



IPRO 310

A vision for Blind Swimmers

The Next Generation

# TECHNOLOGY

## Objectives

- Evaluate approaches by past IPROs
- Research previously unconsidered technologies
- Design and develop a prototype for preliminary testing
- Evaluate performance of prototype and document findings

## Device

# Designing and Building Prototypes for Assisting Blind and Visually Impaired Swimmers

## Research

Radio research

Generating signals

-Simple single frequency oscillator requires less processing

Amplification

-Integrated operational amplifiers are reliable and affordable

Transmission

-Loop antenna can create a barrier of any shape and size

Receiving

-Ferrite core antenna small and compact



Medium Frequency Considerations

-Higher frequencies require shorter antennas but attenuate faster

-Transmission through water causes greater attenuation

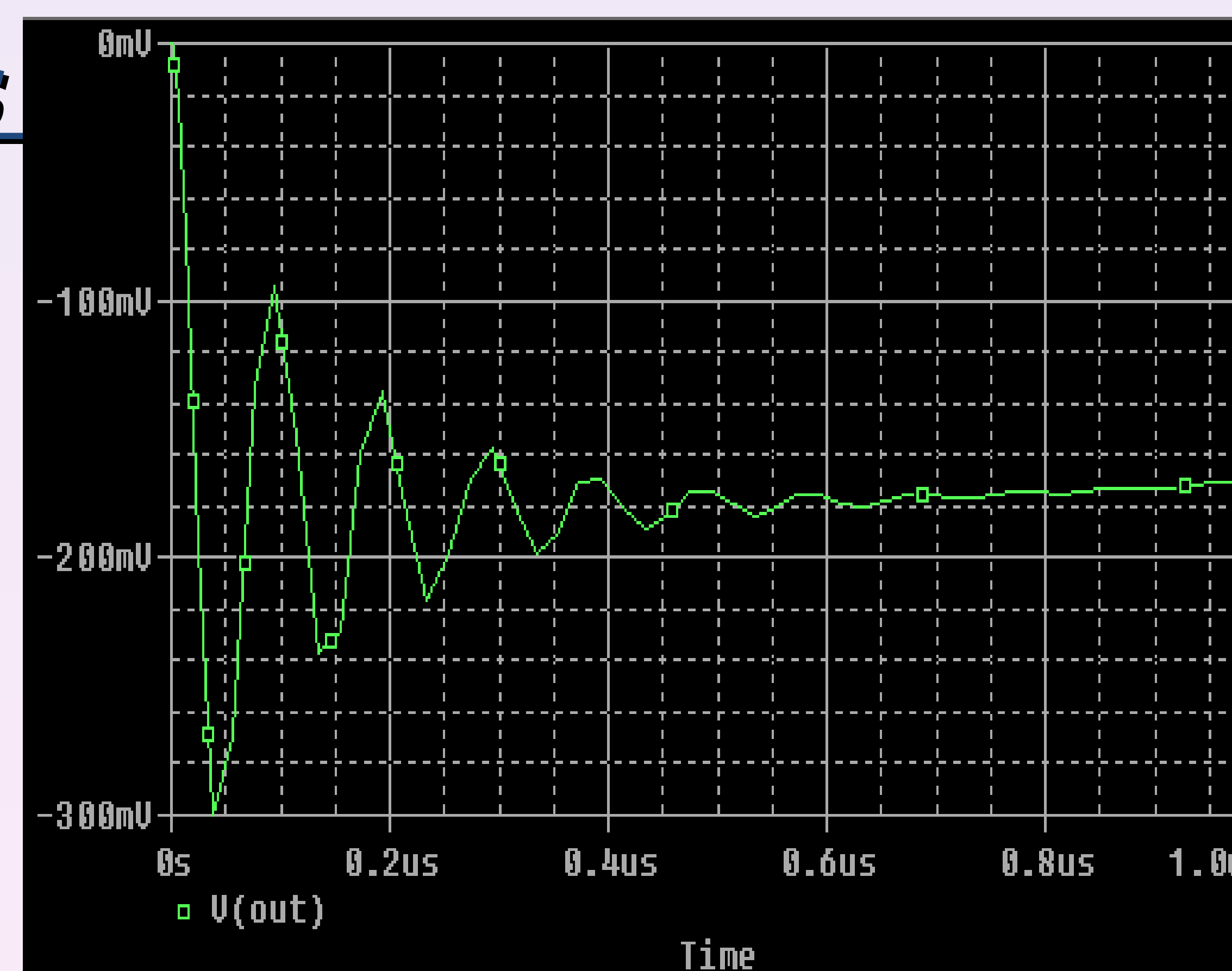
-There are limited frequency options due to FCC regulations

## Conclusion

The technology team met all our objectives. We successfully managed to assess relevant technologies and decided on Radio. We then researched the technology and incorporated the knowledge into our design. We designed and built a prototype device that communicates tactile information to the swimmer. The tactile feedback design was based on the survey collected from the previous three semesters. Theoretically there is a wide range of applications for the technology.

## Testing/ Results

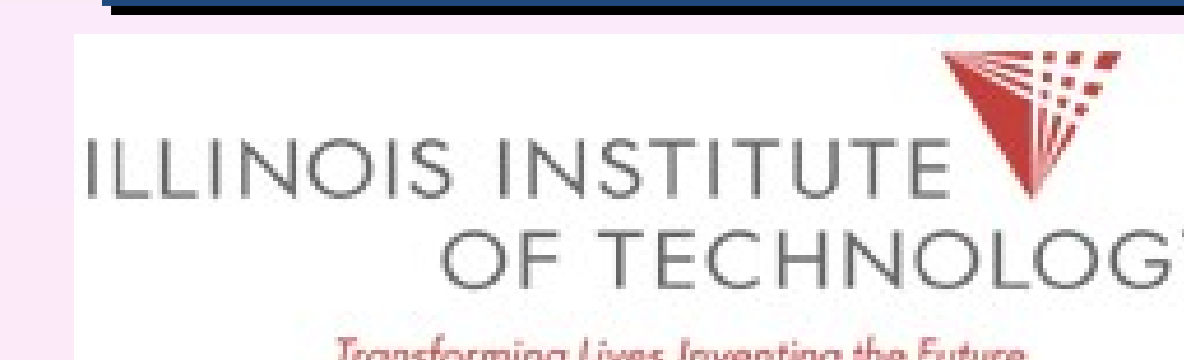
- Tests predicted a potential issue with our standard operation amplifiers
- The slew rate on a typical op amp is not high enough to function properly with our chosen frequency



## Next Steps

- Test cue conflict theory and its effects on disorientation by means of the communication team protocol
- Waterproof the receiver and the transmitter
- Incorporate the receiver into a wristband to maintain low profile

## ACKNOWLEDGMENTS



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