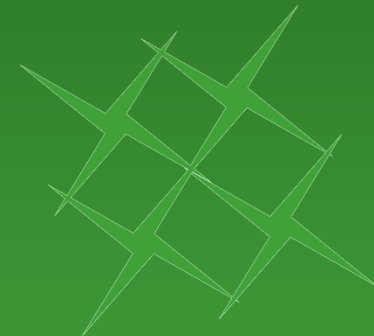




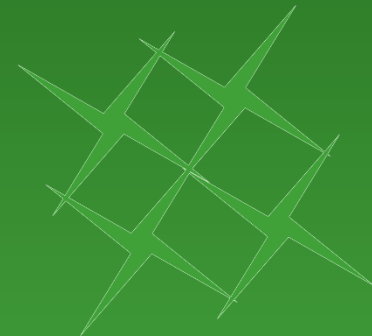
Introduction: GreenArrays Status and some Relevant Modules

Greg Bailey
SVFIG Forth Day
18 November 2017



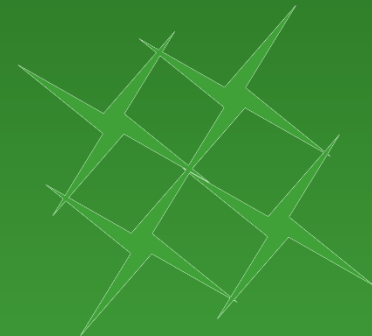
Today's Topics

- Status and Relevant modules – Greg (15)
- EVB001 Studio – Stefan Mauerhofer (30)
- Binaural obstacle detection – Daniel Kalny (60)
 - Bat-inspired binaural obstacle detection is a biomimetic approach to building maps for mobile robots. Daniel will show how to implement it in GreenArrays chips. His presentation will include introduction to a gaussian mixture model, useful programming tips for GA144, and a live demo.
- Sunrise Project (AN019, 020) – Greg (15)



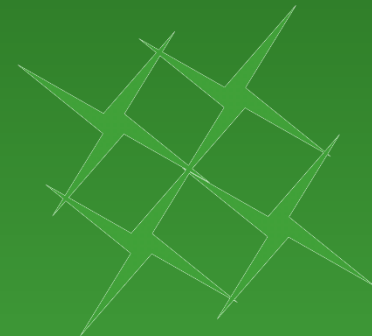
GreenArrays Status

- 2015-16 Sunrise design exercise
 - Successful first prototype
 - Product cancelled, more than customers required
- 2017 Efforts
 - Moving software development environment to run on the chip itself
 - Considering our own chip-consuming products



Relevant Modules

- Used in the work presented today
- Covered in recently published materials
 - AB006: Transparent Port Bridge
 - AN017: Ganglia Mark 2
 - AB005: Delay Lines (or buffers)
 - AN002: Simple Oscillators



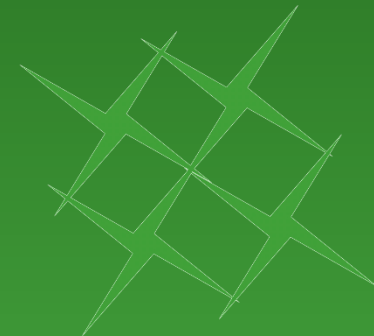
AB006: Transparent Port Bridge

- Purpose: Connect two GA144s to look like a double sized chip
- Transparent: Looks like 400.UP on one chip is connected to 400.UP on the other
- Flow control implemented in this version
- Implementation: 2-wire sync between 300s
- Setup: Boot 2nd chip 300, set same code in 300 of 1st chip.



AN017: Ganglia Mark 2

- Extends message format of Ganglia to handle arbitrary number of path segments
- Can reach across port bridge into 2nd chip
- array-Forth 3 uses this to implement internal IDE from inside polyFORTH on chip
- Path is created and destroyed for each transaction
- No path crossing issues



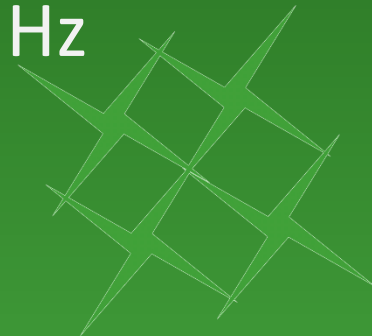
AB005: Delay Lines (or buffers)

- Needed 1920 word FIFO buffer
- Chain 30 nodes as single large buffer
- No room for code in nodes
- No time to pump 30 nodes of code in stream
- Store instructions on stack
- Push 3 words in one end (2 instr 1 data)
- Receive 3 words other end (2 instr 1 data)



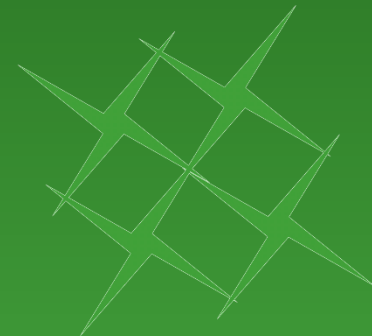
AN002: Simple Oscillators

- Previous work with crystals could not excite high freq high q crystals (loop granularity). We were only able to excite 10MHz with 20 turn pot varying V_{DD}
- Stefan tried Bresenham interpolation to give average periods in 1/64 loop iterations
- Crystal is able to filter this crummy, phase jittery signal and take excitation!
- We now routinely design with 9 and 10 MHz crystals from pin to ground.



For More Information on GreenArrays and These Modules

- Primary Website
 - <http://www.greenarraychips.com>
- Announcement Blog
 - Technical <http://www.greenarraychips.com/blog2>
- Tech Support on e-mail, Skype, Phone





Thank You!

For more information, please visit

<http://www.greenarraychips.com>

