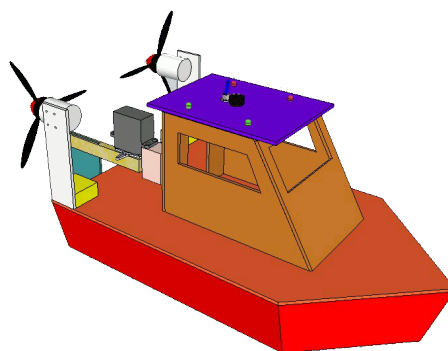




THE REMOTE CAPTAIN. NAVAL MODELLING



Authors: Pere Compte Jové, Imma Abad Nebot



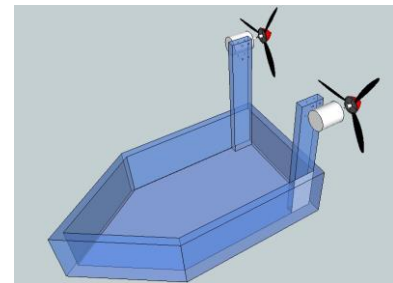
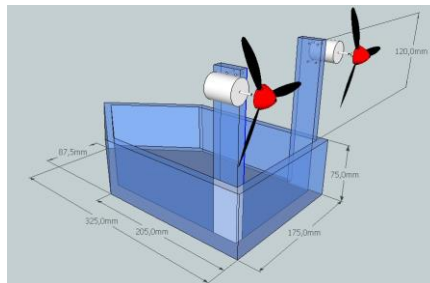
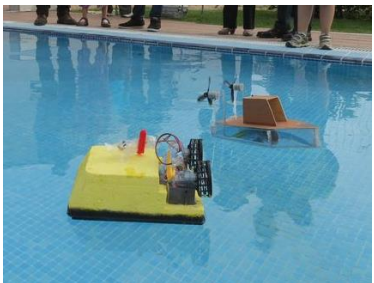
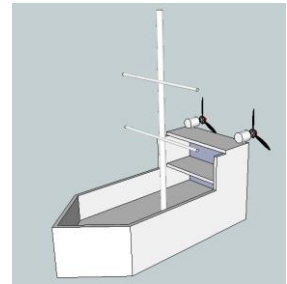
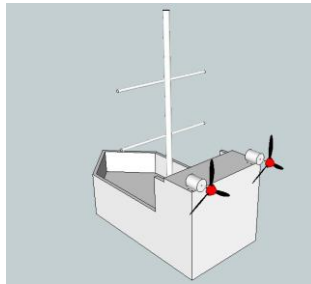
THE REMOTE CAPTAIN. NAVAL MODELLING. ABSTRACT.

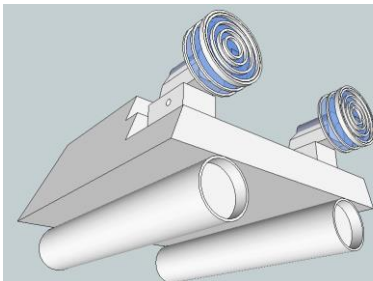
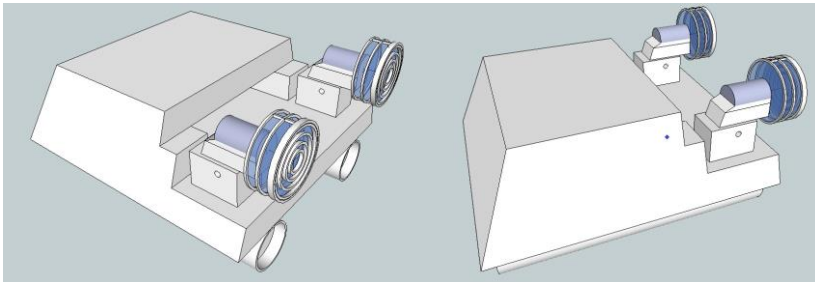
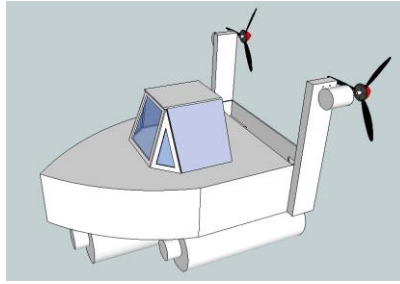
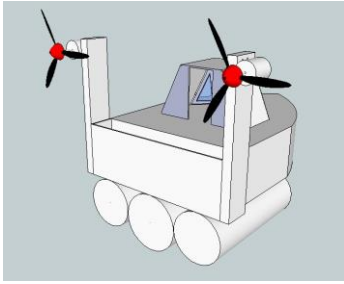
Ship model design carried out by students from an engineering point of view. The project starts with the proposal of different kinds of ships. After analysing the projects, the chosen one is built up. It works with a reversing switch made by the students which lets the user to control two motors (forwards and backwards).

Students incorporate a bluetooth device and they control it with a smartphone. The mobile app is set up by AppInventor designing different control systems: with buttons, voice control, with an accelerometer (the ship sails to its destination according to the hand position)... The ship control can be shown at a naval modelling exhibition. The possible failures may can be discussed and solved for future models.

Students' participation in this kind of exhibitions is very important, because they have the chance to exhibit their project in a place where there are experts in modelling, and this situation gives them the chance to improve their models.

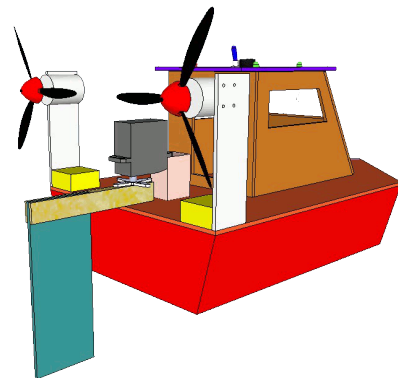
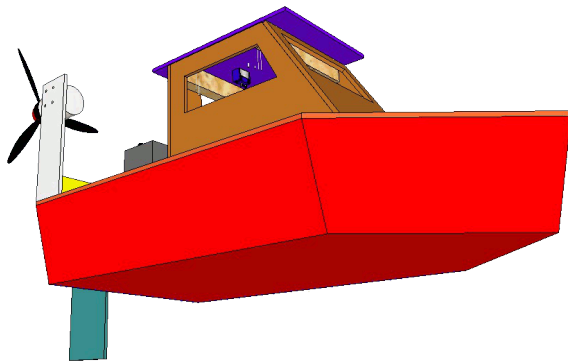
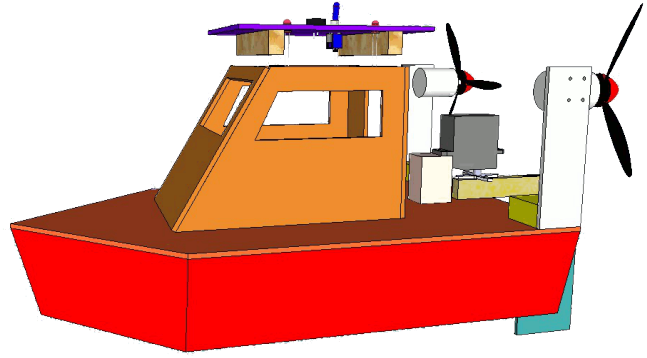
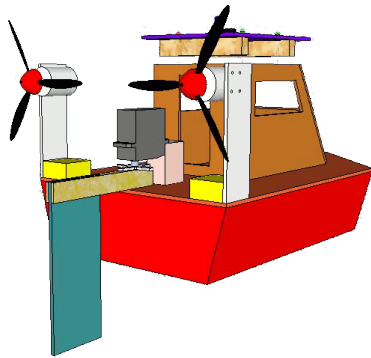
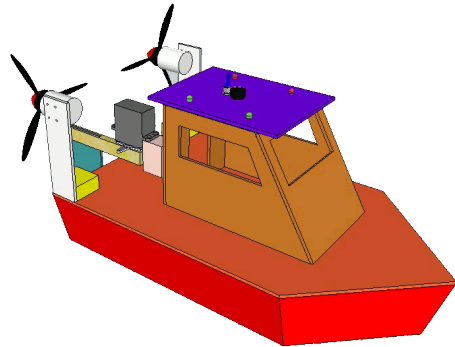
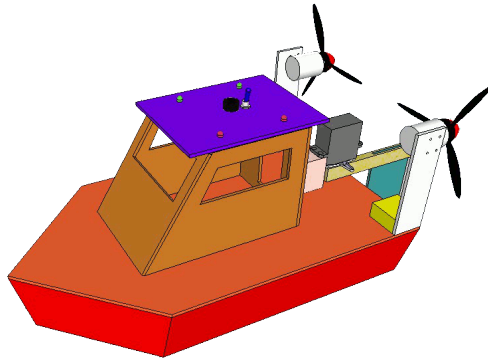
<http://www.cordemariavalls.cat/modelismenaval/>

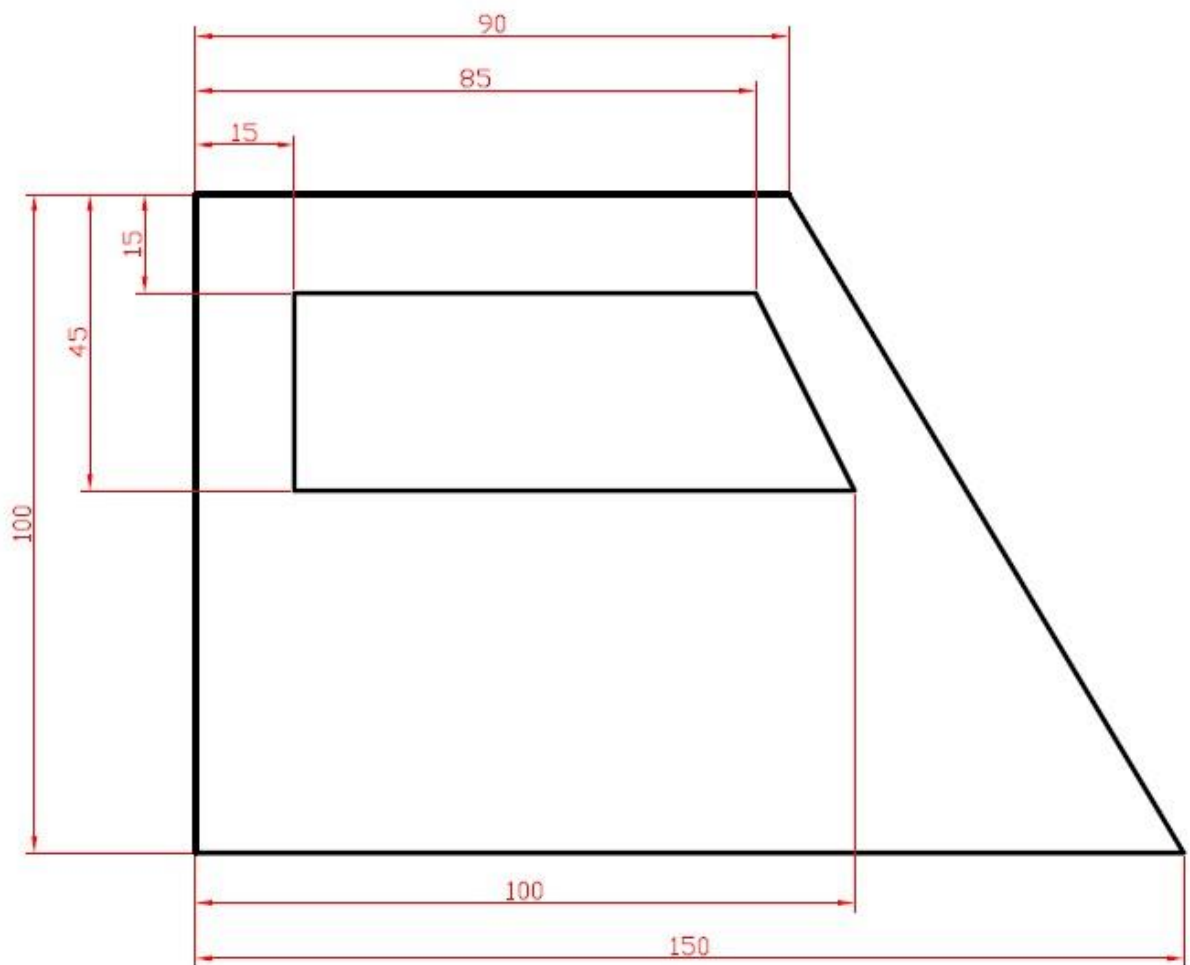




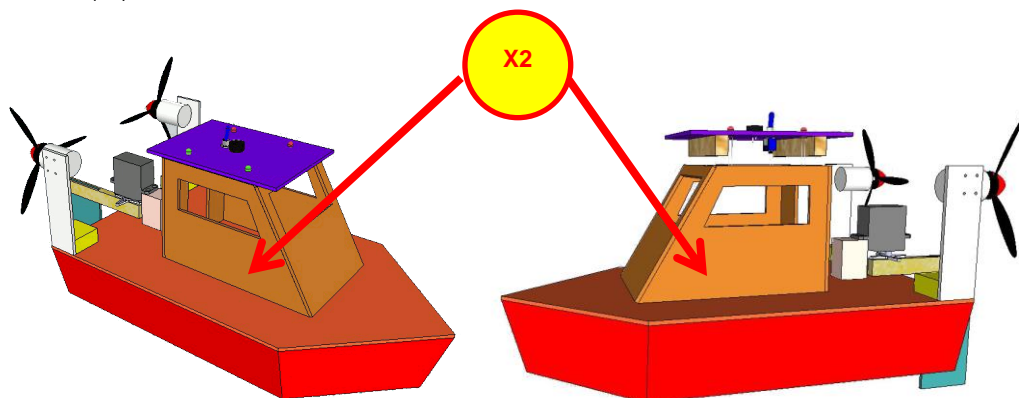
DRAWINGS TO BUILD THE BOAT.

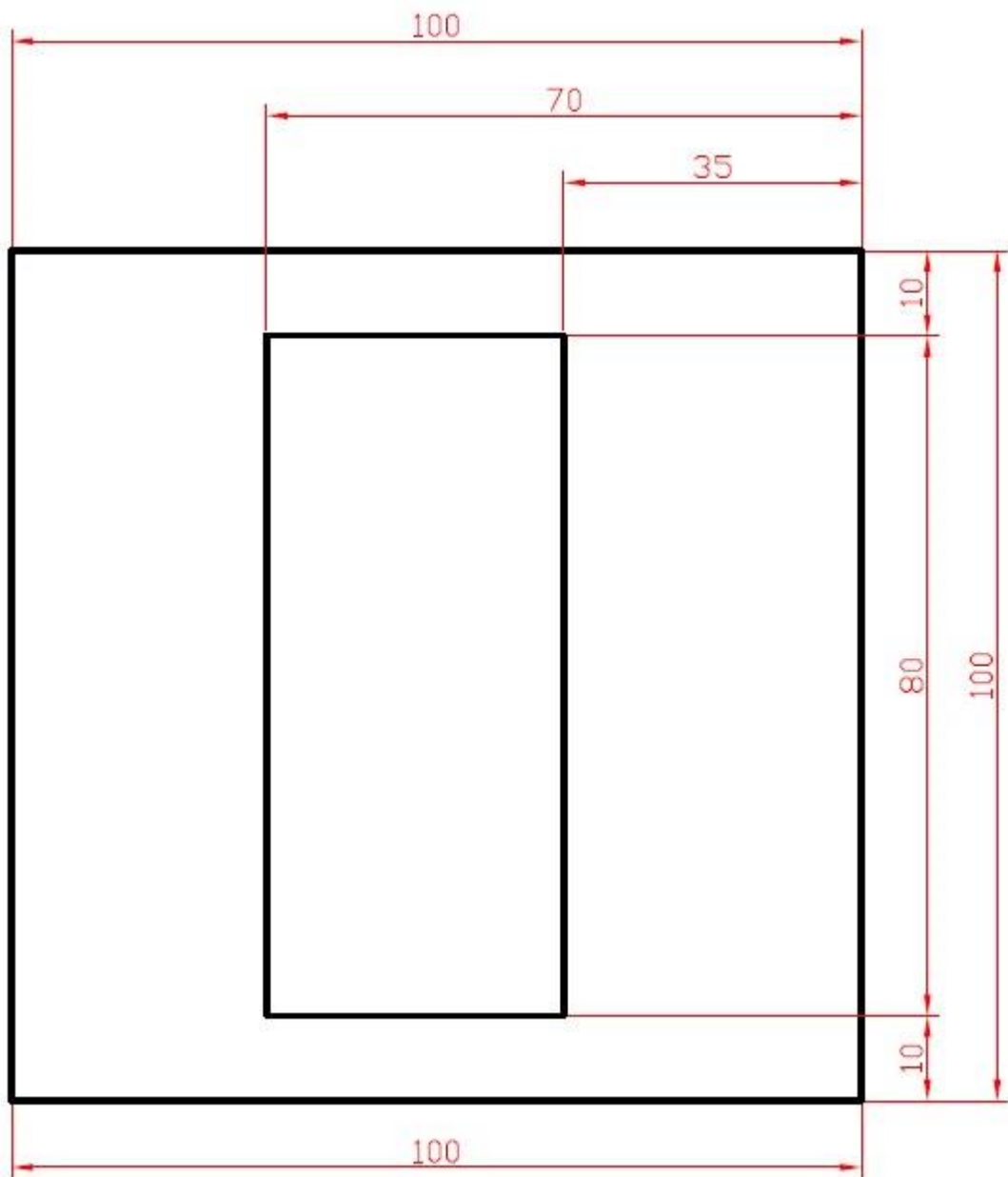
Plans



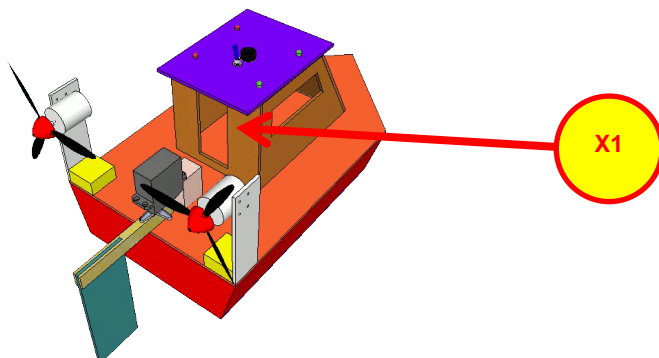


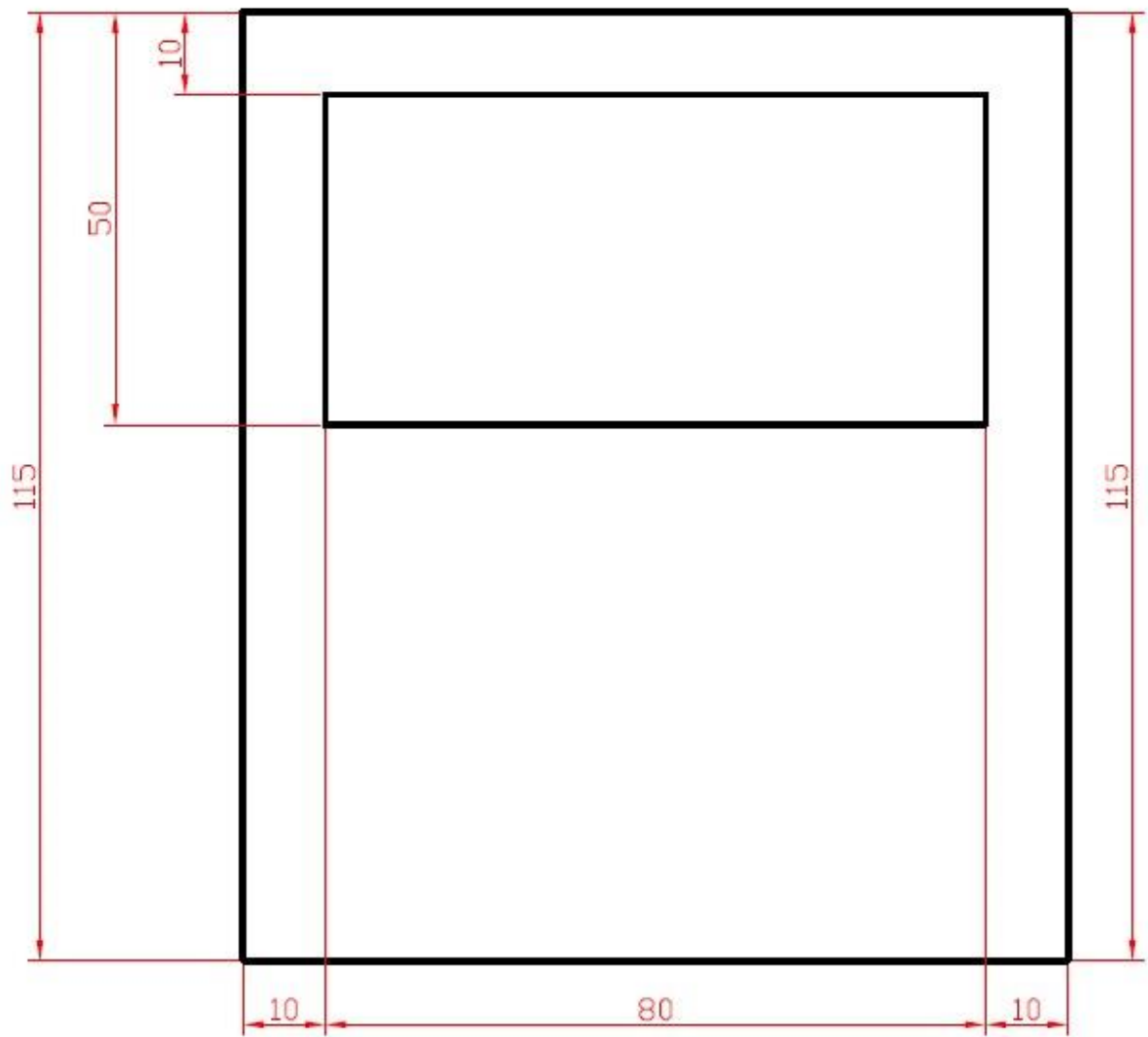
LATERAL (x2). Values in millimeters



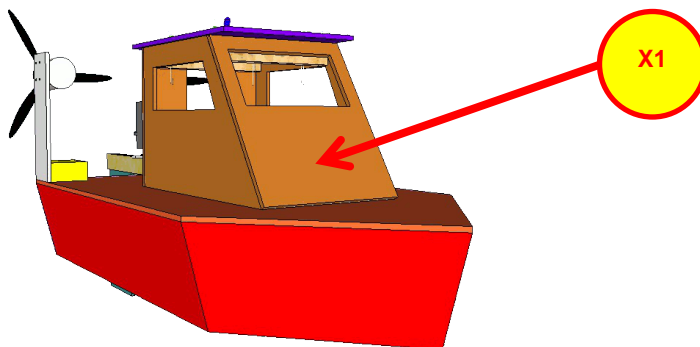


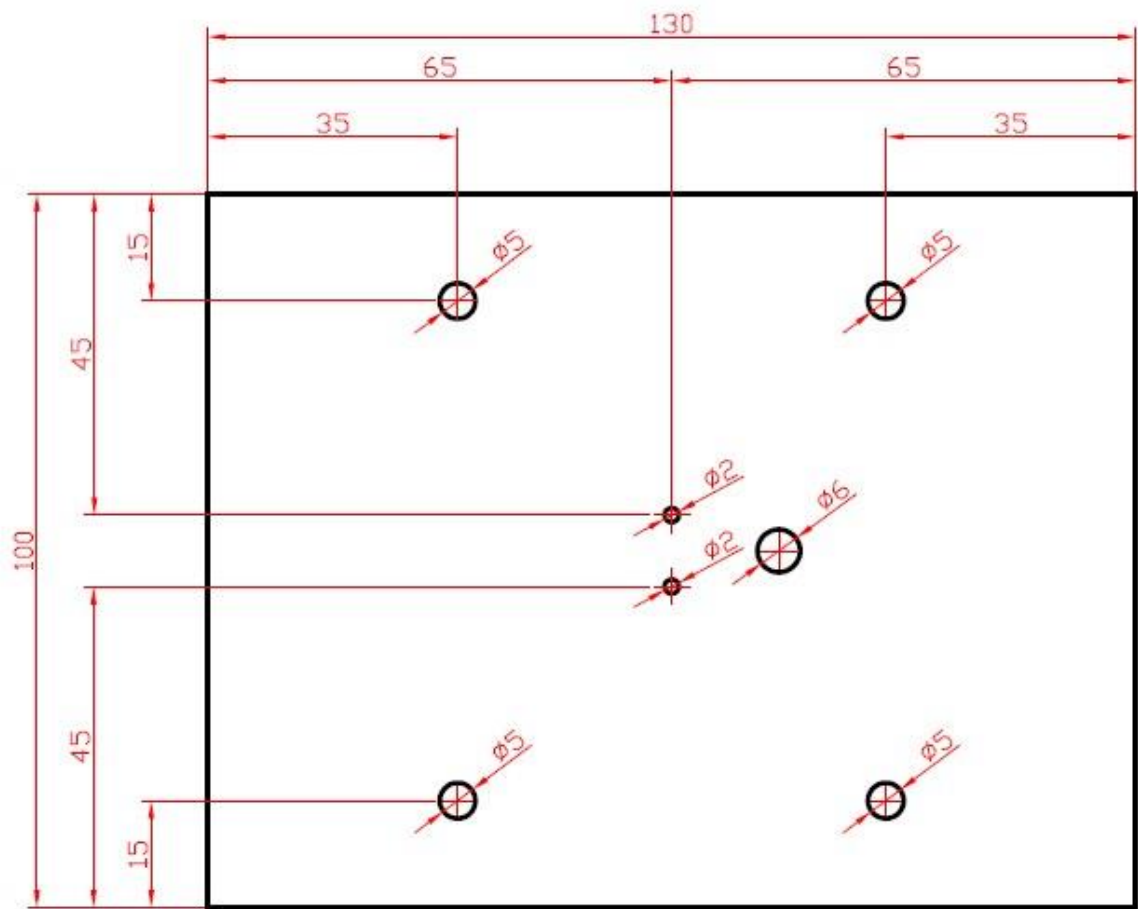
Back. Values in millimeters



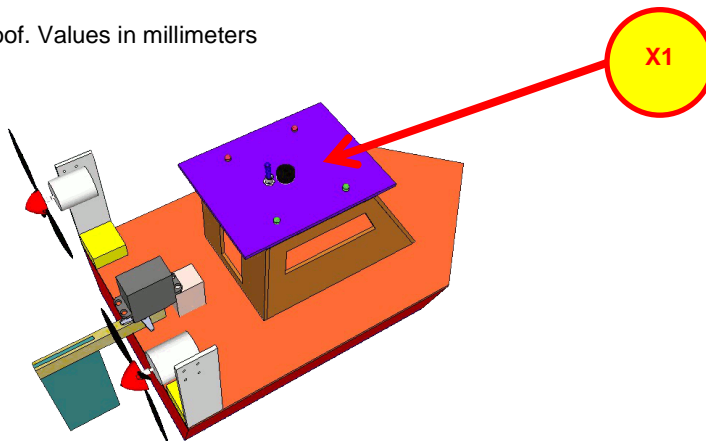


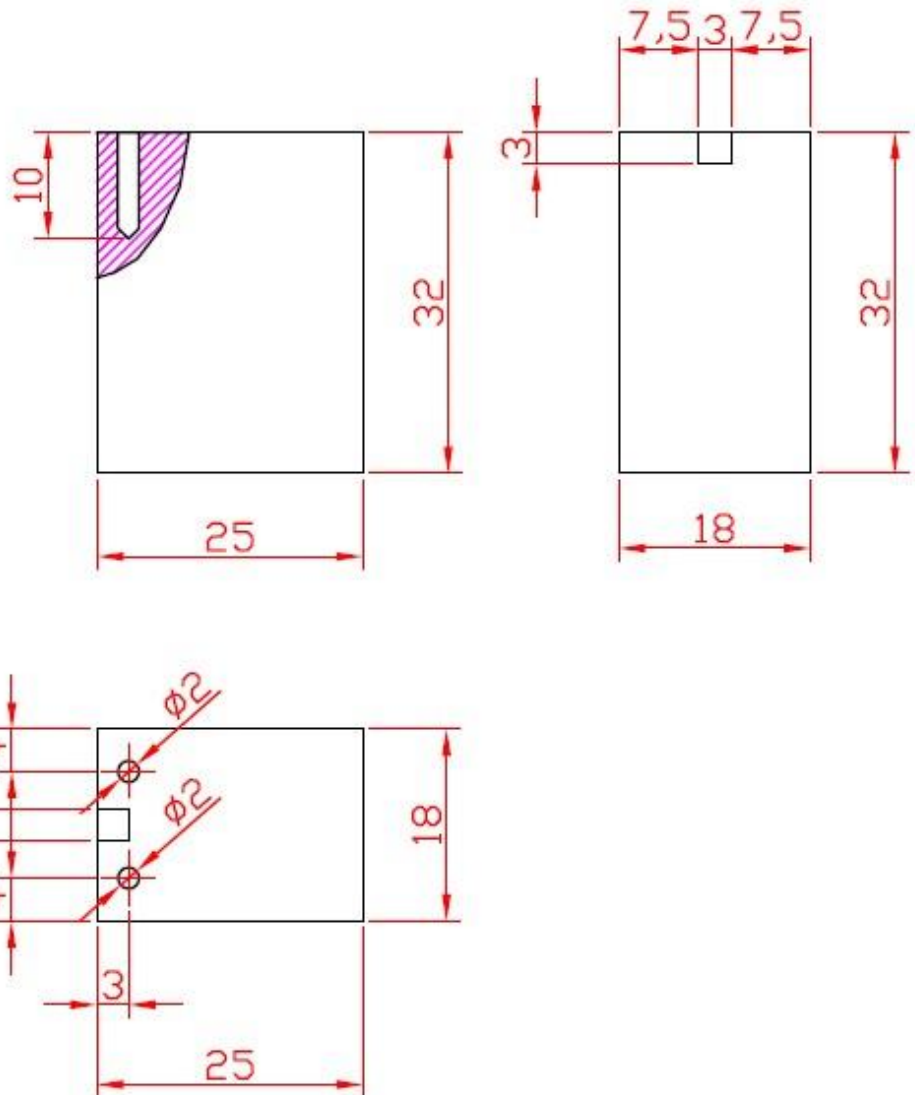
Front. Values in millimeters



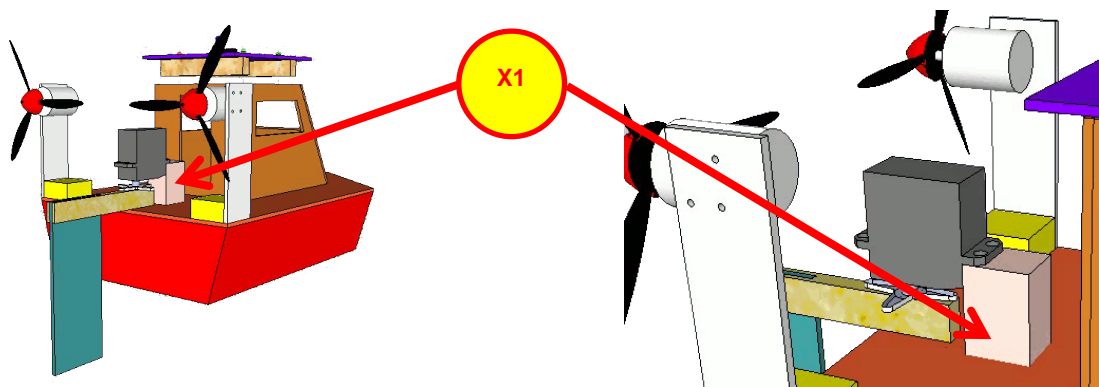


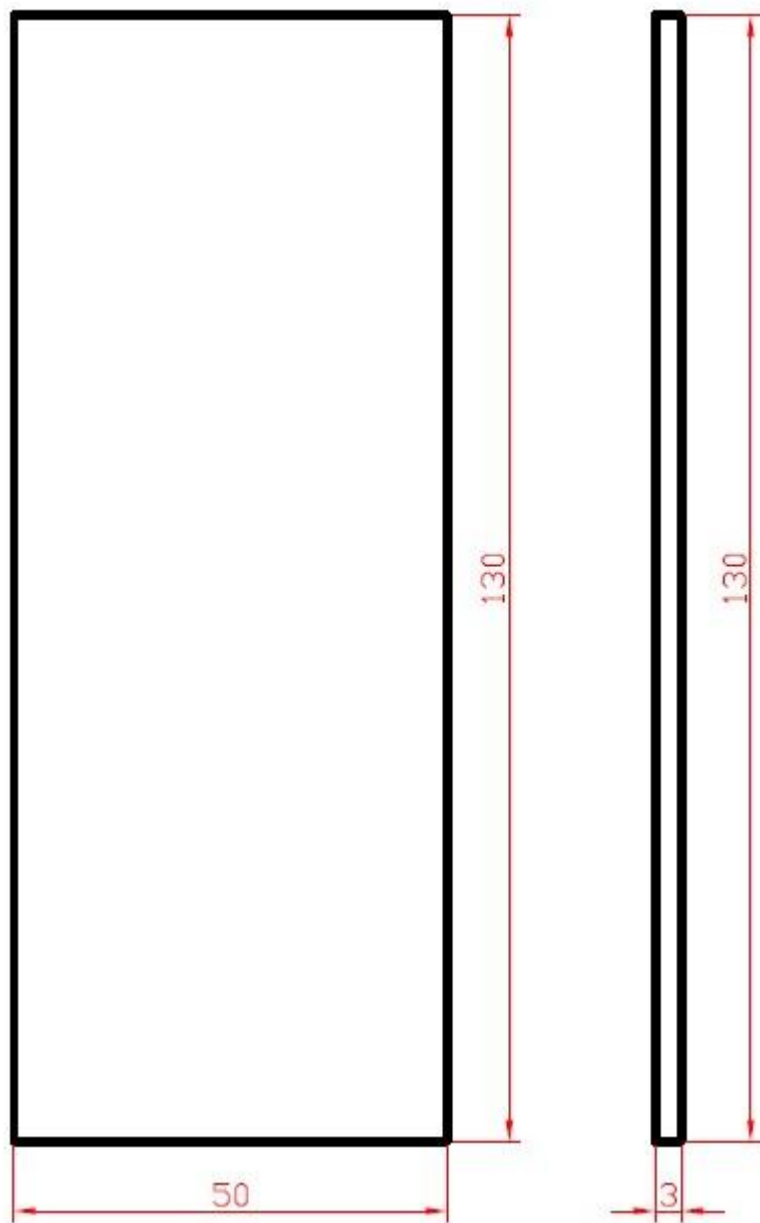
Roof. Values in millimeters



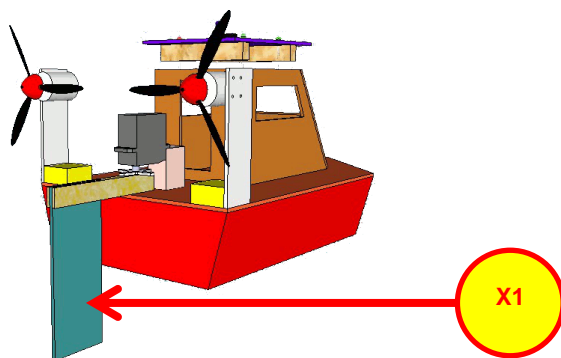


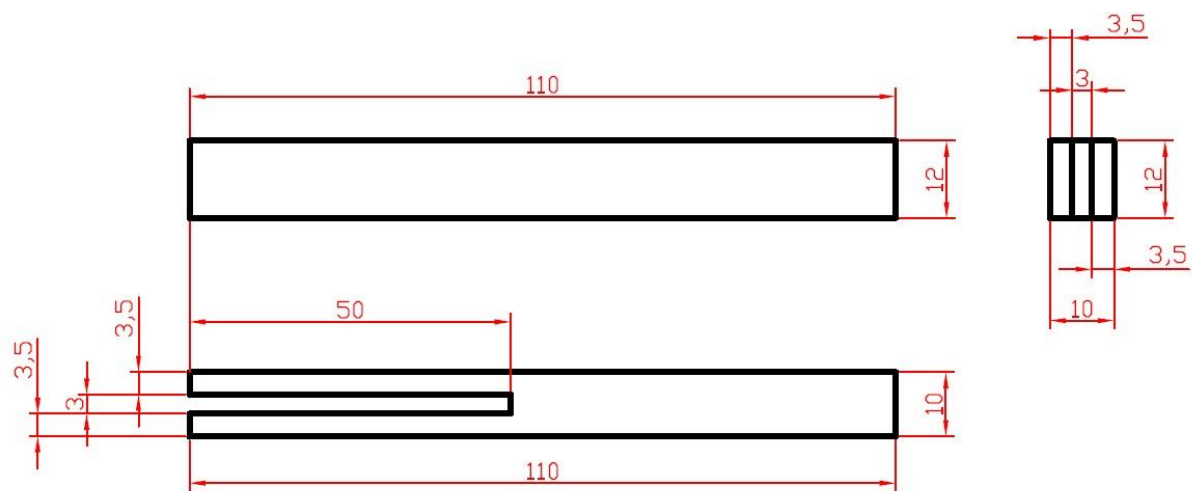
Servo support. Values in millimeters



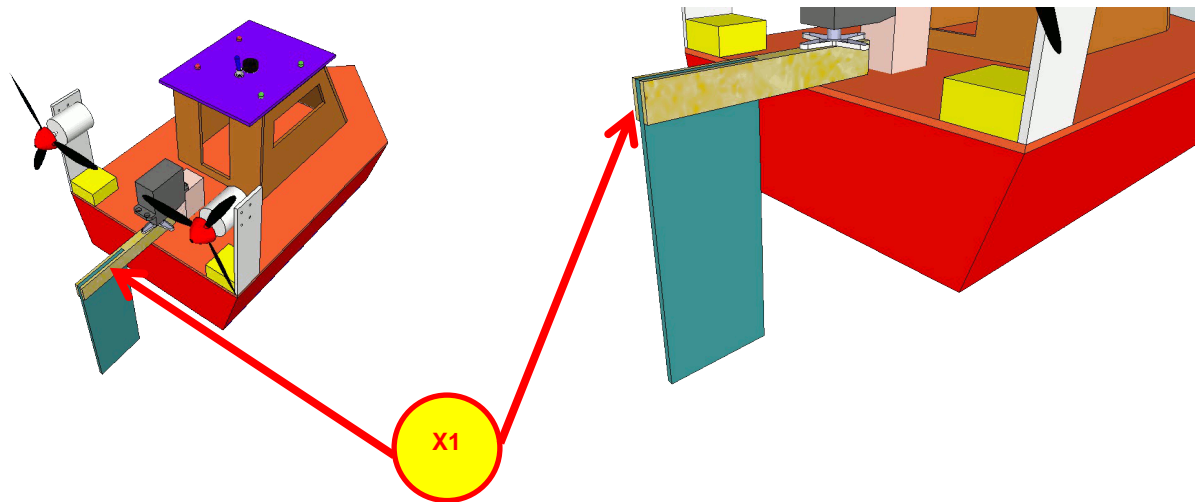


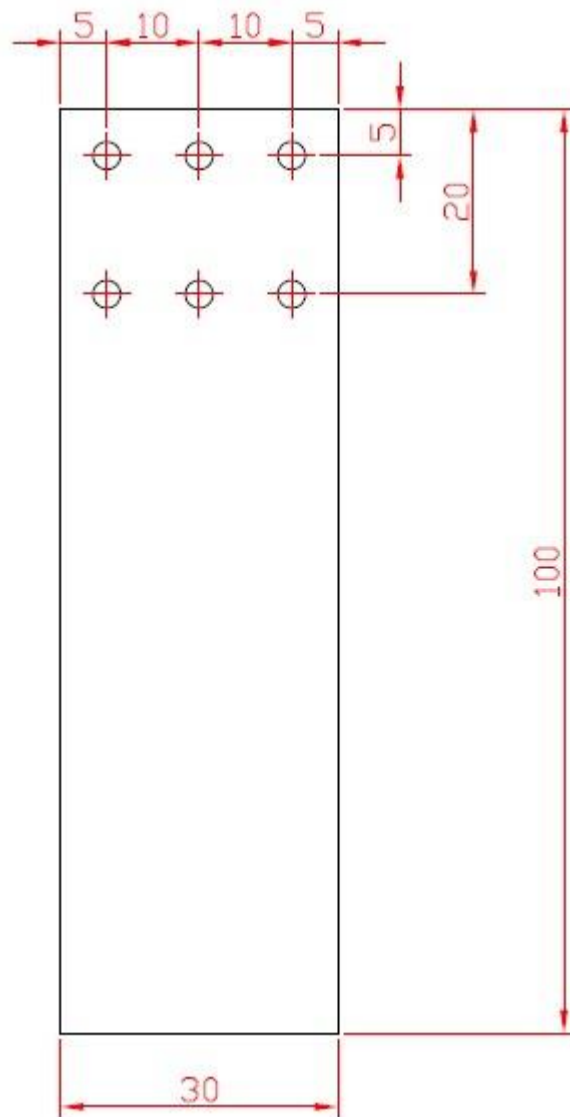
Rude Blade 1. Values in millimeters



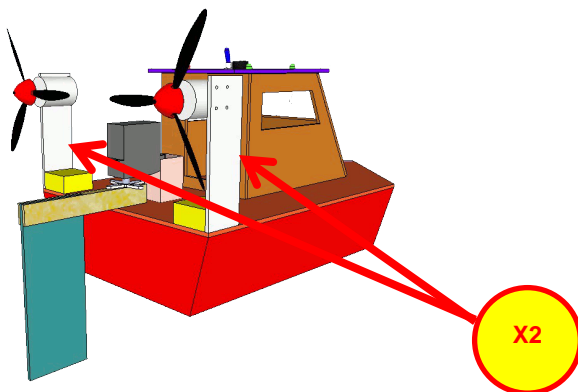


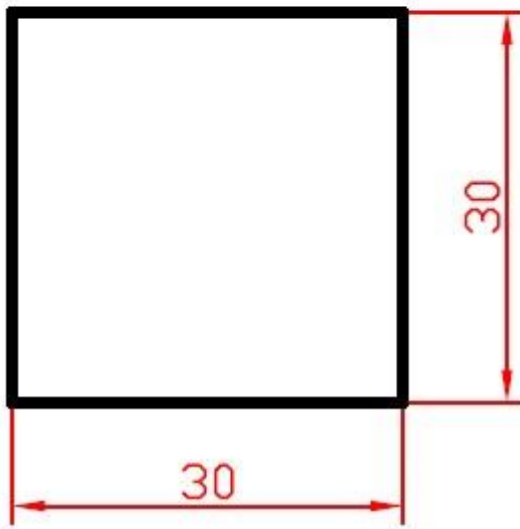
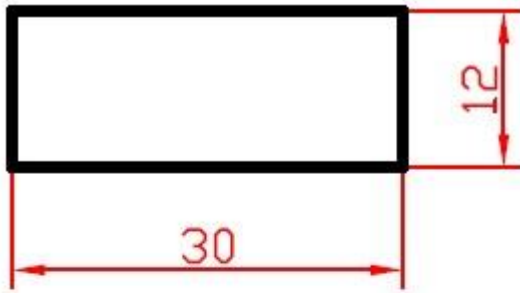
Rude Blade 2. Values in millimeters



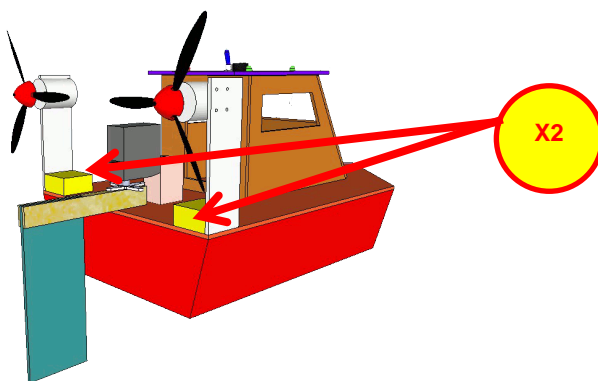


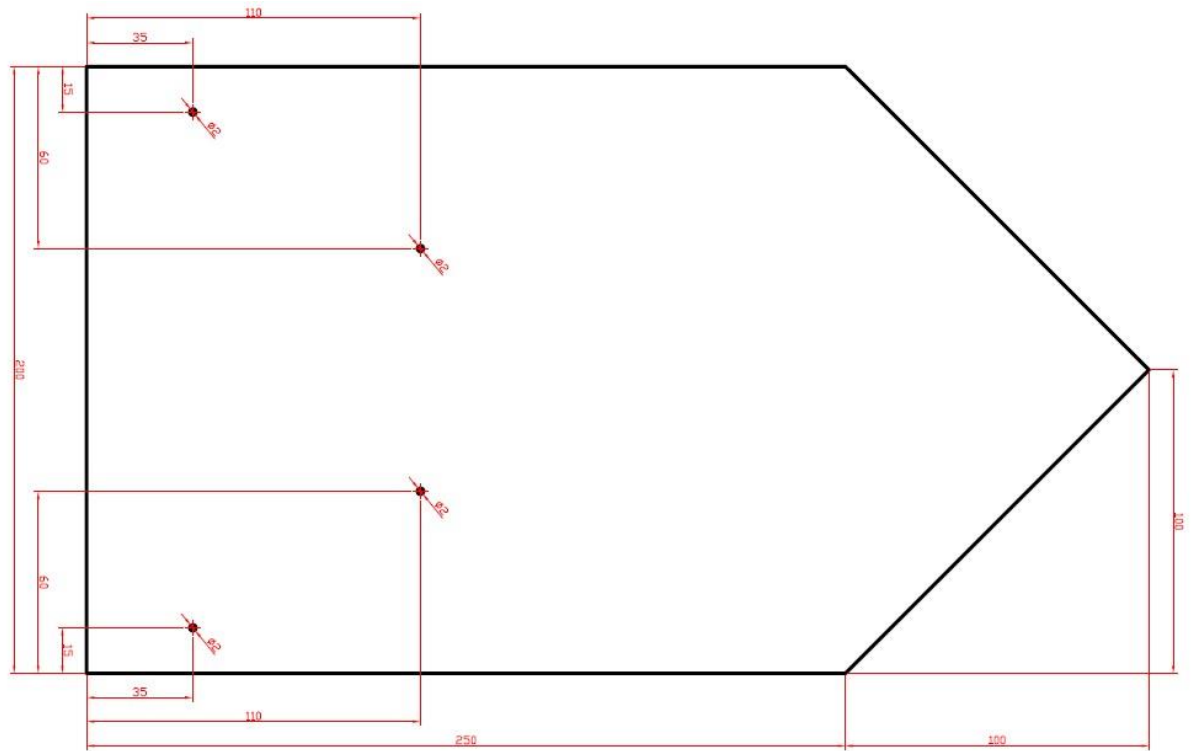
Motor support (x2). Values in millimeters



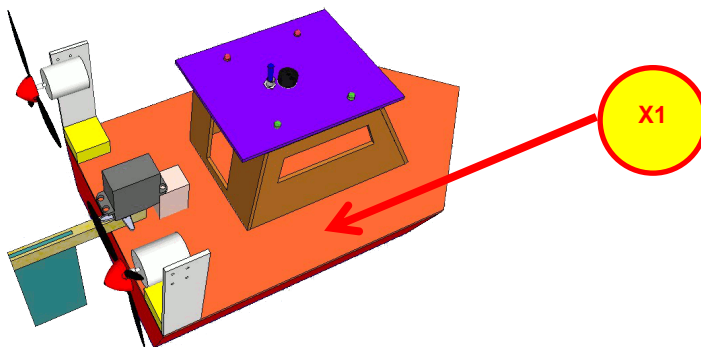


Motor support board (x2). Values in millimeters

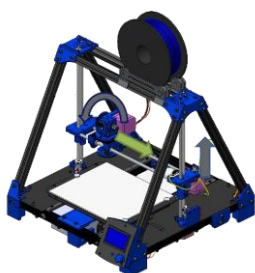




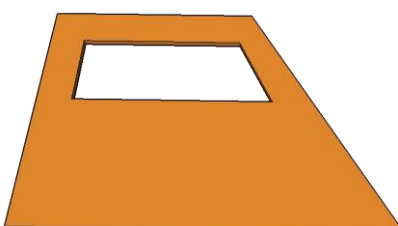
Floor. Values in millimeters (350 mm x 200mm)

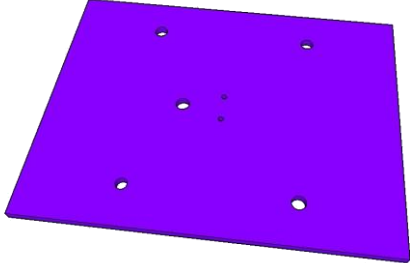

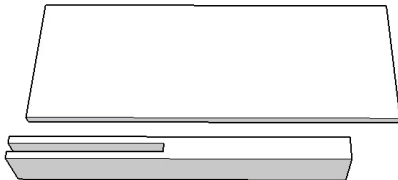


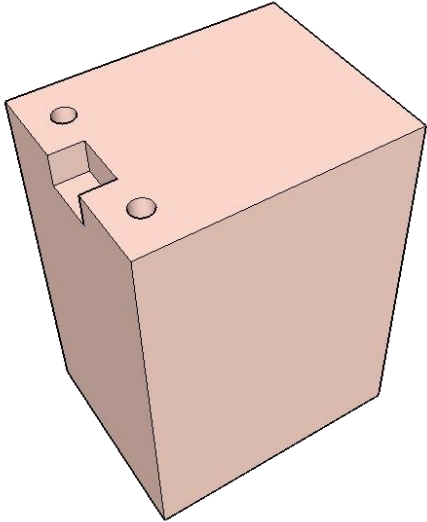
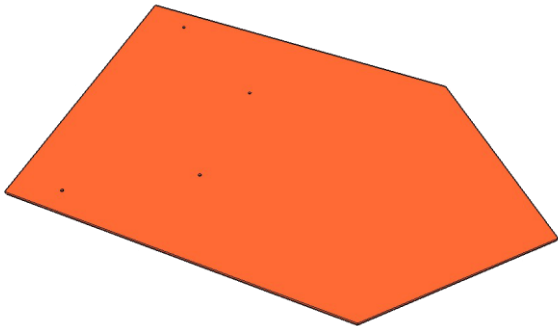
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You can download formats .skp, .stl and .gcode

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	<p>Download (.skp) https://drive.google.com/open?id=1aY01Ncux754VZLqpPR9uXvw7-Yhj-e0f </p> <p>Download (.stl) https://drive.google.com/open?id=1UW_N9PSpheawBY5NcH6ZWGttGgmhR2 </p> <p>Download (.gcode) https://drive.google.com/open?id=1XRFCYTflKj6sf470-nlnWLIeO4T5dLG8 </p>
	<p>Download (.skp) https://drive.google.com/open?id=1rOel9_L5bQLEUhPtK3LnhDLcO0kB8QzK </p> <p>Download (.stl) https://drive.google.com/open?id=1n1DjDTiJQNA3109jKweyz_eeLnHhfMuk </p> <p>Download (.gcode) https://drive.google.com/open?id=1DQ2Dfope-11BxgQndwx6Gky5LPoeRV3Z </p>
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	<p>Download (.gcode) https://drive.google.com/open?id=1WDQID4ozYDNCUnMSjc3jdSWOEpyu-ybr</p>
	<p>Download (.skp) https://drive.google.com/open?id=16SNa5bGZ7SgAMSL40qqejZiVniD7IDw6</p> <p>Download (.stl) https://drive.google.com/open?id=1bFq20fG3Jsyw3TUKvIo8xOf8eOKU7eER</p> <p>Download (.gcode) https://drive.google.com/open?id=1E8axGVifb9xR0XbIlBa-5TOW04kKAv0Z</p>
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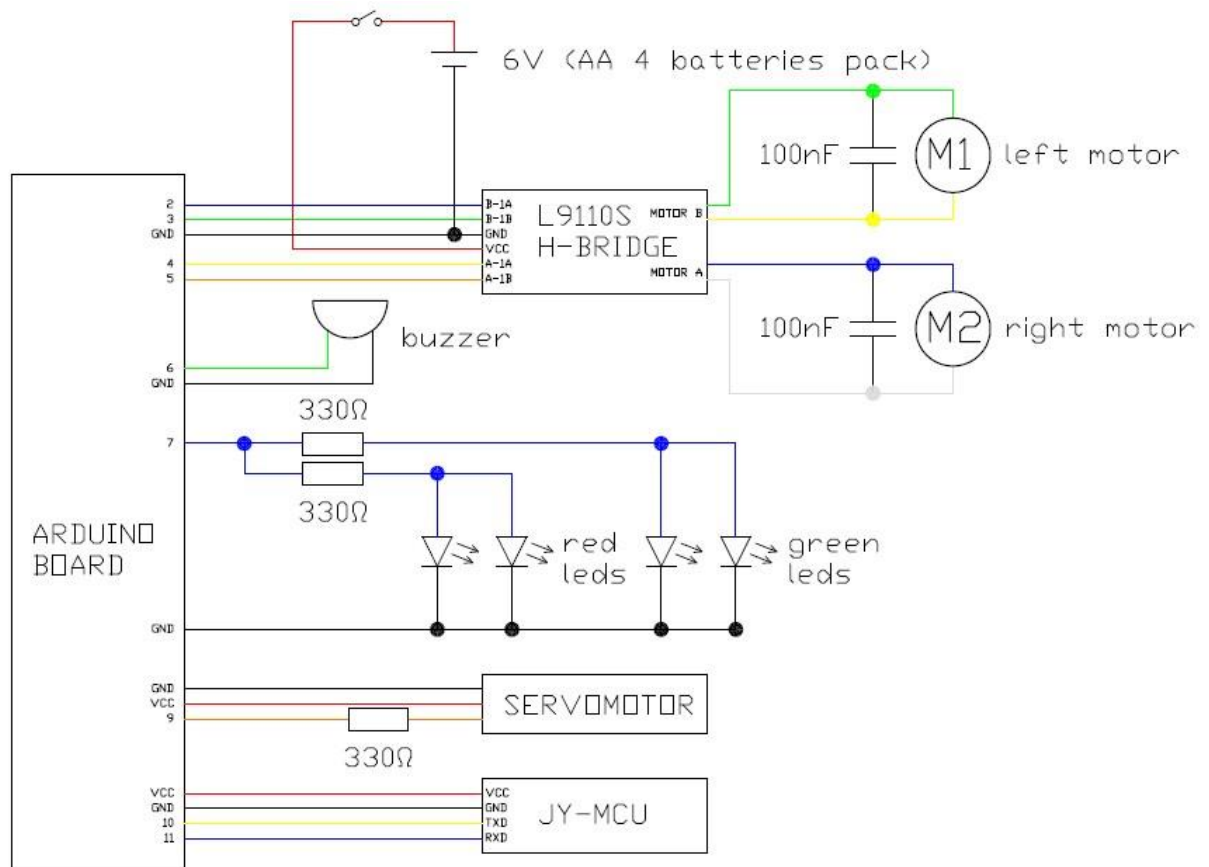
	<p>Download (.skp) https://drive.google.com/open?id=1NXSeIDxCH4-6L4ICM96pp_feWu1wk9Jz</p> <p>Download (.stl) https://drive.google.com/open?id=19TVDNX6-ubLAUyZKjloLkI9KyBqBr6tc</p> <p>Download (.gcode) https://drive.google.com/open?id=1NTgXWZXLMPqNbn7Ut-GJkDR1jp3uAEJz</p>
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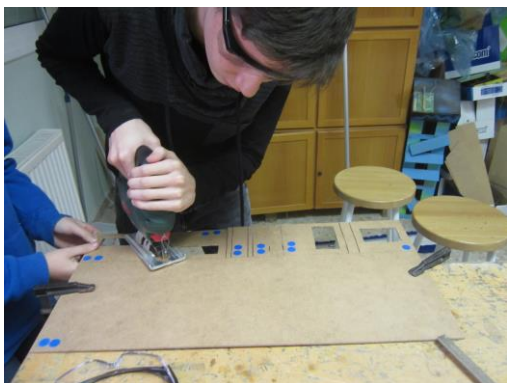
Printing blades at Cesire Aulatec. Barcelona

<http://www.cordemariavalls.cat/modelismenaval/documents/helix%20vaixell%20CESIRE.pdf>

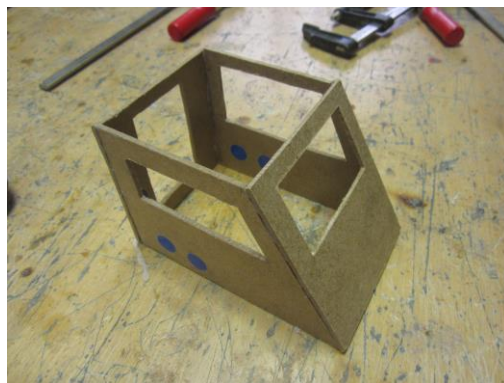
ELECTRONIC CIRCUIT



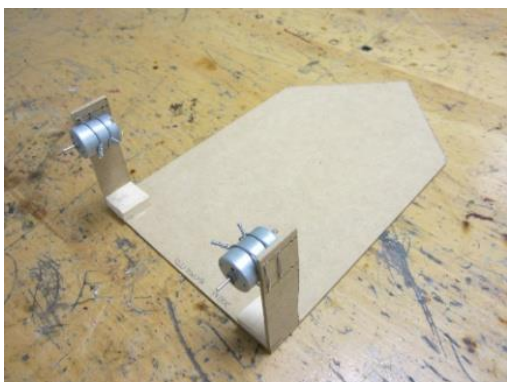
HOW TO BUILD THE SHIP.



Draw and cut medium density fibreboard (MDF)
3 mm 30 cm x 60 cm.



Build up a cabin.



Make holes so that the cables of the engine
can go into the cabin.



Make holes so that the cables of the engine
can reach the cabin through the lower part of
the ship.



Build the bottom of the boat with glascofoam
(thickness 8 cm)
You can incline it 30 degrees.



Verify that it adjusts perfectly.



Create the design you wish.



Rude blade element to connect to servo and blade.



Insert this part into the rude blade.



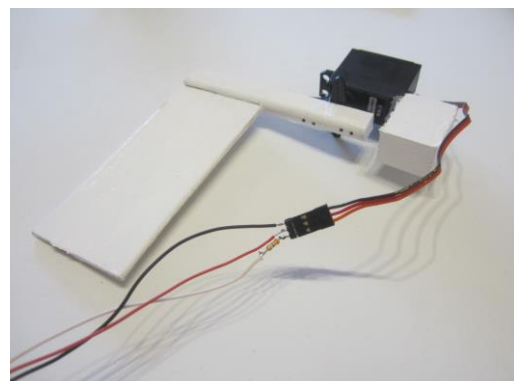
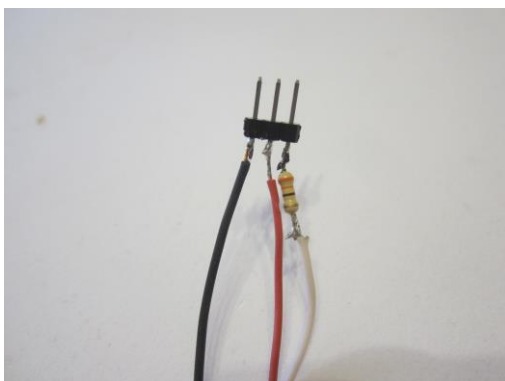
Tighten 2 screws to fix the servomotor.

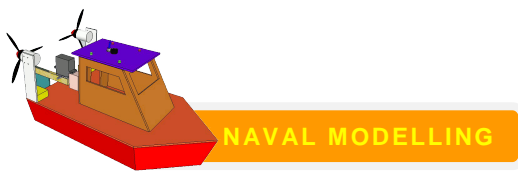


Paint the rude blade.



Fix the servomotor to the rude blade with an adapter.



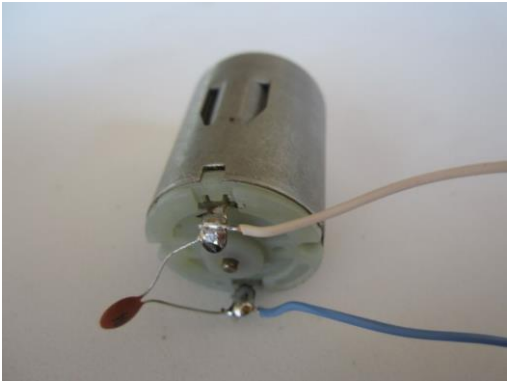
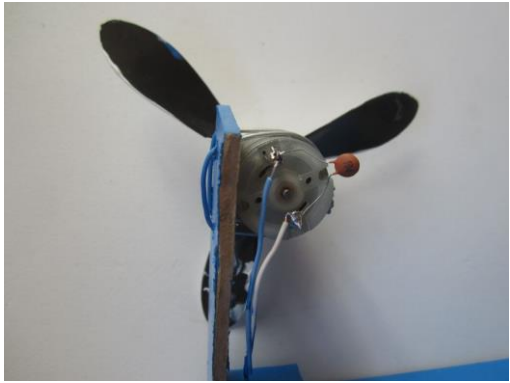
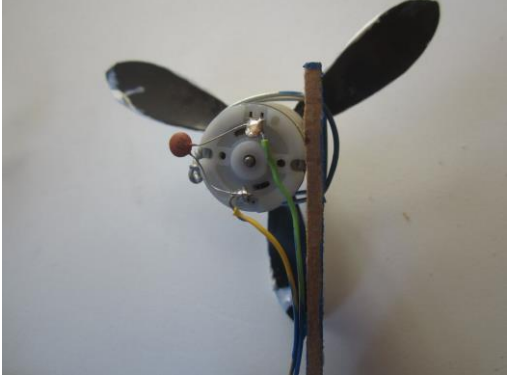
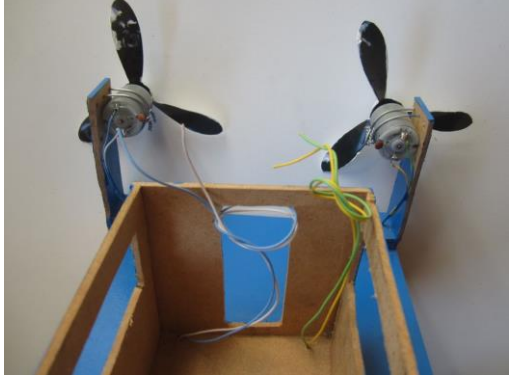


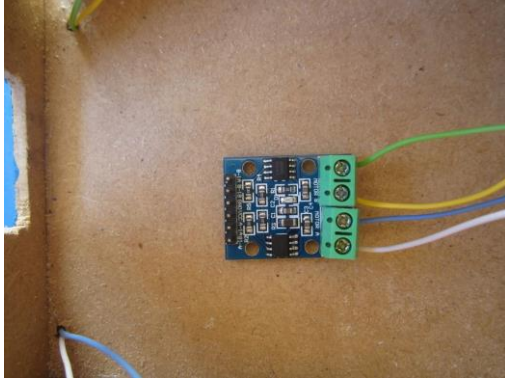


Make a terminal with black red and orange wires. Connect a resistor 330Ω to the orange wire.

Connect terminal to servo and to arduino black (GND), red (VCC) orange (pin 9).

WIRES, ELECTRICAL AND ELECTRONIC DEVICES

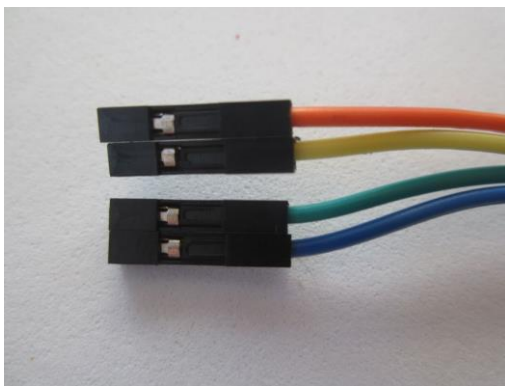
 <p>a</p>	
<p>Motor refrigerator hole (face down position).</p>	<p>Condensator 100k (100 nF).</p>
	
<p>Watch out refrigerator holes.</p>	<p>Put the holes face down to avoid water to enter.</p>
	
<p>Iron condensator and at up position green wire (50 cm long) and at down position yellow wire (left motor). All wires must be 50 cm long.</p>	<p>Introduce wires into the cabin.</p>



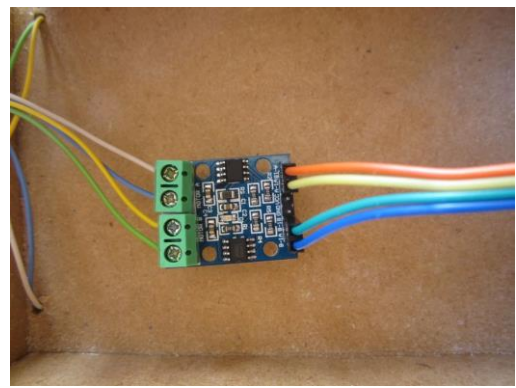
Connect wires at motor A (white and blue wires) and motor B (yellow and green wires) to L9110S H bridge driver controller board.



Wires (blue, green, yellow, orange) female - male 20 cm long.



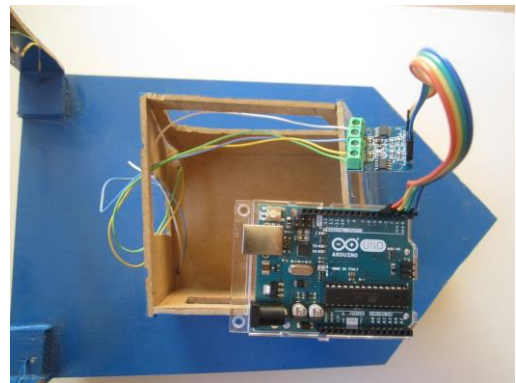
Female must be connected to L9110S H bridge driver controller board.



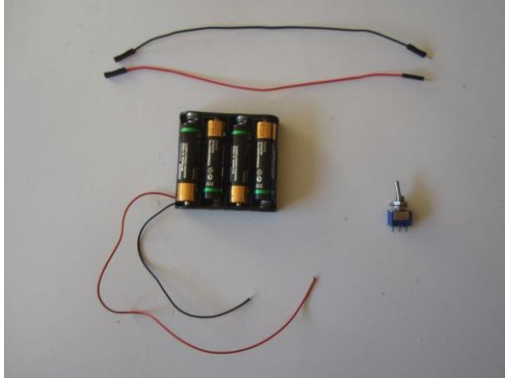
Connect: B-1A: blue wire B-1B: green wire A-1A: yellow wire A-1B: orange wire.



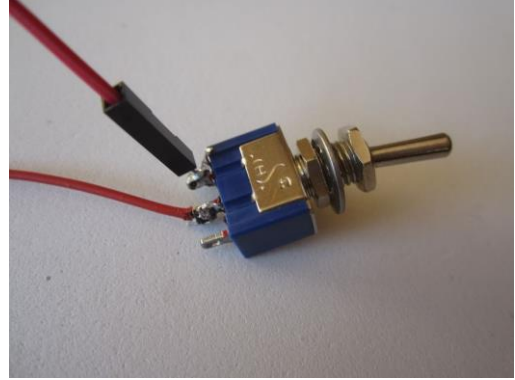
Connect to arduino board (blue wire: 2, green wire: 3, yellow wire: 4, orange wire: 5).



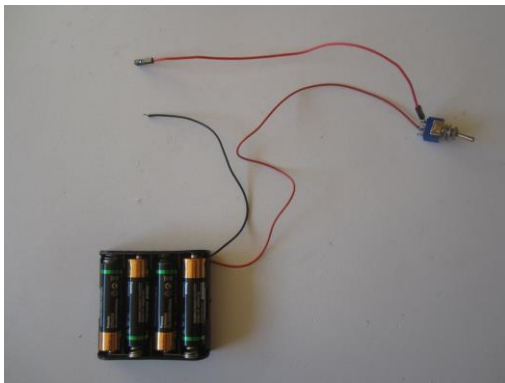
System Connected to Arduino Uno board.



(black, red) wires female / male 20 cm long
AA 4 batteries pack, switch.



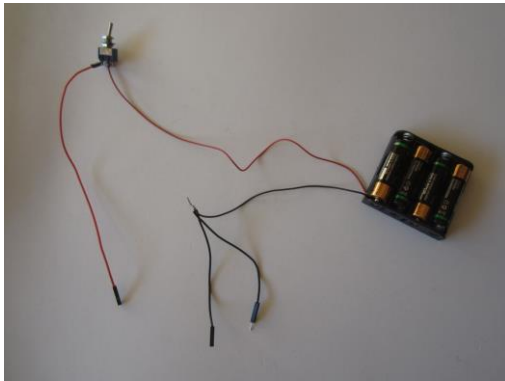
Iron red wire AA 4 batteries pack with a switch in the middle.
Iron red male wire with the switch.



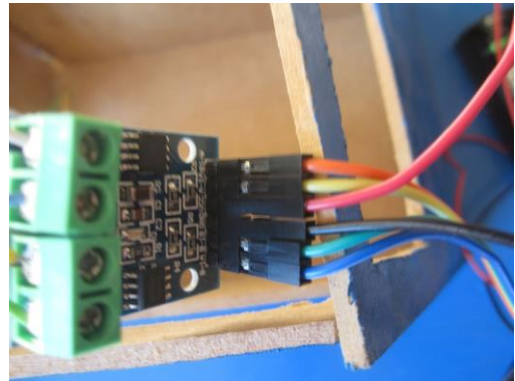
System AA 4 batteries pack connected to switch.



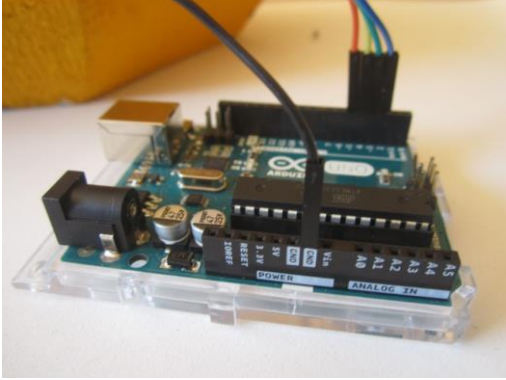
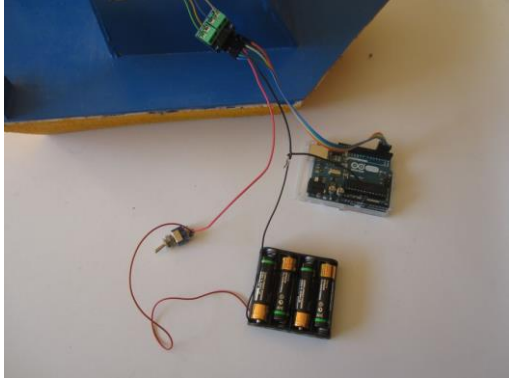

Trim black wire female /male long 20 cm middle.



Iron the three black wires.



Connect red (VCC) and black (GND) wires.

	
<p>Connect to arduino board black female wire (GND).</p>	<p>Power supply System.</p>
	
<p>Connect a USB cable.</p>	

FORWARD Arduino program

```
void setup() {  
  
  pinMode(2,OUTPUT); // BLUE WIRE TO DRIVER MOTOR  
  
  pinMode(3,OUTPUT); // GREEN WIRE TO DRIVER MOTOR  
  
  pinMode(4,OUTPUT); // YELLOW WIRE TO DRIVER MOTOR  
  
  pinMode(5,OUTPUT); // ORANGE WIRE TO DRIVER MOTOR  
  
}  
  
void loop() {  
  
  digitalWrite(2,LOW);//FORWARD  
  
  digitalWrite(3,HIGH);  
  
  digitalWrite(4,LOW);  
  
  digitalWrite(5,HIGH);  
  
}
```

BACKWARD Arduino program

```
void setup() {  
  
  pinMode(2,OUTPUT); // BLUE WIRE TO DRIVER MOTOR  
  
  pinMode(3,OUTPUT); // GREEN WIRE TO DRIVER MOTOR  
  
  pinMode(4,OUTPUT); // YELLOW WIRE TO DRIVER MOTOR  
  
  pinMode(5,OUTPUT); // ORANGE WIRE TO DRIVER MOTOR  
  
}  
  
void loop() {  
  
  digitalWrite(2,HIGH); // BACKWARD  
  
  digitalWrite(3,LOW);  
  
  digitalWrite(4,HIGH);  
  
  digitalWrite(5,LOW);  
  
}
```

RIGHT Arduino program

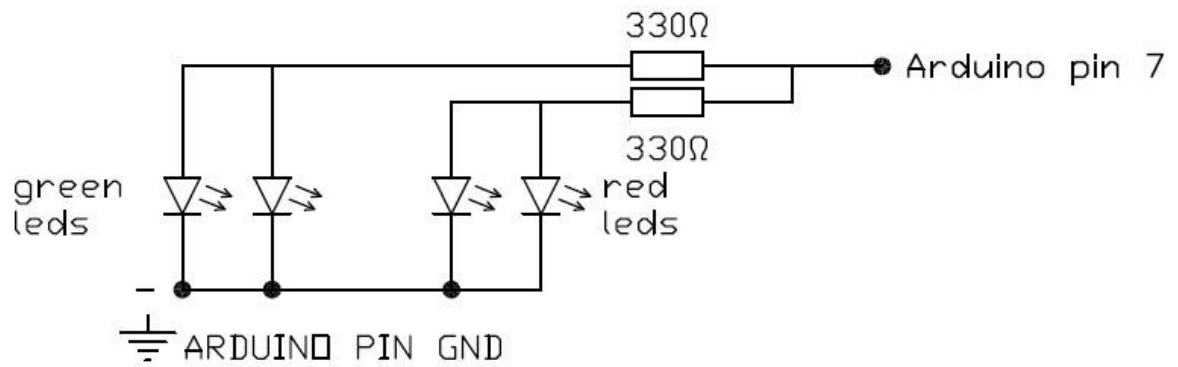
```
void setup() {  
  
  pinMode(2,OUTPUT); // BLUE WIRE TO DRIVER MOTOR  
  
  pinMode(3,OUTPUT); // GREEN WIRE TO DRIVER MOTOR  
  
  pinMode(4,OUTPUT); // YELLOW WIRE TO DRIVER MOTOR  
  
  pinMode(5,OUTPUT); // ORANGE WIRE TO DRIVER MOTOR  
  
}  
  
void loop() {  
  
  digitalWrite(2,LOW);//RIGHT  
  
  digitalWrite(3,HIGH);  
  
  digitalWrite(4,HIGH);  
  
  digitalWrite(5,LOW);  
  
}
```

LEFT Arduino program

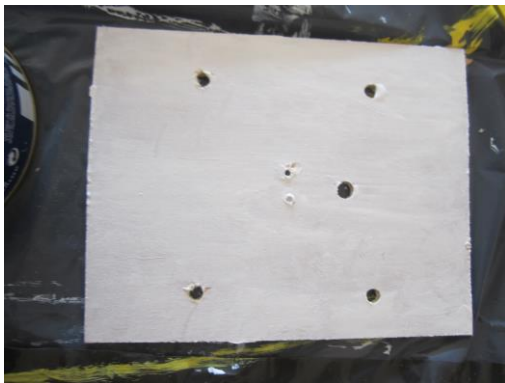
```
void setup() {  
  
  pinMode(2,OUTPUT); // BLUE WIRE TO DRIVER MOTOR  
  
  pinMode(3,OUTPUT); // GREEN WIRE TO DRIVER MOTOR  
  
  pinMode(4,OUTPUT); // YELLOW WIRE TO DRIVER MOTOR  
  
  pinMode(5,OUTPUT); // ORANGE WIRE TO DRIVER MOTOR  
  
}  
  
void loop() {  
  
  digitalWrite(2,HIGH);//LEFT  
  
  digitalWrite(3,LOW);  
  
  digitalWrite(4,LOW);  
  
  digitalWrite(5,HIGH);  
  
}
```

OTHER CONNECTIONS

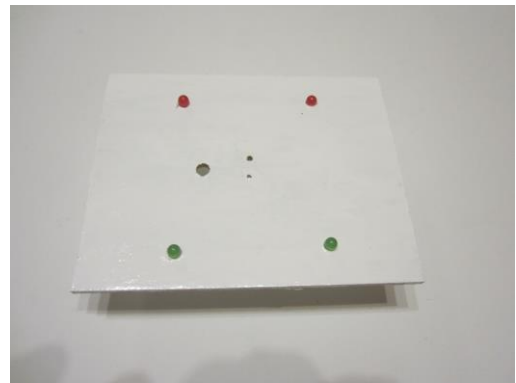
ROOF LIGHTS



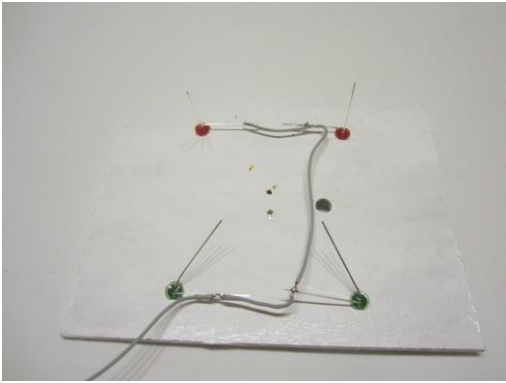
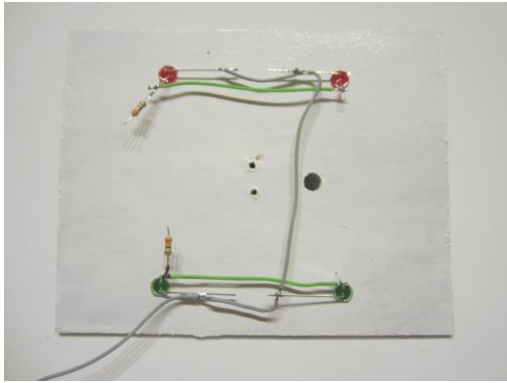
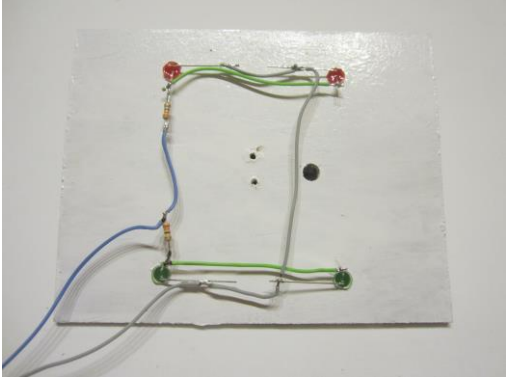

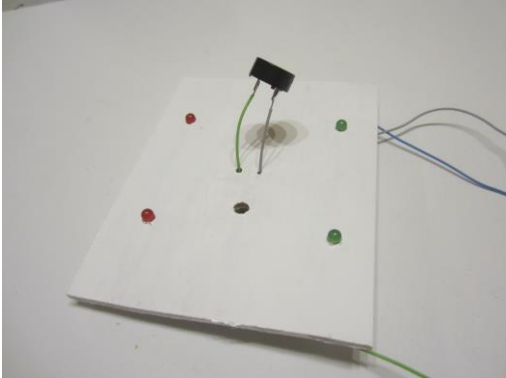
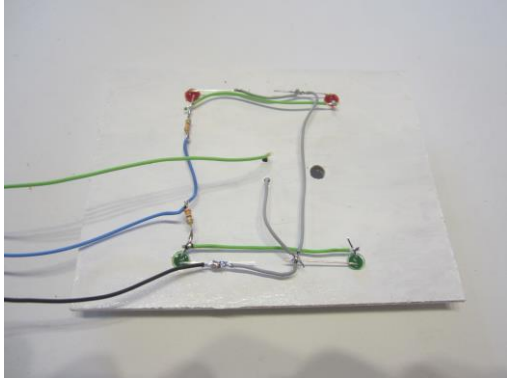
ROOF BUZZER



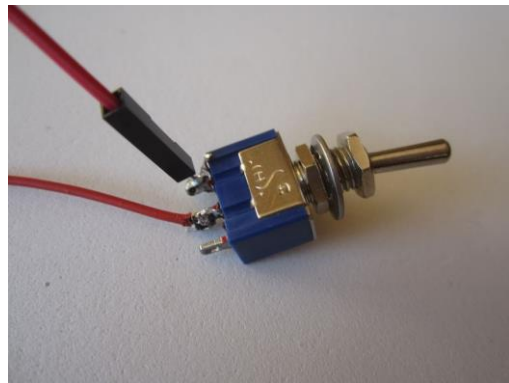
Roof.



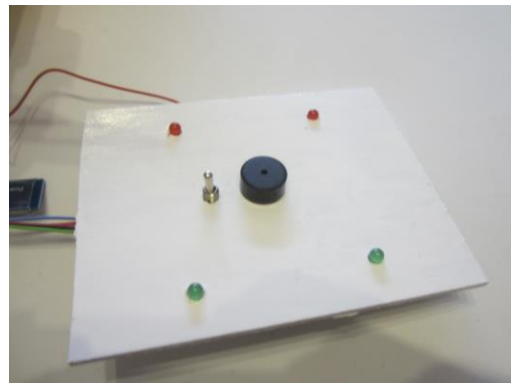
Insert two red and two green leds.

	
<p>Connect all katodes a GND.</p>	<p>Connect together red leds anode and put a resistor 330 Ω. Connect together green leds anode and put a resistor 330 Ω.</p>
	
<p>Connect blue (arduino pin 7) wire to two resistors .</p>	<p>Iron grey wires (GND) and green wires (arduino pin 6) to the buzzer.</p>
	
<p>Insert wires buzzer.</p>	<p>Iron grey wires (GND). Connect to arduino green (pin 6) blue (pin 7) black (GND).</p>

ROOF SWITCH

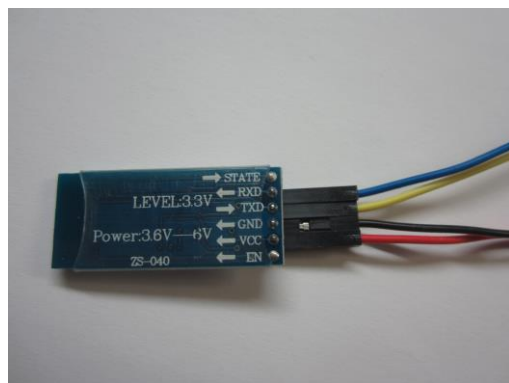
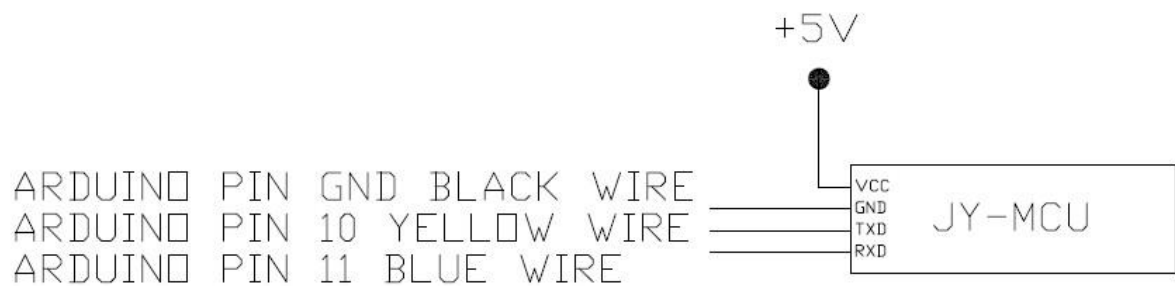


Switch.



Insert the switch in the roof.

BLUETOOTH



Connect to arduino red (VCC), black (GND,) yellow (pin 10) and blue (pin 11).

SHIP CONTROL PROGRAM

NAVAL MODELLING. BOARD

READ BLUETOOTH VALUE				
IF VALUE RECEIVED IS "e"				F
T				
STOP BOAT (MOTOR 1 AND 2 STOPPED)				Ø
IF VALUE RECEIVED IS "h"				F
T				
FORWARD BOAT (MOTOR 1 AND 2 FORDWARD)				Ø
IF VALUE RECEIVED IS "b"				F
T				
BACKWARD BOAT (MOTOR 1 AND 2 BACKWARD)				Ø
IF VALUE RECEIVED IS "t"				F
T				
TURN AT RIGHT (MOTOR 1 FORWARD AND 2 BACKWARD)				Ø
IF VALUE RECEIVED IS "d"				F
T				
TURN AT LEFT (MOTOR 1 BACKWARD AND 2 FORDWARD)				Ø
IF VALUE RECEIVED IS "a"				F
T				
DO A SOUND				Ø
IF VALUE RECEIVED IS "c"				F
T				
CONNECT OR DISCONNECT LIGHTS OF ROOF				Ø
IF VALUE RECEIVED IS.... PUT SERVO RUDDER BLADE AT POSITION:				
v	w	x	y	z
RIGHT 40 DEGREES	RIGHT 20 DEGREES	MIDDLE	LEFT 20 DEGREES	LEFT 40 DEGREES

Arduino program

```
//SHIP SCIENCE ON STAGE BY PERE COMPTE JOVE WITH ARDUINO
#include <SoftwareSerial.h>
SoftwareSerial blue(10,11); // bluetooth controller WIRE YELLOW 10 TXD AND WIRE
BLUE 11 RXD
char rec;
#include<Servo.h>
Servo myservo;
void setup() {
  pinMode(2,OUTPUT); // WIRE TO DRIVER MOTOR
  pinMode(3,OUTPUT); // GREEN WIRE TO DRIVER MOTOR
  pinMode(4,OUTPUT); // YELLOW WIRE TO DRIVER MOTOR
  pinMode(5,OUTPUT); // ORANGE WIRE TO DRIVER MOTOR
  pinMode(7,OUTPUT); //ROOF. GREEN WIRE AND RED LEDS

  Serial.begin(9600);
  blue.begin(9600);
  myservo.attach(9); //Servo rudder blade
}

void loop() {
  if (blue.available()){
    rec=blue.read();
    Serial.println(rec);
    switch(rec){
      case'e': //STOP
        digitalWrite(2,LOW);
        digitalWrite(3,LOW);
        digitalWrite(4,LOW);
        digitalWrite(5,LOW);
        break;
      case'h': //FORWARD
        digitalWrite(2,LOW);
        digitalWrite(3,HIGH);
```

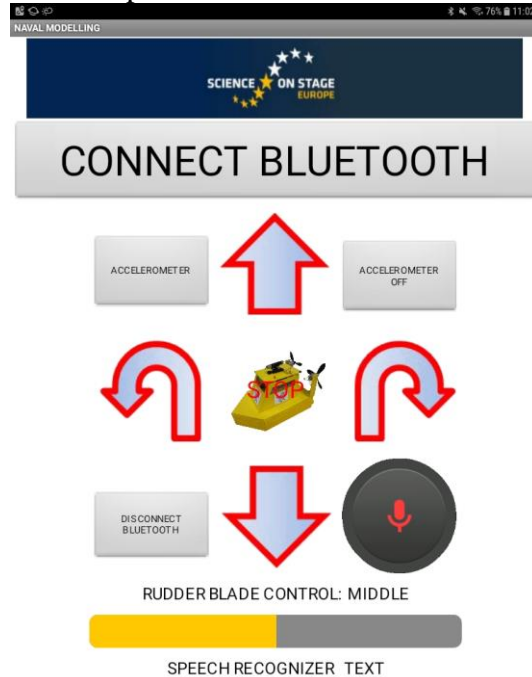
```
digitalWrite(4,LOW);
digitalWrite(5,HIGH);
break;
    case'b': //BACKWARD
digitalWrite(2,HIGH);
digitalWrite(3,LOW);
digitalWrite(4,HIGH);
digitalWrite(5,LOW);
break;
    case'f': //RIGHT
digitalWrite(2,LOW);
digitalWrite(3,HIGH);
digitalWrite(4,HIGH);
digitalWrite(5,LOW);
break;
    case'd': //LEFT
digitalWrite(2,HIGH);
digitalWrite(3,LOW);
digitalWrite(4,LOW);
digitalWrite(5,HIGH);
break;
    case'a': //SOUND pin 6 BUZZER
    tone(6,220); //Sound frequency 220Hz
    delay(1000);
    noTone(6); //Stop sound
    delay(500);
    tone(6,220); //Sound frequency 220Hz
    delay(1000);
    noTone(6); //parar so
    delay(500);
break;
    case'c': // Green and red leds of roof. Invert state pin 7 lights
    digitalWrite(7,!digitalRead(7));
break;
    case'v': // pin 9 SERVO right 40 degrees rudder blade control. You must calibrate this
value: 50
```

```
myservo.write(50);
delay(120);
break;
    case'w': // pin 9 SERVO right 20 degrees rudder blade control. You must calibrate this
value: 70
        myservo.write(70);
        delay(120);
        break;
    case'x': // pin 9 SERVO middle rudder blade control. You must calibrate this value: 90
        myservo.write(90);
        delay(120);
        break;
    case'y': // pin 9 SERVO left 20 degrees rudder blade control You must calibrate this
value: 110
        myservo.write(110);
        delay(120);
        break;
    case'z': // pin 9 SERVO left 40 degrees rudder blade control. You must calibrate this
value: 130
        myservo.write(130);
        delay(120);
        break;
    default:
        delay(500);
        blue.print(rec);
        blue.println("this value is not correct");
    }
}
```

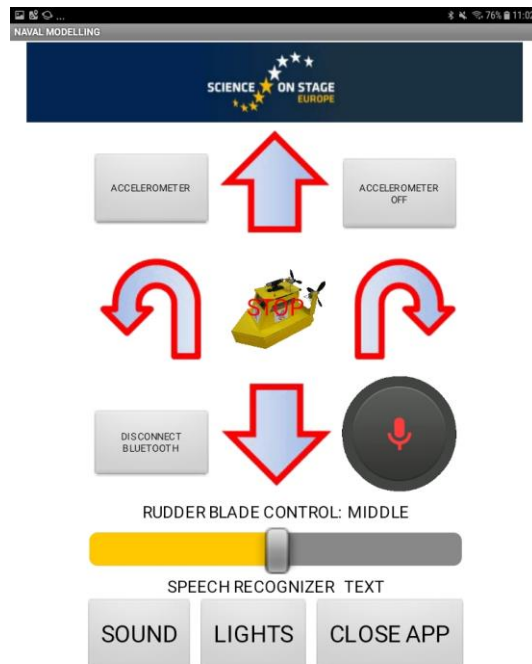
APP WITH APPINVENTOR.

APP PROGRAM

Initial aspect



This appearance is shown when you connect bluetooth.

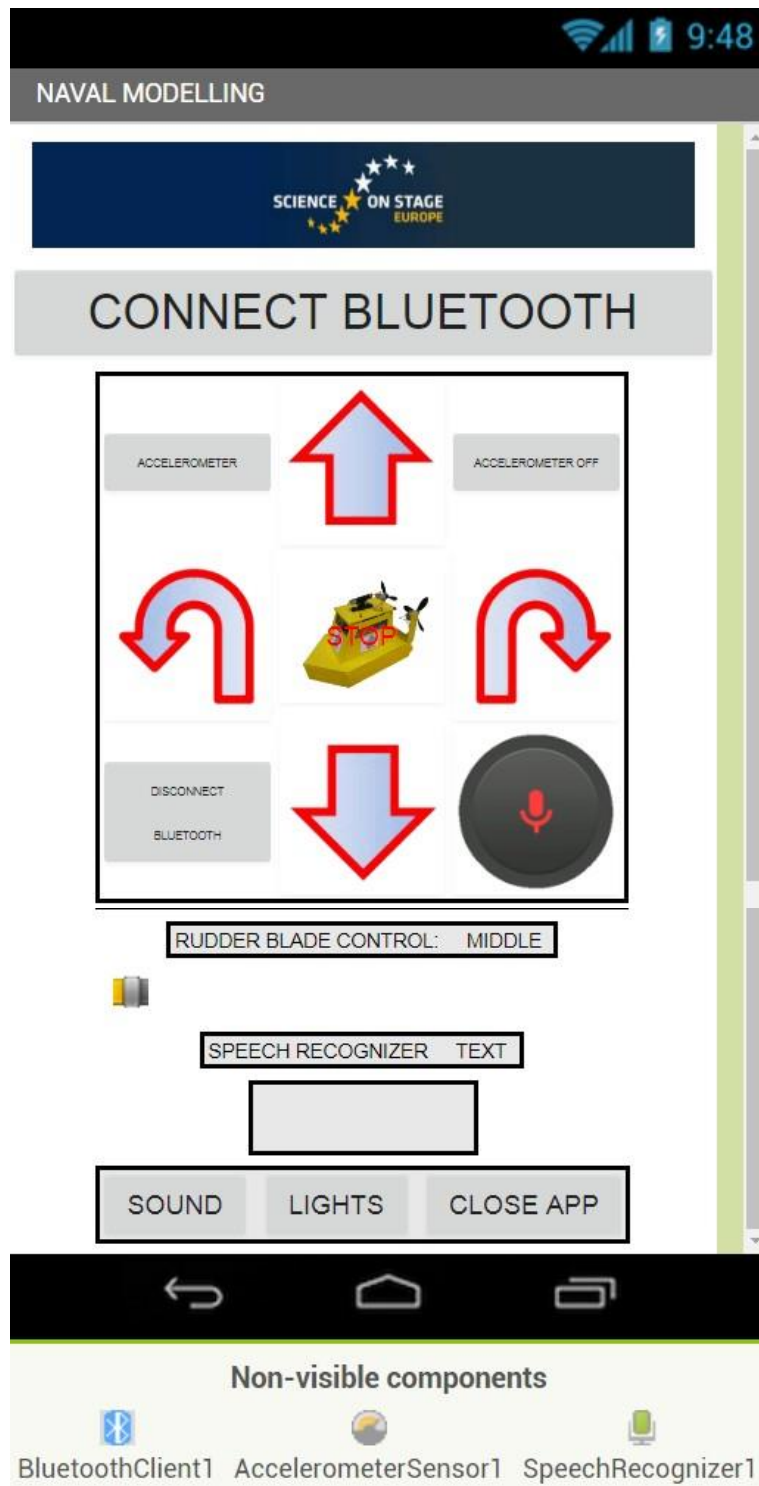


Download App (.apk): <https://drive.google.com/file/d/1-8PpHyGgkbJpKkuKcNqLg6Y35qsZIEAn/view?usp=sharing>

Original program that you can modifie (.aia):

<https://drive.google.com/file/d/1XNC7a1PYz9yYjM-4JY6JzGv9iH54nr40/view?usp=sharing>

STEP TO STEP APP PROGRAMMING -DESIGNER



Components

Screen1

Image1

ListPicker1

TableArrangement1

ButtonForward_b

ButtonLeft_d

ButtonRight_f

ButtonBackward_h

Button_STOP_e

Accelerometer

AccelerometerOff

ButtonVoice

ButtonDisconnectBluetooth

HorizontalArrangement1

Label1RudderBlade

LabelPositionRudder

Slider1RudderBlade

HorizontalArrangement2

LabelSR

LabelSpeechRecognize

HorizontalArrangement3

HorizontalArrangement4

ButtonSound_a

ButtonLight_c

ButtonCloseApp

BluetoothClient1

AccelerometerSensor1

SpeechRecognizer1

Properties	
Screen1	
AboutScreen	<input type="text"/>
AccentColor	<input type="checkbox"/> None
AlignHorizontal	Center : 3 ▾
AlignVertical	Top : 1 ▾
AppName	NAVAL MODELLING
BackgroundColor	<input type="checkbox"/> Default
BackgroundImage	None...
CloseScreenAnimation	Default ▾
Icon	vaixell4eso2014_900.gif...
OpenScreenAnimation	Default ▾
PrimaryColor	<input type="checkbox"/> None
PrimaryColorDark	<input type="checkbox"/> None
ScreenOrientation	Unspecified ▾
Scrollable	<input checked="" type="checkbox"/>
ShowListsAsJson	<input type="checkbox"/>
ShowStatusBar	<input checked="" type="checkbox"/>
Sizing	Fixed ▾
Theme	Classic ▾
Title	NAVAL MODELLING
TitleVisible	<input checked="" type="checkbox"/>
TutorialURL	<input type="text"/>
VersionCode	1

Image1	ListPicker1
Height	BackgroundColor
50 pixels...	<input type="checkbox"/> Default
Width	ElementsFromString
300 pixels...	<input type="text"/>
Picture	Enabled
LOGOSONS2.png...	<input checked="" type="checkbox"/>
RotationAngle	FontBold
0.0	<input type="checkbox"/>
ScalePictureToFit	FontItalic
<input type="checkbox"/>	<input type="checkbox"/>
Visible	FontSize
<input checked="" type="checkbox"/>	25
	FontTypeface
	default ▾
	Height
	Automatic...
	Width
	Fill parent...

<p>Image</p> <p>None...</p> <p>ItemBackgroundColor</p> <p><input checked="" type="checkbox"/> Default</p> <p>ItemTextColor</p> <p><input type="checkbox"/> Default</p> <p>Selection</p> <p></p> <p>Shape</p> <p>default ▾</p> <p>ShowFeedback</p> <p><input checked="" type="checkbox"/></p> <p>ShowFilterBar</p> <p><input type="checkbox"/></p> <p>Text</p> <p>CONNECT BLUETOOTH</p> <p>TextAlignment</p> <p>center : 1 ▾</p> <p>TextColor</p> <p><input checked="" type="checkbox"/> Default</p> <p>Title</p> <p></p> <p>Visible</p> <p><input checked="" type="checkbox"/></p>		<p>TableArrangement1</p> <p>Columns</p> <p>3</p> <p>Height</p> <p>Automatic...</p> <p>Width</p> <p>Automatic...</p> <p>Rows</p> <p>3</p> <p>Visible</p> <p><input checked="" type="checkbox"/></p>
--	--	--

ButtonForward_b

BackgroundColor

Default

Enabled

☒

FontBold

☐

FontItalic

☐

FontSize

FontTypeface

Height

Width

Image

Shape

ShowFeedback

☒

Text

TextAlignment

TextColor

Default

Visible

☒

ButtonLeft_d

BackgroundColor

☐ Default

Enabled

☒

FontBold

☐

FontItalic

☐

FontSize

FontTypeface

Height

Width

Image

Shape

ShowFeedback

☒

Text

TextAlignment

TextColor

☐ Default

Visible

☒

ButtonRight_f

BackgroundColor

☐ Default

Enabled

☒

FontBold

☐

FontItalic

☐

FontSize

FontTypeface

Height

Width

Image

Shape

ShowFeedback

☒

Text

TextAlignment

TextColor

☐ Default

Visible

☒

ButtonBackward_h

BackgroundColor

☐ Default

Enabled

☒

FontBold

☐

FontItalic

☐

FontSize

FontTypeface

Height

Width

Image

Shape

ShowFeedback

☒

Text

TextAlignment

TextColor

☐ Default

Visible

☒

Button_STOP_e

BackgroundColor

Default

Enabled

FontBold

FontItalic

FontSize

14.0

FontTypeface

default

Height

60 pixels...

Width

60 pixels...

Image

vaixell4eso2014_900.gif...

Shape

default

ShowFeedback

Text

STOP

TextAlignment

center : 1

TextColor

Red

Visible

Accelerometer

BackgroundColor

☐ Default

Enabled

☒

FontBold

☐

FontItalic

☐

FontSize

FontTypeface

Height

Width

Image

Shape

ShowFeedback

☒

Text

TextAlignment

TextColor

☐ Default

Visible

☒

AccelerometerOff

BackgroundColor

☐ Default

Enabled

☒

FontBold

☐

FontItalic

☐

FontSize

FontTypeface

Height

Width

Image

Shape

ShowFeedback

☒

Text

TextAlignment

TextColor

☐ Default

Visible

☒

ButtonVoice

BackgroundColor

☐ Default

Enabled

☒

FontBold

☐

FontItalic

☐

FontSize

FontTypeface

Height

Width

Image

Shape

ShowFeedback

☒

Text

TextAlignment

TextColor

☐ Default

Visible

☒

ButtonDisconnectBluetooth

BackgroundColor

Default

Enabled

☒

FontBold

☐

FontItalic

☐

FontSize

FontTypeface

Height

Width

Image

Shape

ShowFeedback

☒

Text

TextAlignment

TextColor

Default

Visible

☒

HorizontalArrangement1		Label1RudderBlade
AlignHorizontal	Left : 1 ▾	BackgroundColor
AlignVertical	Top : 1 ▾	<input type="checkbox"/> None
BackgroundColor	<input checked="" type="checkbox"/> Default	FontBold
Height	Automatic...	<input type="checkbox"/>
Width	Automatic...	Fontitalic
Image	None...	<input type="checkbox"/>
Visible	<input checked="" type="checkbox"/>	FontSize
		10
		FontTypeface
		default ▾
		HTMLFormat
		<input type="checkbox"/>
		HasMargins
		<input checked="" type="checkbox"/>
		Height
		Automatic...
		Width
		Automatic...
		Text
		RUDDER BLADE CONTRC

LabelPositionRudder	
BackgroundColor	<input type="checkbox"/> None
FontBold	<input type="checkbox"/>
Fontitalic	<input type="checkbox"/>
FontSize	<input type="text" value="10"/>
FontTypeface	<input type="text" value="default"/>
HTMLFormat	<input type="checkbox"/>
HasMargins	<input checked="" type="checkbox"/>
Height	<input type="text" value="Automatic..."/>
Width	<input type="text" value="Automatic..."/>
Text	<input type="text" value="MIDDLE"/>
TextAlignment	<input type="text" value="left : 0"/>
TextColor	<input checked="" type="checkbox"/> Default
Visible	<input checked="" type="checkbox"/>

LabelPositionRudder

BackgroundColor

☐ None

FontBold

☐

FontItalic

☐

FontSize

10

FontTypeface

default ▾

HTMLFormat

☐

HasMargins

☒

Height

Automatic...

Width

Automatic...

Text

MIDDLE

TextAlignment




left : 0 ▾

TextColor

☒ Default

Visible

☒

Slider1RudderBlade	
ColorLeft  Default	HorizontalArrangement2
ColorRight  Default	AlignHorizontal Left : 1 ▾
Width 225 pixels...	AlignVertical Top : 1 ▾
MaxValue 6	BackgroundColor  Default
MinValue 0	Height Automatic...
ThumbEnabled <input checked="" type="checkbox"/>	Width Automatic...
ThumbPosition 3	Image None...
Visible <input checked="" type="checkbox"/>	Visible <input checked="" type="checkbox"/>

LabelSR

BackgroundColor

☐ None

FontBold

☐

Fontitalic

☐

FontSize

FontTypeface

HTMLFormat

☐

HasMargins

☐

Height

Width

Text

TextAlignment

TextColor

☐ Default

Visible

☒

LabelSpeechRecognizer

BackgroundColor

☐ None

FontBold

☐

FontItalic

☐

FontSize

FontTypeface

HTMLFormat

☐

HasMargins

☐

Height

Width

Text

TextAlignment

TextColor

☒ Default

Visible

☒

HorizontalArrangement3	HorizontalArrangement4
AlignHorizontal Left : 1 ▾	AlignHorizontal Left : 1 ▾
AlignVertical Top : 1 ▾	AlignVertical Top : 1 ▾
BackgroundColor ■ Default	BackgroundColor ■ Default
Height 30 pixels...	Height Automatic...
Width Automatic...	Width Automatic...
Image None...	Image None...
Visible <input checked="" type="checkbox"/>	Visible <input checked="" type="checkbox"/>

ButtonSound_a

BackgroundColor

☐ Default

Enabled

☒

FontBold

☐

FontItalic

☐

FontSize

FontTypeface

Height

Width

Image

Shape

ShowFeedback

☒

Text

TextAlignment

TextColor

☐ Default

Visible

☒

ButtonLight_c

BackgroundColor

☐ Default

Enabled

☒

FontBold

☐

FontItalic

☐

FontSize

FontTypeface

Height

Width

Image

Shape

ShowFeedback

☒

Text

TextAlignment

TextColor

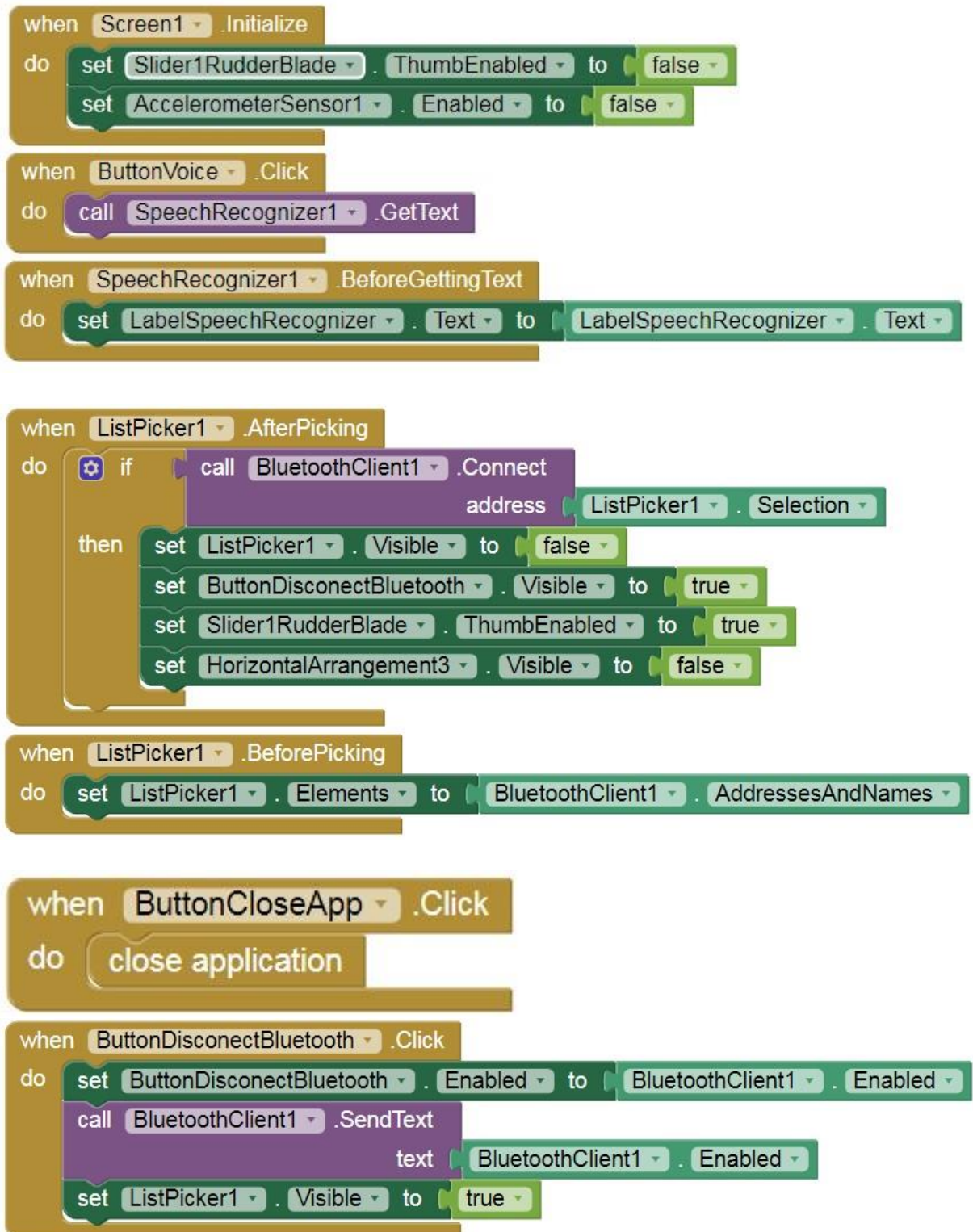
☐ Default

Visible

☒

ButtonCloseApp	
BackgroundColor <input type="checkbox"/> Default	
Enabled <input checked="" type="checkbox"/>	
FontBold <input type="checkbox"/>	
FontItalic <input type="checkbox"/>	
FontSize <input type="text" value="14"/>	
FontTypeface <input type="text" value="default"/>	
Height <input type="text" value="Automatic..."/>	
Width <input type="text" value="Automatic..."/>	
Image <input type="text" value="None..."/>	
Shape <input type="text" value="default"/>	
ShowFeedback <input checked="" type="checkbox"/>	
Text <input type="text" value="CLOSE APP"/>	
TextAlignment <input type="text" value="center : 1"/>	
TextColor <input type="checkbox"/> Default	
Visible <input checked="" type="checkbox"/>	
BluetoothClient1	AccelerometerSensor1
CharacterEncoding <input type="text" value="UTF-8"/>	Enabled <input checked="" type="checkbox"/>
DelimiterByte <input type="text" value="0"/>	LegacyMode <input type="checkbox"/>
HighByteFirst <input type="checkbox"/>	MinimumInterval (ms) <input type="text" value="400"/>
Secure <input checked="" type="checkbox"/>	Sensitivity <input type="text" value="moderate"/>
SpeechRecognizer1	

-BLOCKS



```

when ButtonBackward_h .Click
do
  if BluetoothClient1 . Available
  then
    call BluetoothClient1 .SendText
    text " h "

when Button_STOP_e .Click
do
  if BluetoothClient1 . Available
  then
    call BluetoothClient1 .SendText
    text " e "

when ButtonLight_c .Click
do
  if BluetoothClient1 . Available
  then
    call BluetoothClient1 .SendText
    text " c "

when ButtonSound_a .Click
do
  if BluetoothClient1 . Available
  then
    call BluetoothClient1 .SendText
    text " a "

when ButtonForward_b .Click
do
  if BluetoothClient1 . Available
  then
    call BluetoothClient1 .SendText
    text " b "

when ButtonLeft_d .Click
do
  if BluetoothClient1 . Available
  then
    call BluetoothClient1 .SendText
    text " d "
  
```

```

when ButtonRight_f.Click
do
  if BluetoothClient1.Available
  then
    call BluetoothClient1.SendText
    text "f"
  
```

```

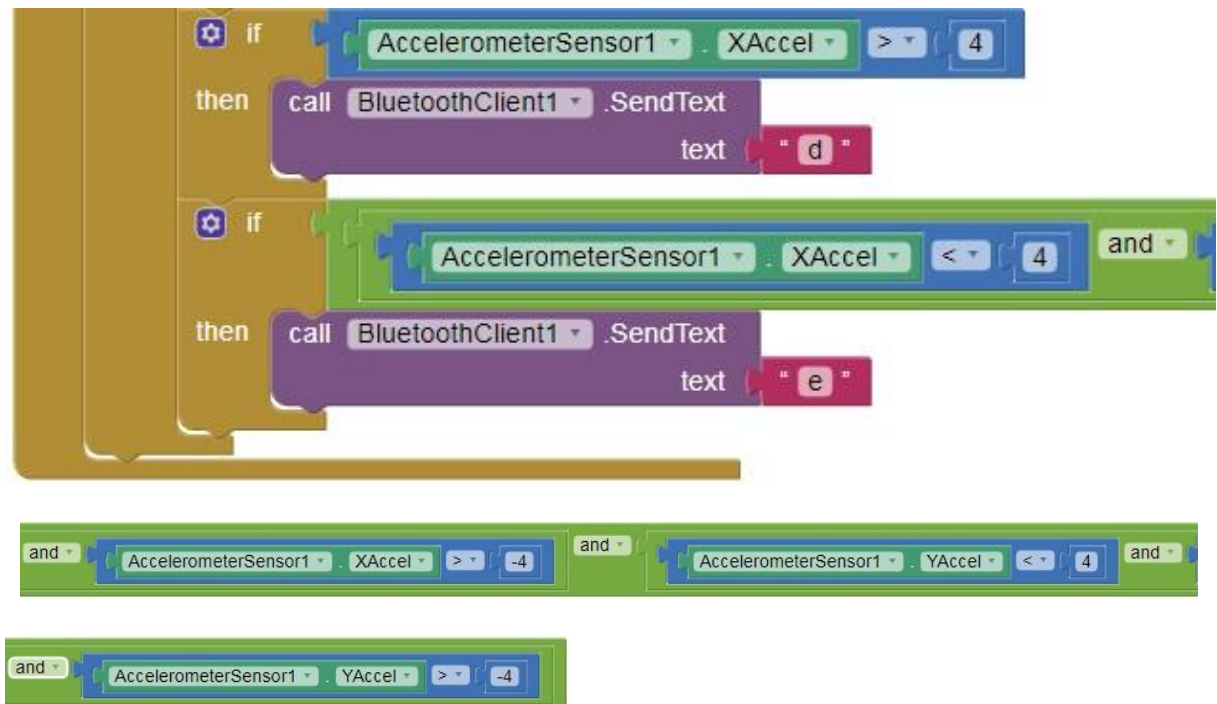
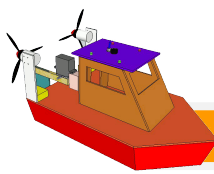
when Accelerometer.Click
do
  if BluetoothClient1.Enabled
  then
    set AccelerometerSensor1.Enabled to true
  
```

```

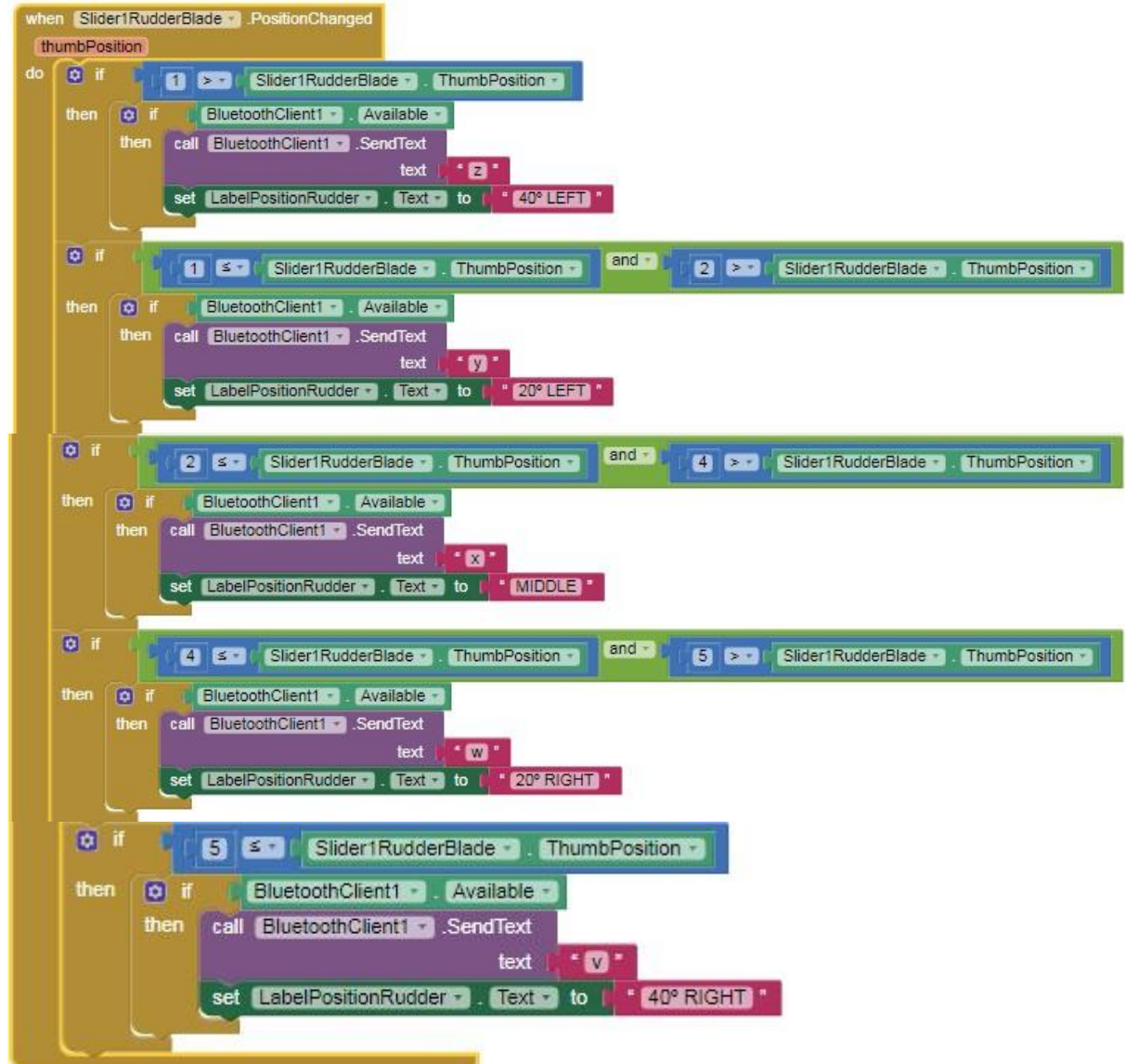
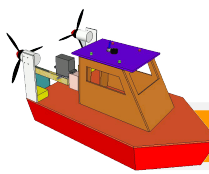
when AccelerometerOff.Click
do
  if AccelerometerOff.Enabled
  then
    set AccelerometerSensor1.Enabled to false
  
```

```

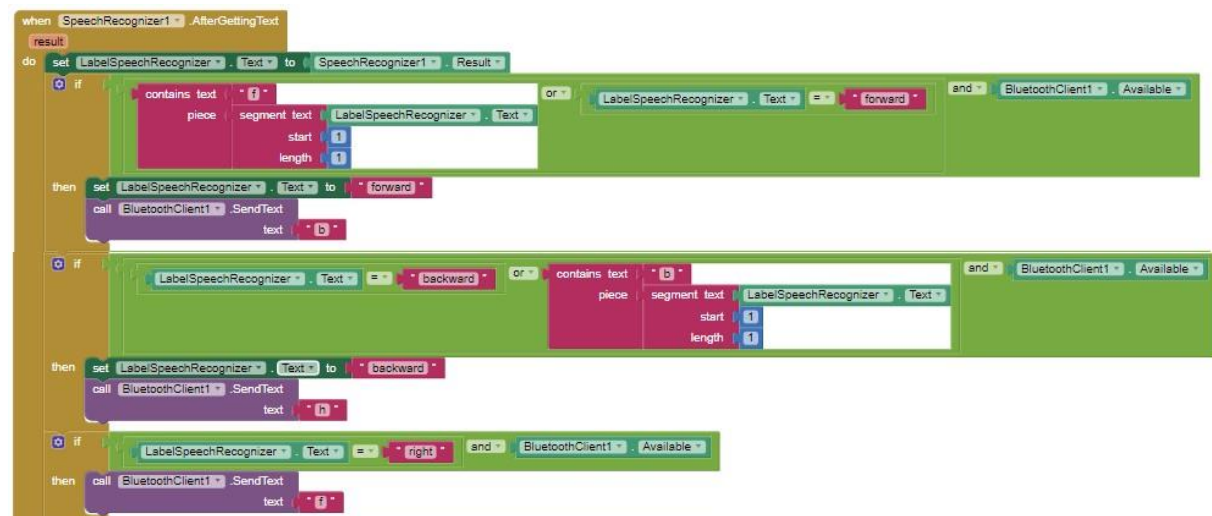
when AccelerometerSensor1.AccelerationChanged
  xAccel yAccel zAccel
do
  if AccelerometerSensor1.Available and BluetoothClient1.IsConnected
  then
    if AccelerometerSensor1.YAccel > 4
    then
      call BluetoothClient1.SendText
      text "h"
    if AccelerometerSensor1.YAccel < -4
    then
      call BluetoothClient1.SendText
      text "b"
    if AccelerometerSensor1.XAccel < -4
    then
      call BluetoothClient1.SendText
      text "f"
  
```

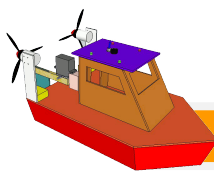


Rude Blade Control



Speech Recognizer







DOWNLOAD

DOWNLOAD APP

Download App (.apk):

<https://drive.google.com/file/d/1-8PpHyGgkbJpKkuKcNqLg6Y35qsZIEAn/view?usp=sharing>

Original program that you can modify (.aia):

<https://drive.google.com/file/d/1XNC7a1PYz9yYjM-4JY6JzGv9iH54nr40/view?usp=sharing>

DOWNLOAD ARDUINO CODE

Download Arduino code (.ino):

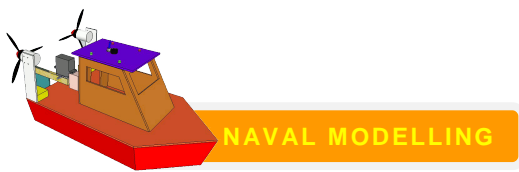
https://drive.google.com/file/d/1nvNuv9MUKZt-aL3lhpX3QWEGIOQ_6Uov/view?usp=sharing

MATERIAL LIST AND EQUIPMENT NEEDED

Quantity	Description	Price (€)	Total price (€)
1	Medium-density fibreboard (MDF) 30 cm x 60 cm x 3mm	1,55	1,55
2	Motor 28 mm high torque	1,01	2,02
2	Capacitor 100 nF	0,01	0,02
2	Propeller	0,81	1,62
1	Stripboard (perfboard)	0,05	0,05
1	Miniature PCB piezo transducer	0,82	0,82
1	Arduino UNO board + USB cable	4,99	4,99
1	L9110S H-bridge	0,99	0,99
1	Miniature toggle switch	0,19	0,19
1	4AA battery case Standard slot holder	0,22	0,22
1	HC-06 4 pin serial wireless bluetooth RF transceiver Module	3,42	3,42
2	Red led	0,015	0,03
2	Green led	0,015	0,03
1	Servo	3,72	3,72
3	Resistor 330Ω	0,01	0,03
1	Resistor 10kΩ	0,01	0,01
1	Resistor 5600Ω	0,01	0,01
0,25	Single row stripconnectors arduino	0,25	0,07
1	Power bank box portable external battery charger for Mobile phone	1,18	1,18
0,2	Hot 1x40 pin single row female 2,54 mm breakable header connector	0,10	0,02
0,3	40 Dupont wires jumpercables male-male and male-female	1,28	0,39
0,1	Glascofoam 8 cm width 1,2m x 0,6m	5,73	0,57
0,06 m	Wood strip 3 cm x 1,2 cm	2	0,12
0,025 m	Wood strip 3,2 cm x 2,5 cm	2,5	0,06
2	Screws 2,5x10 mm	0,01	0,02


Others:

Quantity	Description
0,5 m	Fishing line rope string nylon
1	Drill diameter 2mm
1	Drill diameter 5mm
1	Drill diameter 6mm
1	Glue
1	Silicon glue
1	Solder wire
1	Solder
1	Silicon glue gun
1	Electric saw
1	Try-squares
1	G--clamp




1	Ruler
1	Paint brush
1	Paint can
1	File
1	Scissors
1	Drill
1	Computer
1	Tablet /smartphone

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http://www.picaxestore.com/index.php/en_gb/picaxe.html




Motor - MM28 - High Torque
GBX004
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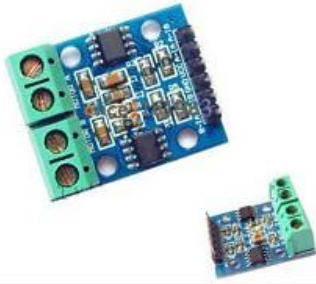
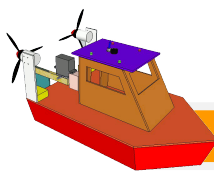


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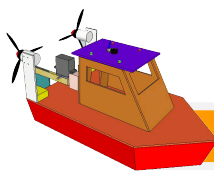
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