

DEFINITIONS

Wearable Electronics:

Active Electronic
Devices or Systems
Worn like a shirt
or like a watch.



Technologies For:

Subsystems
or Components.

Hard or soft.

Public or Private.



OVERVIEW

Applications

- Communication
- Commerce
- Information
- Medical
- Identity
- Appearance

Technologies

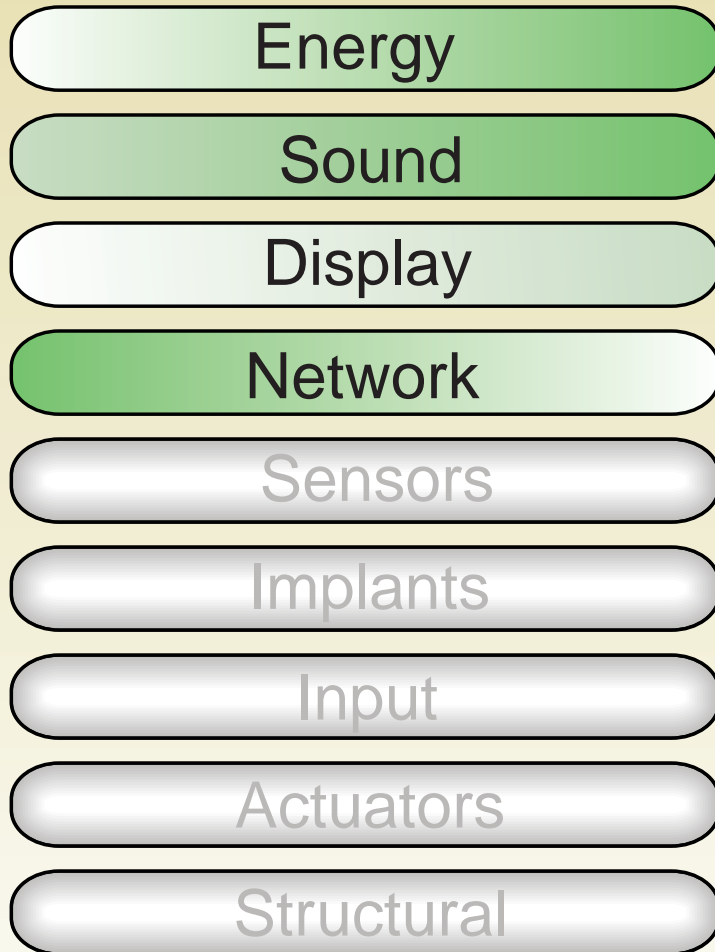
- Energy
- Sound
- Display
- Network
- Sensors
- Implants
- Input
- Actuators
- Structural

COMMUNICATIONS

Communications

(for example)

Cellular Phone



Lithium Ion Battery

Speaker, Earbud, Microphone

Small hand-held LCD

GSM, CDMA, TDMA, etc.



Energy

Sound

Display

Network

Sensors

Implants

Input

Actuators

Structural

Batteries:

Hard (NiCad, Lilon)

Flexible (polymer)

Solar Cells

Polycrystalline (rigid, flat)

Amorphous (shaped, flexible)

Mechanical

Momentum (self-winding watch)

Parasitic (shoe power)

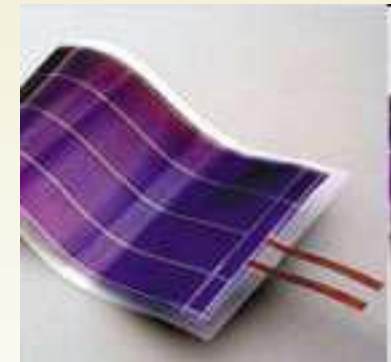
Compressed Gas (nitrogen)

Chemical Conversion

Sugar Combustion (implants)

Fuel Cells

Beamed Power (Tesla, TI Microwave)



SOUND

Energy

Sound

Display

Network

Sensors

Implants

Input

Actuators

Structural

Speakers

Dynamic (voice coil)

Piezo Electric

Piezo Heterodyne (media lab)

Earphones

Near Field (Neckphone)

Sound Detection

Microphone (omni, directional)

Boom Mike

Directional Headmount (Jabra)

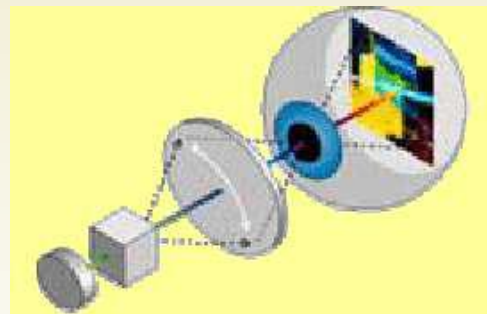
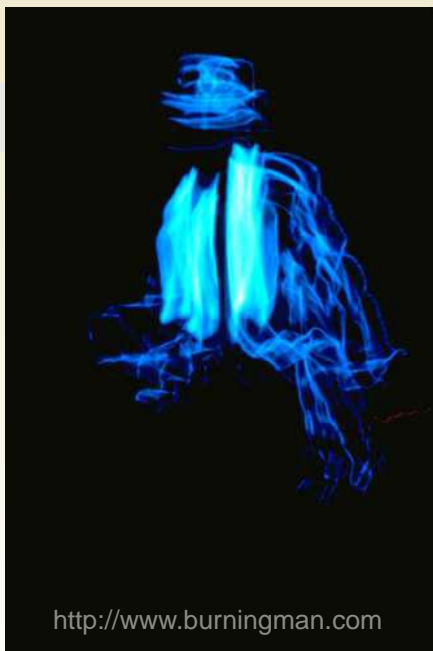
Synthetic Aperture Mike



DISPLAY

- Energy
- Sound
- Display**
- Network
- Sensors
- Implants
- Input
- Actuators
- Structural

- Head Mounted Display
 - “Eye Phones” (obscuring)
 - “Virtual Vision” (superposed)
 - UW HIT (direct LASER write)
- Hand Held Display (Cell Phone)
 - LCD
 - OLED (flexible)
 - PDLCD (flexible)
 - LED (flexible matrix)
- Larger Display Technologies
 - Fiber Optic
 - ePaper (microballs etc.)
 - LED
 - Electro-Luminescent



NETWORK

Cellular (6km)

3G Cellular (384kbs - live video)

WiFi (802.11a/b: 100m)

Bluetooth (10m)

IR (line of sight)

VLF BAN (150khz, 1m, theremin)

PublicPrivate