

# Gulfstream

x SCADpro

P E D E S T A L   R E I M A G I N E D

WINTER 2021

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# Gulfstream

Gulfstream Aerospace is the global standard in business and private aviation. They boldly anticipate future needs, elevating aviation to an art form. By understanding their customers and delivering with precision, they create and serve unparalleled aviation experiences that build lifelong personal relationships. What drives Gulfstream is making every aspect of the journey a moment worth remembering. Headquartered in Savannah, Georgia, Gulfstream maintains a close relationship with the Savannah College of Art & Design.

## X SCADPRO

Founded in 1978 by President Paula Wallace and her family, the Savannah College of Art & Design (SCAD) prepares talented students for creative professions, shaping the leading designers, artists, and future leaders of tomorrow. SCADpro is recognized as the preeminent university partner in higher education and among design agencies worldwide, generating business solutions for the world's most influential brands.

## INTRODUCTION

This project was a collaborative learning experience between the Savannah College of Art & Design (SCAD) and Gulfstream Aerospace. The varying students' backgrounds, majors, education levels, and personalities paired with the professor's automotive design background and an involved Gulfstream team, created a dynamic learning experience and partnership.



## W E L C O M E   A B O A R D



RAFAEL CORAZZA

SCAD Industrial Design  
Professor



PAUL RUNKO

Account Lead

## C O U R S E

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Professor Rafael Corazza and SCADpro account lead Paul Runko were the air traffic controllers of the operation. They ensured the student team was always rising to meet the expectations of Gulfstream and flying en route in the design process.

## HYBRID CLASS EXPERIENCE

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For this project, virtual met on-ground learning in SCAD's very first socially-distanced hybrid SCADpro experience given the context of the COVID-19 pandemic. Masks were worn and distance kept, but that didn't stop the team from collaborating across majors and states.



M E E T T H E T E A M

Our team is made up of innovative designers and problem-solvers committed to delivering a bold product redesign to impact aviation for years to come.

We are the creators and collaborators of Gulfstream Aerospace x SCADpro.



RYAN SULESKY

Project Manager

Industrial Design



SARAH VARGAS

Graphic Design Lead  
Visual Manager

Industrial Design



JULIA BOHSE

Lead Industrial Designer  
Resources Manager

Industrial Design



HARRISON KENT

Lead Industrial Designer

Industrial Design



MEET THE TEAM



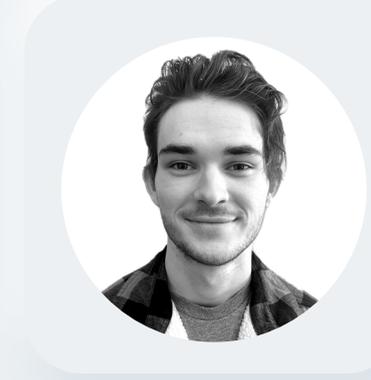
ABBY ASKEW  
Industrial Design



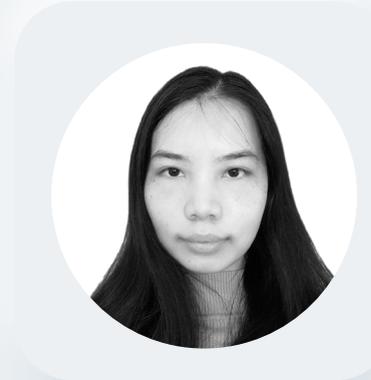
SUWENJING LI  
Industrial Design



JENNA ROY  
Industrial Design



CORBIN THOMPSON  
Industrial Design



CONNIE MALONE  
Visual Effects



EURI CHU  
Visual Effects



LUKE LOBOTSKY  
User Experience Design

3 majors

8 on-ground

3 online



## B R I E F

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We were tasked to reimagine the Gulfstream pedestal for a future aircraft. It was important to Gulfstream that we deliver an innovative solution that improves ergonomics, strengthens brand identity, is capable of customization, and improves overall functionality.

## OUR MISSION

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We will implement the luxury “wow factor” of a Gulfstream jet’s cabin in our pedestal redesign and advance the overall flying experience for the pilot, prioritizing their comfort and wellbeing. We set out to give Gulfstream pilots the same five-star experience their passengers feel when flying Gulfstream.



## C H E C K I N G - I N

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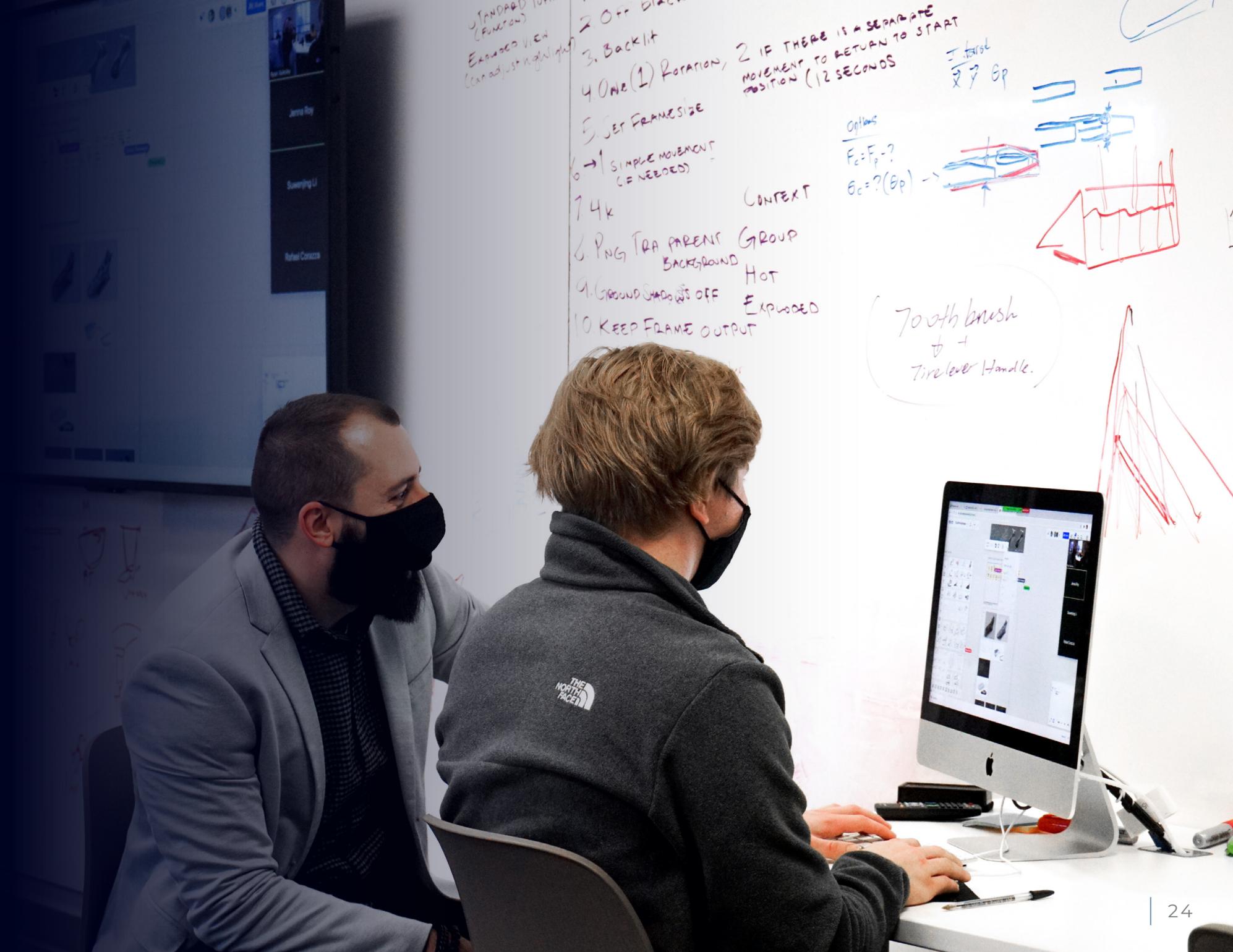
Our journey began by understanding the values of the brand we were designing for. The Gulfstream brand evokes confidence, comfort, excitement, and freedom. We worked to translate those values in our design by empowering the Gulfstream pilot with improved ergonomics, functionality, and aesthetics. Gulfstream is the pinnacle of business and private aviation and we were motivated to reach that standard.





# PRIMARY RESEARCH

The goal of our primary research was to collect data points and gain insights in understanding the Gulfstream pilot's flight deck experience, including pain points. The team dove into conducting surveys and interviewing pilots. Just as their customers lead busy lives with evolving needs, so do Gulfstream pilots and we were committed to crafting a pedestal experience highly personalized for them.





9

IN-DEPTH  
INTERVIEWS



34

SURVEY  
RESPONSES

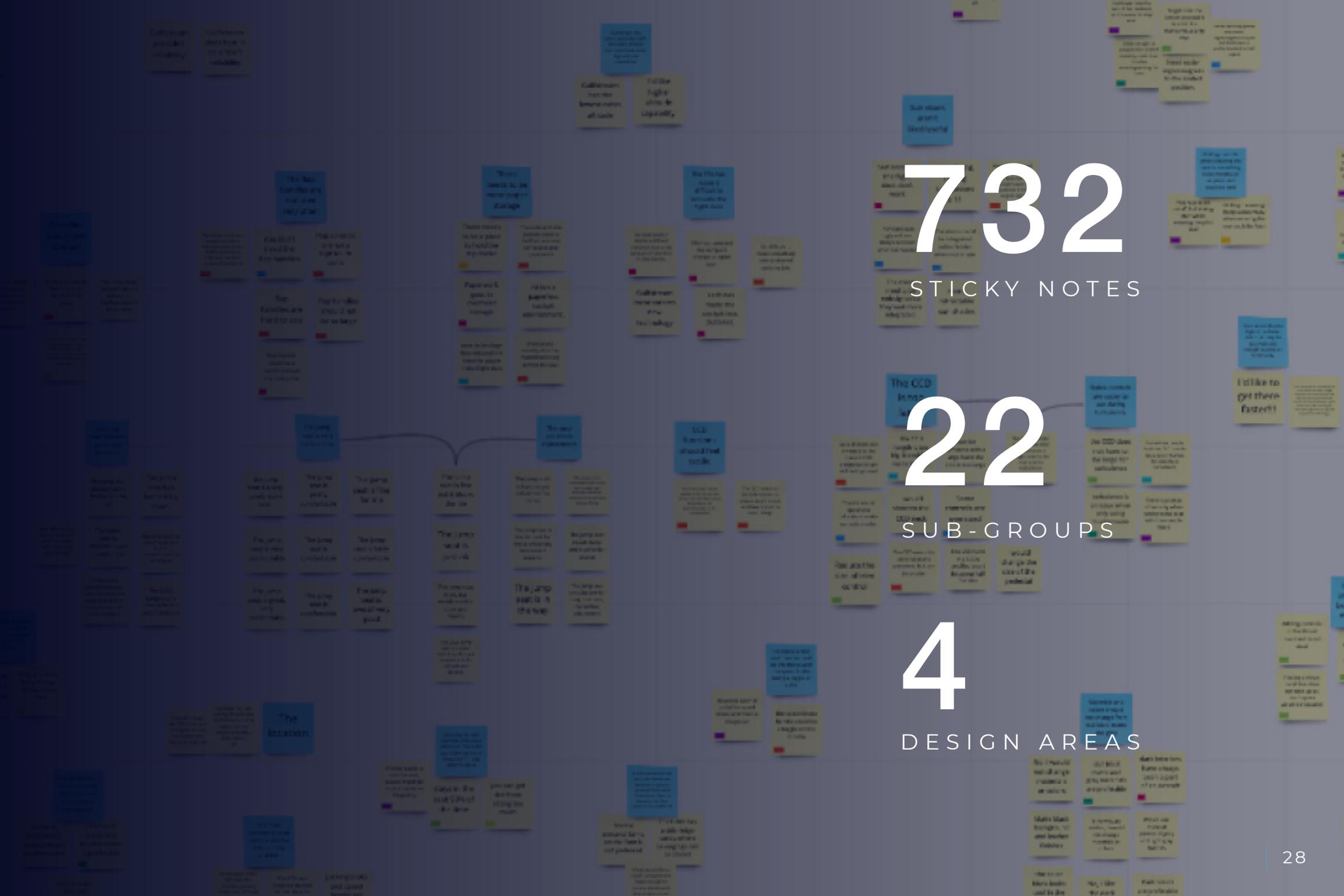


12

HOURS OF  
AFFINITIZATION

## PRIMARY INSIGHTS

The primary research process involved interviewing nine Gulfstream pilots to design a pedestal solution that suits their needs. We established twenty-two sub-groups of insight categories, and began forming four design directions we could move forward with concepting. Gulfstream pilots provided us with valuable feedback that ultimately informed the concept we landed on moving forward.



732  
STICKY NOTES

22  
SUB-GROUPS

4  
DESIGN AREAS



“Gulfstream symbolizes the top of  
a career in business aviation.”

- Pilot Nick F.

How can we create a flight deck experience  
that emphasizes Gulfstream's standard for  
luxury, performance, and elegance?

## EXUDE LUXURY

---

For Gulfstream pilots, attention to detail makes the difference in creating an elevated aircraft experience. We wanted to exude that same feel of luxury in the pedestal. Details matter because they are how to deliver the best possible aircraft experience, which we took seriously as a factor guiding our design process.



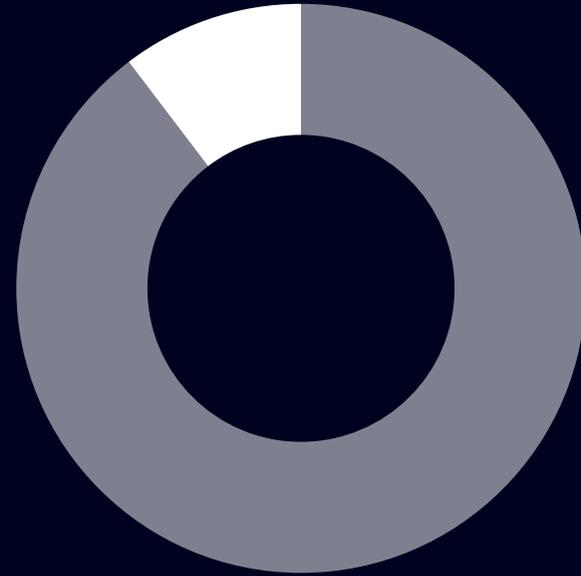


“There’s not much comfort sitting in  
an airplane for 15 hours straight.”

*-Gulfstream Pilot*

How might we make Gulfstream pilots feel more comfortable?

How can we empower the pilots in the flight deck to feel as comfortable as the passengers in the cabin?



Pilots stay in their seat **90%** of the time during a flight.

- **Not In Seat**  
(10%)
- **In Seat**  
(90%)





“Getting into (and out of) the  
seat is a contortion act.”

*-Gulfstream Pilot*

## R O O T P A I N P O I N T

---

All the pilots feel discomfort when entering their seat as a result of the existing pedestal's proportions. This creates opportunity to rethink those proportions to make the pilots feel as comfortable as their passengers.



● Needs More Storage  
(60%)

● Enough Storage  
(40%)

60% of pilots said there was **NOT** enough room for their personal belongings on the flight.



## C U P   H O L D E R S

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All in the details... the smallest elements often make the biggest difference in user experience. Gulfstream consistently emphasized to us in their briefings, feedback sessions, and interviews that the pedestal needs to have at least four cup holders to suit their pilots' refreshment needs. Pilot Bud recommended incorporating cupholders on the outboard side, where they are not as easily accessible.

How can we innovate  
our pedestal's use of  
space to minimize  
clutter?

“You can never have enough  
storage.”

*-Gulfstream Pilot*

Brighton & South Coast Railway  
Hayling Island to  
Bournemouth Central  
(L. & S.W. Via HAVANT)



“Pilots who are new to flying a certain plane may not understand the controls at first.”

*-Pilot Bud*

How might we make the controls more intuitive?

## MOODBOARDS

We collected references and created moodboards to guide our design process and get a feel for design elements the Gulfstream team positively responded to.



# LEAST INTUITIVE CONTROLS

## 1. Parking Brake

"The parking brake is a challenge to use."

*-Pilot David*

## 2. Touchscreens

"Touchscreens on the DU are an ergonomic nightmare."

*-Pilot Todd*

## 3. CCD

"The CCD is not one of my favorite items as it is not intuitive."

*-Pilot Justin*



## OPPORTUNITIES

Explore Lighting  
Maximize Storage

Improve Entry  
Exude Luxury

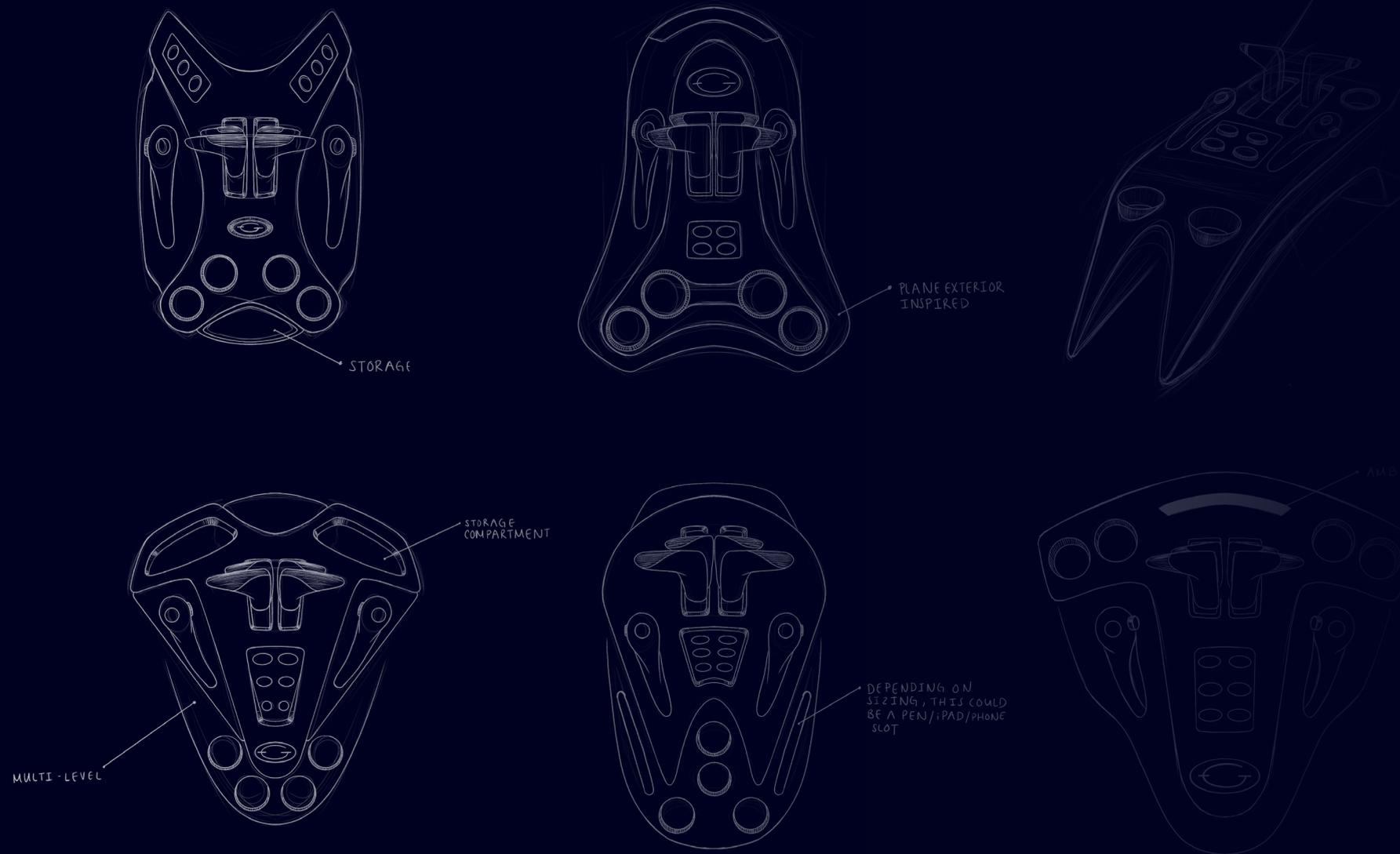
Strengthen Branding  
Intuitive Controls

## I D E A T I O N

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The ideation stage of design involved channeling all of the feedback and insights we received from Gulfstream pilots into concrete concepts on paper. The Gulfstream team encouraged thinking big and pushing the limits. The industrial design team went to work with exploratory thinking and produced a variety of sketched forms while problem-solving.



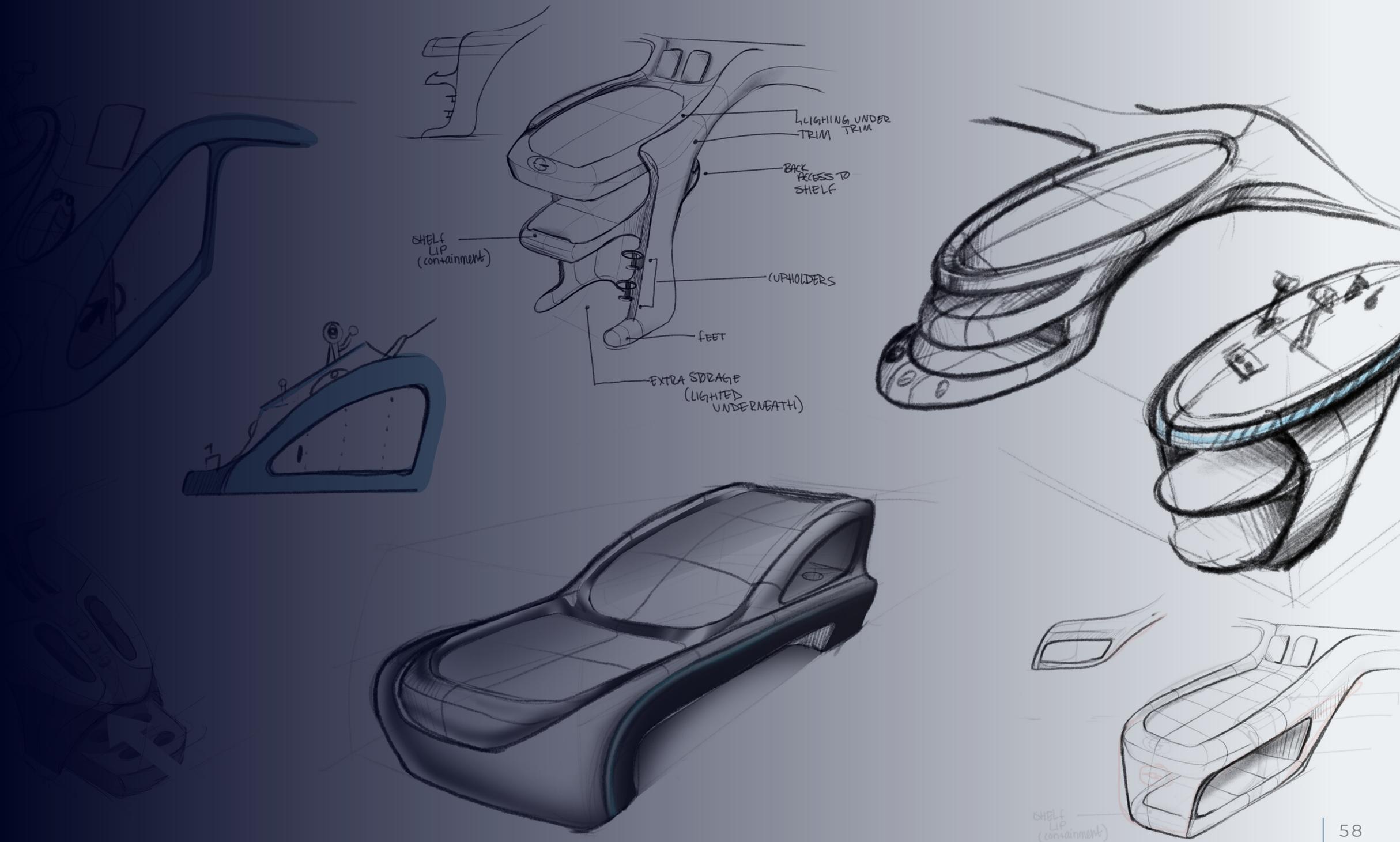


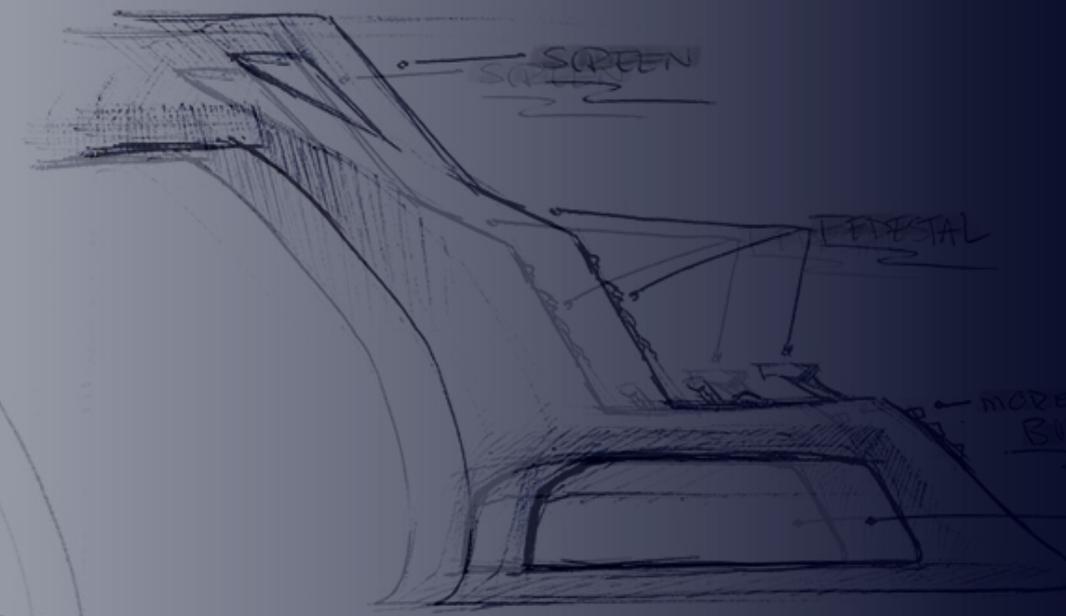
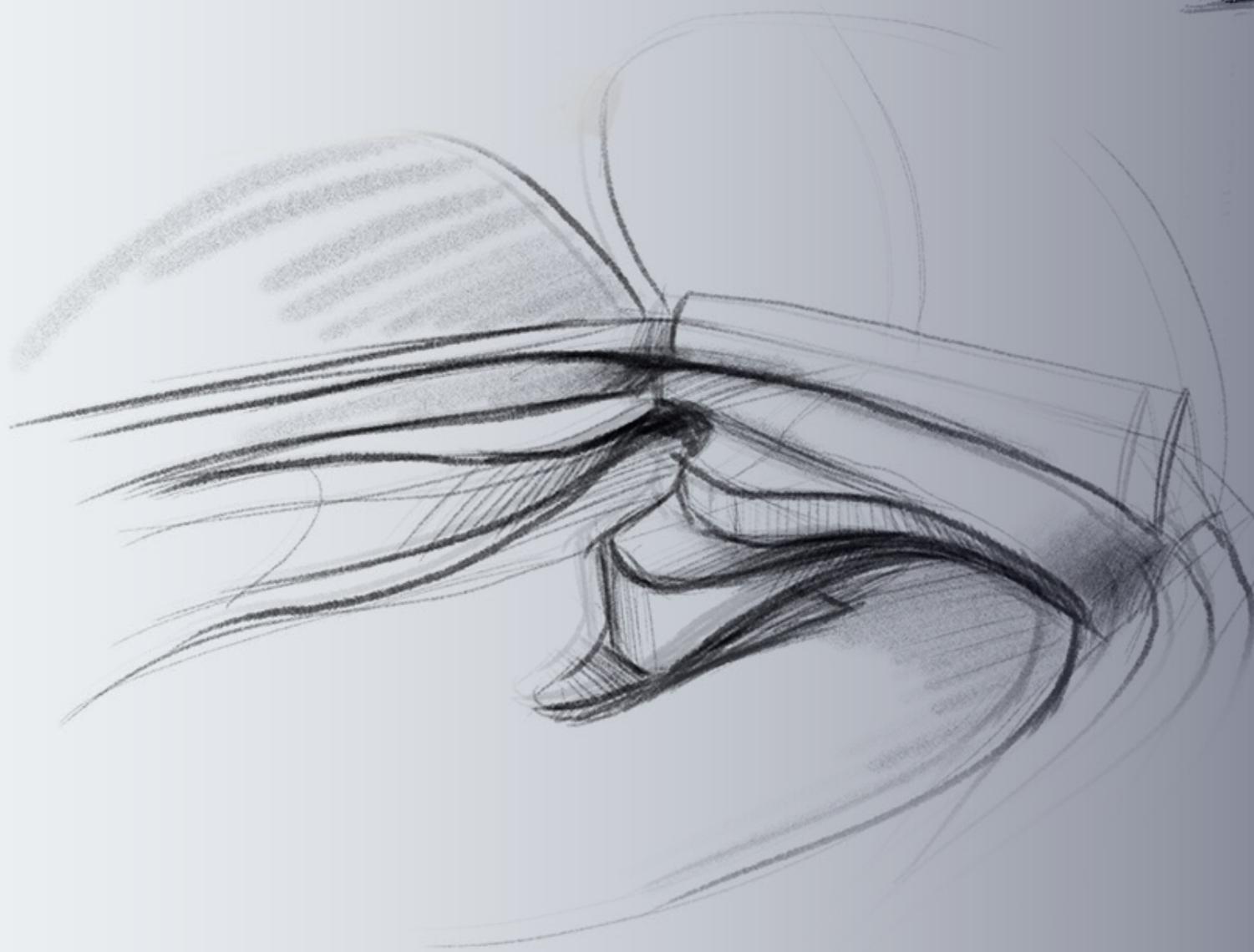
## INITIAL

As the sketching process began, it was important we ideated in terms of the overall form of the pedestal before getting caught up in the smaller details.

## EXPLORE

The industrial design team developed concepts to redesign the control configurations, rethink the form of the CCD, shorten the overall proportions of the pedestal, strengthen branding, and incorporate clever storage solutions. The team soared in two design directions: visionary and iconic. The visionary team looked to fly forward with an innovative and cutting-edge approach as the iconic team sought timeless elegance.





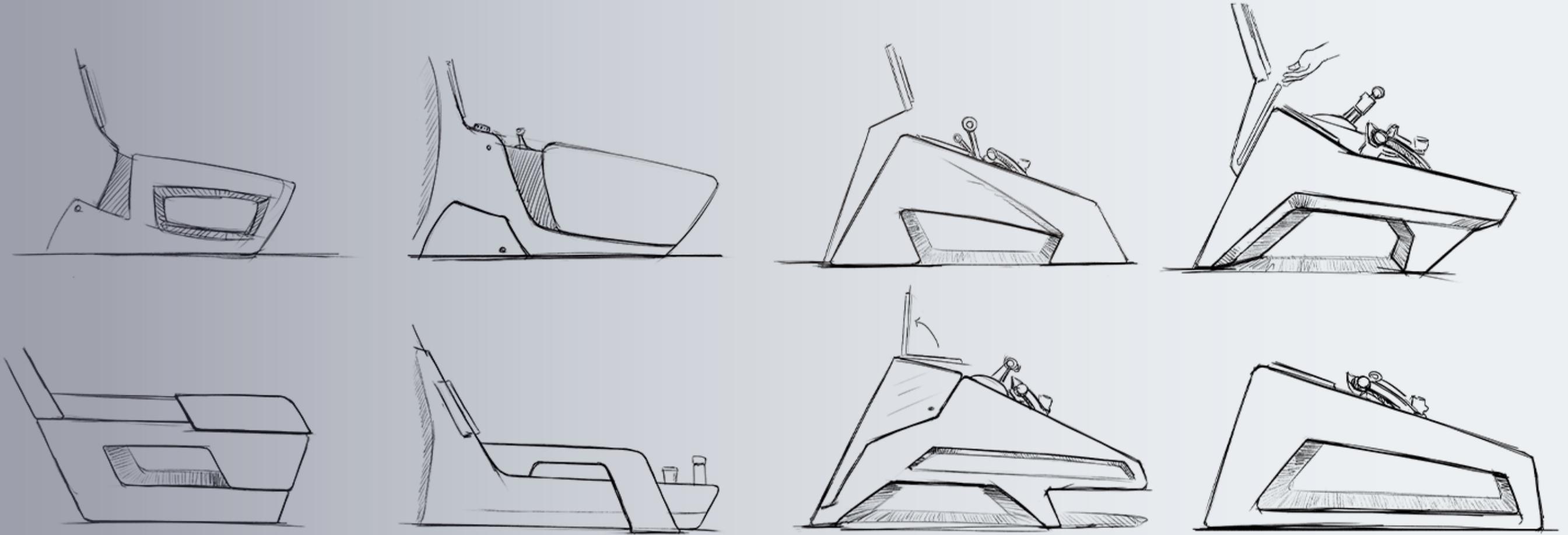
## FORM LANGUAGE

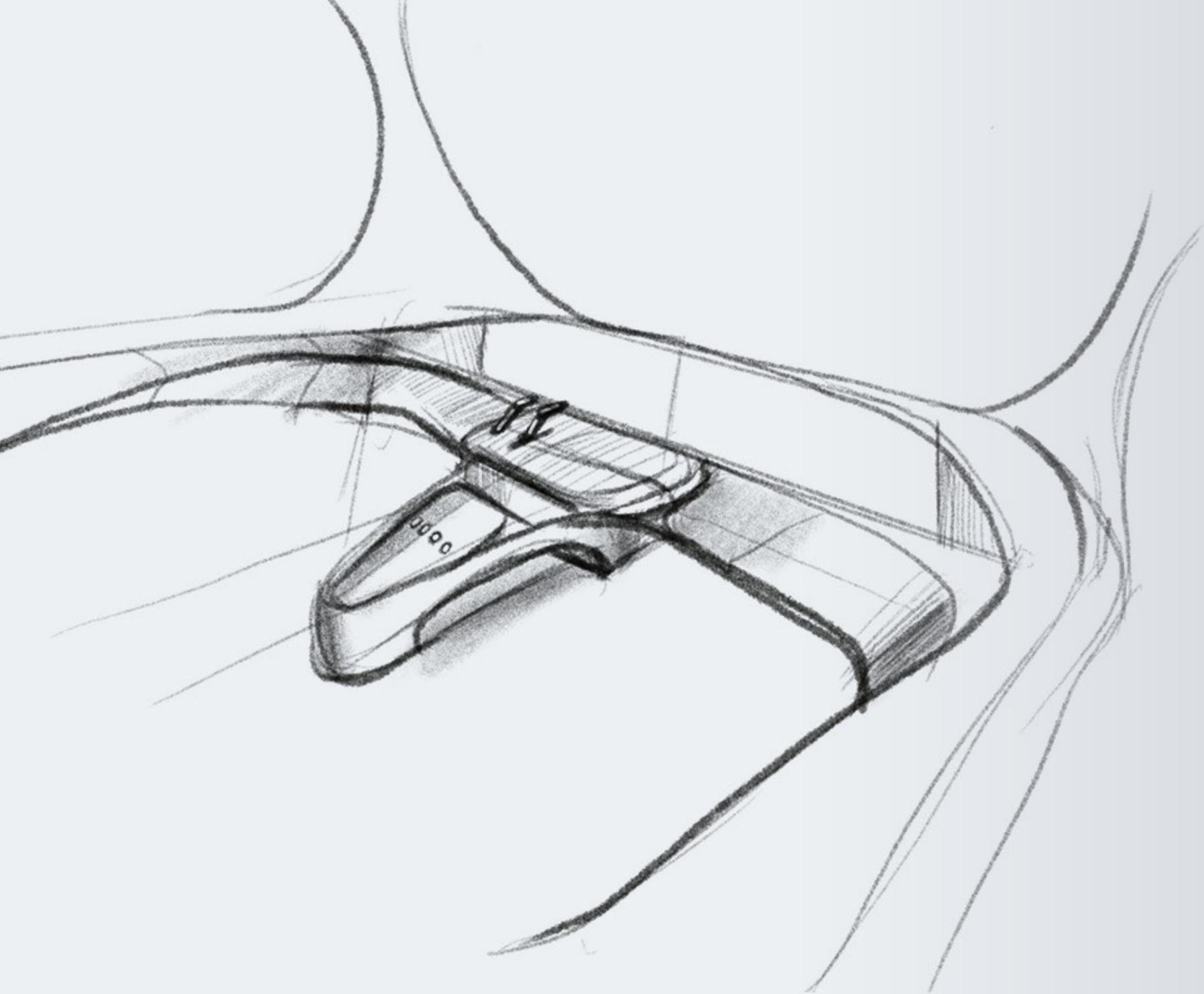
When approaching the design for the pedestal, the team considered a variety of form directions, from the more angular and geometric to more sloping, elegant lines.

## STORAGE

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Many sketches explored the possibility of creating a hollow space beneath the pedestal to create elevated storage space.





“Gulfstream jets are dynamic and epitomize excellence. That should be reflected in the pedestal.”

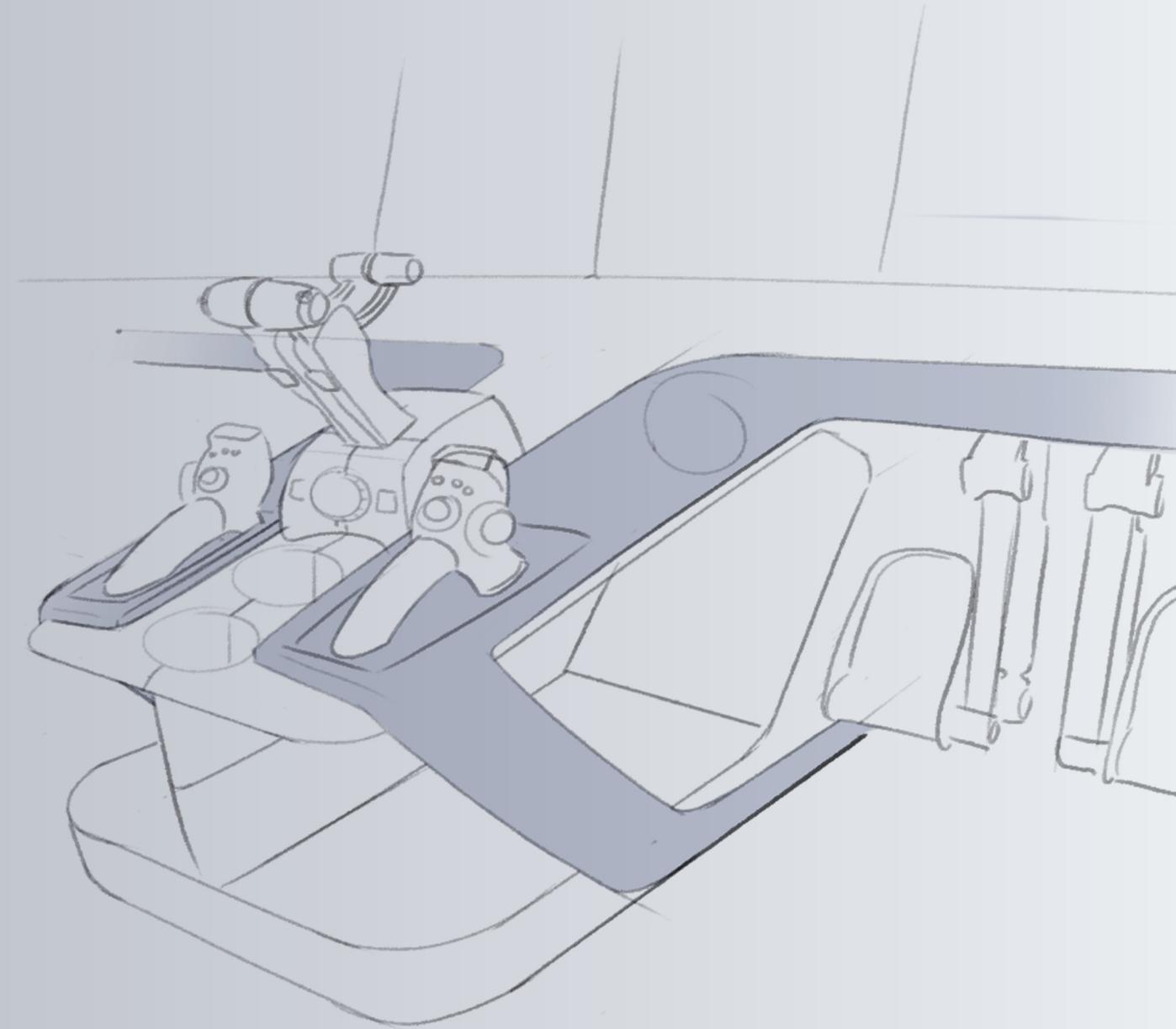
-Gulfstream Pilot

Explore cup holder layouts  
Condense control formats  
Save space

## REIMAGINE

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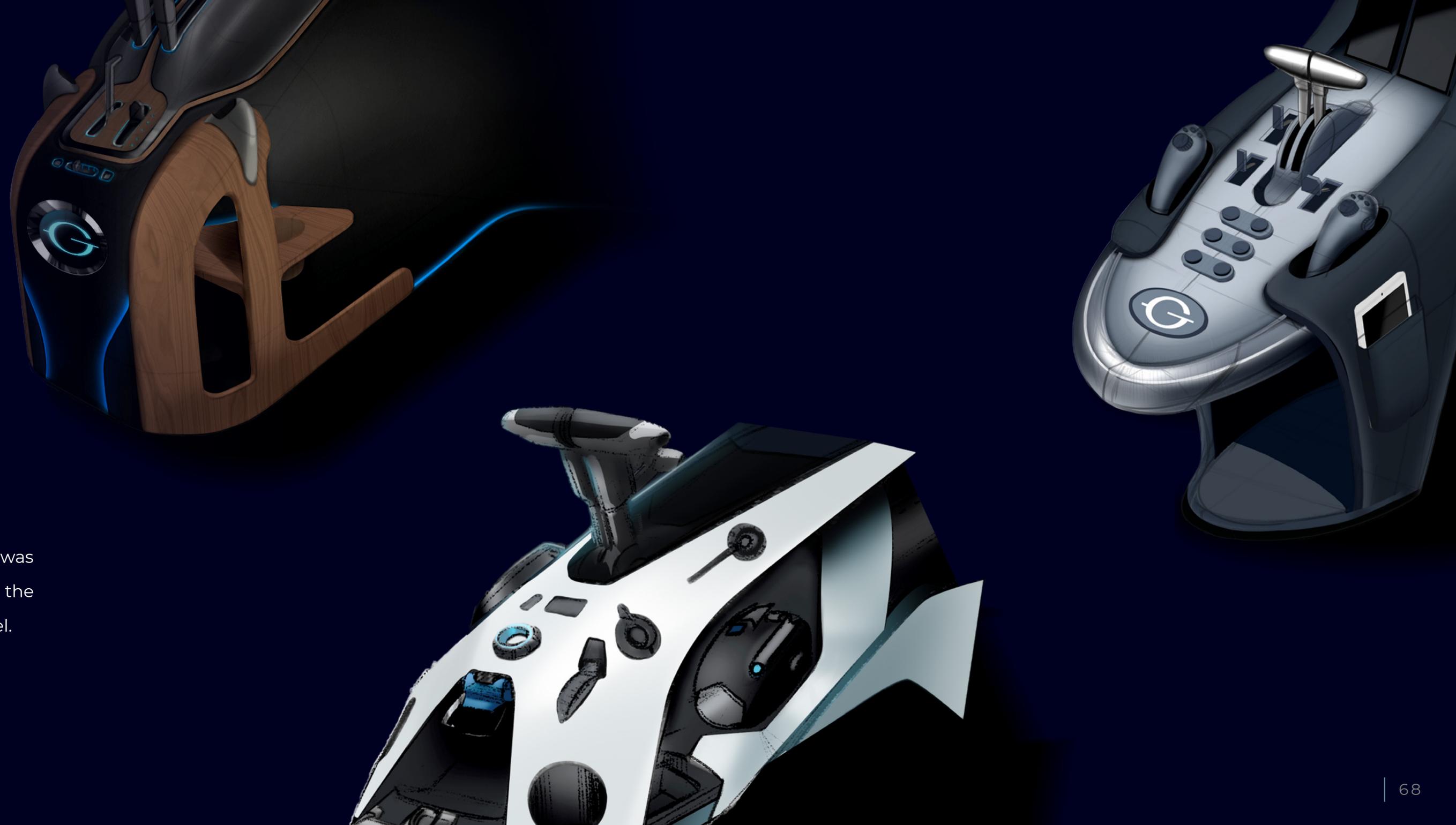
Our exploration involved understanding the parameters we would have to ideate within, to ensure our design would be as practical as it is aesthetic. We also experimented with storage solutions.



## M I D T E R M

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After our midterm presentation with Gulfstream, it was evident we needed to streamline our design, refine the form, and deliver a more elevated, sophisticated feel.





## REFINING CONCEPT

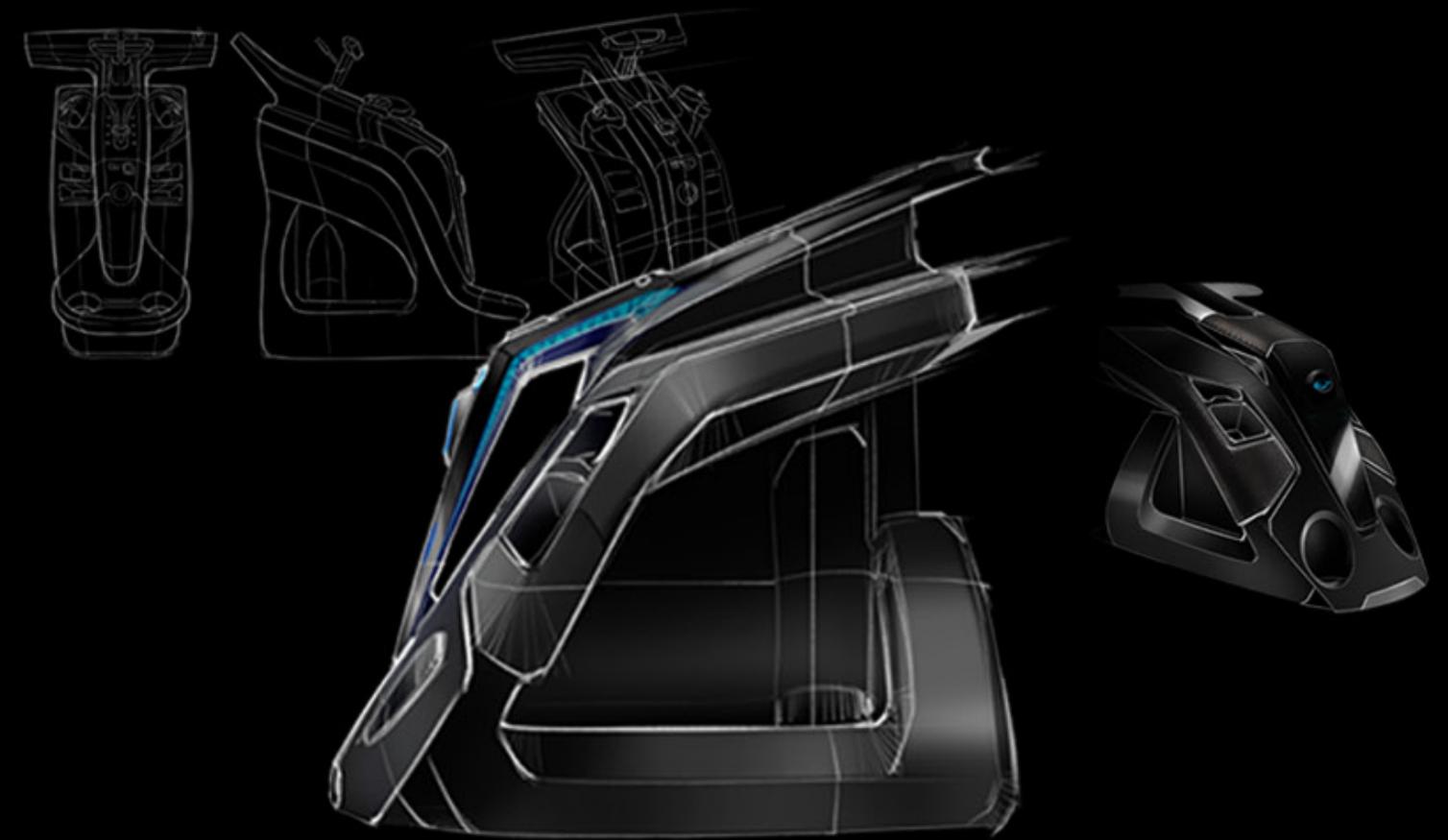
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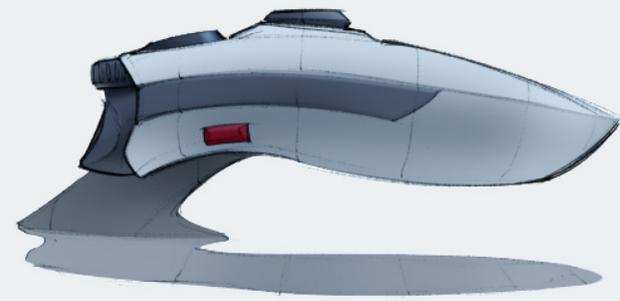
After presenting the designs to Gulfstream, client feedback guided the team in the iconic direction. The main points from Gulfstream were ensuring the pedestal felt like their brand identity, having all controls easily within reach, explore more lighting solutions, and incorporate plenty of cupholders!

## REFINED CONCEPT

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Two weeks of ideation resulted in a dynamic, structured pedestal that seamlessly integrates aesthetics with functionality. The need for a more ergonomic ingress and egress resulted in the form's distinguishing slope.

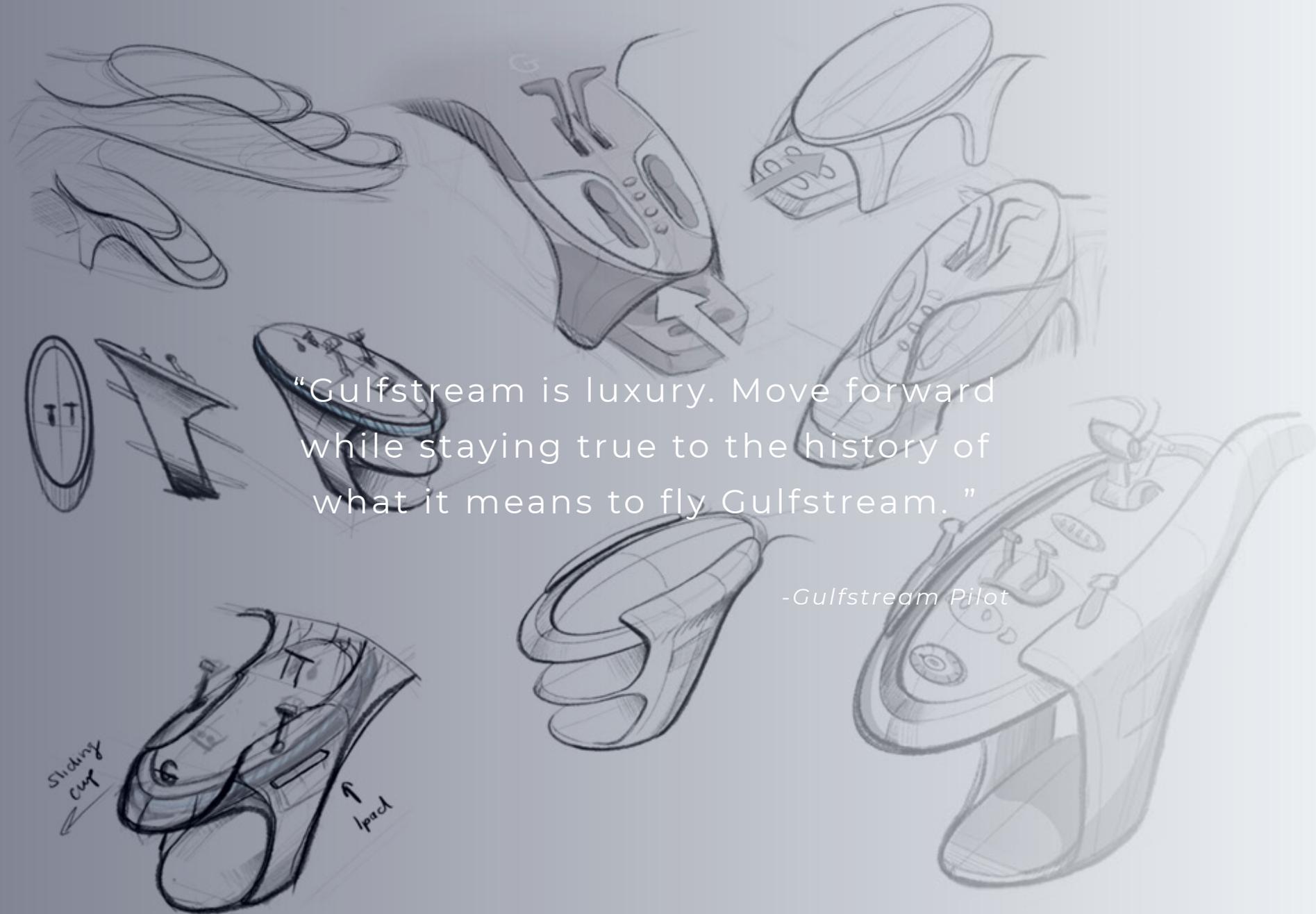




## CCD

The Cursor Control Device (CCD) was a pain point among Gulfstream pilots for its bulkier proportions, creating opportunity to evolve its form and improve ergonomics. This playful approach takes influence from the form of video game controllers.





“Gulfstream is luxury. Move forward while staying true to the history of what it means to fly Gulfstream.”

*-Gulfstream Pilot*





## I D E A T I O N   &   M O C K - U P

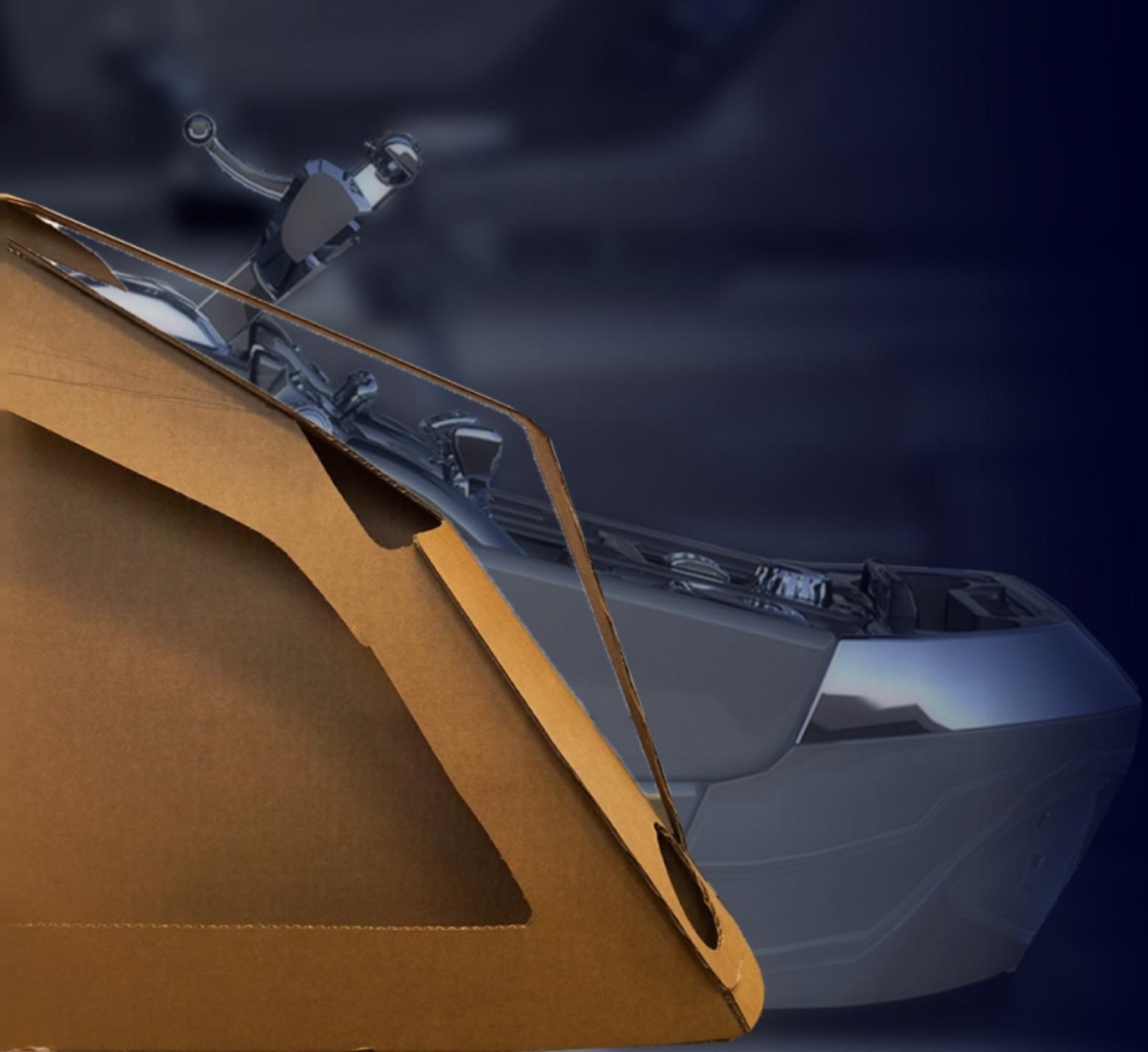
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Our model-making began with preliminary testing. In order to better understand the pilot experience, we created our own flight deck seating and pedestal setup out of cardboard to experience firsthand the pain points brought up in the interviews and surveys.

## USER TESTING

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We recreated the existing flight deck's pedestal to ensure the proportions of our concept would work within the parameters of the flight deck. We also tested the ergonomics of control actions by comparing the existing pedestal's configuration with our layout options.



## SKETCH MODELS

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We continued to produce mock-ups to test the functionality of our designs and ensure all actions were intuitive and comfortable. This cardboard iteration shows how the proportions of our evolved concept compares to the existing pedestal. We reduced the overall length of the pedestal and volume by almost 50%, saving considerable space for an easier ingress and egress experience.

The image shows several 3D printed prototypes of control components, including a joystick and various buttons, arranged on a dark surface. The prototypes are light-colored and show detailed textures and shapes. The background is dark, making the prototypes stand out.

## PROTOTYPING

—

To better communicate the function and applications of the control concepts, working prototypes were developed to test ergonomics and functionality using 3D printing technology in the SCAD DigiLab.

# PILOT FEEDBACK



We checked in with Gulfstream pilots for their seal of approval on the functionality and ergonomics of all control prototypes.



End Meeting



## REFINED MODEL

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We refined our model based on pilot feedback and insights. The 3D printed control elements were strategically placed on a foam core body to have a physical mock-up. Seeing the form in 3D gives the client a better understanding of how to interact with our pedestal and its compressed proportions.

INTRODUCING  
THE GULFSTREAM PEDESTAL  
REIMAGINED





## FINAL DESIGN

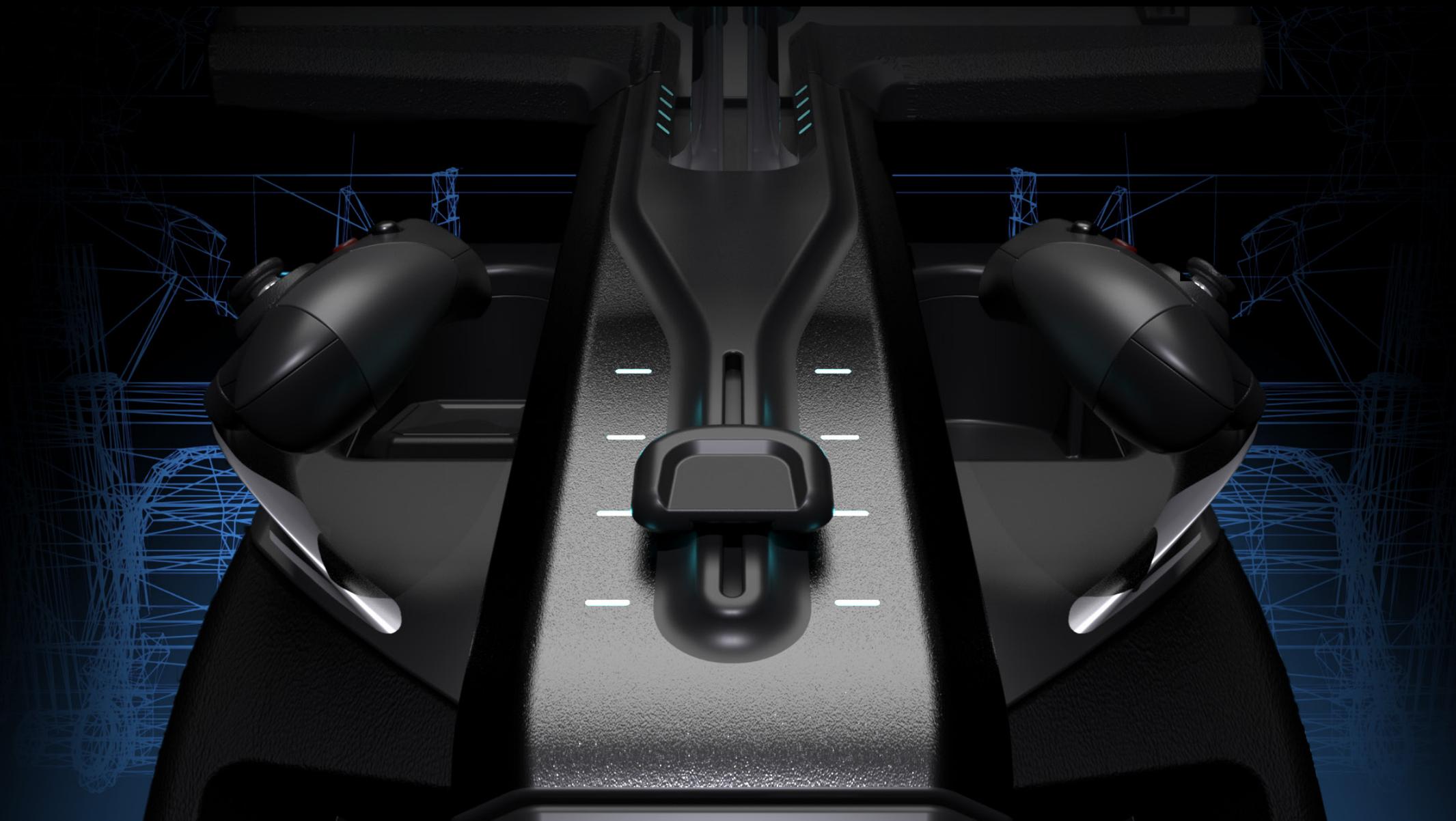
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We set out to create a pedestal that will stand out visually in the luxury jet universe. Our new design uses special fly lines to reference the beauty of a Gulfstream jet's exterior and create a modern, elevated feel.

MODELED IN SOLIDWORKS AND RENDERED IN KEYSHOT

AERODYNAMIC

FLY LINES



## I N C L I N E

---

We created a more inclined pedestal without compromising any functionality. Most Gulfstream pilots agreed they would be more likely to get up out of their seats if there was a more ergonomic ingress and egress. With these compressed proportions, they will be more likely to stand up and stretch their legs during a flight, helping minimize fatigue and improving their overall physical and mental wellbeing. With our pedestal, pilots will always be looking forward to jumping into their next Gulfstream flight.



PEDESTAL 360°



## INTUITIVE CONTROLS

We oriented controls to be intuitive because pilots who are new to flying Gulfstream may not immediately be able to pick up the nuances that are specific to each model. That created opportunity for rethinking forms, as well as button configurations, to improve legibility and intuitive action. By design, the Gulfstream flight deck will be the easiest to navigate of any jet in its class.





## INTUITIVE ACTION

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To improve intuitive action, starting from the aft portion, we retro-fit the rudder, pitch controls, and flap controls to remain in the same places with minor design adjustments. The yaw trim now has an easy grip design. The flight control reset remains a guarded button, now featuring an attractive translucent covering.

## DESIGN ELEMENTS

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With a variety of forms and controls making up the pedestal as a unit, elements like thin fillets between division of materials, wide chamfers, and round edges in place of corners bring consistency to the design.





PARKING BREAK

EXTRA STORAGE

## DESIGN LANGUAGE

The driving factors influencing this design are clean lines and an iconic feel with an edge. This can be seen with geometric angles contrasted against flowing lines.

PARKING BRAKE

FLAP CONTROL

CCD & CONTROLS



## LIGHTING CONTROLS

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One of our main design considerations was lighting. When it comes to the flight deck at night, dropping anything involves a scramble. So we illuminated the Gulfstream flight deck with bright blue lighting for improved functionality. Lighting the controls with the same shade improves visibility and legibility so the pilot will always push the right buttons.



SIGNATURE ELEMENTS

Teal Lighting

Curvilinear Forms

Wide Chamfers



## BRANDING

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We sought to strengthen Gulfstream's brand identity by referencing forms used in the cabin and highlighting the jet's iconic oval windows. The oval shape appears as the signature emblem on the front of the pedestal. Featuring the brand's trademarked logo, the emblem is trimmed in a distinct blue.

SIGNATURE ◦  
EMBLEM



ALUMINUM  
GUARD



## ATTENTION TO DETAIL

We implemented a piece of Gulfstream's heritage by incorporating a small aluminum guard to make the overall pedestal feel lighter when viewed from the cabin. We want Gulfstream clients to feel luxury no matter which direction they are facing.

## THROTTLE

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The throttle received an aesthetic refresh while maintaining its overall functionality. It is now the host for the speed brake. With this integration, Gulfstream will see pilots activating the speed brake with their thumb using a variable push button for intuitive ergonomics.





## P A R K I N G   B R A K E

—

We heard directly from Gulfstream pilots that the shape and location of the existing parking brake are awkward. Here, the size and position were altered to improve ergonomics.

## C U R S O R C O N T R O L   D E V I C E

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The CCD was completely redesigned. With the same function, it now occupies less space, and fits in the pilot's hand in a familiar and fun way, similar to a game controller.





## S T O R A G E

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Pilots lead busy lives and want to feel empowered to work without clutter. This created a design opportunity to explore storage solutions for items the current pedestal simply does not accommodate. These items include the pilot's cellphone, tablets, work papers, pens, and a carry-on bag.

## C U P H O L D E R S

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60% of Gulfstream pilots said there was nowhere near enough room for their personal belongings. We minimized clutter by introducing five new storage areas for the pilots' essentials and made room for two additional cupholders.



COMPARTMENT A

wireless charging



COMPARTMENT B

suitable for eyeglasses  
and pens

MATERIAL & TRIMS



OBSIDIAN BLACK  
LEATHER



LUXAN CHESTNUT LEATHER



IVORY LEATHER



BRUSHED ALUMINUM



GULFSTREAM BLUE  
LEATHER



## CUSTOMIZATION

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The pedestal is capable of customization, employing different material finishes to suit different clients' tastes and vision for their ideally tailored Gulfstream experience. The main body is ABS, a hard, lightweight, and extremely durable plastic that is easy to maintain and available in a variety of colors and textures.

To connect the front of the plane to the back, the wrap-around material is customizable. Materials and finishes can be selected to match the client-selected finishings for the cabin. With this material connection, the pilot gets to experience the same first-class sense of luxury the Gulfstream passengers feel, finally uniting the front and back of the aircraft.

## VISION VIDEO

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The team developed a dynamic Vision Video to show off the form and functionality of the reimagined pedestal, strengthen understanding of the design, and support the main presentation.



## VIRTUAL REALITY

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Virtual reality technology was utilized to create a simulated flight deck experience to test the human factors of the design concept and have the Gulfstream team actively engage with the pedestal. The proportions of the space were based on Gulfstream's current symmetry flight deck.





## P R E S E N T A T I O N

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After ten weeks and numerous iterations, it was time for the SCADpro team to present their final deliverables to the Gulfstream Aerospace team. Held in a SCAD conference room at Arnold Hall, the team hosted an array of select Gulfstream professionals, limited to ten, to abide by social-distancing guidelines.

The presenters told the project story through a video presentation and accompanying Vision Video that showed off the final design concept.



GULFSTREAM  
SEAL OF APPROVAL

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Following the presentation, the Gulfstream team delivered constructive feedback and enthusiasm for the outcome, labeling it their “most successful SCADpro experience so far.”



## L A N D I N G

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The Gulfstream experience begins and ends with the pilots. It was our mission from the start to empower them to feel their best on the job. Gulfstream is that pinnacle of a career in aviation, and we made sure to design a pedestal experience worthy of the Gulfstream standard and brand.



THE GULFSTREAM PEDESTAL  
OF TOMORROW

## CONCLUSION

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The team successfully landed, having met all criteria of the design brief with a happy client. A special thanks to everyone involved: Gulfstream for making this experience possible, Paul Runko for securing the presentation location, SCAD for allowing the Gulfstream team to attend with social-distancing regulations in place, Professor Rafael Corazza for leading an incredible team, and the students for all their hard work and contributions.



THANK YOU FOR FLYING  
WITH SCADPRO





x SCADpro