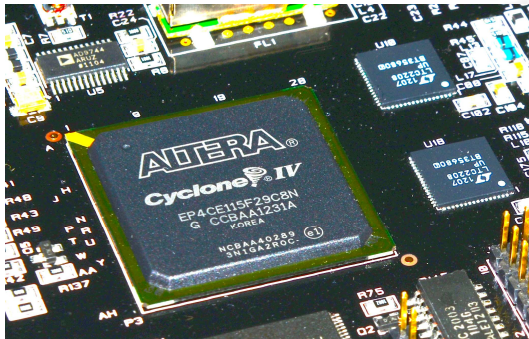# The ANAN-100/D HF & 6M Software Defined Radios

The ANAN-100 & ANAN-100D radios define a new level of performance in Amateur Radio transceivers, based on the very popular OpenHPSDR Hermes and Angelia (ANAN-100D) represent the state-of-the-art in the amateur HF radio space,

The ANAN-100D is the first HF transceiver with a true phase coherent dual front end comprising of two 16 bit 130MSPS ADCs and a large Cyclone IV FPGA which allows for a huge amount of headroom and DSP processing power, the current firmware incorporating 14 receivers and diversity reception uses around 30% of the FPGA resources!

Both transceivers use a Gigabit Ethernet interface to connect to the outside world, this means no drivers, huge bandwidth, better noise isolation from the PC and networked radios with remote access and much more. The PC to SDR cable can be longer or you can go wireless and connect the radio to your Wi-Fi and use the radio from anywhere in your home or office.
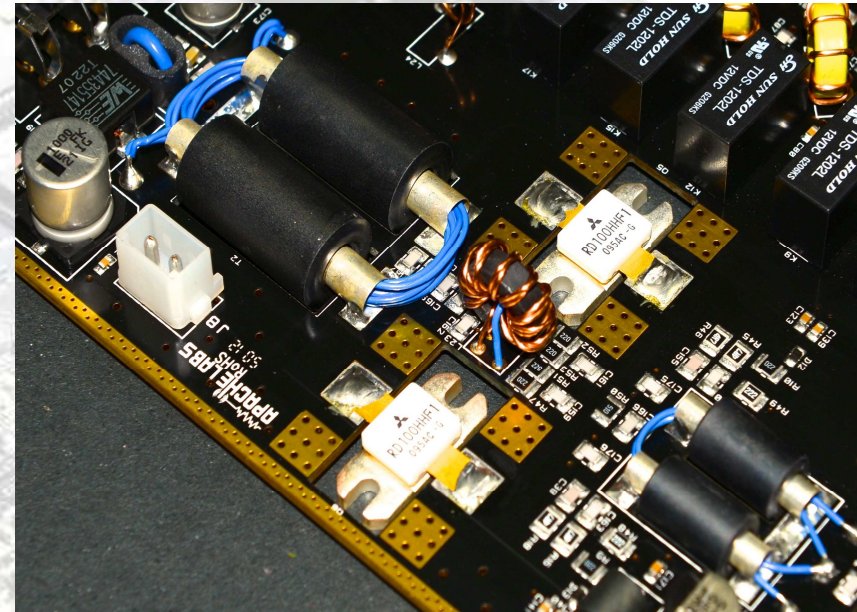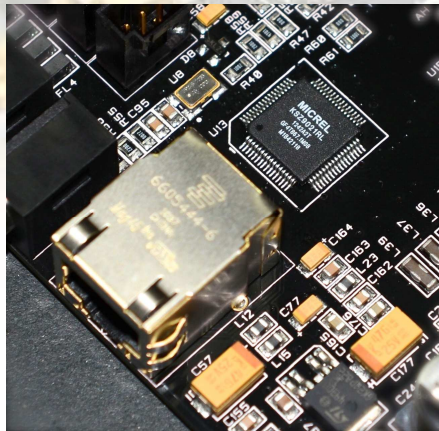
Both radios use rugged Mosfets for the 100W Power Amplifier, our PA design uses custom input/output transformation designed for an almost flat gain response from 160M through 6M, unlike other radios the IMD is -31dB below PEP even on 6M, the entire housing is a single piece aluminium extrusion and heat sink for the PA, resulting in very effective cooling and minimal fan noise.
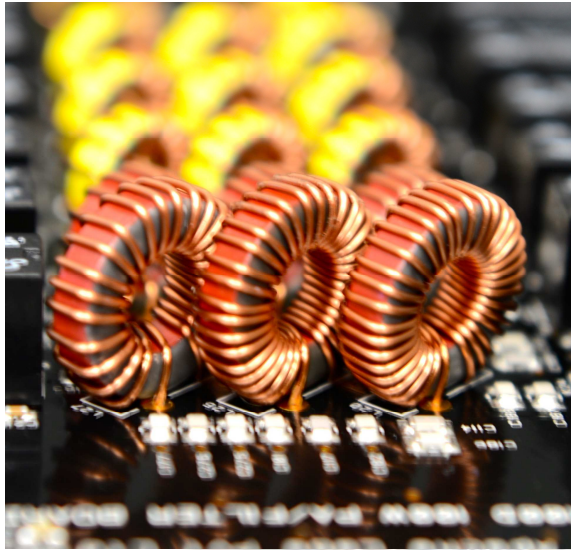
Unlike conventional radios where front end filtering is at the cost of degraded receiver IMD due to the small BPF inductors and less than optimum filter shape factor (low Q circuits) the ANAN-100/D uses a combination of LPF/HPF banks with oversized toroids to achieve excellent BPF shape factor without effecting the IMD of the receiver.

The ANAN radios use gold plated connectors for all RF connections resulting in improved performance and increased dependability.
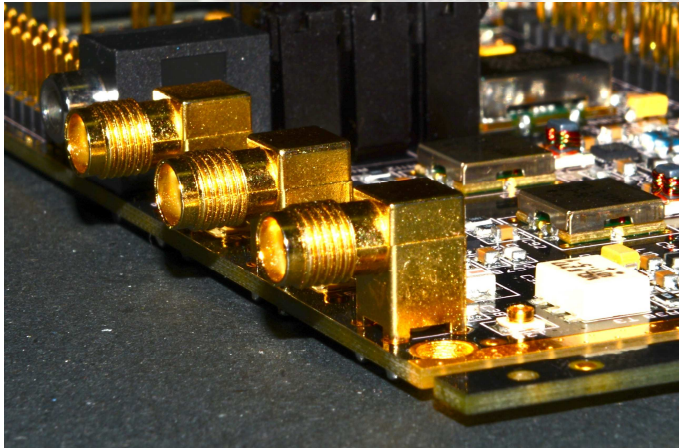

The large FPGA inside the ANAN-100D opens up the possibility of providing a soft core processor such as the Altera Nios (r) II if desired.
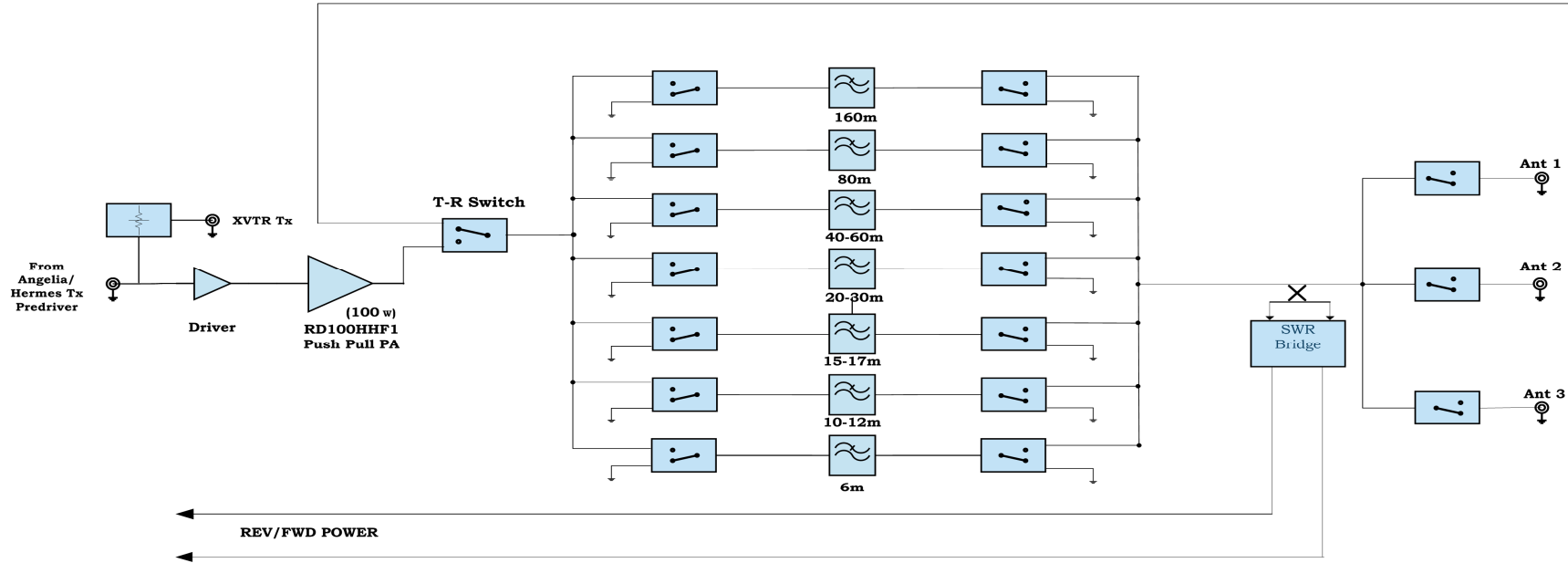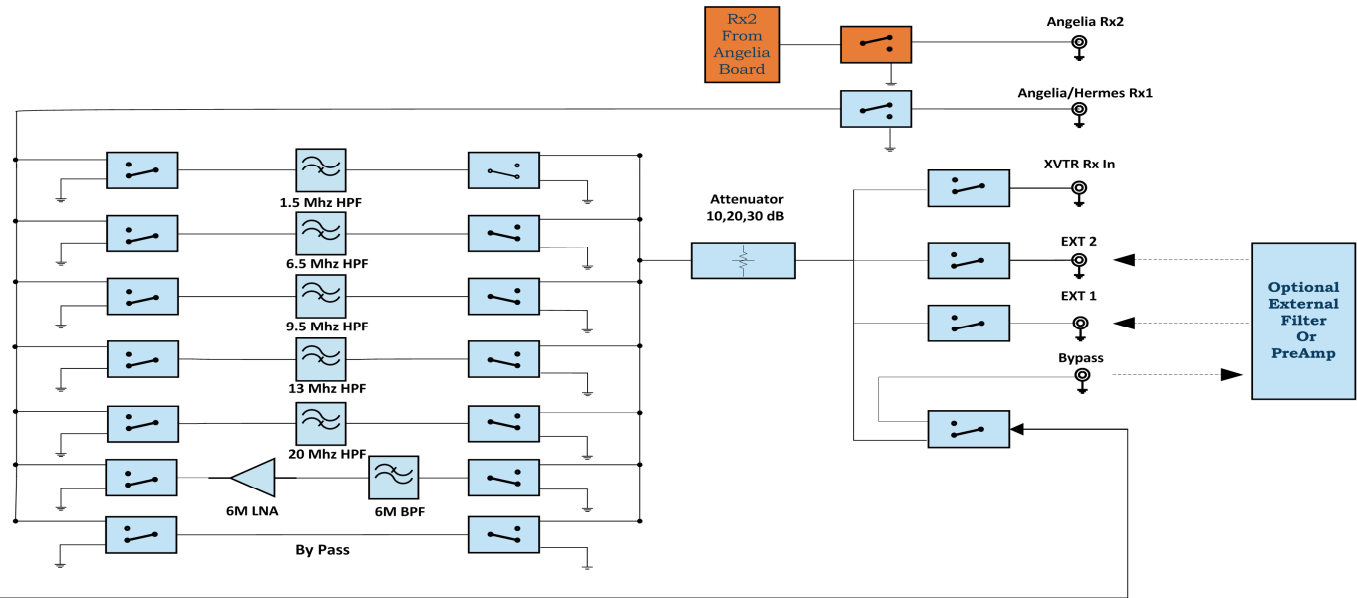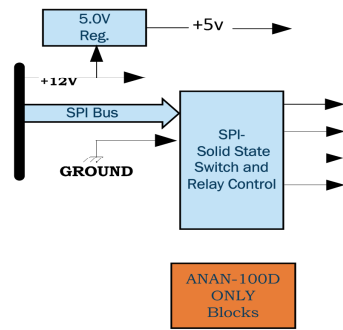
With a very high dynamic range of over 120dB and an IP3 of +50dB (preamp off) the limiting factor could be the LO phase noise, keeping this in mind the designers have used an extremely low noise TCXO, when phase locked with the 10Mhz TCXO the phase noise at 200Hz is < -130dB/HZ
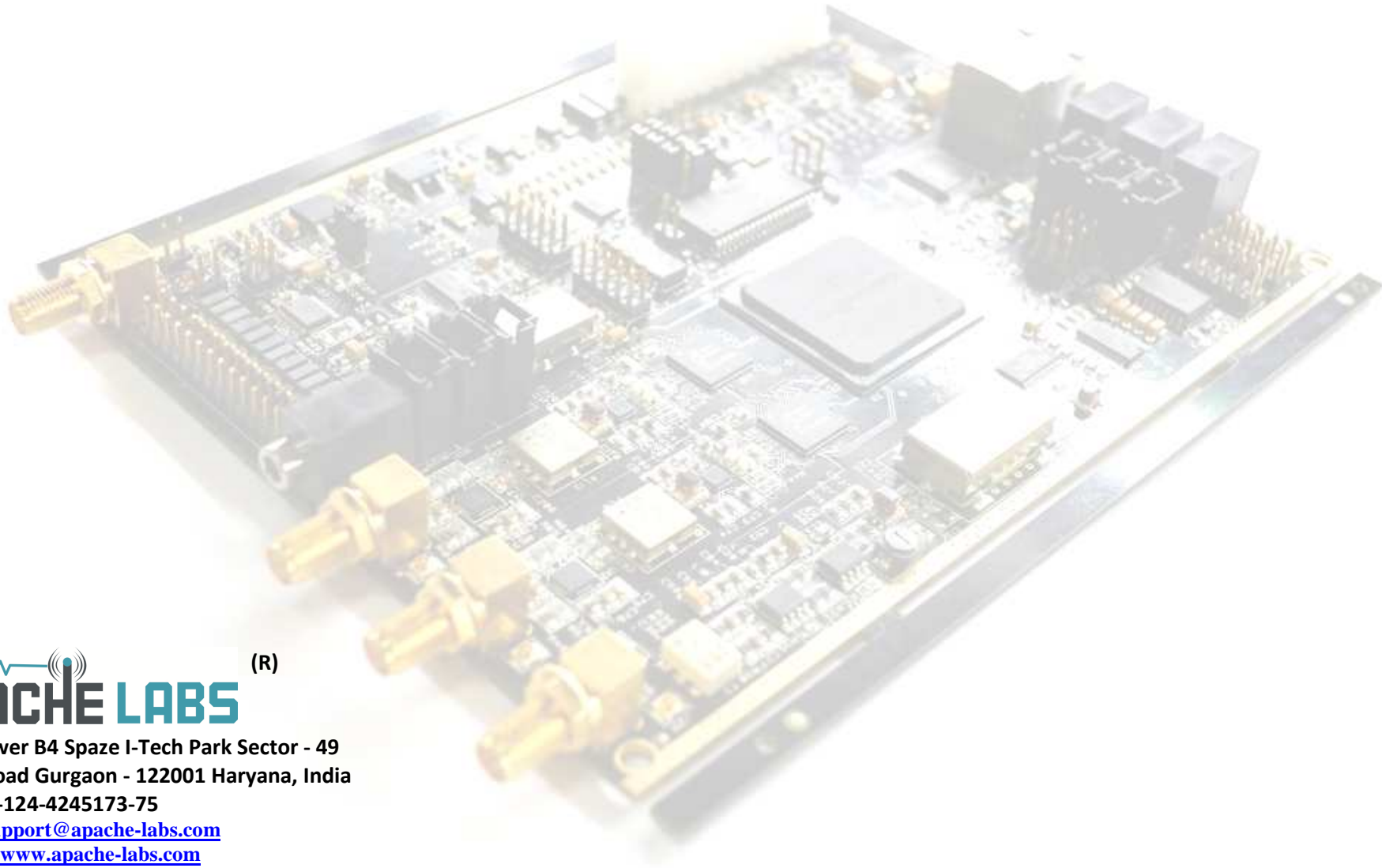
Angelia/Hermes Block Diagram
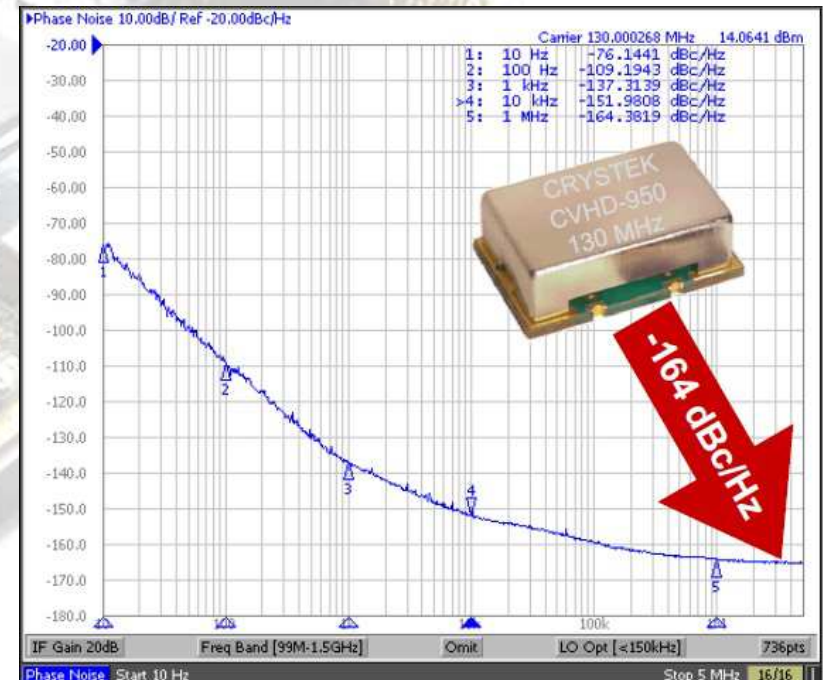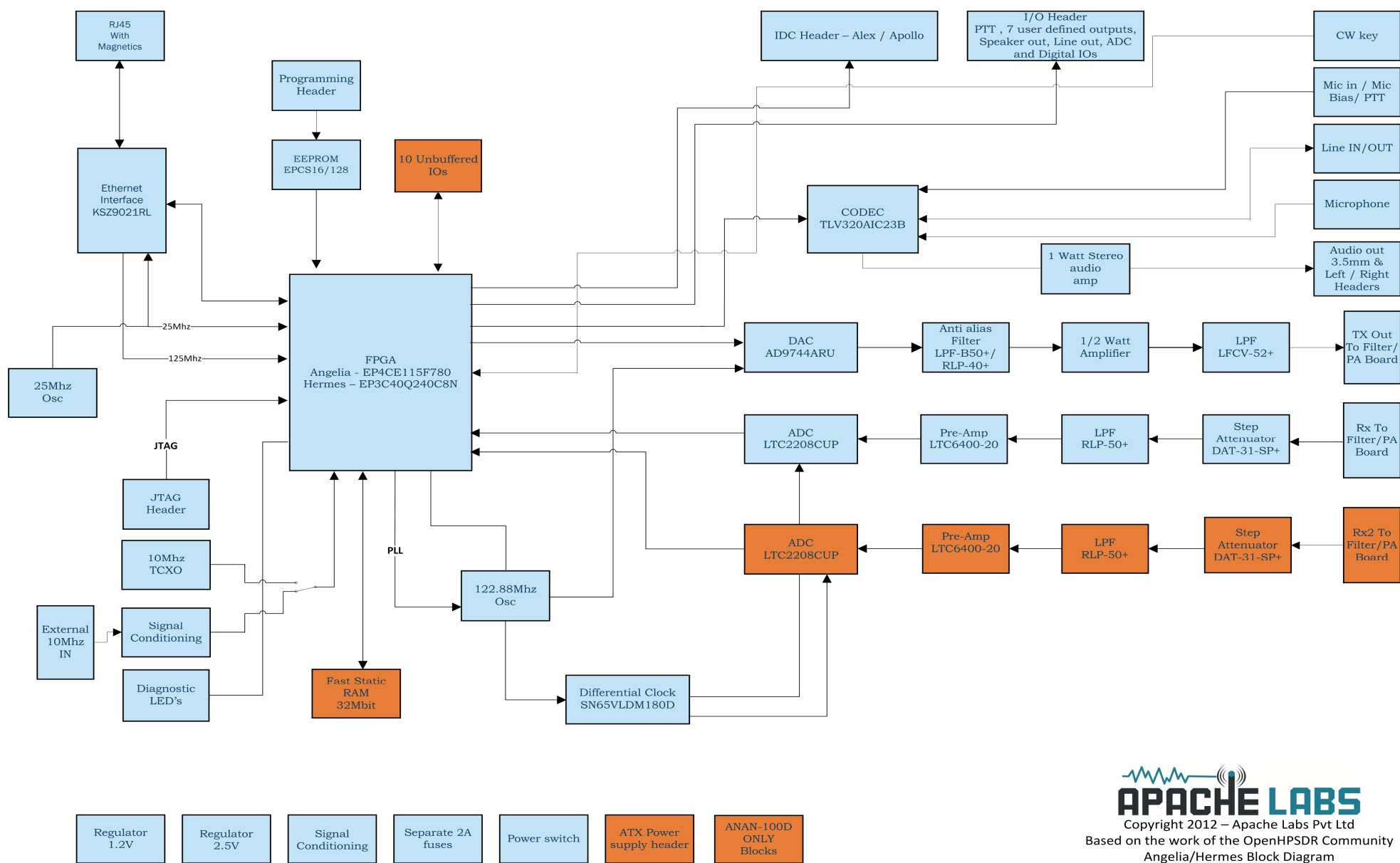
APACHE LABS
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Based on the work of the OpenHPSDR Community
100W PA & Filter Board

Rx2 From Angelia Board

Angelia Rx2

Angelia/Hermes Rx1

5.0V Reg.

+5v

+12v

SPI Bus

GROUND

SPI- Solid State Switch and Relay Control

ANAN-100D ONLY Blocks

1.5 Mhz HPF
6.5 Mhz HPF
9.5 Mhz HPF
13 Mhz HPF
20 Mhz HPF

6M LNA

6M BPF

By Pass

Attenuator 10,20,30 dB

XVTR Rx In

EXT 2

EXT 1

Bypass

Optional External Filter Or PreAmp

From Angelia/ Hermes Tx Predriver

XVTR Tx

Driver

(100 w) RD100HHF1 Push Pull PA

T-R Switch

160m
80m
40-60m
20-30m
15-17m
10-12m
6m

SWR Bridge

Ant 1

Ant 2

Ant 3

REV/FWD POWER

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