

# Creating a Hyper-car for the brand Lockheed and Martin

I am going to create a hypercar for Lockheed Martin, the global aerospace, defence, and security company best known for creating fighter jets. My idea is to translate their aero warfare superiority onto the road, and I figured the best way to do that would be through a hypercar. I will be taking inspiration for the design from some of their most famous jet designs.

## Environment

The hypercar I will be creating will be heavily tracked- and fast-road-used. It is going to be a one-off special for the brand, with the pure intent of showing that they not only dominate the sky with their jets but also the roads with their cars.

## Lockheed and Martins need for a vehicle.

Currently, Lockheed and Martin are primarily known for their aerospace and defence innovations, them venturing into the hyper-car world I feel like it would be a great opportunity for them to show off their cutting-edge technology. They'd be able to integrate their advanced futuristic materials into a hypercar allowing them to show that they can not only dominate in the aero innovation industry but also the automotive.

Additionally, if they made a hypercar it would tap into a completely different market for the brand while enhancing their public image. A high-performance hypercar would tap into a much younger audience and be a great publicity stunt, potentially opening their brand to more possible customers. Overall while a hypercar is so unconventional for a defence contractor, such a project could align with their broader strategic approaches and technological advancements.

## Vehicle benchmarking

If Lockheed Martin were to create a hyper-car, they would be competing with established brands that will be well known for their high performance and advanced technologies, some of these would be,

Bugatti Chiron- this car is renowned for having its quad-turbocharged W16 engine, which is a feat in engineering itself, it's got one of the highest top speeds and does all of this in ultimate luxury.

McLaren P1- This is a hybrid hypercar that utilises a lightweight aerodynamic design made of ultra-lightweight carbon fibre. It has a twin-turbocharged V8 engine that is also paired with an electric motor.

Ferrari LaFerrari- This is another hybrid hypercar but instead of a v8 this car houses a 6.0L V12 engine (typical of Ferrari) it also has an electric motor just to enhance its performance even further.

Porsche 918 Spyder- This car differs from the previous 2 with its AWD drivetrain system and lack of turbos. It's also a hybrid however its electric motors predominantly power the front wheels.

### *Specifications to meet to be considered competitive with these cars.*

#### Performance

The hypercar should aim for a 0-60 time in less than 2.5 seconds and a top speed nearing 300mph which would make it one of the quickest vehicles in a straight line in its class.

#### Powertrain

Being Lockheed Martin it's only right that the vehicle should utilise a jet propulsion system along with a combustion engine, the propulsion system should be on a switch and used for track use only when you need the car's full potential; it would be completely unnecessary for road use. This would therefore make this vehicle a hybrid of sorts, however, it wouldn't be efficiency focused.

#### Aerodynamics

As jets will be this car's only predecessor it should include fighter jet-inspired active aero flaps and sharp creases down either side of the vehicle with large intimidating intakes. Aero flaps will help the vehicle handle like it is in the air and not on the track, providing ultimate downforce.

#### Technology

Integration of Lockheed Martin's technology that they utilise in their jets would be a good addition to the hypercar, this would include advanced driver-assisted systems (ADAS). Along with the propulsion system that they use in the jets to help propel the car to astronomical speeds. A sophisticated infotainment system will also be necessary as this would help it appeal to tech-savvy consumers.

#### Sustainability

The car should include eco-friendly technologies like regenerative braking and an energy-efficient design so that it would align with modern consumer values.

By meeting all these points, I believe that Lockheed Martin could position themselves as a remarkable competitor in the hypercar/hypercar market by combining both their innovative technology and their jet-inspired past.

### **Infrastructure/ Technology study**

Because Lockheed Martin is an aerospace company, I feel it would only be right for them to include cutting-edge aerospace technology. Given their expertise in advanced materials, propulsion systems, avionics and autonomous technologies; the hyper-car would probably introduce a lot of technologies that aren't normally seen in the typical hyper-car markets. Here are some examples of things that I think they might include in their hyper-car design.

#### *Active aero systems and advanced aerodynamics*

As Lockheed Martin predominantly focuses on military aircraft technologies, I feel it is only right that their hyper-car includes active aero flaps that can help maintain downforce for the vehicle and excel its handling capabilities to a new level; this would include movable spoilers, rear

diffusers and adjustable front flaps on the front wings to help aid the car round corners. These would all be controlled by a computer that will adjust all the aero in real time to give you the best possible performance around a track.

#### *Lightweight materials*

Lockheed Martin is well known for its innovative materials that they use on their aircraft like carbon composites, titanium, and specialised alloys. These would be great for a hypercar as they can be used to increase the rigidity of the vehicle chassis while keeping it incredibly lightweight. This would help the vehicle maintain stability at high speeds and keep its form properly around tight corners on the track.

One of the materials I have seen they commonly use on their jets is 'Carbon-fibre-reinforced polymer CFRP.

#### *Jet propulsion systems*

As Lockheed Martin is an aerospace company they have ultimate knowledge in jet propulsion engines, I feel like it would be great to incorporate one of these systems into a vehicle as a track-only option as it would be far too violent for road use. A jet propulsion system is incorporated in the rear of the car to push it to immense speeds on the track, it would strictly be available in 'Track mode' for the vehicle and the computers would monitor how much thrust it provides so it doesn't become overwhelming for the vehicle. It would be used comparably to F1 cars 'push-to-pass' button to create an easy overtake for the car. Aside from this system, the car would just be ICE powered.

#### *Advanced autonomous driving and autopilot systems*

With Lockheed Martin's upper hand in avionics, they could include an auto-driving system in the car using the technologies that they use for the autopilot in their jets. While on track this could just be an assistance to the driver, giving them pointers on where to brake and where to accelerate etc. This car is not just for race car drivers so it needs to be seen as user-friendly to anyone who is in the market for it so I believe this would be a worthy feature to add. I feel like AI could be incorporated into this as well for ultimate knowledge in the streets as well as on the track, it could replicate famous driving styles around the track and achieve insane times.

The technologies it would use from jets would be Sensor fusion, radar, lidar, GPS, and real-time processing systems used in drones and aircraft.

#### *Advanced cockpit and display systems*

On the interior of this car, I'm looking to make it feel like you're driving a jet on the road, a centralised driving position (like the McLaren F1) to simulate that you're inside a jet cockpit. A HUD (heads-up display) will be projected on the windscreen displaying important information like speed and the G's you're pulling. A lot of modern cars are going for a minimalistic interior design that is easy for anyone to use, but with this car I want it to intimidate you the moment you get inside, it will have lots of screens crowding your face and switches everywhere all having their meaning (like the inside of an aviation vehicle) but with a modern touch. A lot of the screens will use gesture control and will change the display depending on what driving mode you are currently in.

#### *High-performance sensors and monitoring systems*

Lockheed Martin's monitoring systems that they use in their fighter jets can be translated over to the hyper-car to make them safer to use and perform better on track, these could include

real-time telemetry, performance analytics and advanced safety systems like collision avoidance of suspension and braking systems that will change depending on the current road conditions.

#### *Exotic active suspension and chassis control*

The suspension in the vehicle could adjust to the current road conditions so the vehicle can perform optimally at any given time. These systems would include active suspension dampening, electromagnetic suspension, and air suspension to adjust the ride height (so that the car would be able to remain at the optimal height for the part of the road it's on)

A hypercar designed by Lockheed Martin would blend all the innovative technologies that they have learned from military-grade aircraft and then blend them into the hypercar world. From the propulsion jet engines to the HUD, I feel all their technologies would help push the hypercar to its limits both around the track and on the road. The car would not only function as a performance beast but also something for the brand to highlight all of their new technologies on.

### Scenario for the Lockheed Martin Hyper-car

The most realistic scenario for the Lockheed Martin hypercar would be on the ultimate track environment where its upper hand on speed and performance and its innovative technologies from the aviation industry will come into its own.

#### *Exterior design for the vehicle*

The car will look comparable to the F-22 Raptor but on the road, it will have a matte black finish on the exterior highlighting its sharp aggressive lines and jet-like downforce and spoilers. From the rear of the car, you will be able to see if the massive rear diffuser, is not just there to look aggressive but also to provide real amounts of downforce around the track.

There will be active aero systems scattered all over the car that will adjust depending on what circuit you are racing on. There will be flaps on both wheel arches on the front and the splitter on the bottom of the bumper at the front will raise and lower depending on the corner that you are attacking.

#### *LED lighting*

The car will include LED lighting all around the vehicle integrated into the aggressive lines in the bodywork. I also want the LED lights to indicate when the car is using its jet propulsion system and the power it is producing will be indicated from green to red on the side, this will make it more of a spectacle to see going around the track.

#### *Interior design of the vehicle*

The cockpit is going to be crowded with plenty of screens everywhere and a HUD in your face so you can't miss it, it will be overwhelming yet intuitive for the track. You shouldn't feel comfortable in the car you need to realise what the car is capable of and it's not like driving your everyday hyper-car. There will be a separate screen for the AI side of things in the vehicle where you will be able to choose how much AI assistance you want while you are driving.

#### *AI integrated into the vehicle.*

The hypercar will have real-time AI that will be able to assist you while you are driving around the racetrack, it will be able to see what corner you are approaching in the vehicle and adjust itself accordingly to that corner. For example, if you are approaching a sharp chicane after a long

straight, just before the corner the car will throw up the necessary aero flaps and stiffen the suspension to allow it to keep control navigating the corner at the best possible speed. One of the many displays inside the vehicle, it will show you the best possible routes to take around the track that you are driving on; this can be in several different driving styles from various Formula 1 drivers, and you will be able to pick which one you want to replicate around the track. Another feature I would like to implement in the car is feedback after you have been racing, the AI will record your lap times and analyse how you have taken each corner; then if you choose to you will be able to receive feedback on how to improve your lap times and where the AI feels you lost the most time.

### *Dual motor jet propulsion system*

What will make this stand out to its competitors on the track will be its straight-line performance. On the straights you will be able to use its jet propulsion engine to get an instant, immense boost of extra power (like the push-to-pass button on F1 cars). This boost will allow you to pass near enough anything on the straight on a racetrack making it superior at tracks like Lemans. The jet will be linked up to the AI assistance unit so it only activated when you're on a racetrack, it won't be able to be activated on the road as there is nowhere where that kind of speed is required, it would just be simply dangerous. For driving normally, it will just use an ICE engine which will still have an immense amount of power, but it will be a lot more manageable than the jet propulsion system.

### *Autonomous mode*

The car won't have to be manned by a person to be driven, around a track it can be autonomously driven using similar kind of systems to the autopilot that Lockheed Martin uses in their fighter jets. These will calculate the quickest possible time around the track and then try to achieve it, in whatever road conditions. It will be a showcase of Lockheed Martin's superiority and advancement in Autonomous technology to the public and perhaps open them to new clientele.

To summarise the aesthetic of the vehicle is a sleek and sharp stealthy look to go with the military aerospace feel. I will emphasize the sharp lines with LEDs, obviously some for the headlights for the vehicle and then separate LEDs up the side to indicate things like the 'Jet Propulsion' engine's power.

## **User study**

### *The age group of the user*

35-60 years old I feel will be the age group for this user, it will have to be someone wealthy, has an established career and a fine taste for exclusive collectors' items.

### *Lifestyle*

The users will be of high class, ultra-high net worth individuals

They will be the owner of multiple properties, obviously plenty of other exotic cars in their collection. It would also be essential that they have access to a private race course for them to unlock the full potential of their vehicle.

The user should show great interest towards rare collectable pieces that demonstrate a feat in engineering and exclusivity.

They should also have a strong connection with the Lockheed Martin brand and will be able to fully appreciate what the brand is doing in creating a hypercar.

### *Dependence and Affinity*

This vehicle will entice technology enthusiasts as it will display forms of technology that have never been seen on a car like this before. It will appeal to someone who is using new forms of technology in their everyday lives and can easily accustom themselves to forever-changing systems and features. They are intrigued by the talk of all these new features that this car is meant to introduce to the car community.

### *Brand dependence*

The user will have to already be a big fan of Lockheed Martin's work, admiring the brand's reputation in military defence and the aerospace industries. They respect the brand's hard work in these industries, and they trust they will be equally as impressive in the automotive industry, expecting the car to mirror these values.

### *Personality traits*

They are forward thinkers who can appreciate impressive innovation in technology, and their actively looking for brands that are going to be setting new trends rather than following them. They are the kind of person that enjoys staying ahead of the technological advance and the easiest way for them to show this is through their possessions.

Everything they buy or invest in, they expect maximum/peak performance from it; they are thrilled by the dangerous things in life, and this will make sure they appreciate the vehicle's unearthly performance.

They have to have a collector's mentality, they want to collect rare and valuable items, and they will want to own Lockheed Martin's hypercar both as an investment and as a status symbol.

### *Needs and desires*

The vehicle needs to be exclusive and rare but still embody Lockheed Martin's legacy in the military aerospace industry, the car must be a piece that goes beyond ordinary hyper-car performance and tech, it needs to stand out from the crowd to emphasize its speciality. To help solidify its exclusivity for the customer there will only be a small production number for this vehicle and all of the vehicles made will be numbered, they will be able to be visually customized to an extent by the customer to add uniqueness to each car.

The customer will be drawn to Lockheed Martin's engineering and technological advancements prowess. Features like Pilot-grade HUD and autonomous driving capabilities will be able to meet their utmost desires for innovation in the automotive industry.

The user will also want an exhilarating driving experience, they expect the car to be like nothing they have ever driven before; immense power but remains under control due to its adaptive AI capabilities. They also don't want the car to feel too safe, there needs to be a visceral connection to the machine they are controlling, lots of real feedback from the pedals and the steering making every drive give you the ultimate thrill.

### *User needs and desires for this vehicle*

They want a car that will combine power and thrill while remaining in complete control of itself, this will be able to be achieved with Lockheed Martin's AI system which will manage the suspension and steering feedback in the background in real-time, you won't even be able to tell

that it's working. It will be possible for this system to be completely disabled but it won't be recommended for beginner drivers.

However, it's not just about owning the car; once the car has been bought you will be part of an exclusive club. You'll get invited to special events and track experiences hosted by Lockheed Martin and exclusive previews on all of Lockheed Martin's technology in the making. You will also get invited to get experiences in Lockheed Martin's other vehicles like their famous fighter jets.

The user wants a brand that showcases what a military brand can do when they put their time into making a hyper-car, features like a cockpit-inspired interior and the exterior being made of materials like CFRP, will allow the car to not only look beautiful but also function beautifully.

The user profile defines the ideal owner of Lockheed Martin's exclusive hypercar, it makes it a statement and also an exhilarating piece of engineering.

## Design Direction

### *Design direction and theme*

The theme for my project is going to be 'Fighter Jet for the Road'

The hypercar will embody Lockheed Martin fighter jets' stealth ESC styling with all of the top-end precision that their company is well known for. It will be heavily inspired by aerospace vehicles with lots of angular forms all over the exterior to help achieve the aggressive stance that I am looking for. The hypercar should have an aggressive stance but also be able to convey its high-performance characteristics and exclusivity.

It will reflect heavily from fighter jet influence, high-end exclusive technology, with both aggressive and functional design aesthetics.

The overall design language will be lots of aggressive sharp lines (reminiscent of Lamborghini Concepts), this will help create a sense of speed and power. All unnecessary curves and accents will be avoided it will be just purposeful streamlined lines. The design should be able to speak for itself, it's not just a hypercar; it's also a collector's piece, an innovation in the automotive industry for technology and a statement.

### *Size and type of vehicle*

This vehicle will be an 'Extremely exclusive hybrid hypercar' as an extremely high-performance vehicle it will appeal to those who appreciate a marvel of innovative technology.

The hypercar will have an extremely low stance while remaining wide to help improve the weight distribution while cornering, this will also allow for it to be more stable/manageable at high speeds.

The dimensions of this car will be similar to a Bugatti Chiron or the Rimac Nevera, but a lot more aggressive looking than these two; far more angular shapes across the body, and the width will look intimidating wide. It will be wide, but the cockpit will be slim in the centre. These should emphasise this hypercar performance-orientated focus while still retaining an exclusive style.

The weight distribution and balance are essential in a performance car of this calibre, I will try to keep the weight distribution as close to 50-50 as possible, this might mean placing the driver close to the front of the vehicle; this would also be more reminiscent of a fighter jet so may not

be a bad thing. The weight of the jet propulsion engine and the internal combustion engine will keep the rear end nicely planted down which is important for high-speed driving.

#### *The balance between aesthetics and functionality*

The primary focus for this project is going to be Functionality with form-driven aesthetics. I feel that every aesthetic feature on this hypercar should have a real function behind it; the aesthetic appeals should appear naturally from the car's high-performance functions.

The aesthetic focus will be on the clean sleek minimalistic lines that will drape across the exterior of the car, the car will be recommended to be sprayed in a dark non-reflective matte colour similar to those of fighter jets, however it will feature LEDs across the vehicle integrated into those sharp lines (so that they don't protrude from the exterior form at all). I would also like to make these LEDs across the exterior programmable but only to an extent as it needs to keep in touch with Lockheed Martin's sophisticated public image. All the fighter jet-inspired lines and the angular shapes will help keep the design fresh for years to come.

Aerodynamics and cooling will need to be prioritized on this build to help keep both engines cool enough, especially when the vehicle is racing flat out around a race track, all of the intakes and vents should most importantly be functional but then integrated into the stealthy shape of the vehicle to help add to the aesthetics, I'd like to create some intakes similar to the ones you see on the side of the jet. All the materials on this vehicle will be military aerospace inspired like carbon-reinforced polymers; these will ensure the optimal power-to-weight ratio. All the suspension will have to be fully adjustable on this car so that it can cope with the high speed cornering and acceleration, I would like to incorporate an advanced steering system that will give you direct haptic feedback helping you feel at one with the road for an improved driving experience.

#### *Key design features and elements*

Inside the cockpit will be heavily inspired by fighter jets, I want the user to feel intimidated when they enter the vehicle; it needs to be clear to them that it's not just any hypercar. It will feature a HUD display with all the telemetry data that you will need. You will be surrounded by high-end materials such as high-quality alloy bevels on all of the screens and Alcantara covering everywhere else.

There will be a screen inside that will be allocated to AI use so you can choose whether to have it integrated into your driving giving you driver assistance or you're able to select an option to go without it if you are a confident enough driver.

There will be a distinctive combination of LEDs on the side that will show when the car is in the fully autonomous model, this will allow viewers to see its potential and capability when the car is being controlled by just a computer. It will be a great showcase for Lockheed Martin autopilot technology. These LEDs could also act as a safety feature for when the vehicle is being used on the track.

I feel like this design direction shows Lockheed Martin's determination to create something that functions exceptionally while still having breathtaking timeless aesthetics, this will make the car not only a collector's dream but also the next benchmark in the automotive industry for innovative technology. The result is going to be an ultra-exclusive fighter jet for the road hypercar that's as thrilling on a racetrack as its dynamic looks.

## Inspiration

I feel if I want this car to capture the essence of Lockheed Martin it needs to follow these main attributes.

### *Design inspiration sources*

I will take lots of inspiration from Lockheed Martin fighter jets like the F-35 or F-117 Nighthawk, I will use these as references for the angular shapes that I will follow with the exterior of the hypercar (sharp lines and non-reflective surfaces). The fighter jets have these attributes so they don't appear on the enemy's radar, and I feel these would also work perfectly for the theme of my aircraft.

Materials will also play a big role; I will use the fighter jets as inspiration; I want there to be very little 'visual noise'.

### *Hypersonic and supersonic aerodynamic attributes*

I will try to follow the same features that the fighter jets use for flying at supersonic and hypersonic speeds, I'm going to integrate components like adjustable flaps at the front and dynamic venting systems, these will aid the car stability at high speeds and cooling for the two engines.

### *Military-grade AI*

I want to involve military-grade AI systems in this car to aid with handling its ferocious power for a more novice driver, it will be able to suggest what kind of settings you want the car to be in depending on what conditions you are driving in and the track you're planning to be racing round.

### *Spacecraft and satellite technology*

Lockheed Martin has strong ties with NASA and many other international space programs so it would be cool to integrate some design features that have been used on past spacecraft, which would really make the design out of this world. As I'm planning to run two engines on this car heat will start to become an issue so using some spacecraft heat-resistant components should come in handy.

### *Key attributes for the hypercar*

Sharp and angular lines will be all over the exterior of the car, and the matte paintwork will mean no light is reflected from the vehicle giving it a menacing look. There should be plenty of visual cues that communicate to the public that this is a highly-strung performance car.

All of the colour cues will be military-themed such as gunmetal grey, deep blacks and maybe some dark tones of navy blue. To help it maintain a futuristic feel there will be decorative LEDs throughout the sharp lines of the bodywork.

### *Timelessness*

It will prioritize simplicity. It won't follow the current trends in the automotive industry; it will be the vehicle setting them. All the military-grade materials that I will be using will ensure excellent build quality and robustness for years to come.

### *Functional attributes*

Inspired by Lockheed Martin's jets the vehicle should have a finely tuned and designed aerodynamic profile (Lockheed Martin's supersonic vehicles will be great inspiration for this). To remain aerodynamic and stable at such high speeds adaptive aero will be incredibly important on this vehicle, I also feel it would benefit from an airbrake system.

### *AI and driver assistance*

AI co-pilot is a must in this vehicle of this performance to help keep all the power managed and stop the driver from driving past his talent. It would be able to offer the driver a unique balance of AI assistance while still having plenty of feel of the manual power of the car.

### *Cooling and heat management*

The hypercar cooling systems should reflect Lockheed Martin's innovative technology that they use on their fighter jets, it should include elements like heat vents, thermal resistant body panels and lots of ducting that is inspired by aircraft cooling systems, this would allow for the cooling to work efficiently without adding lots more weight.

My design will prioritise fighter jet aesthetics, with lots of aero spec features that will be functional, but the form will fall from them as well. It will offer a unique driving experience that will be completely out of this world, establishing this vehicle as a performance monster and an extremely exclusive collector's piece.

## **Design brief: Lockheed Martins' exclusive Hyper-car**

My design brief will give a clear outline of the vision for the vehicle, the purpose and all the specific requirements that I have made for the development and research for Lockheed Martin's exclusive hypercar.

### *Project Overview*

**Name:** Hypersonic

**Purpose:** Designing a hypercar for Lockheed Martin displaying their advanced aerospace technology and how it can be applied to a Hypercar. It will give the user a unique racing car experience while remaining an exclusive collector's item.

**Core identity:** It will be heavily inspired by a stealth Jet fighter, there will be lots of angular shapes all over the vehicle and AI assistance to enhance the driving experience.

### *Target Audience*

**Demographics:** 35-60-year-olds, will have to be extremely high net worth individuals, big car collectors and possibly enthusiasts of innovative technology

### *Design Theme*

**Concept-** Jet for the track

Lots of aggressive sharp exterior accents across the vehicle, and non-reflective finishes to give it a stealthy effect.

Will be incredibly futuristic but incredibly understated, and the aesthetics will be timeless which should help emphasize its longevity and exclusivity.

### *Vehicle attributes*

#### *Performance goals*

Acceleration- 0-60 in less than 2 secs

Top Speed- 350+mph

Range (without jet propulsion system)- 400 miles

#### *Key features*

AI-assisted drive co-pilot- Lockheed Martin's robotics will inspire this; it will offer recommendations and help depending on what track and the conditions you are racing in. It will keep the driver safe and also allow him to achieve better results.

Advanced aerodynamics- Active splitters and spoilers, adjustable flaps all over the vehicle to enhance handling characteristics and cooling systems derived from aerospace.

Exclusive materials- Fighter jet-inspired materials like Carbon reinforced polymers and heat-resistant composites

#### *Unique selling points*

Exclusive design

Aerospace Heritage

Performance Mastery

Innovational edge

#### *Timeline*

Concept Development- 6 months

Prototyping and testing- 1-2 years

Final Production Model reveal- 1 year

### *Summary*

Lockheed Martin's exclusive hypercar will be a technological marvel, it will be combining jet aesthetics and technology but for the road. It will have groundbreaking performance and intelligence to assist it. It's designed to appeal to collectors, and I believe it will turn into a timeless icon in the automotive industry.

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