

PIPISTREL

BY TEXTRON eAVIATION

PANTHERA

SPECIFICATION AND DESCRIPTION



Provisional Specification and Description valid for Type Certified Panthera 152 mode aircraft, subject to change pending certification.

PANTHERA

SPECIFICATION AND DESCRIPTION

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INTRODUCTION

This Specification and Description provides general information about the design, performance, and standard equipment of the Panthera (Model 152).

Due to the lapse of time between the date of this publication and Aircraft delivery, Pipistrel d.o.o. (hereinafter Seller) reserves the right to revise this Specification and Description when occasioned by product improvements, government regulations, or other good cause, as long as the revisions do not result in a material reduction in Aircraft performance.

If there is a conflict between this Specification and Description and the Aircraft Purchase Agreement into which it is incorporated, the terms and conditions of the Aircraft Purchase Agreement control.

For further information contact:

Pipistrel d.o.o
Goriska Cesta 50a
SI-5270 Ajdovscina
Slovenia

Telephone: +386 5 36 63 873
Email: sales@pipistrel-aircraft.com

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GENERAL DESCRIPTION

The Panthera is a single-engine low-wing piston aircraft. The Aircraft has provisions for four passengers (four is standard) and will be certified for a single pilot. The Panthera has one interior storage compartment for personal items and baggage.

One Lycoming IO-540-V4A5 engine with a Hartzell three-blade, constant-speed propeller powers the Panthera, and a Garmin® G1000 NXi system provides pilots with a digital avionics suite.

Certification

The Panthera is pending certification in accordance with EASA CS-23, Normal Category, to include day, night, VFR and IFR.



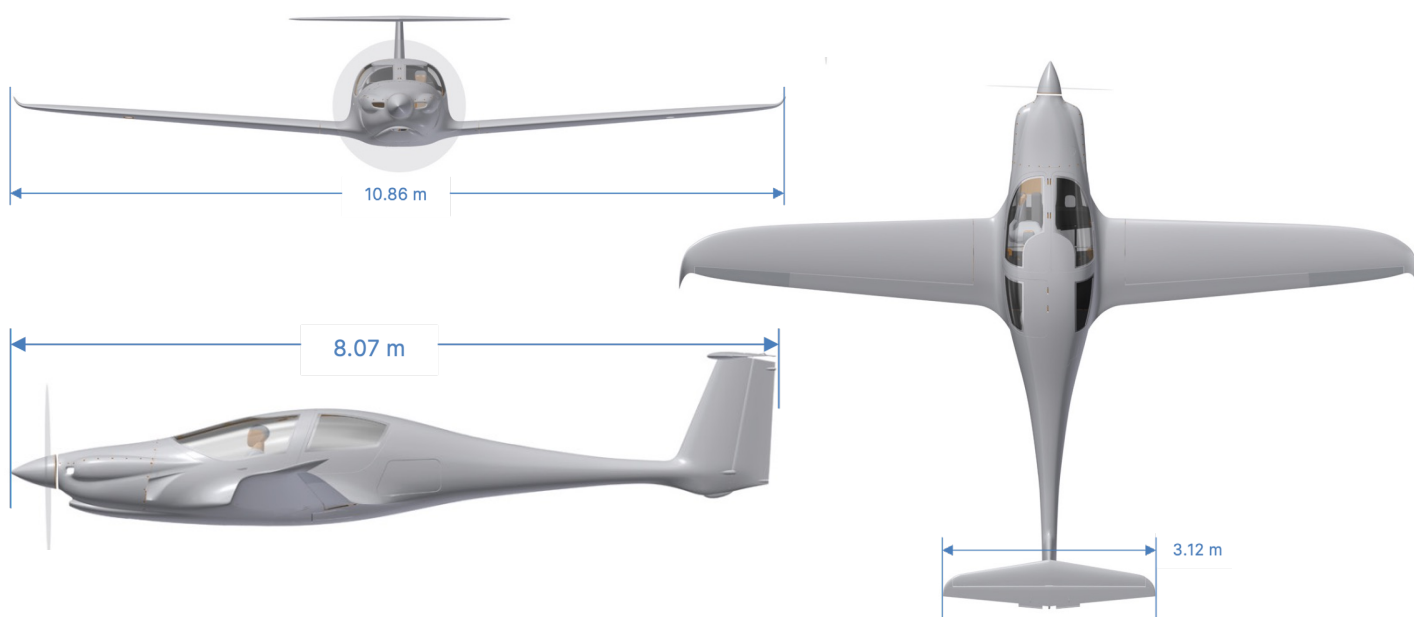
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GENERAL DESCRIPTION

Approximate Dimensions

Overall Height	7 ft 2 in (2.19 m)		
Overall Width	35 ft 8 in (10.86 m)		
Overall Length	26 ft 6 in (8.07 m)		
	Span (overall)	Area	Sweep (at 25% chord)
Wing	35.6 ft (10.86 m)	121 ft ² (11.23 m ²)	0°
Horizontal Tail	10.2 ft (3.12 m)	16 ft ² (1.49 m ²)	TBC
Vertical Tail	4.83 ft (1.47 m)	12.9 ft ² (1.2 m ²)	TBC



Design Weights and Capacities

Maximum Takeoff Weight	2,999 lb (1,360 kg)
Maximum Landing Weight	2,866 lb (1,300 kg)
Basic Empty Weight	1,949 lb (884 kg)
Fuel Capacity (usable)	82 gal (310 liters) 492 lb (223 kg)

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PERFORMANCE

All performance data is based on a standard aircraft configuration, operating in International Standard Atmosphere (ISA) conditions with zero wind. Takeoff and landing lengths are based on a flat, even, hard surface at sea level with a dry runway. Actual performance will vary with the individual aircraft and other factors such as environmental conditions, aircraft configuration and operational/ATC procedures.

Takeoff Distance over 50 ft Obstacle	2,156 ft (657 m)
Takeoff Ground Roll	TBD
Maximum Takeoff Weight	
Maximum Climb Rate	1,260 ft/min
Service Ceiling	18,000 ft (5,500 m)
Maximum Cruise Speed (+/- 3%) 6,000 ft (1,829 m) altitude; maximum cruise power (or full throttle)	195 ktas (361 km/hr)
Maximum Ferry Range (+/- 3%) 1 Pilot, VFR, Range allows for taxi, take off, climb, cruise, descent and VFR fuel reserve of 30 minutes at maximum range power	1,480 nm (2,740 km)
Typical Maximum Range (+/- 3%) 4 Occupants, IFR, Range allows for taxi, take off, climb, cruise, descent and IFR fuel reserve of 45 minutes at maximum range power	920 nm (1,704 km)
Landing Distance over 50 ft Obstacle	2,316 ft (706 m)
Maximum Landing Weight, Full Flaps	
Landing Ground Roll	TBD
Maximum Landing Weight, Full Flaps	
Noise Levels	TBD
Takeoff	TBD
500 ft at full power	

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DESIGN LIMITS

Design Load Limits	
Flaps Up	-1.52 to +3.8 G
Operating Limit Speeds	
VNE (Never exceed speed)	220 kias (407 km/hr)
VNO (Maximum structural cruising speed)	185 kias (343 km/hr)
VA (Maneuvering speed)	134 kias (248 km/hr)
Flap Limit Speeds	
VFE (Flaps extended 15°)	150 kias (278 km/hr)
VFE (Flaps extended 45°)	130 kias (241 km/hr)
VLE (Landing Gear extended)	150 kias (278 km/hr)

Pipistrel reserves the right to revise this data whenever occasioned by product improvement, government/ authority regulations or other good cause.



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FUSELAGE

Design and Construction

The fuselage, including the vertical tail, is a semi-monocoque structure made of state-of-the-art carbon fiber sandwich shells. The cockpit area is reinforced by a composite substructure.

The front bulkhead, made of high-temperature high-strength carbon fiber composite, serves as the fire wall and supports the engine mount and nose landing gear strut.

A wing spar carry-through box supports the detachable wings and the main landing gear. A central tunnel stiffens the structure and supports the landing gear mechanism. The roll bar, consisting of one central and two lateral pillars, reinforces door and window openings.

The rear bench shell, cabin rear bulkhead, and aft longitudinal ribs serve as attachment points for mechanisms and belts. The parachute container is fixed to the cabin rear bulkhead, and the baggage compartment floor provides attachment points for baggage nets and harnesses.

The tail cone and vertical stabilizer are reinforced by carbon fiber ring frames and closed by a web, with ribs serving as horizontal tail attachment points and carrying the rudder hinges, tail skid, and rear jack point.

Nose Section

The nose section forward of the firewall houses the Lycoming IO-540-V4A5 piston engine, supported by an engine mount attached to the front bulkhead at six fitting points. The engine compartment is enclosed by two covers, fastened together with a series of screws.

The windshield is integrated into the front doors. The polycarbonate windows extend forward, offering an unobstructed view to the front and the side.

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Interior Spaces

The flight compartment and cabin are described in following pages.

Aft Fuselage

The baggage compartment is housed behind the cabin rear bulkhead, and is accessible either through the baggage compartment external door, or by removing the left seat backrest. The tail cone, behind the baggage compartment bulkhead, houses avionics and other systems and sensors.

WING

This Aircraft features a detachable wing design of composite construction incorporating a single spar structure. Each wing is connected to the fuselage by two bolts through the spar ends and the fuselage carry-through box.

Manually actuated ailerons are located on the outboard part of the wing. Electrically actuated flaps are attached to the trailing edges of each wing.

EMPENNAGE

The empennage features a T-tail configuration. The elevator is a one-piece composite structure, as well as the rudder.

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LANDING GEAR

Design and Construction

The landing gear is a retracting, tricycle type with a nosewheel and two main wheels. It consists of an oleo pneumatic nose strut mounted to the engine mount, and two main-gear struts with trailing link arms and oleo pneumatic shock absorbers.

The retraction mechanism is actuated electrically, with a backup manual mechanism.

Nosewheel Steering

Nosewheel steering is mechanically actuated by the rudder pedals, and moved simultaneously with the rudder.

Brakes and Tires

Each main gear wheel is equipped with a hydraulically operated brake. Each brake is operated independently with a toe brake on each rudder pedal.

The Panthera is equipped with single wheels and tires (one nose gear and one each left and right main).

	Ply	Size
Nose Gear Tire	14	5.00-4
Main Gear Tires	6	15 × 6.00-5 (or 380 × 150-5)

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PROPULSION

Powerplant

The Aircraft is powered by a single, fuselage-mounted, 6-cylinder Lycoming IO-540-V4A5 piston engine.

The engine uses ram air for cooling for the cylinders, with a plenum surrounding the top of the engine for optimum cooling pressure distribution and lower cooling drag.

The power is controlled through Throttle and Mixture levers in the flight deck.

Takeoff Power Rating (at sea level)	260 hp
Time Before Overhaul	2,000 hr

Propeller

The engine drives a Hartzell Raptor 74-inch diameter, constant speed propeller. Its three blades are made of composite with a protective metallic leading edge. A hydraulic governor adjusts the blade pitch based on inputs from an RPM lever in the cockpit.

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SYSTEMS

Flight Controls

The manually operated dual Primary Flight Controls (PFCs) consist of one central stick for each front seat, driving push rods to one aileron on each wing and to one elevator on the horizontal tail. Two sets of rudder pedals control one rudder on the vertical tail via cables and pulleys.

The secondary control system provides electric trim for the pitch and yaw systems, by actuating trim tabs on the elevator and rudder, respectively. A yaw damper system provides additional comfort to the pilot.

The flaps are electrically driven by a single actuator. The flaps position is selected on a control panel on the dashboard.

Fuel System

The Panthera features two main fuel tanks of 23.7 gallons, one in each wing, and two auxiliary fuel tanks of 18 gallons, one in each wing. Fuel quantity is measured by a level sensor in each main tank and indicated on the Multi-Function Display. All four tanks are equipped with minimum fuel level switches. Fuel is transferred from the auxiliary tanks to the main tanks via electric transfer pumps, activated in the cockpit.

A manually operated fuel selector is used to select the wing feeding the engine. An electric fuel pump drives the fuel to a gascolator, and then to the main mechanical fuel pump in the engine.

The engine is designed to operate on AVGAS grade 100LL (blue).

Total useable fuel is 82 gal (310 L).

Electrical System

The aircraft's 28-volt direct current electrical system is powered by a 150-amp integrated generator and a main 11.7 amp-hour battery. The alternator and main battery are controlled through the MASTER switch on the instrument panel. Power is supplied to the main bus which delivers power to the avionics relay and circuit breakers.

In the event of failure, the battery will supply a reduced number of direct-current loads with power for at least 45 minutes.

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SYSTEMS

Exterior Lighting System

Standard exterior lighting consists of wing tip and tail navigation and anti-collision strobe lights, mid-intensity wingtip landing/recognition lights, and a high-intensity landing/taxi light on the right landing gear leg. All the lights are LED technology.

Environmental System

The environmental system consists of a ventilation and heating system. Cabin ventilation is a ram air and fan system, with a manifold that distributes the air to a set of outlets in the cabin. The heated air is mixed with the fresh air in a mixing chamber in front of the firewall, before entering the distribution manifold.

Intensity, temperature, and distribution are electrically adjusted via a control panel in the dashboard. A manually actuated shutoff valve allows for closure of outside ventilation.

A manually actuated backup fresh air inlet provides ram air to the windshield outlets.

Each occupant has one multidirectional, manually operated ventilation outlet, and a footwell air outlet.

The optional air conditioning system is independently controlled and provides cool air via dedicated overhead outlets.

Ballistic Parachute Rescue System

The aircraft is equipped with a ballistic parachute rescue system. The parachute and its pyrotechnic system are contained in a canister inside of the baggage compartment. Two aramid belts are kept within the cockpit cage structure and are attached to the robust wing spar box.

The system is activated by pulling a handle in the central overhead panel. As the parachute is ejected, the belts tear the outer composite shell of the fuselage, leaving the airplane hanging from the parachute in a slightly nose-down position.

When not flying, the handle is locked via a safety pin, which should be removed before flight.

The recommended maintenance interval for repacking the parachute is to be determined.

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FLIGHT COMPARTMENT

The Panthera features a Garmin G1000 NXi avionic suite. The main interfaces are two 10.4" PFD/MFD screens.

Instrumentation



- | | |
|---|---|
| 1. Caution/Warning Lights | 11. Secondary Circuit Breaker Panel |
| 2. Landing Gear Lever | 12. USB-A/C Power Socket |
| 3. Autopilot | 13. Master Switch and Magnetos/Start Switch |
| 4. Flaps Lever | 14. ELT Remote Switch |
| 5. Instruments Dimmer | 15. System Control Panel |
| 6. Primary Flight Display | 16. Fuel Transfer Control Panel |
| 7. Multi-Function Display | 17. Climate Control Panel |
| 8. Standby Attitude and Heading Indicator | 18. Lights Control Panel |
| 9. Audio Control Panel | 19. FMS Keyboard Controller |
| 10. Main Circuit Breaker Panel | (not depicted, on the central console) |

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FLIGHT COMPARTMENT

Avionics

The Garmin® G1000 NXi integrated avionics system includes the Garmin® Integrated Flight Deck (GIFD), flight crew radio communications, navigation receivers, Engine Indicating System, Crew Alerting System, Flight Guidance System and Attitude/Heading Reference System.

Flight Displays

The GIFD includes two 10.4-inch, high-resolution Liquid Crystal Displays (LCDs) in widescreen, landscape orientation. The displays can be interchangeably used as Primary Flight Display or Multi-Function Display.

The PFD is located on the pilot's instrument panel. The PFD displays flight information, including Synthetic Vision Technology, moving map imagery, and color-coded Crew Alerting System messages.

The MFD is located in the co-pilots instrument panel, displays a detailed moving map, terrain, traffic, and weather information as well as a dedicated engine and systems information window. Display of electronic charts and taxi diagrams are included.

The interface with the PFD/MFD is performed through the buttons and knobs on the sides of the screens, or via an independent GCU 476 FMS controller on the central console.

Garmin's Integrated Avionics Unit (GIA)

Dual Integrated Avionics Units include the Global Positioning System with Wide Area Augmentation System (WAAS) receivers, Very High Frequency (VHF) communication radios, VHF navigation radios, and glideslope receivers in addition to supporting input-output processing, aural alert generation, and Flight Director functions.

Engine Indicating System (EIS)

The Engine Indicating System (EIS) displays electrical, fuel and engine information on the MFD.

Crew Alerting System (CAS)

The Crew Alerting System (CAS) displays Warning Messages (red), Caution (yellow), and Advisories (white) on the PFD/MFD.

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Flight Guidance System (FGS)

The GFC 700 Automatic Flight Control System (AFCS) is controlled using the GMC 707 autopilot controller, with Yaw Damper and Automatic Wing Level buttons.

The AFCS can be divided into the following functions:

Flight Director:	The Flight Director provides vertical/lateral mode selection and processing, and command bars showing pitch/roll guidance.
Autopilot:	The autopilot provides automatic flight control in response to Flight Director steering commands and attitude and rate information.
Automatic Pitch and Yaw Trim:	The trim system provides automatic pitch and yaw trim when the autopilot is engaged.
Yaw Damper:	A Yaw Damper is standard equipment and provides comfort, especially in climb and cruise flight.

Air Data Attitude Heading Reference System (ADAHRS)

The air data, attitude and heading information is processed by a single GSU 75 ADAHRS unit.

Audio Panel

The communication and navigation is managed by the Garmin® GIA 64W Integrated Avionics Unit. COM/NAV inputs are performed via the GMA 1360 audio panel and/or the GCU 476 FMS controller.

Transponder with ADS-B In/Out Capability

The Garmin® GTX 345R has a built-in 1090 ES transponder with ADS-B "Out" and dual-link ADS-B "In".

Emergency Locator Transmitter (ELT)

The Kannad Integra AF 2-frequency (GPS navigational interfaced) Emergency Locator Transmitter (ELT) consists of the ELT transmitter, an antenna mounted on the tail cone and a remote switch on the instrument panel.

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FLIGHT COMPARTMENT

Carbon Monoxide Detector

A remote mounted CO detector displays alerts on the Garmin® PFD/MFD in case of high carbon monoxide concentrations, and the built-in pressure sensor indicates altitude warnings at 10,000 feet, 12,500 feet, and 14,000 feet as a reminder to the pilot that supplemental oxygen should be used.

Standby Instrumentation

An electronic Garmin® GI 275 standby attitude and heading indicator is mounted on the left side of the instrument panel. It is a self-contained air data and attitude/heading reference system and is connected to the airplane's pitot and static systems, as well as a dedicated magnetometer. The electronic standby indicator remains operational in the event of a complete electrical failure using an integrated backup battery with a minimum of 60 minutes of run time.

In case of PFD/MFD failure the Garmin® GI 275 can interface with Garmin GFC 700 autopilot.

WiFi/LTE Datalink with PlaneSync™ Technology

The Garmin® GDL 60 advanced datalink system enhances the avionics capabilities. It provides automatic database updates via 4G LTE cellular or Wi-Fi connectivity. Additionally, it logs flight and engine data and allows remote checks of fuel and systems status through the Garmin® Pilot™ smart-device app.

Optional Equipment

The avionics suite can be complemented by a series of optional equipment and avionics functionalities.

Garmin Connex Satellite - Iridium

Fully Integrated weather, satellite phone and text messaging through Iridium Communications. Available communication services include request/response-based Garmin® Connex Worldwide Weather with graphical and text weather services (where available), sending and receiving of in-flight text messages and voice calls, and aircraft position reporting. Requires a subscription.

Garmin Traffic Awareness System

GTS 825 Traffic Awareness System. A 360° zone of detection identifies other nearby transponder-equipped aircraft and vocalizes for specific traffic-spotting information. Uses Garmin®'s exclusive CLEAR CAS technology with up to 40 miles of active surveillance.

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Garmin SiriusXM Weather and Radio Datalink

The SiriusXM weather and radio data link provides weather information and digital audio entertainment in the cockpit. The system is available in the U.S. only. Requires a subscription.

Garmin DME

Distance Measuring Equipment (DME). Garmin GDM 450R receiver, displays on the PFD.

Garmin SurfaceWatch

The SurfaceWatch feature provides aural and visual annunciations to help the flight crew maintain situational awareness and avoid potential runway incursions/excursions during ground and air operations in the airport environment. Requires a subscription.

Garmin Terrain Awareness and Warning System

The Garmin® TAWS (Terrain Awareness and Warning System) is an optional feature to increase situational awareness and aid in reducing controlled flight into terrain (CFIT). TAWS satisfies TSO-C151b Class B requirements for certification. TAWS provides visual and aural annunciations when terrain and obstacles are within the given altitude threshold from the aircraft.

Jeppesen ChartView

ChartView resembles the paper version of domestic Jeppesen terminal procedures charts. The charts are displayed in full color with high resolution. The MFD depiction shows the aircraft position on the moving map in the plan view of the approach charts and on airport diagrams. Available data includes domestic arrivals (STAR), Departure Procedures (DP), Approaches, Airport Diagrams and NOTAMS.

Integrated Oxygen System

Built-in oxygen system with outlets for all four occupants through an overhead manifold. The system is activated and monitored via the MFD. Bottle size: 22 cu.ft.

Air Conditioning

Electric Air Conditioning System, controlled via a dedicated control panel.

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INTERIOR

Cabin

Entry to, and exit from the airplane is accomplished through two gull-wing type doors, one on each side of the cabin at the front seat positions. A third gull-wing door on the left side gives access to the rear seats. Emergency egress is performed through cabin doors. A sharp tool is provided to facilitate shattering of the canopy if doors cannot open.

The Panthera offers a four-seat configuration with ergonomic sporty seats made of carbon fiber and wrapped in high-quality leather.

The following are included in the typical arrangement:

- » Two longitudinally-adjusting crew seats for the pilot and front passenger, and a fixed bench seat for rear passengers.
- » Each seat equipped with a three-point safety belt with a detachable shoulder belt, inertia reel and a lift lever type buckle.
- » Six adjustable air vents throughout the cabin, one for each occupant, and two for the windshield. Additional footwell air vents are provided for each occupant.
- » Cup holders are provided for the occupants.

Certified burn-resistant materials are used throughout the cabin.



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INTERIOR

Windows

The main doors/windshield, rear door and rear right windows are made from Lexan shatter-resistant polycarbonate.

Interior Lighting System

Interior lighting includes LED backlit instrument panel lighting, a dashboard flood light, and map lights for each occupant. Automatic footwell and ambient lights aid during nighttime entry into the airplane.

Interior Storage

A baggage compartment is located behind the cabin's rear bulkhead, and can be accessed via an external door, or by removing the rear left seat backrest. The compartment is limited to 110 lbs (50 kg) of load. The cabin area is equipped with pockets and nets for storing small items, manuals and documents.

EXTERIOR

The external airframe is covered by a protective acrylic paint coating. The high-quality decals offer a distinctive look to the Panthera.

The registration number and flag can be also added as decals, per request of the Purchaser.

WARRANTY

The buyer is entitled to a warranty granted by Pipistrel for products and goods for a period of 24 months or 1,000 hours, whichever comes first.

Tel: +386 5 3663 873 | Email: sales@pipistrel-aircraft.com | www.pipistrel-aircraft.com

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