

convair 880 lavatory

exploring the representation of aircraft interiors

Architectural History Thesis

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The Convair 880 Lavatroy by Dorothy Draper

Starting her career in 1923, Dorothy Draper began her own design practice called "Architectural Clearing House" which would later become Dorothy Draper Company. Dorothy Draper quickly became one of the most influential interior decorators of her time, using affordable materials to create lavish interior spaces.

Draper developed a style that utilized vibrant colors, patterns, and practicality which in turn made her a sought after designer. In 1936 she published a book titled 'Decorating is Fun! How to be Your Own Decorator'. Which acted as a guide for others to achieve her style of bold design. Throughout her career, Dorothy Draper designed interiors for hotels, restaurants, theaters, department stores, commercial establishments, private corporate offices, the interiors of jet planes and automobiles. Towards the end of her career, Dorothy Draper established herself as a bold, confident designer when she retired in 1960.

The paper explores the representation of aircraft interiors and how Dorothy Draper's design of the Convair 880 Lavatory is unlike any other representations before and there after. Allowing for her drawing to stand out and convey more information than typical interior representations.



The Convair 880 Lavatory by Dorothy Draper. It was made for (as the client) General Dynamics Corporation. Its medium is airbrushed gouache, brush and gold paint, graphite on illustration board.

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Introduction

Known for her affordable lavish design styles, the American interior decorator Dorothy Draper (1889-1969) quickly became one of the most influential interior decorators of her time. Draper developed a style that utilized vibrant colors and patterns to appeal to luxurious clients through the use of low budget materials, making her a sought after designer. As a result of her successful career as a bold designer, Dorothy Draper was asked to create one of her famous luxurious interior spaces for the Convair 880 Aircraft. At a time when the aircraft industry was experiencing what was known as the "lounge wars" (Schulman, 2017). Every major airline was competing for high-end clients to use their services by creating more and more luxurious interiors within the aircraft. At the same time, Dorothy Draper's career ran almost parallel to the development of Aircraft interiors and it became apparent that Draper and the Airline industry would eventually cross paths.

The interior design of the Convair 880 was also one of Dorothy Draper's last designs towards the end of her career in 1958-59, and also one of the last projects that took place during 'the great lounge wars' amongst airlines. The paper aims to focus on the representation of aircraft interiors and questions how abstract representation of interiors can provide more information than literal perspectives. Going beyond notational representation and utilizing the viewer's imagination in order to convey the interior design that would otherwise not be shown through literal perspectives.

The drawing of the Convair 880 lavatory is unlike any other representation of an aircraft interior and provokes the question, is there an 'ideal' drawing convention or style that best represents



Figure 1: Dorothy Draper. Retrieved from <https://archive.curbed.com/2015/7/1/9944754/dorothy-draper>



Figure 2: Dorothy Draper, with a Convair executive, working on the design for their airplane interiors on behalf on Howard Hughes. Retrieved from <https://www.dorothydraper.com/historical/>

aircraft interiors? In turn, is Dorothy Draper's representation of the Convair 880 the best way to represent an interior design of an aircraft? The paper aims to explore and answer these questions in order to gain a deeper understanding of Dorothy Draper and the interior design of the Convair 880 Lavatory.

To examine these questions, the paper will explore how both the timelines of Dorothy Draper's career and the interior design of aircraft play a vital role in the overall design and execution of the Convair 880 Lavatory. Moreover, the representation and design of aircraft interiors will also be explored further to compare previous projects with the Convair 880. It will examine what makes Dorothy Draper's representation successful compared to the other interior design representations of aircraft. As a result, the drawing itself will then be analyzed and broken down to develop a clear understanding of what the drawing is trying to achieve and how. Finally, the paper will look at the importance of abstraction in drawing representation. In the context of the drawing, is abstraction essential in order to convey a design concept? All of this will result in a conclusion that answers the proposed questions and provides greater insight into the representation of aircraft interiors. The utilization of the imaginative drawing will be explored further.

I. The Timeline

Draper began her design practice in 1923 with the name 'Architectural Clearing House'. At the time, it was unheard of that a woman would go into business for herself (Dorothy Draper & Company, 2016). Her bold personality was reflected in her designs and allowed for her to stand out as a designer. Carleton Varney¹, who was Dorothy Draper's mentee, states in his biography of the designer that "she revolutionized the concept of "design", by breaking away from the historical "period room" styles that dominated the work of her predecessors and contemporaries." (Varney, 1988). One of her first major projects in 1930 was the Carlyle Hotel, where she was able to design with cheap materials but created the appearance of being extremely expensive. After the design of the hotel, the term 'Draperisms' began to form. Draperisms are key Dorothy Draper signatures that included massive black-and-white checkerboard floors, elaborate plaster moldings, and wide stripes that could be painted by hand. These 'Draperisms' became more and more apparent throughout



Figure 3: Carlyle Hotel Interior. Retrieved from <https://archive.curbed.com/2015/7/1/9944754/dorothy-draper>

¹As an artist she was a modern, one of the first decorators of the breed, and a pioneer. She invented "Modern Baroque", a style that had particular application to large public spaces and modern architecture. She craved public space, the canvas on which she did her most inspired work. (Varney, 1988)



Figure 4: Palácio Quitandinha em Petrópolis Lobby. Retrieved from <https://pin.it/2IKdmXh>

her projects, through the use of bold color choices, patterns, finishes and detailing. An example of these 'draperisms' can be clearly seen in the interior of the Fairmont hotel in San Francisco, designed in 1934. Dorothy Draper made use of what she described as, "masses of beautiful color, a sense of balance and scale, and an awareness and love of smart accessories" (Owens, 2005). It was these characteristics that largely defined many of Dorothy Draper's designs. Moreover, it allowed for her to stand out as a designer, especially during the 1930s when the Great Depression was devastating the American economy. Her designs helped to create the appearance of luxury for cheap budgets, allowing hotels to charge more for their rooms simply because it had the appearance of being expensive. In contrast, The Palácio Quitandinha em Petrópolis in Rio de Janeiro is a notable project due to its extreme cost during a time of economic crisis. Showing how revered she was as an interior decorator.

After establishing herself as a well known interior designer, Dorothy Draper publishes her own book titled 'Decorating is Fun! How to be Your Own Decorator in 1939'. In this book, Draper provides insights into how she creates spaces and provides the opportunity for others to do it themselves. Moreover, "Draper was not only a woman but an autodidact with an uncommon sense of assuredness, whose early success grew out of a combination of instinct and bravado rather than academic training" (Owens, 2005). The book began to make her even more popular than she already was, propelling her into working in other design related professions. In the 1950's Dorothy Draper started designing the interiors of automobiles. This was at a time where Draper began to go beyond hotel interiors and started to look at other mediums she could apply her unique style to. She did a "line" for Packard and Chrysler where her use of vibrant colors was utilized to create a bright red leather interior with white accents and aluminum finishings. The 1952 Packard was advertised as "Fashion-keyed by Dorothy Draper", as she was so prominent at the time the cars ended up selling very well. In an article, the Packard stated the car was "The smartest - with exclusive beauty that reflects the daring originality and comfortable practicality of Dorothy Draper." (Vouge Article). The article promoted Dorothy Draper as one who could create amazing original interiors while still maintaining a high level of comfort and practicality.



Figure 5: 1952 Packard Interior. Retrieved from <https://www.flickr.com/photos/coconv/14787755984>



New 1952 Packard "300"—one of eight new models in four price ranges

Overnight.....it's one of the Packard immortals!



Throughout the fashion world, the achievements of Mrs. Dorothy Draper have long been legendary. Now, for the first time, she has brought her talents to the field of motoring... in the magnificent new 1952 Packard.

Consistently, up through the years, Packard has dominated motordom's roster of never-to-be-forgotten cars.

And now, here in your time, is the greatest Packard of them all.

The *smartest*—with exclusive new beauty that reflects all the daring originality... and comfortable practicality... of talented Dorothy Draper.

The *finest performing*—with the incredible smoothness of Packard Thunderbolt engines, America's highest-compression eights...

the unequalled simplicity and efficiency of Packard's exclusive Ultramatic Drive... and the most restful riding and driving ease you've ever known!

The best *long-range buy*—with deep-down, precision-built goodness that mellows with mileage... stays silently new, year after year after year.

Definitely—never has a Packard so clearly deserved to be called an "immortal." And never has a Packard been so practical to own!

ASK THE MAN WHO OWNS ONE

PACKARD for 1952

FASHION-KEYED by DOROTHY DRAPER

Figure 6: Vouge Article About Draper's Design of the 1952 Packard. Retrieved from <https://www.motorcities.org/story-of-the-week/2014/remembering-dorothy-draper-mary-ellen-green>

During 1930 to 1960, the cost of flying was extremely expensive and out of the realm of possibility for most people. Due to the costs, it was up to the airlines to convince those who were wealthy enough to travel with their airline instead of the competition. Airline companies would push themselves to develop a product that was efficient, traveled long distances and had luxurious interior spaces that made flying a comfortable and valued experience. In 1930 a German Architect, Fritz Augus Breuhaus de Groot designed the interiors of the Heinkel 70 commuter plane for Lufthansa. It served as an important moment in aviation history because popular architects and designers were being brought on to create the interiors of vehicles such as ships, aircraft, trains, and automobiles. While around the same time in 1935, Norman Bel Geddes completed the interiors for Pan American's famous China Clipper (The Flying Boat). These seaplanes were the most luxurious form of travel, acting as flying and floating five-star hotels, roughly the size of a modern, commercial jet plane (Clarke, 2004). Images of the China Clipper can be seen in figures 7 and 8. Norman Bel Geddes set out to create a lavish interior and fitted the aircraft with lounges, dining areas, sleeping cabins, and dressing rooms. It became a pivotal point



Figure 7: China Clipper (flying boat). Retrieved from <https://www.messynessychic.com/2017/12/15/the-long-lost-world-of-the-luxury-flying-boat/>

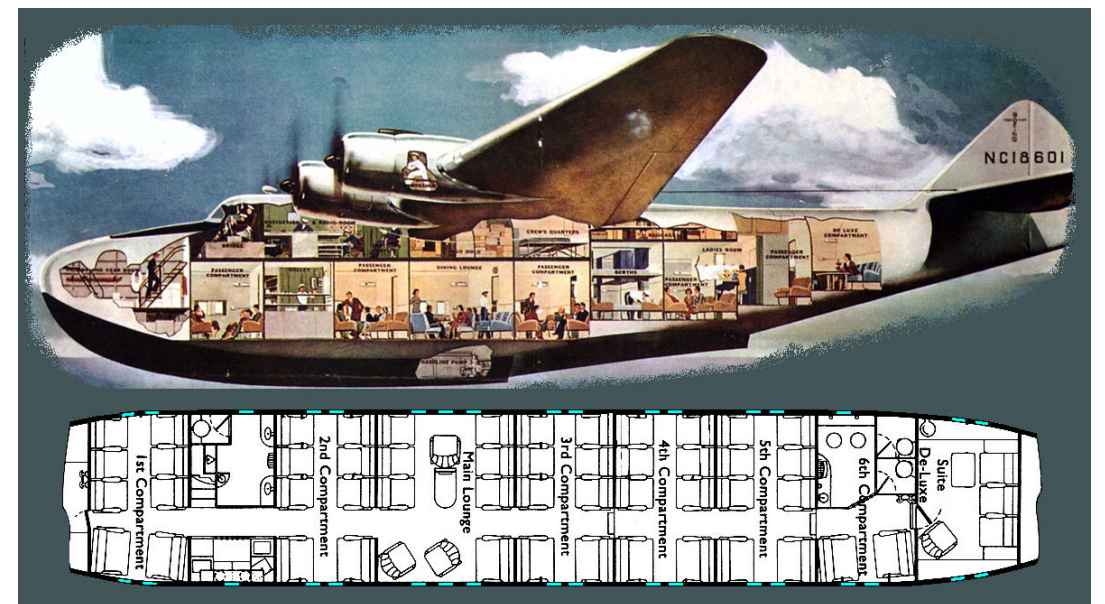


Figure 8: China Clipper (flying boat). Retrieved from <https://www.messynessychic.com/2017/12/15/the-long-lost-world-of-the-luxury-flying-boat/>



Figure 9: United Airlines' DC-3 Lounge. Retrieved from <https://www.pinterest.ca/pin/498844096229163013/>

in aircraft design as it began to allow for designers to think of aircraft as flying living rooms and set the bar high for interior design of aircraft. In parallel, Henry Dreyfuss, an American industrial designer who worked on various train interiors. He placed a focus on improving the look, feel and usability of products. Dreyfuss was then brought on to design living room environments for lounge chairs in the United Airlines' DC-3s in 1936. The focus on practicality along with appearance got designers to think more about the entire experience of air travel. With a need for more practicality being introduced, Raymond Loewy, a French-American industrial designer, designed the interior of the Boeing 307 Stratoliner for TWA in 1939. This project was before the Convair 880, and serves as an important project because it is the first project to highlight the design of a lavatory. The design of the lavatory can be seen



Figure 10: Boeing 307 Lavatory. Retrieved from <https://secure.boeingimages.com/archive/Boeing-307-Stratoliner-Lavatory-2JRSXLJZUP3.html>

here. Loewy created a lavatory that was extremely spacious with mirrors set at different heights and a seat to sit comfortably for the women to touch up their makeup. The finishes are what you'd expect in a restaurant of the time. Loewy even used a bright pink wainscoting in the interior, perhaps influenced by one of Draper's projects.

After her successful design of the 1952 Packard, Dorothy Draper was then asked to be a designer for the Convair 880 airplane along with Harley Earl, an American automotive designer. Who designed the general layout, typical seating rows, seats and overhead luggage compartments. While the two major designs within this aircraft, the lounge and the lavatory were designed by Dorothy Draper. The interior design utilizes Drapers style, with the use of vibrant colors and glossy finish materials. Yet they also appear to be spacious and comfortable for the user. It is at this point where the aircraft industry intersects with the timeline of Dorothy Draper's career. The developments of Dorothy Draper's career and the aircraft industry both placed a focus on luxury and comfort, during a time of economic crisis. Developing a sense of individuality to stand out from the rest of the competition, both airline company and Dorothy Draper were focused on developing a unique style that would ultimately converge for the design of the Convair 880. The drawing of the lavatory captures the two timelines coming together to create not only a unique design but a unique drawing style as well.



Figure 11: Convair 880 mock-up interior. Retrieved from <https://www.pinterest.ca/pin/304555993527078863/>



Figure 12: Convair 880 Interior Images. Retrieved from <http://content.deltamuseum.org/reader-rails/Convair880/#>

II. Representation of Aircraft Interiors

Up until 1958, when Dorothy Draper designed the interior of the Convair 880 lavatory. The interior design of aircraft aimed to present a sense of luxury and class. When airlines displayed their lavish interiors to consumers, they would often use photographs showing people of high class enjoying their flights. The people were often smiling and laughing in large groups to portray an enjoyable experience and to showcase how spacious the aircraft could feel. As seen in the following examples³, the people in these photographs were clearly of high societal status based on not only their clothing but the interior of the aircraft. These interiors created a wealthy atmosphere that would entice others to fly with the airliner as

³Schulman, B. (2017, December 7). Airlines battled for Your Butt in 'the great lounge war'. HuffPost. Retrieved March 16, 2022, from https://www.huffpost.com/entry/the-great-lounge-war_b_5863774



Boeing 377 Stratocruiser | 1949



TWA coach 'living room' | 1971



Coach piano bar on an American 747 | 1971



Boeing 747 Captain Cook Lounge



Figure 13: Interior images of various Boeing Aircraft. Retrieved from <https://www.boeing.com/history/>

well. Sometimes photographs would only show the aircraft without people, to highlight the expensive use of materials and to make it seem like the interior was bigger than it really was. In these photographs it is clear that there was a lack of space, yet in order to sell these images to potential clients, the photograph would focus on the design of the interior rather than the atmosphere of people enjoying that space.

Moreover, very rarely illustrations were used to represent literal aircraft interiors and even more rare was drawing used to manipulate the reality of aircraft interiors like the drawing of the Convair 880 lavatory. An example of a drawing style that could be seen as both imaginative and notational was the



Figure 14: Boeing Model 326 Lavatory. Retrieved from <https://secure.boeingimages.com/archive/Boeing-Model-326-Lavatory-2JRSXLXNW31.html>

drawing of the Boeing Model 326 Lavatory. It is an important drawing because it is a design of a lavatory that could have influenced Dorothy Draper's design of the Convair 880 lavatory. However, the drawing of the Model 326 is a very literal perspective, utilizing typical vanish points. The drawing is not skewed, nor is it hiding partitions to make it feel more open. Yet the graphic nature of the drawing brings in an imaginative quality to it, keeping the materials ambiguous and highlighting certain finishes in black. The lack of color allows for the lavatory to feel more open and allows the viewer to imagine potential materials and finishes. Boeing used the same drawing style for the dining area of the Boeing Model 326. The use of black for the flooring, chairs and even on some of the walls anchors the

drawing down, while the use of white for the ceiling creates a sense of openness and height that contrasts the reality of the interior. This style of representation has only been seen in these specific drawings for Boeing, yet the drawings offer an interesting perspective on the representation of aircraft interiors. It allows the airliner to keep its materiality ambiguous while showcasing a sense of spaciousness and clean design that could appeal to potential clients. For this drawing type, it is about the representation of surfaces depicted in the drawing, rather than trying to manipulate the perspective and hide unnecessary objects, focusing on the literal perspective with the abstract representation of materials.

However, in 1955 G. Th. Rietveld, a dutch designer and architect was asked to create a design for the airplane manufacturer Fokker and KLM. Understanding the constraints of the aircraft as a long narrow tube with low lighting was a perspective yet to be publicly observed in aircraft design. In order to combat this, Rietveld experimented with the use of color in order to create a sense of spaciousness. When designing the interiors Rietveld generated a series of drawings to showcase the interiors. Some of these drawings are literal plans and elevations, acting as notational representations of the design. Even a couple of perspectives were drawn from a realistic viewing point within the aircraft. Similar to the drawings for the Boeing Model 326, the drawings use a literal perspective with an abstract representation of materials. This allows for the drawings to maintain a sense of imaginative qualities, yet the perspective of the viewer remains realistic. Generating a sense of balance between an imaginative and notational drawing type which acts as a powerful representation when presenting to potential clients. Allowing the client to have an association with the location, yet is still able to imagine what material qualities could attain the colors depicted.



Figure 15: Aircraft interior design drawing by Rietveld in the 1950s for KLM. Retrieved from <https://100jaar-destijl.hetnieuweinstituut.nl/en/aircraft-interiors-g-th-rieveld>

⁴ The aircraft interiors of G. Th. Rietveld. 100 years of De Stijl. (2017, May 22). Retrieved March 16, 2022, from <https://100jaar-destijl.hetnieuweinstituut.nl/en/aircraft-interiors-g-th-rieveld>



Figure 16: These drawings served to show the client different possibilities that could be done to the interior of the aircraft. Rietveld uses both perspective and isolated drawings in order to convey his design intent of creating a spacious feeling within the cabin.

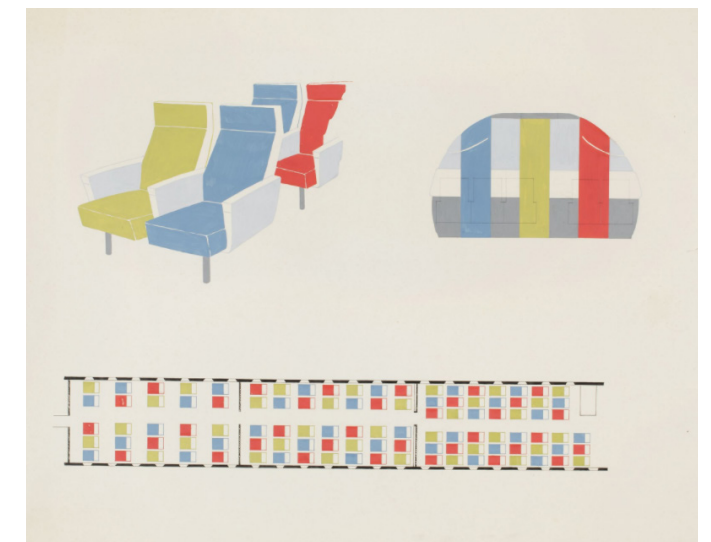




Figure 17: KLM Douglas DC-8 Lounge Space. Retrieved from <https://100jaar-destijl.hetnieuweinstituut.nl/en/aircraft-interiors-g-th-rietveld>

However, there were a couple of drawings that were more imaginative, taken from abstract viewpoints, removing walls and isolating objects to convey the sense of spaciousness he initially wanted. One of these drawings has striking similarities to the drawing of the Convair 880 lavatory, with the lounge being isolated in space and having a section-like cut to open up the interior. Yet the drawing was only done a couple of years before the Convair 880 drawing. In comparison, the drawing of the KLM lounge space appears to be more sketchy than the drawing of the Convair 880, allowing for the Convair 880 lavatory to feel like more of a finalized and confident drawing.



Figure 18: Convair 880 Lavatory. Retrieved from <https://collection.cooperhewitt.org/objects/18491729/>

There are striking similarities between the two drawings and how they represent the interior design within an aircraft.

The drawing completed by Rietveld in 1955 appears to have influenced the Convair 880 drawing, through use of isolation and bold colors, the drawing is able to depict more than what would be experienced in reality. Up until Rietveld's and Dorothy Draper's drawing of aircraft interiors, representation of aircraft interiors has strictly been through the lens of a camera or a realistic sketch taken from within the cabin. Yet both Rietveld and Draper are able to better express their interiors through the manipulation of the drawing. The abstraction of the depicted reality is able to go beyond what can strictly be seen and is in fact able to provide an understanding of the interior space as a whole.

III. Convair 880 Lavatory Drawing Analysis

The lavatory drawing is isolated in space, taken from a perspective that does not exist in reality and is unlike most other aircraft interior representations. The selected isolation of the subject matter allows for the lavatory to have a sense of spaciousness that otherwise would not be conveyed had the drawing included other elements such as a clear roof and side partitions on the left of the drawing. The perspective drawing of the lavatory isolates the room so that the subject matter is clear and the overall design intent is conveyed. The Convair 880 aircraft was intended to be a luxurious high-speed plane that would beat the competition. As a result, Dorothy Draper went on to create a design that best represented the intentions of the Convair 880.

Through the use of isolation, the drawing focuses on the lavatory without any other possible distractions. Allowing the viewer to have a clear idea of how that space might be experienced in reality. Yet within the drawing there are subtle references that the space is still located within an aircraft. Through the use of a faint gradient, implying a concave background wall to help locate the lavatory and provides depth to the drawing while maintaining a sense of isolation. The abstract representation enables Dorothy Draper to convey the intangible aspects of the project in a successful way.



Figure 19: Convair 880 Lavatory. Retrieved from <https://collection.cooperhewitt.org/objects/18491729/>

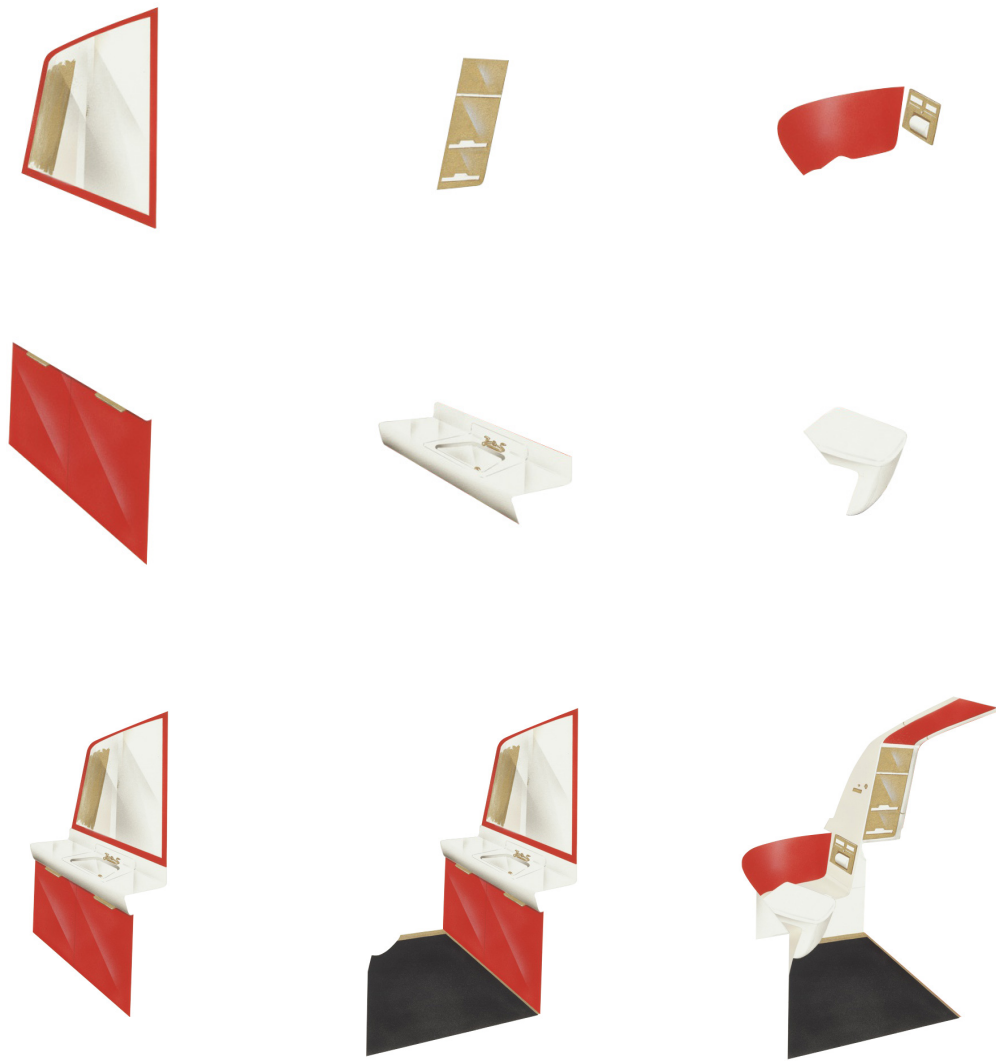


Figure 20: Experimenting with isolating the drawing further into a series of components

Exploring this use of isolation further, the image is broken down into a series of components in order to highlight different aspects of the design. Through the isolation of these components, colors and the detailing of these components becomes apparent. When the components are fully isolated, they appear skewed and some of them would most likely not be clearly understood such as the cabinets or the toilet. However when isolated in a series of components the interior can still be understood yet it feels even more open. This is due to the reduced amount of information, leaving it up to the viewer to interpret how that space could feel or appear. The drawing of the Convair 880 lavatory isolates the lavatory in such a way that the space is still able to be understood. If isolated too much, then it becomes unclear as to what the drawing is trying to convey to the viewer. It becomes a balance of excluding and including information in the drawing so that anyone looking at it can understand what the drawing is about. When isolating the drawing from its background, it is apparent that it plays a major role in the isolation of the lavatory. The background subtly indicates that there is a curved wall of the aircraft, helping to maintain the drawings location. Without the background, the drawing is completely isolated, however it appears to lose a small bit of depth and perhaps feels incomplete or more diagrammatic.

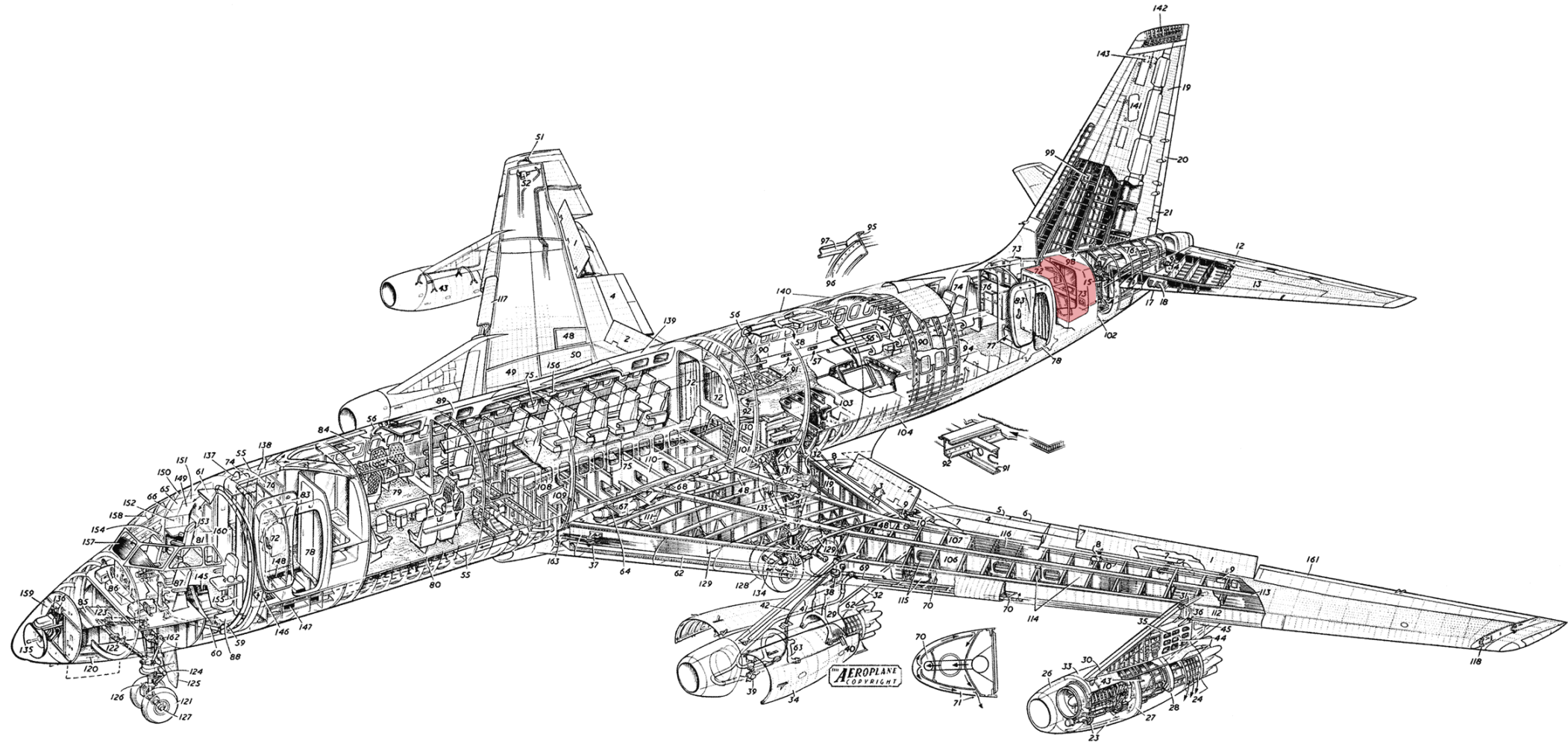
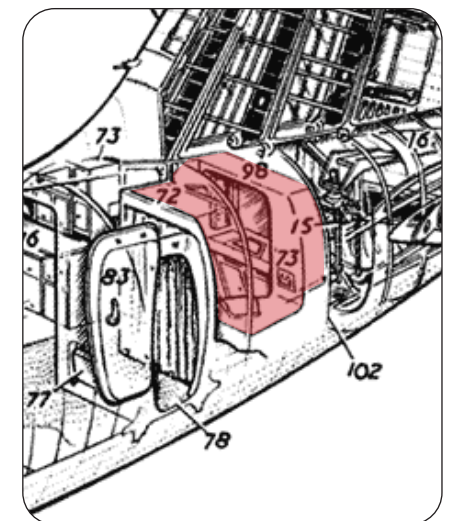


Figure 21: Convair 880 Cutaway Drawing. Retrieved from <https://conceptbunny.com/convair-880/>

The image above is a detailed drawing of the Convair 880 aircraft. Within this image, the lavatory designed by Dorothy Draper is highlighted in red. It is clear that it is a very different drawing type than the lavatory drawing. It shows the importance of isolating the lavatory so that the design is clear to the viewer. Too much included information results in the image above. The field of aviation is extremely complex and technical, however what is seen as most important to customers is the looks and experience of the interior of the aircraft. Dorothy Draper's drawing of the lavatory conveys a sense of luxury and high standards, omitting the unnecessary information so that the viewer has a clear idea of how that space would feel.



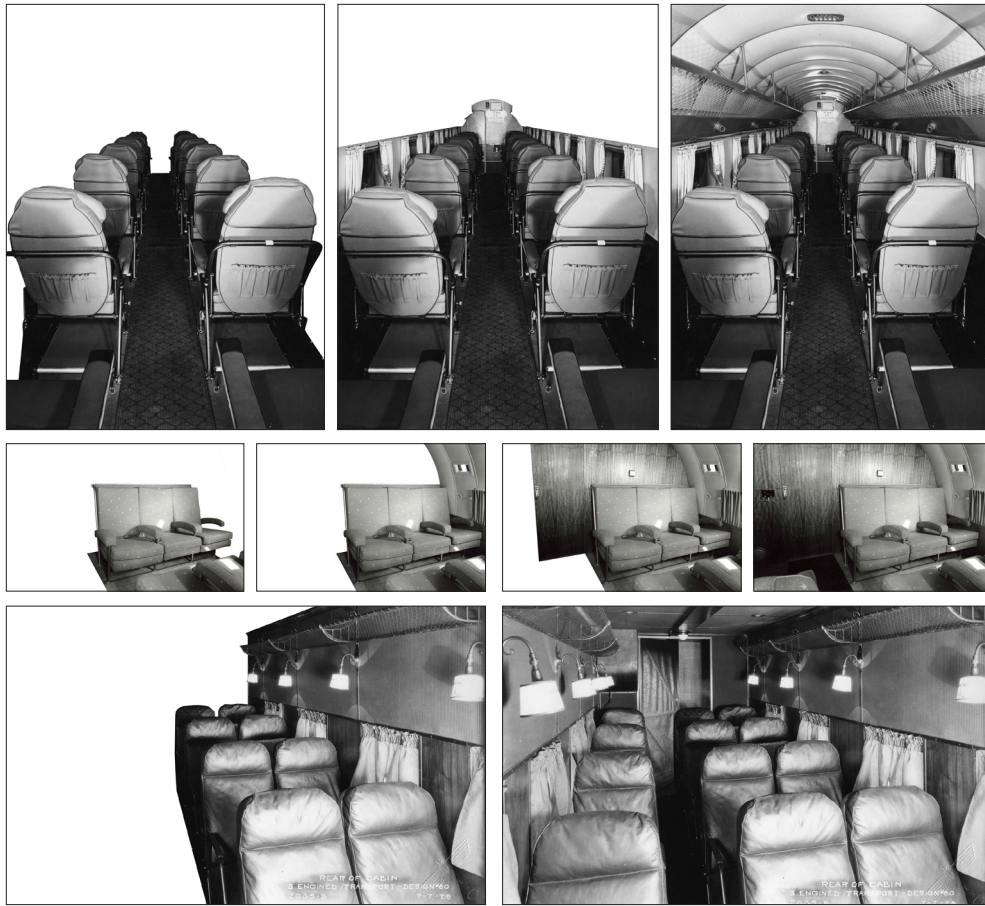


Figure 22: Isolation Exploration

The use of isolation is then applied to some existing photographs of aircraft interiors to determine if it is the use of isolating components that allows for the Convair 880 lavatory to feel more open, or if there are other factors as well. When breaking down these images, the image does feel more open due to the enclosing elements such as walls and roof being removed. However, these images do not convey the same quality as the Convair 880 lavatory. This is most likely due to the use of perspective in the drawing that would allow for the lavatory to feel more open. The same could be done in photography with the use of different lens lengths, allowing for interior images to feel more open as well. However at the time of these photographs, changing the lens length may have not been available.

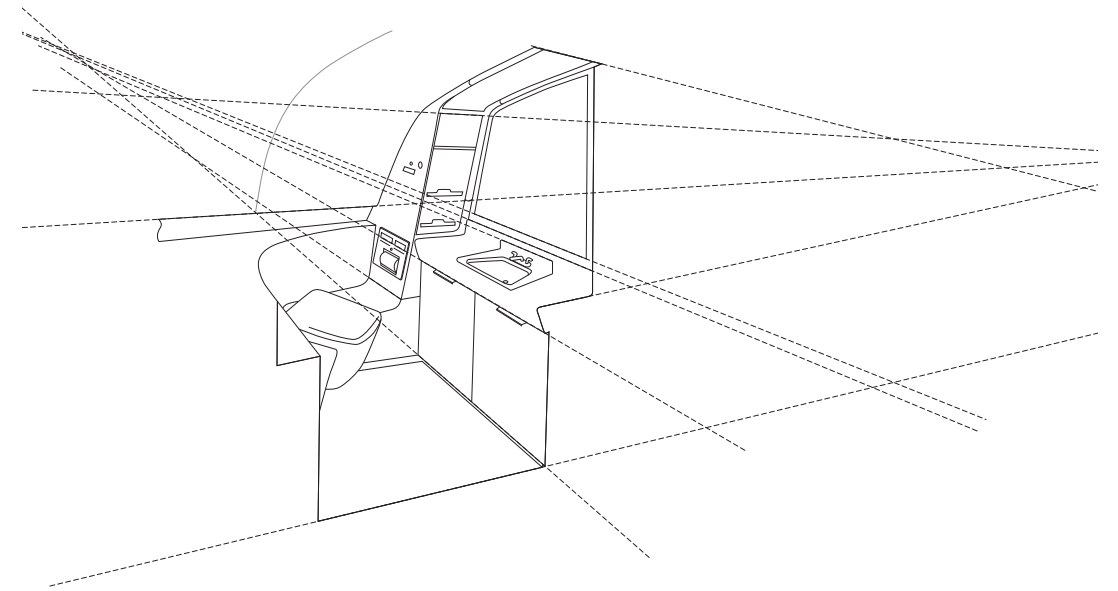
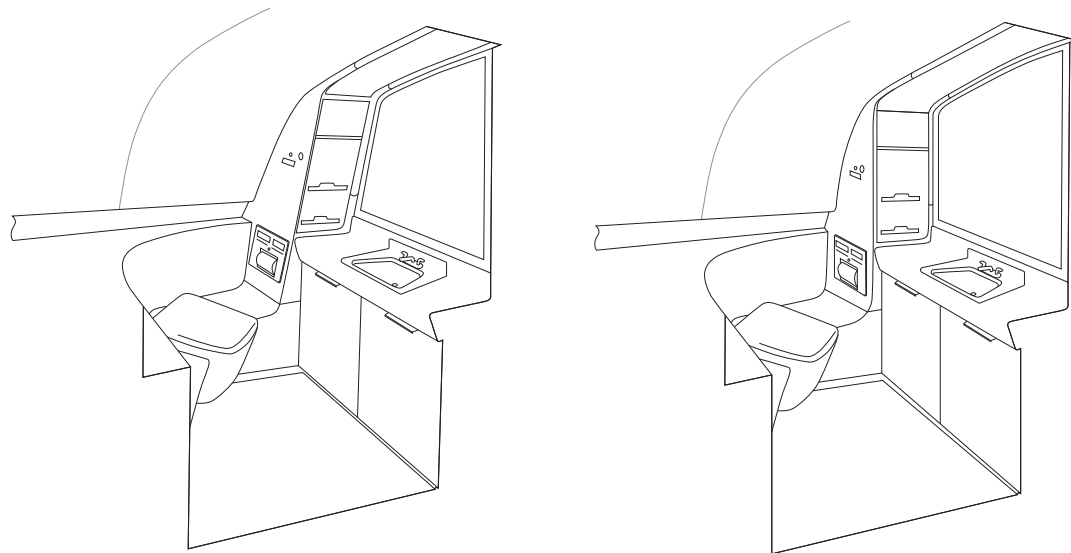


Figure 23: Vanishing Points

The vanishing points of the perspective drawing were explored in order to better understand the structure of the perspective. When determining the perspective it was discovered that some aspects of the drawing do not converge to the vanishing points. Moreover, the implied section cut is skewed from the rest of the drawing. This could have been done in order to open up the interior space more to convey more information about the lavatory. Moreover, the vertical lines of the drawing are slightly angled outwards, further allowing the drawing to feel more open. The manipulation of the perspective provides insight into the representation of interiors, allowing for the drawing to break away from reality and could potentially improve other representations of interior spaces.

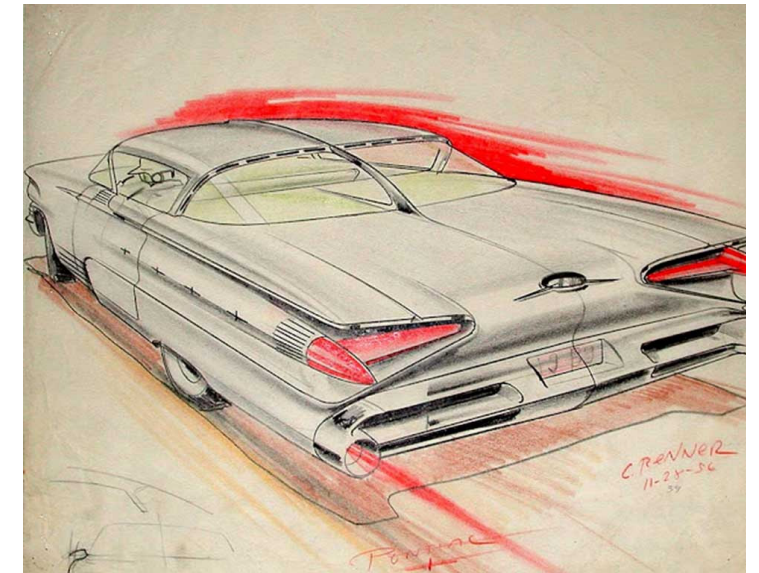


Skewed Vertical Lines (Original)

Corrected Vertical Lines (Modified)

Figure 24: Analysis of vertical lines within the drawing

The use of slightly angled lines can be further found throughout the drawing as well. A comparison can be shown here when the drawing itself has been reduced to simple linework and then redrawn with true vertical lines. The changes are subtle yet it generates the question, was there a further intention behind slightly skewing the drawing like that? Perhaps the reason being that the subject of the drawing is the interior space within an aircraft and the skewed drawing represents that implied motion of the aircraft. A similar style could be compared to the design drawings of automobiles around the same time as this drawing (in 1950). The drawing style of the Convair 880 lavatory has similarities to automobile design drawings because just before the Convair 880 project, Dorothy Draper worked on an automobile interior design for the 1952 Packard. The drawings of automobile design around that time have a sense of a skewed angles that implies a sense of motion or



⁵ Will, R., & Walter. (n.d.). Studio art collector Federic Sharf. Dean's Garage. Retrieved March 21, 2022, from <http://www.deansgarage.com/2013/studio-art-collector-fedric-sharf/>



Figure 25: 1952 Packard Drawing. Retrieved from <https://www.pinterest.ca/pin/388928117811204612/>

speed. Similarly, the skewed angles of the lavatory drawing generates a sense of high speeds that would be associated to the Convair 880, which was considered the fastest four-engine commercial jet until the advent of Boeing's 747. (Delta Museum, n.d). It is possible that the design and the drawing was influenced by Dorothy Draper's previous project of the 1952 Packard and overall automobile design drawing. Highlighting the body lines of the car in order to create a sense of speed while sitting still, the same effect could have been intended for the Convair 880 Lavatory to emphasize a sense of speed and luxury.



Figure 26: Convaire 880 Lavatory. Retrieved from <https://collection.cooperhewitt.org/objects/18491729/>

There is also the comparison of what was drawn to what was built. A photograph of the Convaire 880 lavatory allows us to further understand aspects of the drawing that were abstracted. This includes the angled vertical lines as well as the portion highlighted here which was greatly skewed. The finishes of the drawing appear to be high end and boldly colored, however in the photograph it appears that cheaper plastics were used for the lavatory. The Convaire 880 lavatory quickly becomes a typical airplane lavatory after viewing the photograph which is most likely why only the drawing is ever presented and not the finished product. It is also clear by the positioning of the camera that it is within a confined space and not all elements are clearly visible. Making the abstract drawing more



Figure 27: Convaire 880 Lavatory Photograph. Retrieved from <https://www.alamy.com/convaire-880-mock-up-interior-image68624104.html>

powerful than the literal interior, because the drawing is able to convey Dorothy Draper's intention of creating a luxurious and spacious lavatory. The manipulation of perspective and use of typically bold Draper colors, allows for the design of the Convaire 880 lavatory to appear as free from the constraints of the confined aircraft. The drawing is able to highlight its design intent rather than focus on the context. By doing so, once the design is translated into reality, it will maintain some of its key characteristics such as a sense of luxury and popular Draper style. In the photograph above, some of these design characteristics did carry over, however it appears other aspects had been lost as well.

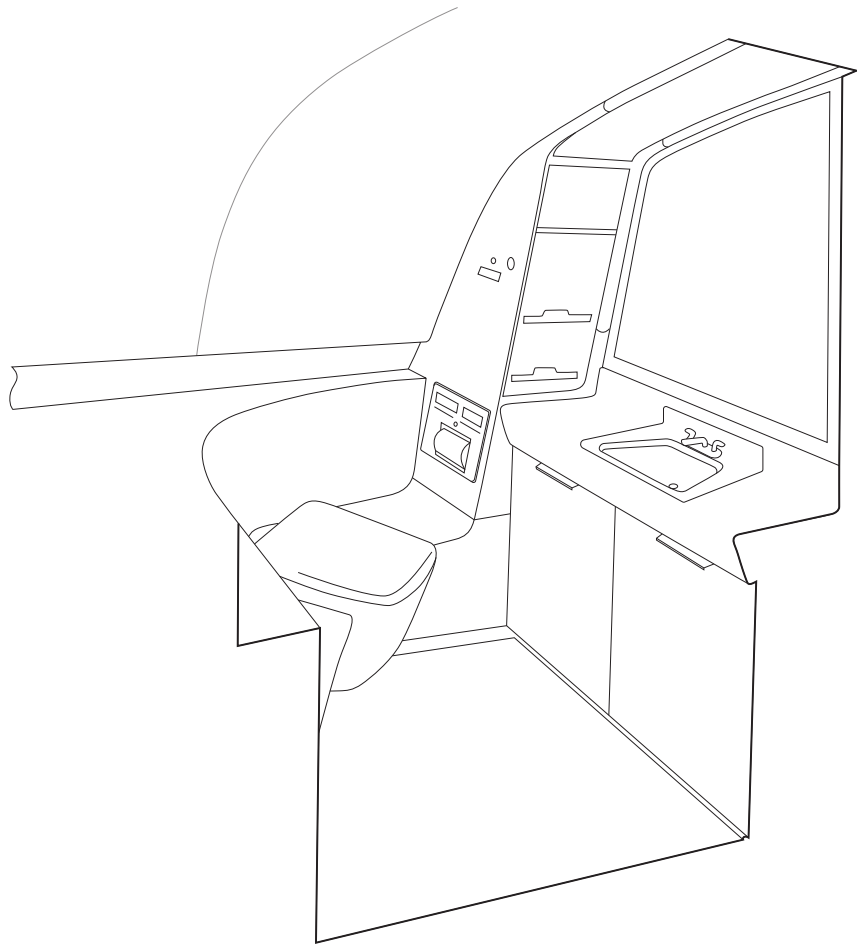


Figure 28: Convair 880 lavatory line drawing. Own drawing

Dorothy Draper designs always heavily involved the use of colors and patterns within her interior designs. It is clear that the Convair 880 lavatory is no different with its bold use of colors, however there are no patterns. A simple reduction of the drawing was then done through flattening the colors and also removing the colors all together. Without color the drawing could have been done by anyone, with no sense of materiality or design style. It is even more ambiguous than the drawing of the Boeing Model 326 shown earlier. The drawing itself has no linework, making it feel light and sharp with very precise detailing. Along with implying a very well detailed project, what largely makes this design a Dorothy Draper project is the use

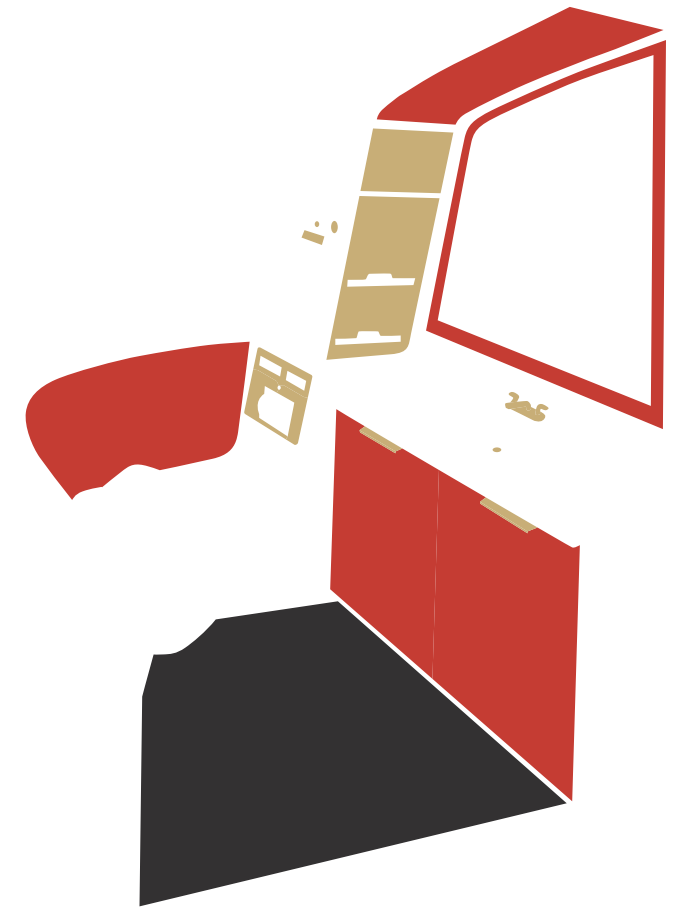
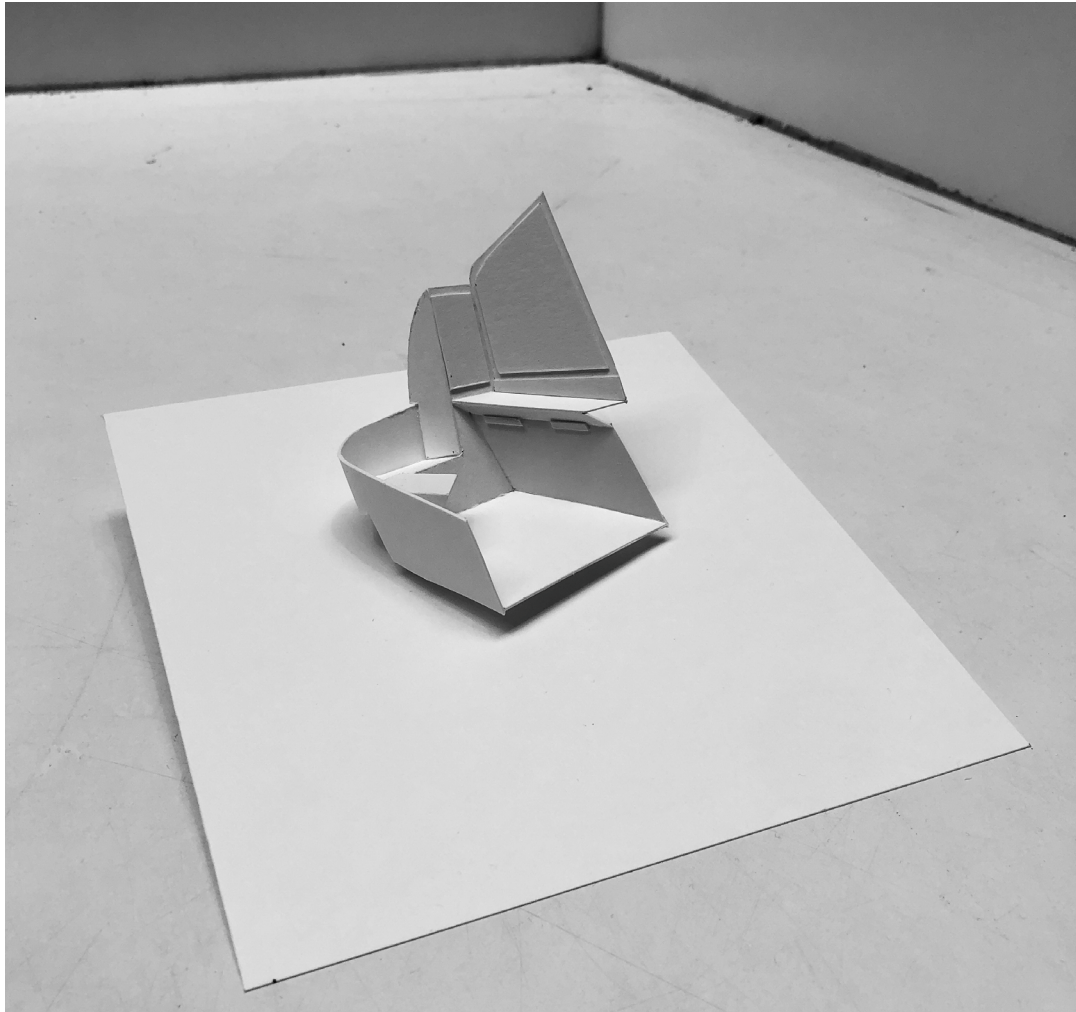


Figure 29: Flat color analysis. Own drawing

of bold color. Without the color, the design loses a lot of the qualities that made it powerful and the sense of luxury and depth is removed. However, when the colors are flattened, the image quite literally becomes flat itself with no sense of depth. Additional information such as material quality is also removed when there are no reflections on the surfaces. The drawing becomes even more abstract and diagrammatic in quality when the colors are simplified. The drawing rides this fine line of including just enough information to convey specific qualities of the interior yet not too much information that would potentially obscure aspects of the drawing.



Finally a model was also generated from the drawing, transferring the literal perspective into a physical 3D object. When building up the model, it was difficult translating the drawing due to its skewed perspective. However despite this difficulty, the 3D model was able to represent many of the qualities of the drawing itself without the use of color and a sense of materiality. More so than simply reducing the drawing to simplistic line work. The model was able to provide some insight into what the drawing was trying to convey. A spacious room isolated, allowing the viewer to have a clear idea of the composition of the interior without any obstructions. The model also allows for the opportunity to view the space from different perspectives, however it is clear that the initial drawing perspective aims to focus on all the finishings within the interior. Showing the brass faucet, red cabinets with brass handles, brass colored paper towel and toilet paper holders, all of the main components of the lavatory are shown within the drawing.

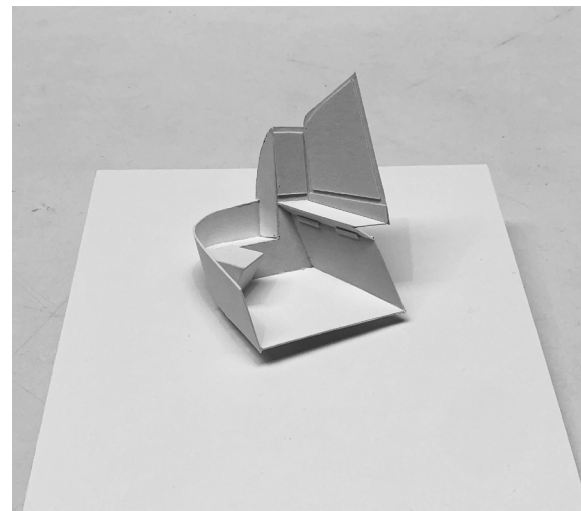
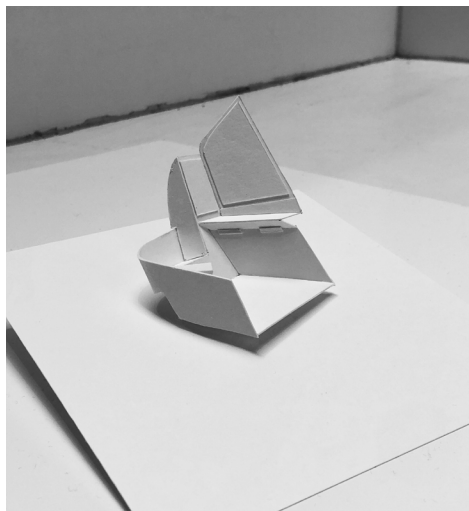


Figure 30: Physical model of Convair 880 Lavatory drawing. Own model

Conclusion

Aviation is an extremely technical field in which the drawings and assemblies for the aircraft must be very precise. These technical drawings are intended for innovation and engineering in order to produce the most efficient aircraft on the market. Meanwhile, interior perspectives and drawings capture the attention of potential clients, allowing for the airlines to present a sense of luxury and status. Within aviation, there is a clear distinction between the tangible and intangible and how they convey information. The tangible is representative of technical aircraft drawings, while the intangible is the atmosphere and high social status that airlines try to convey. The representation of aircraft interiors became an essential part of selling a sense of luxury to potential clients during the development of aviation from the 1930s to the 1960s, focusing on the intangible aspects of air travel. These interiors were shown through photography, literal perspective drawings and abstracted drawings, such as Rietveld's and Draper's. However, it is only Rietveld and Draper who had taken a more abstract approach, while everyone else before and after focused on the strict reality of the interiors. Yet these two drawings produced by Rietveld and Draper are able to convey the most amount of information through their design proposals. The drawings create a sense of spaciousness and vibrance that allow the viewer to interpret it as an inviting, luxurious space. Moreover, the drawing of the Convair 880 lavatory is able to represent Dorothy Draper's style, through the use of a bold, red along with brass finishings. The clean edges of the drawing generates a sense of sleek design with precise detailing, clearly showing Dorothy Draper's attention to detail. However, when the drawing is compared to the as-built photographs, it appears as a completely different space. What was built was not nearly as powerful as what was proposed, appearing as if budget had gotten the best of the project. In the

same light, it proves how strong the drawing of the lavatory really is, acting as the ideal way to interpret the design of the Convair 880 lavatory. It is also the ideal drawing method to represent an interior design of an aircraft because of its ability to convey more than notational information. The drawing is able to create a sense of atmosphere unlike any other drawing through the use of abstraction. Furthermore, the use of abstraction plays a vital role in the representation of aircraft interiors, as explored in the Boeing Model 326, Rietveld's KLM lounge design and Draper's Convair 880 Lavatory. It is abstraction that makes these drawings powerful and convey information that literal photographs could not. Representation of interiors is about carefully selecting what information is included and excluded in order to generate a clear understanding of what the drawing is trying to convey.

The nuances of angled vertical lines and skewed vanishing points help to generate a space that is experienced completely different in reality than it would through drawing. The drawing of the Convair 880 lavatory along with the KLM Douglas DC-8 lounge space by Rietveld are unlike any other aircraft interior representations because they go beyond reality to focus on the qualities of the design that would otherwise be obstructed. These representations can be understood as imaginative drawing types that allow the viewer to interpret the space and fill in the missing information as they best see fit. That type of imaginative drawing style is extremely effective in the context of aircraft interiors because those spaces are typically confined and cramped. Through selective inclusion of information, the drawing is able to generate a sense of spaciousness and depth that a photograph may not. The Convair 880 lavatory is an imaginative drawing that utilizes abstraction to convey the intangible design intent of Dorothy Draper and is thus one of the best ways to represent an interior design of an aircraft.

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Appendix: Timeline

1923

Dorothy Tuckerman Draper starts her own design firm called "Architectural Clearing House." Which would later become Dorothy Draper Company.

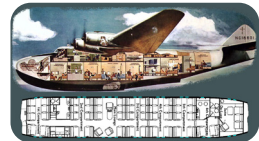


1930's



Fritz Augus Breuhaus de Groot, a German Architect designs the interiors of the Heinkel 70 commuter plane for Lufthansa. He was also responsible for the interiors of the Hindenburg.

1934



Norman Bel Geddes Completed the interiors for Pan American's famous China Clipper (The Flying Boat).

1936



Henry Dreyfuss, an American industrial designer who also worked on various train interiors. Worked on designing living room environments for lounge chairs in the United Airlines' DC-3s in 1936.

1938-59



Raymond Loewy, a French-American industrial designer. Designed the interior of the Boeing 307 Stratoliner for TWA.

1948-53



Charles Butler and British architect James Gardener were creating re-designs for the Vickers Viscount Turboprop airliner which had a major influential impact.

1958-59



By 1960 Convair had hired General Motors stylist Harley Earl who was already a design stylist of Eastern Airlines. To create the interior of the Convair 440. Dorothy Draper was then brought on with the title 'designer'.

1960

Dorothy Draper retires with one of her last projects being the International Hotel at Idlewild Airport. She later dies in 1969. Carlton Varney then purchased Draper's company.

Dorothy Draper designs one of her first official projects, the Carlyle Hotel. At this point in her career, the term "Draperisms" began to define her style.



Draper designs the Fairmont in San Francisco. Her use of bold colours and patterns gives interiors a sense of 'wealth'. Allowing the hotel to charge people more money.



During the Great Depression, Draper spends \$10 million designing the Palácio Quitandinha in Petrópolis located in Rio de Janeiro



Dorothy Draper publishes her own guide to interior design in 1939, titled "Decorating is Fun! How to be Your Own Decorator".



In the 1950's Dorothy Draper starts designing the interiors of automobiles. She did a "line" for Packard and Chrysler.



Dorothy Draper focuses on the design of the Lavatory and Club lounge within the Convair 440. This method of representation of aircraft interiors has not been done before.

