Power and FPGA

Power.sch

Ethernet

Ethernet.sch

Clock

Clock.sch

RF Frontend

RFFrontend.sch

Input Output

InputOutput.sch

Filters

Filters.sch

PA

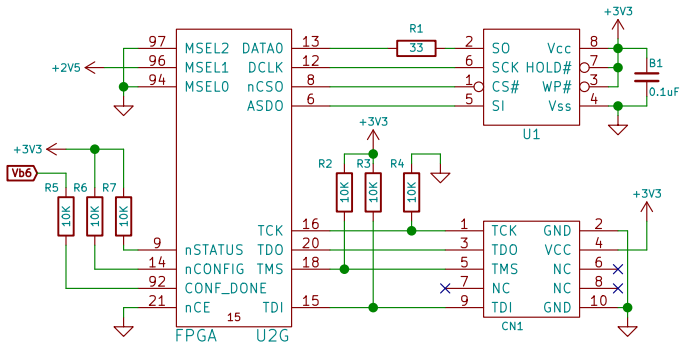
PA.sch

KF7O Steve Haynal
SofterHardware

Sheet: /
File: hermeslite.sch

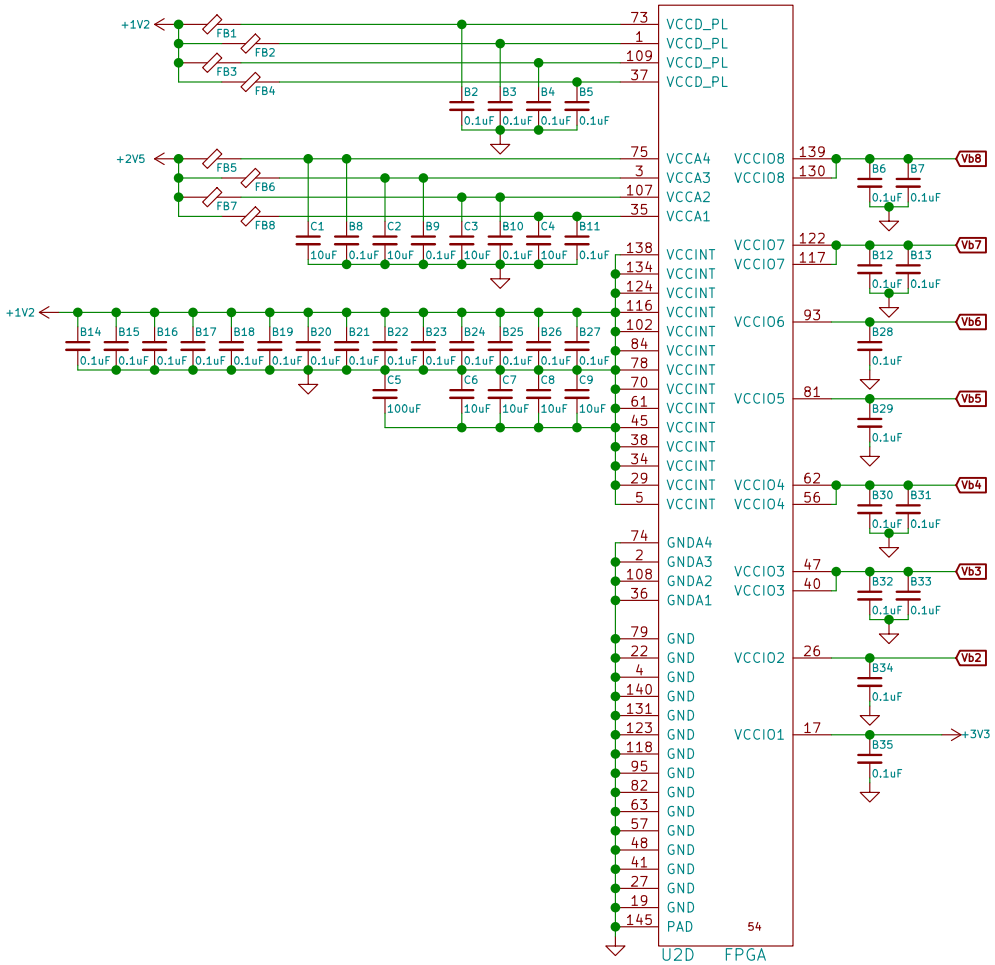
Title: Hermes-Lite

Size: USLetter	Date: 2016-02-18	**Rev: 2.0-pre1**
KiCad E.D.A. kicad 4.0.1-stable		Id: 1/8



Pullup Bank Voltage TBD at Layout

JTAG Connector
FPGA programming
May be used as 30 Mb/s
interface to SBC



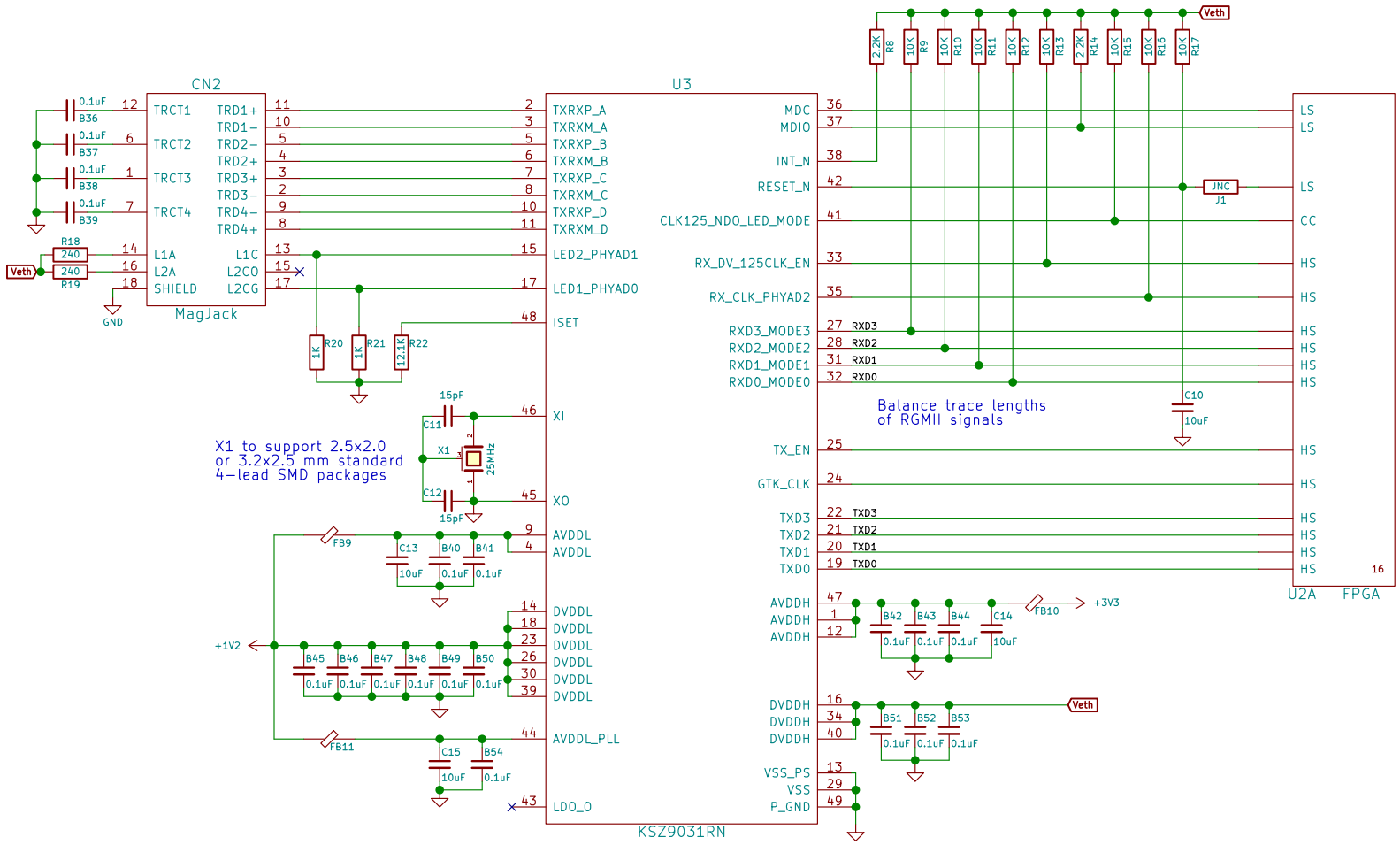
To Do: Add switching power supply. Texas Instruments TPS65265 with recommended schematic and layout from datasheet will be used. Will generate 1.2, 2.5 and 3.3V.

KF7O Steve Haynal
SofterHardware

Sheet: /Power and FPGA/
File: Power.sch

Title: Power

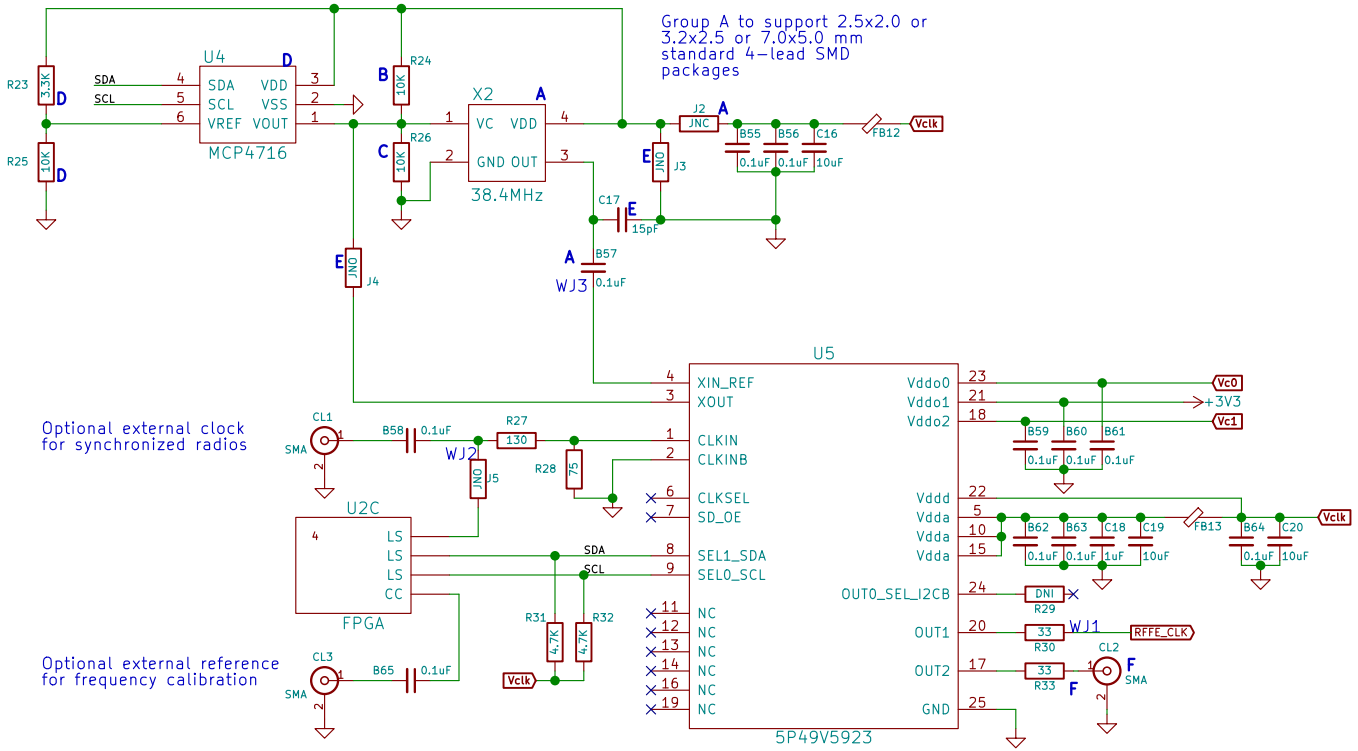
Size: USLetter	Date: 2016-07-10	**Rev: 2.0-pre2**
KiCad E.D.A. kicad 4.0.1-stable		Id: 2/8

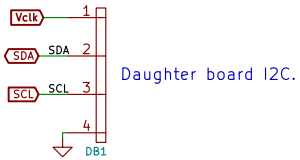


KF7O Steve Haynal	
SofterHardware	
Sheet: /Ethernet/	
File: Ethernet.sch	
Title: Ethernet	
Size: USLetter | Date: 2016-07-10	**Rev: 2.0-pre2**
KiCad E.D.A. kicad 4.0.1-stable	Id: 3/8

Build Options

Versa with oscillator: Include A, include B and/or C with adjusted values per oscillator's spec, exclude D and E
Versa with VCO: Include A and D, exclude B, C and E
Versa with crystal: Include E, E jumpers shorted, exclude A except oscillator footprint is now stuffed with crystal, include C as 15pF capacitor, exclude B and D
Versa with second output for synchronized slave: Build one of the Versa options above, include F
No Versa but oscillator to AD9866: Exclude all Versa components, build for oscillator, connect WJ3 to WJ1
No Versa but external clock to AD9866: Exclude all Versa components, A, B, C, D, and E, wire from WJ2 to WJ1
See RF Frontend sheet for additional AD9866 clock options



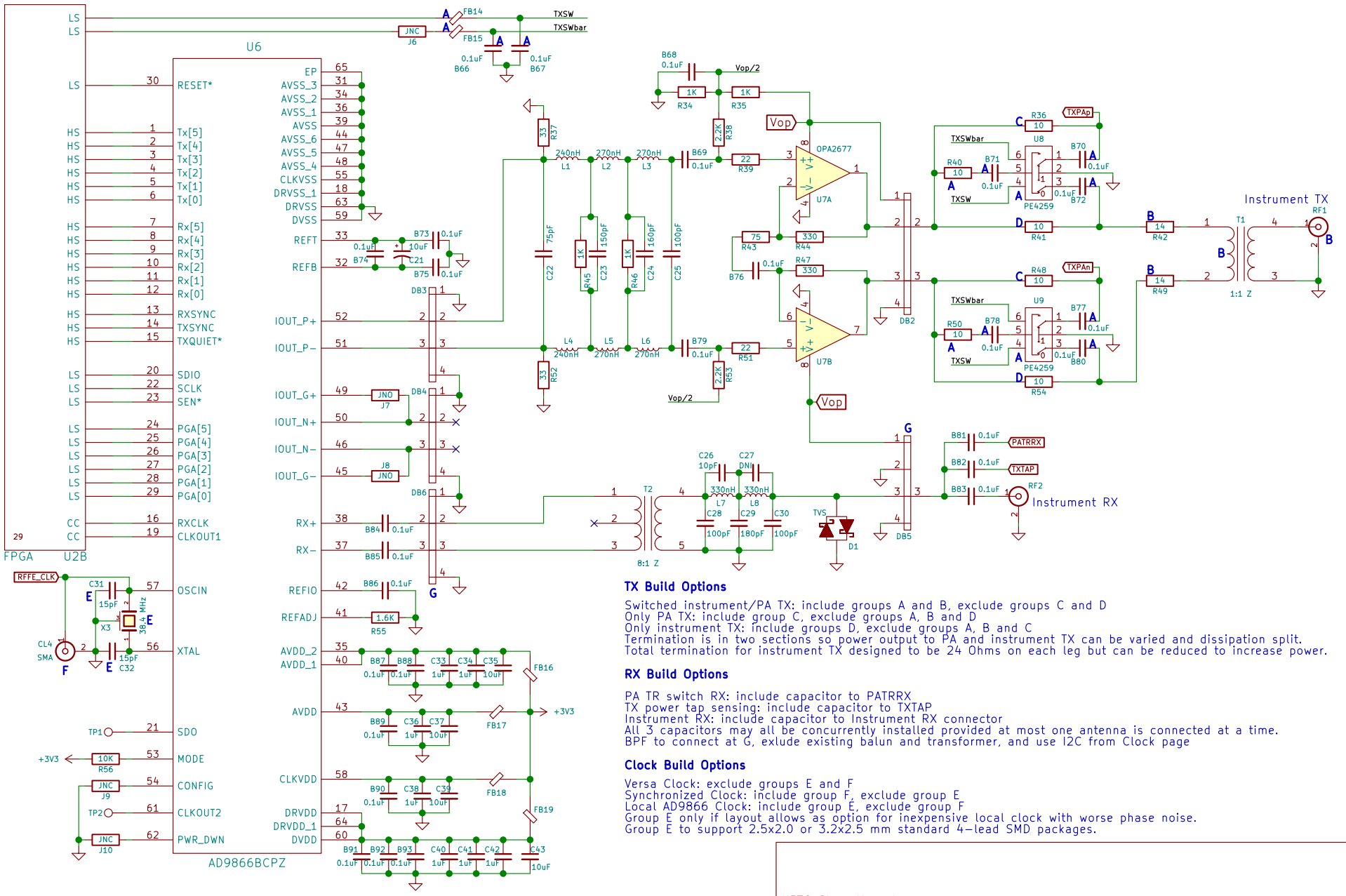


Daughter board I2C.

KF7O Steve Haynal
SofterHardware
Sheet: /Clock/
File: Clock.sch

Title: Clock

Size: USLetter	Date: 2016-07-10	**Rev: 2.0-pre2**
KiCad E.D.A. kicad 4.0.1-stable		Id: 4/8



TX Build Options

Switched instrument/PA TX: include groups A and B, exclude groups C and D
Only PA TX: include group C, exclude groups A, B and D
Only instrument TX: include groups D, exclude groups A, B and C
Termination is in two sections so power output to PA and instrument TX can be varied and dissipation split.
Total termination for instrument TX designed to be 24 Ohms on each leg but can be reduced to increase power.

RX Build Options

PA TR switch RX: include capacitor to PATRRX
TX power tap sensing: include capacitor to TXTAP
Instrument RX: include capacitor to Instrument RX connector
All 3 capacitors may all be concurrently installed provided at most one antenna is connected at a time.
BPF to connect at G, exlude existing balun and transformer, and use I2C from Clock page

Clock Build Options

Versa Clock: exclude groups E and F
Synchronized Clock: include group F, exclude group E
Local AD9866 Clock: include group E, exclude group F
Group E only if layout allows as option for inexpensive local clock with worse phase noise.
Group E to support 2.5x2.0 or 3.2x2.5 mm standard 4-lead SMD packages.

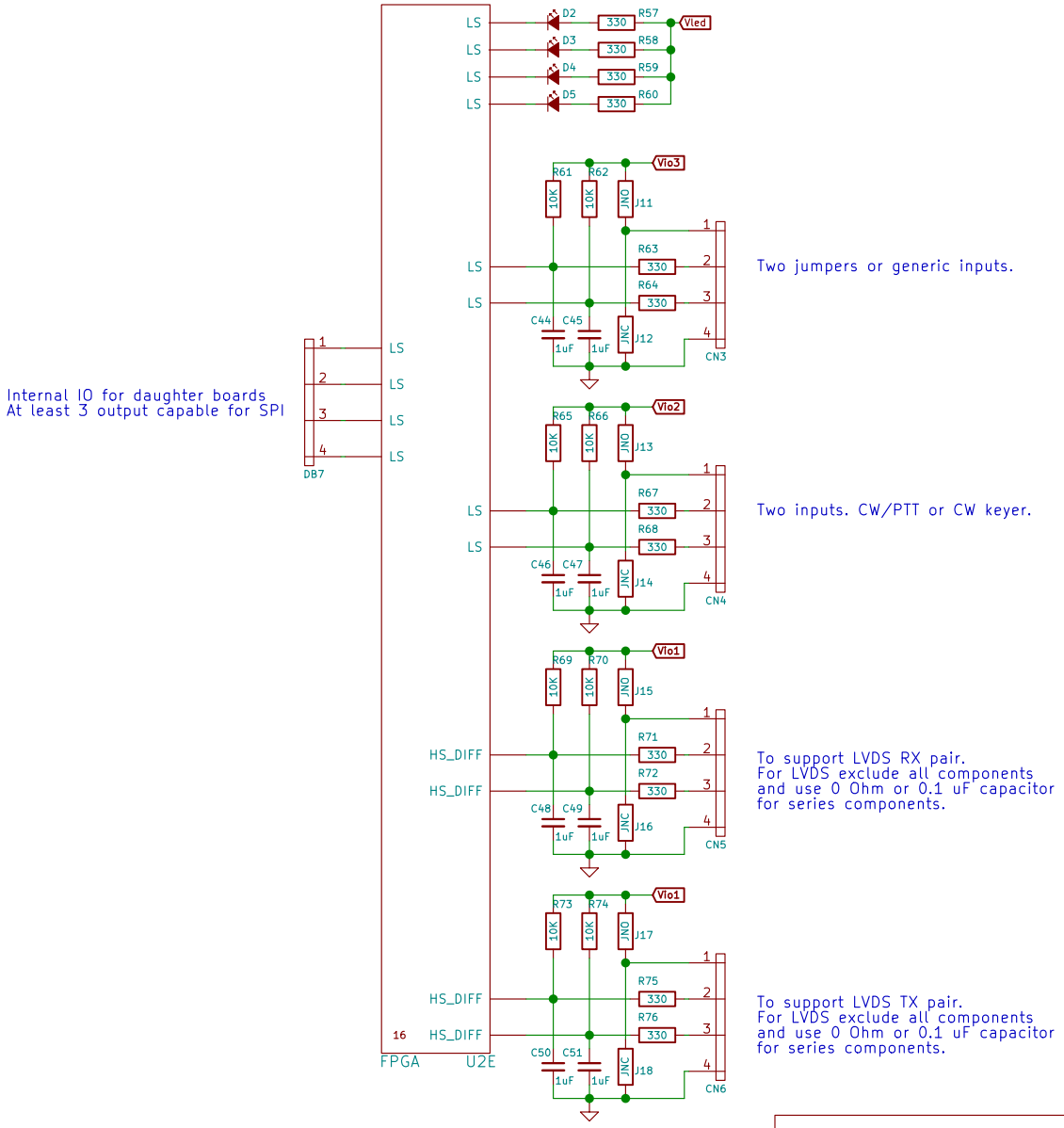
Op Amp Design by Jim N2ADR
TX Filter Design by Claudio IN3OTD/DK1CG
RX Filter Design by Andrew G4XZL

KF7O Steve Haynal
SofterHardware

Sheet: /RF Frontend/
File: RFFrontend.sch

Title: RF Frontend

Size: USLetter	Date: 2016-07-10	**Rev: 2.0-pre2**
KiCad E.D.A. kicad 4.0.1-stable		Id: 5/8

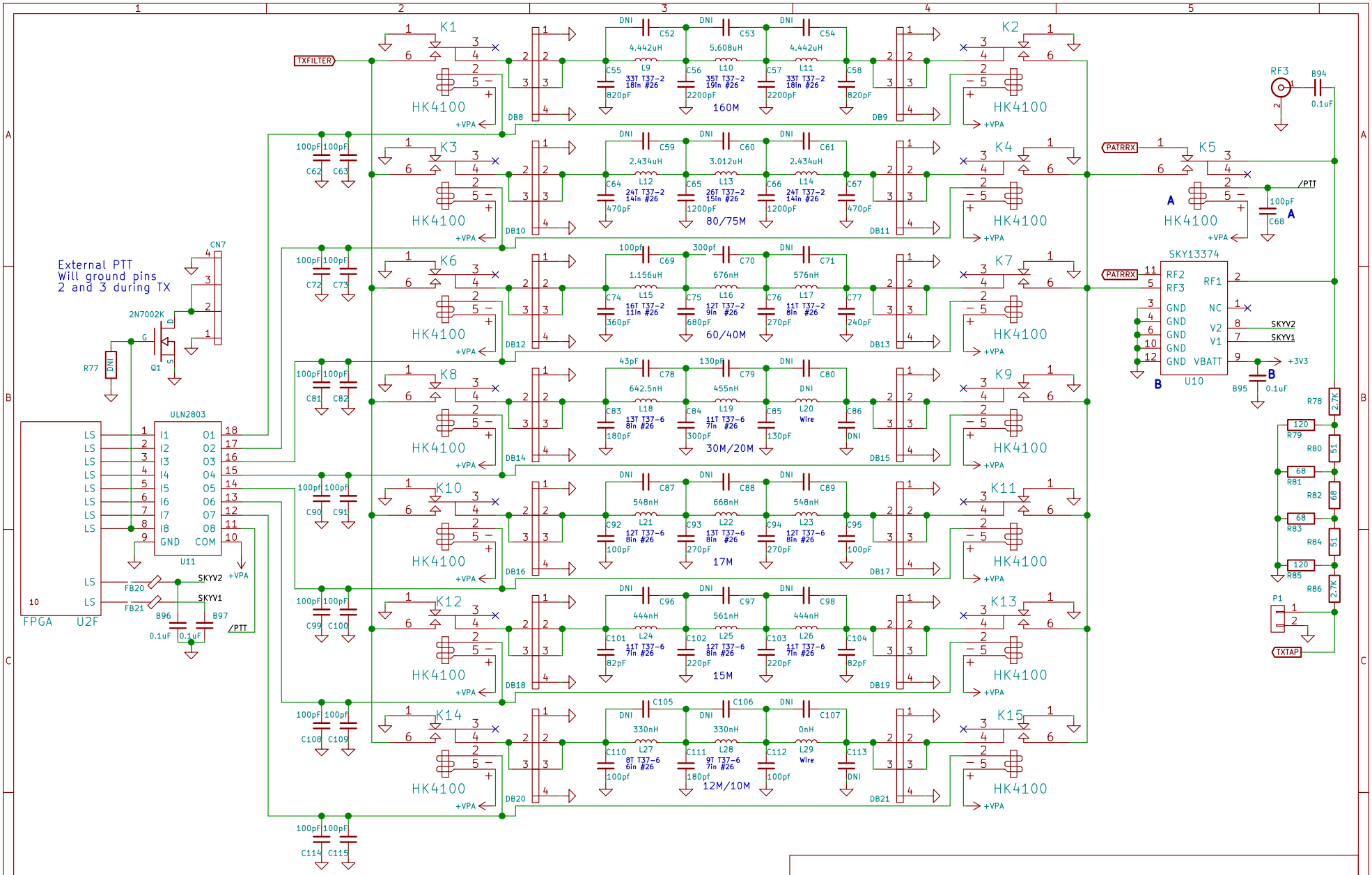


KF7O Steve Haynal
SofterHardware

Sheet: /Input Output/
File: InputOutput.sch

Title: Hermes-Lite Input Output

Size: USLetter	Date: 2016-07-10	**Rev: 2.0-pre2**
KiCad E.D.A. kicad 4.0.1-stable		Id: 6/8



Filter design by John W9JSW, Graeme ZL2APV and Glenn VK3PE

Build Options

Default relay TR: include A, exclude B
Experimental Skyworks TR: include B, exclude A, footprints will overlap

KF7O Steve Haynal
SofterHardware
Sheet: /Filters/
File: Filters.sch

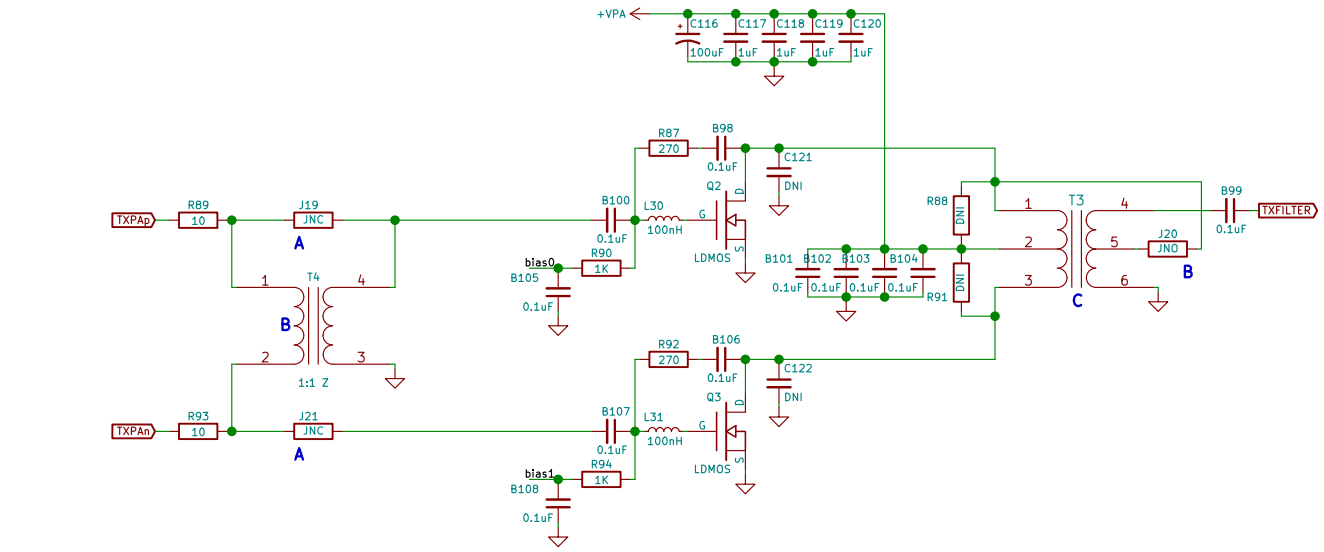
Title: Hermes-Lite V2 5W Power Amplifier

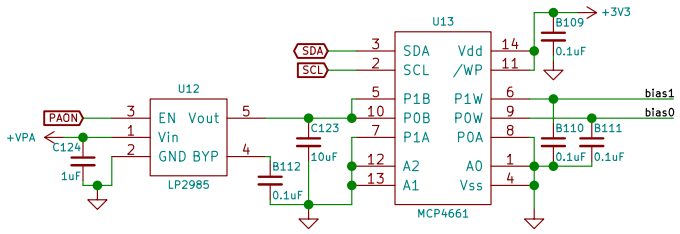
Size: USLetter	Date: 2016-07-10	**Rev: 2.0-pre2**
KiCad E.D.A. kicad 4.0.1-stable		Id: 7/8

Build Options

Class AB Push Pull: include A, exclude B, C is BN43-202 4 turns primary, 1+1 turns secondary, pin 5 not connected
Class A: include B, exclude A, exclude mirror PA using bias1, C is as in W9JSW 5W PA, BN43-202 with 1T RC-316, pins 3 and 6 not connected, jumper from pin 5 to 1 may be short wire

All values are first-cut place holders. To be refined with simulation and experimentation.





All I2C address to be checked for overlap!!
Position bias logic near digital logic, run long bias lines.

Design based on work by Claudio IN3OTD/DK1CG, John W9JSW, and other LDMOS/MOSFET QRP PA designs

KF7O Steve Haynal
SofterHardware
Sheet: /PA/
File: PA.sch

Title: Hermes-Lite V2 5W Power Amplifier

Size: USLetter	Date: 2016-07-10	**Rev: 2.0-pre2**
KiCad E.D.A. kicad 4.0.1-stable		Id: 8/8