Welcome

- Who am I?
- What are we going to do today?
  - Overview of Harris
  - EDSGN100 project overview
  - Questions
HARRIS OVERVIEW
Who is Harris

- International communications and information technology company headquartered in Melbourne, Florida serving government and commercial markets
  - Publicly listed on NYSE (ticker: HRS)
  - Approximately $5.5 billion annual revenue
  - More than 15,000 employees located in 125 countries around the world
  - Workforce includes nearly 6,000 engineers and scientists
  - Founded in 1895

- Leader in design, deployment and operation of highly-reliable, secure communications systems and information networks for voice, data, imaging and video

- Have hired **over 1100 new grads** over past 5 years

Follow us on Facebook to see what we’re up to! (facebook.harris.com)
R&D fuels new products

$1.0 billion in fiscal 2010

Government funded $721

Internally funded $326

Antennas

Electro-optics

Signal Processing

Microelectronics

Integrated Information Systems

Image Processing

Mechatronics
Business segments

RF Communications
Tactical and land mobile radios, systems and networking apps for global Defense, Security and Public Safety markets

Government Communications Systems
Technology and systems integration for Defense, National Intelligence and Federal/Civil markets

Integrated Network Solutions
IT services, managed services, cyber integration, and media solutions supporting Government, Energy, Healthcare, Broadcast and Enterprise networks
Government Communications Systems

**Defense Programs**
- SATCOM systems, advanced Avionics, and wireless defense communications systems
- Customers include U.S. DoD, Army, Air Force, Navy and Marine Corps

**National Intelligence Programs**
- Intelligence, Surveillance and Reconnaissance (ISR) solutions that collect, process, distribute and analyze data
- Space electronics and structures
- Customers include NSA, NRO, NGA and other agencies

**Civil Programs**
- Communications and information processing technologies that enable high-reliability networks
- Satellite ground and weather processing
- Customers include FAA, NOAA and Census Bureau
Integrated Network Solutions

**Harris IT Services**
- Design, deploy and operate secure, reliable communication systems and information networks
- End-to-end solutions in transport, hosting and information services; program management, enterprise services management, and information assurance

**Harris CapRock Communications**
- Managed satellite communications solutions serving remote locations and harsh environments around the world

**Healthcare Solutions**
- Secure infrastructure, imaging and informatics solutions that connect, process and analyze data to reduce costs and improve patient outcomes
RF Communications

Tactical Communications

• Tactical radio products and integrated systems
• JTRS-approved; delivering the JTRS promise today
• Leading the transformation from narrowband to wideband networking
• Tactical ISR products and applications
• Communications Security products

U.S. Department of Defense

International

Public Safety & Professional Communications

• Full range of Land Mobile Radio products
• Integrated IP-based communications systems
• Advanced 4G/LTE broadband communications systems
University Relations

- Internships & co-op programs
  - Robust real-work experience
  - Tours of Harris Facilities & Labs
  - Executive Leadership Panel
- Endowments, scholarships and research projects
- Participation on advisory councils and in “cluster organizations”
Careers At Harris Corporation

New Grads have the opportunity to join Harris as:

- Software Engineers
- Electrical Engineers
- Mechanical Engineers
- Manufacturing / IE
- Network Engineers
- Quality Engineers
- Systems Integration & Test Engineers
- Systems Engineers
- Finance
- Supply Chain/Procurement
- Human Resources
EDSGN100 PROJECT OVERVIEW
Problem Description

• Harris has a problem that most of you are probably familiar with. Our devices require electrical power to operate which is often provided by batteries.
• Batteries never last as long as you want them to and always quit at the worst possible time.
• The problem is critical for Harris because our users often depend on our equipment to keep them alive.
Existing Solutions

What does Harris and our customers do today?

On the Power Source Side
• More/Larger batteries: added cost, weight, size
• Better batteries: technology is what it is today
• Prime Power: not always available

On the Power Consumption Side
• Reduce power (don’t use as much): hard to do, lost functionality
• Modify use (don’t use as often): burden on the user
Design Challenge

• Harris wants users to be able to operate their devices and charge their batteries without the use of “prime” (AC or vehicle) power.

• Design Statement: Design a charger system for mobile devices that operates from sources other than standard wall or vehicle power. It must meet the following specifications and guidelines:
  – It must successfully address the use case that you have identified. Constraints such as weight, size, cost, ease of use, ruggedness, etc., will depend on the identified use case.
  – It must use two different sources of “alternative energy”.
In addition to the objectives in the previous slide, the design should address the following specific issues which are important to our users:

- **Safety**: Identify potential safety issues and describe how these issues are addressed.
- **Economic viability**: Describe overall system economics and compare to other possible solutions for the use case, i.e., a consumer may not be willing to spend as much for the convenience, but a first-responder may to ensure connectivity.
- **Environmental impact**: Describe the pros and cons of your system’s environmental impact.
• Identify a “use case” that your design will target.
  – “Use Case”: A specific scenario that a user would operate in.
    The first and most important step in defining an engineering
    problem.
  – Example: “A soldier in the desert with a manpack radio.”

• Develop a list of constraints/requirements that
  are important for that use case.
  – Requirements set the bar for your design and tell you when you
    are or are not successful.
  – Requirements may not be all technical (e.g. cost, portability,
    safety).
  – The better you do at identifying requirements and making sure
    they cover the use case the easier it will be to determine whether
    a solution works.
Design Methodology (cont.)

- Come up with a potential solution.
- Review (test) the solution against the requirements.
  - Which requirements are met and which are not.
  - Can the design be modified to meet the failed requirements.
  - Are the requirements too stringent? Can we bend on one or two if the design does well meeting the others?
- Repeat the above two steps until all of the requirements are met.
  - Refine the design or start fresh.
Project Deliverables

• Each instructor will clarify expectations and due dates.
• The final deliverable will be a technical report and summary poster which includes:
  – A definition of the use case and related constraints.
  – The proposed solution and alternative solutions considered.
  – Benchmarking analysis of existing charging solution on the market.
  – A block diagram of the system and a concept of operations.
  – Analysis of energy consumption profile and charging requirements.
  – A physical model of the alternative power source charger.
  – Up-front and operating costs for the system.
Questions?