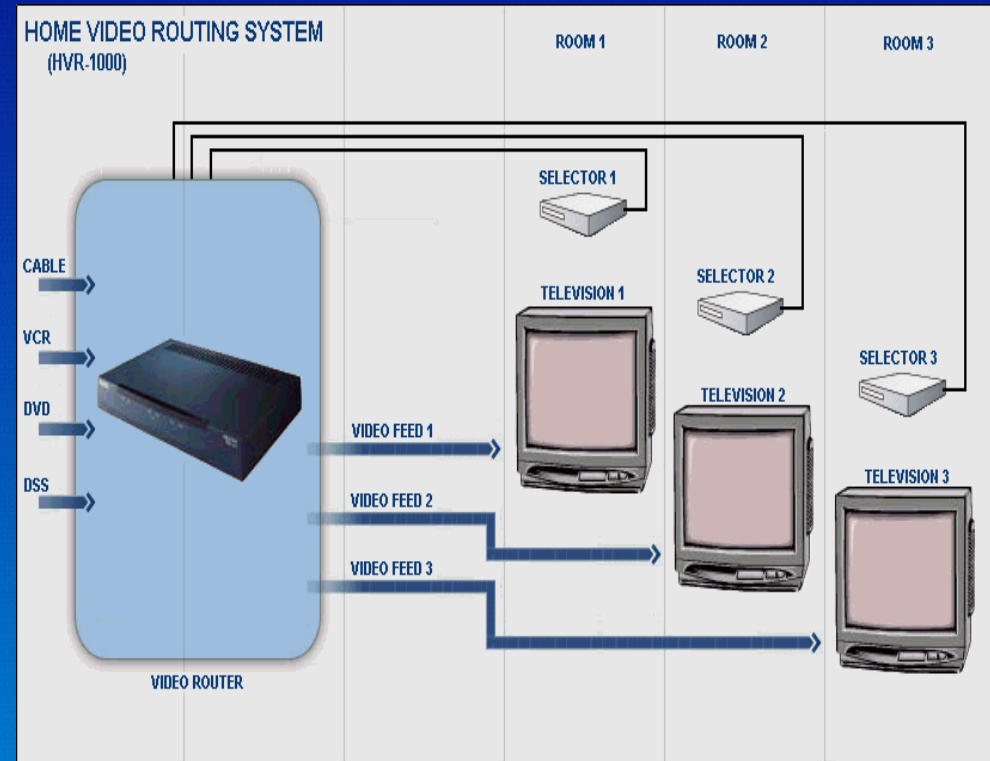




Austin Roundtree  
Jason McLachlan  
Katarina Miletijev  
Marck Gorszwick

# HVR-1000 Diagram

- Purpose of product
  - Provide an affordable solution for home video distribution
- Major components
  - Router/Controller
  - Selector box
- Typical setup



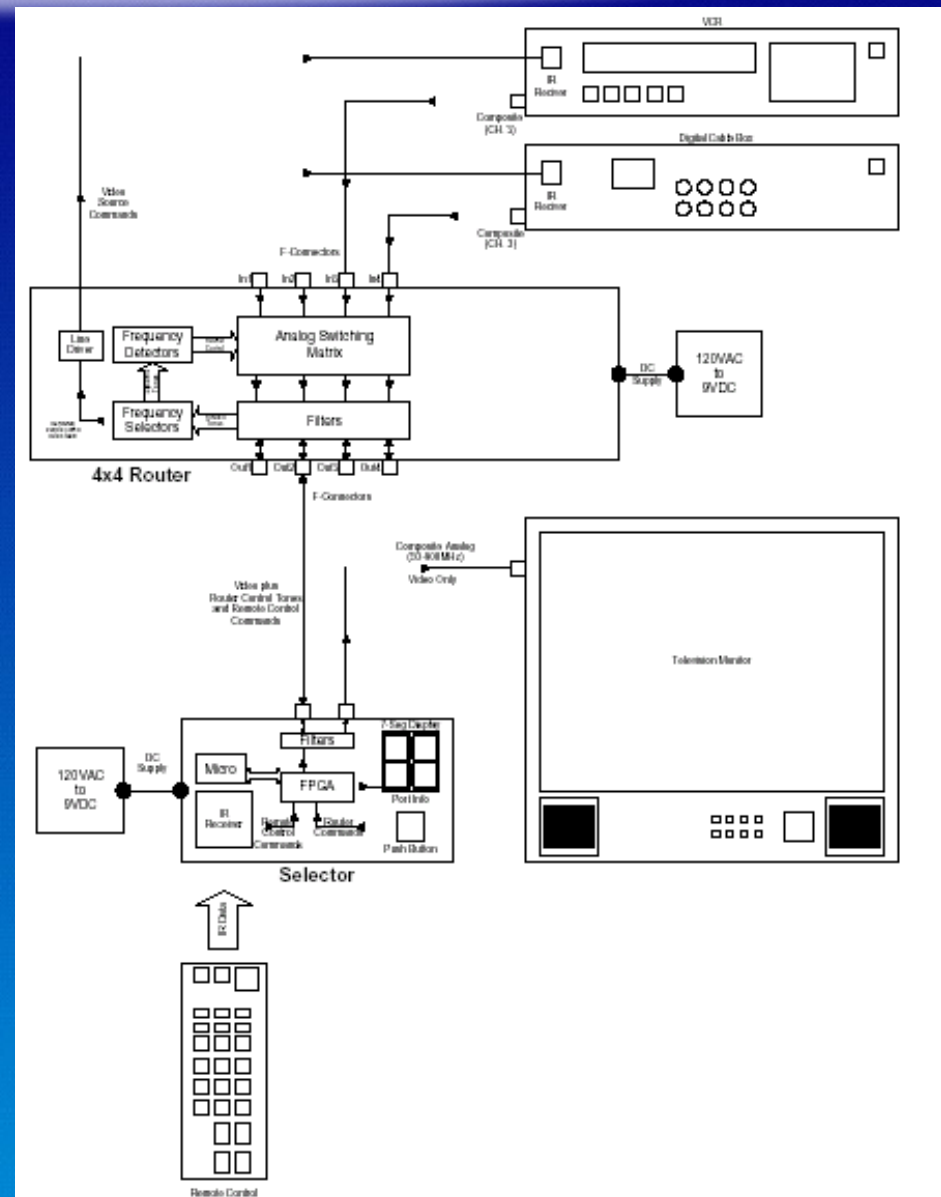
# Project Results

- Original Goals:
  - Route video from multiple sources
  - IR Relay
  - Wireless component
- Actual Product
  - Route video
  - Full bandwidth
  - Full featured development board



# Functional Description

- 4x4 router
  - Analog in
  - Analog out
  - Control from selector box via tone control
- Selector box
  - User pushbutton
  - In-band signaling



# Austin Roundtree

- Work in a team
- Improve analog design skills
- Improve creative problem solving skills
- Broaden overall knowledge of electronic design



# Katarina Miletijev

- Gain knowledge in analog design
- Participate in group product
- Broaden communications skills



# Jason McLachlan

- Demonstrate mastery of electronic engineering
- Push the envelope
- Be creative
- Work well with others

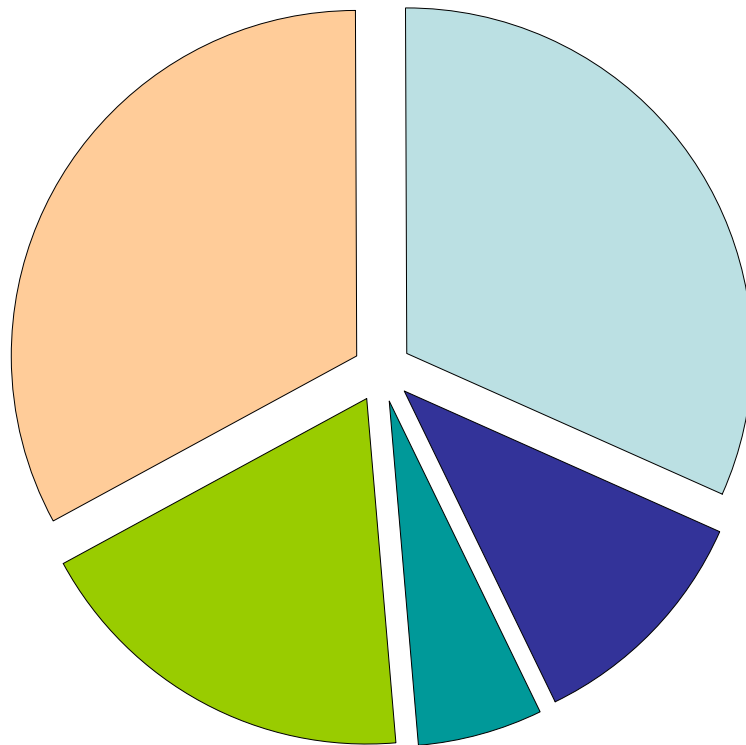


# Marck Gorszwick

- Work in dynamic group
- Build communications knowledge
- Learn video fundamentals



# Budget (Actual)

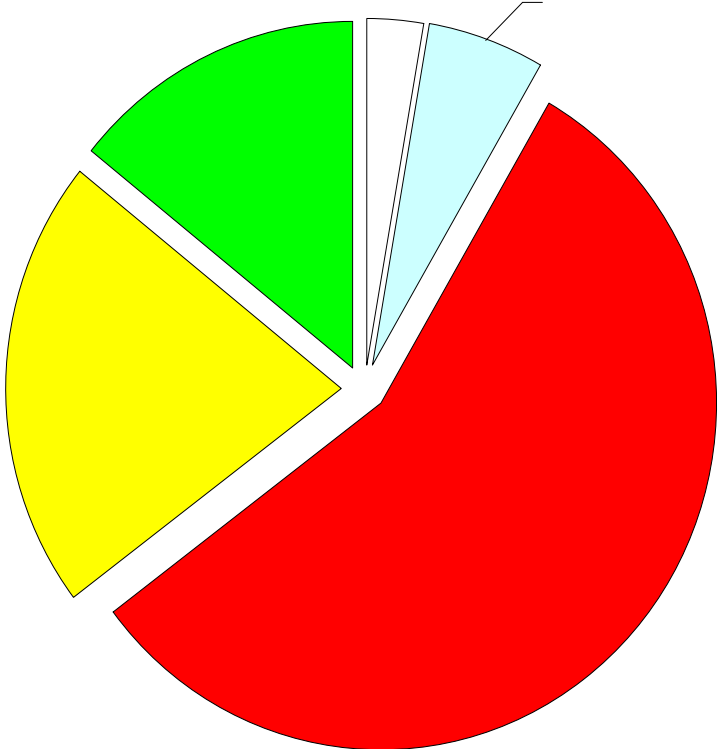


- PCB
- Active
- Passive
- Lab Supplies
- Administrative

Total \$2,000



# Budget (Projected)

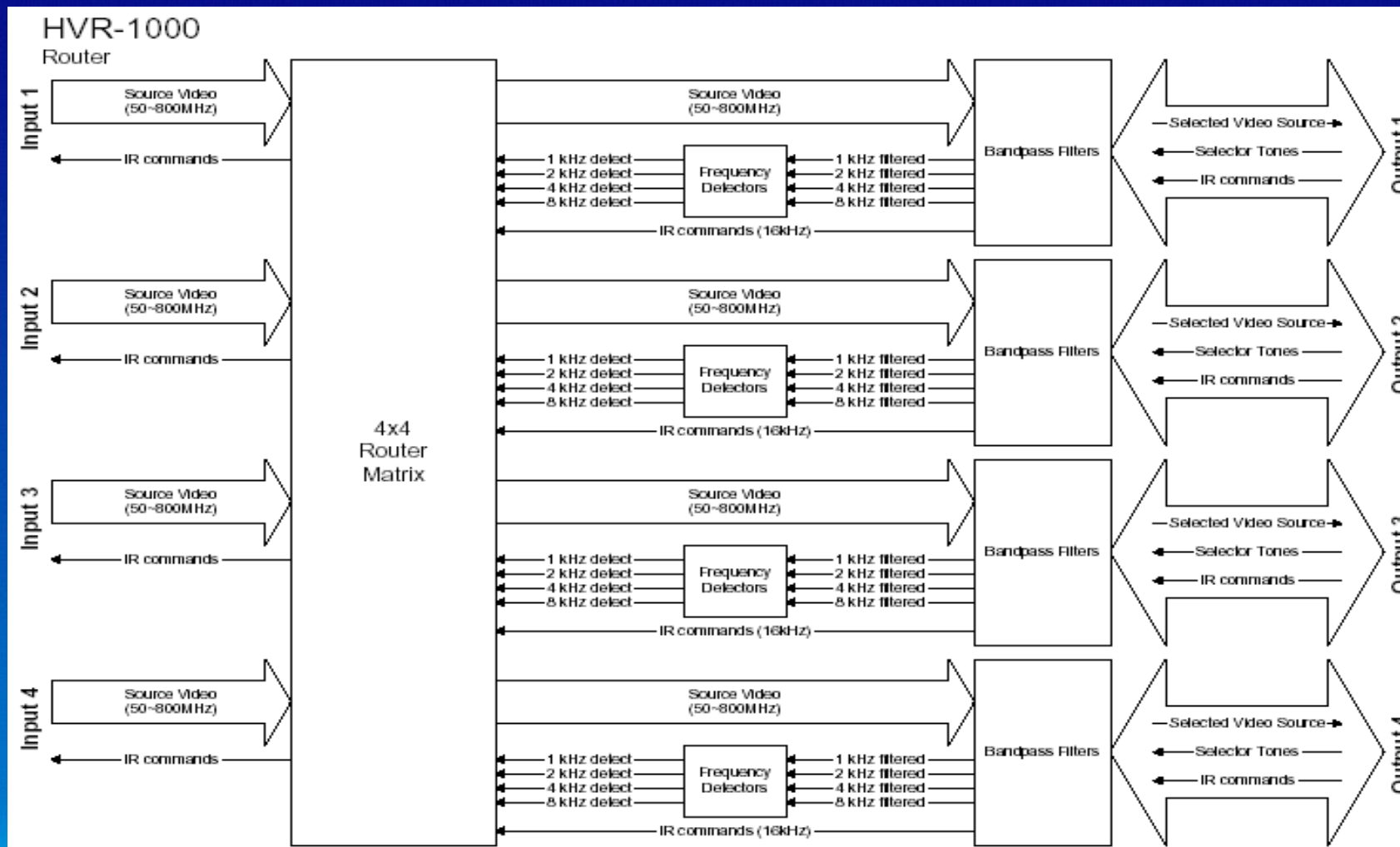


- Actual
- Lab Use
- Salary
- Lab Equipment
- Software

Total: \$70,857



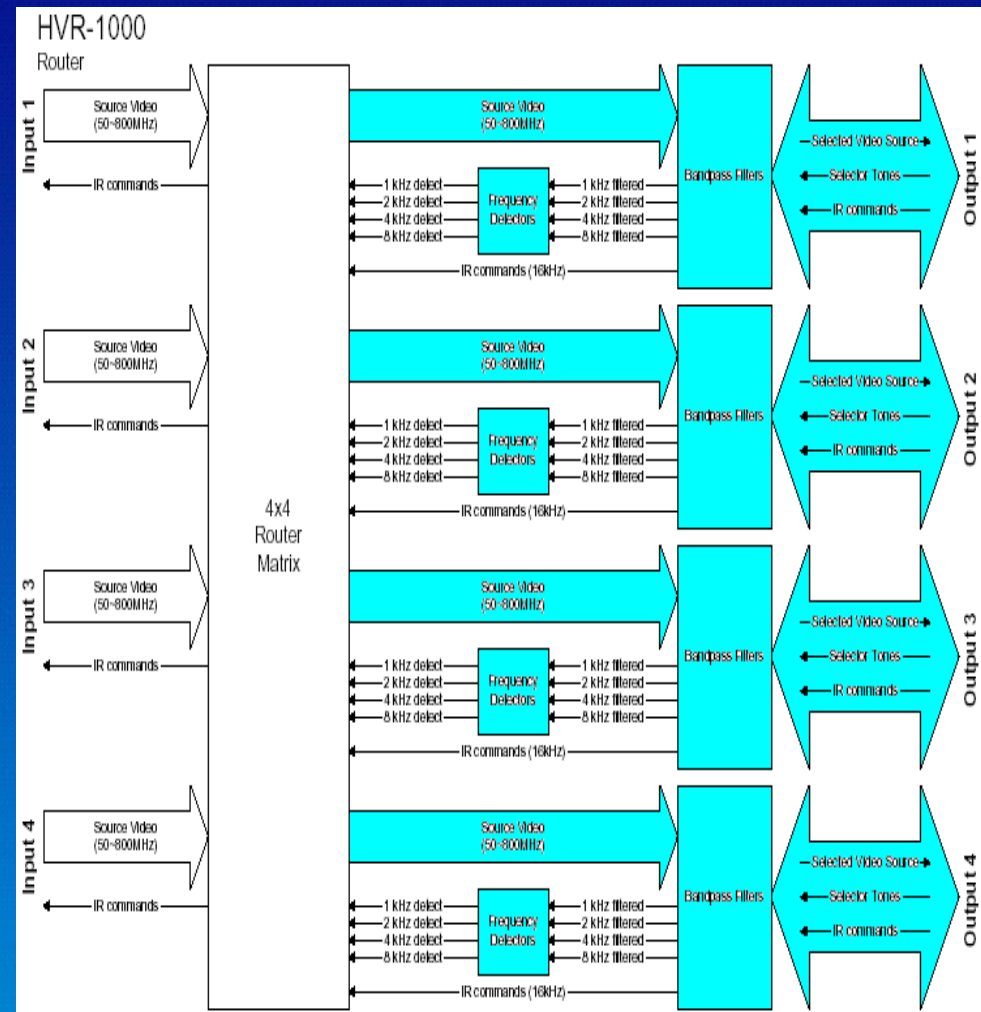
# Router Operation



# Component Breakout

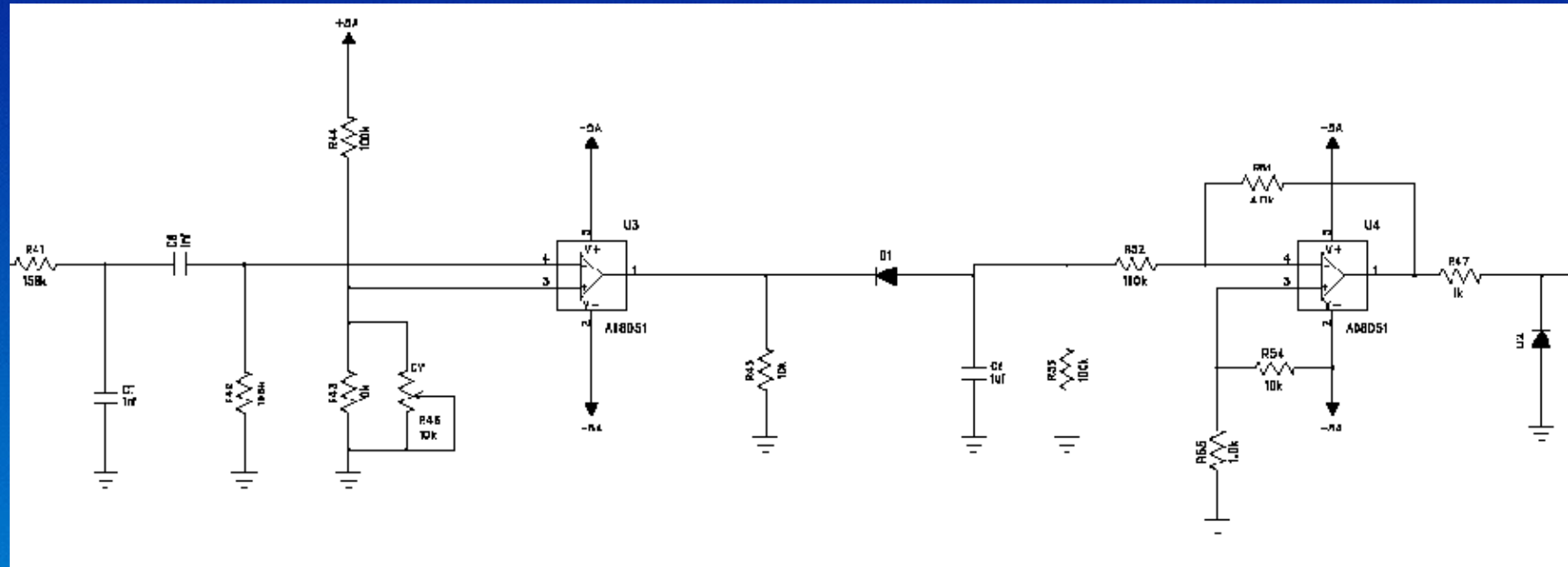
Detector Circuit

Marck Gorszwick  
marck@psonix.com



# Component Breakout (Tone Detect)

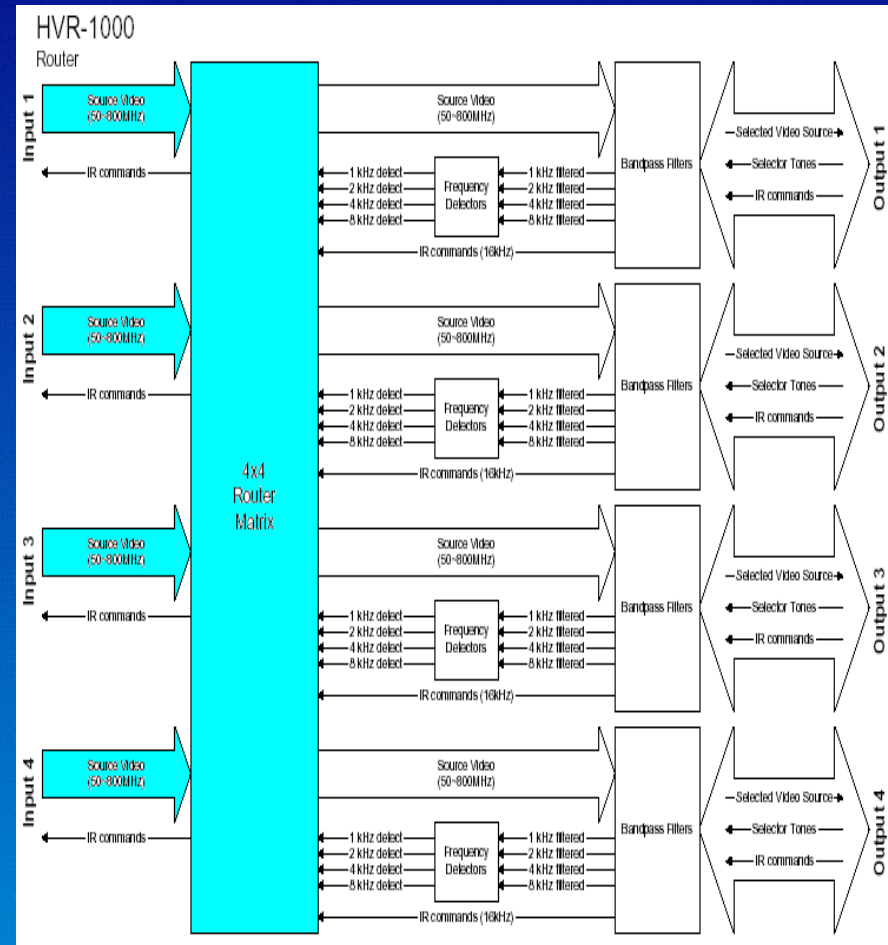
- Series of 1<sup>st</sup> order bandpass filter
- $f_c = 1, 2, 4, 8$  kHz



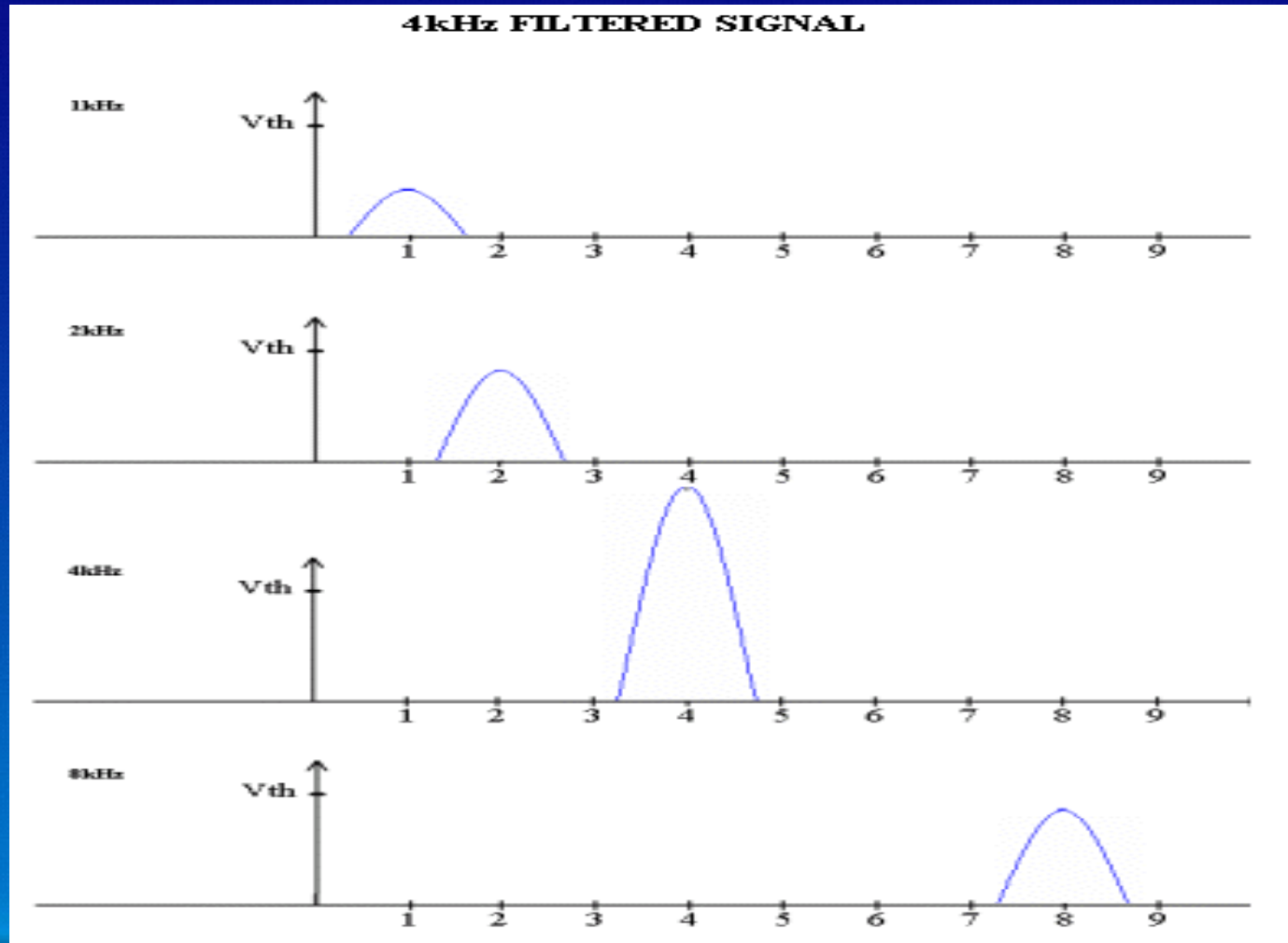
# Component Breakout (Matrix)

Video Matrix

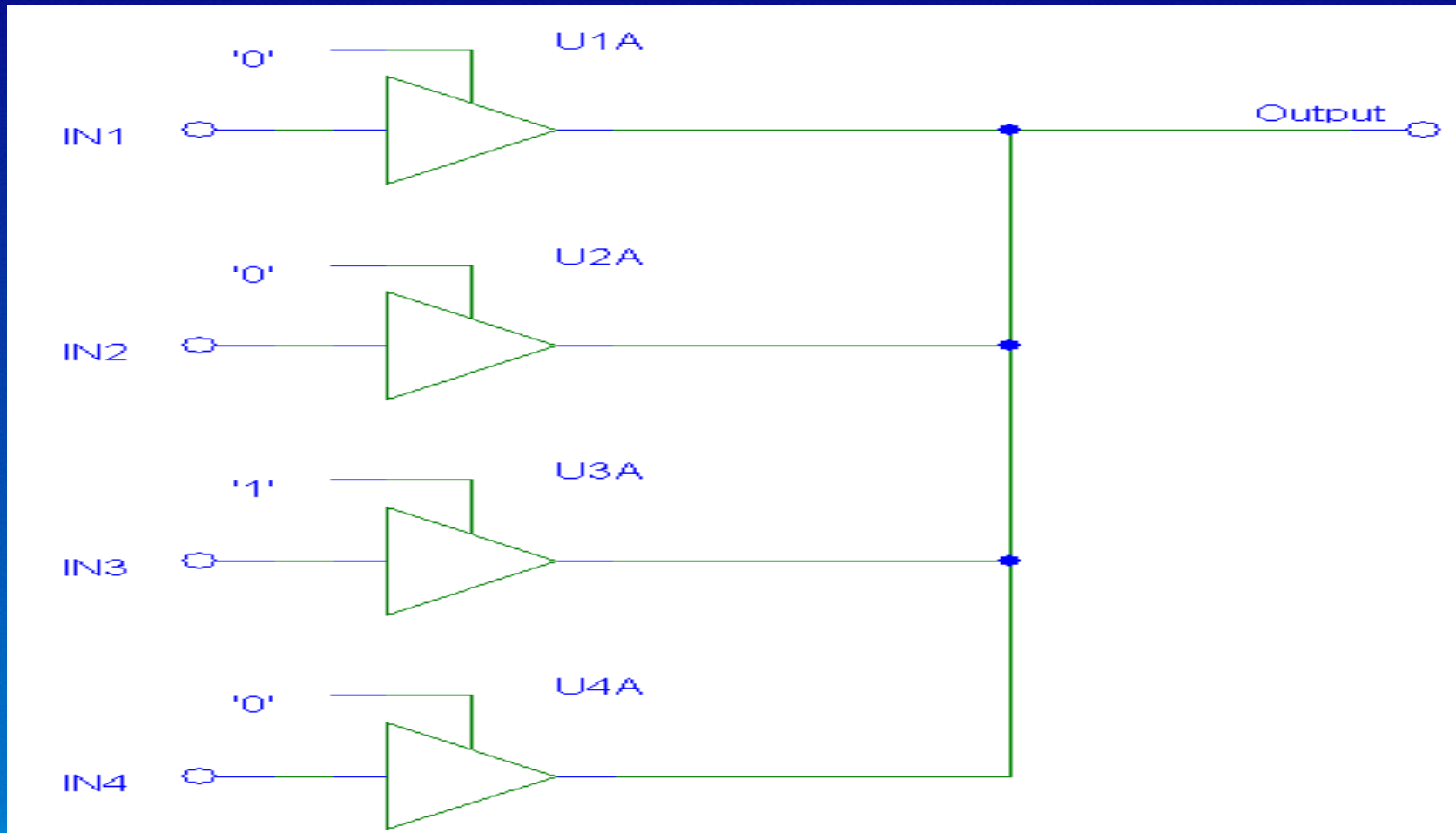
Katarina Miletijev  
kat@psonix.com



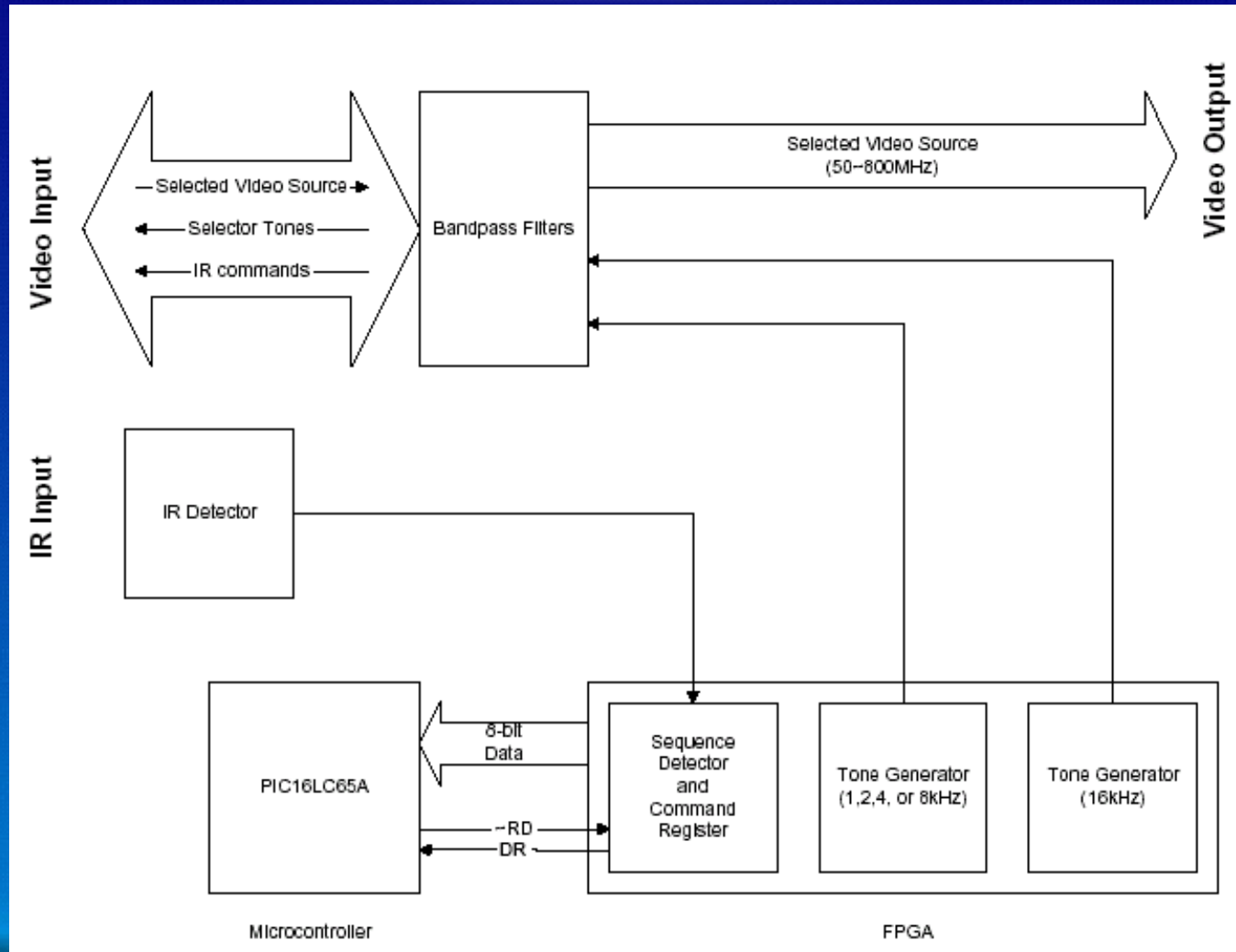
# Component Breakout (Matrix)



# Component Breakout (Matrix)



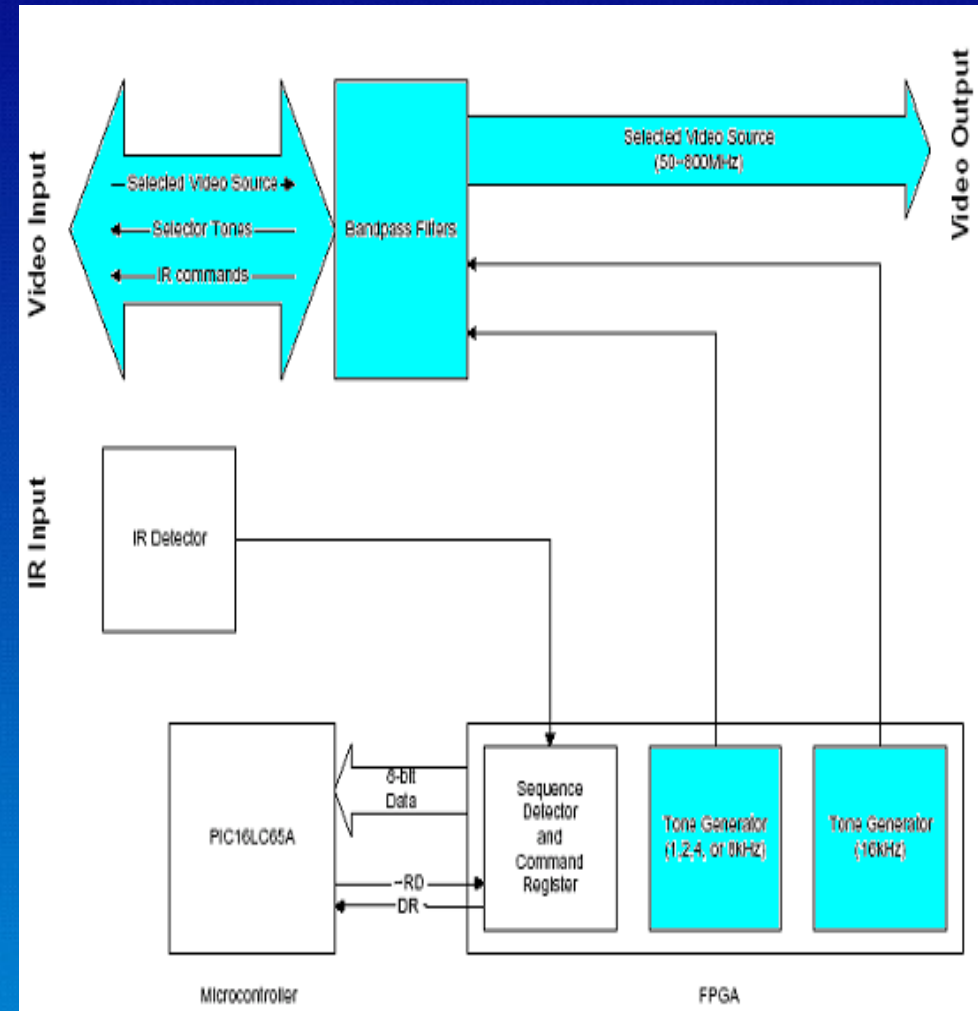
# Selector Operation



# Component Breakout

Tone Generation

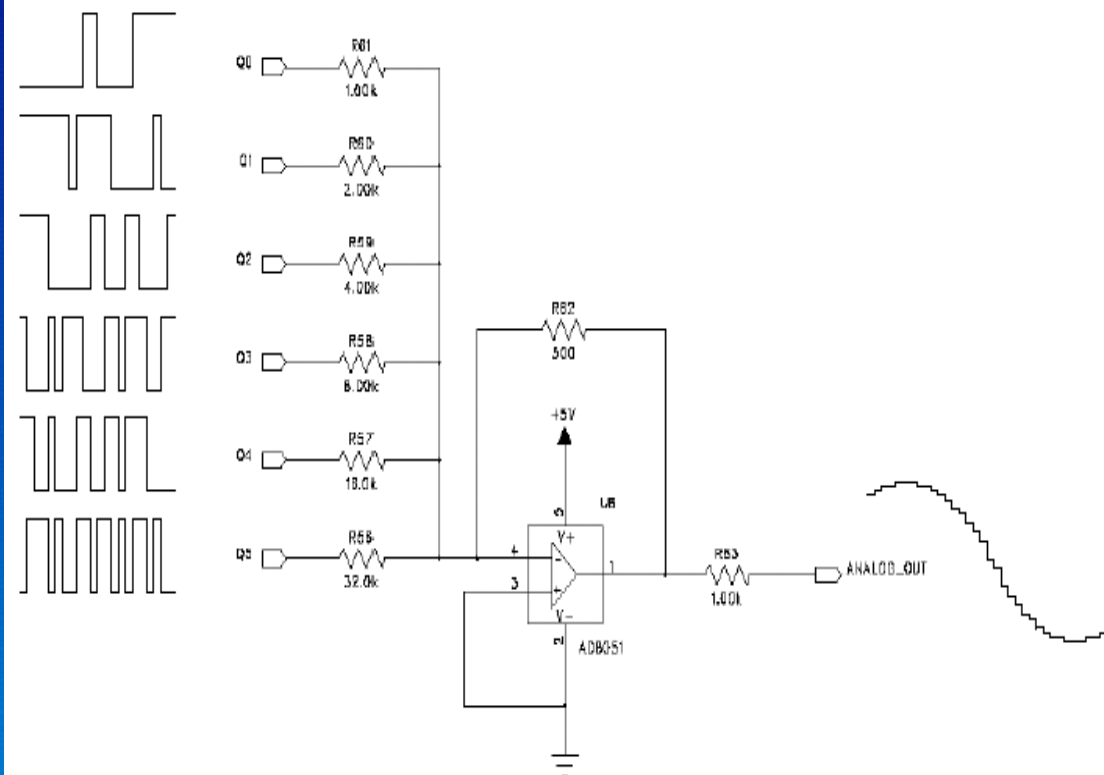
Austin Roundtree  
austin@psonix.com



# Component Breakout (Tone)

- Variable Frequency
  - 1 kHz
  - 2 kHz
  - 4 kHz
  - 8 kHz
  - 16 kHz

HVR-1000  
D-to-A Converter



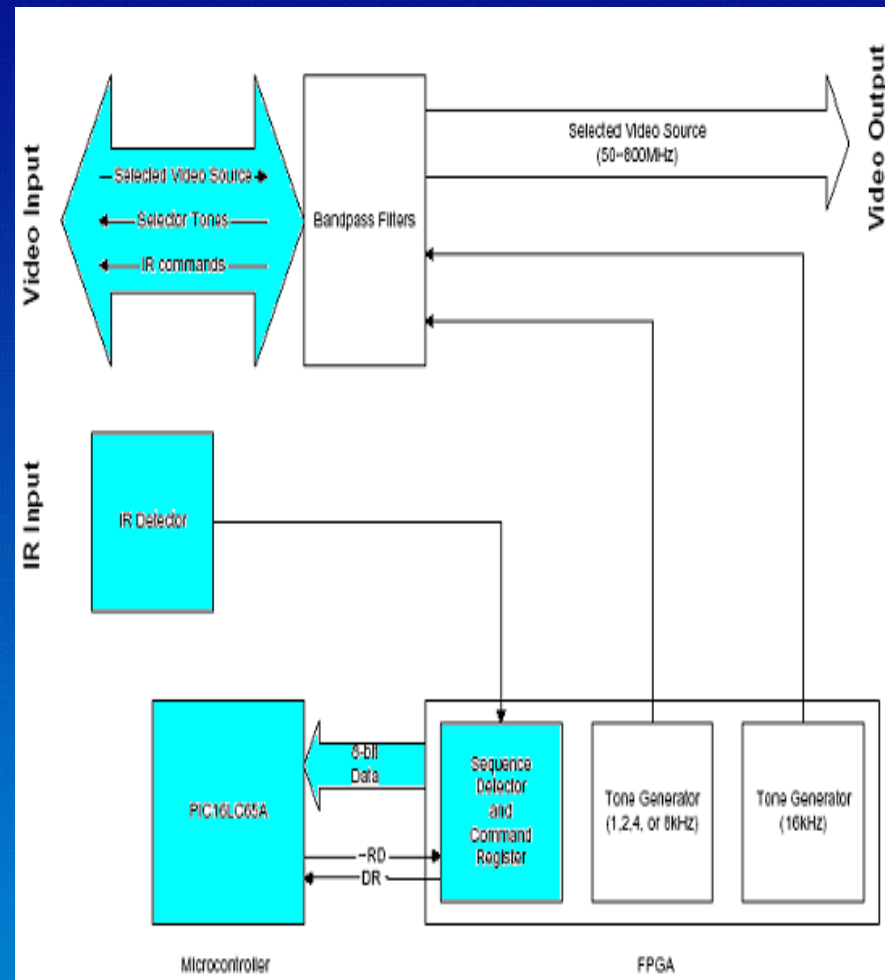
$$\text{ANALOG\_OUT} = [-(500/1000) Q0] + [-(500/2000) Q1] + [-(500/4000) Q2] + [-(500/8000) Q3] + [-(500/16000) Q4] + [-(500/32000) Q5]$$



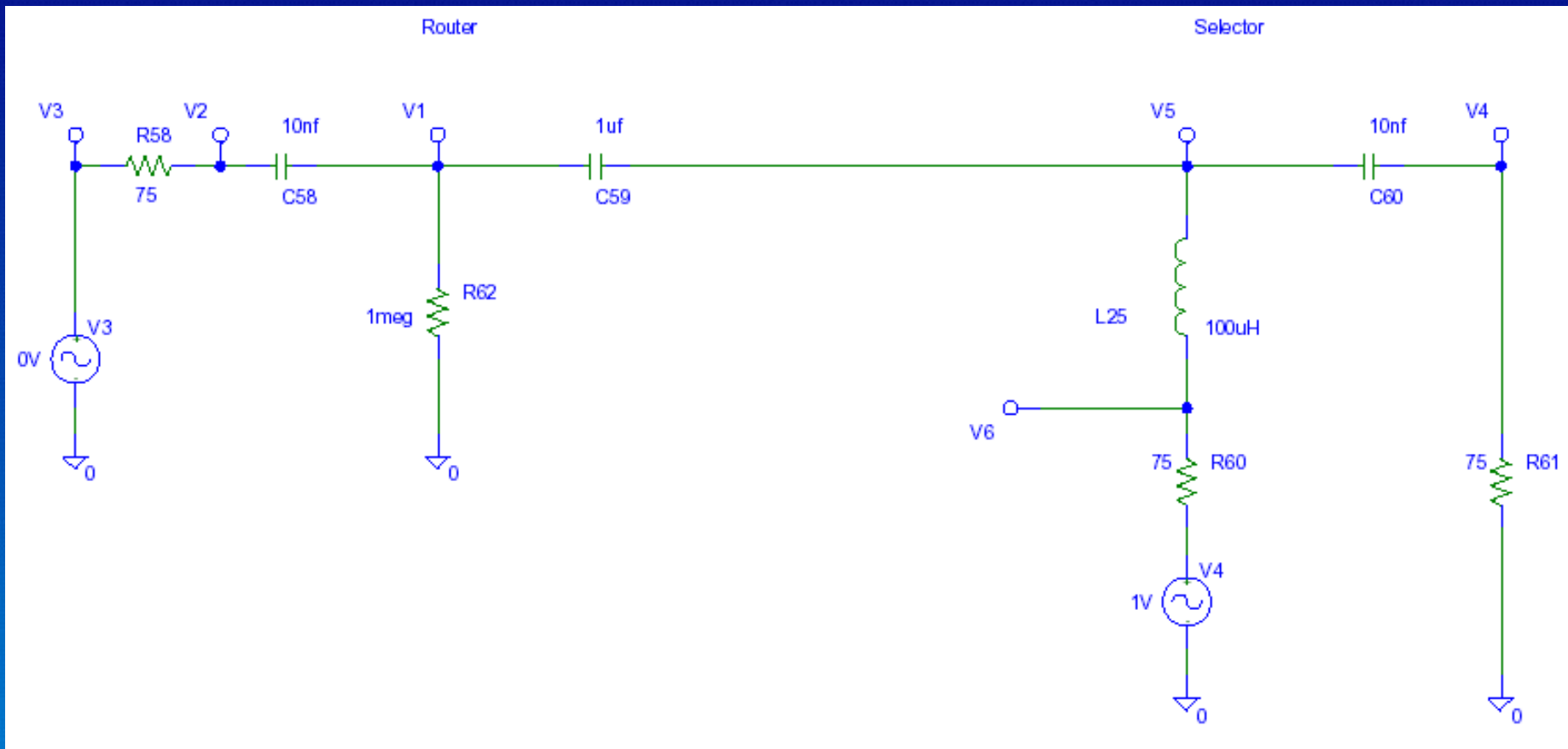
# Component Breakout

Senior Engineer

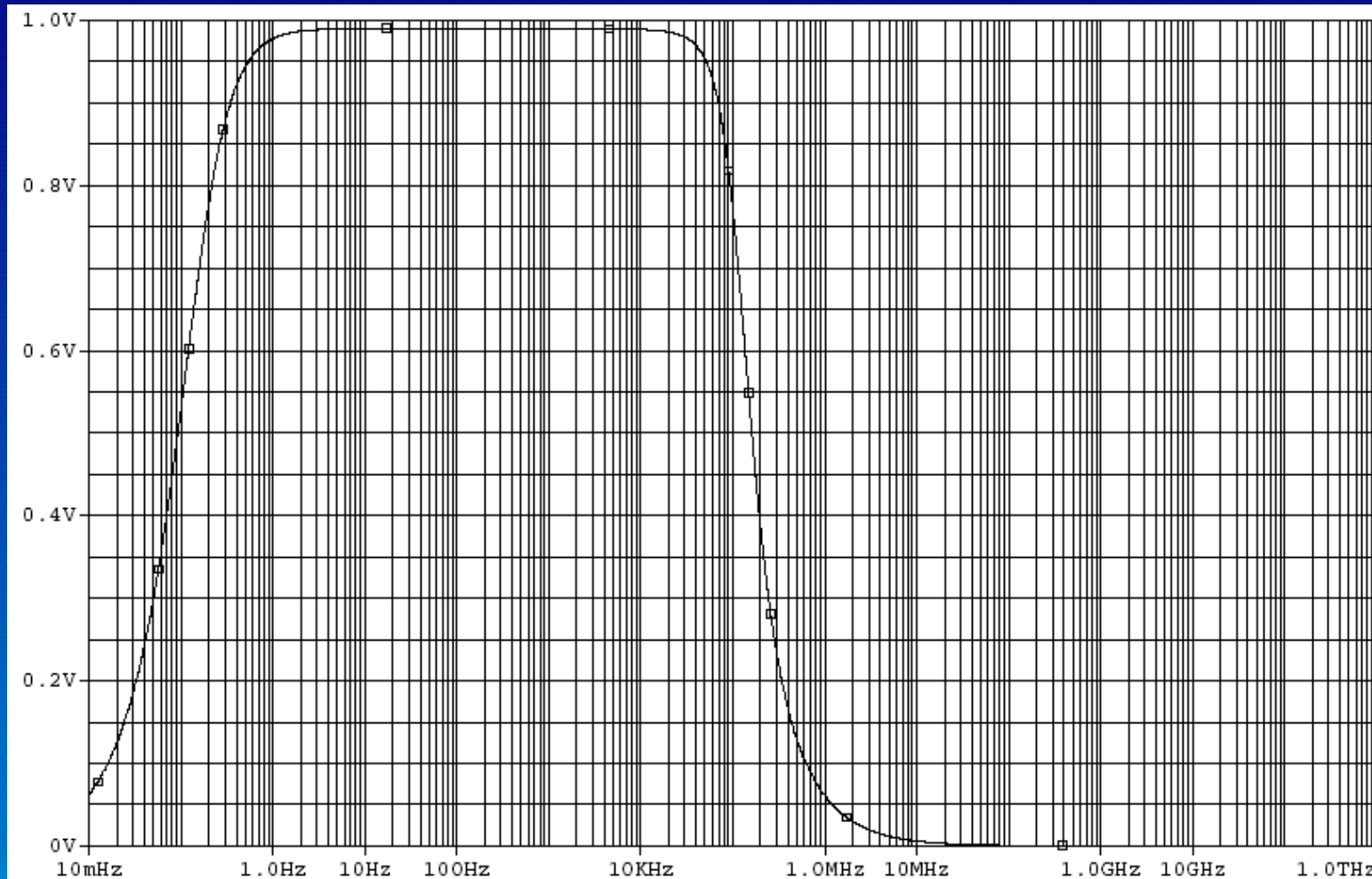
Jason McLachlan  
jason@psonix.com



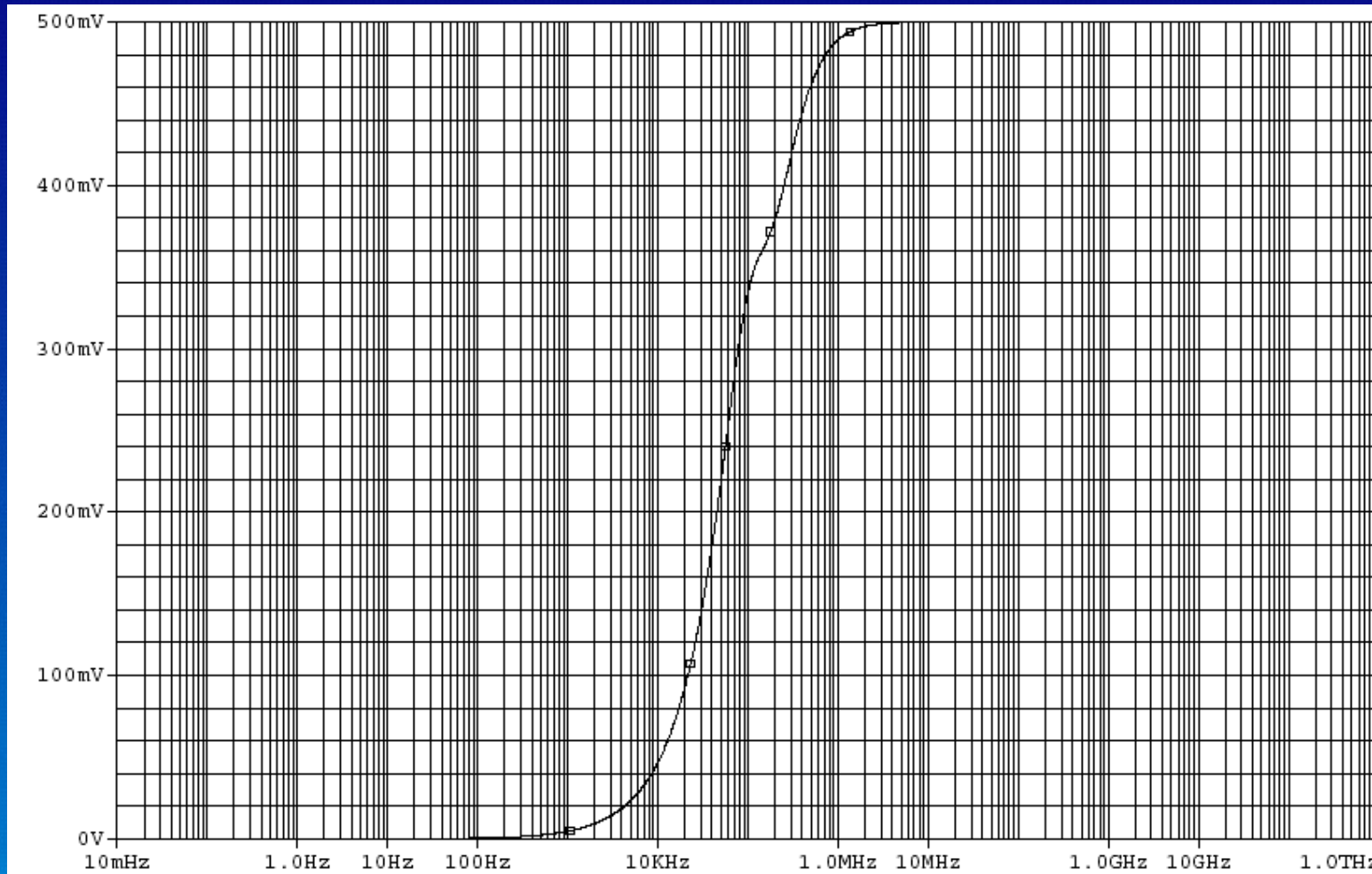
# Impedance Network



# Frequency Response



# Selector Response



# Lessoned Learned

- Team Dynamics
  - Overcoming distance limitations
  - Varying backgrounds
- Budget
- Time Management
  - Administrative tasks
  - Product verifications/Design reviews
- Protel/Orcad
  - PADS comparison

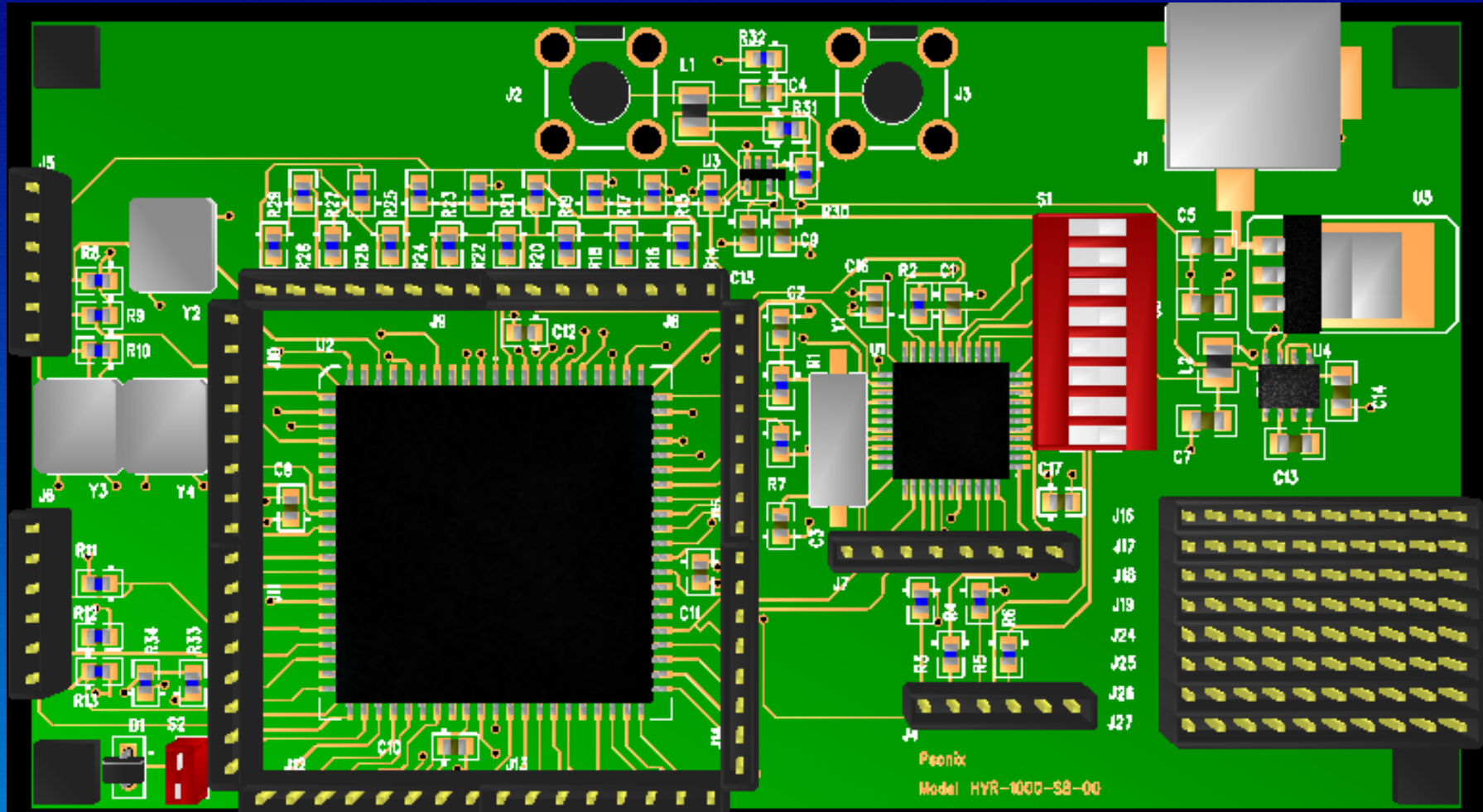


# Crucial Tasks

- PCB Layout
  - 4 layer board
  - Multiple boards, one sheet
  - Frequency Design
- 193A Design Review
  - Provide working Proof of Concept

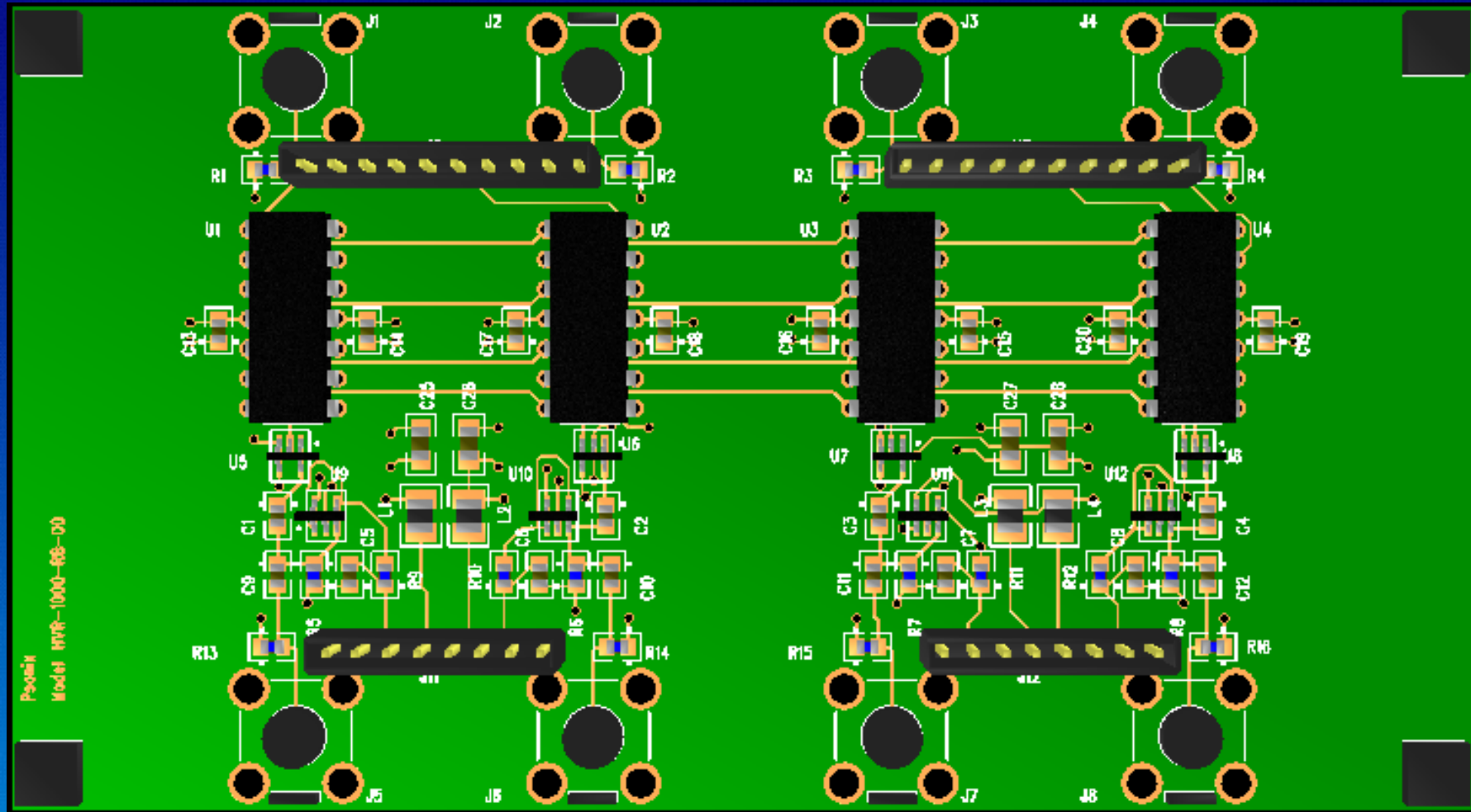


# Selector Board





# Router Board



# Questions from Audience

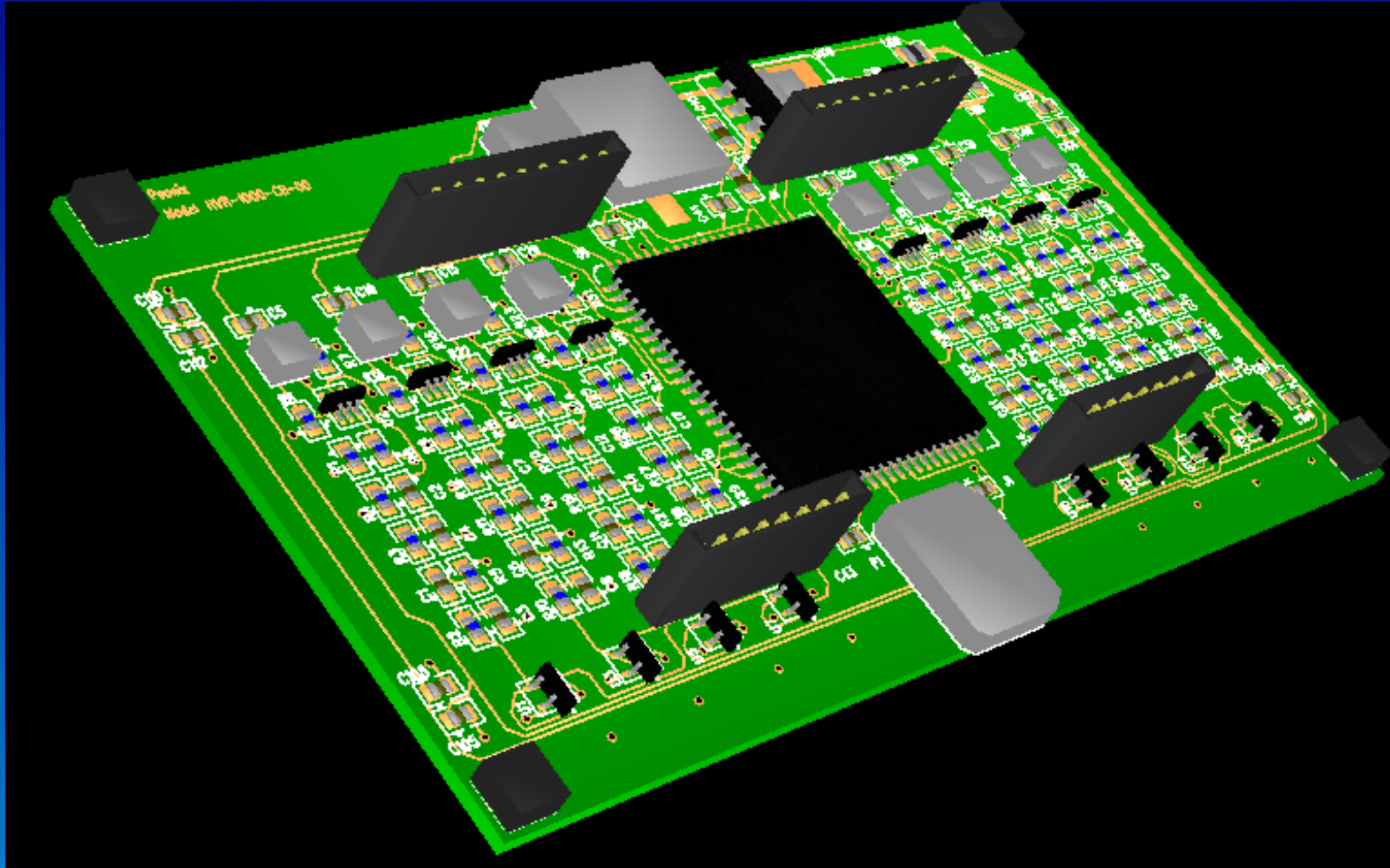
- Technical
- Investors interested in Psonix
  - Funded by MMRG Venture Partners
  - Email: [engineering@psonix.com](mailto:engineering@psonix.com)
- Publications available at [psonix.com](http://psonix.com)



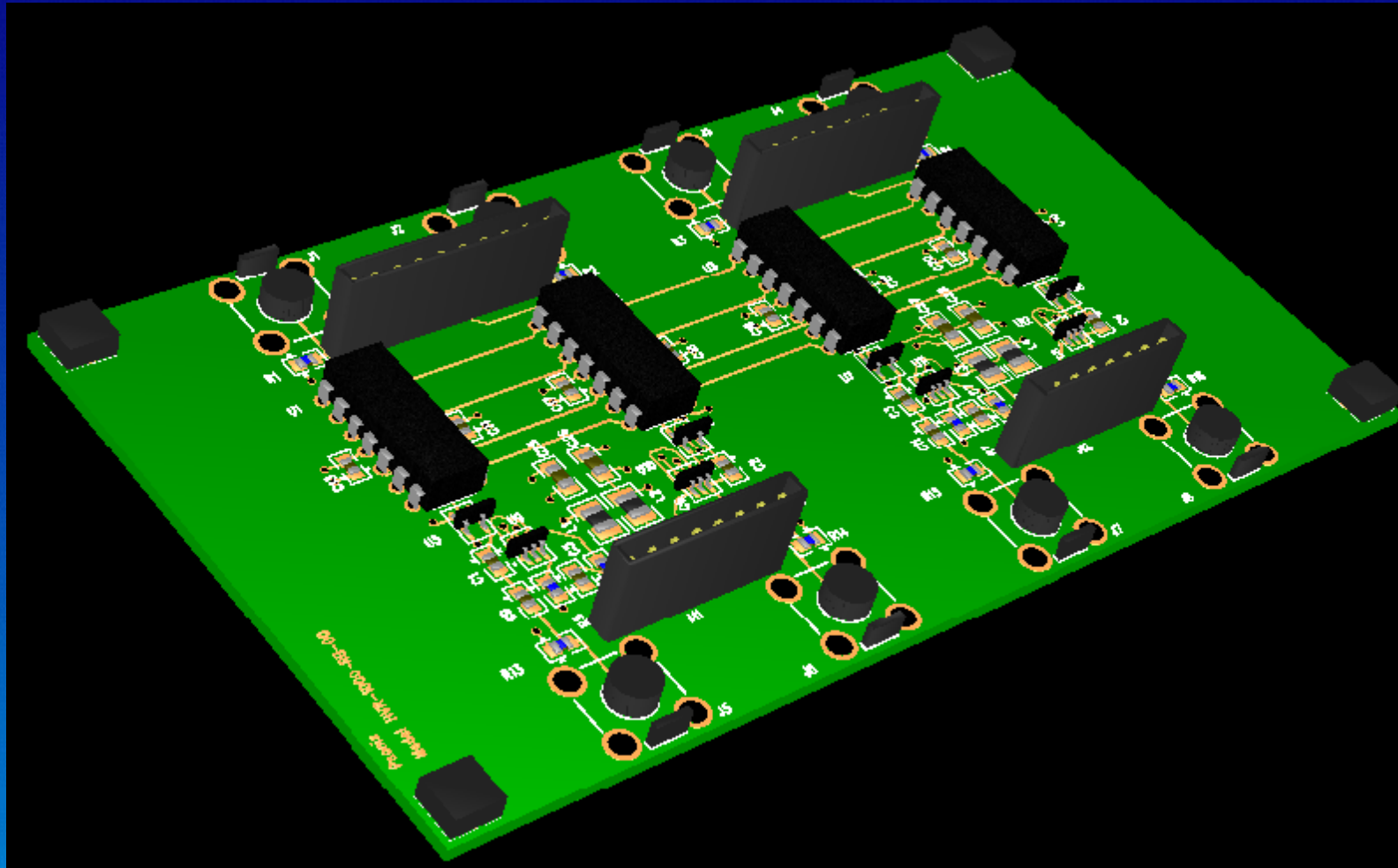
# Psonix Design



# 3-D Controller Board



# 3-D Router Board



# 3-D Selector Board

