



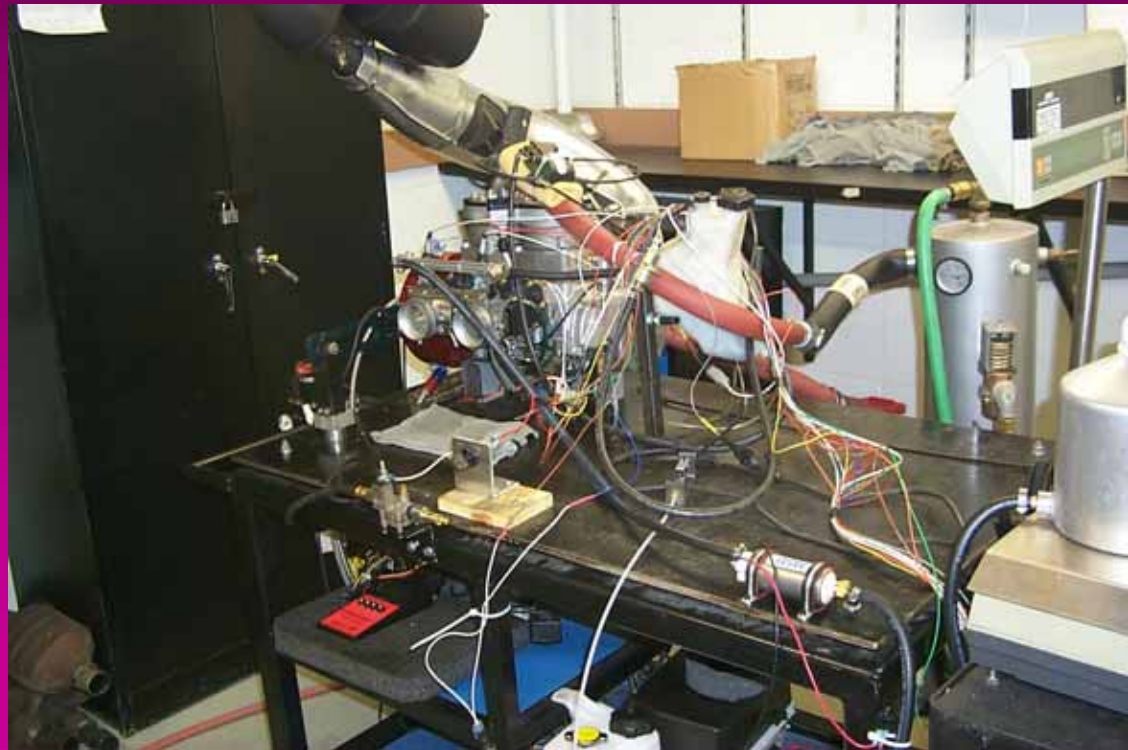
# Minnesota State University, Mankato Xtreme

- AET Program
  - 1989
  - TAC-ABET Accredited
  - 140 Majors
    - The Team
  - Seven Seniors
  - Ten Undergraduates
  - Faculty Advisor



# Primary Engine Choice

- Polaris 500cc 2-stroke with Variable Exhaust
- Cost
- Power to Weight
- Cold Start
- Low Maintenance



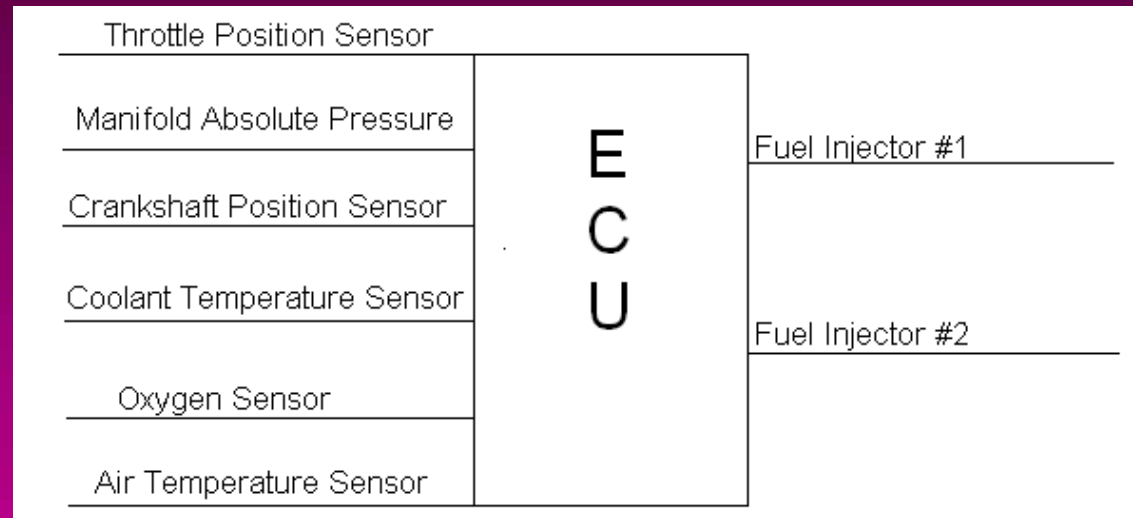
# Electronic Engine Control System

- Motec ECU

- Sensors

- Fuel Injectors

- Closed loop Capable



# High Pressure Direct Injection

- Injector Driver
- 100 Volt Injectors
- 1.0k - 1.5k psi Fuel Pressure
- Controlled by Motec ECU



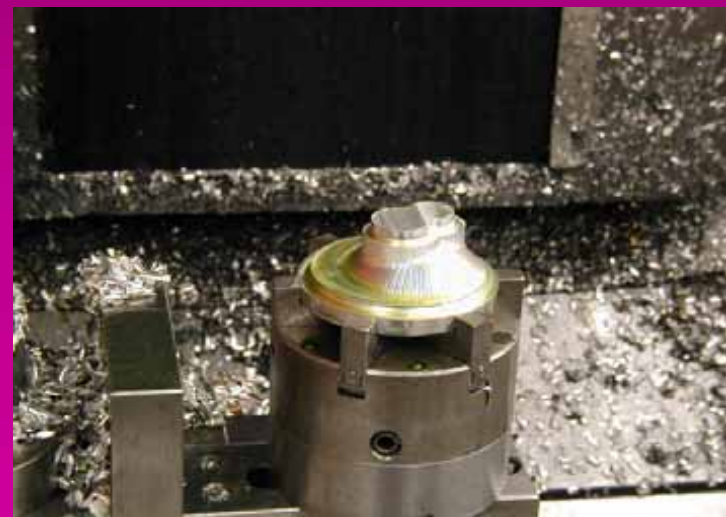
# Redesigned Combustion Chambers

## ➤ Modifications

- Spark Plug
- Injector Placement
- Offset Dome
- O-Ring Sealed

## ➤ How ?

- Drawn on ACAD
- Rapid Prototype Model
- Machined at Suburban  
Mold



# Back-Up Engine Choice

- Polaris 500cc H.O.
- Light Weight Four Stroke Engine
- Reliable
- Easily Achieves Improved Emissions



# Turbo Charged Four Stroke

- Aerodyne Aerocharger
  - Variable Vein Turbo Charger
  - Capable of up to 10 psi boost
- Closed Loop Fuel Injection
  - Maintains Stoichiometric Air/Fuel Ratio
  - Compensates for Temperature and Altitude



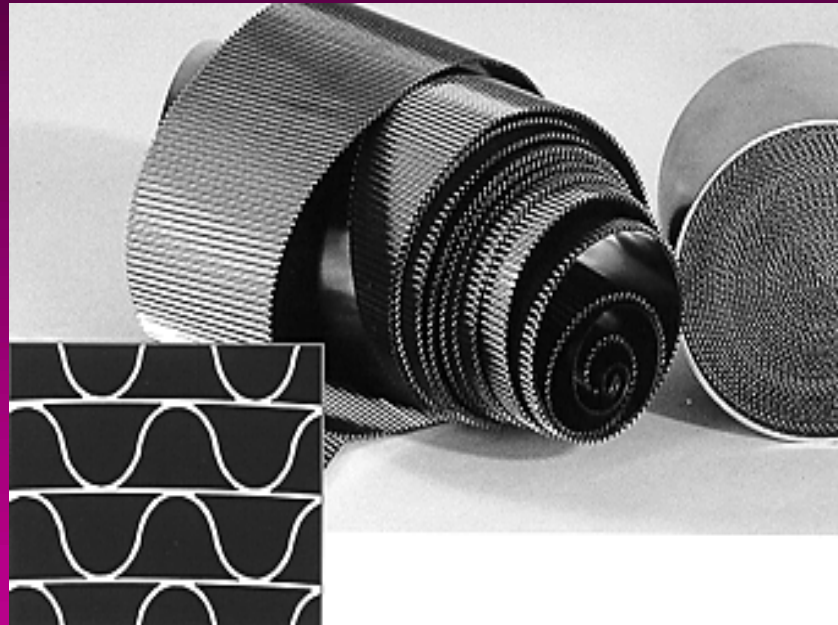
# Noise Reduction

- Liquid Cooled Engine
- Koolmat
- Heat Master
- Thermozone
- Silencer
- Catalyst
- Air Box



# Metal Substrate Catalytic Converter

- 5 : 1 Platinum to Rodium
- High Flow Design
- Housed Inside Silencer



# Improvement to the Chassis

- Ergonomics
  - Safety
    - Tether Cord
    - Running Board Trim with Grip
  - Comfort
    - Forward Controls
    - Digital Tachometer and Exhaust Temperature Gauges



# Improvement to the Chassis

- Suspension/Chassis
  - Edge Chassis
  - Plastic Skis
  - Fox Shocks
  - Large Rear Idler Wheels
  - 144" Long Track
- Brake System
  - Weight reduction
  - Dissipates Heat



# Operator / Outfitter Perspective

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## Ease of Operation

- electric start
- temperature/altitude compensation
- hand and thumb warmers
- long track
- plastic skis
- two-stroke = low maintenance
- aesthetic appeal

# Environmental Impact

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Lower Emmissions

Quieter

Improved Fuel Economy

# QUESTIONS

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