Vertex

(the game, not to be confused with Virtex)

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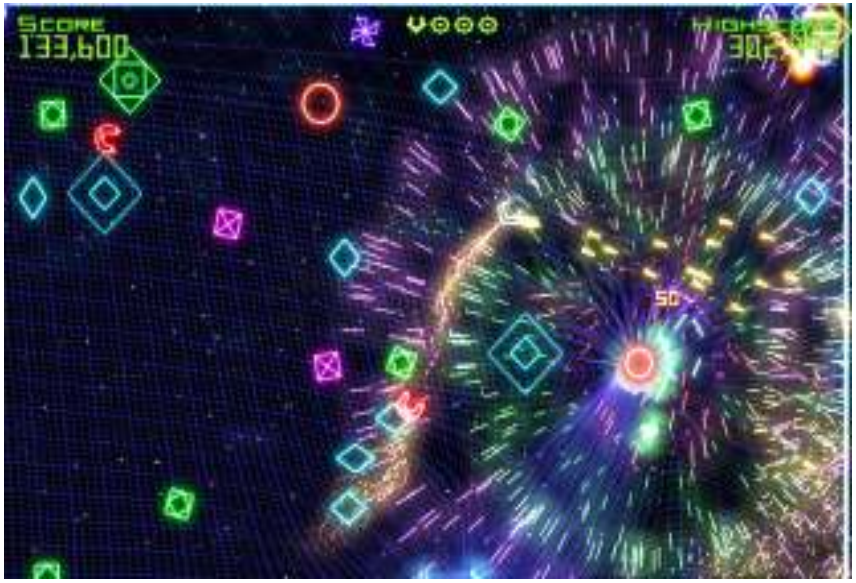
Overview

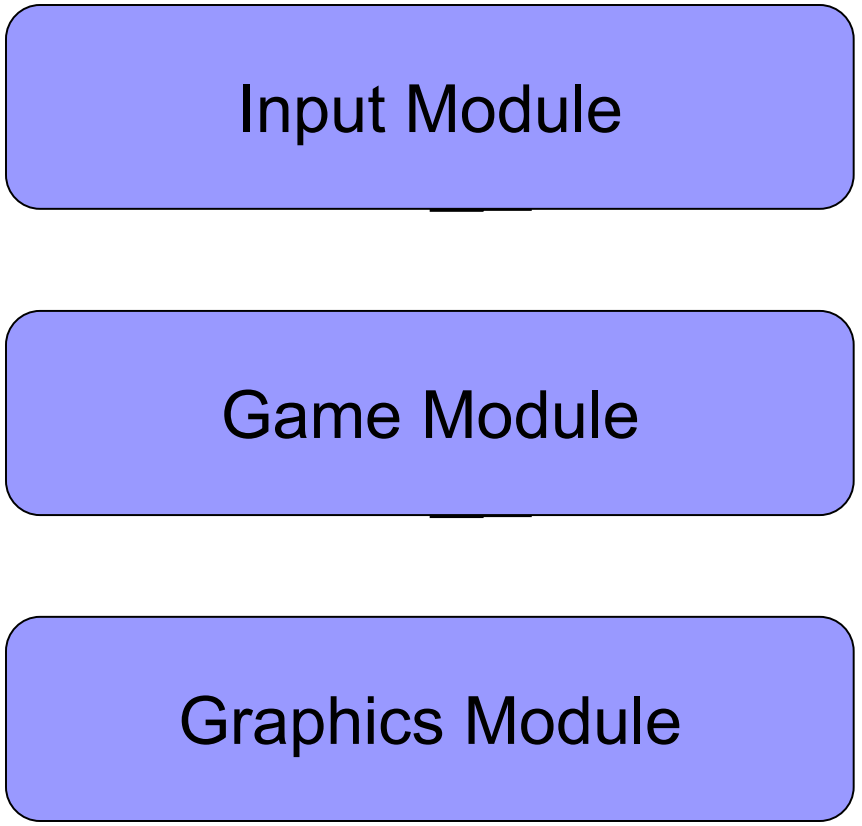
- A game where you are in a ship and must survive as long as you can
- Use 2D wireframe graphics



Screenshot from *Geometry Wars: Retro Evolved (PC)*

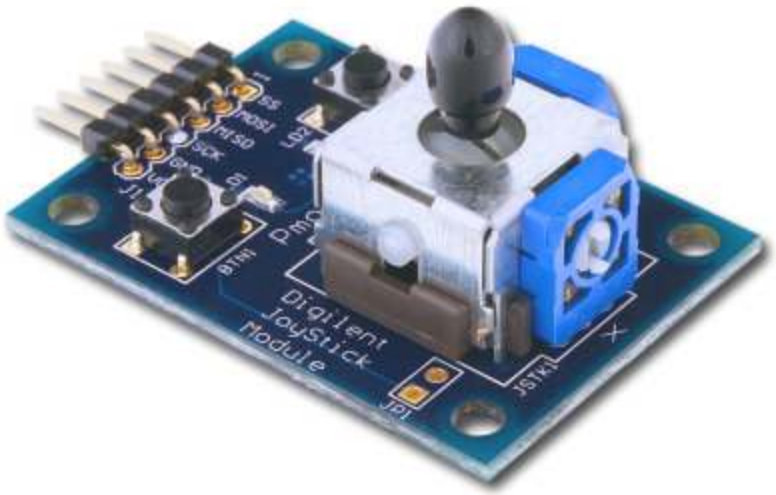
High Level Modules

- Three top level modules



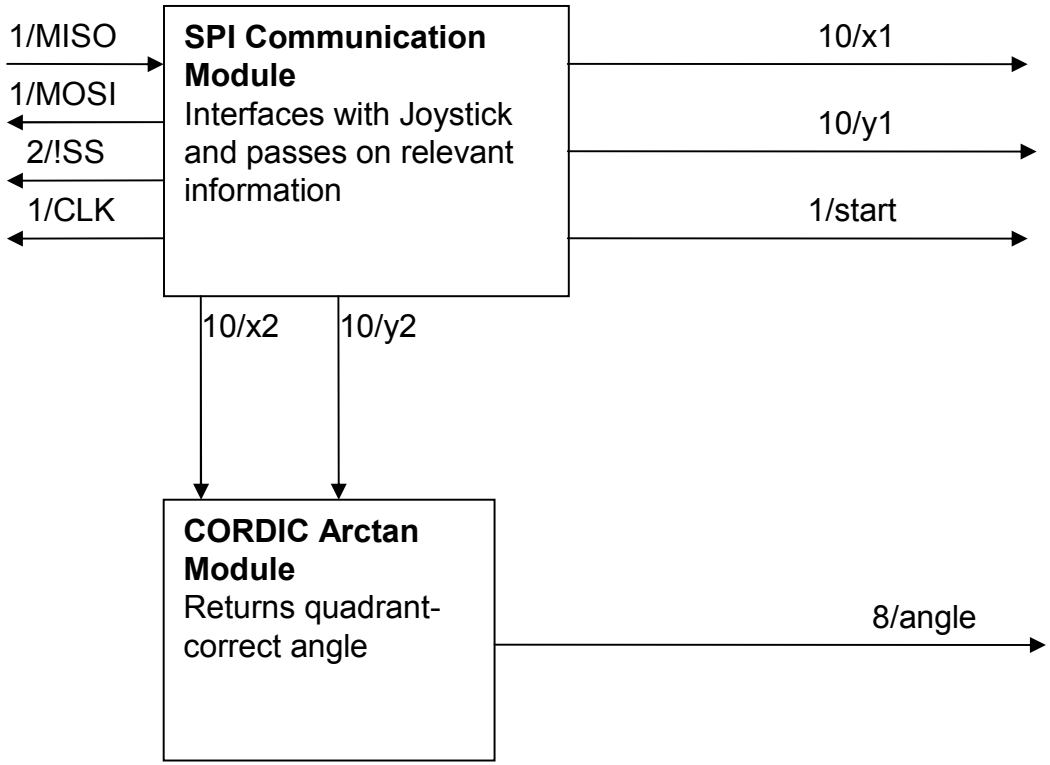
Input Module

- First iteration will simply be labkit buttons
- Once other modules are complete, interface with two joysticks
- Joysticks use SPI



http://www.digilentinc.com/

Input Module



Game Module

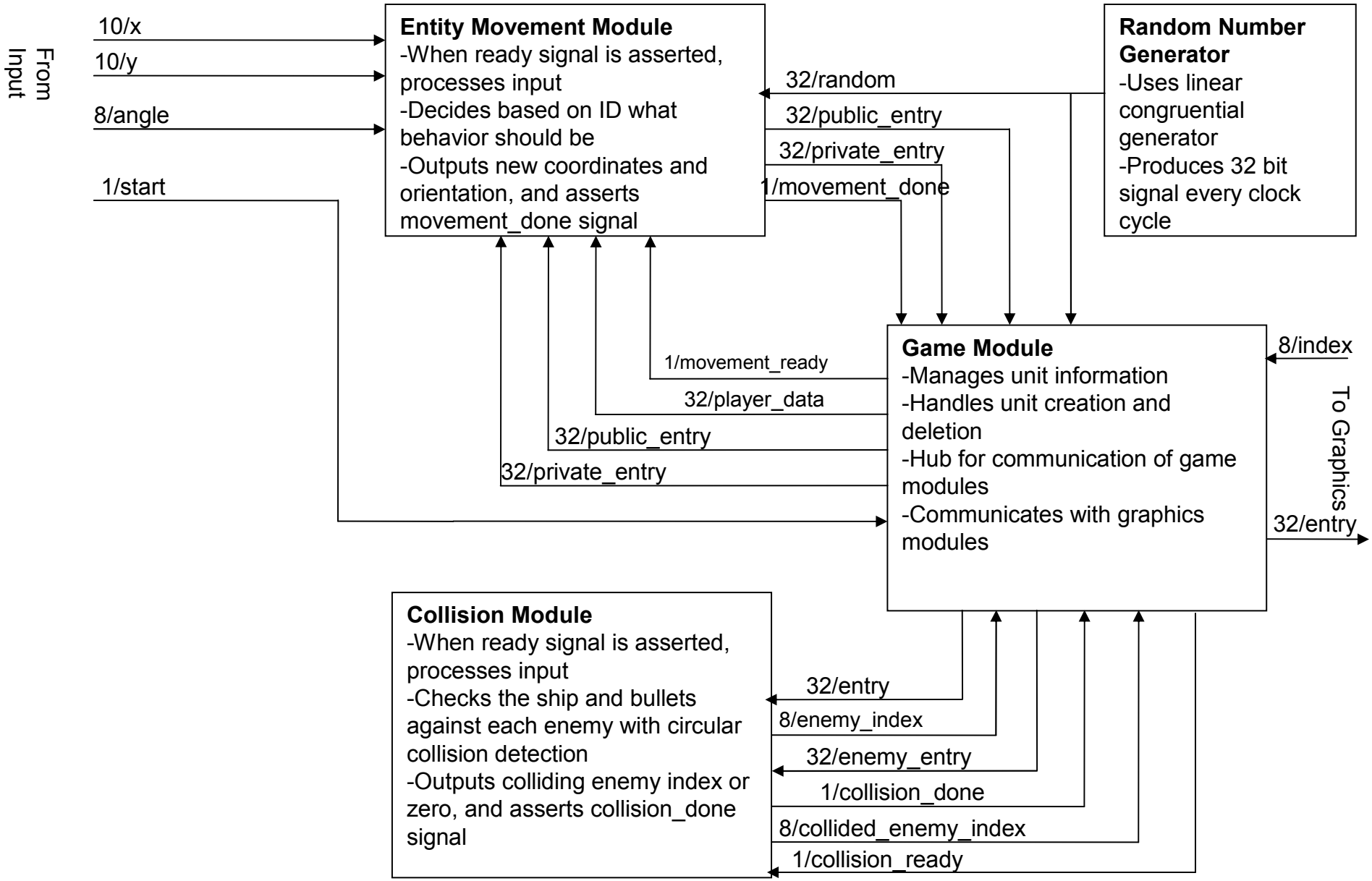
- Entities

0001_0000000001_0000000001_00000001

[31:28] ID [27:18] X [17:8] Y [7:0] ANGLE

- “Public” and “Private” information
- Information stored in two 256x32 BRAMs
- Public Table, Private Table
- FSM: Spawning, Moving, Colliding, Done

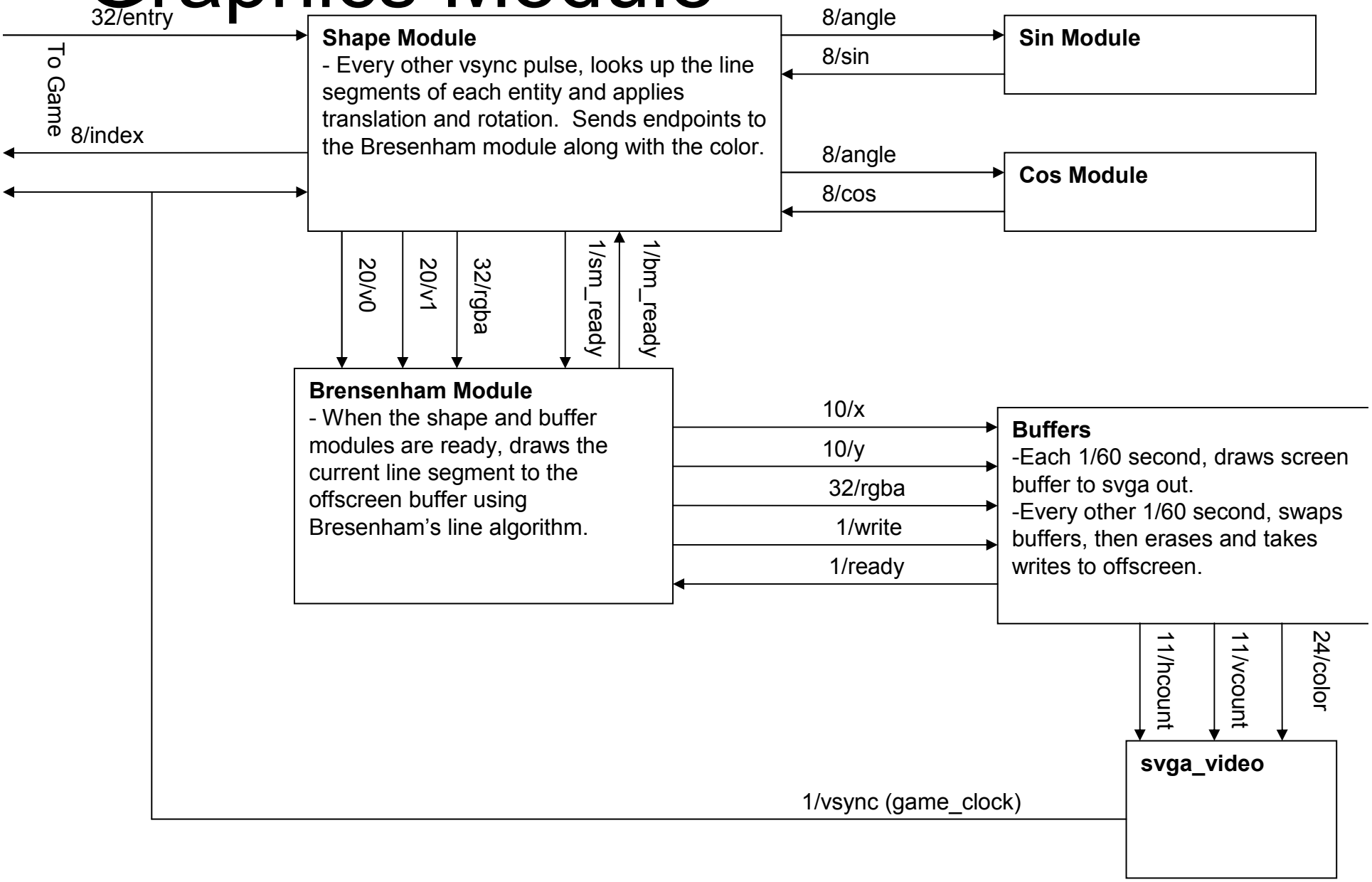
Game Module


From Input
10/x
10/y
8/angle
1/start
Entity Movement Module
-When ready signal is asserted, processes input
-Decides based on ID what behavior should be
-Outputs new coordinates and orientation, and asserts movement_done signal
Random Number Generator
-Uses linear congruential generator
-Produces 32 bit signal every clock cycle
32/random
32/public_entry
32/private_entry
1/movement_done
1/movement_ready
32/player_data
32/public_entry
32/private_entry
Game Module
-Manages unit information
-Handles unit creation and deletion
-Hub for communication of game modules
-Communicates with graphics modules
8/index
To Graphics
32/entry
Collision Module
-When ready signal is asserted, processes input
-Checks the ship and bullets against each enemy with circular collision detection
-Outputs colliding enemy index or zero, and asserts collision_done signal
32/entry
8/enemy_index
32/enemy_entry
1/collision_done
8/collided_enemy_index
1/collision_ready

Graphics Module

- Double buffers using ZBT memories
- Lookup tables for entity shapes: 16:16:32
- Translates and rotates line segments
- Bresenham's line drawing algorithm
- Pipelines line segments

Graphics Module



Timeline

	Mark	Don
11/14	Movement	Double Buffers
11/21	Spawning	Bresenham
11/28	Collisions	Shape Module
12/5	Input	Integrate
12/10	Debug	Debug