IMPLEMENTATION AND EVALUATION PLAN FOR RAMC

TEAM RAR:

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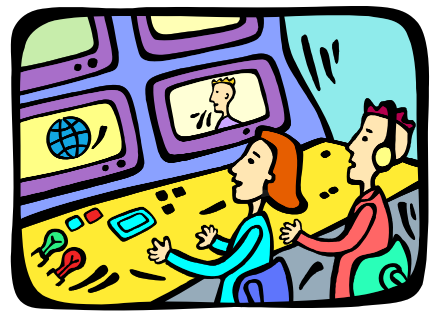
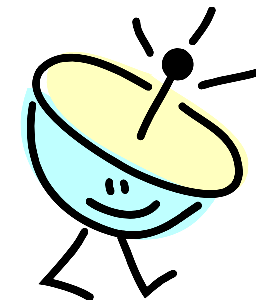
AGENDA

- Project overview
- Design Requirements
- Implementation Plan
- Evaluation Plan
- Conclusion

PROJECT OVERVIEW





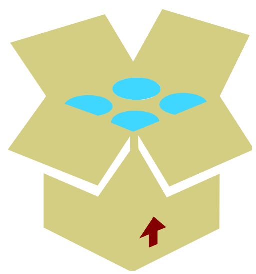
Last semester, we proposed a wirelessly controlled antenna mount with the capability to adjust antenna tilt and azimuth

IMPLEMENTATION PLAN

USER INTERFACE (Tolu and Cyril)

- Write VHDL module for a counter to enable a user to enter input from 0 to 360 (*Jan 23*)

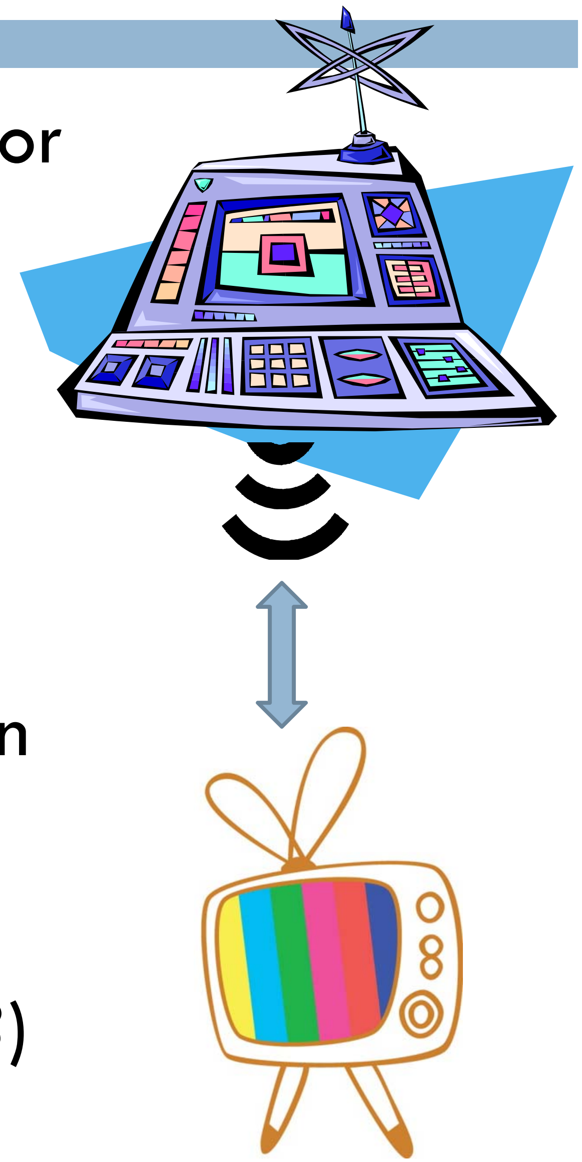
- Create an input holder module to store the user inputs (*Jan 23*)

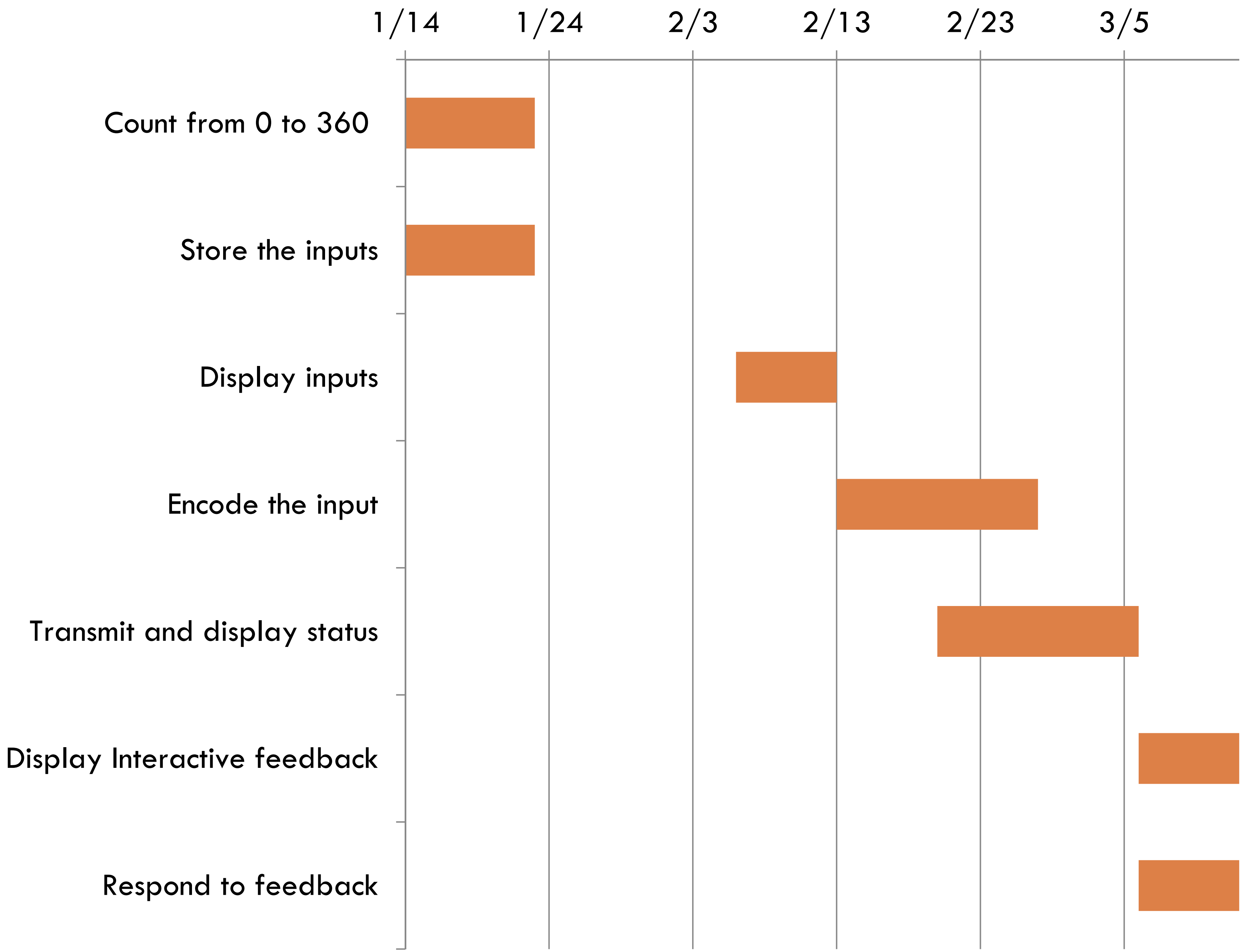


- Display inputs on the board's LCD display (*Feb 13*)

USER INTERFACE (Tolu and Cyril)

- Encode the input values into a stream for transmission (*Feb 20*)
- Transmit input and display transmission status (*Mar 6*)
- Display interactive feedback based on sensor signal (*Mar 13*)
- Response options to feedback (*Mar 13*)

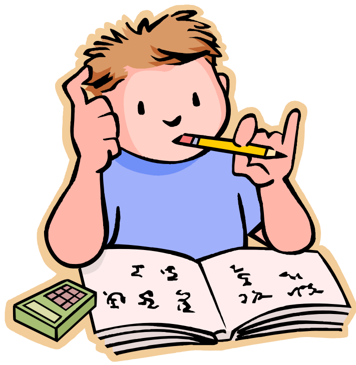




1/14
1/24
2/3
2/13
2/23
3/5
Count from 0 to 360
Store the inputs
Display inputs
Encode the input
Transmit and display status
Display Interactive feedback
Respond to feedback

PHYSICAL IMPLEMENTATION (Iverson and Omolade)

- Design the antenna mount system (*Feb 4*)
- Determine torque and power requirement for motor (*Feb 4*)
- Ordering the motors (*Feb 11*)



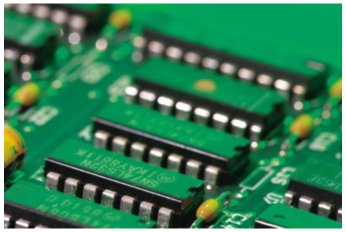
- Determine the motor/driving circuit interface (*Feb 11*)

PHYSICAL IMPLEMENTATION (Iverson and Omolade)

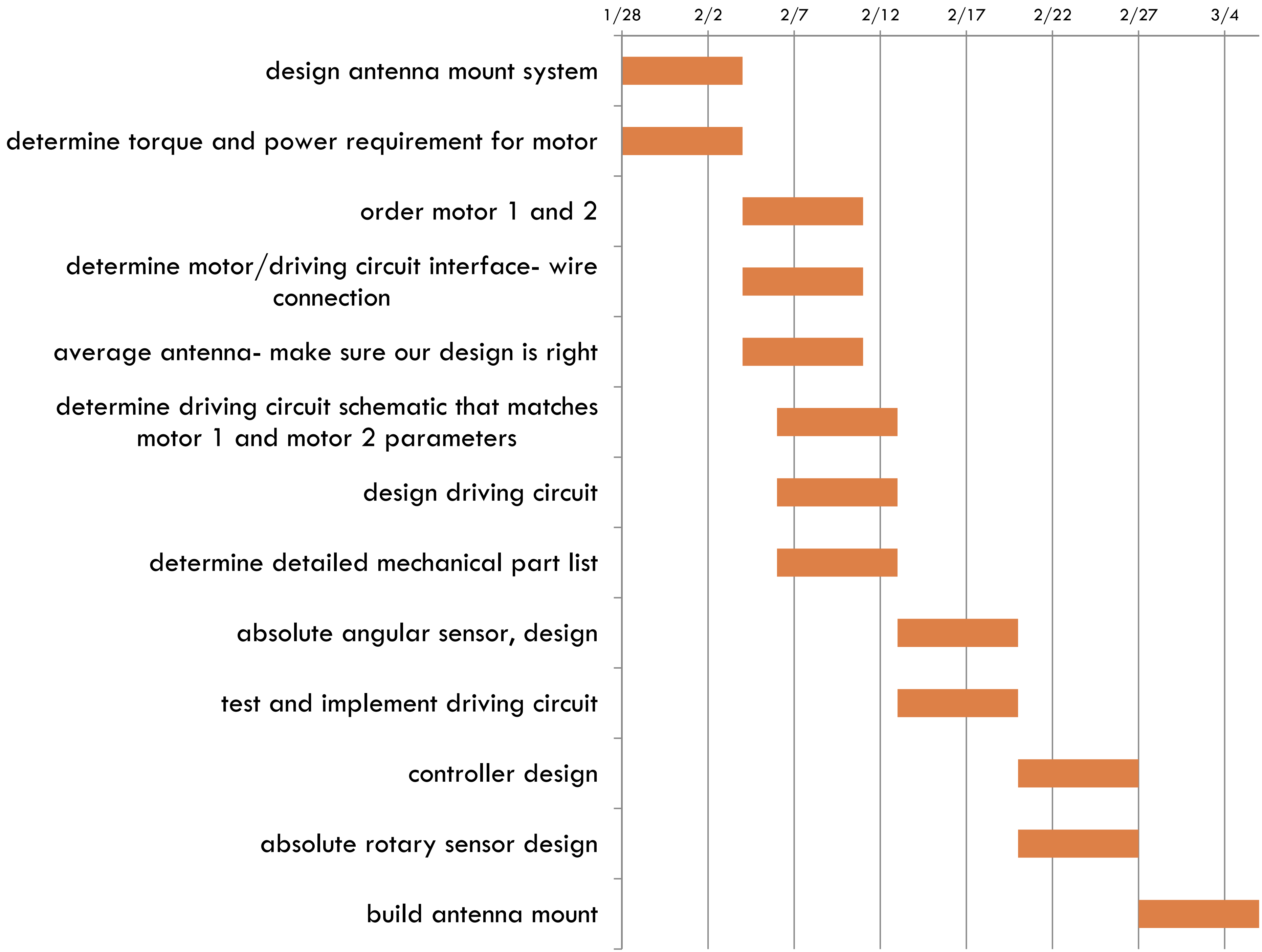
- Determine the driving circuit schematic that matches our motor parameters (*Feb 13*)

- Design the driving circuit (*Feb 13*)
- Determine the detailed mechanical parts list (*Feb 13*)

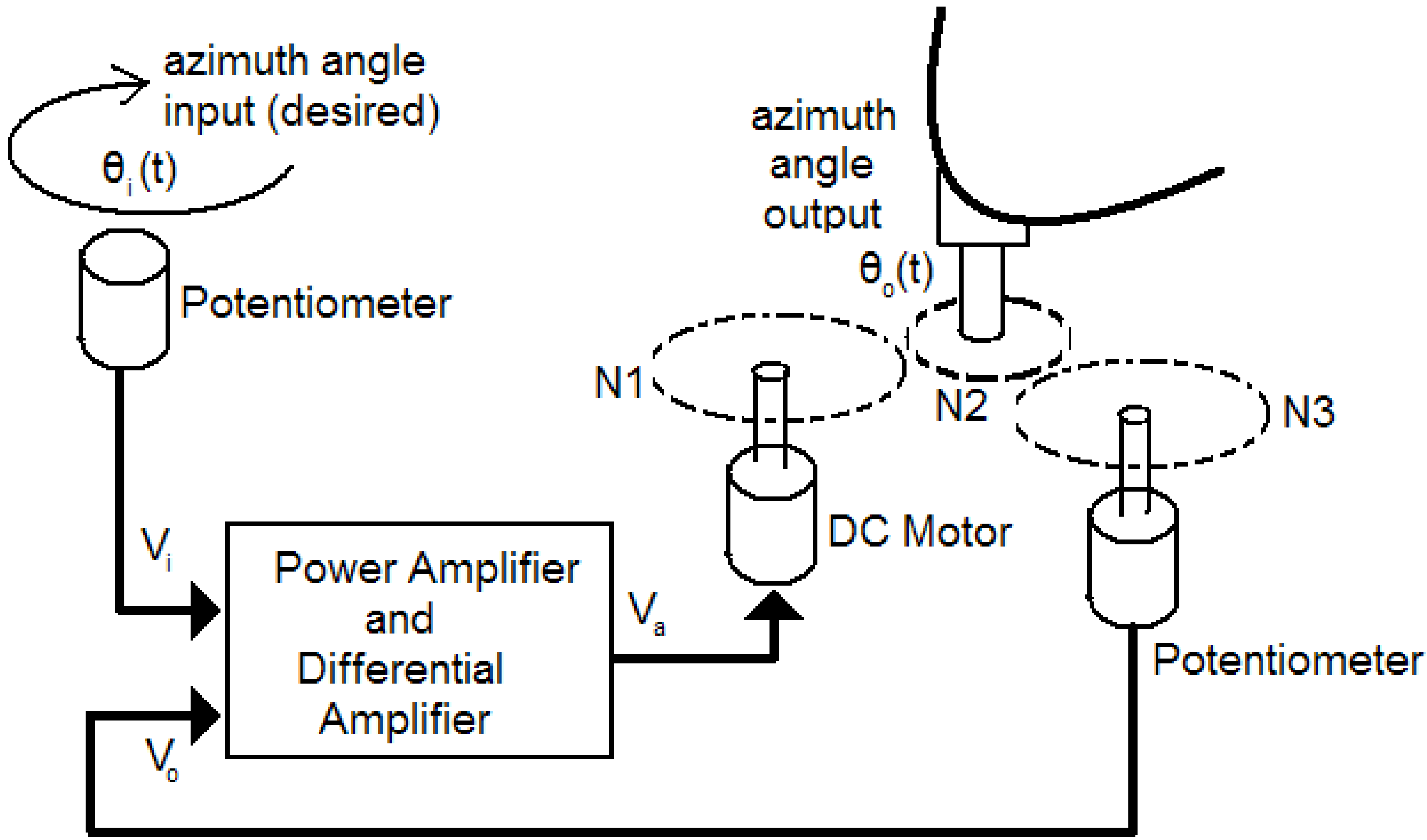
PHYSICAL IMPLEMENTATION (Iverson and Omolade)



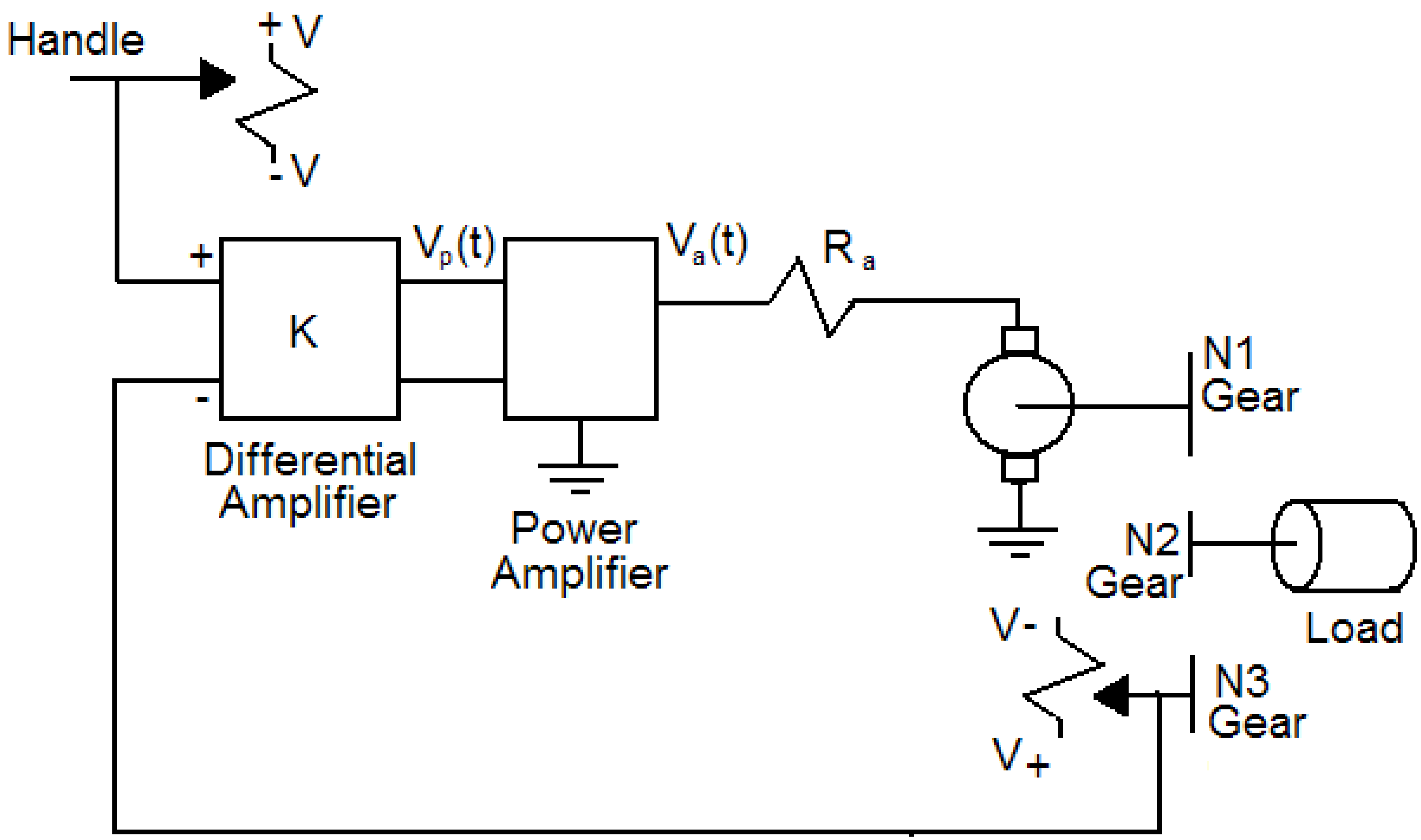
- Design absolute angular sensor (*Feb 20*)
- Test and implement the driving circuit (*Feb 20*)
- Design the controller (*Feb 27*)
- Design the absolute rotary sensor (*Feb 27*)
- Build antenna mount (*Mar 6*)


1/28
2/2
2/7
2/12
2/17
2/22
2/27
3/4
design antenna mount system
determine torque and power requirement for motor
order motor 1 and 2
determine motor/driving circuit interface- wire connection
average antenna- make sure our design is right
determine driving circuit schematic that matches motor 1 and motor 2 parameters
design driving circuit
determine detailed mechanical part list
absolute angular sensor, design
test and implement driving circuit
controller design
absolute rotary sensor design
build antenna mount

Actual Implementation



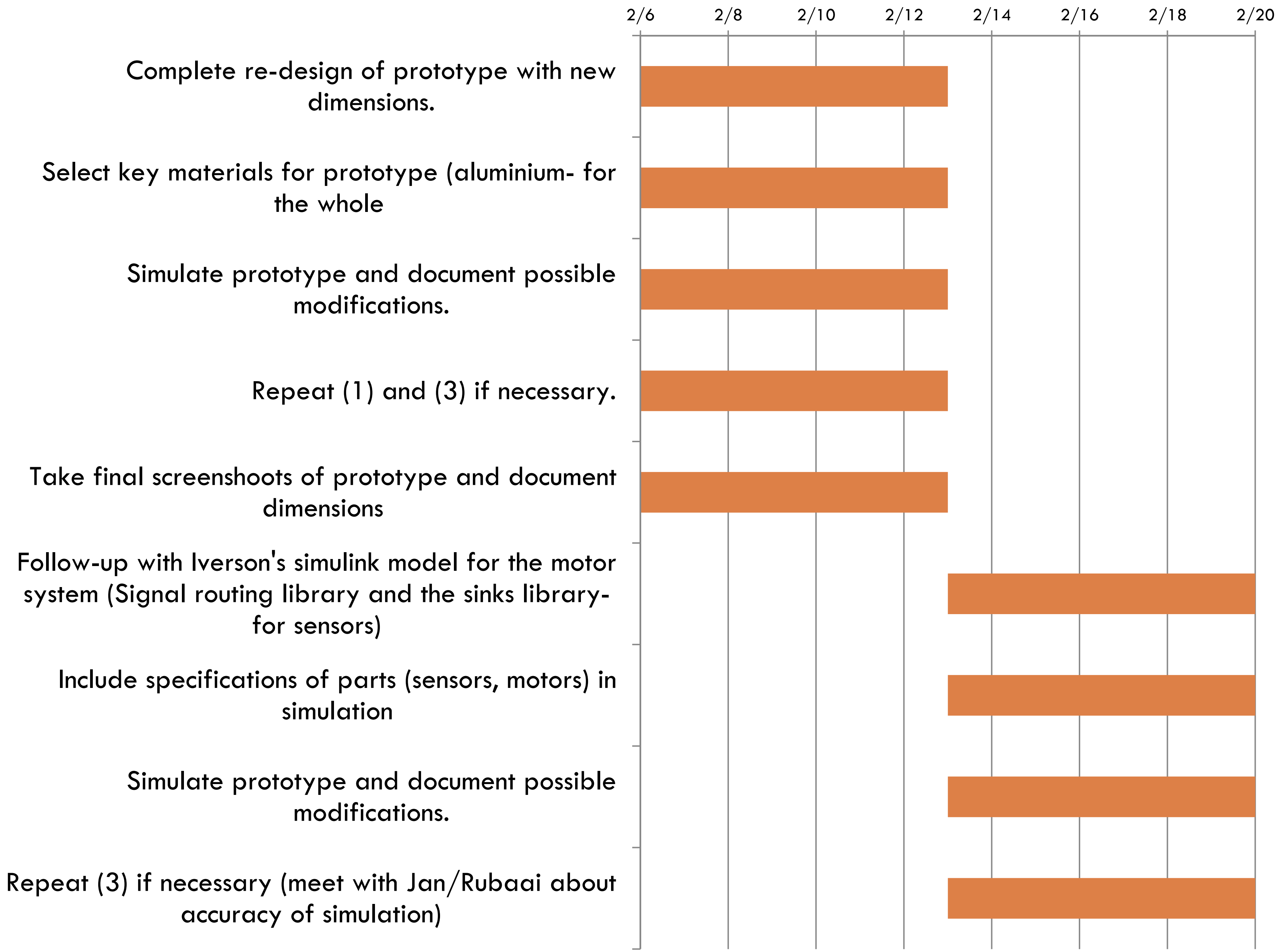
Schematic Diagram



PROTOTYPE SIMULATIONS (Team)

- Complete re-design of prototype with new dimensions
- Select key materials for prototype
- Simulate prototype and document possible modifications
- Reiterate (previous steps) if necessary
- Take final screenshots of prototype and document dimensions

-All due February 13


2/6
2/8
2/10
2/12
2/14
2/16
2/18
2/20
Complete re-design of prototype with new dimensions.
Select key materials for prototype (aluminium- for the whole
Simulate prototype and document possible modifications.
Repeat (1) and (3) if necessary.
Take final screenshoots of prototype and document dimensions
Follow-up with Iverson's simulink model for the motor system (Signal routing library and the sinks library- for sensors)
Include specifications of parts (sensors, motors) in simulation
Simulate prototype and document possible modifications.
Repeat (3) if necessary (meet with Jan/Rubaai about accuracy of simulation)

RISK MANAGEMENT

- Insufficient funds
  - Response: create reserve bank.
  - Control: *borrowing* parts from professors (e.g: Spartan 3E FPGA board)
- Part malfunction
  - Control: extensive simulations before building
  - Response: purchase parts available from close-by vendors

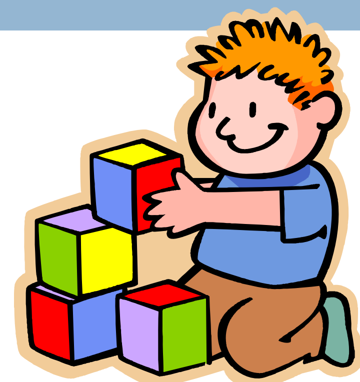
RISK MANAGEMENT (continued)

- Overspecialization
  - Control: Avoided by working on all aspects of design in teams of at least two
  - Response: Increase frequency of "Learning Series"

- Faulty Design
  - Control: allow experts to review design
  - Response: buy pre-fabricated parts already identified

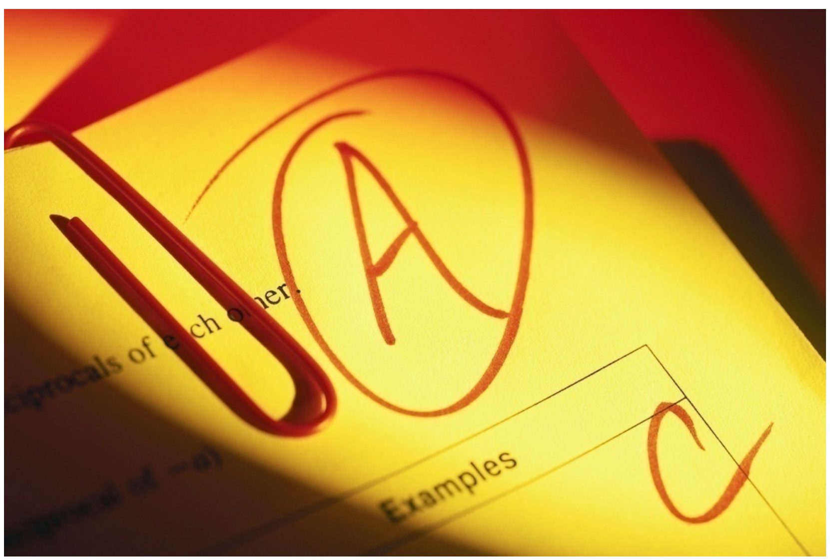
If we run out of time?

- Incremental Design
  - Start small mentality
  - Reduce functionality
  - Place high priority on delivering basic requirements first

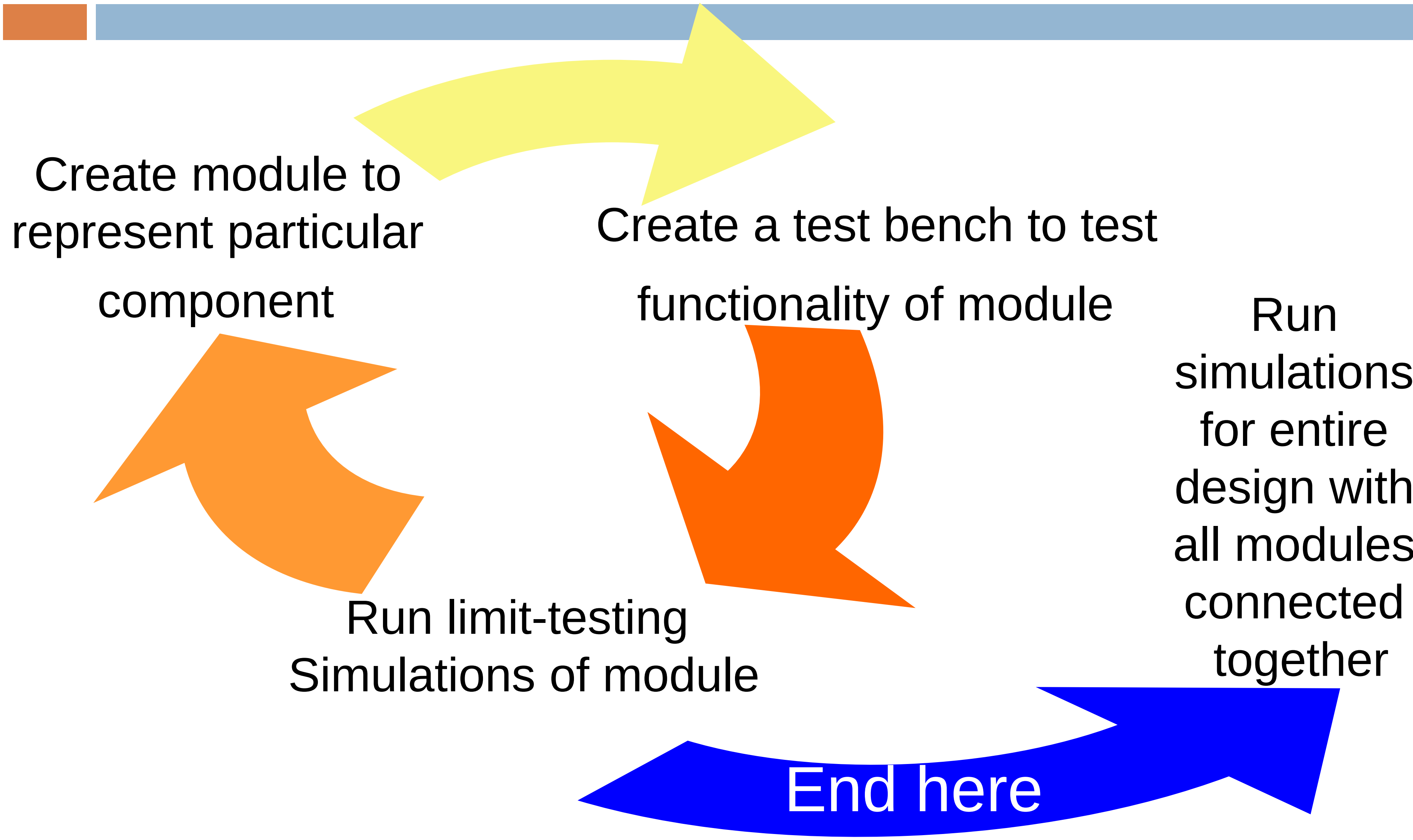


- Purchase prefabricated parts

EVALUATION PLAN



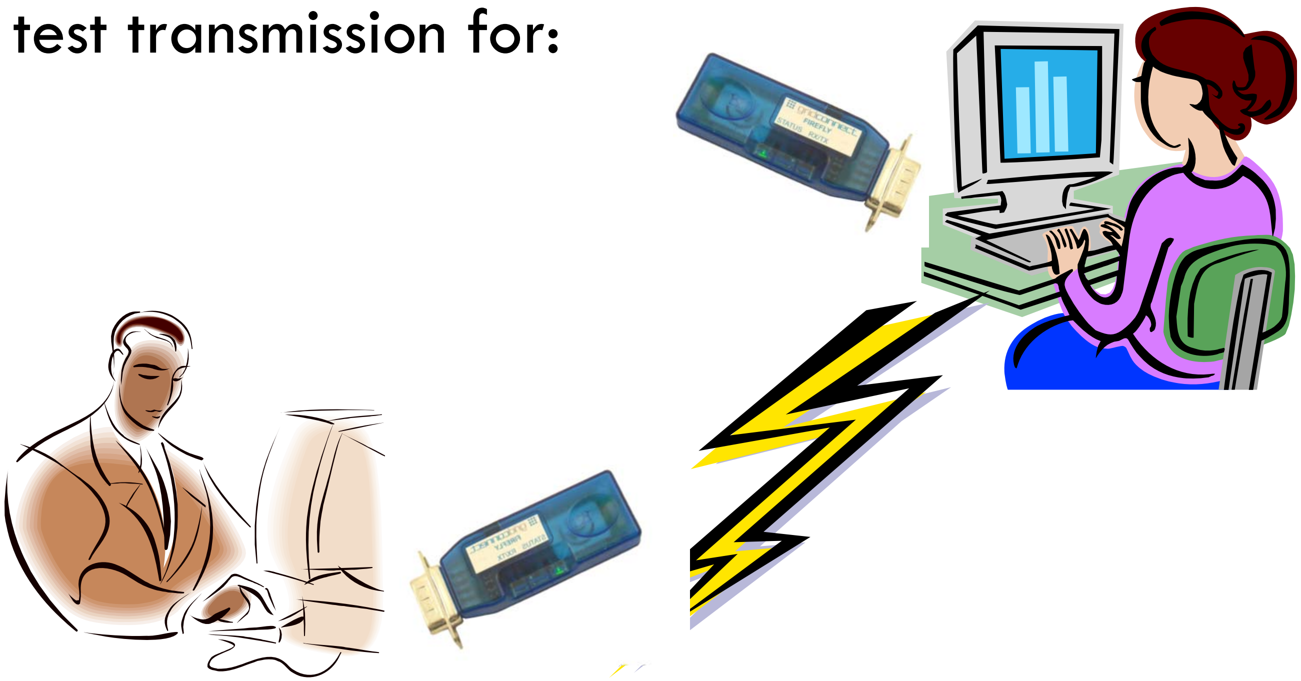
FPGA Test Plan



TRANSMISSION TEST PLAN

- Connect the Bluetooth firefly devices to two desktop computers via their serial ports.

- Set up a connection using the HyperTerminal of the computers and test transmission for:
  - range
  - speed
  - packet loss
  - response time



CONTROLS TEST PLAN

- Build inter-connect blocks of control system in Simulink
- Use Simulink's internal function generator
- In position, velocity, and torque modes, we will simulate the motor's response.
- Use NX6 to conduct stress analysis of our proposed prototype

CONCLUSION

- We have carefully detailed steps of our implementation plan above
- Also included is evaluation plan ensure quality of our final product
- Careful planning and evaluation should ensure that we successfully deliver a functional product by set deadline