

Much Ado About Mannequins: Making the Perfect Form



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Connecting to Collections Care
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Popularity of dress, fashion, and costume exhibits worldwide



Making Movies, Harry Ransom Center, 2010

Exhibitions in major museums across the US, UK, Europe, Japan, Australia and New Zealand*:

- 1976: 7 exhibitions
- 1986: 10 exhibitions
- 1996: 19 exhibitions
- 2006: 42 exhibitions
- 2010: 52 exhibitions

*Statistics from Judith Clark and Amy de la Haye with Jeffrey Horsley, *Exhibiting Fashion: Before and After 1971*, (New Haven and London: Yale University Press, 2014).

Displaying dress and costume

- Costumes are material culture on a human scale, which makes for a compelling presentation
- Museums can highlight social, political, and cultural significance of clothing and costume through exhibition
- Preparation, planning, and execution can be daunting, time-consuming



The Making of Gone With the Wind, Harry Ransom Center, 2014



Presentation Outline

- ◆ Assessing a garment for display
- ◆ Choosing a mannequin style—advantages and disadvantages
- ◆ Taking garment measurements and translating to mannequin
- ◆ Modifying an existing mannequin
 - Additive methods—building onto an existing form
 - Subtractive methods—changing the shape of an existing form
- ◆ Creating a mannequin through subtractive methods
 - Sculpting a mannequin from ethafoam
- ◆ Building up a mannequin
 - Creating a mannequin or partial supports with Fosshape



Presentation outline, continued

- ◆ Underpinnings (slips, petticoats, bustle supports, etc.)
 - Provides support and correct interpretation of garment
- ◆ Best practices for handling and moving garments
 - Dressing the mannequin
 - Transporting to the gallery
 - Installing in the gallery
- ◆ Resources for materials, display practice and methods



Assessing a garment for display, cont.

- Examining costume for problem areas
 - Best examined flat on a clean surface
 - Exterior as well as interior important
 - Make sure hands are clean and dry, or wear gloves
- Most significant are areas that will bear most of the weight of the garment and from the force of gravity
 - Waistline
 - Shoulder seams
 - Heavily embellished areas (beads, applique, passementerie, etc.)
- If in good condition, can these areas be adequately supported?



Assessing a garment for display, cont.

- Weakened areas or losses (holes) at or near waistline





Assessing a garment for display, cont.

- Loss or weakness of fibers
 - water damage
 - rust
 - loss of velvet pile
 - weave of fabric loose or broken



Loss and water damage at shoulder seam

Assessing a garment for display, cont.

- Closures (zippers, hooks and eyes, snaps, buttons)
 - Are they loose, broken, rusted?
 - Can they be fixed, reattached, or replaced?



Assessing a garment for display, cont.

- Can you find a solution to the problem?
 - Consult conservator
 - Display flat
 - Solutions will depend upon budget, time, and staff resources



Assessing a garment for display, cont.

- What did the garment look like in historical context?
 - How did it fit?
 - How was it worn?
 - Were undergarments worn with the garment to give it a particular shape?
- Consult archival photos or descriptions of garment or like garments in context—sources depend upon your collection
 - Fashion periodicals and illustrations
 - Ethnographic studies, oral histories
 - Performance photographs or films
 - Painted or photographic portraits



Illustration from Godey's Lady's Book, 1870s



Costume evoking 1870s gown, from *Gone With the Wind* (1939)



Assessing a garment for display, cont.

- What you wish to highlight about the costume will determine what kind of form you need to make or purchase
- A single garment can tell many different stories—it depends upon your research, or exhibition theme
- Display a costume to highlight garment construction or techniques, how it was worn in performance, evidence of use or wear, etc.?



What type of mannequin should I choose?

- Three major types for this discussion
 - Full body fiberglass or resin mannequin with head, arms, and legs
 - Headless dress form
 - “Invisible” form with no visible neck, arms, or legs



Full body, head-to-toe mannequins

- Advantages
 - Head allows for easy display of headgear
 - Readymade arms, legs and feet for support of sleeves, pant legs, footwear—can be modified if needed
 - For examples of modifying these types of mannequins, see slides of 2013 webinar, Mounting Garments for Display, by Kathleen Kiefer and Petra Slinkard of Indianapolis Museum of Art, available on Connecting to Collections Care website
- Disadvantages
 - Too tall, muscular, and "athletic" for historic garments
 - Heads and feet usually do not fit historic accessories
 - Modern or “fashion” poses can be anachronistic

Full body mannequins

- Example of standard size, athletically-built mannequin that is too tall for customized costumes and has too defined features for well-known personage



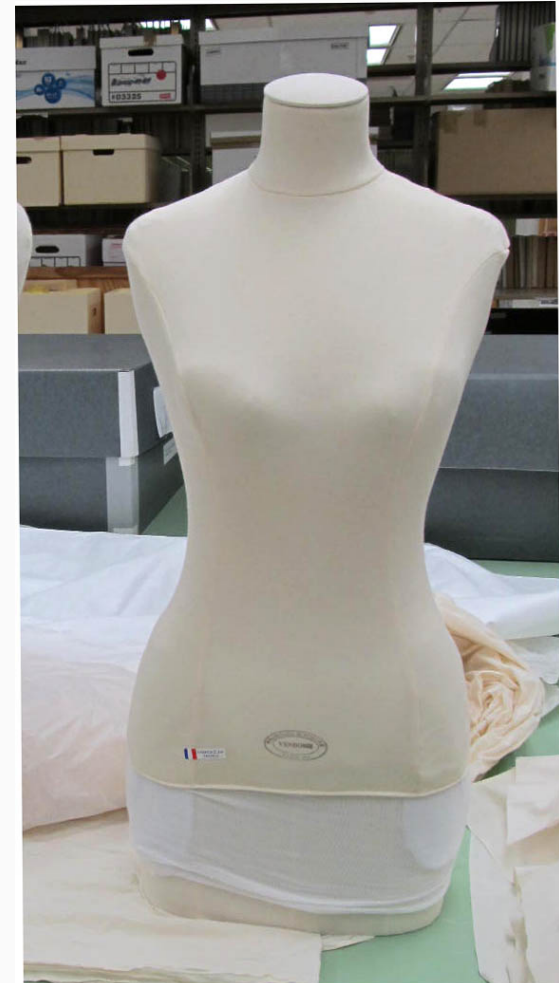
Costume worn by Robert De Niro for *Casino*, 1995



Costume worn by Robert De Niro for *Goodfellas*, 1990

Headless dress form

- Advantages
 - Classic look, less likely to look dated
 - Whether papier mâché, foam (not archival), or fiberglass base, usually covered with fabric and easy to sew into and modify shape, add custom arms, etc.
 - Still evokes the human form without a head with features that could potentially be distracting
- Disadvantages
 - Static, less dynamic look
 - More difficult to display headgear or other accessories (have to engineer a hat mount, arms/hands to hold accessories)



“Invisible” forms

- Advantages
 - Dramatic presentation
 - Can strongly evoke human form without a certain mannequin style of heads, arms, neck, etc.
- Disadvantages
 - More challenging display of accessories
 - Construction can be time-consuming



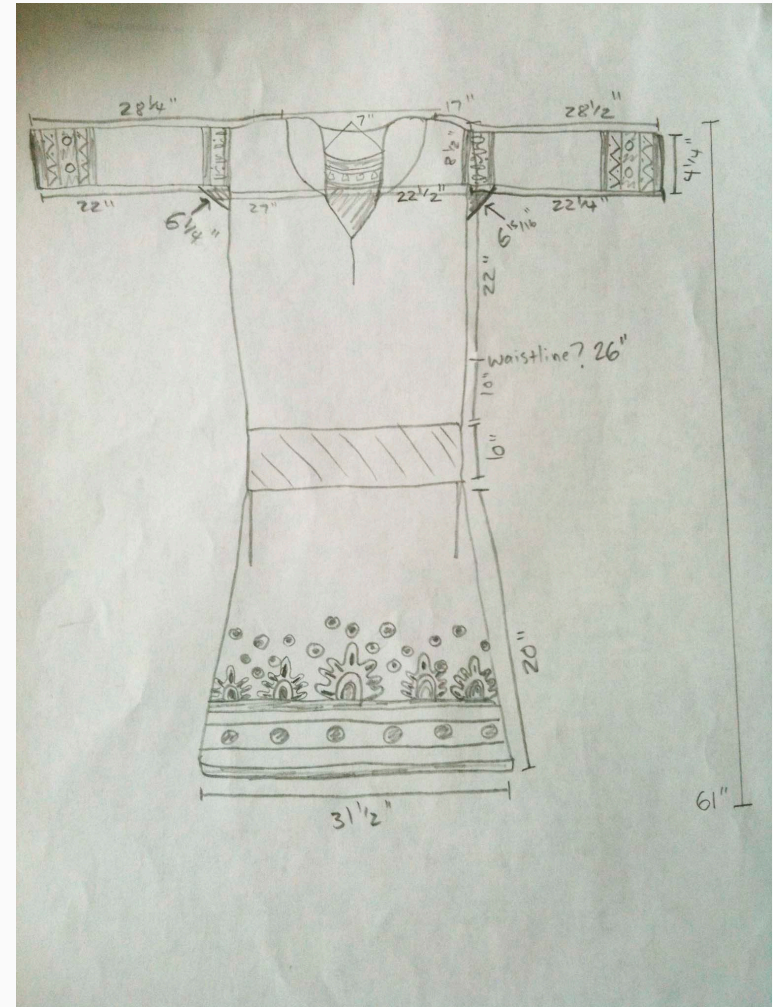


Other questions/factors to consider

- Do you want a unified look for all mannequins in your display?
- What percentage will you be able to fabricate, purchase, or modify?
(from existing mannequins in your museum storage and/or mannequins donated from local sources)
- Be sure to budget your time for both creating or ordering mannequins and supplies

Taking measurements

- Important things to remember for achieving accurate measurements
 - For performance costume (film, theater, dance) or clothing made specifically for individuals (not readymade), never assume that measurements are symmetric
 - For chest, waist, hip, and armscye measurements, measure on the interior of the garment (for difficult to reach or lengthy areas, can take measurements in increments and add up)
 - Measure from closure to closure (for hooks and eyes, snaps, buttons), not the length of the actual garment



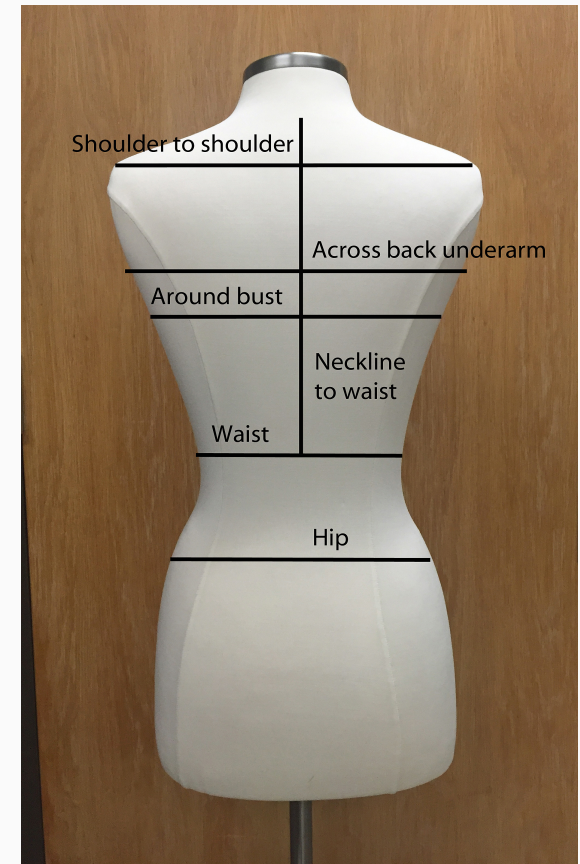
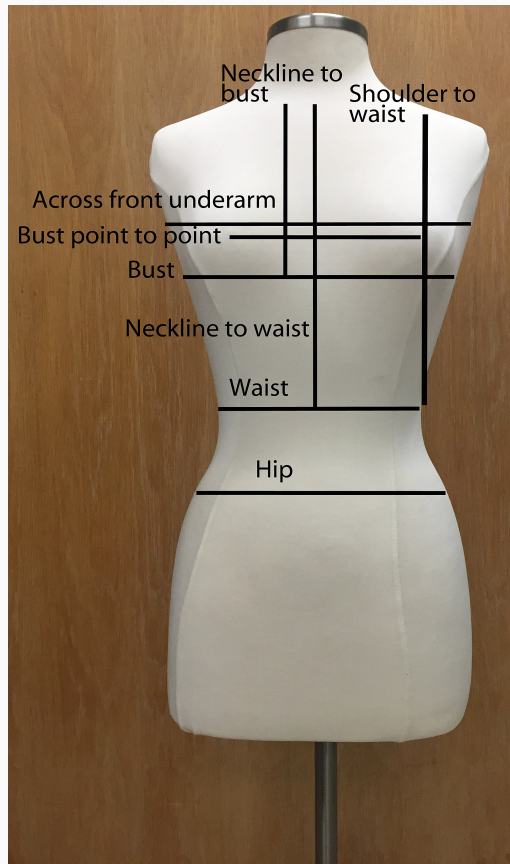
Taking measurements, cont.

- 1) Neckline: 12 ½"
- 2) Across shoulders: 13 ½"
- 3) Neckline to bust: approx. 8"
- 4) Underarms: 15"
- 5) Bust: 33"
- 6) Bust point to bust point: 6"
- 7) Shoulder to waist: 14 ½"
- 8) Waist: 26 ½"
- 9) Hips: approx. 44"
- 10) Outer sleeve length: 23 ½"
- 11) Wrist circumference: 8"
- 12) Inner sleeve length: 16"
- 13) Waist to hem: 40"
- 14) Total garment length: 56 ¾"



Taking measurements, cont.

- Translating to form
- Dress example:
 - Dress form torso is longer than costume's
 - Dress bustline is lower than dress form's (bust point to point is actual mannequin bustline)
 - Through padding, bustline and bust point to point need to be lowered; waistline and hip line raised





Taking measurements, cont.

- Ideally, be sure your chosen mannequin is at least 2” smaller than your garment to allow room to build up to the shape and measurements you need
- While taking good preliminary measurements can lessen the need for handling, placing, and removing a garment from the mannequin, you will likely need to try a garment on its new form more than once



Modifying an existing mannequin—additive methods

- Building up an existing form with padding
- Why not simply order a mannequin with the exact measurements I need?
 - Garments resting against a hard form only—
with no type of soft padding—can cause stress
on garment, look unnatural
 - Custom-built mannequins are more expensive
and can take months to receive





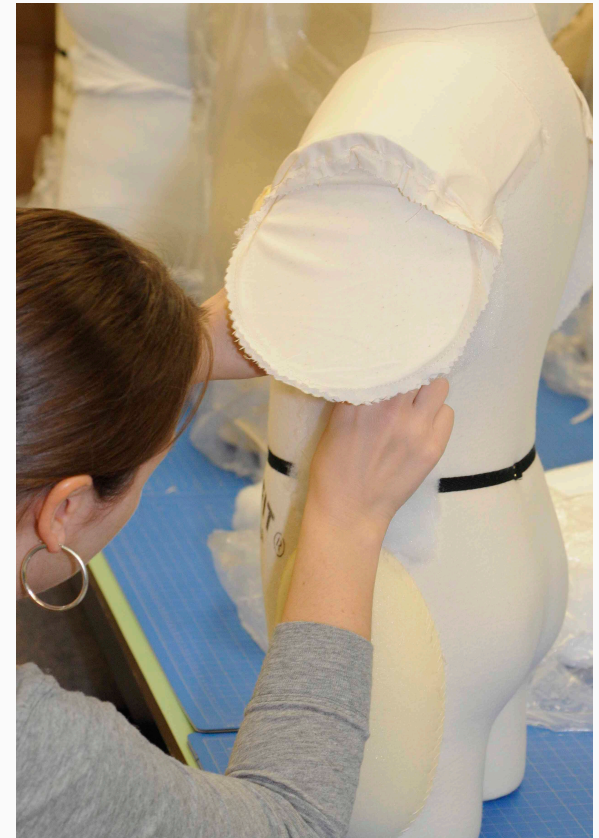
Modifying an existing mannequin—additive methods

- Can usually find a use for or modify most existing mannequins in storage
- Keep in mind that many commercially produced mannequins are made with non-archival materials
- Will need to protect with barrier—stockinette, pantyhose, Marvelseal



Additive methods, cont.

- Adding/extending shoulders
 - Method detailed in Lara Flecker's *A Practical Guide to Costume Mounting*
- Materials needed:
 - Museum board (or any thin board, ideally acid-free)
 - Muslin (unbleached and desized)
 - Polyester batting (fiberfill, desized)
 - Why acid-free, desized?



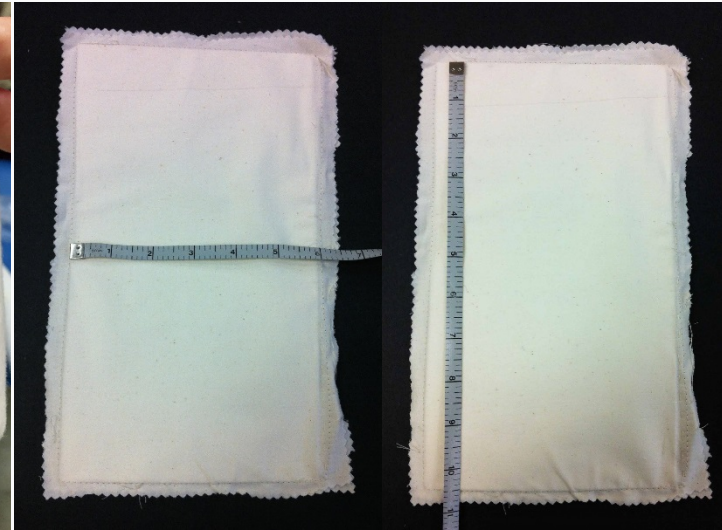
Additive methods, cont.

- Adding/extending shoulders
 - This method is easy and approachable for all level sewers
 - Materials are relatively inexpensive and available/flexible
 - Great for extending shoulders on an existing mannequin
- Example: converting adolescent/teen mannequin used for petite woman's dress



Additive methods, cont.

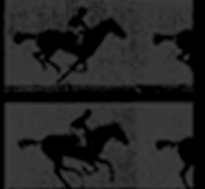
- Cut rectangular and circular pieces from board
 - Length from dress form neckline to shoulder, plus “extra shoulder” length needed
 - Measure width of interior armhole of your garment
 - Cut out circular piece with this diameter measurement
 - Measure half the circumference of the circular piece—this is your length measurement for rectangular piece



Additive methods, cont.

- Sandwich each rectangular and circular board piece between two muslin pieces and sew
- Leave at least 1" for seam allowance
- Sew rectangular shape to shoulders, sew circular "arm" to seam allowance of rectangle
- Secure to form with stitches





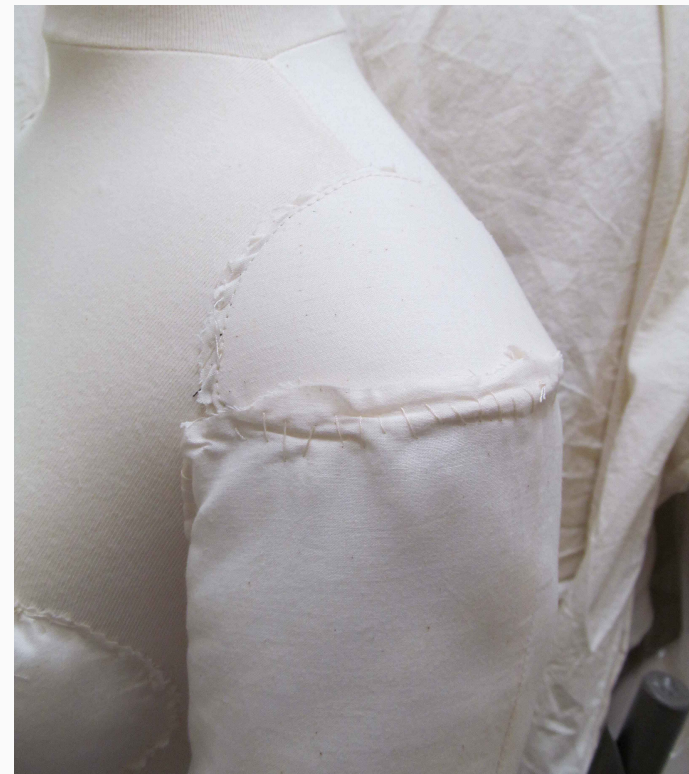
Additive methods, cont.

- Fill in the gap between the extended shoulder and dress form with polyester batting
- Secure batting to form with stitches



Additive methods, cont.

- Extending shoulders
- Use same materials for smaller shoulder extension



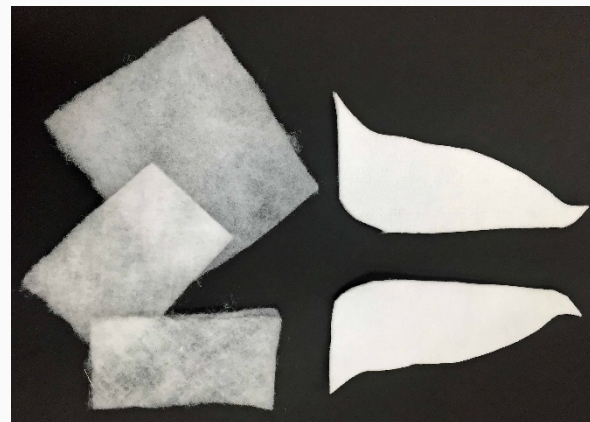
Additive methods, cont.

- Bust/chest modification
 - Materials needed:
 - Unbleached muslin or cotton stockinette
 - Polyester batting (fiberfill)
 - Condensed poly batting (this keeps shape better over time)



Additive methods, cont.

- Stockinette: different widths
 - Large size—good for covering torsos
 - Medium size—good for covering small size torsos (child's form, petite female form)
 - Small size—good for covering arms, legs
 - Medical or archival supply
- Batting: different types
 - Looser felt—good for adding volume, smoothing out layers or hard edges
 - Denser felt—good for building up areas with high weight load (bust, shoulders); will not compress further and will keep shape over time
 - Retail fabric stores (will not be desized), or archival or industry supply



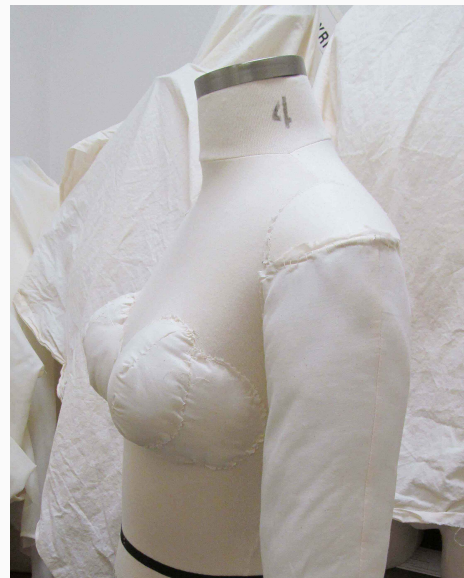
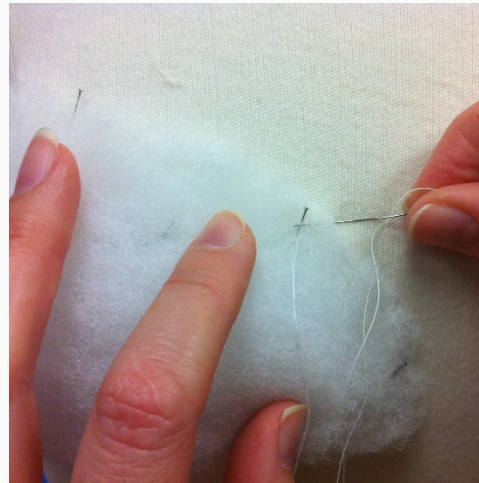
Additive methods, cont.

- Cut out concentric breast shapes from batting
- Thicker poly batting can separate naturally into thin layers and be built up as needed
- Sew shapes together in layers to create volume and shape
- Feather out edges, for smoother, less hard-edged look



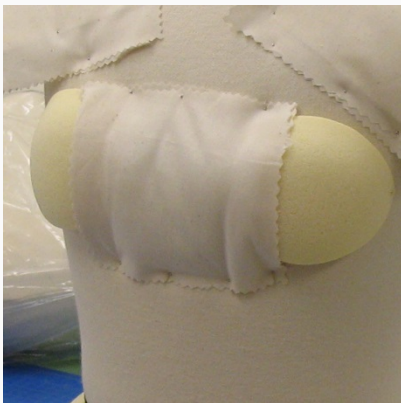
Additive methods, cont.

- Pin batting in place and sew to form
- Always cover polyester batting with a barrier (muslin, cotton stockinette) —small poly fibers can get caught in your garment



Additive methods, cont.

- Polyester batting can be used to accentuate bust or shaped to even out chest



1920s style bustline



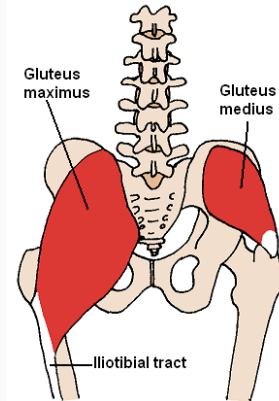
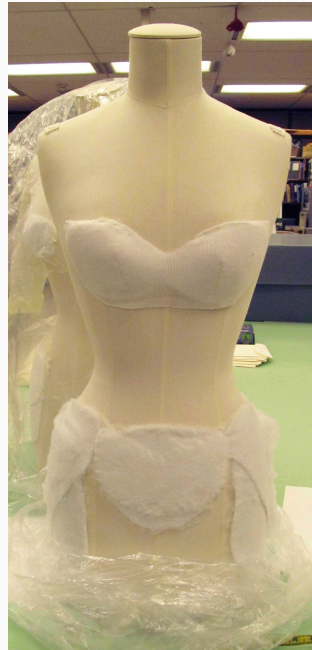
Flattening out bust to create male chest size and shape



Robert De Niro costume from *Stardust* (2007)

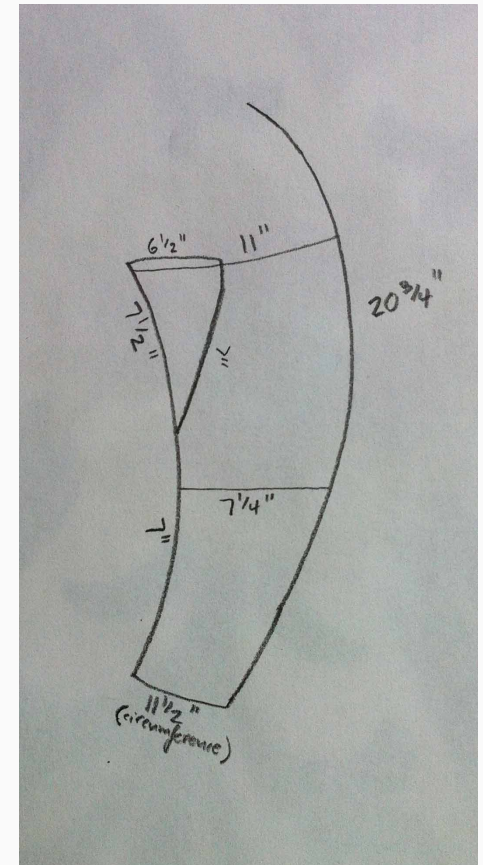
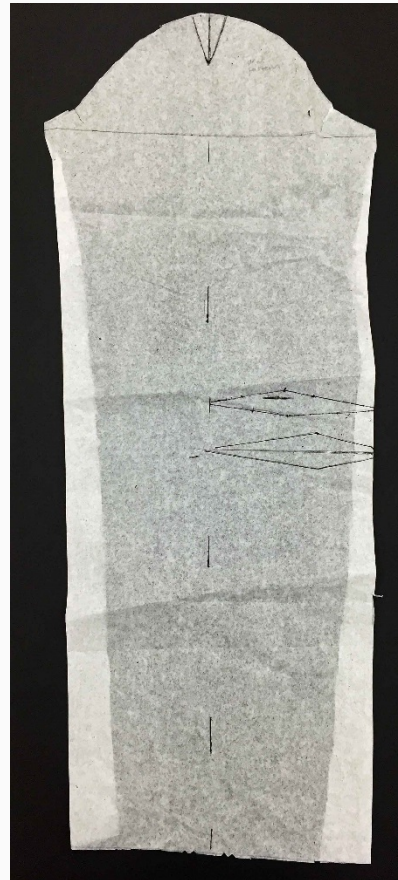
Additive methods, cont.

- Modifying hips, bottom
 - Oval shaped pieces that mimic muscles
 - Add in layers—dense pieces first, soft pieces last to add smoothness and volume; can feather out edges of dense batting with a pin
 - Especially important when displaying corseted styles



Additive methods, cont.

- Adding padded arms with a pattern
 - Use outer arm length, inner arm, and wrist measurement
 - Also take widest and narrowest circumference measurement of sleeve (important for sleeve supports, if needed)
 - Estimate area for elbow bend
 - Make tissue pattern—can be adjustable for different sleeve sizes; can also adapt existing sleeve pattern



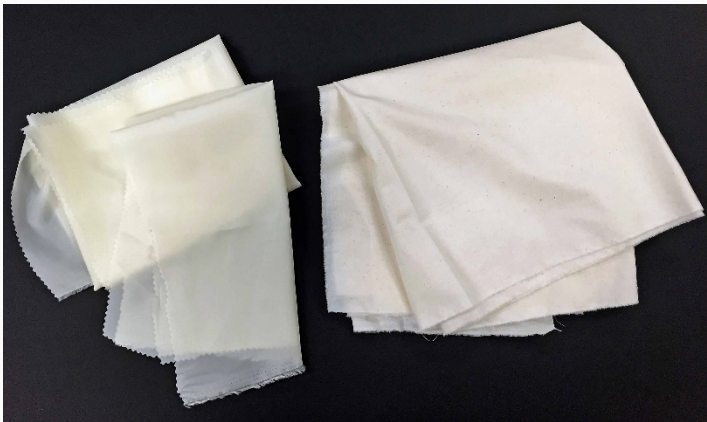
Additive methods, cont.

- Adding padded arms
- Lara Flecker's method
 - Make batting roll, taper at bottom, sew to secure
 - Cut off top of arm batting at an angle, so that it sits flush against armhole of dress form
 - Sew together elbow bend dart



Additive methods, cont.

- Can use cotton muslin for cover, but slippery, smooth fabric is preferable
- Easy to feed through sleeves of costume
- Finish off with fabric-covered disc at wrist



Polyester fabric on left; muslin on right



Additive methods, cont.

- Adding padded arms
 - Secure arms to form using x- stitch—strong, and provides for increased movement
 - Curved needle is the best tool—good for sewing any piece to dress form— not just arms
 - Can purchase from medical supply stores or retail chain or specialty fabric stores (often in quilting section)



Additive methods, cont.



- Using polyethylene pipe insulation for arms
 - Already in shape of arm, slightly curved
 - Inert material
- Carve off corner of top of pipe into curved shoulder shape (round off squared edge and angle so that it will lay flush against form)
- Can pad out with layer of batting, then cover with stockinette or muslin and sew to form



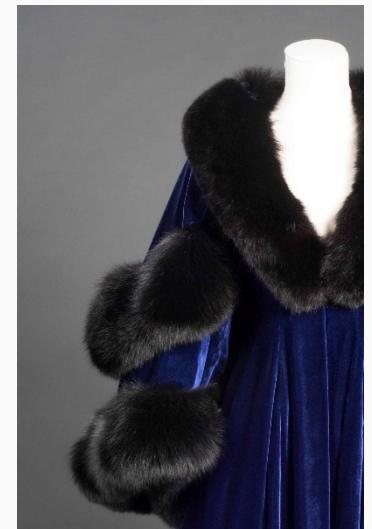
Additive methods, cont.

- Can also attach arms to form with rare earth magnets
- This is a more complicated process
- Use caution using earth magnets!--very strong attraction/connection
- Arm will gently connect to covered muslin metal plate sewn to form
 - Good for placing arms into sleeves of fragile jackets—can do this on a flat surface prior to dressing on form



Additive methods, cont.

- Adding net supports to arms
 - For sleeves with lots of volume or weight
 - Measure length (- 1/2") and circumference of sleeve (double, triple or quadruple depending on volume needed)
 - Gather with running stitch or pleat nylon netting to desired volume and sew to arm



Additive methods, cont.

- For heavy sleeves, always use more layers of tulle—weight of sleeve will compress it
- If inner lining is fragile, cover net with poly or cotton fabric (slippery fabric also helps with dressing)



Quick solutions for display

- Most of these approaches can be achieved with acid-free tissue and nylon netting
- Nylon netting rolls for leg supports (when costume lining or non-lined interior is not fragile, or will not snag)
- Acid-free tissue to support sleeves — can use tissue roll alone, or stuff into stockinette or panty hose and sew to shape, create elbow bend
- Wadded and shaped issue can be inserted between garment and form and used to pad shoulders, bust, waistline, or hips



Modifying an existing mannequin—subtractive methods

- Modifying a papier mâché dress form
- Case study
 - Problem: mannequin shoulders too high and wide—need 1830s “sloping” shoulder posture
 - Bodice cannot close at the upper back and shoulders





Subtractive methods, cont.

- Removing material from papier mâché form
 - Readying form---remove cover, carefully peel back batting layer
 - Do not discard cover or batting! You have taken this material into account when measuring and deciding how much to remove from form—also acts as a barrier
 - Can loosen and remove by seams, and re-sew on seams



Subtractive methods, cont.

- Based on measurement of gap in closure, will remove 1' from form from neckline to underarm to drop shoulders and create slope



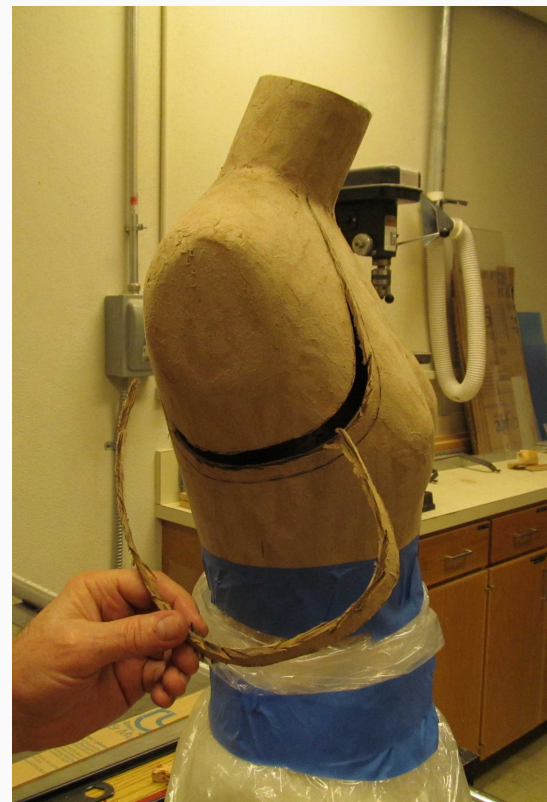
Subtractive methods, cont.

- Before cutting:
 - cover rest of form/cover/batting to prevent getting dirty with debris
- Can use electric rotary tool or hand saw
- Use eye protection and/or mask for dust





Subtractive methods, cont.





Subtractive methods, cont.



Tyvek tape helps keep shoulders in place



Subtractive methods, cont.



Finishing touches

- Dress form cover--Readymade
 - Good for time-sensitive projects
 - Reusable and easily transferable from one form to another
 - Be sure to wash, rinse, and dry thoroughly before using, to discourage dye or other additive migration
 - Available through mannequin supply stores; usually available in many colors/patterns



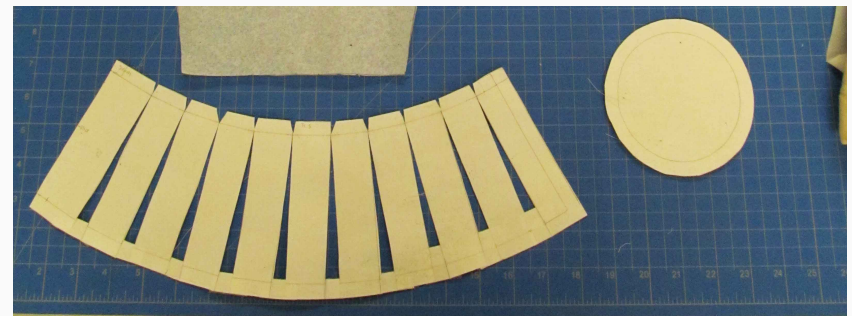
Finishing touches, cont.

- Dress form cover--Create own
 - Use stretch cotton jersey or stretch ribbed fabric
 - Again, be sure to wash, rinse, and dry fabric thoroughly before using; test to be sure fabric dye does not migrate
 - Can make pattern from mannequin
 - Seam to seam measurements for neck, shoulders, bust, waist, and hip
 - Cut two pieces and sew together; can add darts on front and back to shape



Finishing touches, cont.

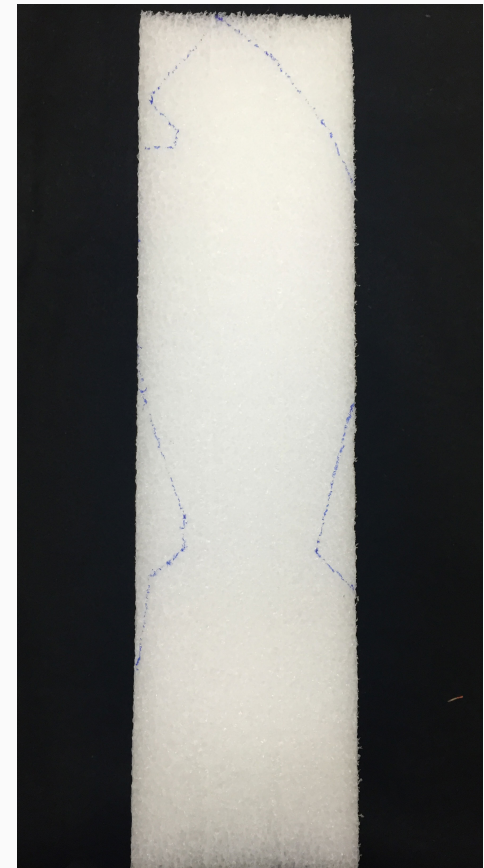
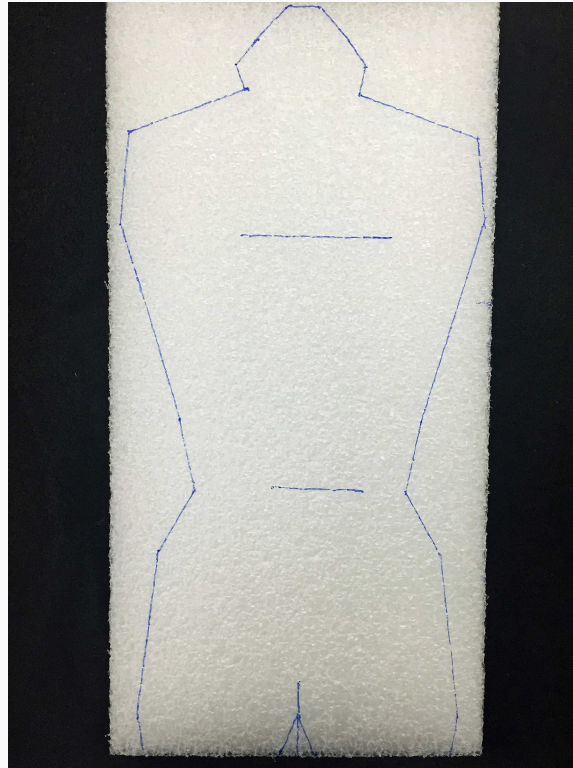
- Dress form cover
 - Can cover only what is exposed—neckline, shoulders
 - Alter pattern to shoulder or bust line, trim if needed, stretch and pin to desired place, sew directly onto form



Subtractive methods—creating form from scratch

Carving from Ethafoam (polyethylene planks)

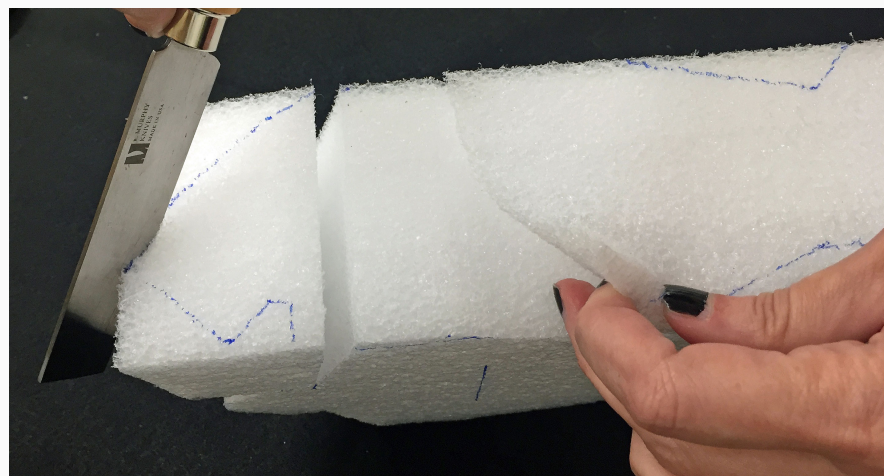
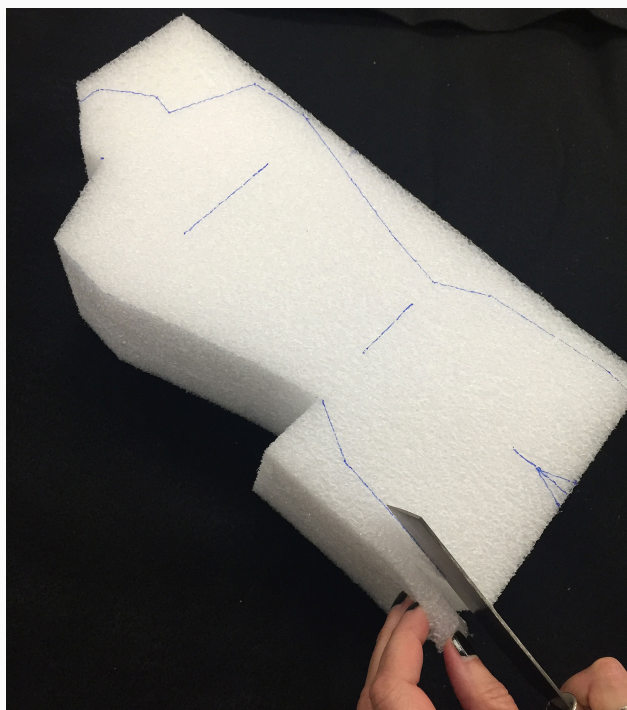
- Trace the shape/measurements of the costume onto the front and side of the foam
- Can use ethafoam knife or any small blade, sharp knife
- Practice carving on miniature pieces of ethafoam to perfect technique





Carving from foam, cont.

Cut halfway through the foam on the front while being careful not to cut off your tracing along the side

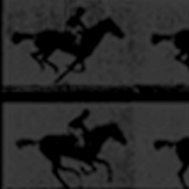




Carving from foam, cont.

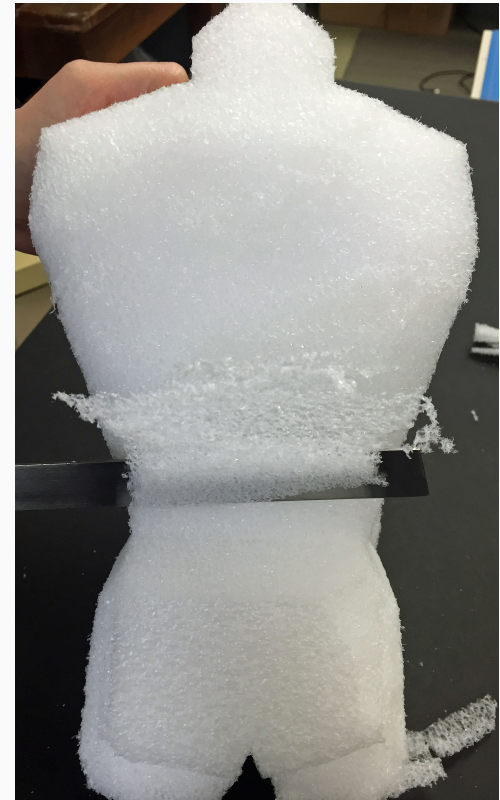
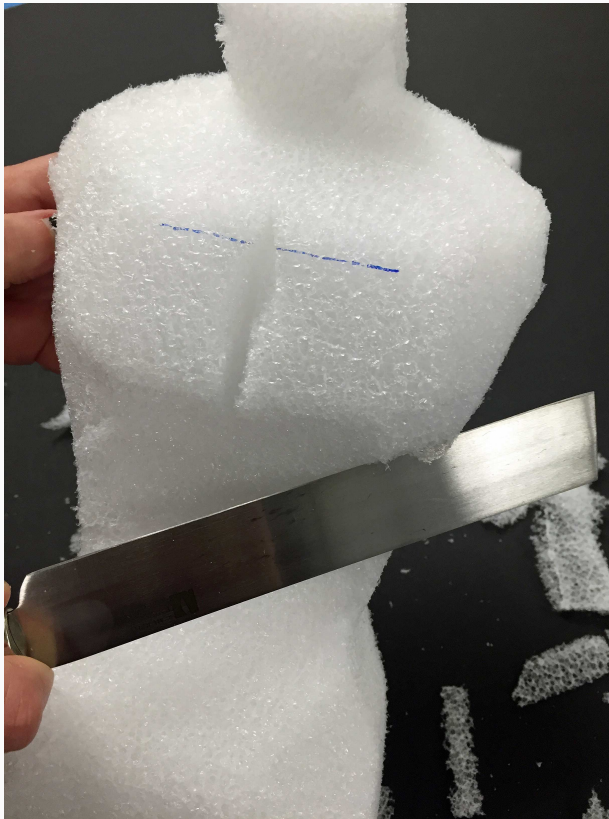
Cut out edges along sides, front and back, and carve out neck below head.





Carving from foam, cont.

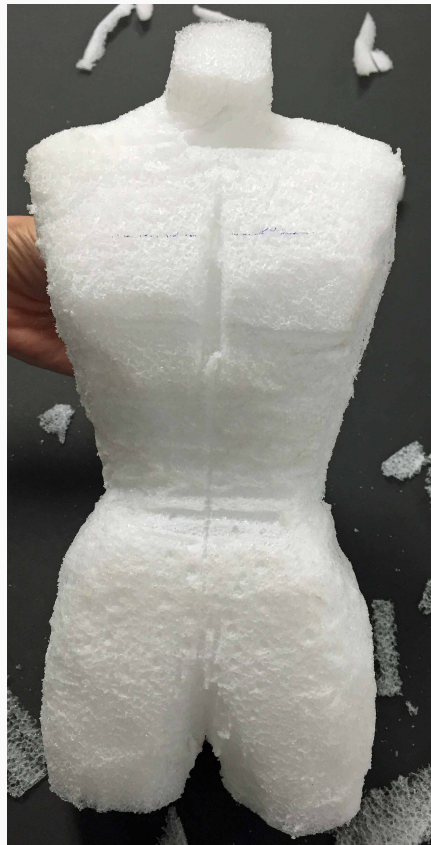
Cut out chest, bust, waist, back, buttocks, and groin. Shape the form with a small knife.





Carving from foam, cont.

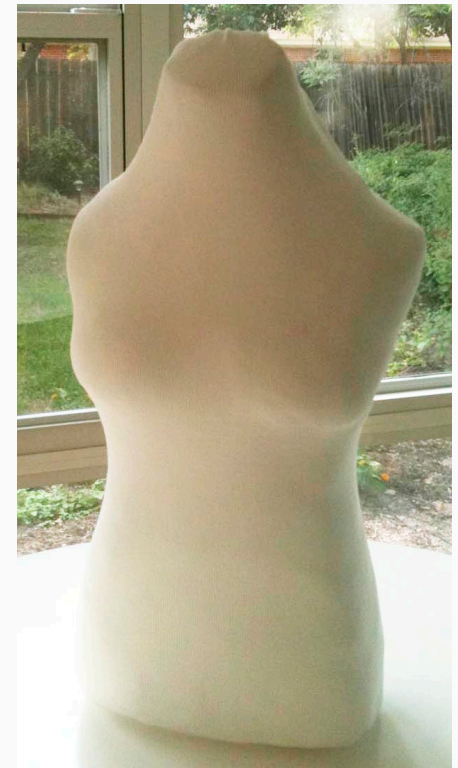
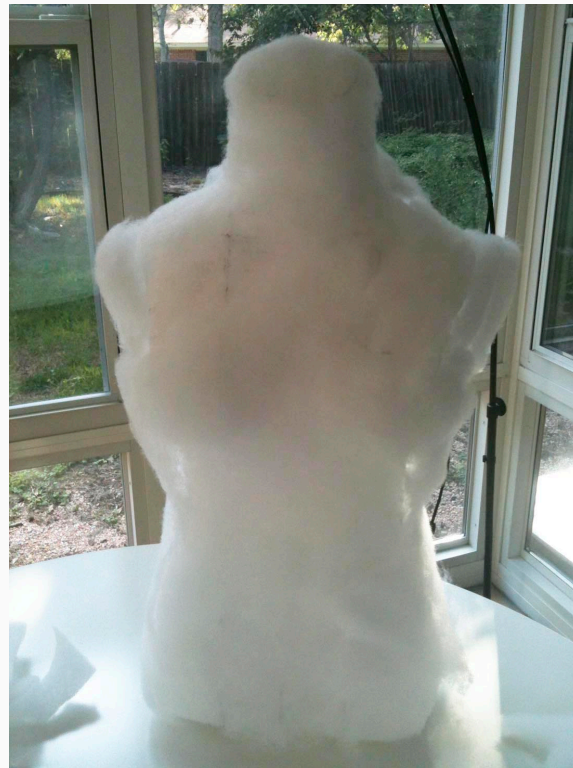
Finely tune and shape the foam so that it fits the costume.





Carving from foam, cont.

- Can also add padding to ethafoam form and cover with stockinette or other material



Carving from foam, cont.

- Denis Larouche intersecting mannequin silhouette approach
- Intersect front and side silhouettes, fill in with ethafoam pieces to create curves, continue to carve and refine
- Technique outlined in Museum Mannequins (listed in Resource section)





Creating a mannequin with Fosshape

- What is Fosshape?
 - Proprietary name for felted, polyester material that activates and shrinks to the shape of a mold when heated
 - Used in theater for headgear, props
- Pros:
 - Easy to work with and shape (and less messy than buckram or duct tape)
 - Easy to sew directly into fabric, in both heated (more rigid) and non-heated (soft, pliable) state
 - Archival material
- Cons:
 - Can be expensive, depending upon project



Creating a mannequin with Fosshape, cont.

- Available in two thicknesses
 - Purchase the 600—
thicker, good for
mannequins



Creating a mannequin with Fosshape, cont.

- Materials needed:
 - A mold--dress form, mannequin arm, leg, etc.
 - Hot air gun OR steamer (hand held or professional steamer is fine)
 - Tissue paper for pattern



Creating a mannequin with Fosshape, cont.

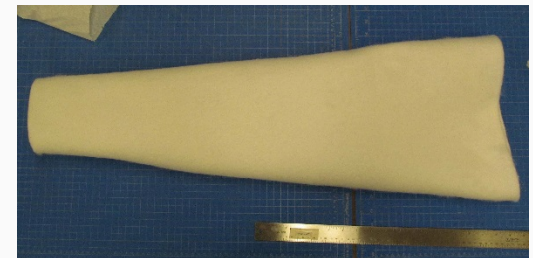
- Make tissue pattern from neckline, shoulder, chest, waist, hip (seam to seam on form), and overall length measurement
- For legs, take tapering measurements of circumference from thigh to ankle
- Add 5 inches to your measurements
- Cut out pattern in Fosshape



Tissue pattern
for leg



Tissue pattern (left) and
corresponding fosshape
pieces (right) for dress
form



Sewn fosshape piece for leg

Creating a mannequin with Fosshape, cont.

- Fosshape pattern should be relatively loose on the intended mold
- The more Fosshape shrinks and contracts, the harder and more sturdy it will become



Form pattern not loose enough



Looser pattern will shrink down



Creating a mannequin with Fosshape, cont.

- Cover all areas with heat source
- If using hot air gun, don't get too close — Fosshape will create holes from intense heat
 - Hot air gun works good, although steamer can provide more even heat
- You will see Fosshape begin to shrink and contract on contact with heat



Fosshape “burned” by heat



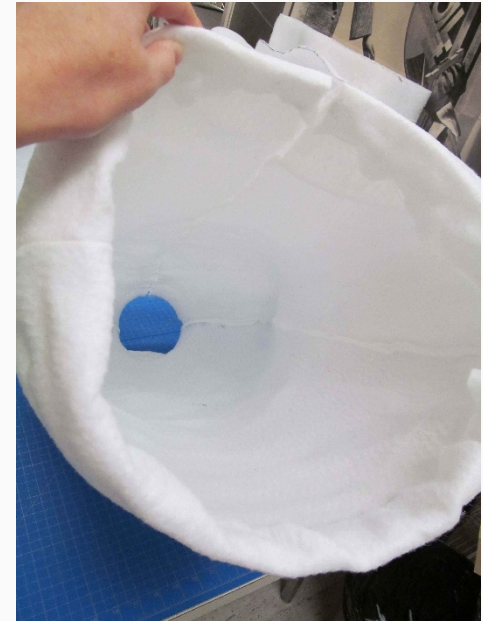
Before heating



After heating

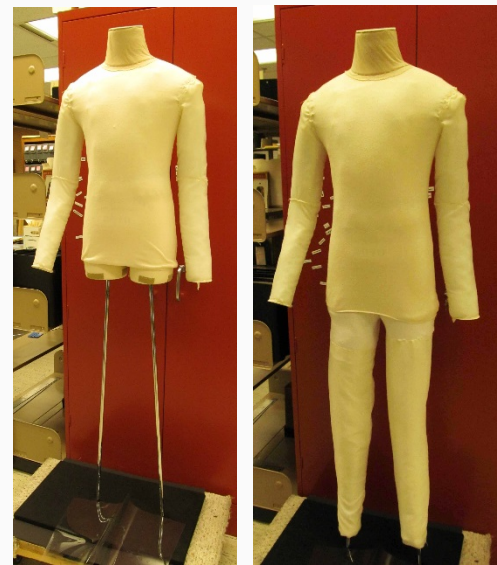
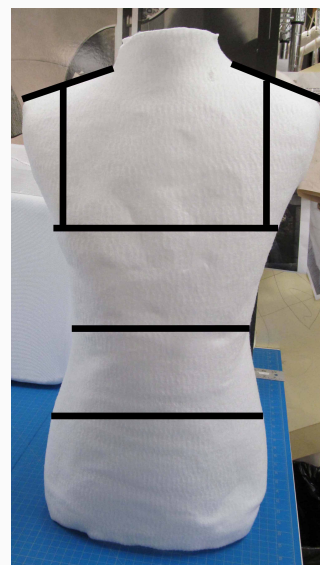
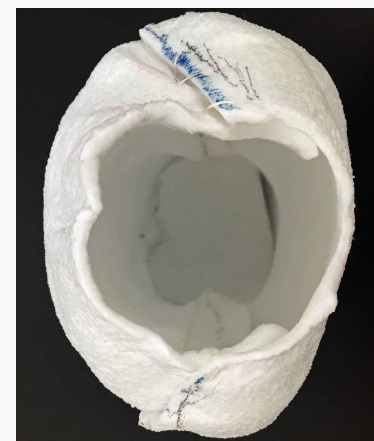
Creating a mannequin with Fosshape, cont.

- Once Fosshape has finished shrinking, cut from mold with single seam
- Will create accurate duplication of form shape
- Whipstitch seam closed
- Or, can cut away portions and resew to create a smaller form



Creating a mannequin with Fosshape, cont.

- Form will need to be supported from inside, especially if garment to be displayed is heavy, voluminous
- Can do this with ethafoam support on inside (will also accommodate pole support for mannequin stand)
- Can sew rigilene at major stress points: shoulders, bust, waist, hips
- Can attach Fosshape-made appendages to dress form with Velcro



Creating a mannequin with Fosshape, cont.

- Can create "invisible" mannequin
- Easier to make subtractions from upper back/neckline and resew; soft, pliable material
- Created for dress with small neck circumference



Creating a mannequin with Fosshape, cont.

- Insect pins can be used to keep neckline flush with form for support
- Inserts directly into soft Fosshape material
- Buy very thin pins, size 000
- Good for short-term display only
- Archival or scientific supply stores



Underpinnings

- Crucial for support and understanding/interpretation of garment
- Gives finished look—no hard edges of mannequin visible
- Consult period or historical models, but **keep it simple!**
- Goal is not exact period accuracy, but what is best for support for garment
- If you have talented staff, students or volunteers, enlist their help



Seamstresses at Selznick International Productions, working on hoop skirts for *Gone With the Wind* (1939)
David O. Selznick Collection, Harry Ransom Center



Underpinnings, cont.



Half scale model of bustle petticoat created by student designer, based on historic style and modified for support for *Gone With the Wind* ballgown

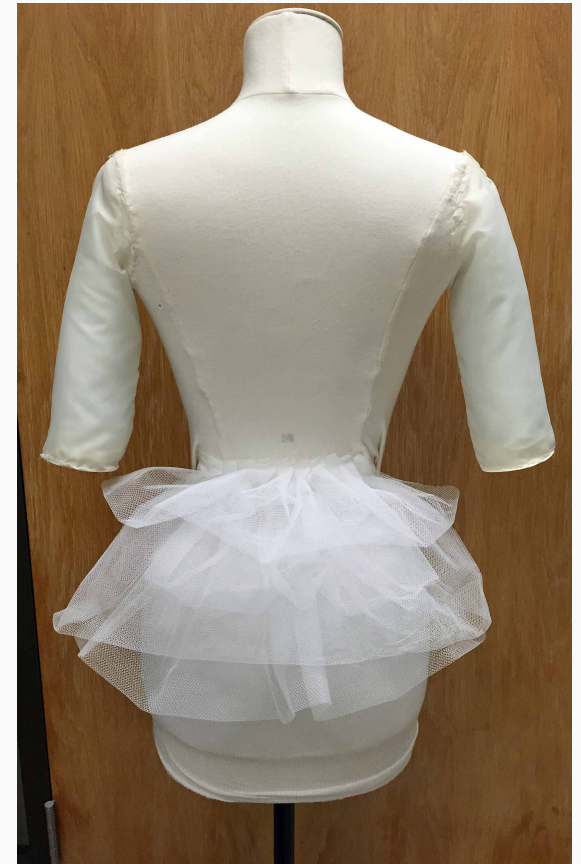
Underpinnings, cont.

- Simple pleated or gathered muslin petticoats with net support for volume
- Can do simple pleat or gather net with running stitch
- Can attach to petticoat or sew straight onto mannequin



Underpinnings, cont.

- Support net ruffles sewn directly to mannequin
- Especially useful if mannequin is dedicated to one particular costume
- Cover net ruffles either with muslin piece, tissue, or accompanying petticoat so that net will not scratch a fragile lining





Handling and moving

- Have a plan for dressing onto mannequin/dress form
- How many people do you need?
 - For dresses—for supporting and guiding each shoulder/arm, closing up bodice, supporting front and back hem, weak areas
 - For pants—one person to hold the form, two people to guide each leg into support poles or leg supports and onto form
 - How many people you need depends upon complexity of garment, fragility and how heavy/voluminous it is
- Whatever support you're able to insert while the garment is lying flat is ideal
- Always make sure you're wearing clean gloves, or have washed hands, before you touch the garment



Handling and moving, cont.

- Moving to gallery
- Consider all possible obstacles, routes
 - Doorways, hallways—are they wide/tall enough?
 - Elevators—if costume is dressed, can it fit?
 - If moving on flatbed trolley, be sure it is covered with muslin, Tyvek, or acid-free tissue or other barrier material
 - Hold on to neck of mannequin—not costume; costume should be covered
 - Turns
 - Have one person ahead to spot upcoming turns or obstacles



Moving costumes for *Sketch to Screen: The Art of Hollywood Costume* at Oklahoma Museum of Art
Photo by Jill Morena

Handling and moving, cont.

- Consider how many people you will need to move costume to platform (or, you can dress on the platform)
 - Before moving, place barrier between platform and costume—mylar sheeting, Tyvek, or tissue
- Wear Tyvek booties over shoes, or remove shoes and wear socks
- Weight down stand/base with conservation weights or similar object
- Once in place, trim barrier material (gently push back hem $\frac{1}{4}$ – $\frac{1}{2}$ " and trim material—push hem back to place)





Conclusion

Important things to remember:

- No matter which type of dress form or mannequin you choose to modify or make, be sure that it is at least a few inches smaller than your garment
- Allow extra time for planning, creating, and modifying each mannequin/dress form, and ordering supplies—you will always need more time than you think

Questions?

Thank you for watching!

