



Ultimate Instruction Manual

Thank you for purchasing a Scarefactory product. The purpose of this manual is to better familiarize you with Scarefactory control systems and components. Adjustments, tips, common problems and programming are all covered in detail. It is recommended that you read and fully understand this document before proceeding with the setup of your prop.

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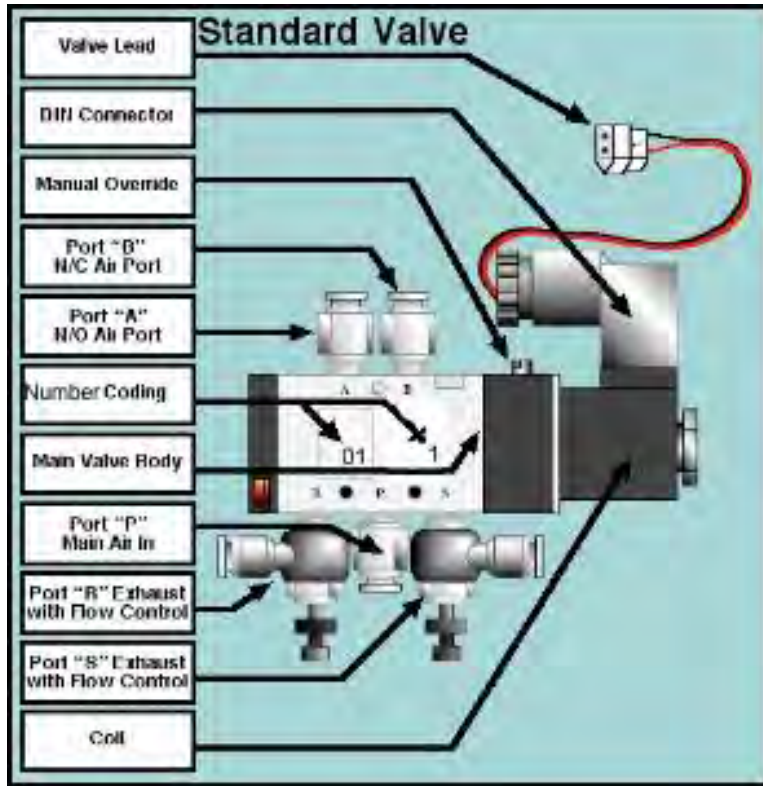
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Pneumatic Systems Overview:

VALVES:

By alternating air flow, valves control the pneumatic cylinders that operate your animation. Scarefactory uses what is known as a pilot-assisted 4-way spool valve, operating at 12 VDC. The term "spool valve" refers to the fact that there is a spool-shaped piece inside the main valve body that slides back and forth, switching air flow.



Valve Lead: This cable plugs into an animation controller or other power-switching device.

DIN Connector: Connects the Valve Lead to the Coil.

Coil: Essentially an electromagnet. Also known as a solenoid. When the coil is energized, the air flow switches from Port "A" to Port "B."

Main Valve Body: Constructed of milled aluminum, this unit houses all of the Ports.

Manual Override Button: Depress this button to manually operate the valve. Depress this button and turn (using a flathead screwdriver) to lock the valve in this position.

Port "P": The main or "Primary" air supply for the valve.

Port "A": Normally Open Air Out. When air is supplied to the valve, it defaults to this position until the coil is energized.

Port "B": Normally Closed Air Out. When the coil is energized, air flows from this port. **Port "R":** Exhaust Port. When Port "B" is open, air exhausts from this port.

Port "S": Exhaust Port. When Port "A" is open, air exhausts from this port.

Flow Controls: Typically found in the exhaust ports, they control the rate at which the air exhausts, in turn controlling the speed at which the animation moves.

When the coil is energized (typically by a PicoBoo or FLEX animation controller), air flow switches from Port "A" to Port "B," causing the cylinder to either extend or retract depending on how it is plumbed. When this happens, air will exhaust through Port "R." When the coil is no longer energized, air flow will default back to Port "A" and air will exhaust through Port "S."

Valve Connection to the Animation Controller: In most cases, the valves for your effect will be mounted to the same board as the animation controller. The valve leads will already be connected to the corresponding control leads on the animation controller. Each set of matching valve lead and control lead will be marked with a matching color or number-- anywhere from 1-16, depending on the complexity of your animation.

Valve Connection Via Extension Cables: In some very rare cases, it is necessary for the valves to be mounted in a separate location from the animation controller. This is usually done in cases where running multiple airlines is impractical. By mounting the valves separately, we can run one main airline and an extension cable.

Depending on the complexity of your effect, there may be anywhere from 1-10 connectors on each end of your extension cable. Each connector will be numbered to a corresponding valve lead and control lead.

AIRLINES:

Connecting/Disconnecting Airlines: The airline fittings used on all Scarefactory animations are known as push-to-connect, or tube fittings.



As the name implies, the airlines simply push into the fittings and stay put. Do not try to pull the airline out of the fitting without first depressing the release ring and holding it down.

Never disconnect a pressurized airline. Serious injury could occur.

Airline blowouts are extremely rare. The three major causes are:

1) Airline is not fully inserted.

Push the airline in until it stops.

2) Line pressure is set too high.

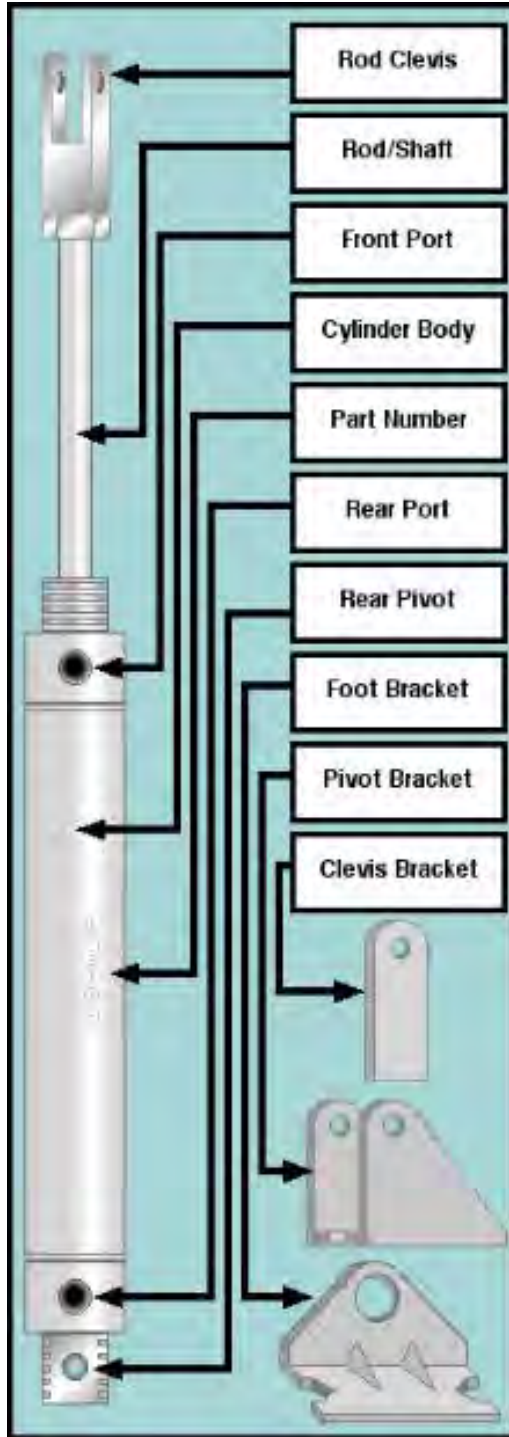
These fittings are rated for a maximum of 115 psi, though Scarefactory recommends operating our animations at no higher than 90 psi.

3) End of airline is smashed, gnarled, or cut at an odd angle.

With a razor-knife, cut the airline squarely across the end. Do not use wire cutters, as they will smash the end of the airline.

Airline Coding: Each airline for your animation will be number or color coded to a specific port on the cylinder valve.

The valves will also be marked with corresponding colors. Simply match the colors on the airlines to the colors on the valves and you can't go wrong.



Not every Valve will require 2 Airlines:

Port "A" or Port "B" may be plugged, depending on the application. An Air Cannon is a good example of this.

CYLINDERS:

Scarefactory uses pneumatic cylinders (also called pistons) on most of its animations.

Pneumatic means "of or relating to air." Cylinders extend/retract as air flow is alternated between the two ports on its body.

Body:

This chamber receives air, pushing the rod in and out based on air flow.

Rod:

The rod slides in and out of the body based on air flow.

Front Port:

Apply air pressure here and the cylinder retracts.

Rear Port:

Apply air pressure here and the cylinder extends.

Rear Pivot:

Point at which the rear of the cylinder mounts.

Rod Clevis:

Most commonly used mount for the front end of the cylinder.

Pivot Bracket:

Point to which the Rear Pivot mounts.

Clevis Bracket:

Point to which the Rod Clevis mounts.

Foot Bracket:

These are used at each end of the cylinder (in lieu of the other brackets) when linear motion is required.

Cylinders will most commonly come be equipped with ordinary fittings, such as those found on Port "A" and Port "B" on the valves. Sometimes, an elbow fitting is used.

It simply comes out of the cylinder and turns at a 90° angle, allowing the airline to run parallel to the cylinder.

There are two basic ways in which a cylinder may be mounted:

LINEAR: Using foot brackets, the cylinder simply pushes and pulls or raises and lowers in a straight line. Dresser drawers and dropping portraits are both examples of linear motion.

RADIAL: Using pivot and clevis brackets, the cylinder is mounted in such a way that it pivots a third point. Elbows, head turns, and jaw function are all examples of radial motion.



Flow Controls

The flow control is the most integral part of making an animation perform well. Essentially, it limits the rate at which air can exhaust from the valve, thus effecting the speed at which the cylinder can move.

Flow controls are adjustable, there is a small knob that can be dialed in or out, as well as a lock nut that can be tightened to ensure that the flow control will remain set.

It is not recommended that you turn the flow controls all the way out. As with *any machine*, running it harder and faster increases wear and tear.

When it comes to adjusting the flow controls, it is best to do so in very small increments. In many cases 1/4 turn of the knob can make a huge difference.

The best way to dial in an animation is to do so using the **manual override button** to operate the valve. Disconnect the power from the animation controller before proceeding.

Depressing the **manual override button** will cause the cylinder to extend/retract just as if the valve were energized. When the override is depressed, air will exhaust from Port "R" Adjusting the flow control in Port "R" will alter the speed at which the cylinder moves from its "at rest" position to its "activated" position.

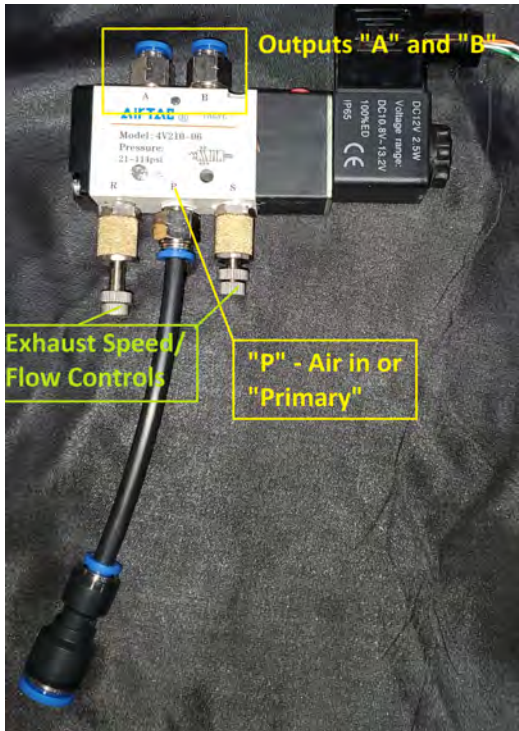
When the manual override is released, air will exhaust from Port "S". Adjusting the flow control in Port "S" adjusts the speed at which the cylinder moves from its "Activated" position to its "at rest" position.

Once the flow controls have been set to your liking, tighten the locking nut on each flow control with a pair of Needle Nose pliers. It doesn't need to be extremely tight, just firm. This will ensure that your flow controls do not come out of adjustment.

It should be noted that not every valve will have two flow controls. Some may have only one, others may have none at all such as in the arms of the Super Flyer Ghoul. The example we have provided happens to be the most commonly used. Any variations can be adjusted using the same basic principles covered in this section.

AIR IN:

There are three basic scenarios you will encounter when hooking up a Scarefactory control board to your air compressor.



1) One valve:

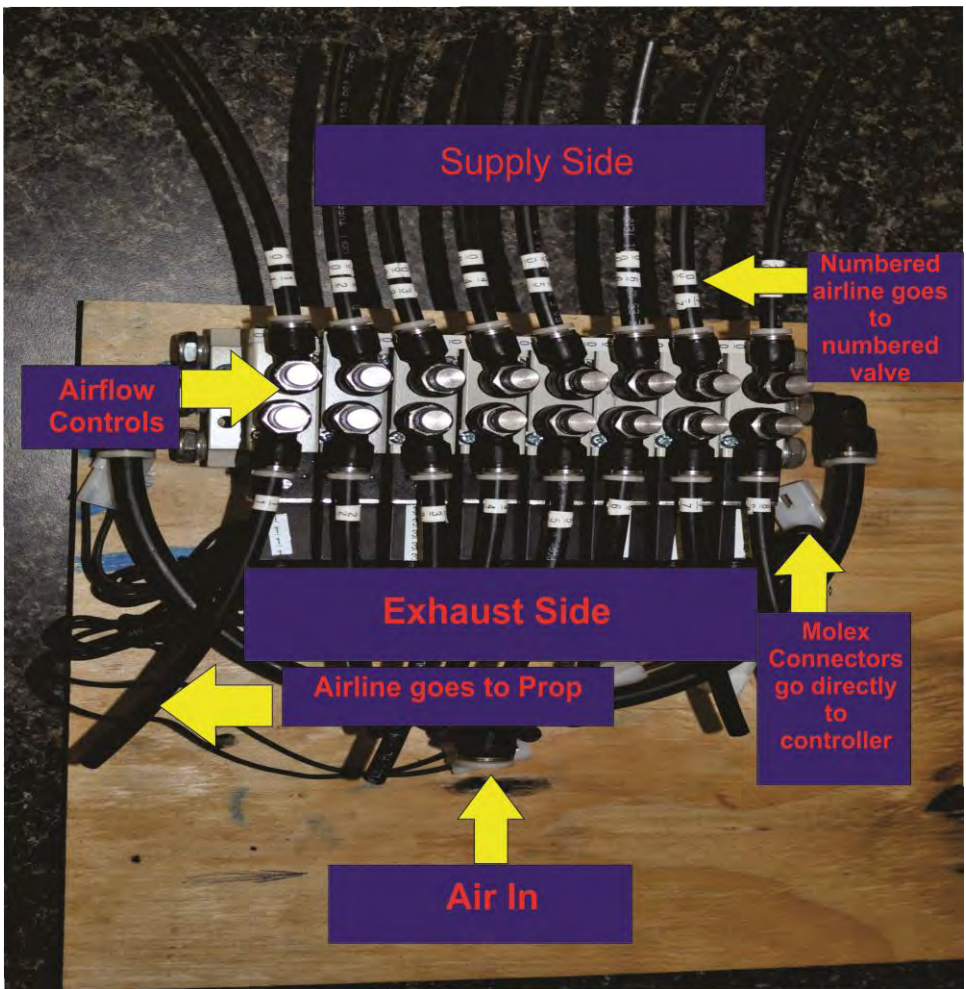
Many simpler Scarefactory animations have one function, and therefore one valve.

Simply run a 3/8" OD (Outer Diameter) airline (also called tubing) into the fitting in Port "P" of the valve.



2) One to Two valves:

All of the valves will run together into a common "line in," typically set up for 3/8" airline OD.



3) Valve Manifold:

Again, the valve will run together into a common "line in." A 3/8" OD airline will almost always be required. Manifolds are used with a "Meter-Out" type of flow control instead of the standard "Exhaust Type" flow control. Manifolds are typically used when there are 4 or more Pneumatic Cylinders in the Character.

COMPRESSOR HOOKUP:

The 1/4" OD and 3/8" OD airlines Scarefactory uses are not commonly available at your local hardware store.

Should you need any, it can be purchased through Scarefactory, most fluid power distributors, or industrial supply companies such as Grainger and McMaster-Carr.

COMPRESSOR SPECIFICATIONS:

Scarefactory animations are designed to operate at or below 90 psi (6.2 bars, metric). Most commercially available air compressors are capable of at least 120 psi (8.27 bars, metric).

When buying a new compressor, **the key factor is the SCFM, or Standard Cubic Feet per Minute** (cubic decimeters per second, metric, or dm³/sec). "Standard" is air at sea level and at 70° F (38° C).

The higher the SCFM (also called CFM) rating of a compressor, the greater the volume of air it is capable of producing Scarefactory recommends using a compressor with a SCFM rating no lower than 5 SCFM (2.4 dm³/sec, metric) at 90 psi (6.2 bars, metric).

Not every effect will require a SCFM rating that high. Different effects require different volumes of air to operate. There are several factors to consider.

1) The number of functions:

A single-cylinder effect (such as a Skelerector) will use much less air than one with multiple cylinders (such as an Impaler).

2) How long the effect operates:

Effects that operate once and reset (such as a Corpselator) will use much less air than one that operates several times each activation (such as an Economy Thrashing Coffin).

3) Size of the effect:

A small multifunction effect (such as an Armed and Dangerous) will use much less air than a large multifunction effect (such as an Impaler). Bigger effect, bigger cylinders.

4) How many effects are running on the same compressor:

The more effects powered by the same compressor, the greater the air consumption. One means of offsetting this is to position the effects so that they go off in turn rather than all at once.

5) It is also important to consider the length of your airline:

Shorter is always better. If your air line is less than 3/4" I.D., then assume a loss of up to 10% of your available air pressure for every 50' of air line

COMPRESSOR MAINTENANCE:

Many compressors are lubricated with oil. Read your compressor manual fully, and be sure to have the proper grade of oil on hand, if needed. Using the wrong grade of oil can be just as detrimental as using no oil at all.

If your compressor is running constantly, you are running it beyond its capacity. You will either need to add another compressor to your system or replace your existing compressor with a larger, more powerful model.

Compressors have a drain nozzle on the bottom of their tank for a reason. During regular operation, water, oil, and dirt accumulate in the tank. Draining your tank every day will help reduce the level of contaminants transferred to your air system.

AIR FILTRATION:

Air can be some pretty nasty stuff. It gets even nastier when you compress it. The kind of contaminants you can find in any given air system include oil, dirt, and water. Each of these contaminants can be detrimental to the longevity of the pneumatic components in your Scarefactory effects.

Oil (and oil vapor, typically from the compressor itself, may interact unfavorably with the seals in your valves. In extreme cases, certain oils have been known to actually dissolve the rubber seals in some valves.

Dirt (and other particles can clog the orifices in your valves, jam the internal spool, and erode the lining of your cylinders.

Water (and water vapor can wash the lubrication from your valves and cylinders, increasing wear and reducing life span.

For these reasons, Scarefactory strongly recommends the use of filtration on your air supply. You wouldn't run your car without the proper filters. You should take the same consideration for your air system.

There are three main types of filters: General Purpose for water and particles, Coalescing for oil, and Activated Carbon for oil vapors.

Your air system should have at least a General Purpose and Coalescing Filter, each with a 5-Micron element. In such applications, always place the General Purpose filter "upstream" from the Coalescing filter. This will increase the longevity of the Coalescing filter's element.

Filter elements should be cleaned regularly, and will need to be replaced on occasion. The more points in your air system that feature filtration, the cleaner your air will be.

NOTE: Each filter will reduce the line pressure slightly. You may need to increase the output pressure to accommodate for this.

Attractions in extremely humid conditions may want to consider installing an air dryer. There are several varieties of dryer available, from large electrical units to small filters with replaceable elements.

TRIGGERING DEVICES:

Every Scarefactory animation controller requires some sort of triggering device, a means of telling the unit when to perform. This can be as simple as a Push-Button or as complex as a Code on a numerical Keypad. Typically triggers are either a Push-Button or PIR (also known as a motion sensor or Infra-Red Detector)



Pushbutton: The simplest trigger Scarefactory has to offer, the pushbutton is a handheld means of manually triggering an effect.



Pressure Footpad: This is a pressure-sensitive mat that will trigger your animation when stepped upon.

Note: Footpads, though very effective, are easy to spot. It's best to disguise them (for example, place the mat under the carpet or a rug)



Personal Intra-Red (PIR) Sensor: The PIR is calibrated to trigger when it senses a human heat signature.

Adjusting: The PIR has an almost 180° field of vision, making it very sensitive. To ensure that your animation triggers exactly when you want it to, you may want to put up "blinders" around the sensor. You can also mask off the sensor's dome using an opaque tape (such as masking tape). Duct tape is not recommended, it can be very difficult to remove.

Placement: Another thing to consider is sensor placement. Placing a sensor on the wall opposite of the doorway, for example, will not yield the desired results. Your effect will be going off before your patrons enter the room. The best strategy is place the sensor perpendicular to your audience's path. For example, aim it across a hallway so that your patrons cross its beam. This will ensure that you get a precise trigger every time.

Note: The PIR Sensor senses body heat and may not function properly if the surrounding environment is too hot to detect the difference. The PIR works by projecting a "Grid" through the surrounding area. It looks for heat changes and motion within the Grid's Squares. "False Triggers" can happen when the PIR Sensor is placed in Direct Sunlight or in an area where there are other moving items

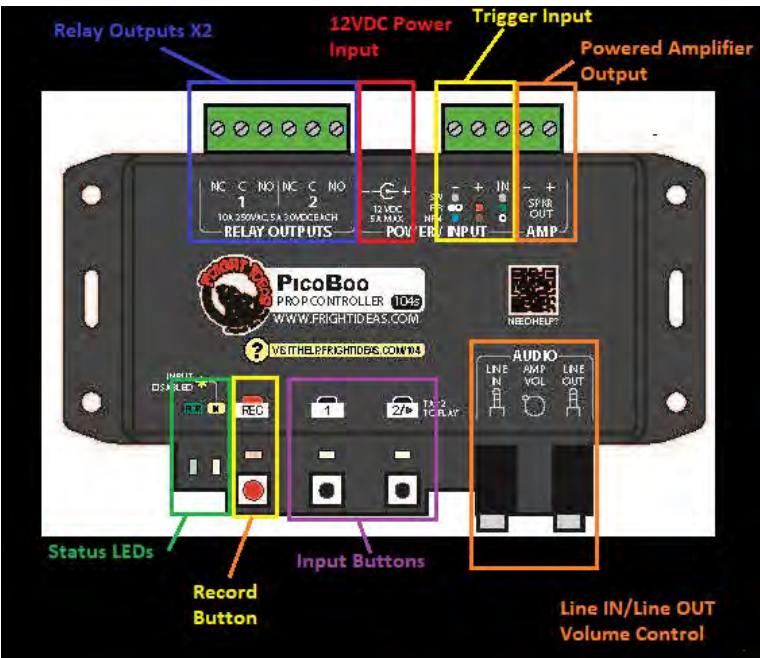


Wireless Remote: Essentially a manual pushbutton without the boundary restrictions of a trigger cable. An actor can roam about the scene freely, never having to worry about getting the cable hung up or giving away the scare.

Animation Controllers:

PicoBoo:

The PicoBoo is a two-output animation controller. It is available with a built-in digital sound effect unit.



Trigger Input: This is where your Triggering Device connects to the unit. **The PicoBoos are designed to work with low-voltage sensors or contact closures only. DO NOT use typical outdoor motion sensors found at local hardware stores.** The PicoBoo will trigger when the IN terminal is connected to the GND terminal.

12V Input: The PicoBoo and PicoBoo+ controllers utilizes a barrel-style connector.

Outputs: This is where any valves/accessories interface with the animation controller. The outputs are simple contact closures, which are switches that you must wire to turn whatever device you want to control on or off. One wire must always go into the common terminal (C), the other into either the normally-open (N.O.) or normally-closed (N.C.). Using the N.O. terminal will result in the device normally being off, and turning on when you press the output's button, while the N.C. terminal will give you the opposite result.

Each relay can handle 10 amps at 125 volts.

“REC” BUTTON: Used for programming.

“1” and “2” BUTTON: Used for programming.

LINE IN: Used for recording optional audio.

LINE OUT: Used for playback of optional audio.

Status LEDs:

The Green **“PWR”** light will be illuminated when the PicoBoo is Powered on.

The Yellow **“IN”** light will be lit when the unit is being triggered by an external trigger

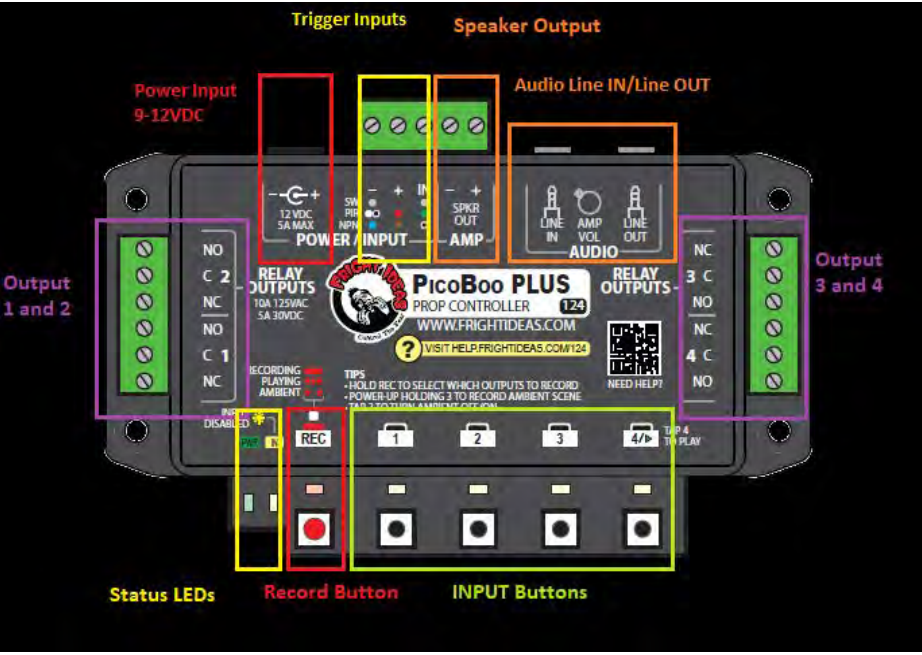
REC: Red. When flashing, prerecorded program is playing. When solid, new data is being recorded.

1: Yellow. When on, output 1 is on.

2: Yellow. When on, output 2 is on.

PicoBoo+

The PicoBoo+ is essentially the same as the PicoBoo. The PicoBoo+ has 4 outputs available instead of PicoBoo, which only has 2 outputs.



PROGRAMMING THE PicoBoo and PicoBoo +:
 The PicoBoo Controllers are end-user programmable. Please read and understand the instructions fully before attempting to reprogram the unit.

First, disconnect any trigger you may have attached.
To record new data to the PicoBoo Controllers:
B1) Press the **REC** button. The **REC** light will come on. From the moment you press **REC**, you are recording new data.

B2) While recording, use buttons 1 and 2 (PicoBoo) to operate outputs 1 and 2. Holding down either of the output buttons for a long time will make them stay on for a long time. Tapping either of the output buttons repeatedly will make them turn on and off repeatedly. Basically, whatever you do with the buttons, the outputs will do to your effect. You have up to two minutes of recording time at your disposal. It is best to allow some blank time at the end of your program so that your effect cannot immediately be re-triggered.

B3) When you are ready to stop recording, press **REC**. The **REC** light will go out.

B4) To play back what you have just recorded, press 2. The **REC** light will flash as your program plays back. When it is finished, the **REC** light will go off.

B5) If you are dissatisfied with your program, you may re-record by repeating steps B1-B3.

The PicoBoo has a built-in digital sound effect unit. It can play both ambient and triggered audio. Ambient audio plays while the unit is waiting to be triggered. Triggered audio is set off when your animation springs to life.

TIP: Recording Outputs One at a Time (PicoBoo+ only)

1. Hold the "REC" button for a few seconds until all the output LEDs turn on.
2. While still holding the "REC" button, use the output buttons to toggle the outputs you'd like to record. If the light is on that output will record, if it's off it will play back.
3. Once you've selected the outputs you'd like to record, let go of the "REC" button.

Now when you record, only the outputs you enabled will accept new animation, the disabled outputs will play back any previously recorded animation. If you need to shorten or clear your scene, you'll need to enable all the outputs again. A scene can only be shortened if all the outputs are enabled for recording.

Using the Internal Amplifier

The PicoBoo has an internal 30 watt audio amplifier that can be used to drive standard speakers. Car speakers or horn speakers are typical. Horn speakers are inexpensive and work well for screams and other mid to high pitch sounds. Standard 4 or 8 ohm speakers are best if you are playing music or lower pitch sounds.

If you hear the audio cutting out as it plays, your power supply is likely overwhelmed. Either swap out the supply with one of higher wattage, or turn down the volume.

Recording Audio:

Before you can record audio, you will need to do the following in preparation:

- C1)** Connect an audio source (such as a CD or MP3 player or laptop) to the LINE IN jack.
- C2)** Connect a set of amplified speakers to the LINE OUT jack.

Recording ambient audio to the PicoBoo or PicoBoo+:

- D1)** Hold down the REC button. You will notice that the REC light does not come on. **D2)** While holding down the REC button, start your audio source and press 1 at the same time. The REC button will light up when you press 1. There is no longer a need to hold the REC button.
- D3)** When you are finished recording the audio, press REC to stop.
- D4)** If you are dissatisfied with your ambient audio playback, repeat steps D1-D3.

Recording triggered audio to the PicoBoo or PicoBoo+:

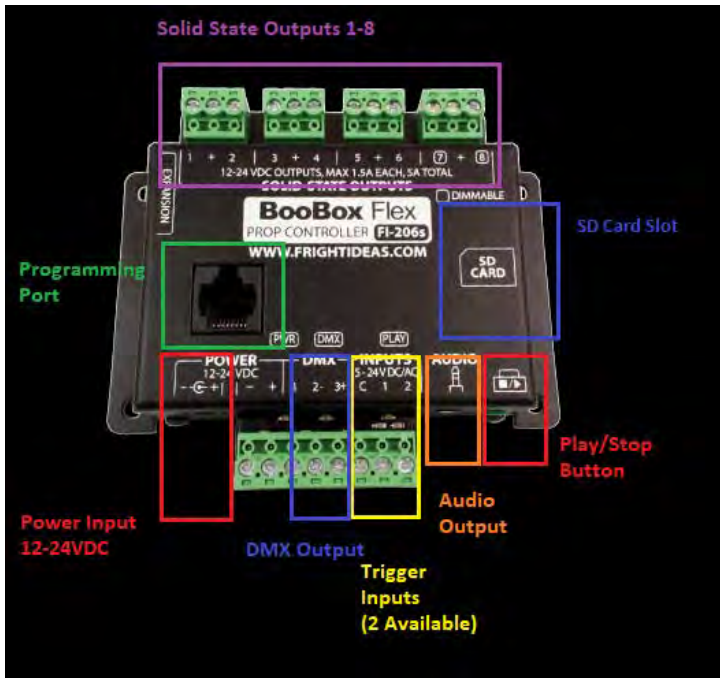
- E1)** Hold down the REC button. You will notice that the REC light does not come on. **E2)** While holding down the REC button, start your audio source and press 2 at the same time. The REC button will light up when you press 2. There is no longer a need to hold the REC button.
- E3)** When you are finished recording the audio, press REC to stop.
- E4)** To play back your triggered audio, remove the audio source from the LINE IN jack and press the Play Button.
- E5)** If you are dissatisfied with your triggered audio playback, repeat steps E1-E3.

You may wish to protect your PicoBoo from tampering. To set the Write-Protect:

- G1)** Disconnect the controllers power supply.
- G2)** Hold down the button 2.
- G3)** Reconnect the power supply while holding down 2.
- G4)** When the REC light begins flashing, you may release 2. Your controller is now write-protected. Program data and audio cannot be overwritten in this mode.
- G5)** To turn off the write-protect, repeat steps G1-G4.

ANIMATION CONTROLLERS: BooBox FLEX (FI206s):

The BooBox FLEX is an eight-output animation controller.



Trigger Inputs: This is where your Triggering Device connects to the unit. The Flex Controller has 2 independent trigger inputs

Power Input: This is where the 12 VDC transformer connects to the unit.

12 VDC TRANSFORMER: Plugs into a standard US outlet (110 VAC). The barrel connector on the end of its cable, plugs into the Prop Controller

Solid State Outputs: Eight control leads are on this unit, labeled accordingly. This is where any Valves, Accessories, or Relays interface with the animation controller.

DMX Output: DMX is a way for digital accessories such as Lights, Fog Machines, and even Relays to communicate with each other across a data cable. This allows synchronization that would not normally be possible. The FLEX controller is available with up to 512 Channels of DMX capability

SD Card Slot: Used to store larger show and audio files. Also used to update the firmware of the FLEX controller

Play/Stop Button: Used to manually stop and start your show. Each subsequent pres will skip to the next scene

Programming Port: The FLEX controller can be easily programmed with the Fright Ideas Director Software and an SD Card.

The Director Connect allows you to see your work in real-time, rather than having to save the program to an SD card first. The ScareMaster is a great real-time programming option for those who don't want to be tethered to a computer.

About Solid-State Outputs:

Solid-state outputs are great for reliably controlling relays, solenoids, and LED lights. They cannot be used to directly control high-current, 110 volt, or contact-closure devices like a relay can. However, unlike relays, they have no moving parts that wear out over time. Use external mechanical or solid-state relays for high current or high voltage loads. This will result in a highly reliable and maintainable system.



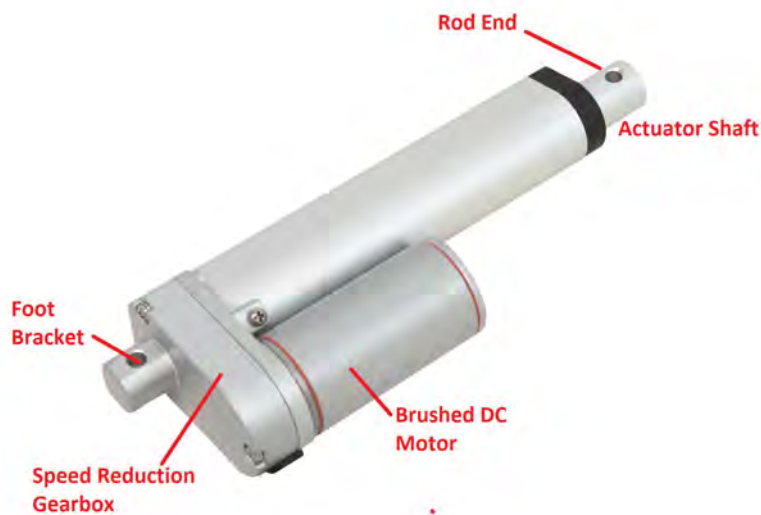
Electrically Operated Props:

Not all Scarefactory products are pneumatic. Many are electrically operated using 12VDC Linear Actuators. Linear Actuators allow us to build props that work much the same as our pneumatic ones. Just without the need for an air compressor. This makes installation and setup extremely easy. Typically you will only need to plug your prop into the wall, hook up your audio system, and start entertaining your guests.

Linear Actuators use a Brushed DC motor to operate. Therefore, Linear Actuators have what is known as a "Duty Cycle". **Duty cycle is the ratio of time a load or circuit is ON compared to the time the load or circuit is OFF**

When you order a programmed prop from us, there will be rest periods build into the program of your prop. There may be delays added to the end of each scene or they may be built into the Trigger's Timer.

Like any DC motor, heat will build up during operation. This is inherent to any brushed DC motor. This heat will eventually cause the motor to fail. It is very important that the prop is able to dissipate this heat by having rest or delay periods built into the programming. If the prop is not being used, it is always best to unplug the unit from the wall.



Brushed DC Motor: The Power Plant of the Linear Actuator. Typically 12VDC

Speed Reduction Gearbox: Allows the DC Motor to Either Produce a Higher Torque Value or a Higher Speed. This works proportionately, if you want more Torque, you have to reduce speed and Vice-Versa

Rod End and Foot Bracket: This is where the Actuator attaches to the moving parts of your prop

Actuator Shaft: Actuator Shafts are designated by their stroke. Typical Values are 2 or 4 inches but may be considerably larger dependent on your specific application

The Actuator is moved out by applying 12VDC to the actuator leads. We can retract the Actuator by simply reversing the 12VDC polarity

NOTE: Linear Actuators are Pre-Lubricated. It is not necessary to lubricate either the Gearbox or the Actuator Shaft

DC Power Supply:



The DC Power Supply is used to convert the 120V AC power from your wall plug, into 12VDC power. DC Power does have a polarity. Meaning, both a positive and negative side.

Power Indicator LED:

When illuminated, indicates the Power Supply is on

AC Power In:

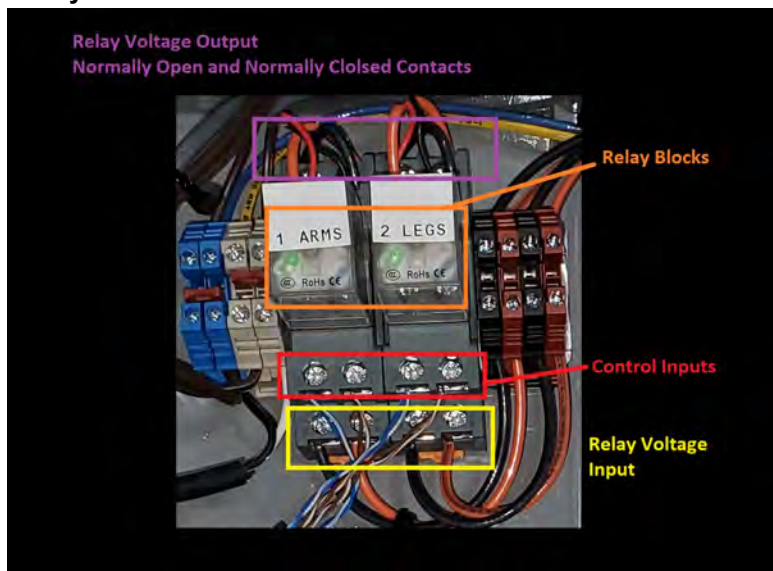
The power coming from your wall plug. There are 2 sides "L" and "N". These stand for "Line" and "Neutral". Line is the conductor that when connected to ground will produce a current flow.

Neutral, won't have current flow unless connected to the line

12VDC Output:

Positive and negative are denoted by a **Plus "+"**, for positive polarity and a **Minus "-"** for negative polarity

Relays:



Changing a small electrical input into a high-current output isn't easy, but this is necessary to operate a high current linear actuator as well as provide a means to alternate the "Push-Pull" or "In-and-Out" action.

Many circuits achieve these conversions through the use of relays, which are indispensable in all kinds of electronic equipment and vehicles.

Think of a Relay as just a remote operated switch. Only operated by a magnetic coil as opposed to a physical switch operated by your hand.

Relay Voltage Input:

This is where the DC Voltage from the Power Supply enters the relay. This is also known as "**Common**"

Control Inputs:

This is where the Relay connects to the animation controller

What Do "NC" and "NO" mean?

"NC" and "NO" Mean "Normally Open" and "Normally Closed"

This refers to the "Default State" or "Normal State", that the Relay is in

Normally Open or "NO"

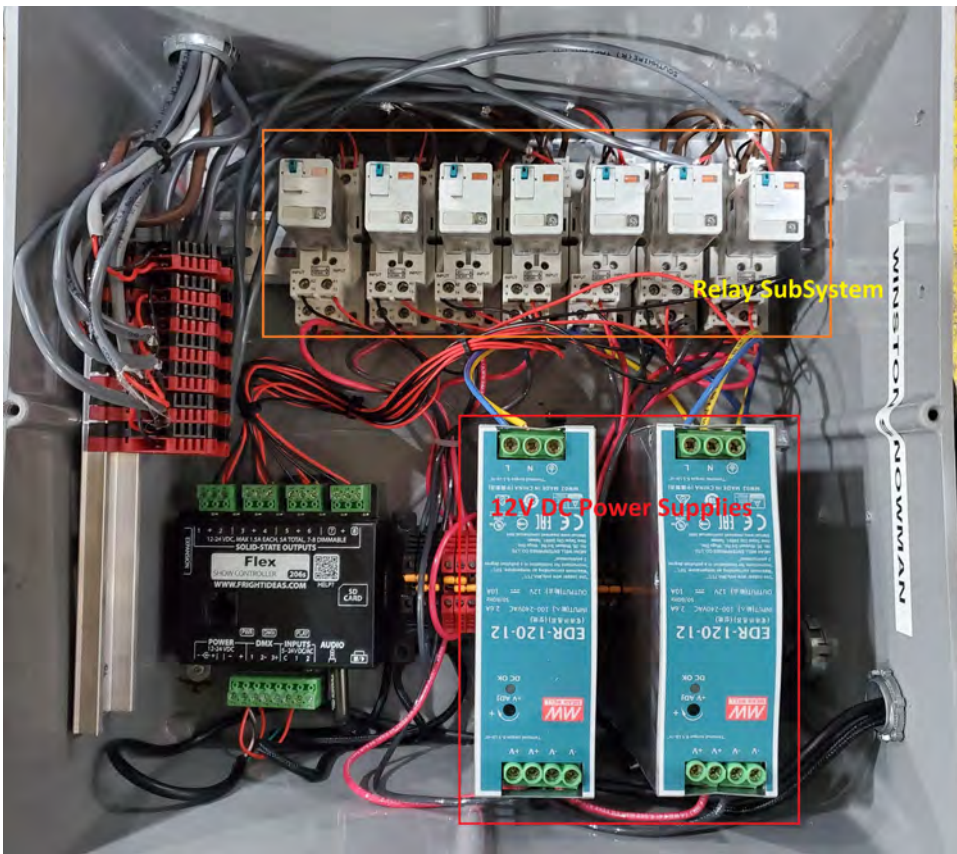
In a normally open relay, a power signal is sent from the prop controller to the Control Inputs on the Relay, activating an electromagnet. This attracts a contact to join together, allowing current to flow through. When the source of power is removed from the Relay Control Inputs, a spring draws the contact away from the second circuit, stopping the flow of electricity.

Normally Closed Relays or "NC"

The fundamentals of an NC relay are the same as an NO relay: an electromagnet moves a physical contact between two positions. But in the case of an NC relay, the default states are reversed. When the first circuit is activated, the electromagnet draws the contact away from the second circuit. As such, NC relays keep the larger circuit in the on position by default.

Our Props use these 2 states in conjunction with each other. This allows us to reverse the DC polarity back and forth. Operating the Linear Actuator in and out

Control Systems Example:



The image on the left is an example of an electrically operated prop's control system.

This is one of our more complex ones, providing 7 different independent movements to this character.

Each relay corresponds to a linear actuator within the prop.

This specific prop contains the following movements:

1. Mouth - Open and Close
2. Eyebrows - Up and Down
3. Head Tilt - Up and Down
4. Head Pan - Left to Right
5. Right Shoulder - Moves the Prop's arm up and down
6. Right Elbow - Moves the Elbow in and out
7. Torso Pan - Moves the Character's torso left and right

ZOMBIETTES:

Our motorized effects are known collectively as “Zombiettes.” These units can be plugged in and left to run continuously for hours on end. There are, however, a few regular maintenance procedures you should follow to ensure that the unit continues to run properly for years to come:

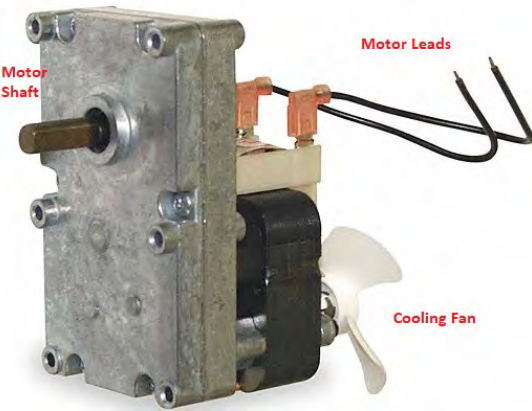
1) FAN: There is a small plastic fan mounted to the motor that cools the unit. **DO NOT REMOVE THIS FAN.** Without this fan in place, the motor will overheat and go bad. It is possible for loose fabric, or even the motor’s power cord to become entangled in the fan. Should this occur, remove power from the unit, untangle the fan, and either remove or secure the obstruction away from the fan.

2) SHAFT COLLAR: This piece, welded to part of the Zombiette’s linkage, slides over the shaft of the motor and is secured with a set screw. Should the set screw become loose, the shaft of the motor will spin inside the collar and your Zombiette will no longer move. Should this occur, remove power from the unit and tighten the set screw. When power is returned to the unit, it should resume normal operation. Tightening the set screw on a regular basis will help prevent this occurrence.

3) NUTS & BOLTS: The repetitive circular motion of the Zombiette can loosen nuts over time. Tighten them regularly, but be sure not to make them so tight the unit cannot function. Also, the shaft of the bolts may begin to wear over time. You may want to replace them occasionally.

4) SCREWS: The motor is held to the mechanism by two 8X32 screws. These, too, may loosen over time, due to the constant vibration of the motor. Tighten them regularly. Use of a high-grade threadlocker is recommended.

5) OUTDOORS: Zombiettes may be used outdoors as long as they have some form of protection from the rain. Nothing will ruin a Zombiette motor faster than being full of water.



REGULAR MAINTENANCE:

Springs:

Many Scarefactory effects use springs to assist in their motion. In time, springs can stretch or even break. If a spring-assisted effect becomes sluggish or stops raising up altogether, check the springs.

Nuts & Bolts:

Scarefactory uses nuts with nylon inserts to help prevent them from coming loose. It is still possible for these nuts to come loose over time, so it is strongly recommended that you tighten the nuts regularly. Don’t crank them down like you would the lug-nut on a car, just get them snug.

Set Screws & Shaft Collars:

Many Scarefactory effects use shaft collars with set screws. Set screws should be tightened as much as humanly possible while not stripping out the Allen Key hole.

Thread Lock:

Thread Lock can be your best friend. Scarefactory recommends using a mid-grade thread locker. Low-grade is pretty much useless. High grade is damn near impossible to get off, not good if you ever need to replace a bolt.

Lubrication:

Lubricating the moving parts on your effect can both improve performance and reduce wear and tear. **DO NOT USE OIL OR WD-40.** Oil soaks into the steel, which helps prevent rust, but does little or nothing to actually lubricate. **USE A HIGH QUALITY WHITE LITHIUM GREASE OR MARINE GRADE GREASE.** Grease will stick to the surface of the steel and lubricate it much better.

Anchors:

Most Scarefactory effects will need to be secured to the ground in some fashion. Mounting plates are included on the base of most Scarefactory effects, ideal for use with concrete anchors.

Troubleshooting:

PicoBoo and PicoBoo+:

TROUBLESHOOTING TABLE	
Problem	Solution
"REC" light keeps flashing or the motion sensor won't trigger scare	<ul style="list-style-type: none">- The motion sensor is warming up, wait 2 minutes, or- Input is set to normally-closed when it should be normally-open (see Trigger section for more details).
Can't record animation	<ul style="list-style-type: none">- PicoBoo is write-protected, disable write-protection (see Settings section for more details), or- Audio source is still connected to Audio Line-In, disconnect.
Sound cuts out when output turns on or off	<ul style="list-style-type: none">- Put diodes or capacitors on your solenoids
Sound cuts out when using the internal amplifier	<ul style="list-style-type: none">- The power supply may be underpowered. Try reducing the volume or swapping out the power supply with one of higher wattage.

Flex Controller LED Error Codes:

The Flex and FlexMax will blink their PLAY LEDs X times, pause, then repeat, when they encounter an unrecoverable error. The number of times the LED blinks tells you what the error is. Popular error codes are described below.

2,3, or 7 Blinks - Bootloader Error

The Firmware file on the SD card (F12XXFRM.BIN) is invalid or too old to be loaded into this controller.

4 Blinks - Bootloader or Behavior Version Error

The Firmware file on the SD card (F12XXFRM.BIN) is corrupt, OR, the firmware loaded into the CPU is too old. Make sure the controller has the latest firmware. Make sure the controller you selected for your show matches the one you are using. For example, make sure you have chosen 206s and not 206 if you have a Flex 206s.

5 Blinks - Behaviors Out of Memory

A bug, or your combination of conditions and actions have run out of memory. Please contact support for assistance.

6 Blinks - Behavior Exception

Please contact support for assistance.

7 Blinks - Monitor Buffer Overflow

This can happen if you are using Monitor mode in Director and it wasn't able to send you all the log data before the buffer overflowed.

9 Blinks - MP3 Decoder Reset Error

The controller's MP3 decoder is not responding. Please contact support.

13 Blinks - FAT FileSystem Error

The SD card is not formatted FAT16 or FAT32. It's greater than 32GB, it's corrupt, or a required file is not found.

14 Blinks - SD Card Error

There is an error communicating with the SD card. It may be damaged, corrupt, not compatible, or does not have a good connection to the SD card socket.

Troubleshooting a non-working Prop Movement in Characters that use Linear Actuators

1. All electrically operated props we make are powered by a 12V DC power supply. This in turn, operates a 12V DC Linear Actuator.
2. Typically when a movement stops working it is 1 of 3 things.
 - a. A bad Relay
 - b. A bad linear actuator
 - c. A short in the wiring running up to that specific movement
3. In order to trace down where the issue is, we will need access to the Box where the Props control system is, a multi-meter capable of detecting 12V DC, and a phillips head screwdriver to remove the lid of the control systems box
 - a. There is live 120V AC running to the power supplies. It's important to be aware of where your hands and tools are.
4. There is a block of relays in every control systems box. Each Relay corresponds to 1 movement of each character and powers 1 linear actuator. The mouth movement is always the first relay in the block. It will always be the left-most relay in the line. Then moving on to the right we will have any head or ear movements. Followed by any neck movements, then arms. Last will be any torso movements such as Panning etc....
5. There is an example photo below. Every prop's control box is a little different but they all work essentially the same way
6. You are essentially just going to trace 12V DC power to the actuator to find out where the problem lives
7. You're going to start at the front of the relay. The front has an orange or red tab near the bottom.
8. Using a Multi-meter, test across the first set of terminals on the bottom front of the relay. Polarity doesn't matter. Our main concern is verifying we have 12V DC across those 2 terminals on the relay block. If there is voltage, continue to the next step below. If not, a wire has likely come loose somewhere between the 12V DC Power Supply and the relay block.
9. Now we will do the same on the back of the relay
10. Continue to trace the wire back into the prop from the control box. Along the way take note of any damage to the wiring. Once you get to the linear actuator you will need to scrape off enough insulation on it's wiring to determine if you are getting 12V DC all the way to it using a DC capable Multi-meter
11. While there, be sure to touch the actuator itself to see if you feel any vibration. It may feel like the actuator is trying to work but doesn't have enough strength. It may also feel hot to the touch.
12. If you have 12V DC all the way up to the actuator itself but the actuator isn't moving, this typically indicates a bad actuator
13. If it is suspected that there may be a short or broken wire somewhere, it may be easier to run a new jumper wire than it would be to track down where the short is

