

## In the Streets

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The goal of this design was to create a garment based on the Theory of Connective Bands (Kuettner, 1971) to visually demonstrate how cloud streets are formed. Widespread cloud bands in the Earth's atmosphere called cloud streets (figure 1) or longitudinal convection rolls are



Figure 1. Cloud Streeting (Bazzell, 2022)

mainly noticeable by aircraft or satellites and are found in tropical and subtropical climates (Kuettner, 1971). These cloud streets are made up of cumulus clouds that are parallel to one another (Schuetz, 1961). If an atmospheric obstacle occurs and changes wind direction, the cloud streets could form a spiraling pattern instead of long parallel lines. They form over oceans or large lakes with flat surfaces (Dempsey, 2022) by masses of warm and cold air rising and sinking in the atmosphere. Longitudinal rolls will develop with this convective motion (Kuettner, 1971). Gravity pulls down the cooler denser air while the warmer less dense air is pushed higher forming long rows of clouds.

## Aesthetics

This design started with the vinyl bubble inspired by a beach ball and represents the earth's atmosphere where clouds are formed. The bubble sits on the shoulders of the wearer with an opening at the top and bottom for the head and legs. The structure is supported by ½" plastic boning sewn into the seams and hem. Plastic tubing with wire was installed for additional support. Because of the support of the boning and wire, the walls of the bubble stand out from the wearer, allowing for plenty of room for arm movement inside the bubble. Strips of gathered tulle and netting were added around the underdress to represent the cloud streets that are formed. These strips are sewn onto the underdress parallel to the piping. The piping was made in a contrasting fabric to the dress to represent the parallel longitudinal lines formed by the convective motion that creates the cloud streets. These piping parallel lines are continuous around the garment.

## Methods

To create the clear bubble pattern, a section of an inflatable beachball section was measured and transferred onto paper. This pattern was digitized into Optitex and exported into Adobe Illustrator to scale the pattern up to fit a human. A muslin was made from stiff home decor fabric. The bubble was created out of clear PVC vinyl and fit on the dress form. Out of the six vertical seams on the bubble, all but one was sewn together to leave an opening to don and doff. Once the final size was confirmed, the bubble had ½" plastic boning stitched to all the pressed

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Figure 2. Process photo

open vertical seams. After fitting on the dress form again, the decision was made to add a horizontal boning strip around the center of the bubble. This would add a support structure at its widest point to help the bubble not collapse on itself. Two plastic separating zippers were shortened and added to the opening after. The zipper tape was folded in half the length of the zipper tape to match the width of the boning. The zippers were sewn onto the top and bottom portions of the bubble. When closed, the zipper pulls meet in the middle of the bubble at the horizontal boning and the separating ends of the zipper at the neck and hem. A section of fabric was added to create a zipper stop and to continue the visual vertical line. One strip of boning was inserted behind the left zipper tape to give it the structure needed to hold its shape. The neckline was finished with ½” wide white bias tape. With the vinyl being clear and marking tools would not work, it was challenging to shape the neckline for a symmetrical look. The bias binding was used to get a visual by pinning and shaping the binding on the bubble while on the form to overcome this challenge. To finish the hem, the vinyl was folded into the bubble and top-stitched around the boning. After completion, the bubble was still collapsing in on itself (figure 2), a ¼” tube with wire was inserted behind the horizontal boning strip for extra support. The tubing is held into place by a fishing line tied around the boning using a fishing knot.

The linen underdress was created by draping a simple princess seam dress. Next, after the pattern was copied to paper, style lines were drawn creating the vertical lines. Each panel of the dress is slightly wider at the hem to achieve the visual look of parallel lines. Piping was made from a contrasting fabric and cut to the length of each seam including the side seams. Once checked on the dress form and confirmed to move forward, an invisible zipper was added to the garment’s left side seam, between the piping and the main fabric. To clean finish the edges, facings were added to the neckline, armholes, and hem.

The “cloud streeting” was created by using a nylon tulle and netting to create dimension. Instead of being cut straight, the strips were cut using a wave-like pattern to create different heights in the ruffles. Each strip has two layers of gathered tulle and one layer of gathered netting sewn together. A narrow seam allowance was created by cutting the seam down to 1/8” and using a zig-zag stitch to bind it together, a technique usually used in heirloom sewing to create puffing. Each strip was hand sewn to the dress parallel to the lining. The collar was created using the same process as the cloud streeting strips. The strips of gathered tulle and netting were layered on the dress form to build the collar. A bias strip was sewn onto the seam allowance of the collar and hand stitched to the neckline of the bubble. Clear plastic snaps were added to the right side of the collar after it crosses over the zipper of the bubble.

#### Cohesion and Contribution

This design was created to represent the Theory of Connective Bands cloud streets and to show the relationships between the wind, convective motion, and parallel rolls. The piping represents the longitudinal convective rolls that help form the cloud streets. The gathered tulle rows placed strategically around the underdress represent the cumulus clouds in the cloud streets. The clear vinyl bubble structure represents the earth's atmosphere and the continuous spiraling pattern of the warm and cold air movement that rises and falls. This design builds on other recent designs exploring and inspired by nature (Zhang, L. et al. 2022 & Hwang, C., Collins, J.).

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