanical Parts List **Version** **8/6/2008**

Part	Value	Description	Footprint/ Package	Library	Manu	Part No.	Vendor	Part No.	Notes
M1		Case	--	--	Hammond	1455N1601	Mouser	546-1455N1601	
		Jumper Cable (Board to Board to Mercury)							
P1	End	Connector Body	--	--	3-M	3473-6610	Mouser	517-3473-6610	Cable End Connector
P1-SR		Strain Relief	--	--	3-M	3448-3010	Mouser	517-3448-3010	Cable End Strain Relief
P2	Middle	Connector Body	--	--	3-M	3473-7610	Mouser	517-3473-7610	Middle Connector with Strain Relief
P3	End	Connector Body	--	--	3-M	3473-6610	Mouser	517-3473-6610	Cable End Connector
P3-SR		Strain Relief	--	--	3-M	3448-3010	Mouser	517-3448-3010	Cable End Strain Relief
	Wire	.050" 10CONDUCT 28AWG		--	3-M	3302	Mouser	517-3302/10FT	Ribbon Cable
		Coax Jumper Board to Board							
		6" SMB to SMB Cable Assembly			?	?	JameCo	175169	RG174, .5ft

For Reference Only, Mating connector for 4 pin VSWR Output

P3	4 Pin	Connector Body	Molex	22-01-3047	Mouser	538-22-01-3047	
P3A		Pins	Molex		Mouser		Crimp pins

Toroid Winding Table 6/22/2008

	Expected Value	Core Type	Color	Turns	Wire	Length	Length	NOTES
RECEIVER BOARD								
L1	3.64uH	T50-2	RED	27T	# 24	20 in.	51 cm.	
L2	6.6uH	T50-2	RED	36T	# 24	25.5 in.	64.5 cm.	
L3	6.6uH	T50-2	RED	36T	# 24	25.5 in.	64.5 cm.	
L4	0.95uH	T50-10	SHINY BLACK	17T	# 22	13.5 in.	34.5 cm.	
L5	1.45uH	T50-10	SHINY BLACK	21T	# 22	15.5 in.	39 cm.	
L6	1.45uH	T50-10	SHINY BLACK	21T	# 22	15.5 in.	39 cm.	
L7	.706uH	T50-10	SHINY BLACK	14T	# 22	11.5 in.	29 cm.	
L8	.950uH	T50-10	SHINY BLACK	17T	# 22	13.5 in.	34.5 cm.	
L9	.950uH	T50-10	SHINY BLACK	17T	# 22	13.5 in.	34.5 cm.	
L10	.520uH	T50-10	SHINY BLACK	12T	# 22	10.5 in.	26.5 cm.	
L11	.706uH	T50-10	SHINY BLACK	14T	# 22	11.5 in.	29 cm.	
L12	.706uH	T50-10	SHINY BLACK	14T	# 22	11.5 in.	29 cm.	
L13	.314uH	T50-10	SHINY BLACK	9T	# 22	8.5 in.	21.5 cm.	
L14	.422uH	T50-10	SHINY BLACK	11T	# 22	10 in.	25.5 cm.	
L15	.520uH	T50-10	SHINY BLACK	12T	# 22	10.5 in.	26.5 cm.	
L16		T37-6	YELLOW	12T	# 24	8in.	20 cm.	
L17	Bead	FB-61-101	GRAY BEAD		# 22	0.7 in.	2 cm.	1 pass thru center
L18	.785uH	T37-6	YELLOW	15T	# 24	10 in.	26.5 cm.	
L19	.197uH	T50-10	SHINY BLACK	7T	# 22	7.5 in.	19 cm.	(55 MHz)
L20	.163uH	T50-10	SHINY BLACK	6T	# 22	7 in.	18 cm.	(55 MHz)
L21	.163uH	T50-10	SHINY BLACK	6T	# 22	7 in.	18 cm.	(55 MHz)
TRANSMITTER BOARD								
L01	4.79uH	T50-2	RED	31T	# 24	22 in.	56 cm.	
L02	3.87uH	T50-2	RED	28T	# 24	20 in.	51 cm.	
L03	2.45uH	T50-2	RED	22T	# 22	16.5 in.	42 cm.	
L04	1.98uH	T50-2	RED	20T	# 22	15 in.	38 cm.	
L05	1.37uH	T50-10	SHINY BLACK	20T	# 22	15 in.	38 cm.	
L06	1.17uH	T50-10	SHINY BLACK	19T	# 22	14.5 in.	37 cm.	
L07	0.123uH	T50-10	SHINY BLACK	5T	# 22	6.5 in.	17 cm.	
L08	0.152uH	T50-10	SHINY BLACK	6T	# 22	7 in.	18 cm.	
L09	0.590uH	T50-10	SHINY BLACK	13T	# 22	11 in.	28 cm.	
L10	0.310uH	T50-10	SHINY BLACK	9T	# 22	8.5 in.	21.5 cm.	
L11	0.310uH	T50-10	SHINY BLACK	9T	# 22	8.5 in.	21.5 cm.	
L12	0.370uH	T50-10	SHINY BLACK	10T	# 22	9 in.	23 cm.	
L13	0.310uH	T50-10	SHINY BLACK	9T	# 22	8.5 in.	21.5 cm.	
L14	0.310uH	T50-10	SHINY BLACK	9T	# 22	8.5 in.	21.5 cm.	
L15	0.251uH	T50-10	SHINY BLACK	8T	# 22	8 in.	20.5 cm.	
T1	--	FT50-43	DULL GRAY	20T	# 22	15 in.	38 cm.	Plus a separate single
T2	--	FT50-43	DULL GRAY	20T	# 22	15 in.	38 cm.	turn winding, #18 teflon insulated thru center

NOTES

See attached note and diagram about toroid winding conventions. (Direction of winding)
All toroids assume equally spaced turns for values shown.
An inductance value tolerance of +/- 5 percent is assumed for black cores.
An inductance value tolerance of +/- 10 percent is assumed for red or yellow cores.
Test frequencies for inductance values: RED = 4 MHz., BLACK = 10 MHz., YELLOW = 20 MHz.