7 December 2023 Haifuraiya Update

Open Research Institute

Toolchain

Analog Devices Reference Design
2022.2 branch direct from repo

Vivado/Petalinux/Vitis
2022.2 with floating license checked out and platform project build from HDL reference design .xsa + sysroot import

Meta-adi
2022.2 branch direct from repo

Libiio 0.25
Determines TES version

Progress - What's been done

Processor Side Cross Compiler Working

- Libiio imports and links correctly.

- Required interpreting the support from Engineer Zone to solve.

- You also need the right version of the example c code.

Tone Transmit

- Constructed and transmitted a transmit buffer in IIO.

- Cyclic works and non-cyclic has unexpected on-air behavior.

Progress - What's been done

Research GPU OPV code

- Making progress understanding where the corresponding functions will appear in hardware.

Single Channel Demo

- Preparing to deploy the general purpose implementation to the ARM processor in the Zynq.

Progress - What's been done

Theseus Cores Block Testing

- We need a deeper dive on the test bench to confirm it's working.

- Initial tests with the automatically generated test bench look good, but it's not a verification.

Polyphase Channelizer Integration

- Documentation about how to incorporate IP into the ADI reference design published.

- Channelizer integration in next sprint.

Moving Forward

Next Steps?

- How to do non-cyclic buffer transmit without completely bogging down the ARM a9 on the sc706.

- Construct buffers for the four tones of Opulent Voice and figure out how to command those.

- Get a profile that reduces the sample rate down from 122.88 MHz to something a bit more reasonable for lower-rate transmissions, like our single channel demo.

Work Submitted

Haifuraiya Technical Support

For the ESA GEO study initiative:

AMSAT-CA (Canada)

AMSAT-UK

JAMSAT

AMSAT-DL

Direct to ESA

Activity expected from ESA at a commercial satellite conference in September 2024 "World Satellite Business Week" https://wsbw.com/

Celebrate!

What we've done is great news

Commanding a complex radio

The 9009 is a very complex base station class radio. We're using it to make modern, innovative, and powerful designs.

Participating in the Process

Our Feedback to Mathworks and ADI has been heard and acted upon. Our consistently delivered regulatory work about open source is making a difference.

Very Few Groups are Doing This

We are doing advanced telecommunications work that very few groups are doing, and we are doing it open source.

Goals for next meeting

1. Demonstrate

2. Document

3. Participate