

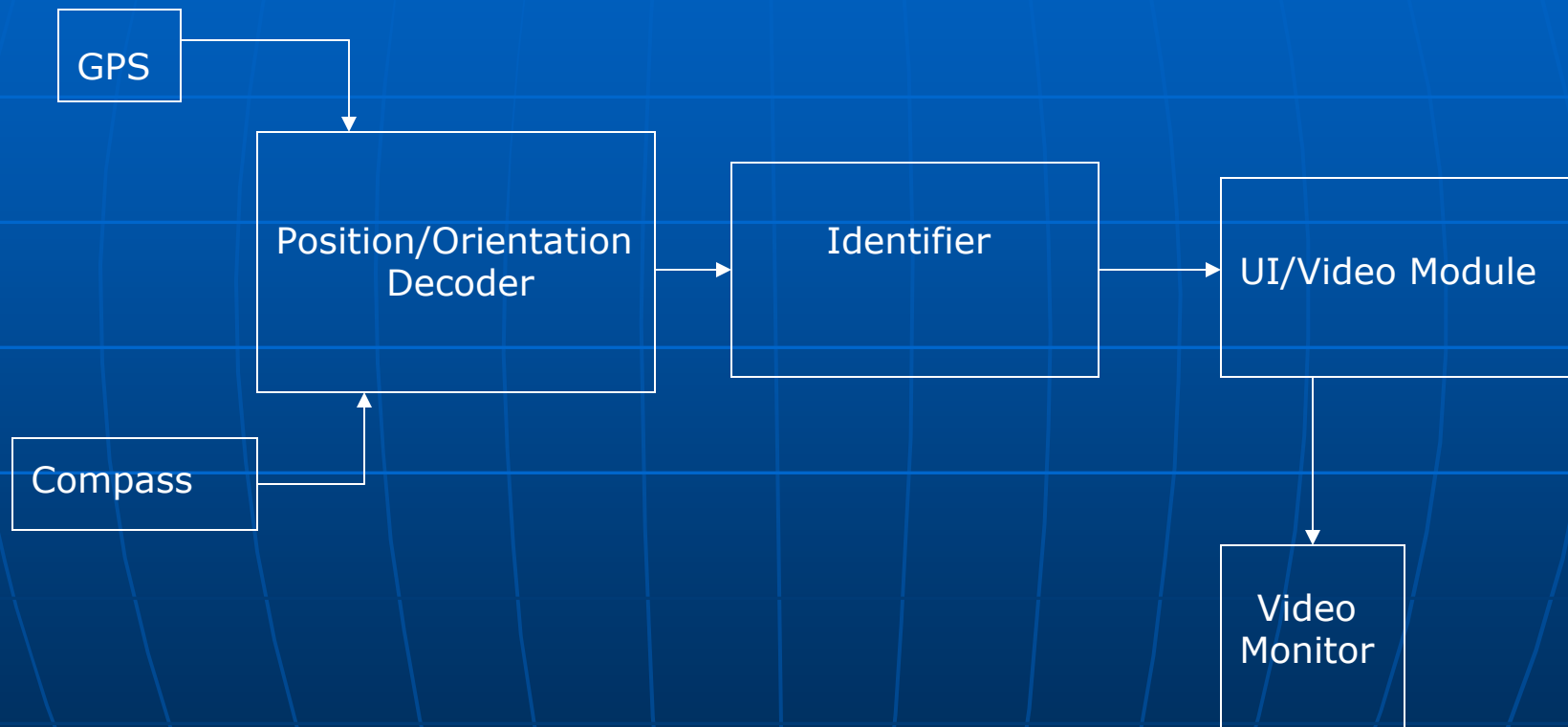
The Local

Christopher Perez

Justin Pun

Jonathan Varsanik

System Structure

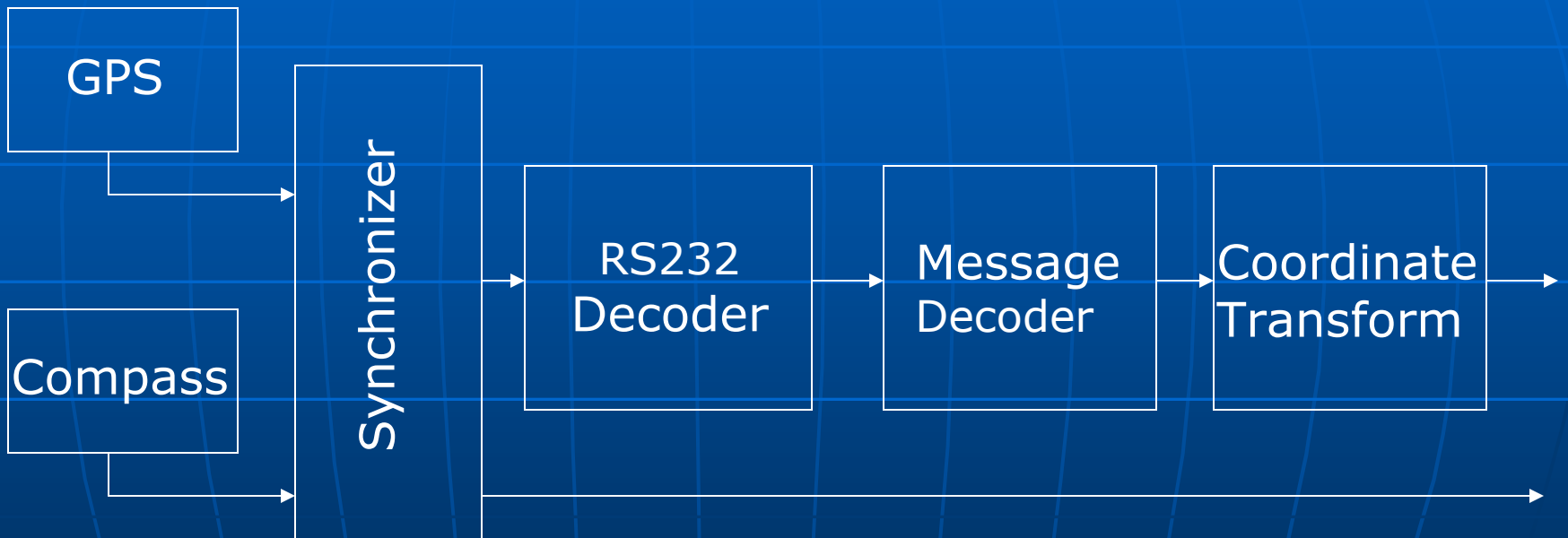


Device Functions

- Locator
 - Indicates current position on a local map.
- Identifier
 - Provides information about desired building.
- Tour guide
 - Takes users on a “tour” by providing information about surroundings.

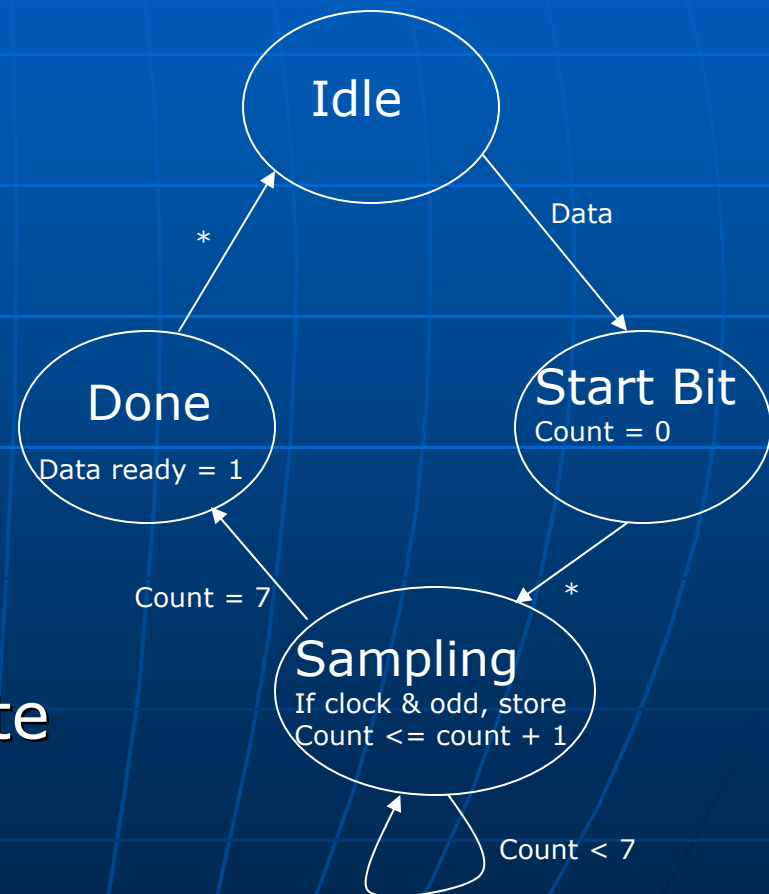
Locator Portion

GPS and Compass



RS232 Interface

- Single ended serial communication standard
- 10 Bits
 - Start bit
 - 8 data bits
 - Stop bit
- Asynchronous
- To Decode
 - Listen for start bit
 - Time form local clock
 - Store data bit at data rate

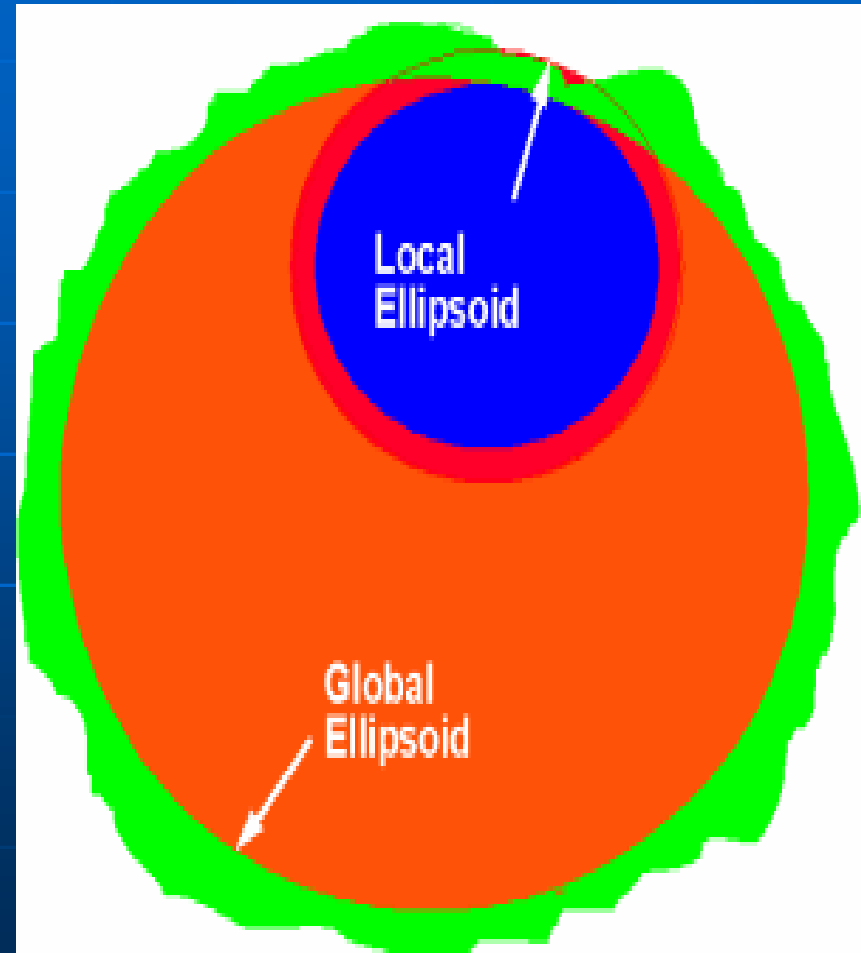


Message Decoder

- GPS uses NMEA Protocol
 - Identifying header
 - Comma separated fields
- To Decode
 - Listen for \$GPGGA header
 - Parse message
 - Store Coordinates

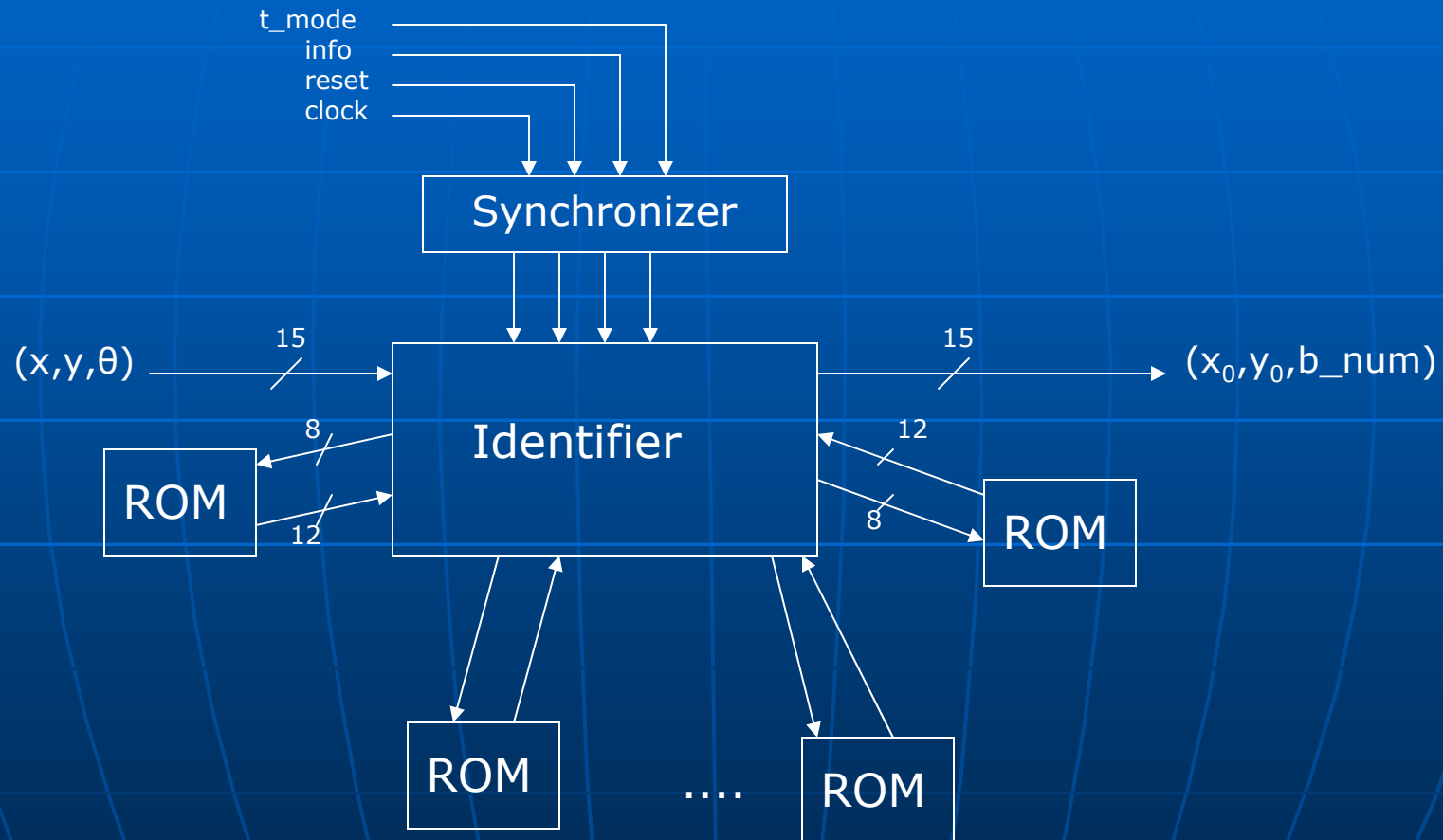
Coordinate Transformer

- Our map is flat, but the world is not.
 - The globe isn't a sphere, either
- WGS Protocol
 - Accurate way to convert Latitude/Longitude to flat local space
- Output position in locally flat space



Identifier Portion

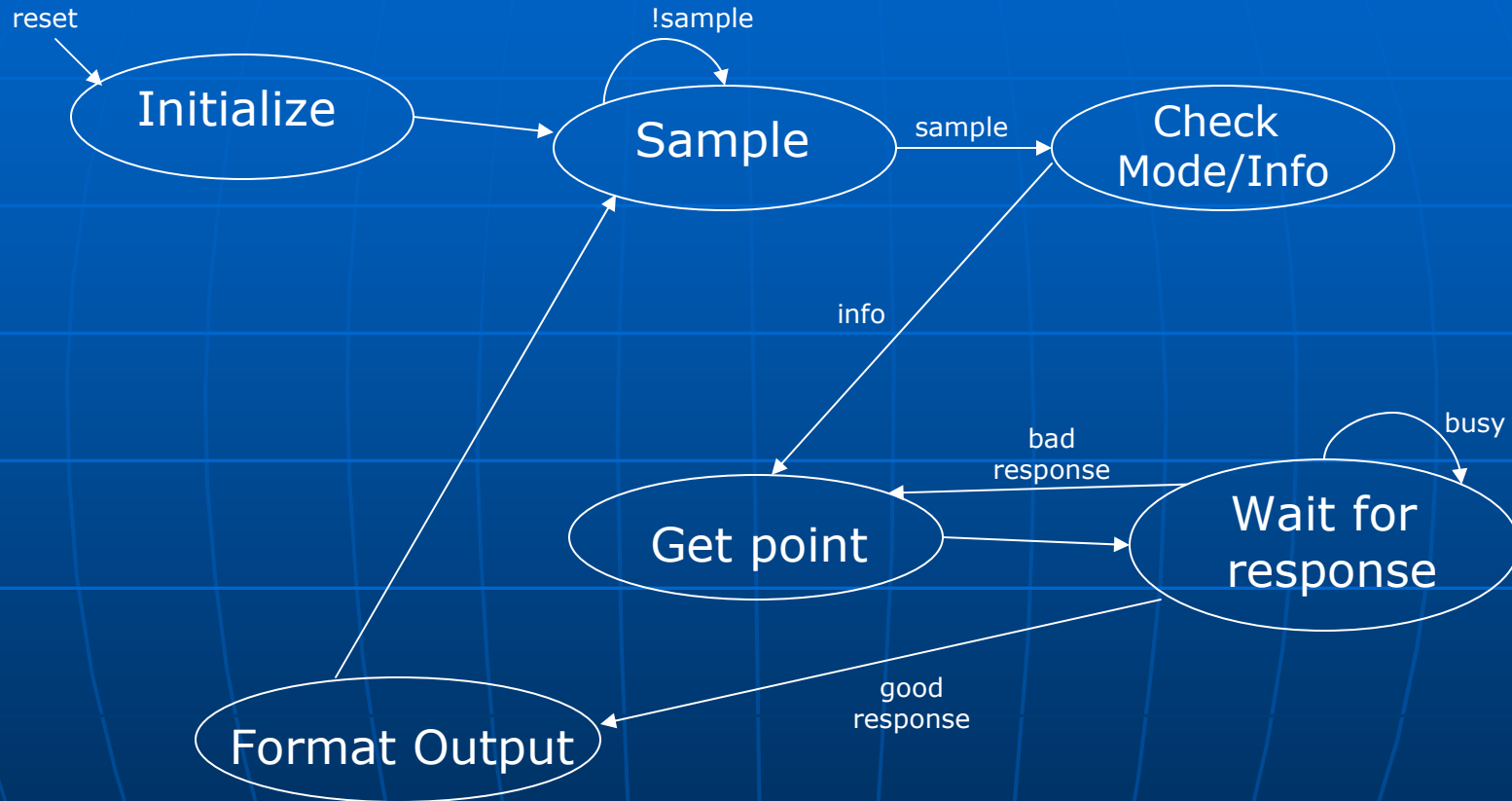
Functional Block Diagram For Identifier



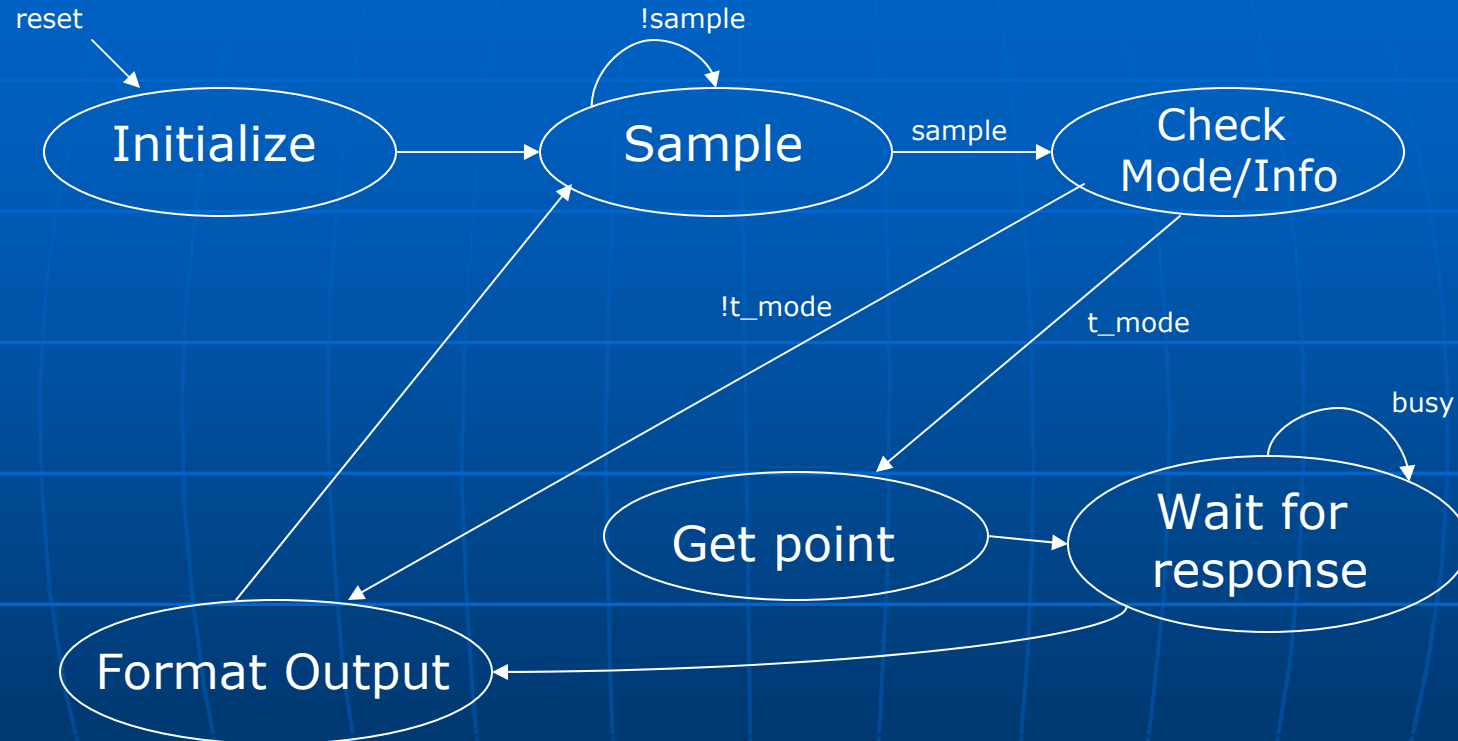
Functionality of Identifier

- Controls the query of points (reading from object memory for each object)
- Determines line of sight coordinates
- Passes building number of interest (if in tour mode or if info button pressed) as well as device position to video module

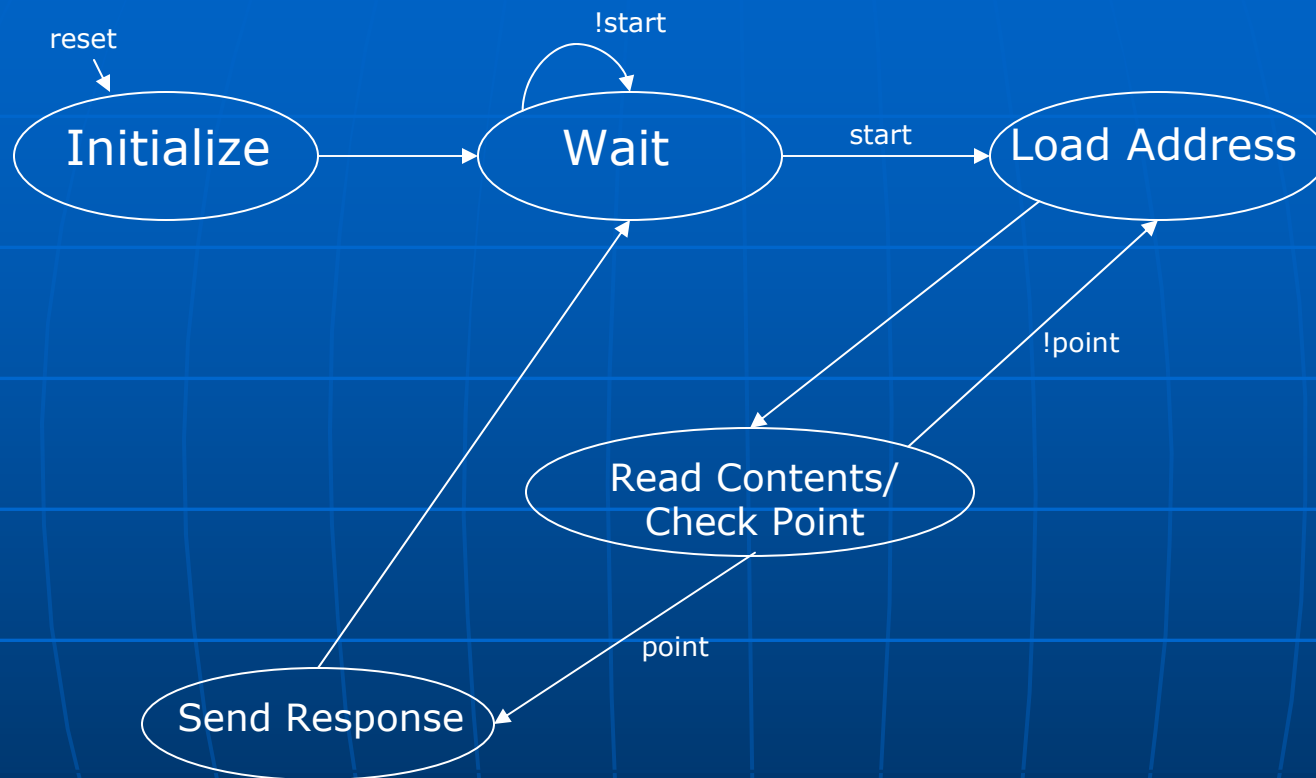
Control FSM (Info Mode)



Control FSM (Tour/Map Mode)



Reading ROMs



Video Portion

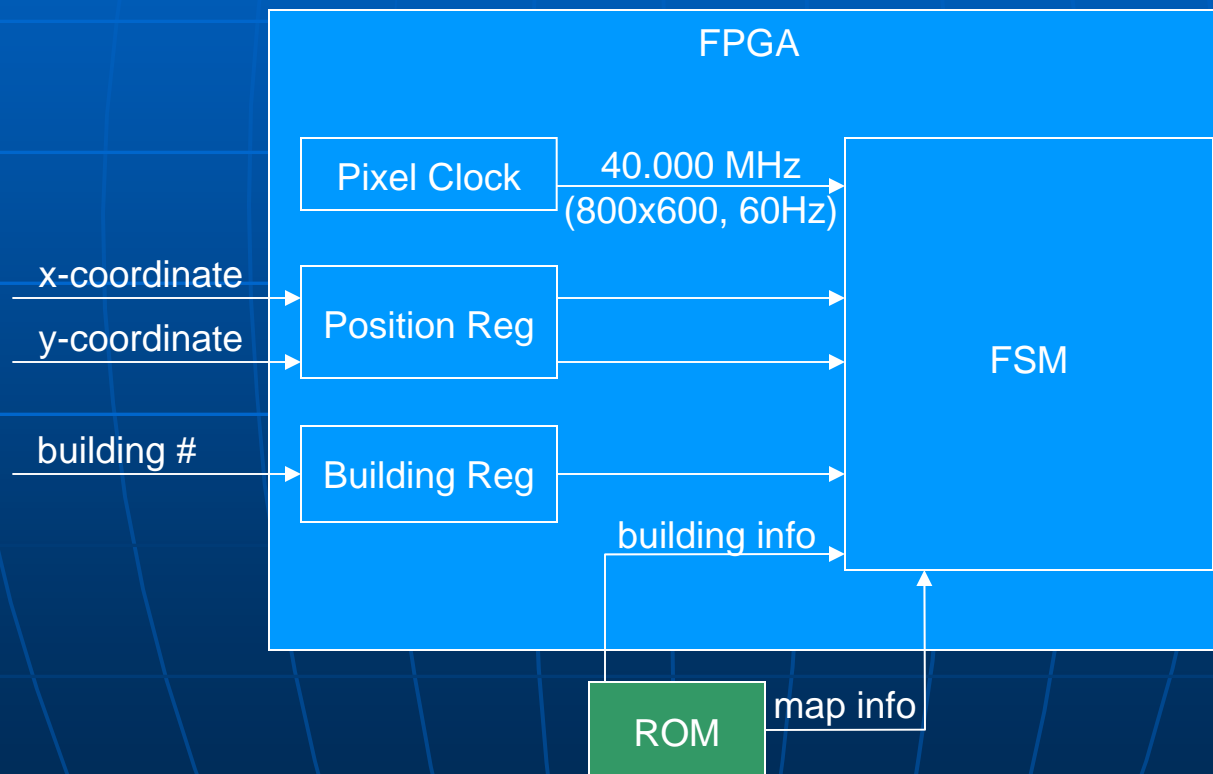
Block Diagram

- Inputs:



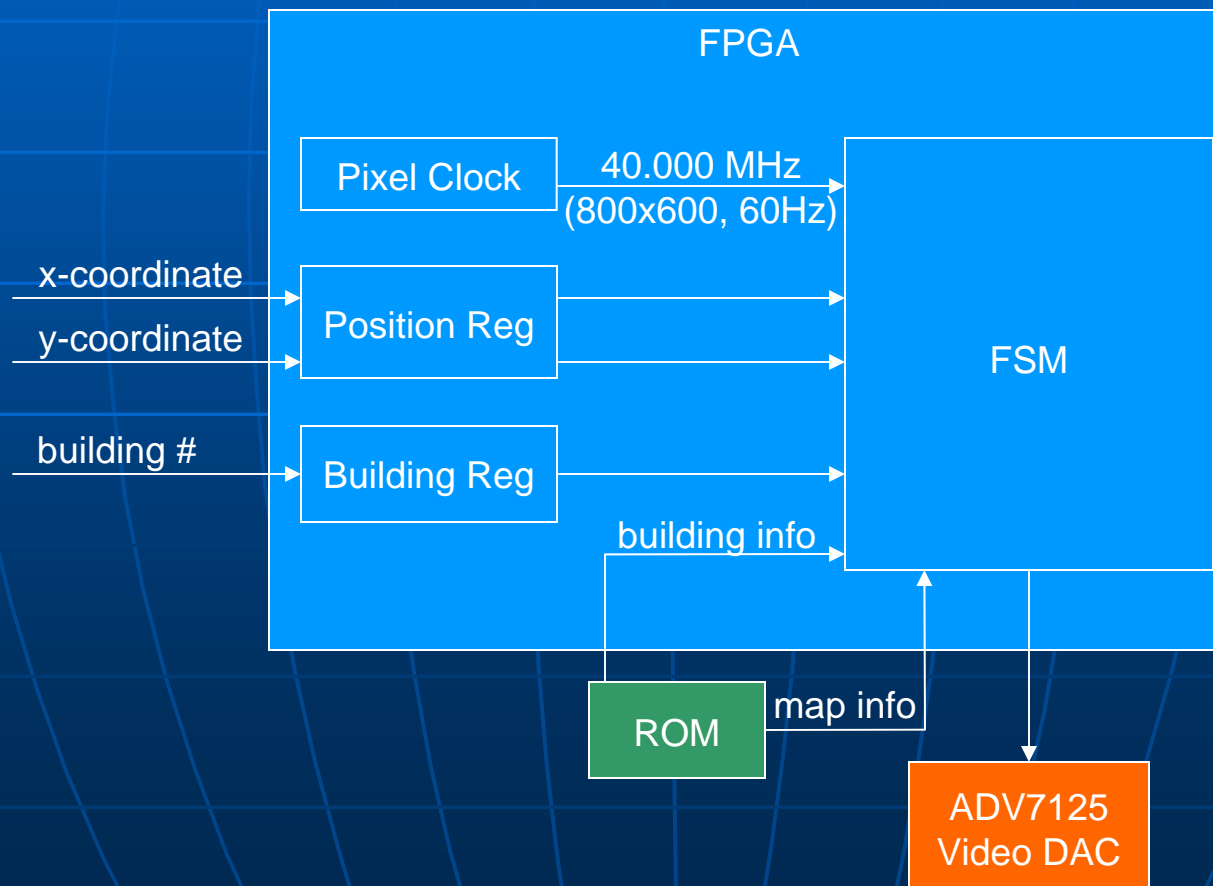
Block Diagram

- Inside the FPGA:



Block Diagram

- Output:



Scalability

- Scrolling Maps
- Rotating Maps
- Zooming
- Giving of Directions
- Audio Playback of Building Information
- More Interactive User Interface
- Live Updating
- Many more....

Timeline

- Interface with GPS, completion of FSM coding, load map onto ROM – April 29th
- GPS/Identifier modules combined, memory initialization complete, map drawing – May 4th
- Work in map mode – May 6th
- Work with info button press, “tour guide” mode – May 8th
- Additional features – May 8th thru May 10th