

Gambesons: Some thoughts on the construction of fabric body armor

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In SCA the term “gambeson” is often used as a general term for all sorts of fabric body armor. Back in period, there were specialized and regional terms for the various forms of fabric body armor. The use depended on whether it lay beneath other armor or over it and whether it had sleeves or not. See appendix A for the Oxford English Dictionary’s take on the gambeson, jupon, acton and jack.

This paper is about some of the things I’ve learned in making 5 gambesons for both my husband and myself for use in SCA combat. I sew, I fight, I research, but this isn’t the final word on gambesons. I’m not so good at giving step by step directions so this is more of background information and general sewing advice you can use in developing your own armor. Please let me know if this works for you or how you do things differently.

Period examples of Gambesons

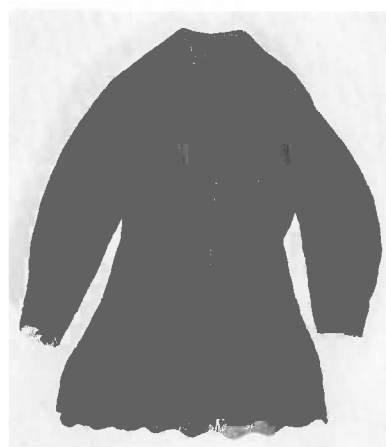
These three images are often used as examples of period gambesons. They are a good starting place though each image has it’s problems.



1. Maciejowki Bible, 1250. I think this is quilted but it could be a coat of plates. This armor is depicted many times in this bible but it’s definitely for lower class solders.



2. Charles de Blois pourpoint, 1364 silk patterned with gold. Some say it’s not quilted at all but rather conservation of the garment gives the appearance of quilting.



3. Charles VI arming coat. Late 14th century. Chartes Cathedral., silk outer layer, wool stuffing, Linen

Pattern –

This really depends on what you want. Look at books. I’ve done 13th and 14th century era gambesons and there’s much data for the 14th and 15th century. You should be able to transfer some of these ideas to other times and areas.

Consider whether this garment will be the primary body armor, will go over other armor or under it. There are far too many variables to go over in this handout. One thing that helps - make sure the garment fits very snugly around the hips. Longer gambesons should have riding slits in the front and back (and possibly on the sides) to help with movement.

Materials

Choosing fabric for your gambeson again depends on what style you are going for. However, natural fibers are the most breathable and comfortable option. The length of fabric needed for each layer is highly dependent on how big you are, the width of the fabric and whether you need to match a pattern in the fabric. As a rough estimate 3 yards of each layer should do.

Outside layer – If it will be on top of armor this is a good place for heraldic display either of arms or colors. You can find cotton brocades in home decorating fabric. Make sure it's washable and colorfast. Silk is period. For gambesons that go under the armor just use plain white canvas or denim.

Middle layer

Cotton Batting – 100% Cotton

Not the 85% cotton/15% poly kind. Read the label.

Blankets – I've seen references to wool army blankets. They are cheap, they wick water away. Too warm?

Blanket Batting – I once used cotton batting that was woven into a blanket. Durable. Works okay but seems more dense and heavy than necessary

Terry cloth – as in towels. I've read about this online but have not seen it used. I'm very intrigued. It would be absorbent, cushiony, easily available. It wouldn't shift and ball up the way batting can.

Moving blankets – potentially low cost, already quilted. Heavier than necessary

More recent ones have shredded paper filling which will not stand up to water.

Foam- This will hold heat in. Don't do it. Not washable.

Pre-quilted fabric – usually polyester and rather flimsy. If you happened to find some that is 100% cotton batting and has a durable cotton cover it should work.

Inside layer - If you ignore the natural fiber advice for the other two layers don't ignore it here. Cotton or Linen, plain weave or light twill.

If it has a checkered pattern you can use it as a guide for quilting

Make your pattern out of good fabric and use it as the inside layer.

You should wash and dry your fabrics on the hottest temperature possible before you start this. You want them to do all their shrinking now before they've been sewn together. You shouldn't need to wash the batting unless you are using a blanket.

Cutting the pattern - You can quilt all your layers ahead of time and then cut out the pieces but this wastes a lot of fabric and quilting. I like to cut out the pieces and then quilt. You should cut the pieces at least an inch bigger all the way around. Some shifting will occur as you quilt and the loft of the batting will take up some extra as well. You can add or subtract layers of batting. I add some to the chest, upper back, shoulders and outer elbow. I thin it out on the inner elbow and armpits.

Quilting

Decide how you want the quilting to go. I've had the best luck with long vertical rows about two inches apart. Closer takes longer to sew and decreases the amount of loft and thus protection the batting can provide. Too far apart and the batting is not held in place and will ball up and shift over time.

Hand sewing - Use safety pins to hold all of your layers together.

Quilting – use a running stitch - - - - -

Machine sewing - The quilting industry has developed many devices that can help in the process. One useful thing is called a “walking foot”. It makes sure the top and bottom layers feed through the sewing machine at the same rate. There are also attached gauges that help keep the rows of quilting even.

I've managed okay without these devices. As long as you're not using thick extra batting or leather, the layers should feed okay through the machine. Use a standard sharp needle (as opposed to the round or ball point ones for knits). A larger, thicker needle would be good - 14 gauge or higher. It's always a good idea to use a new needle for each new project. Fill a few bobbins with your quilting thread ahead of time.

Mark with chalk the first line you intend to quilt through each piece of your gambeson. Start in the center. Compare the left and right front pieces to make sure the primary quilting lines are symmetrical. Use a straight edge since this will be the guide for all the other lines of quilting. All rows of quilting should go in the same direction. It's a good idea to go top to bottom. Your gauge for marking two inches can be as simple as an index card.

Don't quilt all the way to the edge. Leave 1 to 1 ½ inches all around (except maybe at the bottom.) I sometimes have trouble with the bottom layer folding under at the edges while quilting. It gets caught in the stitching and has to be carefully picked out.

Sewing the pieces together

You can sew the pieces together as you would a regular garment, treating the layers as a single piece of cloth. However, this makes for a lumpy seam. It works a bit better to sew the outside layers together. Trim away extra batting if it doubles up or looks lumpy. For the inside you can simply overlap the layers, fold one side under to hide the cut edge and sew along the outside seam. Okay, that didn't sound simple as it really is.

Attaching the sleeves - Many people in SCA attached the arms of the gambeson using metal grommets. Personally, I think this is very bad place to put small hunks of metal. If you'd like to lace the sleeves to the body make a series of button holes instead of grommets or eyelets. It's more period and you are less likely to get small pieces of metal driven into your upper arm. If you don't like doing button holes (and hey, who does?) you can edge with leather and punch holes in that for the lacing. You should set the leather back from the edge a little so that you can take advantage of the padding.

For sewing the arms to the body I've come to like attaching them as much as possible. On one of Josef's old gambesons I only attached the sleeve at the very top. This provided lots of flexibility and ventilation but just didn't look very nice. He though he got hit in the armpit more than he should. His latest one is completely closed at the pits and he's likes it a lot better. The period examples are all closed. For my 13th century gambeson the illustration do not show arm pit ventilation but some of the clothing of that time does.

Have you arm rigging all figured out before you finish the cuff. It's nice to have the cuff be a little longer than the vambraces. Add a little padding at the cuff to keep the vambrace from cutting into the base of the thumb. It's like a bracelet of batting within the cuff.

Many people make a cut away on the inside elbow for flexibility and ventilation. There is no period precedent for this. One of the reasons I like wearing a gambeson is to prevent armor bite and the inside elbow is a key place for having the elbow cop straps bite. You can avoid putting any batting in this area and just have cloth for flexibility.

Finishing the edges - A standard rolled hem will not work with a quilted garment. One popular way to finish a gambeson is with bias tape. Use a contrasting color or make some out of the left over outside layer fabric. Quilters have a trick for making yards and yards of bias tape. It's really cool but you really won't need that much for one garment. In fact, depending on how you make it you might not need “bias” tape for anything but the neck opening. For the bottom edges a rectangle cut on the grain will suffice.

Closure - Buttons are the most period way to close a gambeson. The fabric covered button kits from the fabric store seem like an easy and attractive solution but they are not strong enough to survive SCA combat. The

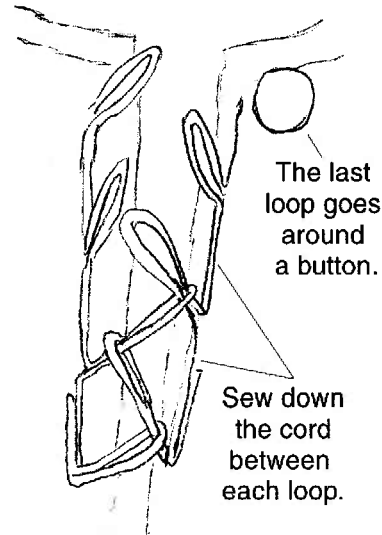
method of making buttons described in Textiles and Clothing is not only period but more durable. Basically you cover a wooden or leather disk with some batting and your fabric and then sew it down.

I've also seen laces, ties, buckles and Velcro used to close gambesons. Consider trying to untie a sweat soaked tie at the end of the day. Velcro is so not period and tends to pick up junk. I like buckles (they're on my device after all) but think how they will interact with your other pieces of armor. Use strong buckles not the wimpy pot metal ones from fabric stores.

The loop closure method I've used for years has sadly no period precedent. I've found vague reference to it being used as the closure for Afghan saddle bags. It's been called the fabric zipper. It's slightly difficult to get into but easy to "unzip" when you're done. There are two ways to do this.

1. Using a cord (round shoelaces work well) make a series of loops that are as far apart as they are long up each side of an opening that you want closed. The loops loop around each other from side to side. The final loop attaches to a button. Leather is good for the button because it is more flexible.
2. One side has loops as above but the other side is a series of holes in the gambeson itself.

You can sew down each loop individually but I like to keep it as one continuous cord and sew down the cord between each loop. Either of these methods can also be used to attach a sleeve to the body of the garment.



Attaching armor

There are many examples of attaching armor directly to the gambeson. Points, the cords that tie armor on, can be made of any sturdy material. Shoelaces work well. Tie the cords to leather that is attached to metal instead of directly to the metal. Armor will cut through the cord eventually. A period text translated in the second Brian Price entry in the bibliography speaks of a knight taking a dozen extra "tresses" of arming point to the field. This suggests that they were not permanently attached and were easily replaceable. Just make sure you reinforce the holes in the gambeson that the points go through.

The care and feeling of gambesons

I know that there is a long tradition of not washing gambesons. That's just silly!

If you've used natural fabrics and washed them ahead of time there should be no restrictions on washing or drying. It just might take a bit longer to dry.

Common stains-

Rust – either from rusty armor or red dirt

Don't use chlorine bleach on a rust stain. Pre-treat with an acidic liquid like vinegar or lemon juice. Let it sit in the sunlight if possible. Repeat if the stain doesn't fade. When it does wash as normal.

Blood – your own saliva will dissolve your blood if you have a small stain. For big blood stains pre-treat with hydrogen peroxide or meat tenderizer or Windex. Wash on cold or medium as hot will set a blood stain.

Small rips should be repaired as soon as possible.

Bibliography

- Caitlin nic Raighne. (mka Martha Rice) Historical Quilting. Ipsley House: 2002. Caitlin's book has a lot about period quilting techniques. She also had a chapter on "How to Make a Quilted Gambeson"
- Carlson, I. Marc. Some Clothing of the Middle Ages: Historical Clothing from Archaeological Finds. 24 May 2005 <http://www.personal.utulsa.edu/~marc-carlson/cloth/bockhome.html> This site has basic patterns for the surviving historical gambesons.
- Crowfoot, Elisabeth, Frances Pritchard and Kay Stanland. Textiles and Clothing 1150-1450. Boydell Press, 1992, 2001. An excellent book for period sewing techniques. There's nothing about gambesons, per se, but the instructions for buttons and button holes (p 170-172) should be really useful
- Danker, Gavin. "Jupons, Jacks, and Arming Coats." Tournaments Illuminated. Fall 1993 AS XXVIII, Issue 108. 13-17
- Goddard, Andy. "Clothing and Armor" Thirteenthcentury.com. May 15, 2005. <http://www.thirteenthcentury.com/pages/clothing05.html>
- Harris, Mark S. "Gambesons, SCA and period." The Florilegium. May 15, 2005 www.florilegium.org/files/COMBAT/gambesons-msg.html The Florilegium contains collections of posting from various elists and the Rialto.
- Height, Michelle. How to Make a Gambeson Also known as: Aketon, Arming coat, Bambikion, Haqueton, Jack or Jupon. May 15, 2005 www.aemma.org/misc/gambeson_instructions.pdf
- Humble, Richard. Warfare in the Middle Ages. London: 1989.
- Kateryn de Develyn "Gambesons, Surcoats, and Military Uses of Quilting" A Collection of Notes on the Historical Aspects of Quilting. May 15, 2005. <http://www.kateryndedevelyn.org/qultmilt.htm>
- Jurgen von Baden. Jurgen's Gambeson. May 15, 2005. <http://www.cs.ndsu.nodak.edu/~malarkey/sca/armourpages/gambeson.html>
- McGann, Tasha Kelly. "The tailoring of the *grande assiette*." La Cotte Simple. May 15, 2005. <http://www.cottesimple.com/> This excellent article will dymystify the making of a grande assiette sleeve like on the Charles de Blois pourpoint. (A mere 4 days later this site was shut down. You can email the author at tasha@cottesimple.com)
- Mele, Gregory. "The Evolution of Arming Clothes." May 15, 2005. <http://www.revivalclothing.com/articles/gmarticle1.htm> Revival Clothing sells gambesons but this little essay is a good summary of the history.
- Newton, Stella Mary. Fashion in the Age of the Black Prince: A Study of the years 1340 to 1365. Boydell Press, 1999
- Oxford English Dictionary. Definition of Gambeson related words <http://0-dictionary.oed.com.iii.slcl.org/>
Accessed through St. Louis County Libray system 17 March, 2005
- Price, Brian R. Techniques of Medieval Armour Reproduction: the 14th Century. Paladin Press: 2000. Chapter 25 is all about arming clothes including gambesons.
- Price, Brian. trans. "How a man shall be armed for his ease when he shall fight on foot c1450" Chronique: The Knighthood, Chivalry, and Tournament Resource Library. May 15, 2005 <http://www.chronique.com/Library/Armour/armyd1.htm>

Stimpzilla. "Gambeson and Cuisse Diary" Stimpzilla's Sumptuary Law Always Dress Above Your Station. May 15, 2005 <http://www.stimpzillasumptuarylaw.com/gambesondiary.html> A blog about creating a leather gambeson.

Thursfield, Sarah. The Medieval Tailor's Assistant: Making Common Garments 1200-1500. Costume & Fashion Press, 2001. This book has great instructon for making a basic pattern for yourself.

Wyley, Stephen Francis. "Gambeson Patterns." Varangian Papers 7. May 15, 2005. <http://www.geocities.com/svenskildbiter/ArmsArmour/gambeson.pdf>

Appendix A

Definition of terms from the Oxford English Dictionary

gambeson

(gæmbson) Forms: 4 **gaumbisoun**, (**campeson**), 4-5 **gambisoun(e)**, 5 **gambeson**, **gambassoune**, **gamesun**, (-son), 7 **gambesone**, 9 **gambeson**, (-soon). [a. OF. *gambison*, *gambeison*, *wambizon*, etc. = Pr. *gambaïso*, med.L. *gambesnem*. A shorter form appears in OF. *gambais*, *wambais*, Pr. *gambais*, OSp. *gambax* = med.L. *gambesum*, *wambasium*.

The forms seem to descend from a Rom. type *wambésio* (subj.), *wambesióne* (obj.), commonly taken to be an adoption of some compound or derivative of OTeut. *wambâ* belly (see WOMB). The MHG. *wambeis*, *wambes* (mod. Ger. *wamms*), Du. *wambuis*, *wammes*, were adopted from OF.]

A military tunic, worn especially in the 14th c., made of leather or thick cloth, sometimes padded; it covered the trunk and thighs, and was originally worn under the habergeon, to prevent chafing or bruises, but was sometimes used as a defence without other body-armor.

13.. *K. Alis*. 5151 Armen hem in breny of yse, With~outen..aketoun, Oither plate, oither gaumbisoun. **c1420** *Anturs of Arth*. xxxi, His gloues and his gamesuns [v.r. gambeson] gloet as the gledes. **a1440** *Sir Degrev*. 302 Gomes wyth gambisoune Lyes opone bent broune, And sterff undere stede. **1736** BAILEY (folio), *Gambeson*. **1835** LONGFELLOW *Outre-mer* Prose Wks. 1886 I. 166 A band of Moorish knights gayly arrayed in gambesons of crimson silk. **1843** JAMES *Forest Days* II. xi, I will pink him to the quick, if his skin be as thick and hard as a German gambeson. **1876** ROCK *Text. Fabr.* iv. 30 Many a rich gambeson garnished with silk, cadas, and cotton.

jupon

(dupn, dupn, F. yp) Forms: 5 **iopon**, -en, -oun, **iupone**, 6 **iuppin**, *Sc.* **iowpoun**, (7 **juppon**), 9 **jupon**. See also GIPON. [a. F. *jupon*, OF. also *juppon*, *gip(p)on* (= Sp. *jubon*, Pg. *jubão*, *gibão*, It. *giubbone*, *giuppone*), deriv. of *jupe*, etc. JUPE.]

A close-fitting tunic or doublet; esp. one worn by knights under the hauberk, sometimes of thick stuff and padded; later, a sleeveless surcoat worn outside the armour, of rich materials and emblazoned with arms. *Obs. exc. Hist.* **c1400** CHAUCER *Knt. 's T.* 1262 (Camb. MS.) In a brest plate & in a lyt Iopoun [*other MSS.* gypon, Iepon, gippon]. **c1440** *Morte Arth* 905 Aboven at a iesseraunt of ientylle maylez, A iupone of Ierodyne iaggede in schredez. **c1450** *Alexander* 2450 Sum in Iopons, sum in Iesserantis. *Ibid* 4722 it wont men in a woddis..in Iopons of hidis. **1480** CAXTON *Descr. Brit.* 39 Without iopen [*Rolls ed.* gipoun] tabard clok or bell. [**1700** DRYDEN *Palamon & Arc.* 1304 Some wore a breastplate, and a light juppon.] **1826** W. ELLIOTT *Nun* 13 A jupon shone Over his armour. **1864** BOUTELL *Her. Hist. & Pop.* xv. (ed. 3) 183 The shield and jupon of the effigy in Bristol Cath[edral].

acton

(æktŋ) Forms 3-5 **aketoun**; 4 **acketton**; 4-9 **aketon**; 5 **akatown**, **aktone**, **actone**, -oun(e), -owne, **hacton**; 6 **hocqueton**, **hocton**; 6-7 **haketon**; 6-9 **hacqueton**; 5-9 **acketon**, **haqueton**; 4- **acton**. [a. OFr. (12th c.) *auqueton*, later (15th, 16th c.) *hocqueton*, *hocton*, mod.Fr. *hoqueton*, cotton wool, padding, whence, a padded and quilted jacket; a. Sp. *alcoton*, *algodon* 'cotton, bombast,' ad. Arab. *alqtun*, *al-qtn* the cotton. *Obsol.* since 16th c. exc. as a historical term. *Acton* is the lineal descendant of the ME. forms; in Fr. the word has since received an initial *h*, which has also influenced English since Caxton's time in the forms HAQUETON, *hacqueton*, *haketon*, *hacton*, some of which also are still in historical use. *Hoqueton*, *hocqueton*, *hocton*, are later Fr. forms, not now used.]

A stuffed jacket or jerkin, at first of quilted cotton, worn under the mail; also, in later times, a jacket of leather or other material plated with mail.

c1300 *K. Alis*. 5150 Withouten cotoned aketoun, Oither plate, oither gaumbisoun. **c1386** CHAUCER *Sir Thopas* 149 And next his schert an aketoun, And over that an haberjoun. **c1400** *Sege off Melayne* 917 Ther oon he keste an acton syne. **a1450** *Syr Percyvelle* 1102 Blode rede was his stede, His aktone and his other wede. **c1450** LONELICH *Graal* II. 199 Here hors, here armures, here akatowns. **1475** CAXTON *Jason* 16 He percid hit and the hauberk and the haqueton. **1496** *Dives & Pauper* (W. de Worde) X. vi. 380/1 We muste do aboute the Jacke or acton of charyte. **1523** LD. BERNERS *Froissart* I. cccxxx. 756 With pauesons and cootes of steele, hoctons, shapeaux, and bassinettes. **1576** HOLINSHED *Chron.* II. 581 The bishop had upon him a certeine cote of defense, which was called an aketon. **1599** THYNNE *Animadver.* 31 Aketon or Haketone you [Speght] expounde a jackett withoute sleeves..But haketon is a slevelesse jackett of plate for the warre, couered with anye other stuffe; at this day also called a jackett of plate. **1609** SIR J. SKENE *Reg. Maj.* 25 That ilk laick landed man haueand ten pundis in gudes and geir, sall haue for his bodie, and for defence of the Realme, ane sufficient Acton, ane basnet, and ane gloue of plate. **1623** CAMDEN *Rem.* (1637) 196 They had also about this time..a jacket without sleeves called a Haketon. **1805** SCOTT *Last Minstr.* III. vi. But Cranstoun's lance, of more avail..Through shield, and jack, and acton past. **1828** *F.M. Perth* III. 341 His rich acton, and all his other vestments, looked as if they had been lately drenched in water.

jack

Forms: 4-6 **iakke**, **iak**, 4-7 **iacke**, 5-6 **iake**, 6 **iakk**, 6- **jack**. [a. F. *jaque*, in OF. also *jaques* (1375 in Hatz.-Darm.), in It. *giacco*, Ger. *jacke*, Du. *jak*, Sw. *jacka* jacket. Ultimate origin uncertain, but app. French: thought by some to be identical with the proper name *Jacques*, perh. as originally worn by the peasantry.

In sense 1 possibly ultimately of the same origin as JACK *n.*¹, but not derived from that word in English, being of common European currency. Sense 2, and still more 3, are doubtfully placed here; both may belong to JACK *n.*¹]

1. a. A short and close-fitting upper garment of men and women; a jacket. *Obs.*

1375 *Will of Thos. de Hemenhale* in *Promp. Parv.* 256 Unum iakke de rubio worstede. **c1375** in *Rel. Ant.* I. 41 Wommen..with her hornes..rydelid gownes, and rokettis, colers, lacis, iackes, pattokis, with her longe crakowis.

b. esp. A coat of fence, a kind of sleeveless tunic or jacket, formerly worn by foot-soldiers and others, usually of leather quilted, and in later times often plated with iron; sometimes applied to a coat of mail. (See Meyrick in *Archæol.* XIX. 224.) *arch.*

c1380 *Sir Ferumb.* 3689 or-out ys scheld & is habreioun, Plates, & iakke & ioupoun, or-out al it ot. **1525** LD. BERNERS *Froiss.* II. clxxxvii. 573 The kyng had on a iacke couered with blacke veluet, whiche sore chafed hym. **1549** *Compl. Scot.* xix. 163 Quhar for i exort ou that e change our sperutual habitis..in steil iakkis and in cotis of maile, to deffend our bodeis. **1562** *Lanc. Wills* (Chetham Soc.) I. 178 On jacke with a brest of plate..iij. **1573** TWYNE *Æneid* x. (1584) Pvj, Through his golden plated iacke he thrust into the side. **1578** BANISTER *Hist. Man* I. 8 Like..the yron plates of a iacke, one lying on an other. **1596** SPENSER *State Irel.* Wks. (Globe) 639/1 The leather quilted jacke in iourneyng and in camping, for that it is fittest to be under his shirte of mayle. **1622** MABBE tr. *Aleman's Guzman d'Alf.* I. 94 They had brought with them good Iackes of Male. **1694** *Lond. Gaz.* No. 3035/3 Persons..arm'd with Blunderbuss's, Pistols,..Jackcaps, Leather Doublets and Jacks. **1828** SCOTT *F.M. Perth* xx, Some had the black-jack, or doublet, covered with small plates of iron of a lozenge shape. **1894** C. N. ROBINSON *Brit. Fleet* 91 The coats of livery, or 'jacks' as they were called, which the soldiers wore at Creçy.

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