



Constructing a Heavy-List Gambeson Tips and Techniques

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An Historic Overview



From "Jonathan and his Armor-bearer Attack the Philistines," from the Maciejowski Bible, circa 1250.

*"Mail is tough but flexible; it resists a cutting sword-stroke but needs a padded or quilted undergarment as a shock absorber against a heavy blow."*¹

Quilted garments were part of soldiers' kits in varying forms and with varying names throughout most of the SCA timeline. As early as the late Roman/early Byzantine period there is documentation for quilted or padded coats called Zabai or Kabadia.² Illuminations from Maciejowski Bible (circa 1250) show aketons or gambesons. "These terms seem to have been interchangeable but the weight of evidence suggests that 'aketon' refers to garments worn under the mail while gambesons were worn over or instead of it...The gambeson is often referred to in contemporary accounts as being worn by the common soldiery and, indeed, is part of the equipment required by the Assize of Arms of 1185 of Edward I of England."³

Extant examples from the fourteenth century include the pourpoint of Charles de Blois (d. 1364) and the late fourteenth century jupon of Charles VI. Fifteenth century documents mention arming doublets and padded jacks.

These garments were worn under maille, over maille, under plate, over plate, or on their own. Some were designed to encase maille or plate. "Infantry, as laid down in the Assize of Arms of 1182, often wore one of two types of gambeson. One type was a sleeveless garment with a stiff collar and stiffened arm openings; the other was a plain quilted garment reaching the knee, with full-length sleeves."⁴ Some had padded collars, some dags, some integral mittens and they were seen quilted in a variety of ways. Their styling often followed the fashion of the day, especially in the later middle ages.



Jupon of Charles VI, late fourteenth century.

Fabric Choices

*"[Late Sassanian] infantry's Karadia were to be made of coarse silk padded with cotton as thick as may be stitched."*⁵

The English Great Wardrobe Accounts detail the use of linen, cotton wool (2.3 lbs.) silk thread, and linen thread for the construction of an aketon (1343-4) to be covered with fustian and enclosing a coat of mail or plate.⁶ When wearing a gambeson you are essentially wearing a quilt. Smart fabric choices can help make the garment more comfortable in warm weather.



Tomb effigy of Walther von Hohenklingen (d. 1386)

I recommend that your gambeson be lined in linen. Cotton and linen are both very absorbent, but linen is also a good heat conductor aiding in keeping the body cool. I use 100% cotton batting for the padding.

For the exterior fabric of the gambeson, I favor linen for the same reason I use it as a lining. Cotton would also be a good choice. There are some 100% cotton home decorator fabrics that work well and create some stunning garments. Avoid poly/cotton blends.

If using linen, be sure to choose an appropriate weight. A midweight linen will work fine as a lining material. Try to use a heavy- or canvas-weight linen for the exterior.
<http://www.fabrics-store.com> usually has a nice variety of linen at a fair price—and you can search by weight. Lightweight and handkerchief weight linen should not be used for your gambeson. It simply will not hold up like a heavier weight.

Always pre-wash, and if appropriate, dry your fabric. I do not pre-wash my batting, but pre-wash and dry all linen, cotton, and wools I work with. Remember to wash your completed garment often! Chemicals in sweat will rot the fabric over time. Washing it regularly will greatly extend the life of your coat. Hang it dry if you're worried about shrinkage. Don't leave your sweaty gambeson in your armour bag until your next event!

You'll need anywhere for 3–4 yards each of fabric and lining fabric for your gambeson depending on width of the fabric and the size of the fighter. A queen-size quilt batting works well, but you might be able to squeak by with a full.

Patterns

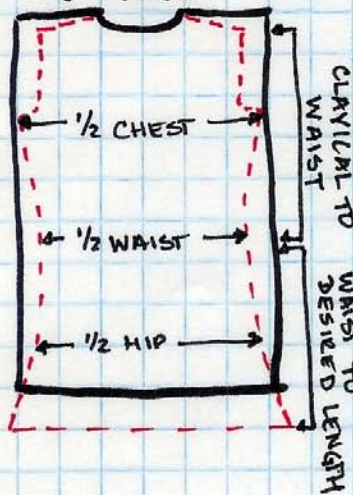
A gambeson pattern need not be complex. In illuminations, early gambesons appear to relatively untailored garments. In fact, you can start with your favorite tunic pattern or even a t-tunic pattern. With some slight adjustments, you will have a fine working pattern for your gambeson.



Assault on a castle (fifteenth century).

The following page will outline how to modify a t-tunic pattern to work as a front tying gambeson. For making your pattern, most fabric stores sell a product called PatternEase. It's usually stored with the interfacings, and is a very easy material to work with when creating and adjusting your patterns.

FRONT



← SLIGHTLY ANGLE SHOULDERS. SHORTEN SO THEY END AT SHOULDER POINTS.

← FLARE BOTTOM A BIT



TAKE $\frac{1}{2}$ FRONT AND ADD 2" TO USE AS A SELF-FACING.

ADJUST T-TUNIC PATTERN TO $\frac{1}{2}$ OF INDICATED MEASUREMENTS + 1-2 INCHES OF EASE, ADD $\frac{1}{2}$ INCH SEAM ALLOWANCES. MORE ACCURATELY, YOU MAY USE THE FRONT MEASUREMENTS FOR EACH (SIDE-TO-SIDE).

COLLAR



← NECK MEASUREMENT + SEAM ALLOWANCE

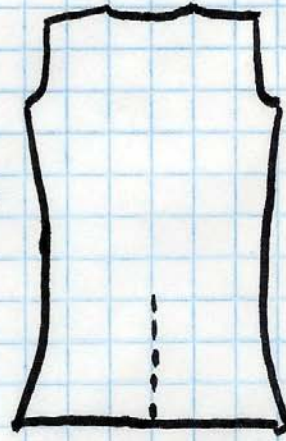
ADJUST FRONT & BACK NECK OPENINGS ACCORDINGLY.

BACK



MODIFY BACK OF T-TUNIC SIMILARLY TO THE FRONT.

MARK CENTER BOTTOM FOR SLIT WHEN GARMENT IS COMPLETE.



SLEEVE



BOTTOM EDGE OF SLEEVE AT THE WRIST SHOULD BE THE MEASUREMENT OF YOUR FLAT HAND ACROSS THE KNUCKLES

NOTE: A STEEP CURVE ↑ IN THE SLEEVE WILL LIMIT ARM MOTION.

Always test your pattern first using inexpensive fabric. When testing the fit, there are a few things to look for:

- The collar should be snug to the neck without binding to help pad the gorget comfortably;
- The shoulder seam should be at the shoulder point. If it extends beyond the point it will constrict overhead arm movement;
- The armseye (armhole) should be big enough for comfort, but not extend too far beyond the armpit;
- The body should fit comfortably without being too large—especially if the garment is to be worn under maille, lamellar, or plate armour. Too much extra fabric can cause uncomfortable bunching;
- Sleeves should cover the wrist bone, but not extend past as it can make it difficult to get your gauntlets on properly.

If you are wearing any armour underneath your coat, be sure to wear it while testing the fit. Make any necessary adjustments to your pattern and construct another test out of inexpensive fabric until the fit seems right. It seems like a bother, but a couple of test garments takes a lot less time and frustration than completing your quilted coat and finding it doesn't fit.

Construction

Once you have your finished pattern, it's time to cut out your fabric and begin quilting. There are different schools of thought regarding quilting. Some folks quilt their fabric before cutting. I find the fabric unwieldy when doing this, and I can't add extra padding over key areas of the pattern. Some folks construct the body of their garment and lining first, then quilt the garment to the lining. I don't care for this approach as the fabric will shrink and misshape a bit when it's quilted, and I don't have the experience to work these changes into my pattern. What I prefer is to **overcut** the fabric, lining and batting pieces by about **1 inch** on all sides, then quilt each pattern piece together, recut each piece to the pattern after quilting, and then assemble my pieces into a finished garment.

Step-by-step, start by overcutting your fabric, lining fabric and one layer of quilt batting for each pattern piece.

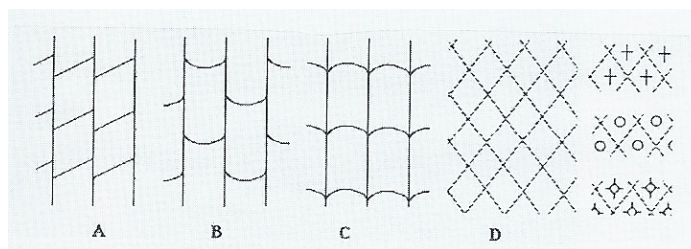
Add a second layer of batting:

- over the shoulders
- in the collar (for stiffness)
- over the hips
- over the biceps
- over the forearms (leave one layer in the elbow for mobility)

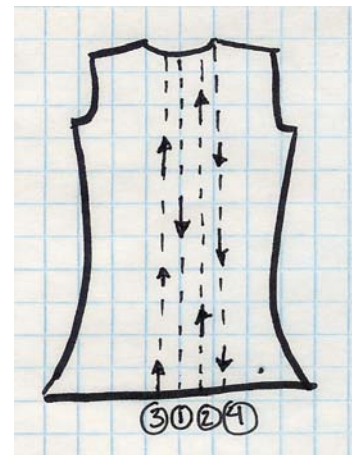
One layer may not sound like much over the torso, but most fighters are wearing some sort of rigid protection over their torso, so the extra padding here doesn't make sense. More padding can afford more protection, but also makes a stiffer, hotter garment. Find the right balance of protection and flexibility that works for you.

With your pieces cut out, make a sandwich by placing your lining fabric right-side down, placing the batting on top, then placing your fabric right side up on top of the batting. If you are using a self-facing for the front opening, do **not** place your batting or lining under this edge as it will add awkward bulk along the front edge. Pin this sandwich together or baste with long, loose stitches.

On the outside of your fabric, use a chalk pencil or tailor's chalk to mark your quilting pattern. It's wise to check the guidelines for quilting distance printed on the bag of batting and to test mark your fabric in a discreet place to be sure the chalk will brush off easily. Some cotton battings need to be quilted rather close together. If I'm making vertical quilting, I set my quilt lines 1 inch apart. If I'm quilting in multiple directions, I usually set my quilt lines further apart. From pictorial and extant pieces, vertical quilting seems to be the most common. The following illustration shows quilting patterns as shown in Byzantine pictorial sources.⁷



Once your fabric is marked you can begin quilting. If you will be quilting in multiple directions, quilt in one direction first. Start from the middle of your piece and work your way out—switching directions with each line. With the proper machine or sewing foot, you might not need to do this, but I'm using an old workhorse of a machine with a standard foot, and the fabric drags a bit with each line of sewing. Switching directions evens out the difference, causing less distortion of the piece. Be careful not to sew over your pins as this can damage your needle and/or your machine. And use the proper needle. A 16 or denim needle for wovens is a must.



The best way to deal with the extra fabric under the sewing machine arm is to roll it.



Once you've completed quilting entirely in one direction, quilt any other directions in the same manner. When your pattern piece is completely quilted, remove any basting, and recut your piece to the exact size of the pattern.

One note on the collar: I cut two linings. Once the collar is quilted and recut, I sew the second lining to the collar right sides together along the top edge, leaving the bottom edge open. Clip your curves and turn the piece right side out. Press the allowance of

the bottom lining edge of the collar in. Once the collar is attached to the coat, you'll blind stitch this lining edge over the seam for a clean finish.

With all of your pieces quilted and recut to size, begin construction of the garment by stitching the shoulder backs to the shoulder fronts. Then stitch the front to the back at the sides. Press your seams open.



Gambeson with two pieced back. Note the seam binding on the shoulder seams. These seams have been stitched down on each side of the seam. Note also the front self-facings free of batting and lining.

At this point, I finish my seams by covering them with seam binding, then sewing each allowance down along the seam line. This reduces any bulk the seam might produce and strengthens the seam. If you don't want to use seam binding, finish the edge of your seams with a zigzag or overcast stitch, then sew the allowances down.

Now, fold each sleeve right sides together and stitch along the long seam. Finish this seam by trimming to 1/4 inch. Overcast or zigzag the allowance.

Pin your sleeves, right sides together to your coat. Match the high point of the sleeve curve to the shoulder seam, and the sleeve seam to the side seam. Baste, then stitch. Finish this seam by trimming to 1/4 inch. Overcast or zigzag.

Pin your sleeves, right sides



Stitching on the collar keeping the lining free.

Set the collar, right sides together to the neck, placing the center collar at the center back. Stitch, leaving the lining free. Blind stitch the lining over the seam.

Turn under 1/2 inch on the raw edge of the facing. Turn facing to the **outside** of the garment. Stitch the facing at the neck seam, stopping at the collar. (This should only be about 1/2 inch to an inch of stitching.) Clip and turn. Blind stitch the facing to the inside of the coat.

With this method of quilting, you now have raw edges to finish at the sleeves and hem. I usually bind these, but it's a great opportunity to add a border in a different color, too!

The last thing you'll need to do is to add the closures. You can use buckles or buttons, but I prefer to use laces and double sets of eyelets. These are easy for the fighter to tie and untie, and they are not likely to get in the way of maille or lamellar worn over the gambeson. The eyelets may be either hand-stitched with a blanket stitch, or machine stitched with the proper attachment.

Add any eyelets you'll need to point armour, as well, such as two at each shoulder to hold a pair of shoulder cops. Not only does pointing armour to your garment work well, it was also done in period.

“[the man-at-arms] shall have no shirt up upon him, but a doublet of fustian lined with satin cut full of holes [for ventilation]. The doublet must be strongly bound there, the points must be set about the bend of the arm and the rest before and behind, and the gussets of mail must be sewn on to the doublet in the bow of the arm and under the arm. The arming points must be made of fine twine such as men make strings for crossbows and they must be twisted small and [be] pointed as points. Also they must be waxed with cordwinder's cord and then they will neither stretch nor break.”(circa 1480)⁸

Construction a gambeson is a time-consuming project, but well worth it! It will help your armour stay put, protect against armour bite, add some cushion between you and your opponent's weapon, add authenticity to your kit, **and** you'll look smashing on—and off—the field in your kit!



Bibliography

Anon. *Old Testament Miniatures: A Medieval Picture Book with 283 Paintings From The Creation to The Story of David*. New York, New York: George Braziller.

Boardman, Andrew W. *The Medieval Soldier in the Wars of the Roses*. Gloucestershire, UK: Sutton Publishing Limited, 1998.

Bull, Stephen. North, Tony, Ed. *An Historical Guide to Arms & Armor*. Facts On File, Inc. 1991.

Crowfoot, Elisabeth; Pritchard, Frances; Staniland, Kay. *Medieval Finds from Excavations in London: 4: Textiles and Clothing: 1150-1450*. Rochester, New York: The Boydell Press, 2001.

Edge, David and Paddock, John Miles. *Arms & Armor of the Medieval Knight: An Illustrated History of Weaponry in the Middle Ages*. New York, New York: Crescent Books. 1996.

Newton, Stella Mary. *Fashion in the Age of the Black Prince*. Suffolk, UK: Boydell & Brewer Ltd., 1999.

Nicolle, David. *Arms and Armour of the Crusading Era, 1050-1350: Western Europe and the Crusader States*. London, UK: Greenhill Books, 1999.

Nicolle, David, Ed. *Companion to Medieval Arms and Armour*. Suffolk, UK: Boydell Press, 2002.

Notes

1. David Nicolle, Ed., *Companion to Medieval Arms and Armour*, p. 111.

2. Ibid. p.69.

3. David Edge and John Miles Paddock., *Arms & Armor of the Medieval Knight: An Illustrated History of Weaponry in the Middle Ages*, p. 57.

4. Ibid. p. 65

5. Ibid. p.82.

6. Newton, Stella Mary, *Fashion in the Age of the Black Prince*, p. 136.

7. David Nicolle, Ed., op.cit. illustration VII-1.

8. Andrew W. Boardman, *The Medieval Soldier in the Wars of the Roses*, p. 127.