



# Communications Technology Group: Flight Tracking and Messaging Systems

With Joel Love

Eleventh Annual School of Science, Engineering, and Health Symposium  
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# Kakurenbo

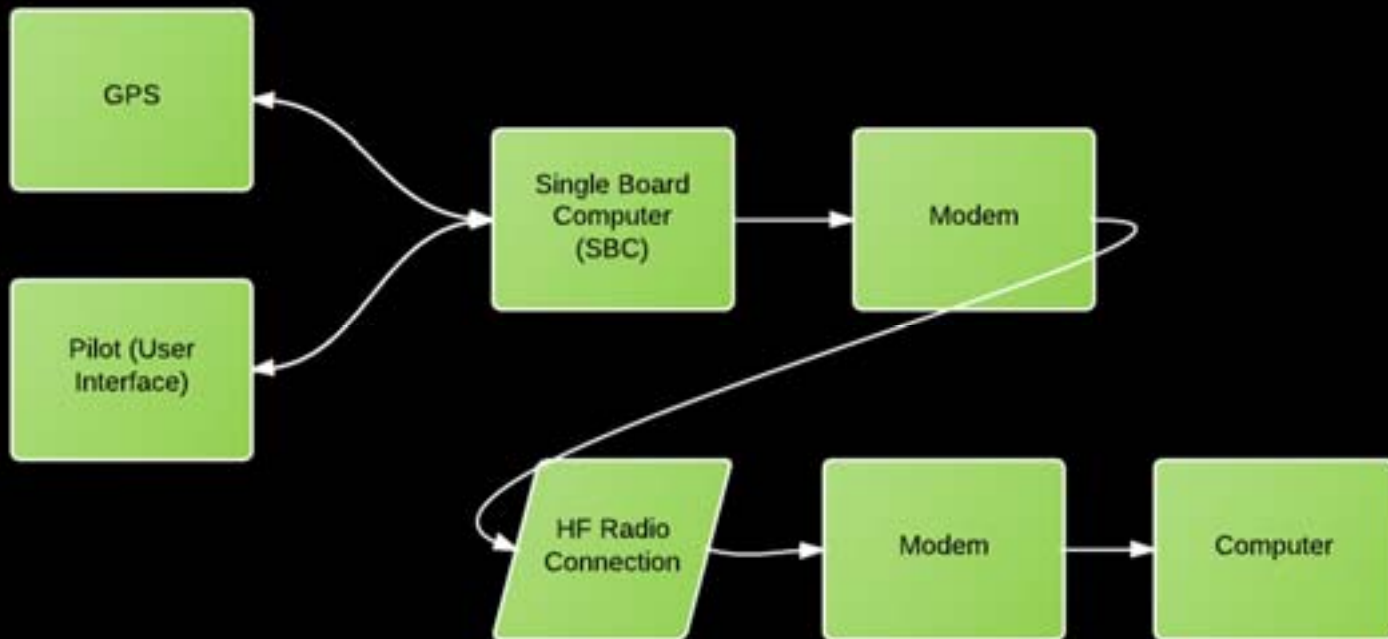


# Origin

- Working with JAARS
- JAARS – provides practical and technical support for Bible translation
  - Transportation – aircraft
  - Remote locations
  - Tracking



# Automatic Flight Following System



# AFFS 1.0 Interface

The Single Board Computer (SBC) is outdated and can no longer be purchased.



# FTMS Solution – AFFS 2.0

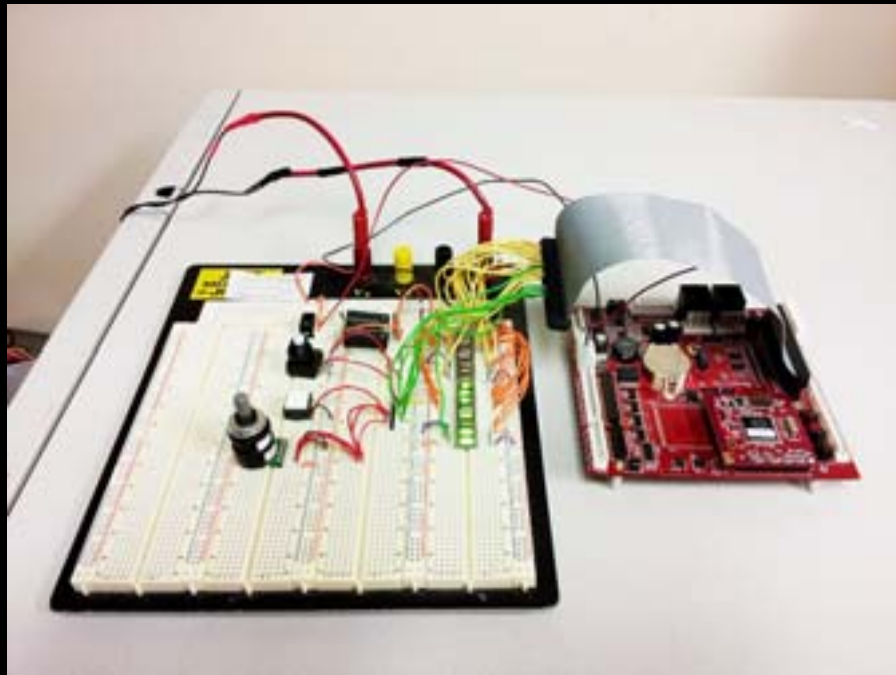
- Replace the existing Single Board Computer with a newer model!



## Project Design - “Battle” Plan

- Build identical user interface
- Port code and interface external hardware
- Compare with AFFS 1.0 to ensure functional emulation
- Incorporate newer technology to improve functionality

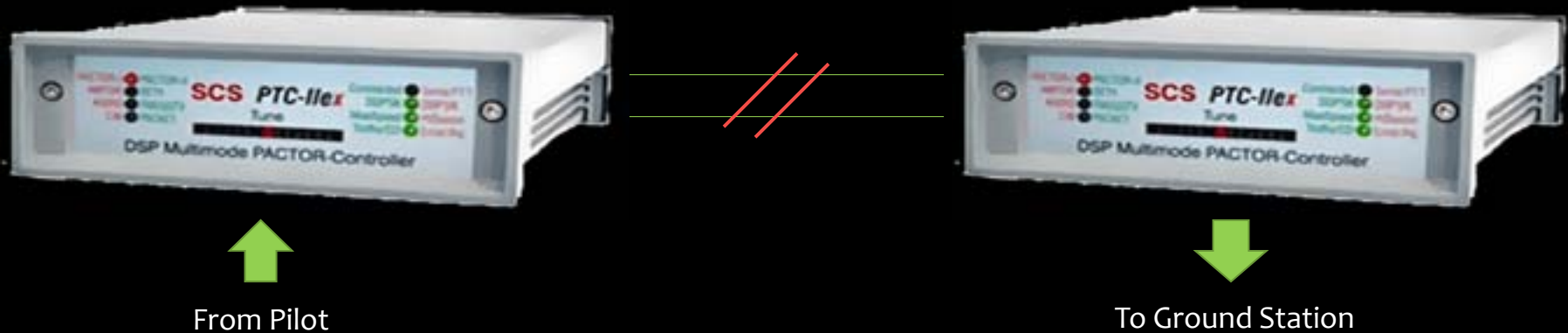
## Our Setup





## Last Year's Work

- Code Successfully Compiles
- Modem Interfaced with SBC – but no connection established



## This Year's Goals

- Set up AFFS 1.0 and compare functionality side-by-side
- Establish a connection between the modems and transmit data to the ground station
- Interface GPS

## Connecting Modems

- Soldered custom cable – eventually replaced with one we purchased
- Debugged “Send” function
  - String Compare function – broken
  - Amplitudes needed to be properly set – FSKA, PSKA

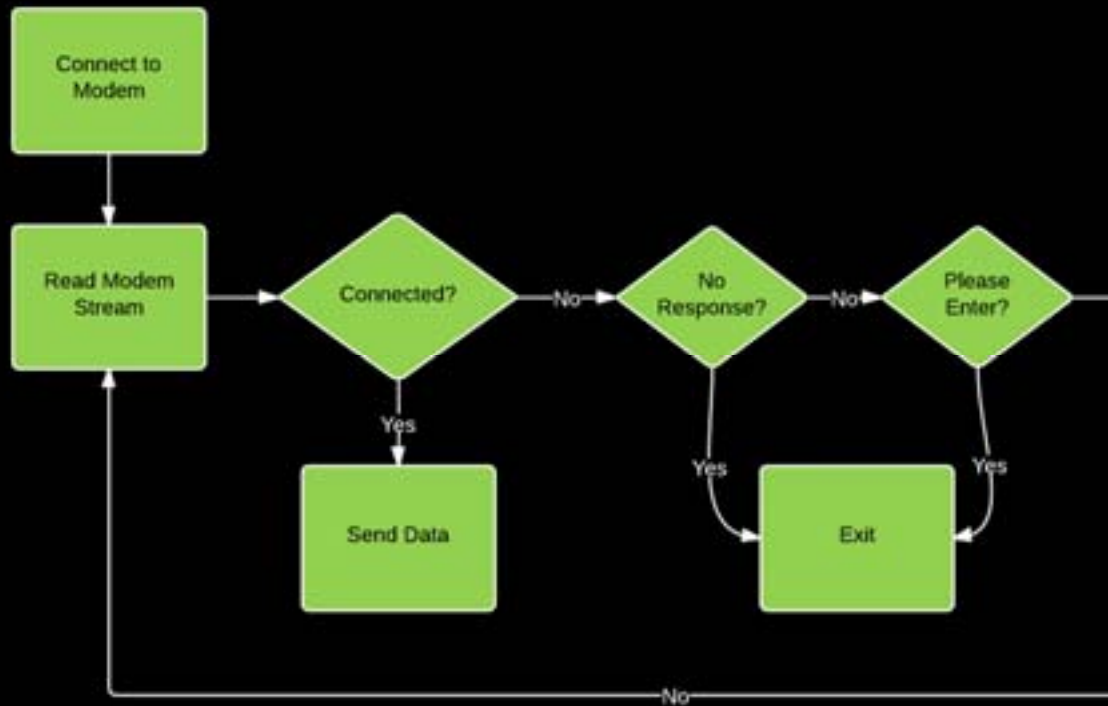
## FSKA, PSKA

- Need to match ground station – why AFFS 1.0 presumably did not work

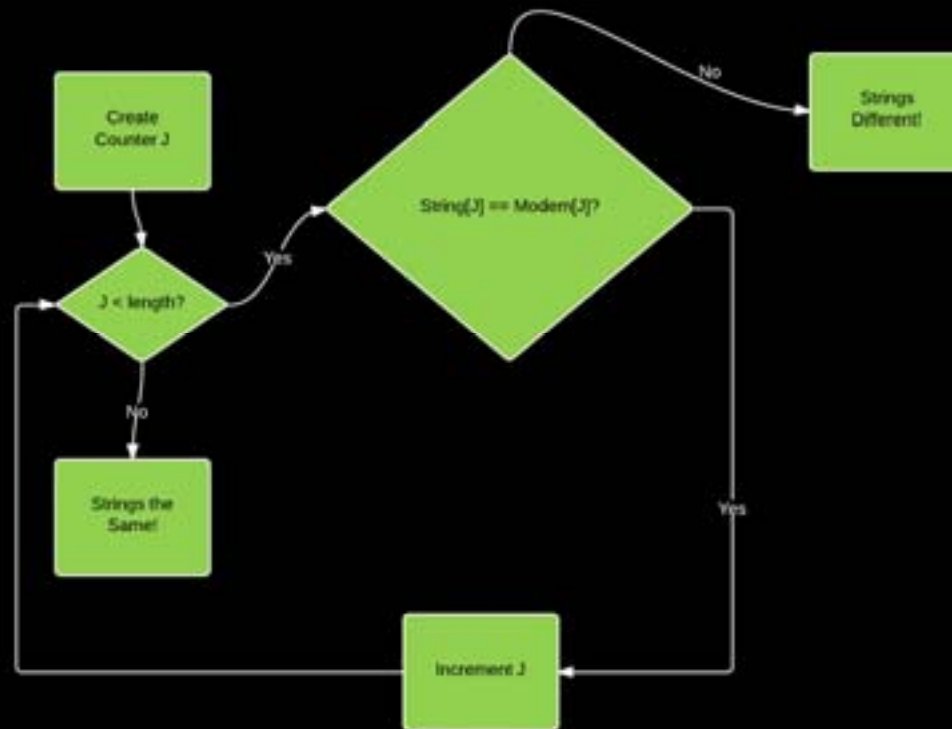
FSKA: Frequency Shift Key Amplitude

PSKA: Phase Shift Key Amplitude

# Connect to Modem Flow Chart



# String Compare Flow Chart



## The Completed System



## Next Steps

- Interface GPS
- Intelligently set FSKA, PSKA values
- Incorporate alternate communication means
  - Cell Phone network
  - Satellite



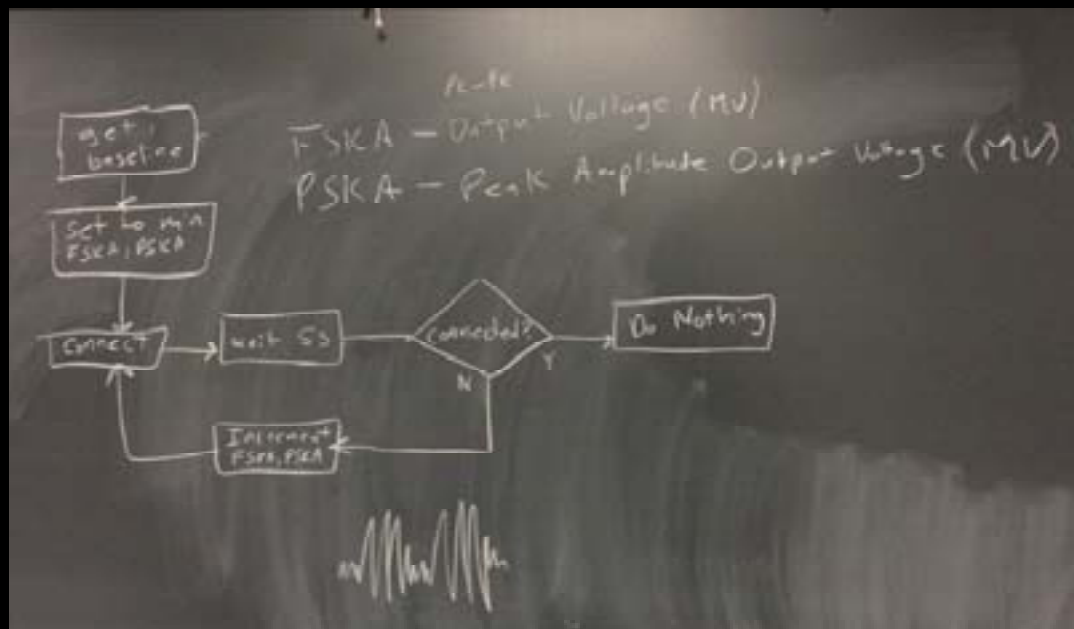
# Acknowledgements

- Dr. Underwood (Group Advisor)
- Carman Frith and Carry Cupka (stakeholders)
- Ben Clouser, John Deseno, Briana Wenger, Melanie Aroniss
- Paul Meyers

Questions, Comments, Job Offers?

# FSKA, PSKA

- FSKA PSKA Control System



# Signal Cable

