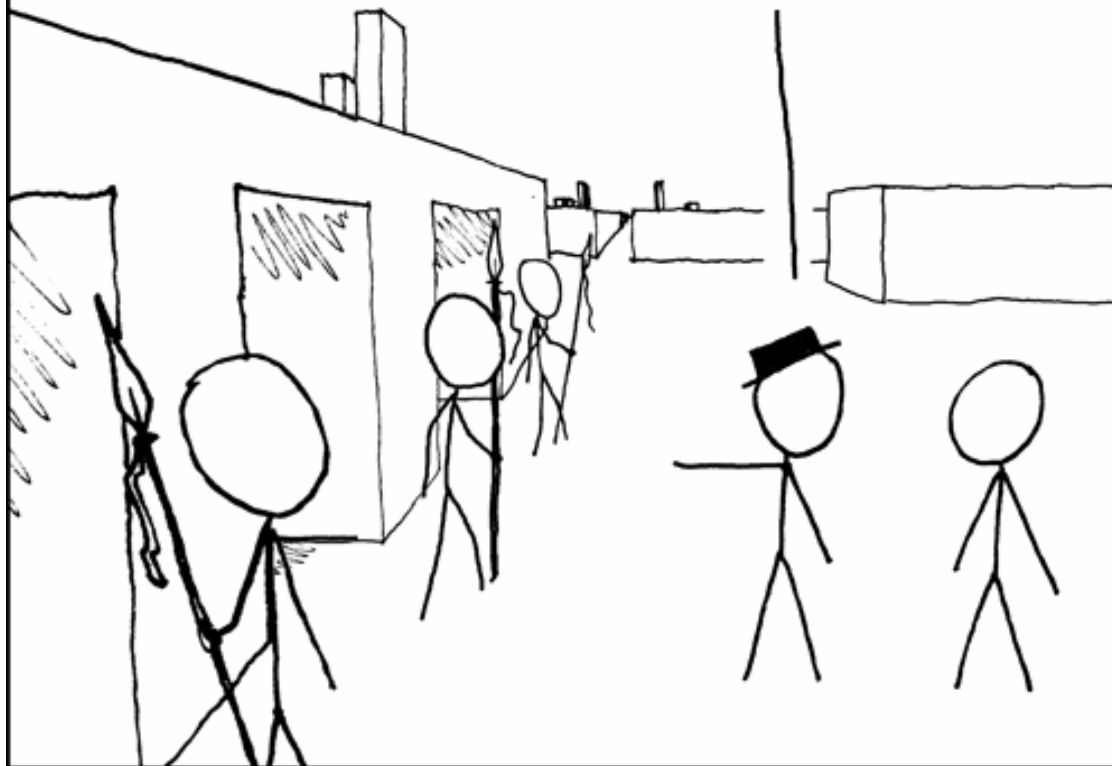


# AGS

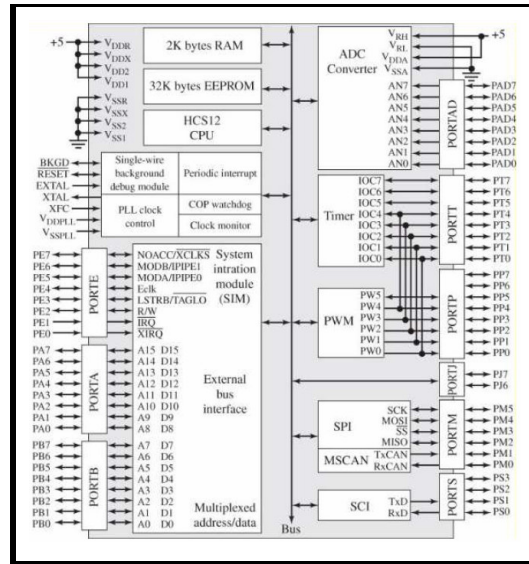
AND OVER THERE WE HAVE THE LABYRINTH GUARDS. ONE ALWAYS LIES, ONE ALWAYS TELLS THE TRUTH, AND ONE STABS PEOPLE WHO ASK TRICKY QUESTIONS.



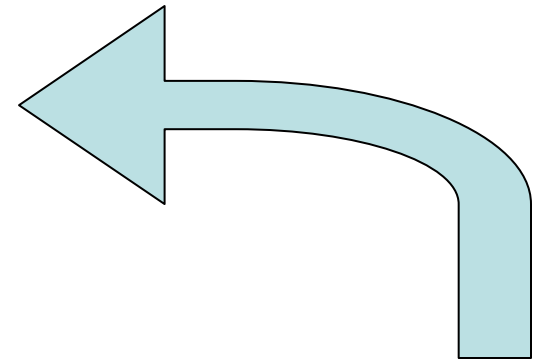
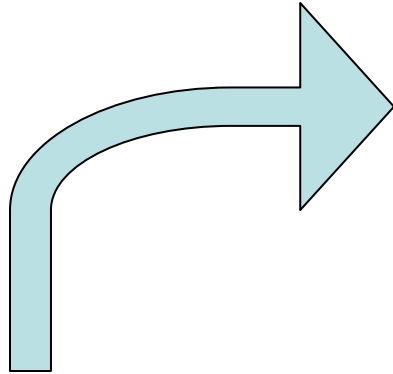
# Main Autonomous Boat Uses

- Transportation
- Fishing and Recreation
- Department of Defense Application
- Security
- Search and Rescue

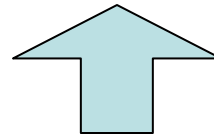
How can we do it?



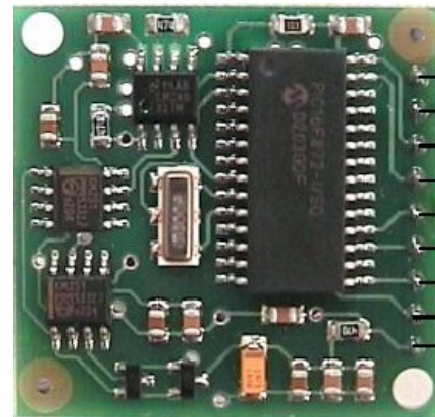
→ → → → Notebook Computer



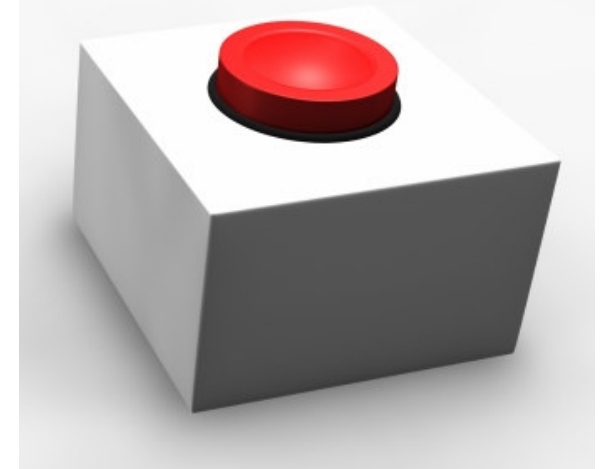
MC9S12C  
(Microcontroller)



Tachometer

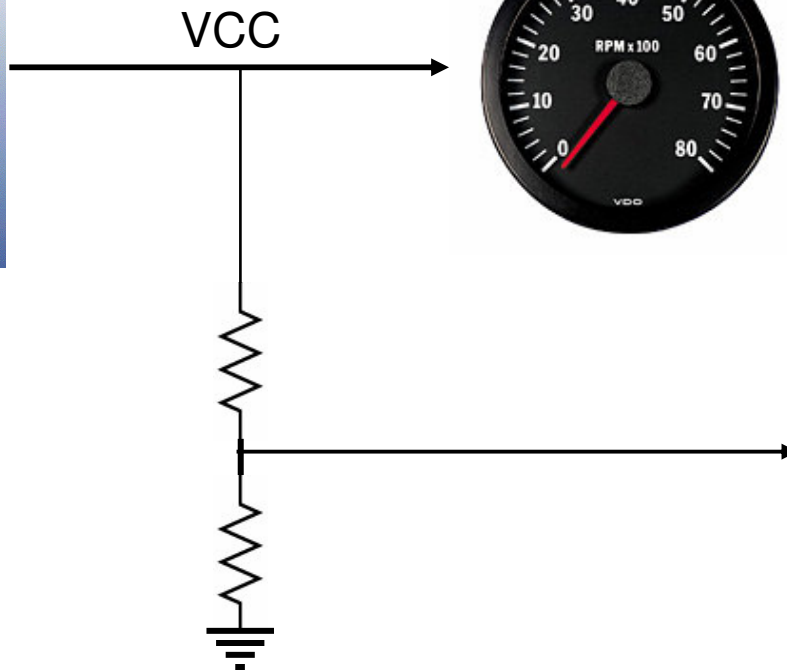


Compass



Speedometer

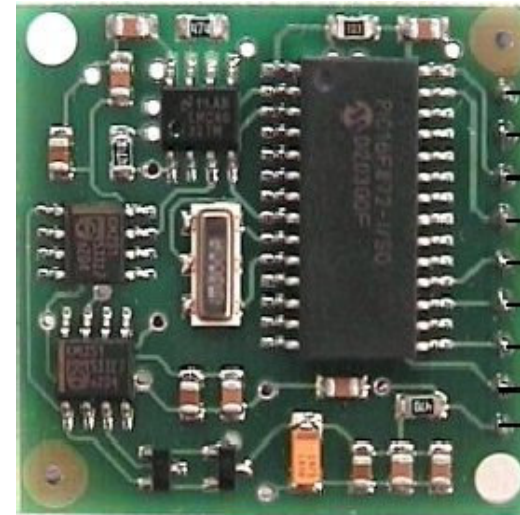
# Tachometer



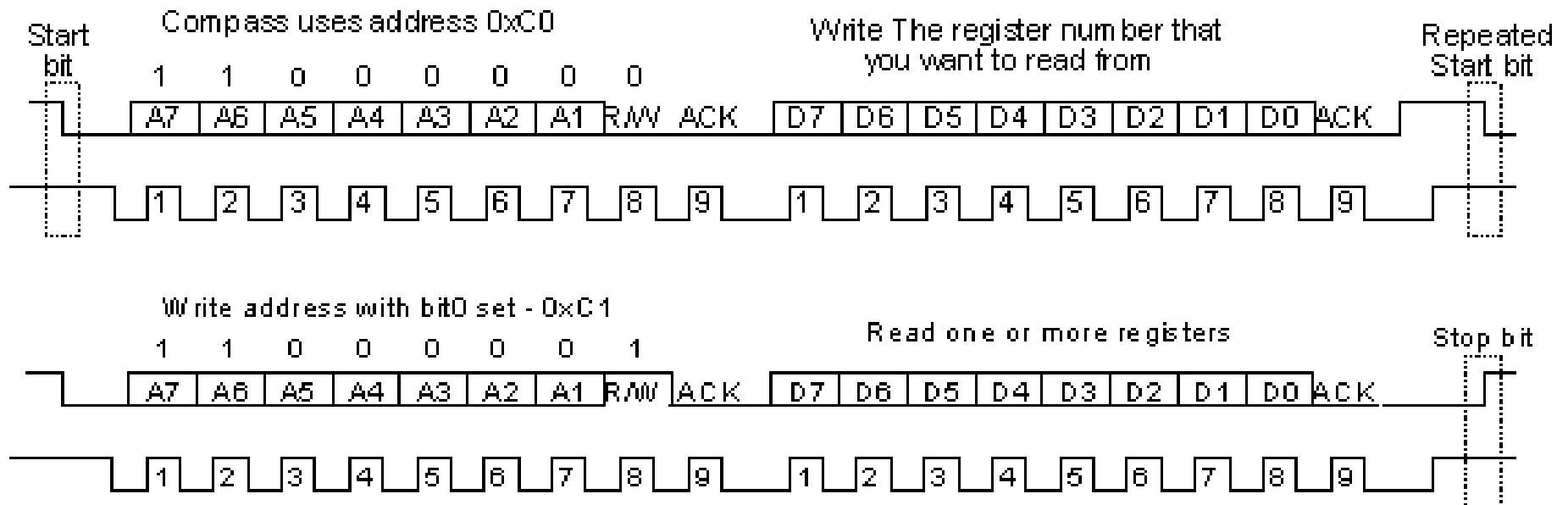
To ADC on  
microcontroller

# Compass

- Direction sent as a 16-bit word.  
0 - 3599 represents 0E - 359.9E
- Pins 2 and 3 to communicate to the micro-controller through an I2C interface.



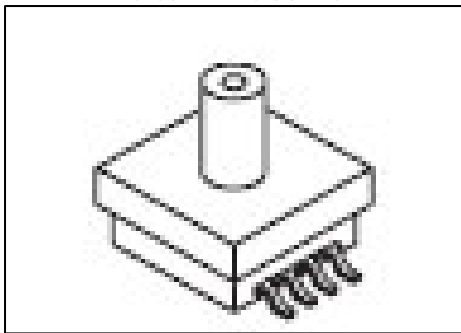
- Pin 9 - 0v Ground
- Pin 8 - No Connect
- Pin 7 - 50/60Hz
- Pin 6 - Calibrate
- Pin 5 - No Connect
- Pin 4 - PWM
- Pin 3 - SDA
- Pin 2 - SCL
- Pin 1 - +5v



# Speedometer

(Actually, it's a pressure sensor)

Real Picture:

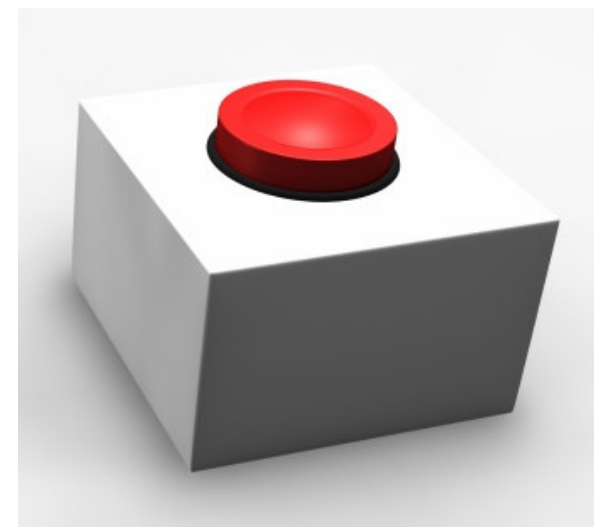


Part # MPXH6250AC6U

+5V applied to  $V_s$

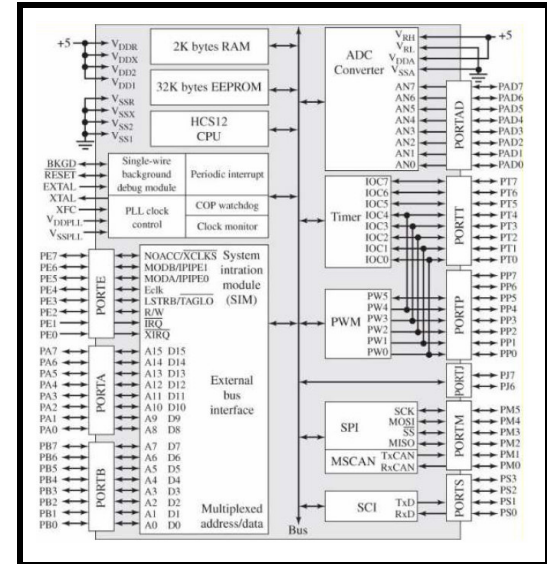
$V_{out}$  gives pressure reading between 0V and 5V

Higher pressure = Higher output voltage



PIN NUMBERS	
1	N/C
2	$V_s$
3	GND
4	$V_{out}$

# Microcontroller



- External Ports Used

- 2 Pressure Sensors

- 1 ADC pin each

- A simple analog voltage will be read

- 1 Tachometer

- 1 ADC pin

- A simple analog voltage will be read

- Compass

- Port T

- A digital signal on multiple pins will be sampled

- Serial Communication

- Rx and Tx pins

- Will send and receive digital pulses serially

# Microcontroller to Laptop Interface

- Serial Interface
  - Half-duplex SCI (asynchronous)
  - RS232 Protocol
    - 1 Start Bit + 8 Data Bits + 1 Parity Bit + 1 Stop Bit = 11 Bits
    - 1 Sensor ID Byte + 2 Byte Raw Sensor Data = 3 Bytes

ASCII Character	Hex-Value	Binary-Value	Sensor
'V'	0x56	0101 0110	"Velocity" from the anemometer
'T'	0x54	0101 0100	"Tachometer" from the motor's tachometer
'C'	0x43	0100 0011	"Compass" from the digital compass
'W'	0x57	0101 0111	"Wind speed" from the wind sensor
'D'	0x44	0100 0100	"Direction" from the wind sensor



# GPS/Sonar - Humminbird 383c

## NMEA Protocol Sentence Structure

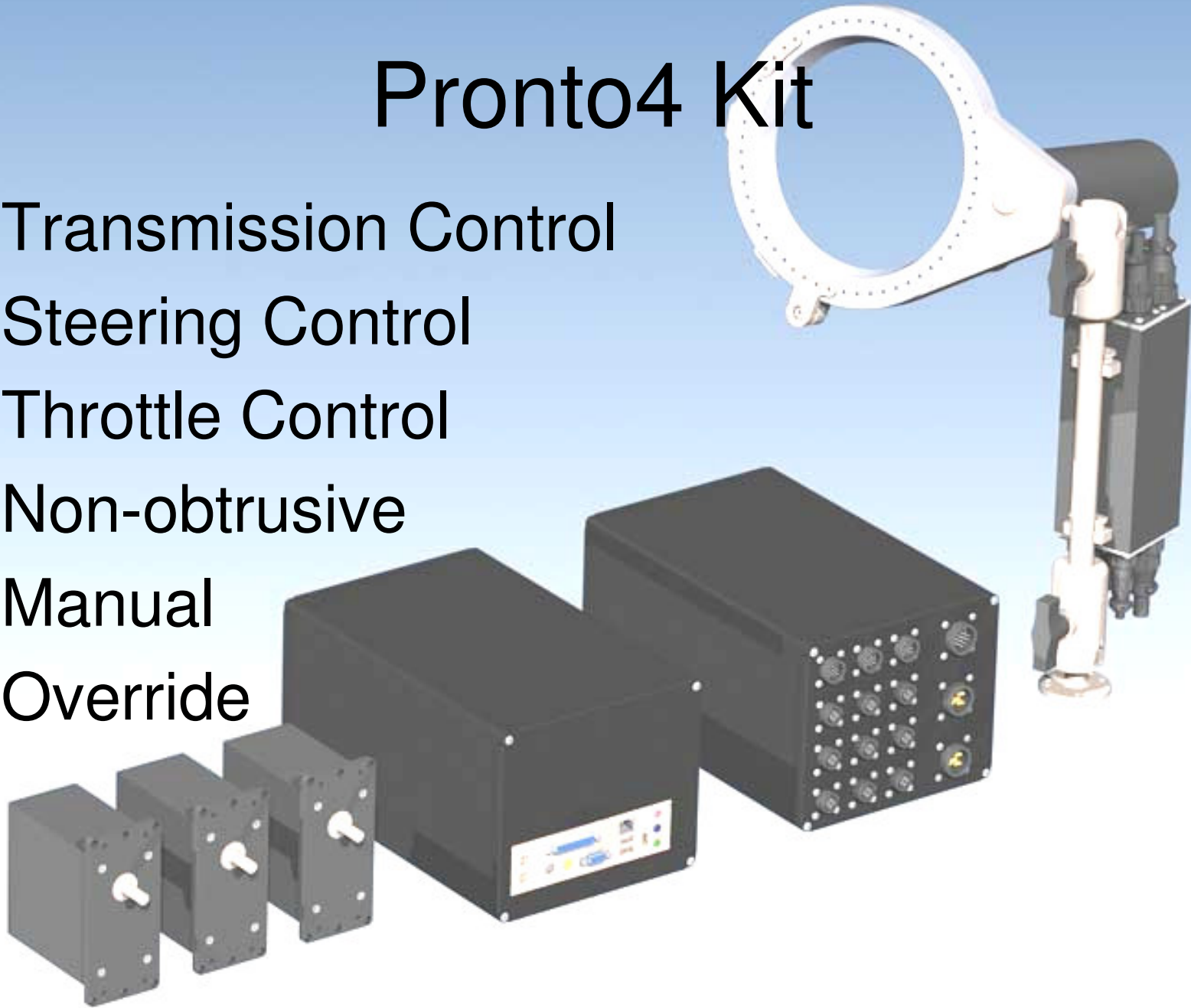
\$type,data1,data2,...,dataN\*checksum

## Relevant NMEA Protocol Sentences

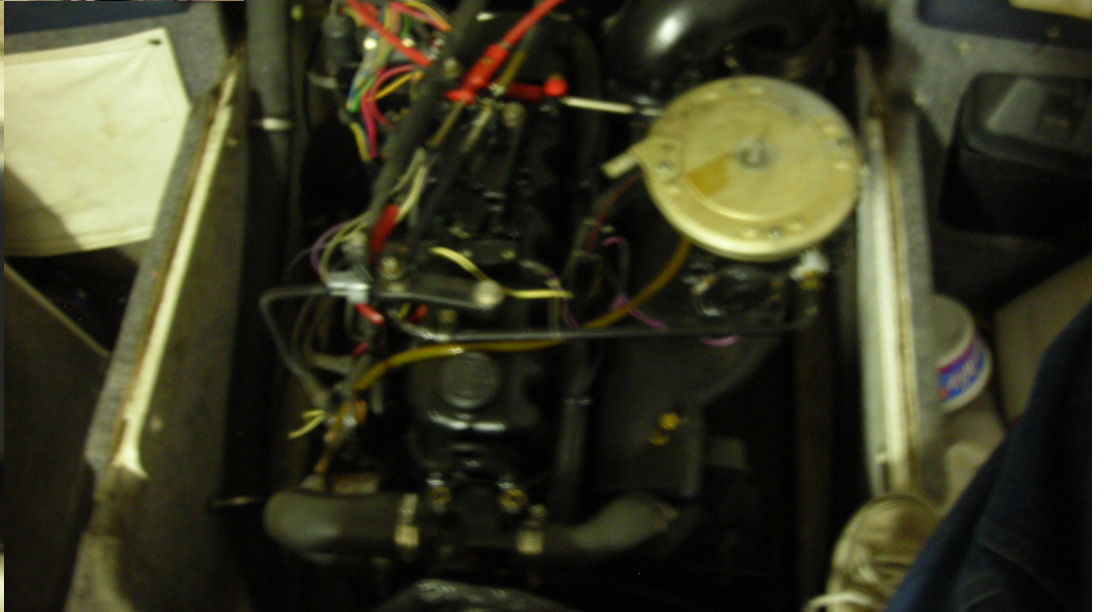
- Latitude            \$GPGLL            dddmm.mm
- Longitude         \$GPGLL            dddmm.mm
- Velocity            \$GPVTG            kph
- Heading            \$GPVTG            degrees
- Depth               \$GPDPT            meters

# Pronto4 Kit

- Transmission Control
- Steering Control
- Throttle Control
- Non-obtrusive
- Manual  
Override

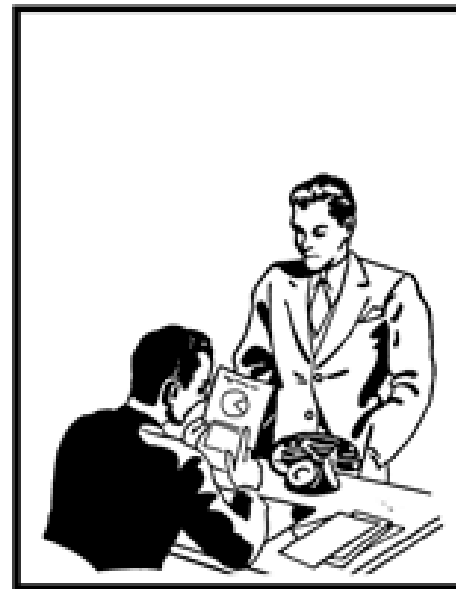
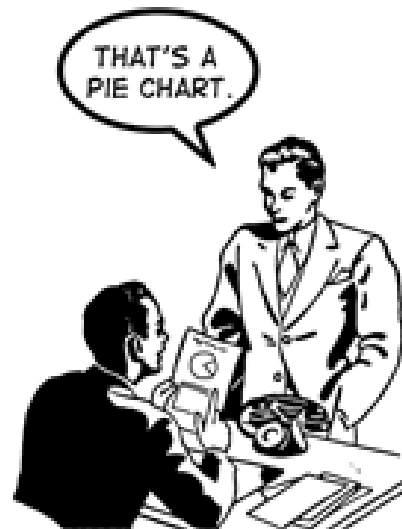


# Pronto4 - Boat Integration



# Anomaly

BY KENNEDY ROSE



WWW.HYPERDEATHBABIES.COM



ECE Department