

Building a Galactic Marine



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Research, research, research! I can't say it enough. The Galactic Marine is in Episode 3 for about 24 seconds, and that is all the screen time they get! There are three helpful pieces of reference material you have at your disposal:

The first resource is the [501st Legion Galactic Marine Costume Reference Library Page](#). This webpage shows the current costume standards your Galactic Marine costume must meet to join the 501st Legion. The page has photos and descriptions which help tremendously. I built my costume to meet all of the 501st CRL guidelines, and it was also approved for Rebel Legion because right now there are very few difference between the two. The costume must fit your body type and meet the rest of the regulations - appearing as the CRL example does, and you will have no issues getting approved. If you need clarification search the current detachment (Blizzard Force) Galactic Marine section and using the search tool to see if your question has already been asked, or create a new post, this will help others working on the costume and build the resources available for the community.

Another resource is Galactic Marines around you! Visit your local Galactic Marine and pick their brain, bring your camera, take notes and ask questions! When I went to Celebration 6 I met a GM and allowed me to meet him out of costume and take photos and ask questions. This was invaluable and those photos and videos helped me during my build a year later.

Not fortunate enough to someone with a GM by you? Look up GM work in progress photos and build threads found on the Blizzard Force and Clone Troopers.net forums. Using these you can learn what worked for them, what didn't, mistakes they made and what they learned from their mistakes. Hopefully making less mistakes yourself. Making mistakes isn't bad, but you want to learn from them, and hope they are small, easy to fix!

My Build Thread (which will eventually be replaced by this more in depth PDF)

<http://www.blizzardforce.com/forum/viewtopic.php?f=98&t=4010&sid=a136573b928b02730781399940472923>

Gallery of over 500 photos taken during my build

<https://picasaweb.google.com/105572498887339170215/GMBuild?authuser=0&feat=directlink>

Photos taken by me of Ken Querio's GM at C6 and other photos (see comments for description)

<https://picasaweb.google.com/105572498887339170215/GMReference?authuser=0&authkey=Gv1sRgCLX0zbWZiofHrAE&feat=directlink>

Links to other troopers builds that helped me:

Midniterider Chest & Back Plate modification

<http://www.blizzardforce.com/forum/viewtopic.php?f=100&t=3301>

Midniterider Installing Toe Armor To The Boots

<http://www.blizzardforce.com/forum/viewtopic.php?f=100&t=3209>

Midniterider Heatshock Helmet Build

<http://www.blizzardforce.com/forum/viewtopic.php?f=100&t=3208>

Midniterider HS/CR US V-1 Helmet Shroud Template & Tutorial

<http://www.blizzardforce.com/forum/viewtopic.php?f=97&t=4311>

Gatz build

<http://forum.clonetroopers.net/index.php?showtopic=15872&st>

Teabo Photo Bucket Gallery

<http://s32.photobucket.com/user/plutto13/library/?sort=3&page=1>

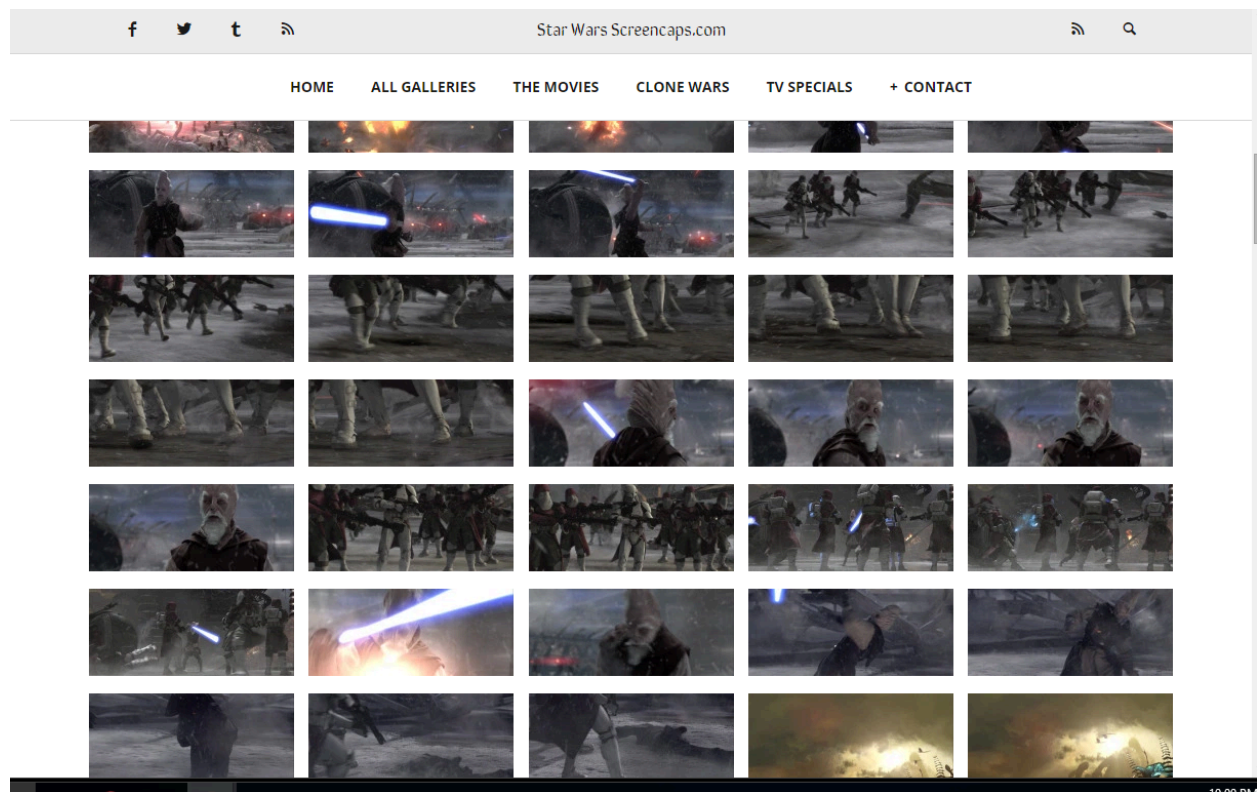
Berzerker Build: Berzerker build thread

<http://forum.clonetroopers.net/index.php?showtopic=15190>

Berzerker_9223 Photo bucket gallery

http://s837.photobucket.com/user/Berzerker_9223/library/Galactic%20Marine%20Build?sort=3&page=1

I recommend using the website StarWarsScreenCaps.net there are 14 screenshots taken from Star Wars Episode III revenge of the sith. I saved all of these in the larges format and use them frequently during my build.



There is also a model turnout that was released online. References are excellent because once you have (for example) your arm ammo box purchased, you can use the different reference materials to help you estimate the size of the ammo belt you will need, since it may be slightly different for everyone.



There is a Gentle Giant GM bust and action figure available, however they are not 100% screen accurate. Base all your final decision off of the materials above and avoid the action figures.

Tools and supply list

Cutting tools

- Rotary Dremmel
- Dimand rottary cutting bit
- Sanding bit

Adhisives

- E-6000 Epoxy
- Devcon Plastic Welder

Paint

Rust-oleum Primer
Rust-oleum Spray Paint
Rust-oleum Clear Coat
Bondo
Bondo Spot Glaze Putty
Acrylic Paint for weathering

Vendor armor list

Bikerchick -

Shin armor is 50.00 for a set

Boot armor set is 25.00

Shin buckles is 4 pc 5.00

If so the knee are 25.00 a set

<http://www.501st.com/forum/viewtopic.php?t=73264>

~~Will Friedrichs IOA (Redkraydragon aka RKD)-~~

~~Backpack kit \$200 (includes all pieces pictured) \$160 with no pouches~~

~~Chest \$70~~

~~Epaulets (pauldron) \$35~~

~~Right shoulder (ribbed) \$35~~

~~Left shoulder (smooth) \$25~~

~~Backplate \$75~~

~~Knees \$15~~

~~(narrow) Shins \$78~~

~~Boot armor \$25~~

~~Shipping 25~~

<http://forum.clonetroopers.net/index.php...opic=16715>

Rafael Montoya on Facebook

Kevin (OSCS) movie clone arms - ASK TO HAVE PADDING INCLUDED - IT IS EXTRA BUT WORTH IT.

Biceps \$45.00

Elbows \$40.00

Forearms set \$45.00

Hand plates \$15.00

Shipping \$26.00

\$170 w/ shipping

Frank (Steelblitz) <kamino8469@comcast.net -

Arm/Chest ammo boxes \$35,

GM belt kit \$165,

Chest Greebs \$12

shipping around \$15

Flex strapping for pairs of elbows, knees, shoulders \$65

Gray coveralls from (Tractor Supply Store) you will need to modify these and add front leg pockets. \$40

http://www.grayandholtclothing.com/61002_GY_Walls_Gray_Short_Sleeve_Poplin_Coveralls_p/61002gy.htm

I am 5'7" and I wear a 50 short

I wear a black fitted under armor compression shirt one size smaller than what I normally wear.

Underarmor Balaclava

Nomex flight gloves, surplus store or online - I've found them for \$12 online.

Helmet (Dan Rod Jr) Galactic Armory \$175.

Boots vendor Crow62 \$150 these can take some time to get. or you can google kenneth cole killamonjaro on ebay.

<http://forum.clonetroopers.net/index.php...opic=18346>

Kama Vendor- General Fidelius - \$60 (I created my own)

Blaster Vendor - Woodchuck

DC-17 shorty \$260

Long Rifle \$360

Store bought items

Gray Coverall from farm supply store such as Fleet Farm

Under Armor or Generic Balaclava

Nomex Flight Gloves

Fabric from JoAnne Fabric (go to joanne.com and click coupons to save lots \$\$\$)

White Marine Vinyl used for helmet cowl

White duck cloth for backpack pouches, belt and belt pouches

Burgundy duck cloth for Kama

Bias tape from JoAnne Fabric for trim

Fitted Under Armor Heat Gear or Cold gear depending on weather

Padding for inside helmet and arms- I used recycled knee pads (\$5 at walmart), or pipe insulation

Lens Material - any dark tinted welder helmet lens or motor cycle helmet found on amazon

Vent Material - Plastic bug net from Home Depot works well

Leather Belts - Chest and Arm Belt I bought mine at Wal-mart

Spare ABS Sheets - used to shim, extend pieces, test paint, reinforce, etc

Rare Earth Magnets for Pouch closures

Trimming and Test fitting Armor

The first lesson trimming armor is to take your time, and as always use your references. You can easily take plastic off, but you can't put it back on! Study reference images, or even better, get your hands on some 501st Clone trooper bicep, shoulder, forearm and hand plates in person. 501st Clone Troopers are more popular than galactic marines, and the two costumes share these parts so you can use another clone's as a reference.

What you'll want to do is turn the armor over and look for the line on the inside of the armor where the molded piece ends, and the extra plastic begins. Here you will make a line to start your trim. This is your first rough trim, then you will continue to refine it so the piece fits your body.





Here you can see where I rough cut the items tracing the mould line with a pencil to help make it more visible, then cut out the piece, and try it on to make sure it fits.



Rough cut elbow and hand plates.



Your armor should fit you!

One reason costumes look so accurate in the 501st costume is because they're customized to fit the person who wears it. Clones were all computer generated so there is more work in customizing these costumes takes longer than a standard stormtrooper or biker scout. After your initial trim you will see there are a front and a back to many parts, which you will size to fit your body and we'll go through that now.

The pieces that need to be fitted for the Galactic Marine are the chest, biceps, forearms and shins



This photo shows my friends completed Bacara bicep on the left and my rough trimmed piece on the right. His piece fit my arm decently so it was a good guide. Look at all that plastic that has to be trimmed off before it will correctly fit my arm! This was extremely helpful in showing me it's OK to cut all that excess off! BUT - take your time. Mark before you trim each time. For this example I marked and tried to take an equal amount off off both pieces. You do not want to cut 4 inches off of one piece, because you will be be getting too close to the details. Instead Take 2 inches off each piece. Continue to mark, and slowly trim until the piece fits you. Trim using the dremel, mark a straight line using a straight edge or using another piece of armor.

REMEMBER: You can use long trimmed pieces as a shim if they're wide enough.

REMEMBER to test fit wearing your under armor, or whatever clothing you'll be wearing as you need it to fit you while wearing that.



As you are slowly trimming your armor continue to tape it together with painters tape and slide it onto your arm. Is it too big? Fit the armor together and draw a line or mark with pencil where you want to trim, and trim less than that line. Just remember you can always take more off, but you can't add it back.



REMEMBER - Test fit all pieces of your armor together with proper undergarments for your character!

Below from top to bottom I am wearing my pauldron, shoulder, bicep, elbow, forearm, and hand plate.



As you can see that's a ton of armor to try and fit on your arm. This photo shows there isn't enough space between the pieces.

REMEMBER - You will need enough space to fit your pieces on with your undersuit AND gloves on! Test fit with these on! For example with the forearm, you will need to make a fist, and be able to get your hand out the opening.



Reviewing a scanned reference photo I can see the shoulder piece overlaps the bicep piece nearly to the ammo boxes. I need to trim more off the inside of my bicep so it can slide further up my arm.



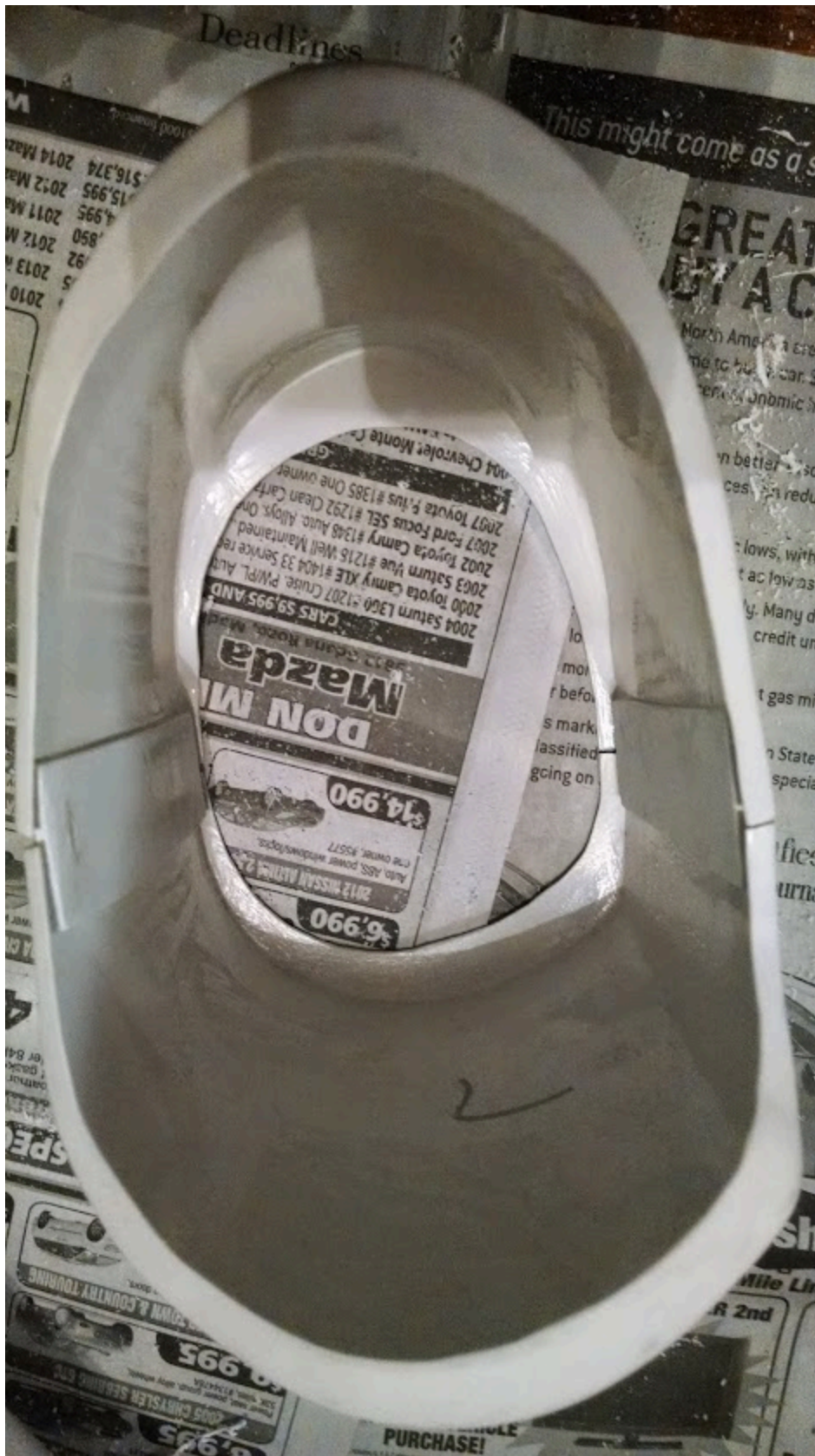
This bicep will also need to be trimmed on the inside so it can slide under the shoulder bell as shown in this reference. Sliding the shoulder bell up will help the rest of the armor fit on my arm as well. The bicep piece will slide under the shoulder bell.



The edge where the armor comes back towards your body is called a return edge. Some piece have this and it makes it look like a more finished piece of armor. The thing to remember is you want enough showing to give the effect, but trim it down so that it doesn't scrape against the under pieces of your costume. This is the inside of my left bicep piece. You can see there is a large amount of return edge on the top and bottom. I took nearly all of it off, because it allowed the armor to slide up my arm, and no one is going to see the return edge under my arm. This is about comfort. If you scroll to the scanned image, you can see a little bit of return edge.



Example of return edge highlight forearm piece here.



After trimming the bicep return edge, giving me more more to slide it up my arm, you can see how much nicer all the pieces fit.

REMEMBER: These return edges will be digging into you as you wear your armor for as long as you troop. You want a minimum amount of return so it looks the part, but is still comfortable to wear. You will know if there is too much return when you see bruises on your arm where it was rubbing! Try avoid this by test fitting as much as possible, moving around in your armor with your undershirt on. I am still ending up with small bruises so that means it's time for me to take more return edge off! Then again you may always end up with bruises.



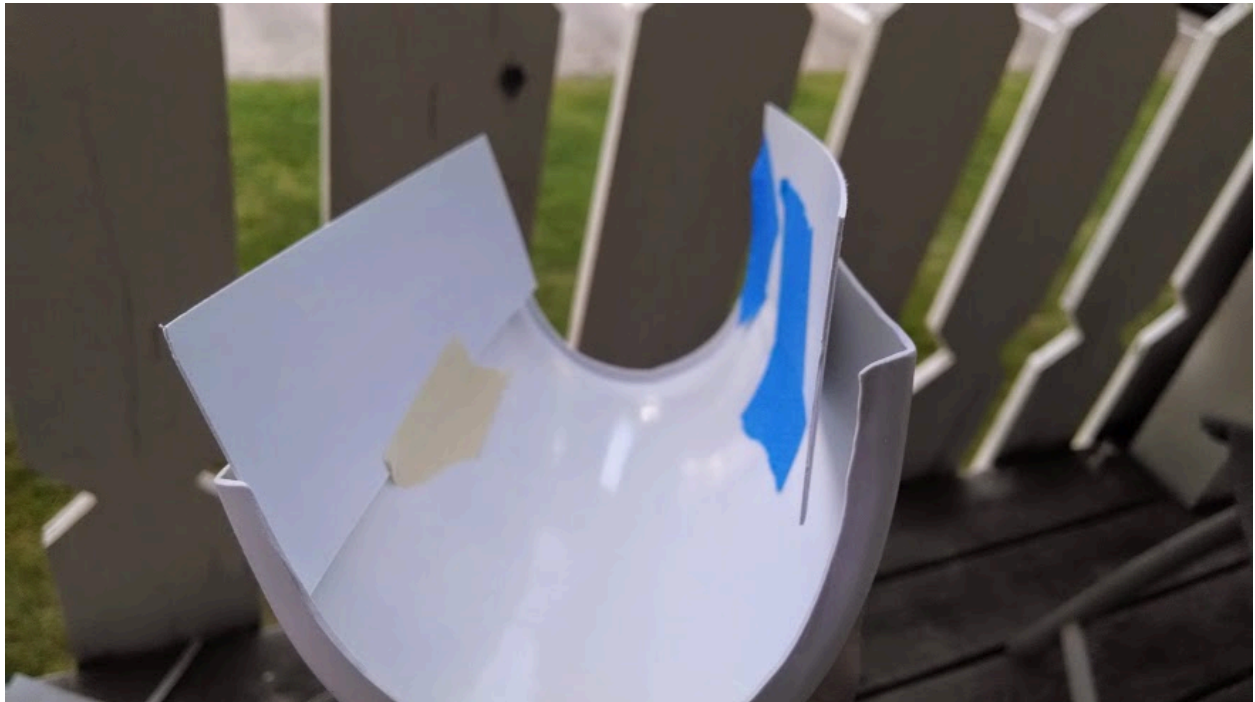
Shimming armor

Shimming is the process of combining two halves of armor into one cohesive piece. This piece should fit you with whatever clothing you will be wearing under that piece for the finished costume.

If you're this far, you should have already rough cut your armor and sanded down the edges. The first step is to get spared ABS and cut a shim or strip that will go between the front and the back piece of armor. Be sure it is wide enough that there is quite a bit of surface to contact both the top of one piece and the bottom of the other.



Here I tape the shims in place to make sure they will fit between the two pieces. I also marked with a pencil where it is, so I know where to hold it when glue them in place using the devcon plastic welder.



Devcon: Mix together in the mixing area provided on the packaging or on anything really. I use spare cardboard or ABS, whatever clean surface.

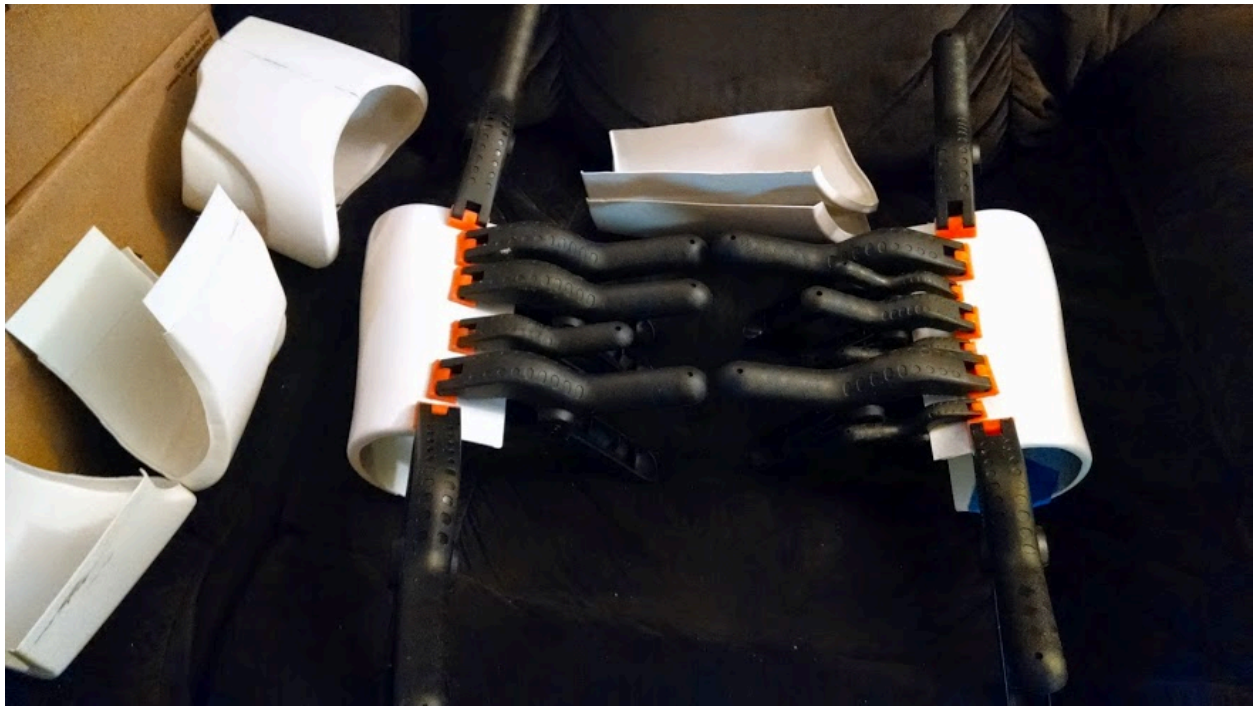
Put a thin layer of devcon on the shim piece and line it up with where your pencil guideline is. Clamp it in place!



Use as many clamps as you can fit on the piece, and where you can't fit clamps, use rare earth magnets! This photo shows the forearm and bicep.



Here you can see some pieces are taking shape. When you shim the front and back armor together, use more devcon so that it squeezes up between the pieces. This will help so you have less to fill with the bondo.

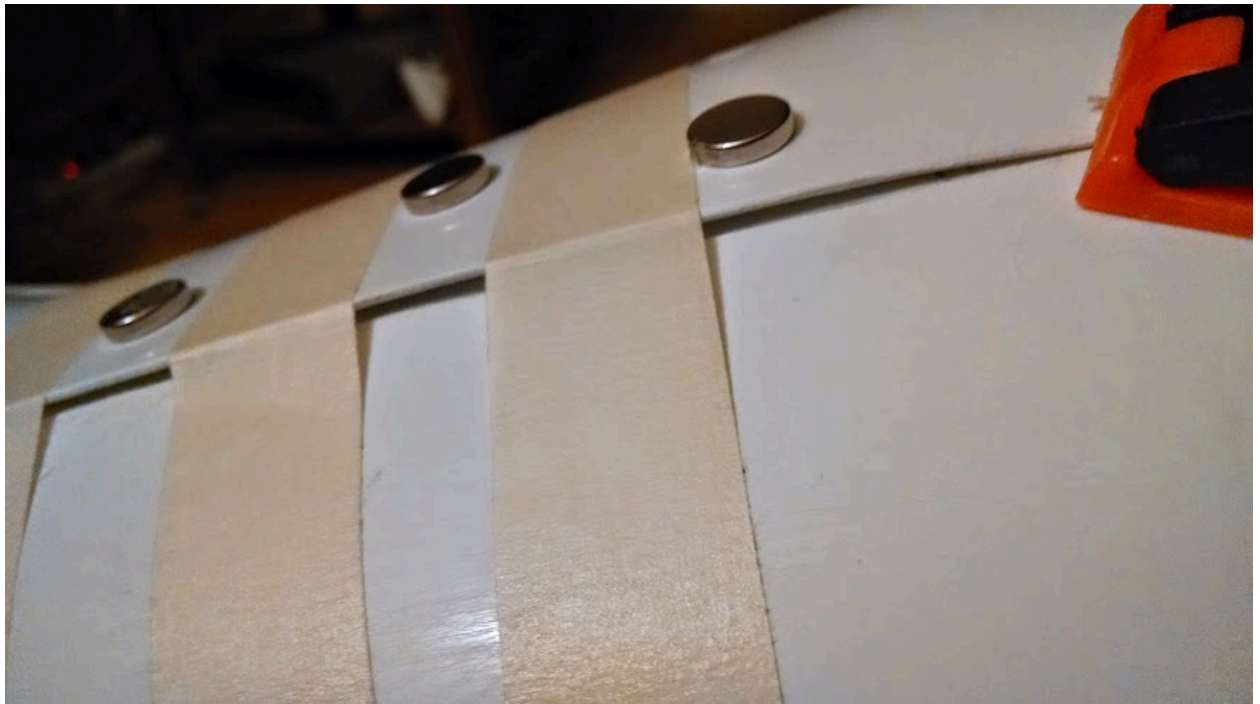


Here the pieces come together!



You can see in the picture below the yellow is the hardened devcon, which forms it's own sort of plastic and helps so you have less to fill with bondo.





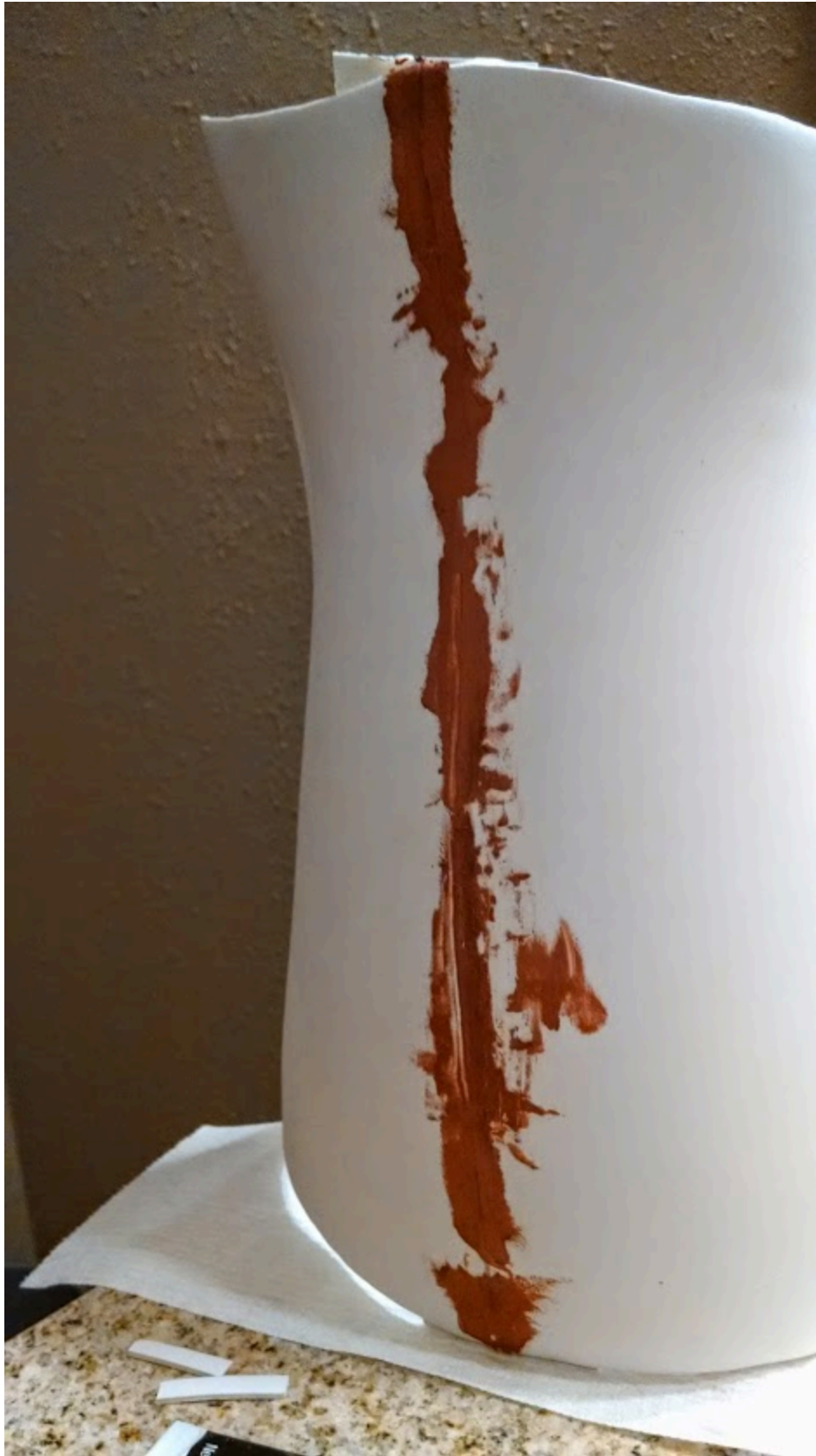


Use a paint stir stick to get coverage where clamps will not reach, and use painters tape for extra reinforcement.

Not all lines will be perfect, this will need some sanding to clean it up, and fill with bondo.



Filling with bondo spot glaze putty, try to apply it smoothly with a piece of scrap ABS or your finger getting in all the grooves and cracks.



You will want to fill in any gaps, then once it dries sand it as smooth as possible using multiple grits of sandpaper. I would recommend 220, then 500, then wet sanding with 1000.



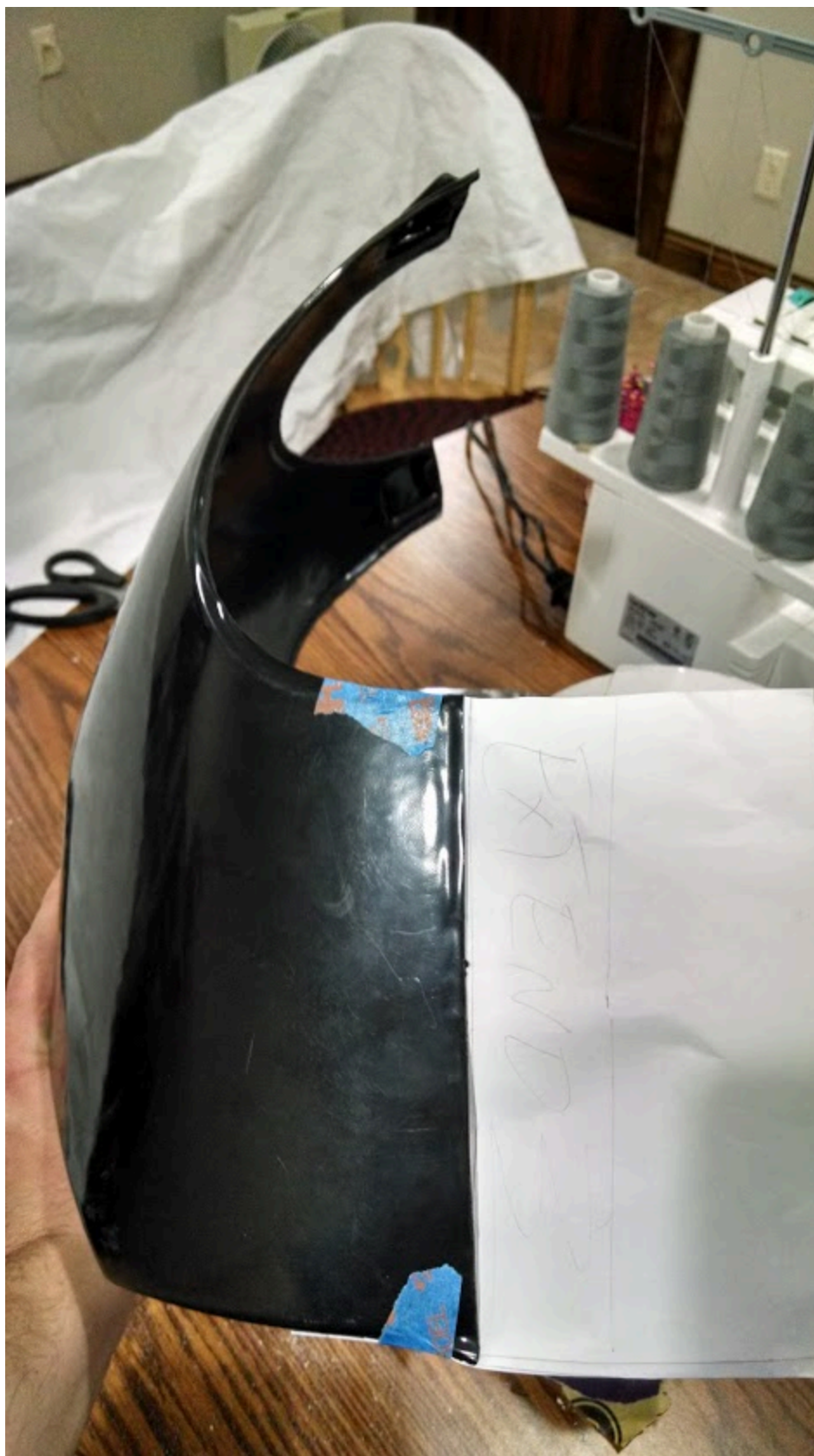
Try to reinforce any pieces that might bend with spare pieces of ABS to help prevent future problems.



One area of concern for me was the chest and back armor. I had bought the back plate from a fellow GM who had extended it, but I bought the chest piece new, so I would have to extend that to match the back. Here you can see the chest in black and the back piece in gray.



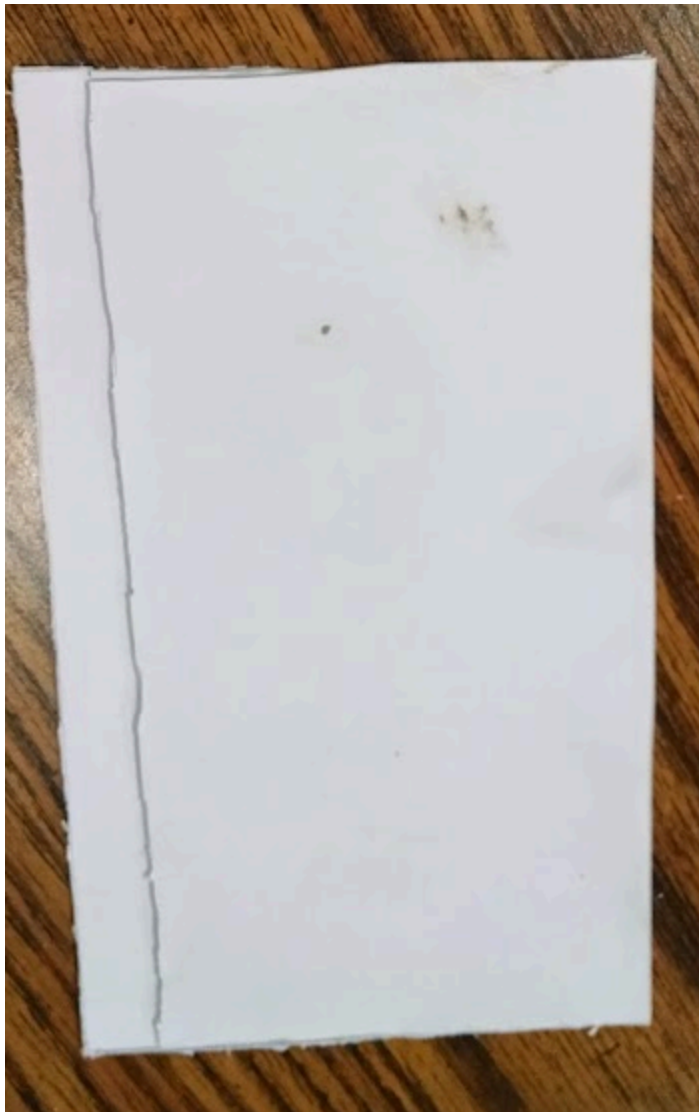
I taped a piece of paper to the armor and had my friends trace the amount of space between the front and the back piece that would need to have the extension or shim. The CRL for the Galactic Marine says a gap is allowed, so I do not have to shim the two pieces together, but a velcro shim will be acceptable to hold the pieces together.



I taped around the paper and tried fitting the armor, imaging what the extension would feel like and making sure it was comfortable.



Next I traced the extension piece out of ABS adding spare material so that it will overlap and I will have area to glue to the inside of the armor. For example this may have been 3 inches so I doubled it to 6 inches and glued the extra 3 inside, and left 3 sticking out.



I used the same technique to devcon the piece on. If you look you can see the extra plastic sticking up to give you an idea how much I used, this is trimmed off later.





Shimming the opposite side



Here you can see how the chest will fit together held with clamps.





I marked the extension where I will trim to so it meets up with the back piece.



I reinforced the this with a second piece of ABS because it will be doing a lot of flexing, and so that it would match up with the chest armor. In the photo below you can see the second piece of ABS decvon'd on to the first. I set this on top of the original piece and that allowed there only to be a small gap, which I filled in with bondo spot putty (should have used normal bondo instead, to help prevent cracking. Spot putty doesn't flex well).



After the extension you can see the front and back fit together with only a small gap.

Here's what it looks like after being filled with bondo and primed. You can see where I extended the chest now is filled with extra ABS plastic. With a few coats of coat of paint no one else will know was extended. No one looks under your arms anyway, but you will want it correct for the CRL so you get approved! I could only find one photo of the seam at a troop (it won't be photographed often), and you can see how it looks here.



Sanding + Wet Sanding + Filling

You want to start with a lower grit to rough up the surface - 400 or so to make it a rough surface for the paint to stick to. We will use my helmet as an example. I sanded it all around with a lower grit sandpaper to try and give it an even smooth surface. Then I went around with a higher grit 600 or so, to give it a smoother appearance. I also filled deep cracks or valleys with bondo spot glaze putty. It is good for small areas because you don't have to mix bondo, the spot glaze comes in a tube pre-mixed. It dries fast and can be sanded within 10 minutes or so.



Just fill in the spots and cracks where you want it to be smooth and then sand it down with a higher grit sandpaper. You will want the filler putty to appear smooth with the surrounding plastic. If you see any cracks or raised areas, they will be visible when you paint.

Fill in with spot putty or normal bondo (if it's a flex point) then put a coat of primer on it and see how it looks! If you're happy with it move on!



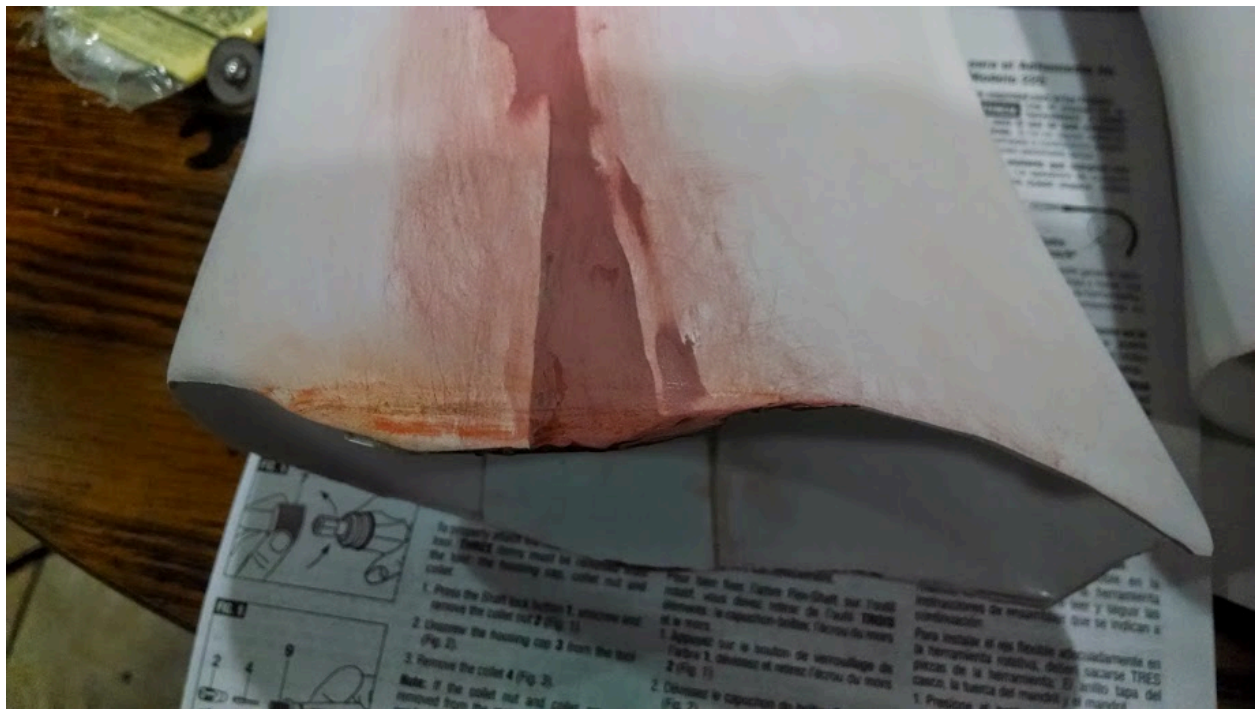
I used a paint brush with bondo to get in this tight space.



make sure to use bondo here, and NOT bondo spot putty because the spot putty will crack as

it's meant to fill in gaps not be a solid rigid structure. Once it's dry use a file to clean up the excess bondo.





After filling and sanding, I put on a layer of primer to see how everything looked.



Honestly I felt the edge would be shown too much, so I sanded it down and tried another coat of primer.



In the end I wasn't comfortable sanding it completely flat. I knew these would be covered by the belts and weathering and no one would notice them unless I made a point to show them. Use the 5 foot rule: take a break from working on it. Come back and look at it from 5 feet away - if you don't notice the problem, neither will someone else!



Preparing for painting
wash with soap+water to remove release agent
sand with multiple grits so paint will stick

Painting

Ensure to read all information on the back of your paint can in order to meet recommended temperature and environment for spray painting. Safety first, wear a respirator and paint in a well ventilated area. I also recommend wearing rubber gloves to avoid getting paint on your hands. Try to find a big box you can cover your piece with to avoid dust, bugs, or anything messing up your paint job.

Test your primer and paint

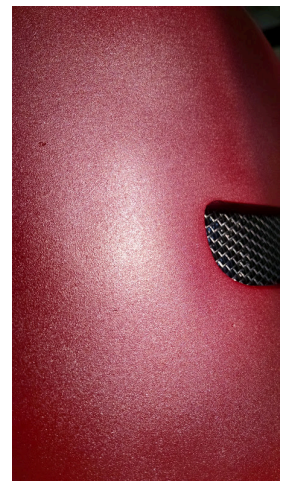
Spray a few coats on a piece of scrap ABS similar to what your armor is made out of. Come back after the recommended re-spray time (on the back of the can) and spray a few coats of your paint onto it. You want to make sure the plastic, primer, and paint do not have negative chemical reactions with each other. This will ensure you don't have any strange texture effects.



Now we will repeat this process on all pieces of the costume that need to be painted.

REMEMBER: Wash all your parts in acetone, then a soap and water wash and dry it before you paint it!

Learn from my mistake: In the middle of my project switched from normal rust-oleum primer to a rust-oleum filler primer (it helps hide tiny crevices and creates less sanding later). Unfortunately I didn't test and it reacted poorly with the rust-oleum claret wine primer/paint combo I was using. This created a pebbling/orange peel effect. I re-sanded my helmet down 3 times before I tried a different primer (I thought it was my technique, or it was too cold) but when I eliminated those from the equation, and tried the filler primer and claret wine paint/primer combo on scrap abs and the same texture was created I realized that was my problem. How I resolved it was I switched back to the original primer I was using and the texture issue no longer happened on the scrap abs, so then I was able to use the normal primer on my pieces and then paint them and they looked great.



Priming

Sand area with multiple grits of sandpaper from low grit, to high grit. You want a surface the primer has something to grab onto. Follow the directions on the can for your specific primer.

Here is the seam on the chest primed and then filled with bondo spot putty.



Another photo of the same piece after a few coats of primer. It's difficult to get it perfectly smooth, but just remember this area will be under my arms, painted, and weathered so it won't often be seen or focused on. It is your costume, so you need to decide how much time and effort **you** want to put into it.



You will want to wet sand all pieces. Make sure your primer is safe for wet sanding. Wet sanding helps to get the pieces smooth for a glossy finish. Adding water helps the paint from clogging the sandpaper. I put a few drops of dish soap in a bucket with warm water in a large bucket. Fill up a spray bottle you buy from dollar store with some water from the bucket. You can use this to spray the piece you're working on and keep it wet. Cut the sandpaper into smaller squares to work with, this makes it more manageable than trying to sand with a giant sheet. Write what grit the paper is with a permanent marker so you can pull one out of the water and see it. Leave the paper to soak for a few minutes before using it. I start wet sanding with 220 grit. I pull out a piece of sandpaper and spray the piece I'm sanding with my water bottle and then sand the piece I'm working on. When I am done I wash off the piece, and let it dry completely. Do not attempt to speed up the process with a hair dryer. I put on another few coats of sandable primer, reading instructions for recoat times on the can. I let that dry completely overnight. Next I repeat the process with 500 grit sandpaper, and then finally wet sand again with 1000 grit.

I would recommend purchasing this E-book [Painting & Weathering for Props & Replicas by Harrison Krix of Volpin Props](#). it is invaluable and taught me a lot for the price you can't go wrong because of the vast amount of knowledge you will gain.

Weathering

I used acrylic paint, and mixed multiple colors together, such as brown, black and red in varying amounts to create different effects. The boots and shins are the most dirty, so I tried to imagine where the dirt would be in the crevices and cracks. Usually I over weathered, let it dry a bit and wiped off the excess with a paper towel. If the acrylic paint is dry and I want to remove it I wet down a Mr. Clean Magic eraser to take it off. But remember this will also remove the gloss from your paint.



Try to keep a consistent pattern on your pieces when weathering them. The costume should overall have a cohesive worn look without pieces being over weathered.

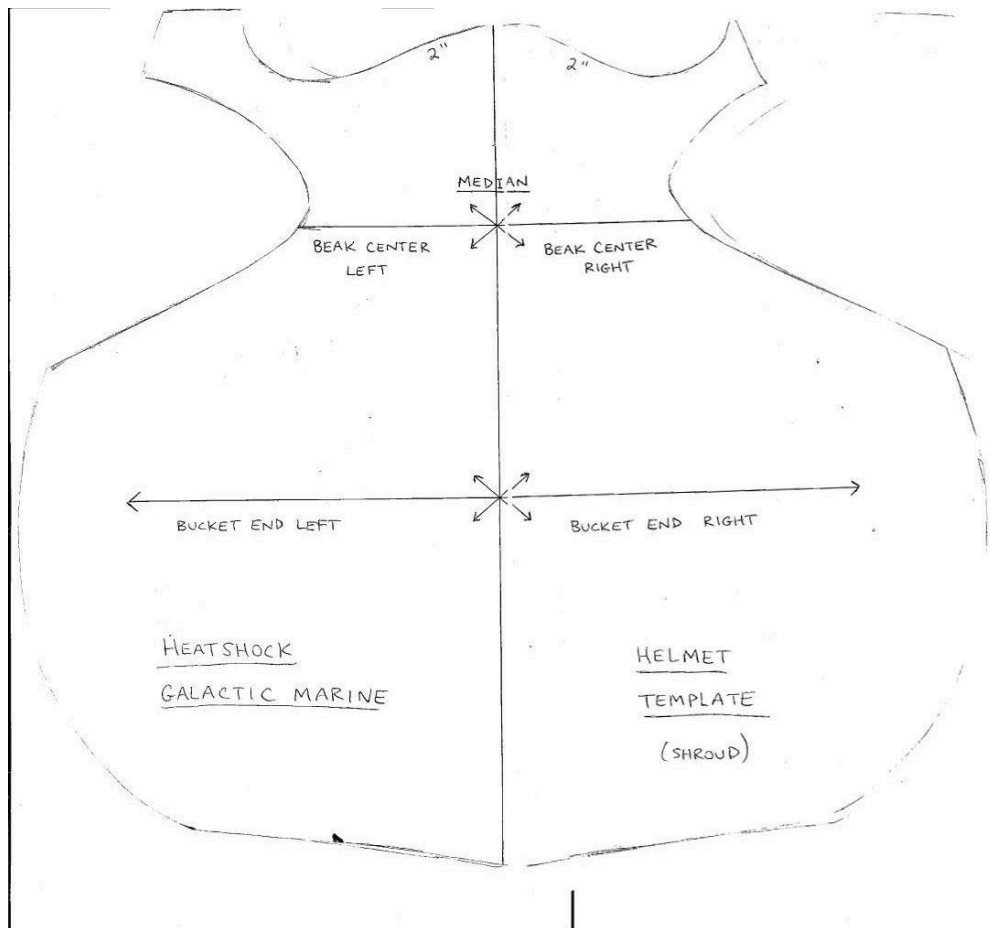
Clear Coat

A clear coat is a barrier of clear paint that helps protect all your hard work from damage. Instead of your base coat of paint being scratched, the clear coat will be scratched and much less visible. Follow the instructions on the can and spray several coats of gloss, or matte clear coat spray paint (depending on your project).

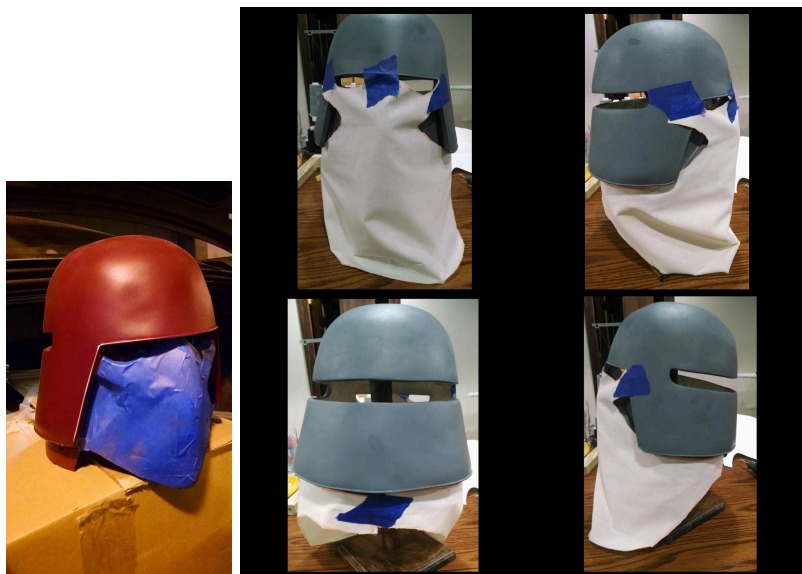
Helmet

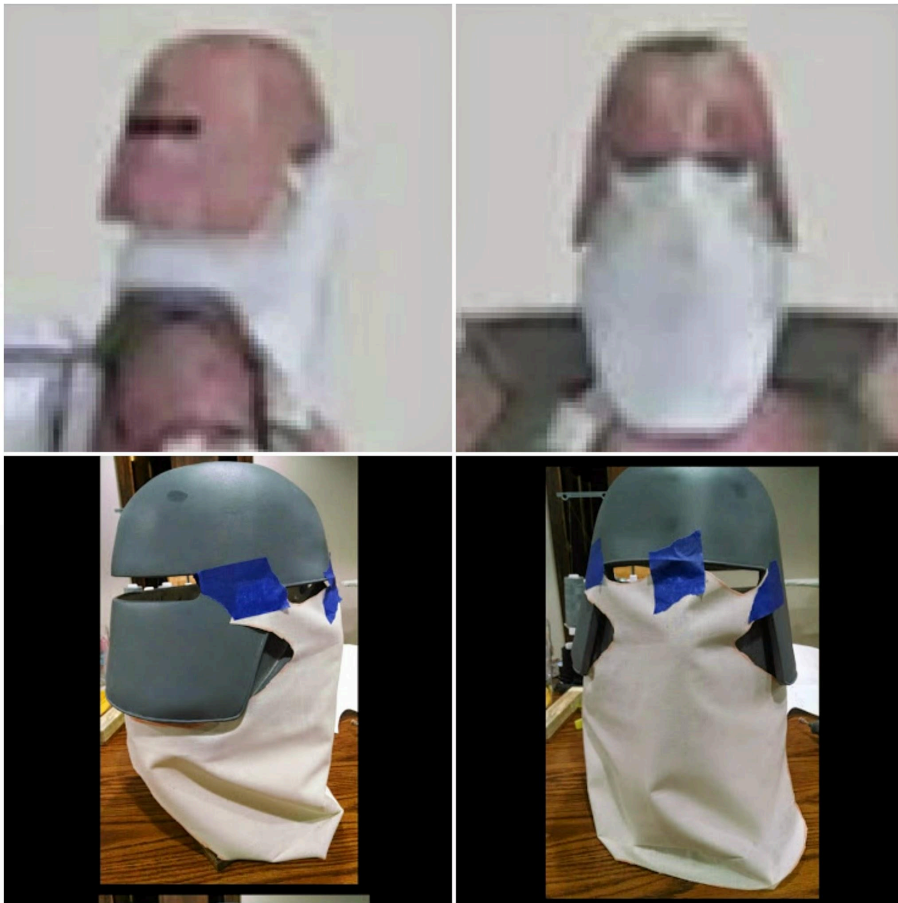
Creating and attaching cowl

Since I have a heatshock helmet, I used the pattern created by Midniterider. Print this out and cut it out of muslin or cheap cloth, to see how it fits on YOUR helmet. You may need to make some adjustments for YOUR helmet, and once you think you have a close pattern, cut it out of marine vinyl.



When you are painting be sure to tape off the beak so that you have a clean surface to attach the cowl. You can see I made a test mockup with this muslin fabric. I did not end up making it wrap all the way around and connect in back. For me it has a front and a back piece so that it can have an open seam on the sides.





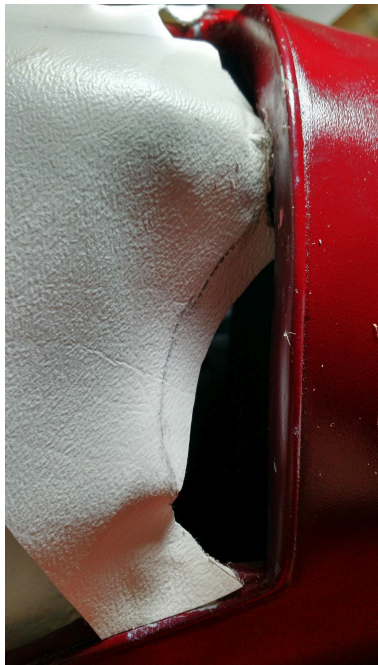
Vinyl template partially applied with hot glue



Some pieces don't fit perfectly, so you may have to trim them with an exacto or possibly heat it up with a hair dryer and stretch it. This may heat up the glue so be careful.



Here I'm tracing the line of the eye hole so I can trim more accurately with an exacto knife. Trim with scissors, exacto knife, and hot glue down as much as you can. I recommend leaving the bottom part of the cowl long, so that you can see where it falls on your chest armor, then you will be able to properly trim it wearing the rest of your armor. Be sure to check those references so you don't trim too much.

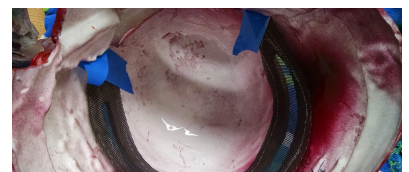
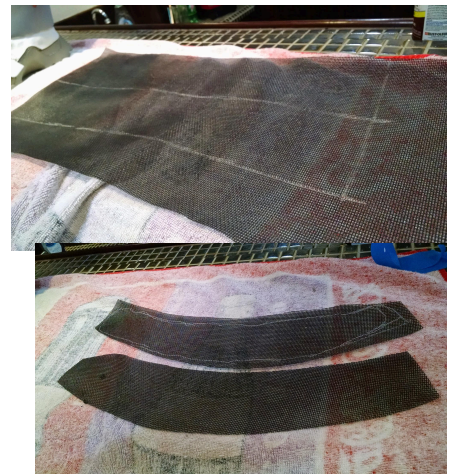


After adding more helmet padding I had to extend the back vinyl a bit so that my neck wasn't visible, so take this into account when you make the back vinyl piece.



Creating and attaching vent mesh

For this I used screen door plastic mesh bought at Home Depot or Menards given to me by my friend Vader Jeff. I held the mesh in place and used a silver permanent marker to show me how much mesh I would need to cover the vent, and extend on the sides of the helmet so I would have something to attach the glue to. You can see I have enough material for two which is helpful because you should double layer it to prevent seeing inside. I used painters tape to hold the mesh in place and ensure it looked good from the outside. After verifying it looked good I took it out and glued the two mesh layers on top of each other with super glue. Once that dried I used tape to hold it in place while I glued the layers inside the helmet.

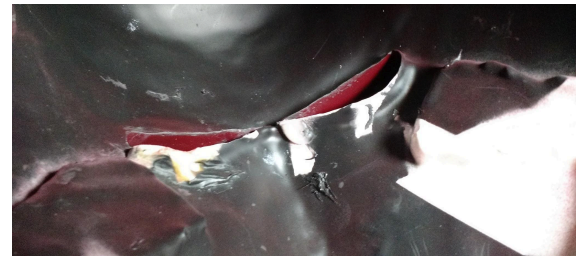




Attaching lenses

I had some smoked plastic left over from a previous helmet kit, but you can use a welders lens off amazon. These can be very difficult to see out of. If you have huge sunglasses or any kind of toy mask with lenses that fit over yours those are other options. I used a heat gun on low heat to warm the plastic so that it would be able to conform to the area the lenses would sit. You can see that it is a curved surface. After a few minutes of warming up the plastic I used oven mits to hold the plastic and see if it would bend slightly with pressure. Once I could tell it would bend I set it on top of the lense on the inside of the helmet and pushed down with my gloves on so that it would form to the curved area.

It can take several attempts and the process is slow going. You want to take your time and make sure you don't burn the plastic by overheating it. This requires patience and you don't want to waste your lens material.



Once you have the lenses formed you can drip hot glue around them to secure them in place. It may not look pretty but this is the method I used and it holds them in place. Try to leave some area for air to pass through so you have less issues with fogging.

You can see in this photo what the lenses look like removed. I have added a piece of padding (cut off of a piece of old knee pads) for the bridge of my nose where the helmet sometimes rests. You want to ensure your helmet is comfortable for you to wear! I popped some old glasses lenses out of a frame and ended up hot gluing them on top of the inside of the plastic in so I don't have to worry about contacts before each troop.



Attaching padding

I bought various thickness of padding from Jo Anne fabric and cut them apart, and added adhesive velcro on the foam, then on the inside of the helmet, so the foam can be moved around. To fit my head comfortably and ensure you have good visibility. This process will take some time to get the helmet in the right spot, so be patient. Make sure it doesn't rest on your nose, and you can move your head comfortably left and right as much as possible.

Chest

Wet forming leather belts is used for the chest, arm, and shin belts.



Get some water boiling.



Pour boiling water in glass bowl/container large enough to put the leather you want to form in.



Add the leather belt you want to form
Be careful about using clamps because any pressure may leave permanent marks that are a pain to remove.

Wet forming the chest belt - excess length cut off after wet forming was complete.



For the shin belts:



Of course these will be HOT to handle!

As soon as I took them out and were safe to handle, I used lots of force to thread the belt through holes I had dremeled in shins. Finally secure around the entire belt with a large rubber band and painters tape to add as much pressure as possible. I had clamps inside to hold the belt tight against the shin to form it to the shape but like I said, be careful where you use clamps and that you have something between the clamp and the leather or else it will leave an impression. Cover the entire thing to ensure there is pressure so the belt forms to the surface of the shin.



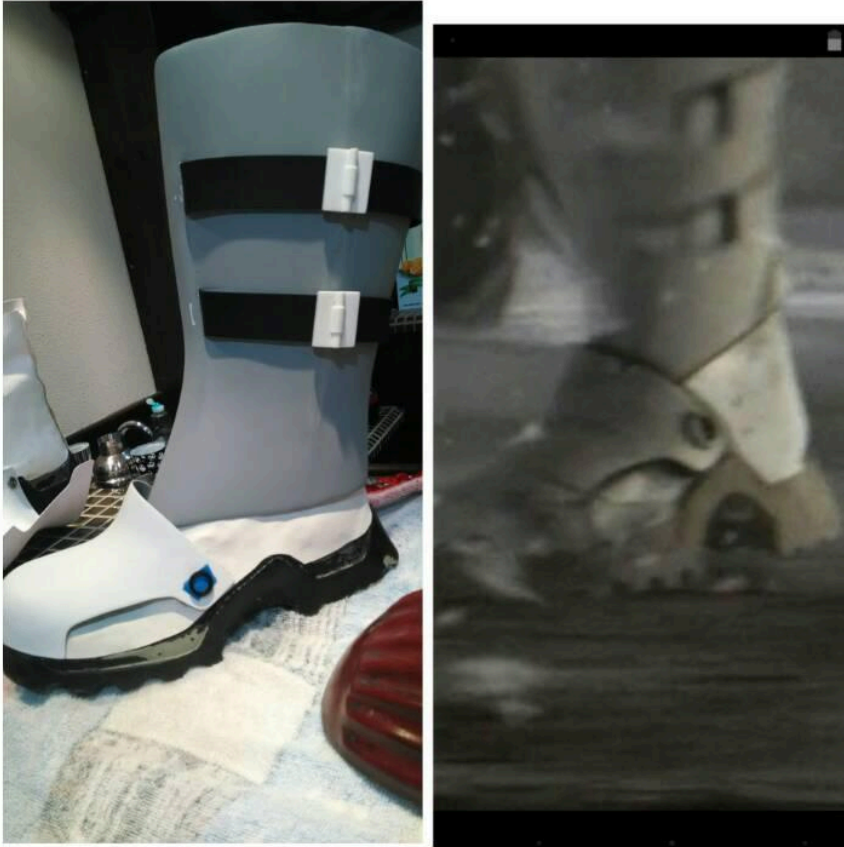
The next day once everything was dry, I drew a light line with a pencil with the belts in place where I wanted them. I slid them down and sanded a small area where I could use devcon

plastic welder to hold the two clean surfaces together.



Test fitting on vinyl covered boot, with boot armor.

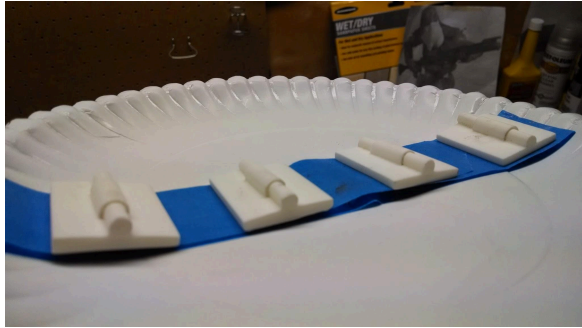
Here you can see the buckles taped on and unpainted shin armor just to get an idea how it's coming along, looking at screen used references as I go along.



I had tested multiple coats of the primer on the leather belt before I wet formed it. It caused no adverse reaction so I went ahead and primed the shins and belt together. Then I applied white paint to the whole piece. Remember that each piece you make is a work of art, then you combine all the pieces and it forms one big piece of art - the finished project.



I would recommend sanding the buckles, then using double sided tape or put one piece of tape end to end, and create a way for them to stick on a disposable surface which you can pick up and rotate and spray all angles when you prime and paint them.



I roughed up the area I would attach the side belt buckles to with sandpaper to make it a clean surface, and then used devcon plastic welder to secure them in place. I used painters tape to secure them in place.

The shin armor rests on top of the boot armor and stays in place without anything securing it.



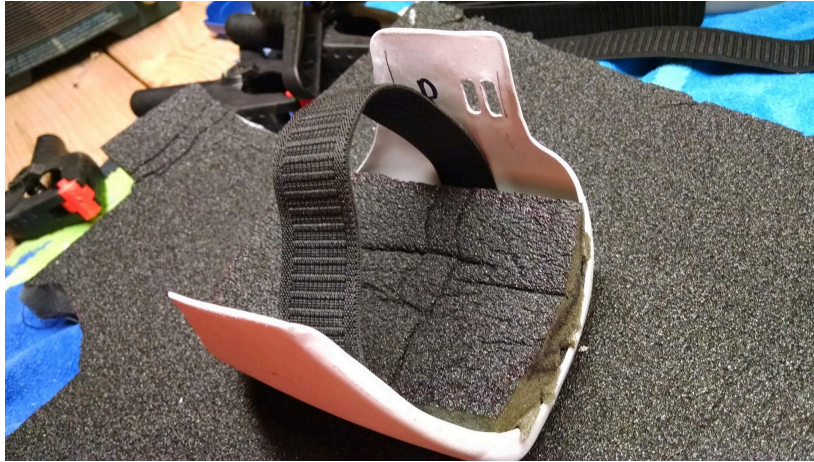
Attaching ammo boxes

I roughed up the area I would be attaching with sandpaper and then following the directions on the epoxy I attached the ammo boxes e-6000. This was for the bicep armor pieces as well as the chest armor pieces. I clamped them down to ensure a secure bond.



Elbow Assembly

After trimming and sanding the elbow pieces I added foam with adhesive backing to the inside so there would be padding to make the armor more comfortable. Next I added an elastic strap, test fitting that I could slide the piece onto my arm.



Then I added the plastic strap, and put on my long sleeve under armor shirt, and ensured my arm fit through the plastic strap as well as the elastic which was tight to hold the piece close to my arm without cutting off circulation. Make sure you can just slide your arm through and it is tight but you can still bend your armor up and down. Once that piece is test fitted with the elastic I glued it down using Devcon plastic welder.





RedKraytDragon Backpack Assembly

Attaching backpack frame to back plate

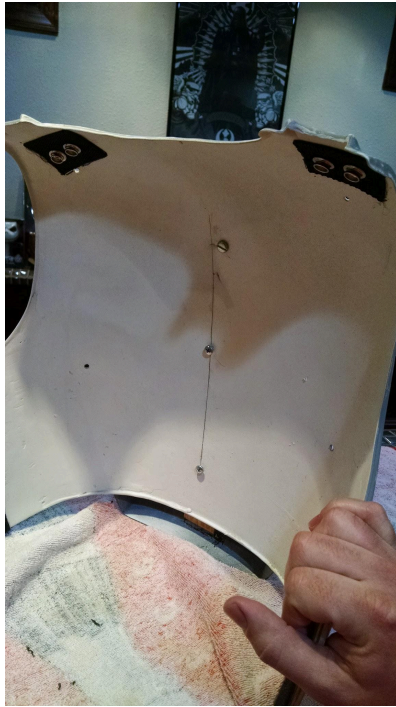
Sand all pieces of the backpack frame. Using your dremel cut the holes for the long cylinder to go through in the backpack frame, and make sure the holes are tight so friction holds the cylinder in place. Slide the cylinder through the hole, it will be tight, but that's how it will stay in place. I taped off the top part of the backpack where the shield will go so that no primer is there. Prime the outside of the backpack frame with the cylinder through it. Wet sand and repeat as much as necessary.

Line up backpack frame in the center of the back plate tape it in place.



I added piece of wood that attaches with enough room the frame to hug the back plate with a very small gap.

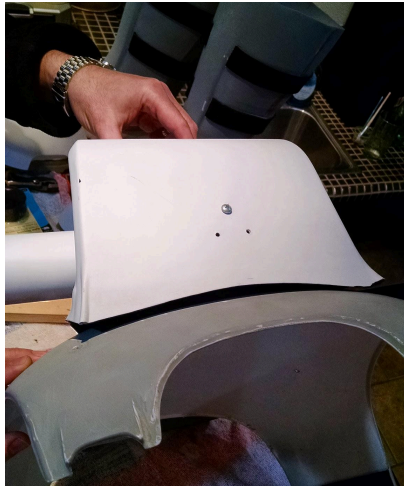




Here are the screws showing how the wood is attached to the back plate. We had to use long screws in order to make it far enough through the back plate into the wood.

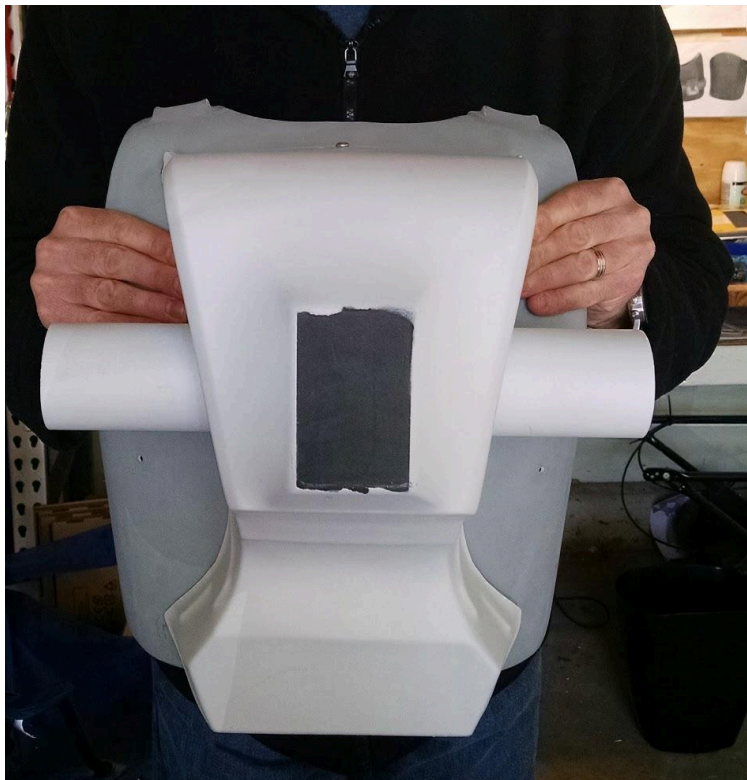


Yes a little of the backpack frame will show under the armor, however this is against your back and no one will see this.



Here you can see the top screw holding the wood in place, there is a matching screw on the bottom. The top screw will be covered by the shield piece not be visible. The bottom one is covered by pouches and no one looks up underneath you. Remember that everything must be held together somehow!

Here is how it looks mounted and primed .

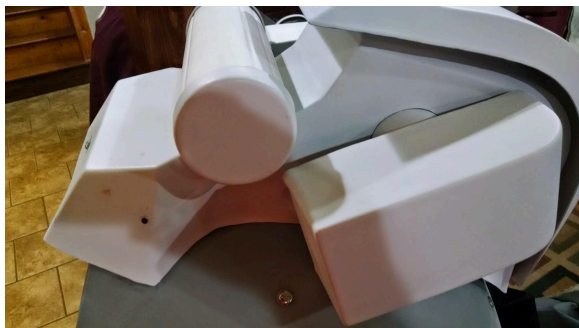
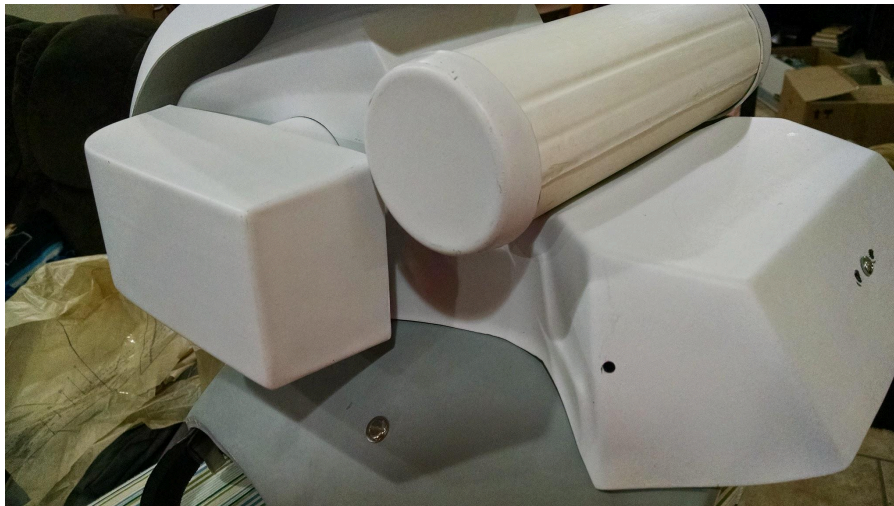


Next I glued on the side boxes by measuring the middle, attaching them there and using devcon plastic welder to glue them in place. I made sure to hold them securely for a minute or two, before securing them tightly with painters tape for added pressure. I left it overnight to dry.

I wasn't sure of the placement of the shield piece onto the top hump, so I used velcro on both to hold it in place. It has held up after 6 troops, and honestly it gives it some mobility if you bump into something, it would just detach, as opposed to ripping the backpack off or causing more damage if attached with devcon plastic welder, so no, it's not perfect, but it works.

On to the T-Detonator. This was included in the backpack kit from RKD. I attached the ridged section to the PVC pipe with devcon plastic weld, and used the same to attach the caps after they were primed and painted. You should always sand any connection points to have a clean surface before attaching them with devcon. This will ensure a solid connection, devcon bonds plastic to plastic (strong bond), not paint to plastic (much weaker). Once the T-Det is assembled, then you measure and ensure it is sitting in the middle of the backpack frame. Then sand both areas to remove any paint, wash them off, and you will have a clean connection point for the devcon. Use devcon plastic welder to hold it in place. You could keep the caps removable to hold keys or money, but I would advise making your pouches usable (which I cover in the next section), and using them to keep your valuables in front of you. If you bought rubber pouch kit, then you may want to keep PVC caps removable.

I used reference images and marked with a pencil approximately where I wanted to drill holes to attach the pouches. Then I made sure they were all approximately the same height and drilled the holes, adding them one by one. For instructions how to create the pouches, check out how to create the belt section below. The same process is used to make the pouches for both pieces.



Here is the pattern for the pouches provided by Midniterider. Print this out, and then cut it out out of white duck canvas, found at Jo-Anne Fabrics.



Sew them together.



Cut a rectangle of ABS and stick it inside to use as backing. Also cut foam and shove it inside to help fill it out. Hold the pouch up to give yourself a half an inch or so, and drill a hole in the ABS, this is how they will hold onto the backpack, with screws and washers on the inside.



At this point I had pinned the pouches shut, but later I used E-6000 to attach rare earth magnets to the flap and opposite side, as the closure.



Backpack pouches completed

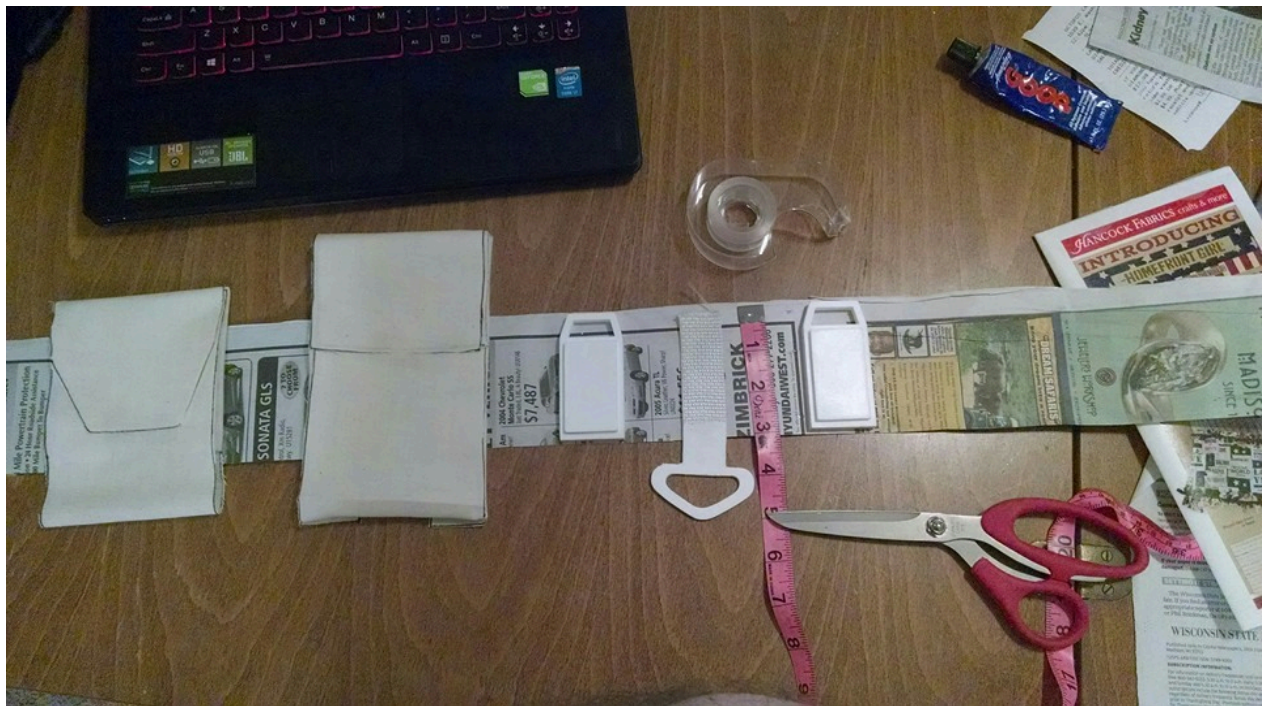


Picture of both backpack and belt pouches attached with rare earth magnet closures.

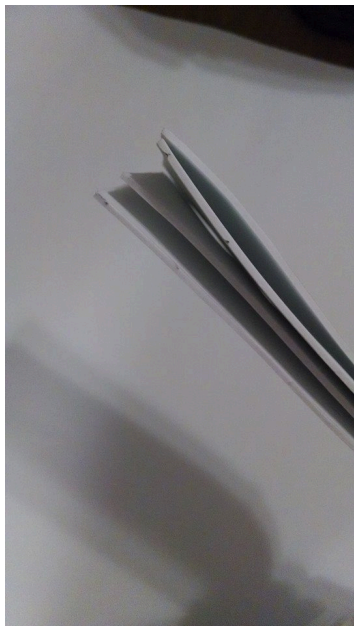


Creating the real usable fabric Belt

The first thing I did was create a paper template with paper pouches and the resin bits I had.



Measure your waist to how big you want the belt to be. Lay out all items on the template. Make sure the template fits you and overlaps. Where it overlaps is where you will add velcro to secure the front and back. Make the part the overlaps behind one of the pouches. Use layered craft foam glued together to form the base for the belt.



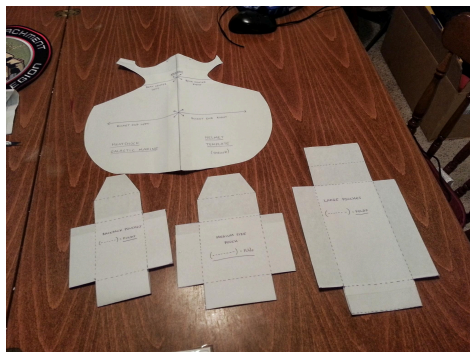


Sew white duck cloth around the base. Sew on hooked velcro on one side, and looped velcro on the opposite side where the belt overlaps. Create this connection point behind one of the pouches to hide it.



Creating Pouches

Download provided patterns for pouches created by Mitniterider and print them out.



Cut them out of fabric



Sew them together.



Use foam to help pad them out.

Finally we will attach them to the belt using E-6000. I used reference images to see where the pouches would be placed. I put the belt on and had my wife measure out from the belt on each side how far the pouches would be placed. What really helped was the belt buckle. used e-6000 on the pouch and the place it would sit on the belt, let is cure for amount of time on the package, then attached them, and held them in place with heavy books.

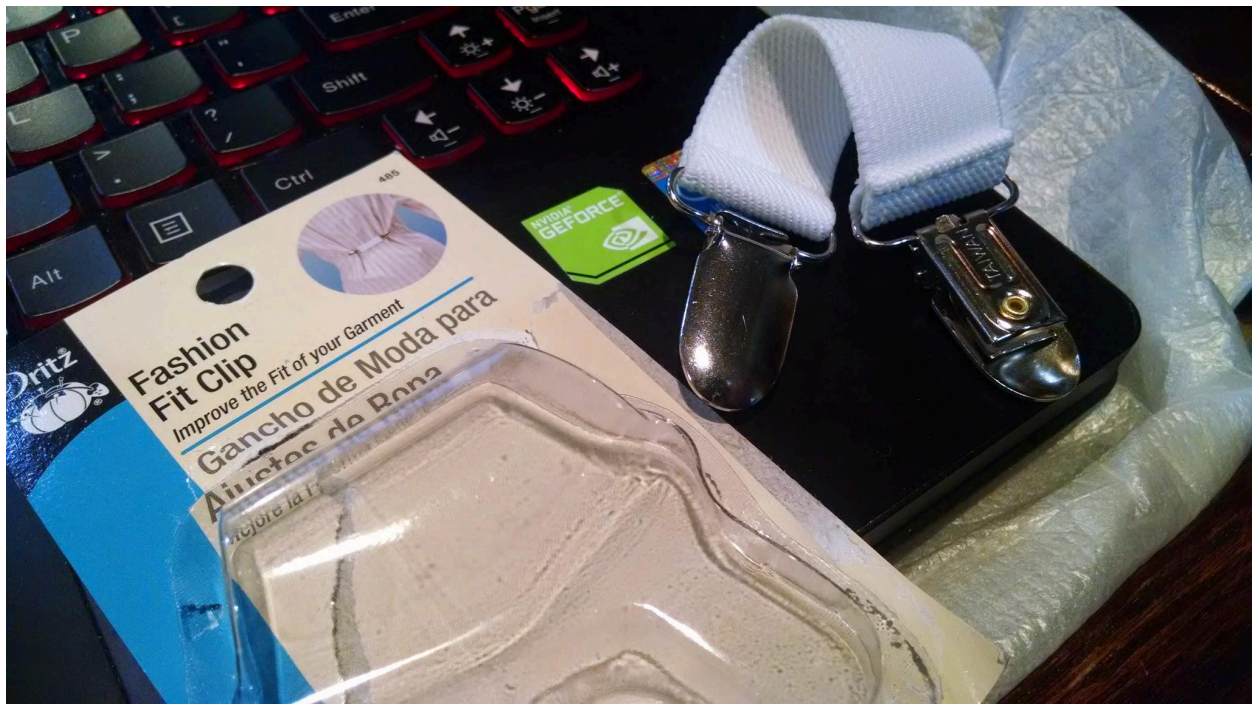


Always compare your pieces and progress with screen used references and the CRL.



Instructions on creating the kama.

I bought burgundy duck cloth from Jo-Anne fabric. Using reference materials I created a test kama out of scrap fabric (muslin). The test looked good, so I cut it out using the burgundy duck cloth. Then I added velcro where it would attach to the belt. I use white bias tape around the edge of the kama. Bias tape was also used for the belts attaching to the bottom belt buckle. I found this fashion fit clip by the sewing section at Hancock fabric. If you search for it online I'm sure you will find something similar. This was used for the white belts to attach to the bottom of the belt buckle.



Attaching belt buckles

Boots

To make boots acceptable for the CRL you have to cover them with white mairne vinyl. Don't buy the fabric backed stuff, make sure it has a slightly rough plastic backing. I traced a pattern on thin paper and transferred that pattern to attach the vinyl with e-6000.

After attaching the vinyl you should let it dry for a day, and then use painters tape to mask off everything but the sole of the shoe. Then follow the instructions on the can of tan plasti-dip, and give it several coats.

Before



During



After



Padding and Strapping

The most helpful tutorial for creating snaps and a strapping system was this hidden snap system tutorial by TK300 <http://www.tonybarnett.plus.com/snaps.html> (original link)
[Snaps and Strapping Tutorial by TK300 Stormtrooper](#) (backup google drive document)

Read that over for the basics and I show you where and explain why I attached snaps where I did.

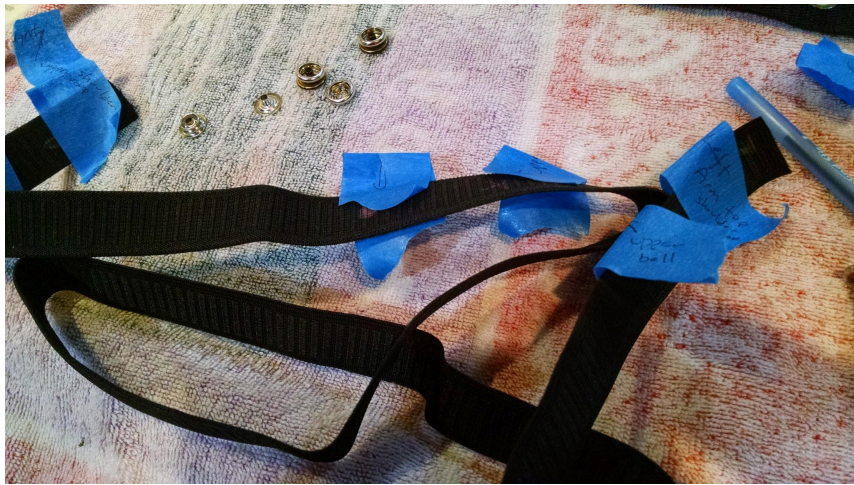
Adding snaps to the hand plate. The first one wraps around you palm, and the second one goes around your wrist.



This is my knee piece with black elastic strap, then flexible silicone strap. I would recommend attaching these two with velcro, and then put velcro inside the knee piece as well. Originally I used snaps, but it was too tight, velcro gives you the ability to re-position it where snaps are a fixed point.



I put on my chest and back and had my friends put a length of elastic down one arm, and measure where each piece of armor would need a snap, and they marked it with blue painters tape, labeling each with the piece of armor. (Left shoulder bell, bicep, etc)



Chest Belt Snaps

Securing snaps for the belt to inside of chest with devcon plastic welder and held in place with clamps. You can see the light pencil marks where the belt will cover.



Chest armor with snaps on top for connection to back piece with webbing. You can also see the snaps used for the belt.



This photo shows the primed chest and back armor attached with webbing and snaps from various angles. It took a long time of trying to get the right length of webbing to use between the

chest and back. My suggestion is to keep trying until it looks correct and doesn't pull awkwardly.



Because of the added weight of the backpack, my buddy Steve added these backpack straps for me. They are actually rifle slings from walmart. Search for rifle sling in the hunting department. These are nice because they are soft almost rubbery texture with grip. He attached them to the back plate with chicago screws. I would recommend making the holes in the slingsn with a soldering iron so that the heat singes the plastic around it and then you have the hole for the screw to go through.



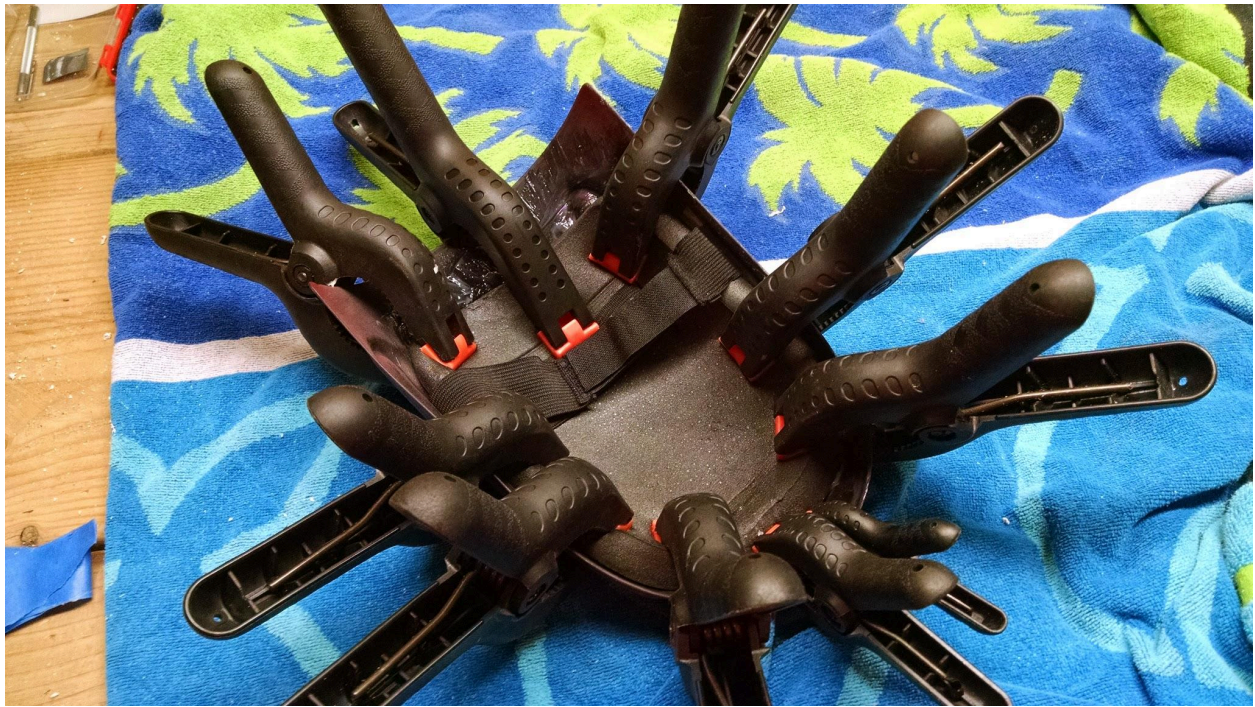


Here is a good shot showing the velcro and the velcro shim piece that connects my chest and back armor. I have seen a solid shim with velcro on it, but that did not work for me. I sewed velcro onto scrap black fabric in a rectangle, and this secures the front and back of my armor.



I bought knee padding from the automotive section of walmart and used devcon plastic welder to secure it inside both shoulder bells. I did not use the elastic to secure it around my arm. It just says in there.





Attaching padding and snaps to biceps and shoulder bells



Secured shoulder pauldrons with elastic. Adhesive loop velcro was stuck on the ABS, with corresponding hook velcro sewn on the elastic.



Attaching Boot Armor

I used velcro on the toe of my boot armor as well as the toe of my boot to keep it in place. I had tried a snap system but there wasn't enough flex when I walked. I would recommend velcro.

Test fitting costume

It may not look pretty, but this is how you know what you fix before it's too late. Test fitting your costume lets you see your progress. You have pieces you can wear - isn't that exciting!? Yes it might not look complete, but that's because it isn't. Test fit often so you can ensure everything you've made this far fits with all your other pieces. Do you have two pieces that rub together or rub against your skin when you walk? Might need to trim them. Two armor pieces pinching you, maybe you will need to add more padding.





This was one of several test fits before leaving for Celebration Anaheim. I needed to get things in place so I could look my best and be as comfortable as possible.





Labeling

Labeling your armor pieces is helpful for many reasons. It helps you if you lose one at a troop, as well as when someone is helping you get dressed you can say “hand me left hand plate” and they will know what you mean.



Improving and Repairing

You are never done with your costume, even once you're approved, there will always be improvements or adjustments to make. You might need to fix cracks in the paint or plastic. Check your armor for cracks at flex points to stay ahead of these things.

It was my goal to finish my GM before celebration, which I was able to do, but it wasn't perfect. You can see once I got back I made some changes so that the costume met my level of satisfaction, before I submitted it. Remember it is your costume, you will be wearing it. If you're not happy then keep working on it until you are!

Before celebration, pre-weathering



After celebration approval photos - post weathering and repaint



Updates:

I also wanted to mention that I re-built my pauldrons out of cardboard and covered them with fake leather because the original ABS ones would not flex enough to fit or conform to my armor.

I cut out paper template and cut for sale sign to fit the 3 pieces for each piece then covered that with fake leather and glued all of it together.

Here is how they attach:



