VILE THINGS

http://www.vilethings.com/vilethings_skeleton_marionette.htm

2005 Lightweight Skeleton Torso Project

The motivation behind this project is to replace our current flying crank ghost marionette.

That was our first haunt prop building project ... w-a-y back in 2001 ... It's still in fine shape, and still performs as it did new. It's carefully wrapped and packed away every season to prevent sunlight damage to the u.v. paint.

So, why build another?
Because the Flying Crank Ghost is a must-have prop, and ours needs a face lift!

The goal is to build a Skeletal Torso out of extruded (sheet) foam, light gauge wire, and polyester batting material to fly on our existing flying crank ghost mechanism. Keeping the prop's weight at bare minimum is essential.

The (recommended) Dayton 6 r.p.m. gearmotor IS a workhorse, but not exactly a powerhouse.

Part One (current page) of this project will include:

BLOCKING OUT

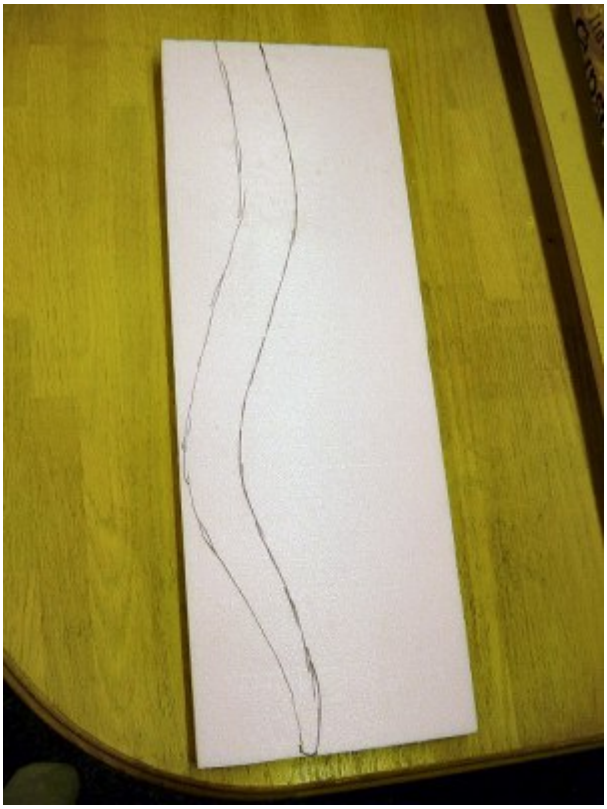
REFINING THE PIECES

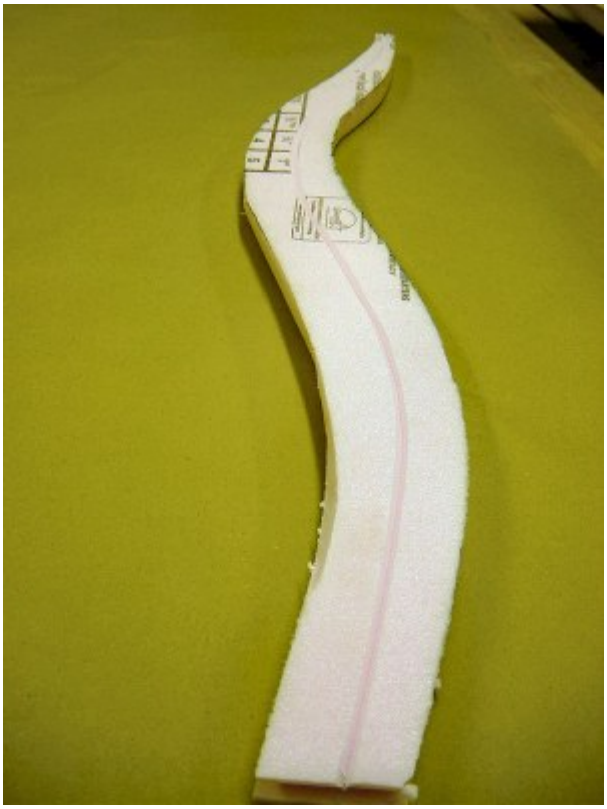
Part Two (Page 2) :

ASSEMBLY

FINISHING

--- SPINE ---





The Spine will be built using 3/4" extruded foam.

The basic shape is sketched on the foam, roughly 30" long. It is suggested to draw a little "big," because it'll be easier to remove excess foam than add missing pieces.

Cut the shape from the sheet, trace the outline and cut two additional pieces. The three pieces will be laminated, making a block for carving.

Before gluing anything together, cut a "V" shaped groove on opposing faces of one piece. These grooves will accept string ... nylon twine to be exact ... the kind you buy on a roll or spool at any hardware store, department store, etc.

This twine will add some degree of strength to the the otherwise fragile foam spine. Having two lengths of twine will insure proper alignment, more on that subject later.

Three *identical* pieces of spine-shaped foam are laminated, including two lengths of nylon twine (one centered along each glue joint)

We use Polturethane glue for our foam projects, as once suggested by Corey Minion of Minion's Web fame.

This glue is perfect for this material. It allows for plenty of work time, it provides some expansion, it cures to a rigid foam-like texture, which machines and finishes very much like the sheet foam itself.

Provided the environmental conditions are good, it's typically workable within a few hours and cured within a day.

Polyurethane glue, often sold in woodworking supply stores, it also weatherproof when cured.

Apply the glue to one surface to be bonded. Use scrap material as a spreader to ensure an even (thin) coat of glue over the entire surface. You'll want to use a spreader "tool." Meaning ... you really don't want this stuff on your bare skin. If I recall correctly, you'll actually shed those skin cells before the glue washes/wears off. (How's that for adhesion?)

On the other half to be bonded, mist the surface with water. Polyurethane glue requires moisture to begin expansion/cure.

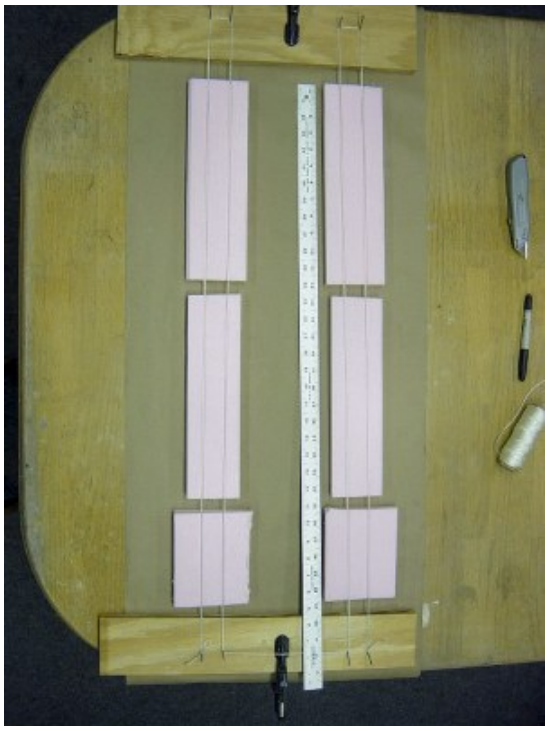
Place the twine in the groove, assemble the halves, and repeat for the third piece of the spine.

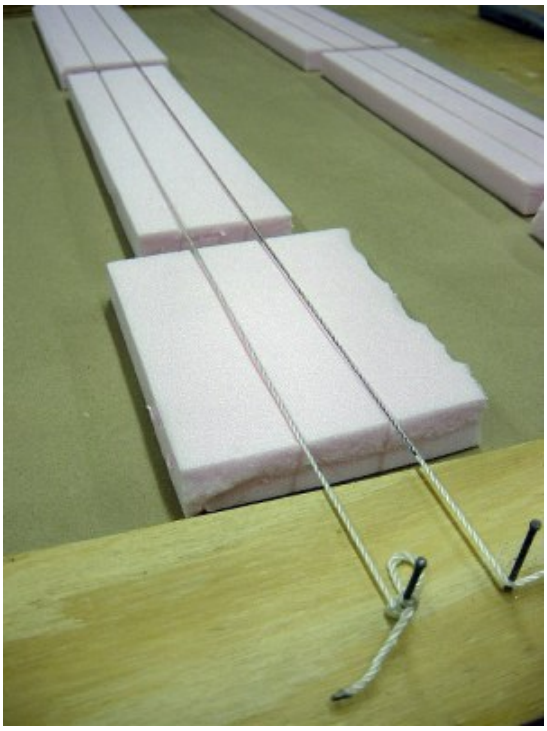
Once all pieces are glued and positioned, clamp and set aside for curing.

We clamped the spine using packaging tape - another Corey Minion tip.

You need to clamp most glue joints to ensure proper alignment during cure time. This rule is especially true for polyurethane glue, as it WILL expand. (Expansion is no good for non-clamped assemblies.)

--- ARMS ---

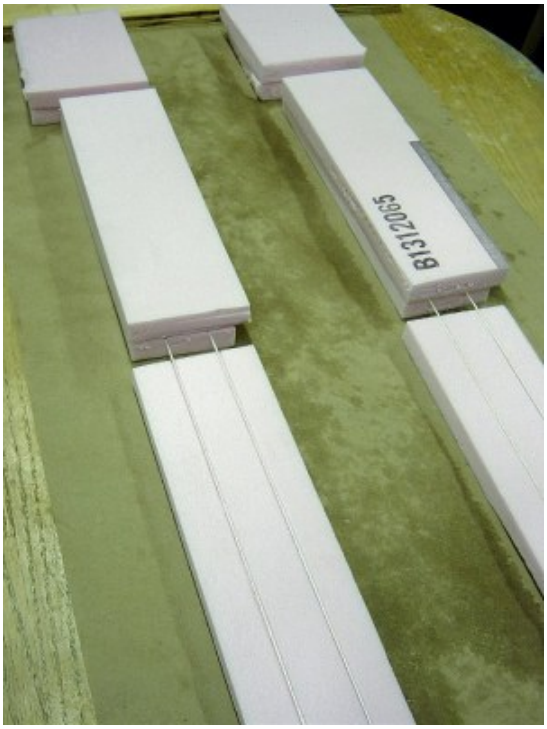




The arms for our Skeleton Marionette will be made using the same materials and construction techniques as the spine. Sheet foam is cut to approximate length and slightly excessive width.

Two grooves are routed approximately one inch apart.

For these body parts, the twine will act as hinges in addition to providing some strength and ensuring proper alignment. We used a quick jig to hold the twine in place for assembly and glue cure. (Too many pieces, not enough hands.)



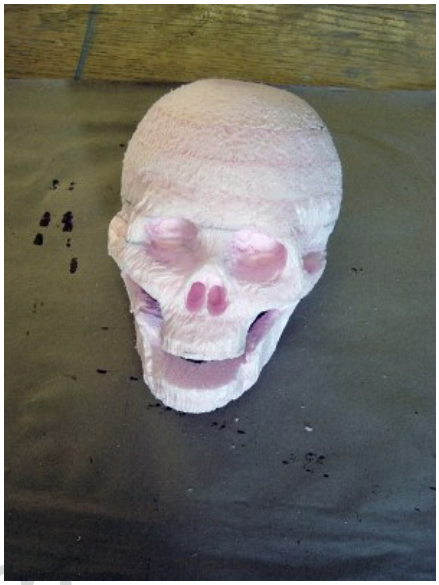
Same procedure ... apply a thin, even coat of polyutethane glue to one half of the joint and mist the other half with water. Place the twine in the grooves, assemble the halves, and clamp.

(Note the high tech clamp we used for the arms - 200 pounds of UltraCal30 on top of a scrap piece of 3/4" m.d.f. ...)

--- SKULL ---

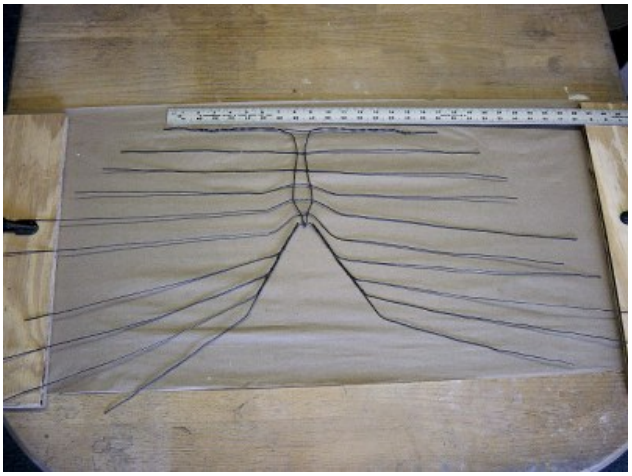
There is little to explain here. Laminate several pieces of foam to build a desired thickness.

We chose to carve a full skull, freeing the jaw once the majority of the rough carving was complete.



--- RIB CAGE ---

We start building the rib cage by making a wire armature.



Since the ribs will need to be bent to proper shape, we'll use a flexible material to bulk the individual ribs out.

A trip to the nearest craft department provided the ideal material.

1/4" thick polyester batting - used primarily by quilters.

Lay the finished armature on the batting, lightly mist with an adhesive, and fold the remaining batting over on itself, encasing the wire armature.

After the adhesive has dried, we used a 1" brush to paint the rib areas of the batting with liquid latex.

A light coat (both sides) is all that is needed at this time.

This will guarantee the halves of the batting and the wire armature behave as one piece during trimming and bending.

Once the latex is dry, the individual wires (ribs) are cut free from the sheet.

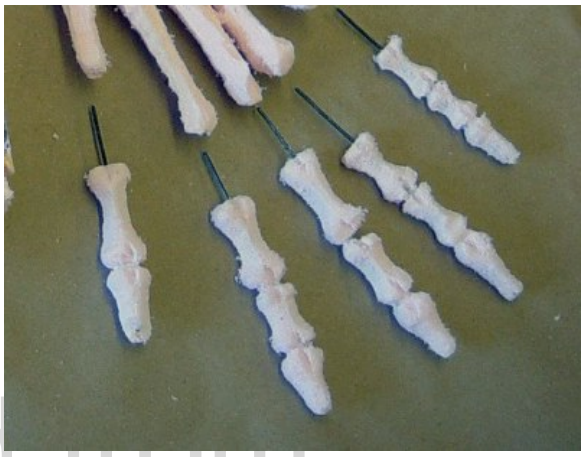
The second photo (above, right) shows the process of sealing the edges.

Liquid latex to the rescue again ... After applying a small amount of liquid latex to the seam, the edge is pressed onto itself, which works the latex into the fabric.

A light application of heat, a blow drier in our case, and a little more pressing, and the seam is closed in a matter of seconds.

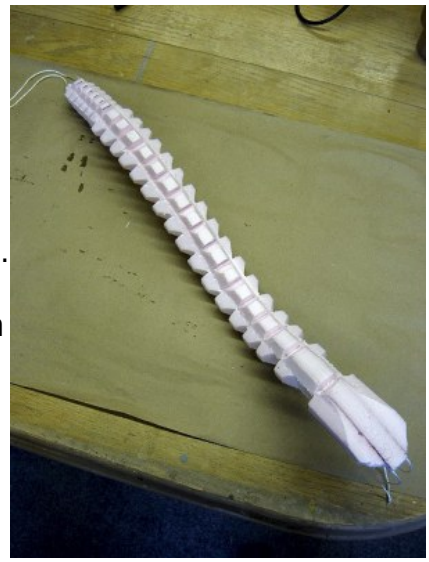
--- REQUIRED EMBELLISHMENTS ---

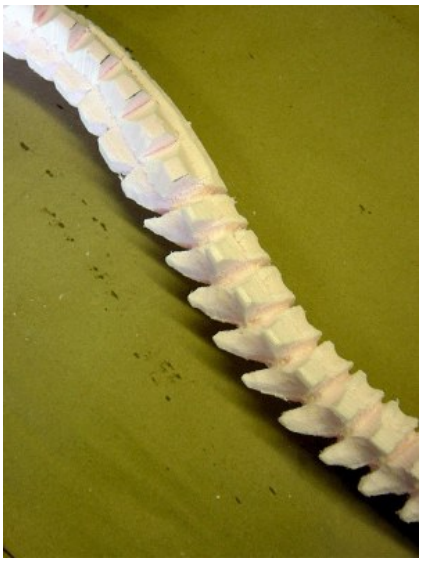
Push a length of wire through a piece of foam, leaving roughly one inch exposed for assembly. shape the foam into the desired form, leaving them a little big for final sanding.



The collar bones, before and after. Shoulder blades. before and after shaping.

REFINING THE PIECES





We first marked the spine block and removed small wedges of excess material using a razor knife.

A dremel was then used to begin shaping individual vertebrae.

One note of caution ... be aware of the placement of the nylon twine within the foam block.

Mark the arm blocks for shape (again, slightly oversized.) Also note the location of the twine.

We started by cutting outside the marks using a saw (reciprocating saw) blade.

These foam pieces, given their finished length vs. width, are not very strong. Patience ... carefully shape the bones using whatever method you're most comfortable with.

The speed of the dremel tool is very nice, but it can be somewhat aggressive on such small pieces. Razor knives, small rasps/files, and sandpaper are all useful for this task.

Knives, saws, rasps, dremel ... anything that will turn an ordinary block of foam into a skull.

After cutting the jaw free, it became painfully obvious that we'd need to add some additional material before shaping the lower teeth. (Flanders did his best "Gramps" impersonation ...)

Better?
A little more sanding, some teeth ...

ASSEMBLY

We'll start assembling the rib cage by cutting the individual ribs to length, then trimming the wires to (roughly) 3/4".

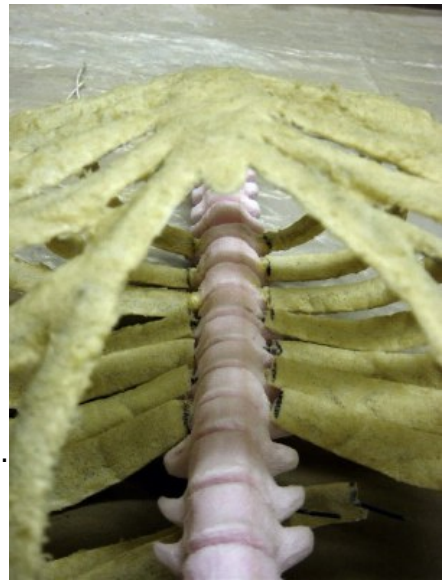
If you desire clean, straight edges on your ribs, now would be the time to address that issue.

The first (uppermost) two pairs of ribs were bent to approximate shape and positioned on the spine.

This is a slightly clumsy undertaking, as the rest of the latex chest piece is loose and flexible. Take your time, and work in small increments ... back and forth ... until you get close.

Continue this procedure until you can no longer manage the whole assembly.

Although not the best picture, you can see cured polyurethane glue on the spine/rib intersection of the first three ribs.



Once this cured, we were able to install and glue the remaining ribs.

After the glue has had ample time to set, flip the whole spine/rib assembly over and re-glue the back side of each joint.

These connections need to be secured very well. When it's time to shape the chest, you don't want to discover any weak or loose ribs.

We needed a combination of mechanical and chemical fasteners for this assembly.

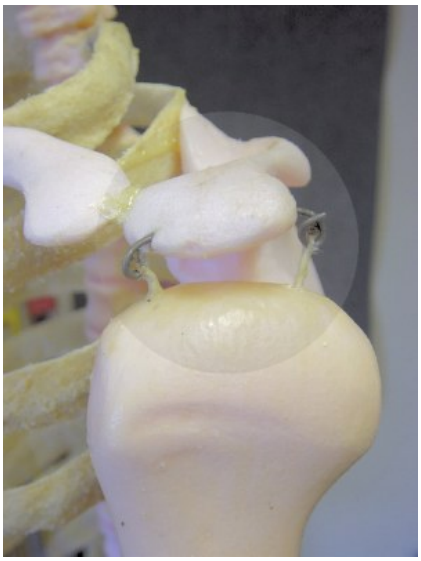
Short lengths of armature wire, used as dowels, are inserted between parts to be joined.

With the aid of small spring clamps, the pieces are held in position for gluing and cure.

Push the wire armature of each finger into the corresponding bone of the hand.

We didn't glue this joint in the event we wanted to change the position later on. Instead, we brushed liquid latex over the entire arm, hand, and finger piece(s). Future texturing and/or skinning will add a sufficient degree of durability to these bones.

A short length of wire is pushed through the foam shoulder blade and glued in place.



The ends of the wire are twisted into hooks. The twine pieces from the arm are attached to the hooks, which are closed (bent into loose loops.)

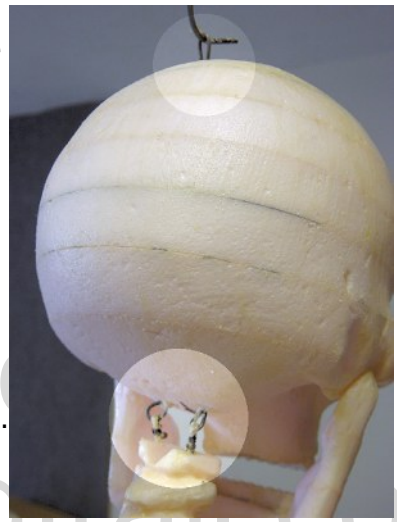
The underside of the skull receives two home made hooks - created by bending armature wire to the desired shape. Slightly oversized holes are drilled into the skull the same distance apart as the two lengths of twine in the spine.

Having two points of attachment here will virtually eliminate any twisting motion between the skull and spine. In the event a twisting head motion is desired, it would be simple enough to tie the pieces together accordingly.

The holes are partially filled with polyurethane glue, the hooks are inserted, and this task is nearly complete.

In order to join the jaw and skull, we inserted a short length of armature wire, half into the jaw, half into the skull. Liquid latex applied over the joint guarantees it will stay together and permit future adjustments.

The twine pieces from the spine are attached to the hooks at the base of the skull.



These hooks can be bent in order to properly align the skull (facing left to right, or tilted left to right.)

A third hook is fashioned and inserted/glued to the top of the skull. The top hook was made a little "long," to be sure it is strong enough to support the weight of the entire finished prop. The extra length here provides more glue surface for a stronger joint.



Above are in-progress photos of the prop so far.

FINISHING

Several coats of liquid latex were brushed/stippled over the entire foam skeleton.

This helped produce a uniform texture. After the latex fully dried, the skeleton was base coated white.

Testing the prop on a Phantasmechanics-style flying rig before detailing/finishing.

This skeleton was first painted yellow... the neon yellow from the photo above.
This color looks fine under blacklight, but horrendous in daylight.
(Horrendous like the blue version of 2001.)

Since this project is supposed to be an exercise in improvement, a color change became a requirement.

Fluorescent paints seem to behave differently than non-reactive paints.
It's difficult to layer over one color without totally masking the glowing properties of the base color.

We decided to re-paint the skeleton in detail, followed by light coats of "glow" paint. The glow paint dries almost clear, with a slight light yellow tint. The result is a skeleton that looks good in daylight and glows nicely under blacklight.

Another option might have been to use "invisible u.v. paint." These products are supposed to be clear in daylight conditions and glow under ultraviolet light.

Here are a few links to suppliers of invisible and visible u.v. paint products.
https://www.clearneon.com/products.php?cat=5003
http://www.wildfirefx.com/products.asp
http://www.dayglostore.com/


A couple of (burnt umber) washes are applied over the (new) white base color.

A dark brown color is mixed and airbrushed into recessed areas of the eye sockets and nasal cavity.

Careful shading using the same color adds some depth to the pieces.

A small detail brush is used to create the illusion that the teeth and some bones are separated.

In the photo of the Skeleton's left hand, (above) You can see the twisted light gauge wire wrapped around the second finger. This wire was twisted into a loop on the back side of the hand, where the string from the crank mechanism is attached.

The photos above show the prop after the first coat of u.v. reactive paint is applied.

As advised by most scenic painters, we applied this color using an airbrush (in a dark room with adequate ventilation) under blacklight.

There is really no other way of knowing how the finish will appear.

Second, and possibly third coats of this color will provide better, or at least more even coverage.

Paint products used for this project:

Createx Pure Pigments (Yellow Ochre, Burnt Umber ...White, and Carbon Black – not shown) Folk Art Blending Gel
Createx Translucent Extender

The white bottle in the center is "glow" paint. This contains the same pigment, probably in powder form, as glow in the dark objects.

It "charges" when lit and will slowly release this energy in the absence of light. It responds beautifully to blacklight, glowing a yellow/green.

Some sources for glow paint/powder:
http://www.hobbyglow.com/
http://www.glowinc.com/

RIT fabric whitener, emits a white/blue glow when exposed to blacklight
Neon Yellow and Neon Green craft paints. (not used after all...)

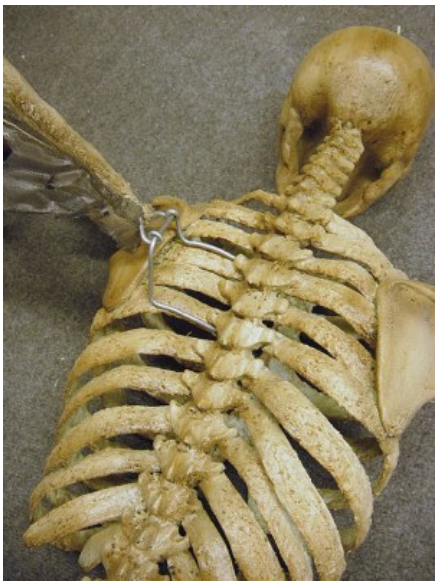
WINGS

We decided to make a pair of wings to justify this fellow's flight.
(If you're interested in seeing these wings during construction, there is a basic how-to here.)

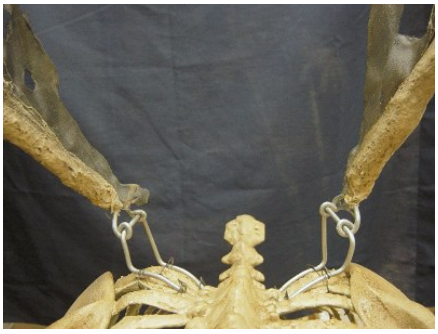
These wings will move as though they're keeping the marionette afloat.

In order to ensure a semi-controlled range of motion, we made a simple hinge to attach the wing to the skeleton.

Leaving the bent wire loops loose, we positioned the hinge on the skeleton and made adjustments until the fit was acceptable. It might take some time to get both sides aligned and fine tuned.



Once satisfied with the placement of both wings, we tied the hinges securely to the ribs and hung him up for a test flight.



The skeleton's head is attached to the third line of the crank mechanism.

The wings are attached to the frame - they won't lift or lower with the crank.

Find a (pivot) point on each wing - where the skeleton's torso is almost supported by the wings. By doing this, you're holding the majority of the props weight by the wing lines.

The crank mechanism now has less weight to move. In addition - the lifting and lowering of the torso now causes the wings to "flap."

After testing the motion of the wings on the prop, the hinges were glued to the rib area. We don't want these to work themselves loose over time.


Photos of the Skeleton Marionette at its lowest and uppermost position(s).


Cheesecloth, recycled from last years' haunt, was dyed a medium gray color using leftover paint washes. Stretch it, break holes, pull strands ... basically destroy it, then position it carefully. (Sounds strange, huh? ...)


The contrast between the "glow" paint and the RIT fabric whitener will make a nice effect. We mixed the RIT whitener with water-based polyurethane, roughly 1:1, and airbrushed it onto the cheesecloth. In the photo above, you can see the gray wash/dye glows a faint purple under blacklight.

The addition of the polyurethane introduces a binder (of sorts) for the RIT dye, and will also help glue the cheesecloth to the prop. Once dry, it will slightly stiffen the fabric, depending on how much is applied.

The same paint is applied to the wing membranes. Once the final painting steps are complete, the cheesecloth is "glued" in place using undiluted water-based polyurethane. (It cures clear.)


Above - Photos of the marionette in the uppermost position,
One under blacklight, one in daylight.

The prop in the lower position - blacklight, daylight.

Short of replacing the crank-mechanism lines with something a little less visible, this prop is done!