

Ultra Wideband (UWB) Antenna

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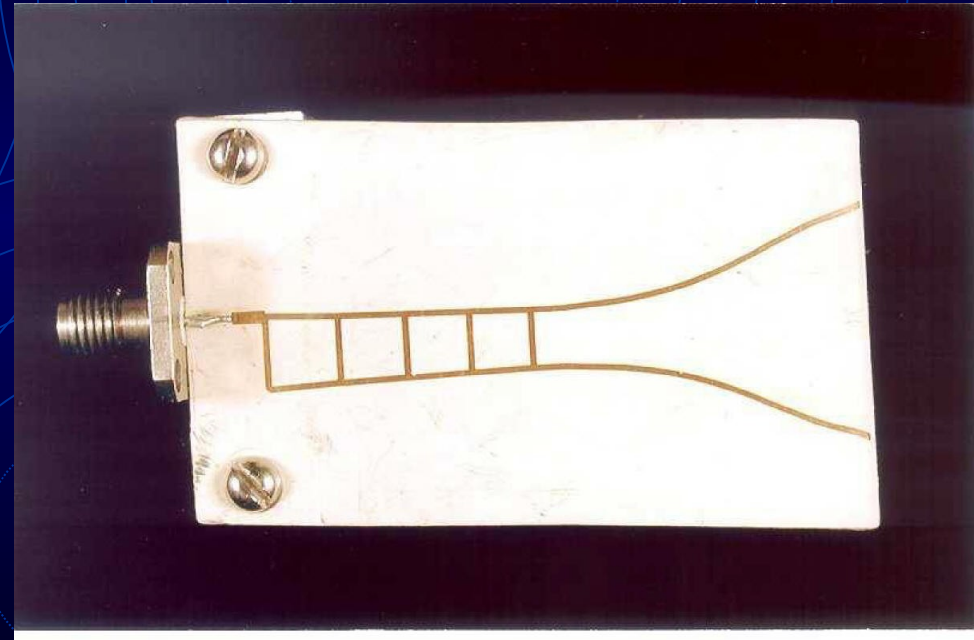
Bradley University

Outline of Presentation

- Project Summary
 - Introduction to UWB
 - Introduction to Antennas
- Review of Previous Works
- Block Diagram
- Requirements and Specifications
- Equipment List
- Schedule

Intro to Antennas

- An antenna is a transducer between a guided wave propagating in a transmission line, and an electromagnetic wave propagating in an unbounded medium, like air.



Intro to UWB

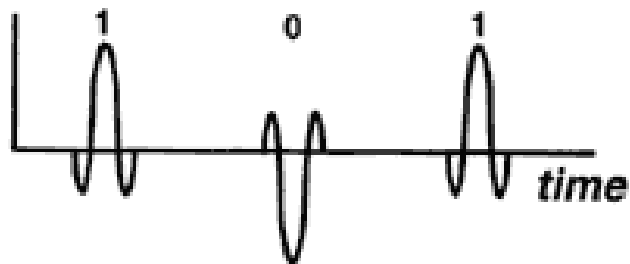
- UWB is defined as a system having a bandwidth greater than 500 megahertz (MHz).
- UWB signals are pulse-based waveforms compressed in time, instead of sinusoidal waveforms compressed in frequency.

Intro to UWB (cont.)

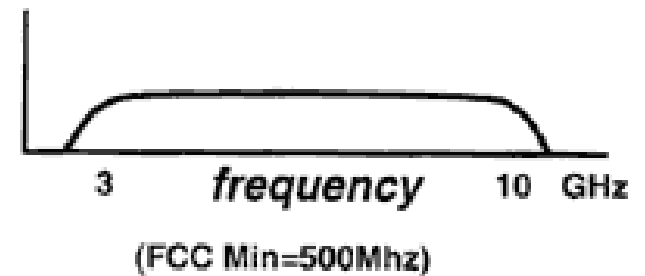
Ultra Wideband
Communication

Impulse
Modulation

Time-domain behavior

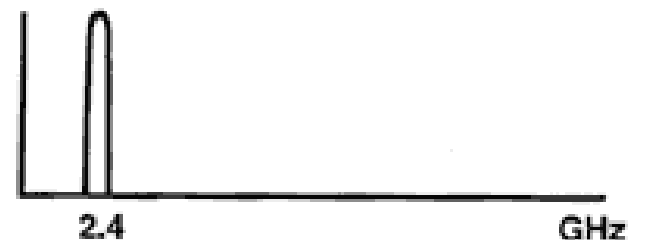
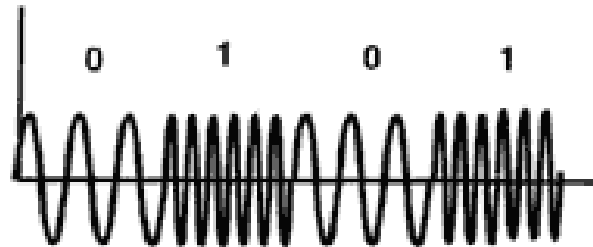


Frequency-domain behavior



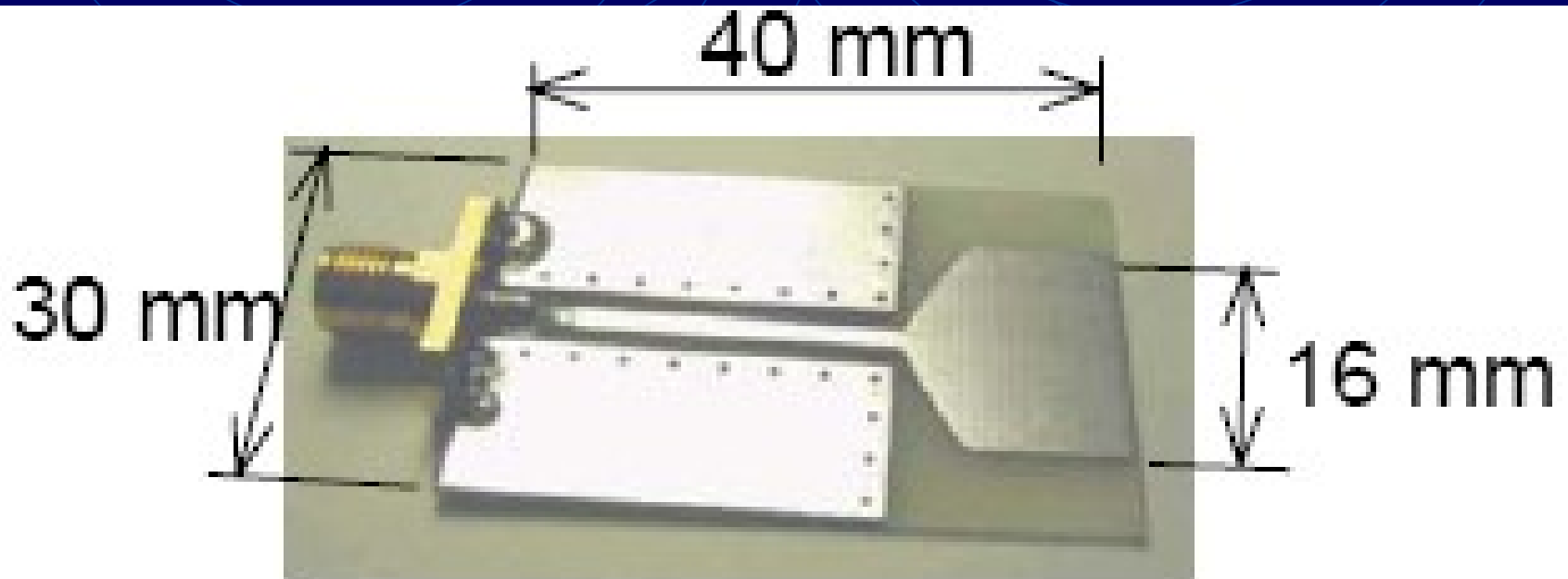
Narrowband
Communication

Frequency
Modulation



Review of Previous Works

- Picture of a Monopole Antenna



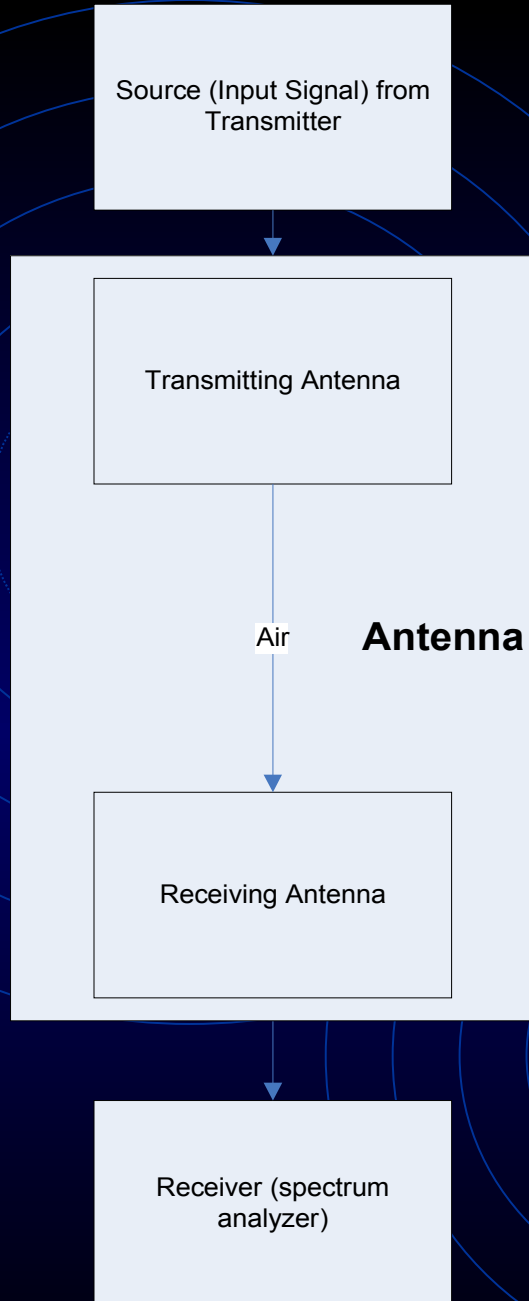
Review of Previous Work (Standards)

- Frequency Range: 3.17 GHz to 10.56 GHz
- Channel Spacing: 528 MHz
- Symbol/Chip Rate: 3.2 MHz
- Sub Carrier Spacing: 4.125 MHz
- Others can be seen at
<http://cp.literature.agilent.com/litweb/pdf/59pdf>

Review of Previous Works (Patents)

- Contoured triangular dipole antenna <http://www.freshpatents.com/Contoured-triangular-dipole-antenna-dt20071.php>
- Dual Sphere UWB Antenna <http://www.freepatentsonline.com/20070247371.html>
- Electrically small planar UWB antenna apparatus and related system <http://www.patentstorm.us/patents/6590545.html>

Block Diagram



Requirements and Specifications

- Omni-directional
- Small in size, low in cost
- VSWR less than 2
- Gain less than 5dB and relatively constant
- Impedance Matching

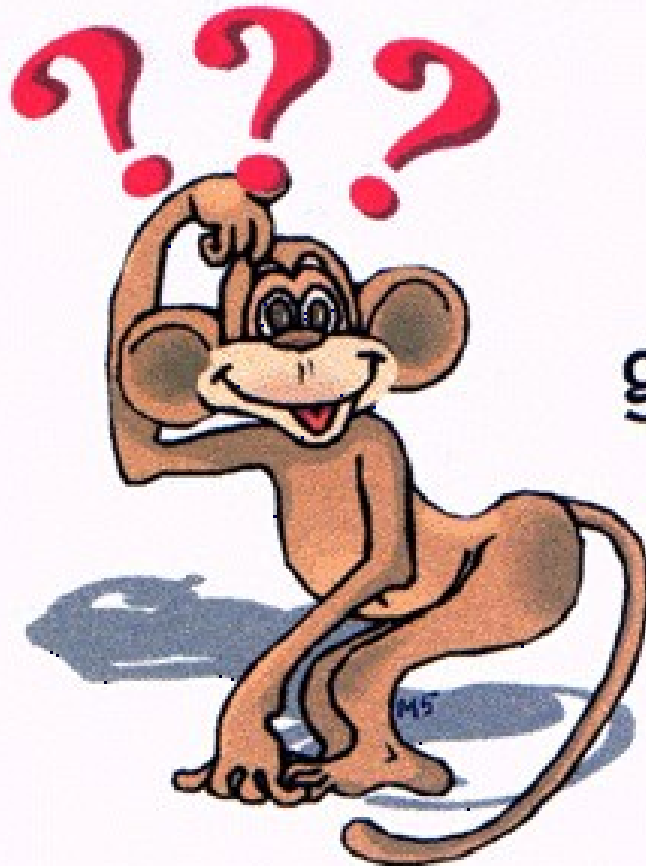
Equipment List

- Network analyzer - HP8722C or HP8410C
- Spectrum analyzer - HP8593E or HP8559A
- Signal generator - HPE4433B
- Agilent Advanced Design System (Ver 2004A)
- Sonnet 10.52
- Anechoic Chamber
- Agilent VEE pro

Schedule

Schedule for UWB Antenna Senior Project						
Week	Date	Objective				
1	24-Jan-08	Computer Designing (Sonnet)				
2	31-Jan-08	Computer Designing (Sonnet)				
3	7-Feb-08	Designing Antenna				
4	14-Feb-08	Designing Antenna				
5	21-Feb-08	Designing Antenna				
6	28-Feb-08	Build Antenna				
7	6-Mar-08	Build Antenna				
8	13-Mar-08	Build Antenna				
9	27-Mar-08	Possible Design Changing				
10	3-Apr-08	Possible Design Changing				
11	10-Apr-08	Possible Design Changing				
12	17-Apr-08	Testing and Recording (Anechoic Chamber)				
13	24-Apr-08	Testing and Recording (Anechoic Chamber)				
14	1-May-08	Final Report and Presentation				
15	8-May-08	Final Report and Presentation				

Questions



Questions
are
guaranteed in
life;
Answers
aren't.