

# **ASTEROIDS**

Implementation of the  
classic Atari game

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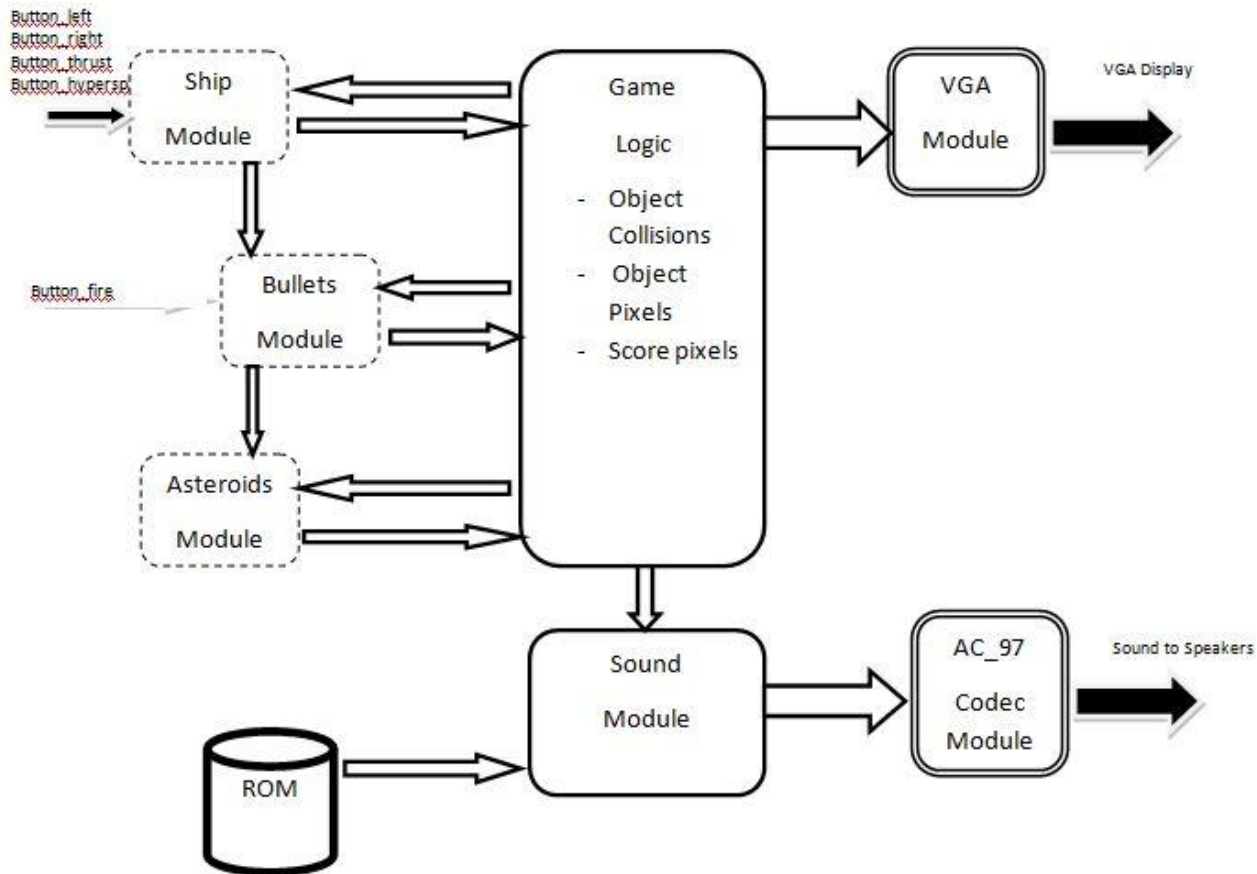
Phillip Mercer, Jr.

# Overview

- Originally developed on MOS 6502 CPU and Digital Vector Generator

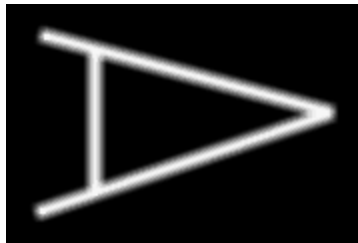


# Block Diagram



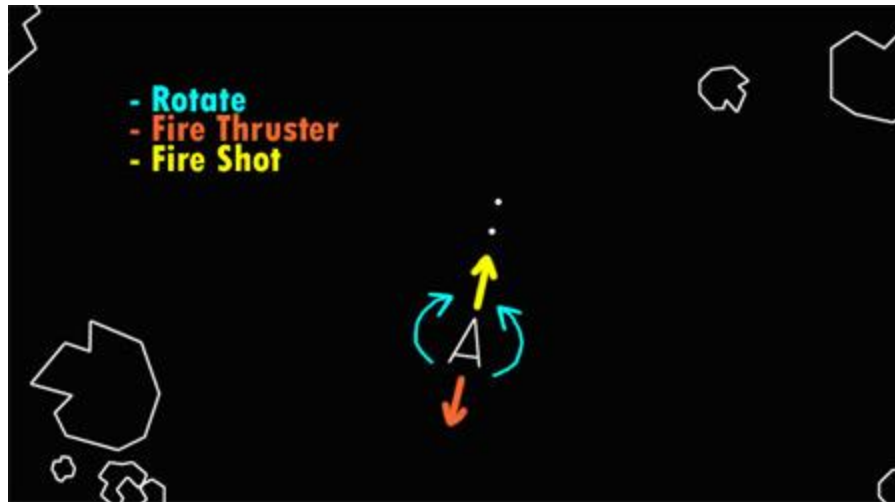
# Ship

- Challenges:
  - geometry of triangle
  - vector drawing
- Utilize Bresenham line drawing algorithm



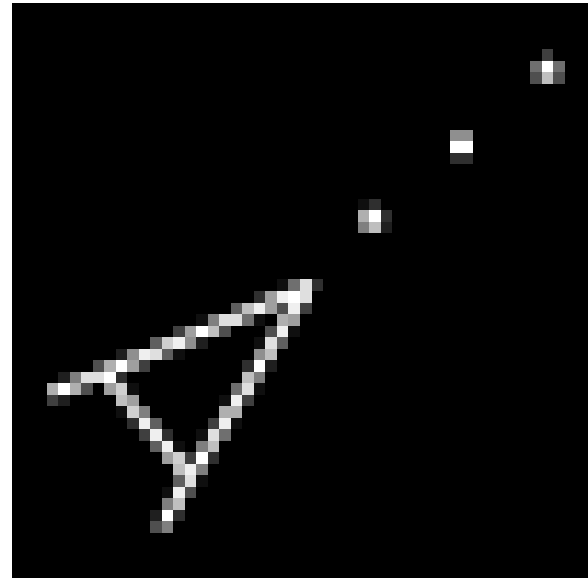
# Ship

- Physics of motion
- Trigonometric functions:
  - Lookup table



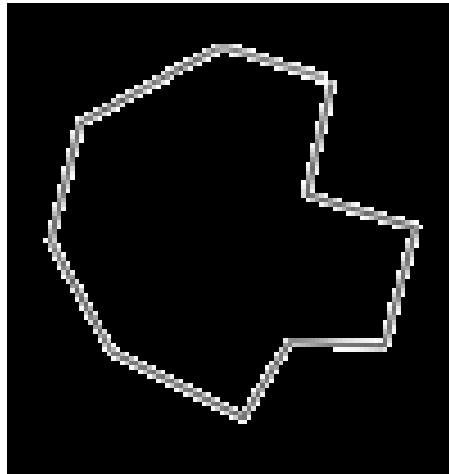
# Bullet

- Limited number of bullets
- Inputs:
  - Ship position
  - Ship velocity
  - Ship heading



# Asteroid

- Couple together smaller asteroids
- Store internal “randomness” variable



# Logic

- Care about:
  - Asteroid and Bullet interaction
  - Asteroid and Ship interaction
- Hardware intense



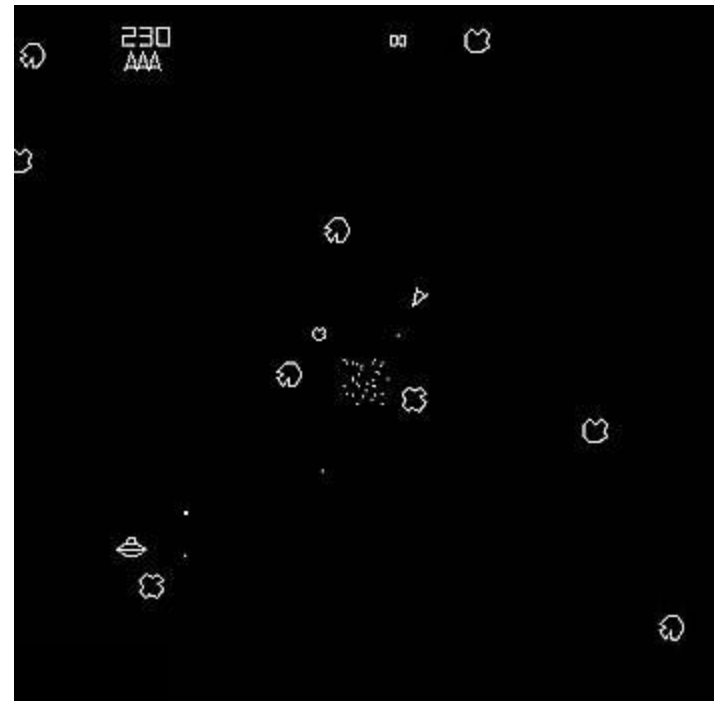


# Sound

- Sound on relevant collisions
- Sounds stored on BRAM
- Expect 5k x 8 memory
- On multiple sounds, play most recent

# Visual

- Score sprite
- Show asteroids, asteroids can overlap
- Bullets
- Ship



# Timeline

- Nov 23 – Individual Modules
- Nov 30 – Game Logic
- Dec 3 – Sound
- Dec 5 – Integration