



Eric Conner Design

## **Animatronics Controller**

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## Show File Format - XXX.ANI

Location	Description
0x0000 - 0xFFDF	Show Data
0xFFE0	Show Number (0xFF)
0xFFE1 - 0xFFE4	Show MS (0xFFFFFFFF)
0xFFE5 - 0xFFE7	<i>SPARE</i>
0xFFE8 - 0xFFEF	"©2019ECD"
0xFFF0 - 0xFFFF	Show Name (15 Characters)

## Config File Format - FIG.CFG

Location	Description
0x000 - 0x00F	Figure Name (16 Characters)
0x010 - 0x0F7	<i>SPARE</i>
0x0F8 - 0x0FF	"©2019ECD"

### Inputs 0x100 -> 0x1FF

Location	Description
0x1X0	Input Enabled (0xFF)
0x1X1	Input Pin (0xFF)
0x1X2 - 0x1X3	Input Min (0xFFFF)
0x1X4 - 0x1X5	Input Max (0xFFFF)
0x1X6 - 0x1X7	<i>SPARE</i>
0x1X8 - 0x1XF	Input Name (8 Characters)

### Servos 0x200 -> 0x2FF

Location	Description
0x2X0	Servo Enabled (0xFF)
0x2X1	Servo Pin (0xFF)
0x2X2 - 0x2X3	Servo Min (0xFFFF)
0x2X4 - 0x2X5	Servo Max (0xFFFF)
0x2X6	Servo Input (0xFF)
0x2X7	Servo Invert (0xFF)
0x2X8 - 0x2XF	Servo Name (8 Characters)

# Class Index

## Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

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<a href="#"><u>servo_t</u></a> (Struct for Servo settings ) .....	7

# File Index

## File List

Here is a list of all documented files with brief descriptions:

<a href="#"><u>Animatronics_Controller.ino</u></a> (A custom Animatronics Controller with the ability to load and save configuration and show files from an SD card in sync with a 16-bit WAV file )	8
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# Class Documentation

## input\_t Struct Reference

Struct for Input settings.

### Public Attributes

- bool **enabled**
- uint8\_t **pin**
- uint16\_t **min**
- uint16\_t **max**
- uint16\_t **value**

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The documentation for this struct was generated from the following file:

- [servo.h](#)

## **servo\_t Struct Reference**

Struct for Servo settings.

### **Public Attributes**

- bool **enabled**
- uint8\_t **pin**
- uint16\_t **min**
- uint16\_t **max**
- uint16\_t **value**
- [input\\_t](#) **input**
- bool **invert**

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The documentation for this struct was generated from the following file:

- [servo.h](#)

# File Documentation

## Animatronics\_Controller.ino File Reference

A custom Animatronics Controller with the ability to load and save configuration and show files from an SD card in sync with a 16-bit WAV file.

### Macros

- `#define INTERFACE_PIN 28`
- `#define TEST_PIN 29`

### Functions

- void [setup](#) ()  
*Setup the Animatronics Controller.*
- void [loop](#) ()  
*Main program loop, load each show file and play it.*
- void [mainMenu](#) ()  
*Main menu.*
- void [loadedShowMenu](#) ()  
*Loaded show menu.*
- void [configMenu](#) ()  
*Config menu.*

### Variables

- `char versionNumber [] = "2.1.3"`

## audio.h File Reference

Functions for playing audio with the PT8211.

### Functions

- void [setupAudio](#) (void)  
*Setup audio output (Note: This is required)*
- uint32\_t [getAudioMS](#) (void)  
*Get the length of WAV file associated with the loaded show in milliseconds.*
- void [playAudio](#) (void)  
*Play WAV file associated with the loaded show.*
- void [stopAudio](#) (void)  
*Stop playing WAV file.*

---

### Function Documentation

#### uint32\_t getAudioMS (void )

##### Returns

Returns the length of the loaded audio file in milliseconds, 0 ... 4294967295

## config.h File Reference

Functions for loading, saving and modifying the config file.

### Functions

- void [loadConfig](#) (void)  
*Load the config file from SD card.*
- void [saveConfig](#) (void)  
*Save the config file to the SD card.*
- char \* [getFigureName](#) (void)  
*Get the figure name from the config file.*
- char \* [getInputName](#) (uint8\_t number)  
*Get the input name for a given number from the config file.*
- void [setInputName](#) (uint8\_t number, char \*name)  
*Set the input name for a given number from the config file.*
- char \* [getServoName](#) (uint8\_t number)  
*Get the servo name for a given number from the config file.*
- void [setServoName](#) (uint8\_t number, char \*name)  
*Set the servo name for a given number from the config file.*
- [input\\_t](#) [getInputData](#) (uint8\_t number)  
*Get the input data for a given input number.*
- [servo\\_t](#) [getServoData](#) (uint8\_t number)  
*Get the servo data for a given servo number.*
- uint16\_t [getServoCenter](#) (uint8\_t number)  
*Get the center position for a given servo.*
- uint16\_t \* [minmaxInput](#) (uint8\_t input)  
*Configure Input Min / Max.*
- void [configInput](#) (uint8\_t number)  
*Configure a given input.*
- void [configServo](#) (uint8\_t number)  
*Configure a given servo.*

- void [invertServo](#) (uint8\_t number)  
*Invert a given servo.*
- void [toggleServo](#) (uint8\_t number)  
*Enable/Disable a given servo.*

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## Function Documentation

**void configInput (uint8\_t *number*)**

### Parameters

<i>number</i>	Input number, 0 ... 15
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**void configServo (uint8\_t *number*)**

### Parameters

<i>number</i>	Servo number, 0 ... 15
---------------	------------------------

**char\* getFigureName (void )**

### Returns

Returns the figure name as a char[16]

**[input\\_t](#) getInputData (uint8\_t *number*)**

### Parameters

<i>number</i>	Input number, 0 ... 15
---------------	------------------------

### Returns

Returns a input\_t struct

**char\* getInputName (uint8\_t *number*)**

### Parameters

<i>number</i>	Input number, 0 ... 15
---------------	------------------------

### Returns

Returns the input name for a given number as a char[8]

**uint16\_t getServoCenter (uint8\_t *number*)**

### Parameters

<i>number</i>	Servo number, 0 ... 15
---------------	------------------------

### Returns

Returns a uint16\_t for the center position of a given servo

**servo\_t getServoData (uint8\_t *number*)**

**Parameters**

<i>number</i>	Servo number, 0 ... 15
---------------	------------------------

**Returns**

Returns a servo\_t struct

**char\* getServoName (uint8\_t *number*)**

**Parameters**

<i>number</i>	Servo number, 0 ... 15
---------------	------------------------

**Returns**

Returns the servo name for a given number as a char[8]

**void invertServo (uint8\_t *number*)**

**Parameters**

<i>number</i>	Servo number, 0 ... 15
---------------	------------------------

**uint16\_t\* minmaxInput (uint8\_t *input*)**

**Parameters**

<i>input</i>	Input pin to read, 0 ... 15
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**Returns**

Returns the Input Min / Max as uint16\_t array, 0 ... 1023

**void setInputName (uint8\_t *number*, char \* *name*)**

**Parameters**

<i>number</i>	Input number, 0 ... 15
<i>name</i>	Input name, char[8]

**void setServoName (uint8\_t *number*, char \* *name*)**

**Parameters**

<i>number</i>	Servo number, 0 ... 15
<i>name</i>	Servo name, char[8]

**void toggleServo (uint8\_t *number*)**

**Parameters**

<i>number</i>	Servo number, 0 ... 15
---------------	------------------------

## interface.h File Reference

Functions for getting data from the serial buffer.

### Functions

- char [getChar](#) (void)  
*Get a char from the serial buffer.*
- uint32\_t [getInt](#) (void)  
*Get a uint32\_t from the serial buffer.*
- char \* [getString](#) (void)  
*Get char[16] from the serial buffer.*

---

### Function Documentation

#### char getChar (void )

##### Returns

Returns a char from the serial buffer

#### uint32\_t getInt (void )

##### Returns

Returns a uint32\_t from the serial buffer

#### char\* getString (void )

##### Returns

Returns a char[16] from the serial buffer



## servo.h File Reference

Functions for working with the servos.

### Classes

- struct [input\\_t](#)  
*Struct for Input settings.*
- struct [servo\\_t](#)  
*Struct for Servo settings.*

### Functions

- void [setupServos](#) (void)  
*Setup the servo output (**Note: This is required**)*
- void [processInputs](#) (void)  
*Load input data from the config file to an array.*
- uint8\_t [getInputCount](#) (void)  
*Get the total number of inputs from the config file.*
- void [processServos](#) (void)  
*Load servo data from the config file to an array.*
- uint8\_t [getServoCount](#) (void)  
*Get the total number of servos from the config file.*
- void [centerServos](#) (void)  
*Move all enabled servos to the center position.*
- void [updateServo](#) (uint8\_t number)  
*Read a given servo input and update its position.*
- uint16\_t [minmaxServo](#) (uint8\_t pin, uint8\_t servo)  
*Configure servo Min/Max.*
- void [recordServo](#) (uint8\_t number)  
*Read a given servo input, save it to the show file and update its position.*
- void [playServo](#) (uint8\_t number)  
*Read a given servo from the show file and update its position.*

## Function Documentation

### **uint8\_t getInputCount (void )**

#### **Returns**

Returns the total number of inputs, 0 ... 15

### **uint8\_t getServoCount (void )**

#### **Returns**

Returns the total number of servos, 0 ... 15

### **uint16\_t minmaxServo (uint8\_t *pin*, uint8\_t *servo*)**

#### **Parameters**

<i>pin</i>	Input pin to read, 0 ... 15
<i>servo</i>	Servo pin to write, 0 ... 15

#### **Returns**

Returns the servo position as uint16\_t, 150 ... 600

### **void playServo (uint8\_t *number*)**

#### **Parameters**

<i>number</i>	Servo number to play, 0 ... 15
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### **void recordServo (uint8\_t *number*)**

#### **Parameters**

<i>number</i>	Servo number to record, 0 ... 15
---------------	----------------------------------

### **void updateServo (uint8\_t *number*)**

#### **Parameters**

<i>number</i>	Servo number to update, 0 ... 15
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## show.h File Reference

Functions for creating, loading, saving, recording and playing a show file.

### Functions

- void [newShow](#) (void)  
*Create a new show file, calls record after the file is created.*
- bool [loadShow](#) (uint8\_t number)  
*Load a given show file from SD card.*
- void [saveShow](#) (void)  
*Save show file to SD card.*
- void [deleteShow](#) (void)  
*Delete show file from SD card.*
- void [playShow](#) (void)  
*Play the loaded show.*
- void [recordShow](#) (void)  
*Record show.*
- void [testShow](#) (void)  
*Test servo function.*
- uint8\_t [getShowNumber](#) (void)  
*Get the loaded show number.*
- void [setShowNumber](#) (uint8\_t number)  
*Set the show number.*
- uint32\_t [getShowMS](#) (void)  
*Get the length of the show in milliseconds.*
- void [setShowMS](#) (uint32\_t ms)  
*Set the length of the show in milliseconds.*
- char \* [getShowName](#) (void)  
*Get the show name.*
- void [setShowName](#) (char \*name)  
*Set the show name.*

- void [saveData](#) (uint32\_t address, uint8\_t data)  
*Brief description.*
- uint8\_t [getData](#) (uint32\_t address)  
*Get data from show file.*
- uint32\_t [getShowFrameCount](#) (void)  
*Get the current show frame.*
- uint32\_t [getShowMaxFrameCount](#) (void)  
*Get the max show frame.*

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## Function Documentation

### uint8\_t [getData](#) (uint32\_t address)

#### Parameters

<i>address</i>	Address to read data from, 0x0000 ... 0xFFE0
----------------	--

#### Returns

Returns data from address, 0 ... 255

### uint32\_t [getShowFrameCount](#) (void )

#### Returns

Returns the current show frame count, 0x0000 ... 0xFFE0

### uint32\_t [getShowMaxFrameCount](#) (void )

#### Returns

Returns the max show frame, 0x0000 ... 0xFFE0

### uint32\_t [getShowMS](#) (void )

#### Returns

Returns the show length in milliseconds, 0 ... 4294967295

### char\* [getShowName](#) (void )

#### Returns

Returns the show name as a char[16]

### uint8\_t [getShowNumber](#) (void )

#### Returns

Returns the loaded show number, 0 ... 255

**bool loadShow (uint8\_t *number*)**

**Parameters**

<i>number</i>	0 ... 255
---------------	-----------

**Returns**

`true` if show loaded and `false` if there was an error

**void saveData (uint32\_t *address*, uint8\_t *data*)**

**Parameters**

<i>address</i>	Address to write data to, 0x0000 ... 0xFFE0
<i>data</i>	Data to write, 0 ... 255

**void setShowMS (uint32\_t *ms*)**

**Parameters**

<i>ms</i>	Show length in milliseconds, 0 ... 4294967295
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**void setShowName (char \* *name*)**

**Parameters**

<i>name</i>	Name of show to write to file
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**void setShowNumber (uint8\_t *number*)**

**Parameters**

<i>number</i>	Show number, 0 ... 255
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