ASRS Database Report Set

Global Positioning System (GPS) Reports

Report Set Description.....A variety of reports referencing use of Global Positioning System (GPS) devices.

Update Number.....33

Date of Update.....October 5, 2023

Number of Records in Report Set.....50

Records within this Report Set have been screened to assure their relevance to the topic.

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, CA 94035-1000

TH: 262-7

MEMORANDUM FOR: Recipients of Aviation Safety Reporting System Data

SUBJECT: Data Derived from ASRS Reports

The attached material is furnished pursuant to a request for data from the NASA Aviation Safety Reporting System (ASRS). Recipients of this material are reminded when evaluating these data of the following points.

ASRS reports are submitted voluntarily. Such incidents are independently submitted and are not corroborated by NASA, the FAA or NTSB. The existence in the ASRS database of reports concerning a specific topic cannot, therefore, be used to infer the prevalence of that problem within the National Airspace System.

Information contained in reports submitted to ASRS may be clarified by further contact with the individual who submitted them, but the information provided by the reporter is not investigated further. Such information represents the perspective of the specific individual who is describing their experience and perception of a safety related event.

After preliminary processing, all ASRS reports are de-identified and the identity of the individual who submitted the report is permanently eliminated. All ASRS report processing systems are designed to protect identifying information submitted by reporters; including names, company affiliations, and specific times of incident occurrence. After a report has been de-identified, any verification of information submitted to ASRS would be limited.

The National Aeronautics and Space Administration and its ASRS current contractor, Booz Allen Hamilton, specifically disclaim any responsibility for any interpretation which may be made by others of any material or data furnished by NASA in response to queries of the ASRS database and related materials.

B Hooey

Becky L. Hooey, Director
NASA Aviation Safety Reporting System

CAVEAT REGARDING USE OF ASRS DATA

Certain caveats apply to the use of ASRS data. All ASRS reports are voluntarily submitted, and thus cannot be considered a measured random sample of the full population of like events. For example, we receive several thousand altitude deviation reports each year. This number may comprise over half of all the altitude deviations that occur, or it may be just a small fraction of total occurrences.

Moreover, not all pilots, controllers, mechanics, flight attendants, dispatchers or other participants in the aviation system are equally aware of the ASRS or may be equally willing to report. Thus, the data can reflect **reporting biases**. These biases, which are not fully known or measurable, may influence ASRS information. A safety problem such as near midair collisions (NMACs) may appear to be more highly concentrated in area "A" than area "B" simply because the airmen who operate in area "A" are more aware of the ASRS program and more inclined to report should an NMAC occur. Any type of subjective, voluntary reporting will have these limitations related to quantitative statistical analysis.

One thing that can be known from ASRS data is that the number of reports received concerning specific event types represents the **lower measure** of the true number of such events that are occurring. For example, if ASRS receives 881 reports of track deviations in 2010 (this number is purely hypothetical), then it can be known with some certainty that at least 881 such events have occurred in 2010. With these statistical limitations in mind, we believe that the **real power** of ASRS data is the **qualitative information** contained in **report narratives**. The pilots, controllers, and others who report tell us about aviation safety incidents and situations in detail – explaining what happened, and more importantly, **why** it happened. Using report narratives effectively requires an extra measure of study, but the knowledge derived is well worth the added effort.

Report Synopses

ACN: 2000093 *(1 of 50)*

Synopsis

Air carrier Captain reported GPS jamming in the vicinity of Ukraine and Syria.

ACN: 1998026 *(2 of 50)*

Synopsis

Corporate jet Captain reported executing a go-around from approach to SMO after experiencing GPS anomalies. Reporter stated he was notified that other aircraft experienced similar anomalies in that area.

ACN: 1996431 *(3 of 50)*

Synopsis

Small transport pilot reported an altitude deviation occurred while trying to reprogram the aircraft's autopilot that may have been potentially caused by a GPS anomaly. The aircraft's autopilot, which was set up for an RNAV approach, initiated a turn off course. As the pilot disconnected the autopilot and tried to determine the cause of the issue, the aircraft descended below the assigned altitude and the pilot was admonished by ATC. After landing, ATC stated that there had been numerous cases of GPS issues on the approach as of recent and asked if the pilot may have also experienced a GPS anomaly.

ACN: 1996263 *(4 of 50)*

Synopsis

Air carrier First Officer reported possible GPS jamming during climb-out, and noted that other aircraft in the area were also experiencing similar indications. ATC then advised the flight crew that the aircraft was slightly off course, and the flight crew opted to follow headings.

ACN: 1994554 *(5 of 50)*

Synopsis

Recreational/hobbyist UAS pilot reported controllability issues flying their UAS and believes the GPS module or remote controller are possible causes.

ACN: 1993952 *(6 of 50)*

Synopsis

Air carrier Captain reported GPS jamming occurred while on an RNAV arrival into LTFM, Istanbul, Turkey. ATC gave the carrier vectors to a successful ILS landing.

ACN: 1992100 *(7 of 50)*

Synopsis

Small aircraft pilot flying reported losing TAWS and other navigational aids while descending into the clouds in solid IMC while landing at the destination airport. As the aircraft broke out of the clouds slightly south of intended position the navigational aids returned. The pilot decided to continue the approach and landing instead of performing a go-around.

ACN: 1991492 *(8 of 50)*

Synopsis

Pilot reported an airspace violation due to a loss of GPS signal in the vicinity of R-5311. The pilot reported the signal loss has occurred in other similar areas with the Garmin 430W.

ACN: 1989982 *(9 of 50)*

Synopsis

MD-11 flight crew reported progressive degradation of all navigation systems after departure. The flight crew determined that continuing to destination airport was not possible. The flight crew requested vectors to return to departure airport. Fuel was jettisoned to get below maximum landing weight and the flight crew landed uneventfully.

ACN: 1984420 *(10 of 50)*

Synopsis

Widebody Captain reported suspected GPS jamming or interference in the vicinity of the Black Sea.

ACN: 1980554 *(11 of 50)*

Synopsis

Flight Crew reported failures of numerous systems in cruise. The crew ran the QRH and check lists and reconstructed a flight plan and continued to destination airport. A go around was performed and the approach was accomplished again, allowing for a safe landing at destination airport.

ACN: 1980406 *(12 of 50)*

Synopsis

Government UAS pilot reported they lost control of the UAS after launch. The reporter believes a GPS error caused the loss of control.

ACN: 1975037 *(13 of 50)*

Synopsis

BE-200 flight crew reported losing communications and flight instruments after takeoff. The flight crew performed an air turnback. The engine starter system was found to be on the incorrect setting, which overrode the generators.

ACN: 1973446 *(14 of 50)*

Synopsis

B777-300 First Officer reported GPS Jamming in foreign airspace.

ACN: 1971766 *(15 of 50)*

Synopsis

B757-200 Captain reported GPS jamming on approach to the airport and requested vectors from ATC. The flight crew expressed concern that vectors from ATC were placing them in unsafe proximity to terrain.

ACN: 1967829 *(16 of 50)*

Synopsis

B737-800 flight crew reported a course deviation due to a temporary loss of GPS service.

ACN: 1963954 *(17 of 50)*

Synopsis

Part 107 UAS pilot reported a loss of UAV control during flight and a subsequent flyaway. During post flight review the UAS crew learned of a GPS failure within the UAS.

ACN: 1963498 *(18 of 50)*

Synopsis

A321 flight crew reported experiencing confusion and difficulty controlling the aircraft when they lost GPS shortly after takeoff.

ACN: 1960050 *(19 of 50)*

Synopsis

Air carrier flight crew reported wind gusts on approach, unstable indicated and vertical speeds, PFD display problem, and poor crew coordination resulted in TA and late touchdown.

ACN: 1957100 *(20 of 50)*

Synopsis

B777 Captain reported being informed by ATC that the aircraft was off course on the approach to land. Upon landing, the flight crew discovered through ATC that there may have been interference with the GPS signal. The flight crew also received an "UNABLE RNP" alert on the navigation equipment while on the arrival.

ACN: 1956997 *(21 of 50)*

Synopsis

Military pilot reported GPS signal degradation led to an incorrect turn and a subsequent altitude deviation during a heading correction.

ACN: 1956103 *(22 of 50)*

Synopsis

Air taxi flight crew reported a track deviation while on arrival and noticed the aircraft was not following the assigned heading. The Captain disconnected the autopilot and hand-flew to the correct course.

ACN: 1949738 *(23 of 50)*

Synopsis

Air Carrier Captain reported a track deviation occurred in the vicinity of the Black Sea as a result of GPS jamming and an FMC malfunction.

ACN: 1943790 *(24 of 50)*

Synopsis

A small single engine GA pilot reported GPS outage caused their auto pilot to fail and they descended below their assigned altitude.

ACN: 1943682 *(25 of 50)*

Synopsis

Air carrier pilot flying into TLV reported GPS Jamming.

ACN: 1940955 *(26 of 50)*

Synopsis

Flight crew reported on a GPS approach to Runway 36 at AAO airport, the Tower Controller at nearby BEC airport informed them via UNICOM that they were lined up with the BEC runway and to sidestep to AAO. Flight crew landed at AAO.

ACN: 1926048 *(27 of 50)*

Synopsis

Air carrier pilot reported GPS Jamming. The reporter also reported a lack of guidance in the QRH when receiving a Terrain Alert while encountering known GPS Jamming.

ACN: 1924069 *(28 of 50)*

Synopsis

Part 107 UAS pilot reported learning another UAS pilot had a fly away due to possible GPS issue. The reporter also expressed concerns about the company's safety culture.

ACN: 1922871 *(29 of 50)*

Synopsis

Flight Instructor reported a loss of GPS signal while on final approach to Runway 23 at IND and hand flew the approach to landing.

ACN: 1909407 *(30 of 50)*

Synopsis

Air carrier First Officer reported the FMC dropped 4 navigational fixes in the routing, causing a course deviation. The First Officer stated the aircraft was in an area of reported GPS jamming.

ACN: 1908478 *(31 of 50)*

Synopsis

A pilot departing HPN reported loss of GPS signal.

ACN: 1906250 *(32 of 50)*

Synopsis

Air carrier pilot reported a loss of GPS signal for approximately 2 hours while in cruise over Turkey and Iraq.

ACN: 1903210 *(33 of 50)*

Synopsis

Air carrier Pilot reported the crew did not notice GPS PRIMARY LOST messages on both displays until ATC asked them why they were 70 miles off course.

ACN: 1902393 *(34 of 50)*

Synopsis

C182 Pilot reported a loss of GPS signal while on vectors for approach.

ACN: 1902118 *(35 of 50)*

Synopsis

An air carrier CRJ-700 Pilot reported a loss of GPS on departure.

ACN: 1896267 *(36 of 50)*

Synopsis

Pilot reported losing GPS and ADS while flying UBBA airspace.

ACN: 1891731 *(37 of 50)*

Synopsis

Air Carrier Captain reported GPS jamming from 50 NM west until 250 NM west of TVL. The Captain states the aircraft eventually left the jamming area. In addition the Captain reported requesting a change to the QRH procedures in order to help overcome the unwanted situation. The request was sent to the Flight Operations Department.

ACN: 1884338 *(38 of 50)*

Synopsis

Light Twin Engine Pilot reported loss of GPS signal which resulted in loss of altitude reporting.

ACN: 1881639 *(39 of 50)*

Synopsis

UAS pilot reported that while flying a UAS for a photo mission, a GPS multipath error occurred and the UAS crashed into a building.

ACN: 1881214 *(40 of 50)*

Synopsis

Pilot reported possibly entering the SMF class charlie airspace by mistake after a momentary GPS signal loss.

ACN: 1880420 *(41 of 50)*

Synopsis

Single Engine Pilot reported a possible airspace violation. The pilot suspects a GPS error contributed to the event and questions whether it could be 5G related.

ACN: 1880243 *(42 of 50)*

Synopsis

Pilot reported GPS failure in flight as did other flights in the vicinity.

ACN: 1878184 *(43 of 50)*

Synopsis

CE-500 Captain and First Officer reported a breakdown in CRM during troubleshooting a GPS failure resulted in confusion and turn in the wrong direction.

ACN: 1871693 *(44 of 50)*

Synopsis

Air carrier First Officer reported a possible conflict and loss of GPS on approach to DEN.

ACN: 1871581 *(45 of 50)*

Synopsis

Flight crew reported both GPS and transponder failed on approach and departure into and out of DEN.

ACN: 1870567 *(46 of 50)*

Synopsis

Light aircraft Pilot reported a small course deviation related to a momentary GPS issue.

ACN: 1870527 *(47 of 50)*

Synopsis

M20 Pilot reported GPS, ADS-B failure which pilot believed was a problem with something other than his aircraft.

ACN: 1870383 *(48 of 50)*

Synopsis

Air carrier Captain reported loss of ADS-B and GPS departing DEN.

ACN: 1870380 *(49 of 50)*

Synopsis

Air carrier flight crew reported failure of GPS and transponder on arrival into DEN.

ACN: 1870379 *(50 of 50)*

Synopsis

Air carrier Captain reported temporary loss of GPS and transponder on approach to DEN. Both systems returned to normal after landing.

Report Narratives

ACN: 2000093 *(1 of 50)*

Time / Day

Date : 202305
Local Time Of Day : 0001-0600

Place

Altitude.MSL.Single Value : 32000

Environment

Flight Conditions : VMC

Aircraft

Reference : X
Aircraft Operator : Air Carrier
Make Model Name : Commercial Fixed Wing
Crew Size.Number Of Crew : 3
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Nav In Use : GPS
Nav In Use : FMS Or FMC
Flight Phase : Cruise
Route In Use : Direct

Component : 1

Aircraft Component : Navigational Equipment and Processing
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Flying
Function.Flight Crew : Captain
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
Experience.Flight Crew.Total : 19082
Experience.Flight Crew.Last 90 Days : 200
Experience.Flight Crew.Type : 2834
ASRS Report Number.Accession Number : 2000093
Human Factors : Situational Awareness
Human Factors : Troubleshooting

Human Factors : Workload
Human Factors : Distraction

Events

Anomaly.Aircraft Equipment Problem : Critical
Anomaly.Inflight Event / Encounter : Other / Unknown
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
Were Passengers Involved In Event : N
When Detected : In-flight
Result.General : Maintenance Action
Result.Flight Crew : Overcame Equipment Problem
Result.Aircraft : Equipment Problem Dissipated

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

On two occasions worse COMM Jamming I've experienced. We got NAV unable RNP, Runway SYS, GPS, TERR POS and ADS-B OUT L messages. Completed checklists, informed dispatch and maintenance control, continued on after the systems reset, automatic maintenance write ups occurred. Occurrences were just abeam Syria and Southwest of Ukraine transiting North.

Synopsis

Air carrier Captain reported GPS jamming in the vicinity of Ukraine and Syria.

ACN: 1998026 *(2 of 50)*

Time / Day

Date : 202304
Local Time Of Day : 1801-2400

Place

Locale Reference.ATC Facility : SMO.Tower
State Reference : CA
Relative Position.Angle.Radial : 023
Relative Position.Distance.Nautical Miles : 4
Altitude.MSL.Single Value : 1800

Environment

Flight Conditions : IMC
Weather Elements / Visibility : Fog
Weather Elements / Visibility.Visibility : 2.5
Light : Dusk
Ceiling.Single Value : 300

Aircraft

Reference : X
ATC / Advisory.Tower : SMO
Aircraft Operator : Air Taxi
Make Model Name : Small Transport, Low Wing, 2 Turbojet Eng
Operating Under FAR Part : Part 135
Flight Plan : IFR
Mission : Passenger
Flight Phase : Final Approach
Route In Use.Other
Airspace.Class D : SMO

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Taxi
Function.Flight Crew : Instructor
Function.Flight Crew : Pilot Flying
Qualification.Flight Crew : Flight Instructor
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Air Transport Pilot (ATP)
Experience.Flight Crew.Total : 6700
Experience.Flight Crew.Last 90 Days : 147
Experience.Flight Crew.Type : 690
ASRS Report Number.Accession Number : 1998026

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Executed Go Around / Missed Approach
Result.Flight Crew : Overcame Equipment Problem
Result.Aircraft : Equipment Problem Dissipated

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Environment - Non Weather Related

Narrative: 1

During the RNAV GPS Runway 21 approach into Santa Monica, after passing the final approach fix and descending through approximately 1800 feet, experienced a loss of the glide path associated with a GPS LOI (loss of integrity) warning. Immediately executed the published missed approach. Regained full GPS functionality during the climb and successfully executed the same approach to a landing at SMO. No further GPS anomalies in later flights. Subsequently heard from my company that other pilots had experienced GPS failure in same location.

Synopsis

Corporate jet Captain reported executing a go-around from approach to SMO after experiencing GPS anomalies. Reporter stated he was notified that other aircraft experienced similar anomalies in that area.

ACN: 1996431 *(3 of 50)*

Time / Day

Date : 202305
Local Time Of Day : 0601-1200

Place

Locale Reference.Airport : SMO.Airport
State Reference : CA
Altitude.MSL.Single Value : 5000

Environment

Weather Elements / Visibility.Other

Aircraft

Reference : X
ATC / Advisory.TRACON : SCT
Aircraft Operator : Personal
Make Model Name : Small Transport, Low Wing, 2 Recip Eng
Crew Size.Number Of Crew : 1
Operating Under FAR Part : Part 91
Flight Plan : IFR
Mission : Personal
Nav In Use : FMS Or FMC
Nav In Use : GPS
Flight Phase : Initial Approach
Route In Use : Direct
Route In Use : Vectors
Airspace.Class D : ZZZ

Component : 1

Aircraft Component : Autopilot
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Component : 3

Aircraft Component : Navigational Equipment and Processing
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Personal
Function.Flight Crew : Single Pilot

Qualification.Flight Crew : Flight Instructor
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Experience.Flight Crew.Total : 8000
Experience.Flight Crew.Last 90 Days : 25
Experience.Flight Crew.Type : 1500
ASRS Report Number.Accession Number : 1996431
Human Factors : Situational Awareness
Human Factors : Time Pressure
Human Factors : Distraction
Human Factors : Workload
Human Factors : Human-Machine Interface
Human Factors : Confusion
Human Factors : Troubleshooting

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Altitude : Excursion From Assigned Altitude
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Anomaly.Inflight Event / Encounter : Other / Unknown
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Regained Aircraft Control
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : Overrode Automation
Result.Air Traffic Control : Issued Advisory / Alert

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Human Factors
Primary Problem : Ambiguous

Narrative: 1

I descended 300 ft. below my assigned altitude. I was cleared to DARTS intersection, which is also the IF for the RNAV 21 approach into SMO and told to expect the RNAV 21 approach into SMO. I changed the next fix in my GNS 530 from DARTS in Enroute Mode to DARTS in the Approach Mode. A minute or so later, I noticed the CDI swing to the final approach course, which [was] about 120 degrees off the course I was on, and the aircraft, which was on autopilot, initiated a turn to the right. I had not yet reached DARTS, and still did not know why the airplane made a turn towards the next fix on the approach before it reached the fix I had input as Direct To. In any event, I decoupled the autopilot, rolled the airplane level, and was beginning to try to figure out where I was and what the box was doing, when ATC gave me a vector, a crossing altitude at and for DARTS - which my airplane had just turned away from for reasons unknown, and cleared me for the approach. I read it back, but was not sure where I was and was trying to fly the airplane and work the box, when I noticed I had descended 300 ft. below the assigned altitude. I immediately climbed back up, and at the same time ATC cleared me to a lower altitude, and then admonished me for having descended below the initial assigned altitude. I

acknowledged his admonition, but was still distracted trying to figure out how to get the box to reflect the approach and get the airplane on the approach. I finally figured it out and flew the rest of the approach uneventfully. Upon landing, after exiting the runway, Tower asked me if I had experienced any GPS anomalies, stating that they had had numerous complaints over the past several days about GPS issues on the approach. I replied in the affirmative. A contributing factor is how ATC works us on that approach. The crossing altitude at DARTS is supposed to be 4,200 ft. but they hold us higher, and the crossing altitude they give is usually much higher than that, as it was today, which sets us up for a "slam dunk" destabilized approach. Within seconds we get descents, approach clearance, and vectors, which result in a high work load at a critical time. It sets us up for the classic destabilized approach. Long story short, I am not sure what happened. I already have scheduled a sim session with a CFII to work on that approach to see if there is anything I did to cause the CDI swing, but I've been flying behind this box for a good 15 years, just had an IPC (Instrument Proficiency Check), and don't think I did anything incorrectly.

Synopsis

Small transport pilot reported an altitude deviation occurred while trying to reprogram the aircraft's autopilot that may have been potentially caused by a GPS anomaly. The aircraft's autopilot, which was set up for an RNAV approach, initiated a turn off course. As the pilot disconnected the autopilot and tried to determine the cause of the issue, the aircraft descended below the assigned altitude and the pilot was admonished by ATC. After landing, ATC stated that there had been numerous cases of GPS issues on the approach as of recent and asked if the pilot may have also experienced a GPS anomaly.

ACN: 1996263 *(4 of 50)*

Time / Day

Date : 202212
Local Time Of Day : 1201-1800

Place

Locale Reference.ATC Facility : ZAB.ARTCC
State Reference : NM

Aircraft

Reference : X
ATC / Advisory.Center : ZAB
Aircraft Operator : Air Carrier
Make Model Name : Large Transport, Low Wing, 2 Turbojet Eng
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Nav In Use : GPS
Nav In Use : FMS Or FMC
Flight Phase : Initial Climb
Flight Phase : Climb

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : First Officer
Function.Flight Crew : Pilot Flying
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Air Transport Pilot (ATP)
ASRS Report Number.Accession Number : 1996263
Human Factors : Situational Awareness

Events

Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Person : Air Traffic Control
When Detected : In-flight
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Flight Crew : Overcame Equipment Problem
Result.Air Traffic Control : Provided Assistance

Assessments

Contributing Factors / Situations : Airspace Structure
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

On climb-out we were receiving multiple indications of jamming as described in company pages. Captain notified ATC as instructed in company pages. Other aircraft checking on to ABQ Center advised controller of multiple indications of jamming. ATC advised we showed slightly off course. We elected to coordinate headings to mitigate any issues.

Synopsis

Air carrier First Officer reported possible GPS jamming during climb-out, and noted that other aircraft in the area were also experiencing similar indications. ATC then advised the flight crew that the aircraft was slightly off course, and the flight crew opted to follow headings.

ACN: 1994554 *(5 of 50)*

Time / Day

Date : 202303

Place

Altitude.AGL.Single Value : 60

Environment

Flight Conditions : VMC
Weather Elements / Visibility.Visibility : 4
Work Environment Factor : Excessive Wind (UAS)
Light : Daylight
Ceiling : CLR

Aircraft

Reference : X
Aircraft Operator : Recreational / Hobbyist (UAS)
Make Model Name : Ruko F11 Mini
Crew Size.Number Of Crew : 1
Operating Under FAR Part : Recreational Operations / Section 44809 (UAS)
Mission : Recreational / Hobbyist (UAS)
Flight Phase : Hovering (UAS)
Airspace.Class G : ZZZ
Operating Under Waivers / Exemptions / Authorizations (UAS) : N
Weight Category (UAS) : Small
Configuration (UAS) : Multi-Rotor
Flight Operated As (UAS) : VLOS
Flight Operated with Visual Observer (UAS) : N
Control Mode (UAS) : Manual Control
Flying In / Near / Over (UAS) : Private Property
Flying In / Near / Over (UAS) : Critical Infrastructure
Flying In / Near / Over (UAS) : Open Space / Field
Flying In / Near / Over (UAS) : Moving Vehicles
Type (UAS) : Purchased
Number of UAS Being Controlled (UAS).Number of UAS : 1

Component : 1

Aircraft Component : Receiver (UAS)
Manufacturer : Ruko
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : GPS Module (UAS)
Manufacturer : Ruko
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person : Outdoor / Field Station (UAS)
Reporter Organization : Recreational / Hobbyist (UAS)
Function.Flight Crew : Person Manipulating Controls (UAS)
Qualification.Flight Crew : Remote Pilot (UAS)
Experience.Flight Crew.Total (UAS) : 45.00
Experience.Flight Crew.Type (UAS) : 5.00
ASRS Report Number.Accession Number : 1994554
Human Factors : Troubleshooting
Analyst Callback : Completed

Events

Anomaly.Aircraft Equipment Problem : Critical
Anomaly.Inflight Event / Encounter : Loss Of Aircraft Control
Detector.Person : UAS Crew
When Detected : In-flight
Result.Flight Crew : Overcame Equipment Problem

Assessments

Contributing Factors / Situations : Aircraft
Primary Problem : Aircraft

Narrative: 1

This is a portion of the information I sent to the manufacturer. They did send me a replacement drone. Which the issues are reduced by a good 10 fold however I still don't have complete control. I still can't land on a 25×25 landing pad because the drone likes to wander it is a GPS drone. I discovered NASA reporting online and felt this was a good way to report what this drone is doing. Simple terms I had a loss of control event. I am having some problems with my F11 mini drone. I had hoped to make a video and explain it in there but the weather for the next week is bad. Flying outside I will start up and everything is running well. I will fly for a long time and all of a sudden it is like somebody else is fighting me for the controls. What happened the last time was with no increase in wind the front props pitched up sending me to the rear. I counter acted that with full right stick forward, front pitch remained up and back pitch raised as well. This allowed me to inch forward at the same time the drone ascended a good 20 feet in the air with my fingers not even touching the yaw/elevation stick. I did manage to get it back to a safe landing area. I re-calibrated compass and gyro with the start up procedure again. I armed the props, took off and hovered at 10 feet for 1 minute and it was all good again. Needless to say this is an unsafe flight condition and it is a reoccurring problem. The exact problem changes but overall it remains very similar. I have also noticed I can't land within arms reach of my 25×25 landing pad outside, however, inside in ATTI (Attitude) mode I have no problem landing within 1 foot. I also ran it for 15 minutes inside on ATTI mode and it was rock steady and responsive to controls. Outside it feels like the GPS is dealing with a very heavy lag and it doesn't agree with my control inputs I'll roll left several feet, then it will push me to the right where my last stable position was. I have been flying the drone for quite some time now and these have been issues the entire time, however, I've flown it enough where I know its a problem that isn't going away by itself.

Callback: 1

The reporter indicated they believe the issue is with the remote controller but they have no way to verify it.

Synopsis

Recreational/hobbyist UAS pilot reported controllability issues flying their UAS and believes the GPS module or remote controller are possible causes.

ACN: 1993952 *(6 of 50)*

Time / Day

Date : 202304
Local Time Of Day : 0001-0600

Place

Locale Reference.ATC Facility : LTBB.ARTCC
State Reference : FO

Environment

Flight Conditions : IMC

Aircraft

Reference : X
ATC / Advisory.Center : ZZZZ
Aircraft Operator : Air Carrier
Make Model Name : B767 Undifferentiated or Other Model
Crew Size.Number Of Crew : 3
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Nav In Use : GPS
Nav In Use : FMS Or FMC
Nav In Use.Localizer/Glideslope/ILS : ILS
Flight Phase : Initial Approach
Route In Use.STAR : RNAV

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Captain
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
ASRS Report Number.Accession Number : 1993952
Human Factors : Workload
Human Factors : Situational Awareness

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy

Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
Detector.Person : Air Traffic Control
When Detected : In-flight
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : Became Reoriented
Result.Air Traffic Control : Provided Assistance

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Airspace Structure
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Environment - Non Weather Related
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Primary Problem : Ambiguous

Narrative: 1

GPS jamming during RNAV arrival. Jamming began while aircraft in a turn and had to wait our turn on the radio behind Company Airline who was experiencing the same issue. There is a remote possibility that an off course deviation occurred on the RNAV STAR due to the time it took to receive vectors. Flight terminated with ATC vectors to an ILS approach. Did not complete an AML entry per the FOM due to mistaking the "X" to be in the X column rather than Y column. GPS jamming from bad actors.

Synopsis

Air carrier Captain reported GPS jamming occurred while on an RNAV arrival into LTFM, Istanbul, Turkey. ATC gave the carrier vectors to a successful ILS landing.

ACN: 1992100 *(7 of 50)*

Time / Day

Date : 202304
Local Time Of Day : 1801-2400

Place

Locale Reference.Airport : SMO.Airport
State Reference : CA
Altitude.MSL.Single Value : 1500

Environment

Flight Conditions : IMC
Weather Elements / Visibility : Rain
Weather Elements / Visibility : Haze / Smoke
Weather Elements / Visibility.Visibility : 6
Light : Night
Ceiling.Single Value : 1200

Aircraft

Reference : X
ATC / Advisory.Tower : SMO
Aircraft Operator : Personal
Make Model Name : Small Aircraft, Low Wing, 1 Eng, Fixed Gear
Crew Size.Number Of Crew : 1
Operating Under FAR Part : Part 91
Flight Plan : IFR
Mission : Personal
Nav In Use : FMS Or FMC
Nav In Use : GPS
Flight Phase : Final Approach
Route In Use : Vectors
Route In Use.Airway : V186
Airspace.Class D : SMO

Component : 1

Aircraft Component : PFD
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : Navigational Equipment and Processing
Aircraft Reference : X
Problem : Malfunctioning

Component : 3

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Personal
Function.Flight Crew : Single Pilot
Function.Flight Crew : Pilot Flying
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Private
Experience.Flight Crew.Total : 262
Experience.Flight Crew.Last 90 Days : 12
Experience.Flight Crew.Type : 183
ASRS Report Number.Accession Number : 1992100
Human Factors : Human-Machine Interface
Human Factors : Situational Awareness
Human Factors : Confusion

Events

Anomaly.Aircraft Equipment Problem : Critical
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
When Detected : In-flight
Result.General : None Reported / Taken

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Human Factors
Contributing Factors / Situations : Procedure
Primary Problem : Ambiguous

Narrative: 1

I was flying as pilot in command on an IFR flight plan with another IFR-rated pilot from ZZZ to Santa Monica SMO where I am based. The plane I was flying is Aircraft X with [manufacturer] avionics, which I am very familiar with and earned my PPL and IFR ratings in Aircraft X airplanes. The ceiling was 1,200 ft. AGL but ASOS was reporting scattered at 800 ft. AGL as well. We were on descent using the RNAV 21 approach and LPV minimums of 440 ft. MSL as well as an autopilot coupled approach. We were in solid IMC around 1,500 ft. MSL when we passed MIPTE, which is 3.3 NM 033 degrees from Runway 21. In solid IMC and a stable approach, the moment we passed through MIPTE we received a "TAWS (Terrain Avoidance and Warning System) Not Available" audible annunciation. At this moment we lost synthetic vision on the PFD (Primary Flight Display) and the vertical glide path. Quickly, we realized we could still fly the LNAV minimums to 685 ft. MSL. However, a few seconds later I realized the CDI (Course Deviation Indicator) showed GPS LNAV but there was no HSI (Horizontal Situation Indicator) at all. This didn't make sense so I looked at the autopilot mode area on the PFD area and noticed I was no longer in NAV/APR Mode but was instead in ROL/PIT Mode. I realized this meant I was in fact no longer tracking any reference and was simply holding wings level and pitch, which maintained my descent. This entire situation took 10 seconds and at the end of it I realized it was very dangerous, we were still in IMC. I audibly said to my copilot, "I think we need to go missed," and right as my hand went to the throttle we broke through the ceiling and the airport was in front of us. Neither of us wanted to go back into the clouds. We were slightly south of where we were used to and that correlates to being blown south in a ROL Control Mode as the winds were from the northwest. Additionally, our TAWS came back as we broke through the ceiling too. At no time did we get a GPS annunciation

or any annunciation indicating actual loss of navigation aid. TAWS was for awareness only and we didn't need it to properly and safely fly the approach. We landed uneventfully. In retrospect I should have gone missed immediately. I did not however, realize I had lost GPS or navigation functionality. The only annunciation was the loss of TAWS which I didn't care about and a clear disappearance of the glide path indicator. For a majority of this situation I believed I had lateral navigation. My familiarity with [manufacturer] avionics is quite high but I was not familiar with warning annunciations for loss of TAWS and GPS. I assumed a loss of navigation references would have a less benign annunciation. Studying the [manufacturer] Pilot's Guide afterwards has led me to realize there are several annunciations where loss of GPS would provide a benign sounding TAWS warning. Looking at SD card data logs from the plane. Quite literally at MIPTE the GPS lost 3DDIFF resolution and went to 3D Mode. This corresponds with a loss of WAAS. This lasted for two seconds before WAAS and 3DDIFF was restored. I suspect this is why I never got a GPS warning as I did not actually use GPS. However, I am still perplexed as to why lateral navigation was not available. My GPS altitude jumped 60 ft. in one second during the anomaly per logs, which could explain the plane's reaction.

Synopsis

Small aircraft pilot flying reported losing TAWS and other navigational aids while descending into the clouds in solid IMC while landing at the destination airport. As the aircraft broke out of the clouds slightly south of intended position the navigational aids returned. The pilot decided to continue the approach and landing instead of performing a go-around.

ACN: 1991492 *(8 of 50)*

Time / Day

Date : 202304
Local Time Of Day : 0601-1200

Place

Locale Reference.Airport : RCZ.Airport
State Reference : NC
Relative Position.Angle.Radial : 245
Relative Position.Distance.Nautical Miles : 25
Altitude.MSL.Single Value : 4500

Environment

Flight Conditions : VMC
Weather Elements / Visibility.Visibility : 10
Light : Daylight
Ceiling.Single Value : 10000

Aircraft

Reference : X
ATC / Advisory.TRACON : FAY
Aircraft Operator : Personal
Make Model Name : Small Aircraft, Low Wing, 1 Eng, Fixed Gear
Crew Size.Number Of Crew : 1
Operating Under FAR Part : Part 91
Flight Plan : None
Mission : Personal
Flight Phase : Cruise
Route In Use : Direct
Airspace.Class E : FAY

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Personal
Function.Flight Crew : Pilot Flying
Function.Flight Crew : Single Pilot
Qualification.Flight Crew : Private
Experience.Flight Crew.Total : 1469
Experience.Flight Crew.Last 90 Days : 10
Experience.Flight Crew.Type : 959
ASRS Report Number.Accession Number : 1991492
Human Factors : Troubleshooting
Human Factors : Situational Awareness

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Airspace Violation : All Types
Anomaly.Deviation / Discrepancy - Procedural : FAR
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Detector.Automation : Air Traffic Control
Detector.Person : Flight Crew
Detector.Person : Air Traffic Control
Were Passengers Involved In Event : N
Result.General : None Reported / Taken

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Airspace Structure
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Environment - Non Weather Related
Contributing Factors / Situations : Equipment / Tooling
Primary Problem : Ambiguous

Narrative: 1

Advised that I flew about 2 miles south into R-5311 going to and coming from Richmond County Airport. My flight planning showed me just north outside of the restricted area, but looking at flight path and speaking with Fayetteville Approach shows I inadvertently passed through R-5311 just south of the northern edge. My Garmin 430W showed a, "GPS SIGNAL LOST," message in the area and went away after a few miles. This has happened before when flying near other military areas such as Cherry Point.

Synopsis

Pilot reported an airspace violation due to a loss of GPS signal in the vicinity of R-5311. The pilot reported the signal loss has occurred in other similar areas with the Garmin 430W.

ACN: 1989982 *(9 of 50)*

Time / Day

Date : 202304
Local Time Of Day : 0601-1200

Place

Locale Reference.ATC Facility : ZZZ.TRACON
State Reference : US

Environment

Flight Conditions : VMC
Light : Daylight

Aircraft

Reference : X
Aircraft Operator : Air Carrier
Make Model Name : MD-11
Crew Size.Number Of Crew : 3
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Cargo / Freight / Delivery
Flight Phase : Initial Climb
Flight Phase : Climb
Route In Use : Vectors

Component : 1

Aircraft Component : Autoflight System
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : Flight Dynamics Navigation and Safety
Aircraft Reference : X
Problem : Malfunctioning

Component : 3

Aircraft Component : Navigational Equipment and Processing
Aircraft Reference : X
Problem : Malfunctioning

Person : 1

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Flying
Function.Flight Crew : First Officer
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine

ASRS Report Number.Accession Number : 1989982
Human Factors : Troubleshooting

Person : 2

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Not Flying
Function.Flight Crew : Relief Pilot
Function.Flight Crew : First Officer
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
ASRS Report Number.Accession Number : 1989984
Human Factors : Troubleshooting

Events

Anomaly.Aircraft Equipment Problem : Critical
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Weight And Balance
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Anomaly.Inflight Event / Encounter : Fuel Issue
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
Were Passengers Involved In Event : N
When Detected : In-flight
Result.General : Maintenance Action
Result.General : Flight Cancelled / Delayed
Result.Flight Crew : Landed As Precaution
Result.Flight Crew : Returned To Departure Airport
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Air Traffic Control : Provided Assistance

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Human Factors
Primary Problem : Aircraft

Narrative: 1

Prior to push back we had a message of unable RNP. We referenced the Company chart stating that there is the possibility of magnetic interference at Gate X and Y. The positions looked in tolerance and we thought the message would clear after push back. The aircraft was showing RNP1. After taxing clear of the ramp the unable RNP message had not cleared. We pulled over and called Dispatch and Maintenance, the RNP was now showing RNP4. We decided that the RNP was sufficient and thought the message should clear after takeoff. Takeoff and initial climb seemed normal. When cleared to our first way point the turn point was coming from the North and the aircraft turned to intercept. The course was obviously in error, so we tried going direct to the way point again without success. I changed the scale on the Navigation Display (ND) to max, I could see ZZZ and our first way point but could not see the start of the turn point. I asked for a heading and to continue the climb while we troubleshot a navigational issue. On climb we figured out that our heading was not matching the magnetic compass and got an message for GPS failure.

The Captain then transferred control of the aircraft to me and looked up the checklist as well as contacted Dispatch and Maintenance. It was determined that we were not going to be able to continue the flight. We coordinated with ATC for a fuel dump to get back to landing weight. On the turn back to ZZZ the heading processed another 30 degrees from the actual magnetic heading. The map on the ND during the turn also shifted and started showing airports for ZZZZ1 matching the position. After landing in ZZZ we started the APU and left all navigational systems on for Maintenance to troubleshoot. While stationary the navigation system continued to slowly change.

Narrative: 2

We had UNABLE RNP message during taxi out increasing to RNP 4. We taxied to and held position on taxiway x then the Captain called Dispatch and spoke with Maintenance, the decision was made to proceed with the flight. On climbout around 5,000 ft, ATC cleared us direct ZZZZZ and when it was entered, a magenta line was drawn to the North instead of our westbound course. We continued the climb with radar vectors on course westbound while we were troubleshooting the problem. Our Navigation Display (ND) heading was initially off about 20 degrees of the standby compass then eventually processed to 45 degrees off. Sensor status showed Global Navigation Satelie (GNS) 1/2 Fail. Inertial Reference System (IRS) status showed blank for drift rate and ground speed. GNS 1/2 appeared to show the correct position but ND showed we were near ZZZZ1. We attempted to call Dispatch with the satellite phone but it did not work. We then made contact with Dispatch and Maintenance for further troubleshooting. When we could not fix the navigation problem the decision was made to return to base. We made the turn back to ZZZ and coordinated with ATC to dump fuel to make landing weight, approximately 44000 lbs. dumped. The Captain flew a visual approach to an uneventful landing at ZZZ Runway XXR.

Synopsis

MD-11 flight crew reported progressive degradation of all navigation systems after departure. The flight crew determined that continuing to destination airport was not possible. The flight crew requested vectors to return to departure airport. Fuel was jettisoned to get below maximum landing weight and the flight crew landed uneventfully.

ACN: 1984420 *(10 of 50)*

Time / Day

Date : 202303
Local Time Of Day : 1801-2400

Place

Locale Reference.ATC Facility : LTAA.ARTCC
State Reference : FO
Altitude.MSL.Single Value : 36000

Aircraft

Reference : X
ATC / Advisory.Center : LTAA
Aircraft Operator : Air Carrier
Make Model Name : Widebody, Low Wing, 2 Turbojet Eng
Crew Size.Number Of Crew : 4
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Cruise

Component : 1

Aircraft Component : GPWS
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : ADS-B (Automatic Dependent Surveillance - Broadcast)
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Captain
Experience.Flight Crew.Total : 11198
Experience.Flight Crew.Last 90 Days : 194
Experience.Flight Crew.Type : 825
ASRS Report Number.Accession Number : 1984420

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Ground Event / Encounter : Ground Equipment Issue
Detector.Person : Flight Crew
When Detected : In-flight
Result.Aircraft : Equipment Problem Dissipated

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Environment - Non Weather Related

Narrative: 1

While cruising at FL360 an amber ADS-B OUT EICAS alert displayed while we were approximately over GOKPA. About 20 minutes later an amber TERR POS EICAS alert displayed. The alerts extinguished about 50 minutes later at approximately 90 NM north of REVDA. Before departing ZZZ for DEL, as a crew during our preflight briefing, we discussed this threat as possibly occurring while flying in the vicinity of the Black Sea. I do not recall the source of our information, whether it was other crew previous experience on flights to and from DEL or other source. But the preflight discussion centered around the possibility of GPS interference in the area of the Black Sea and that if it should occur, we would experience the ADS-B OUT and TERR POS EICAS messages. We also briefly discussed that the EICAS messages would only be displayed while in the vicinity of the Black Sea. I have flown 5 or 6 DEL flights from ZZZ in the past 6 months, the last being two weeks ago. This flight was the first time I experienced this apparently expected GPS interference. Further discussion with the crew indicated to me that this interference is becoming more frequent lately.

Synopsis

Widebody Captain reported suspected GPS jamming or interference in the vicinity of the Black Sea.

ACN: 1980554 *(11 of 50)*

Time / Day

Date : 202303
Local Time Of Day : 1201-1800

Place

Locale Reference.ATC Facility : ZZZZ.ARTCC
State Reference : FO
Altitude.MSL.Single Value : 28000

Environment

Flight Conditions : VMC
Light : Daylight

Aircraft

Reference : X
ATC / Advisory.Center : ZZZZ
Aircraft Operator : Air Carrier
Make Model Name : A321
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Cruise
Route In Use : Vectors

Component : 1

Aircraft Component : FMS/FMC
Manufacturer : #1
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : FMS/FMC
Manufacturer : #2
Aircraft Reference : X
Problem : Malfunctioning

Person : 1

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Flying
Function.Flight Crew : First Officer
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
ASRS Report Number.Accession Number : 1980554
Human Factors : Situational Awareness

Human Factors : Human-Machine Interface
Human Factors : Confusion

Person : 2

Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Captain
Function.Flight Crew : Pilot Not Flying
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
ASRS Report Number.Accession Number : 1980564
Human Factors : Confusion

Events

Anomaly.Aircraft Equipment Problem : Critical
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Anomaly.Inflight Event / Encounter : Unstabilized Approach
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
Were Passengers Involved In Event : N
When Detected : In-flight
Result.General : Flight Cancelled / Delayed
Result.General : Maintenance Action
Result.Flight Crew : Executed Go Around / Missed Approach
Result.Flight Crew : Landed As Precaution
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Flight Crew : Overcame Equipment Problem
Result.Air Traffic Control : Provided Assistance

Assessments

Contributing Factors / Situations : Aircraft
Primary Problem : Aircraft

Narrative: 1

After Aircraft X landed successfully 7 minutes early in ZZZZ. Captain was informed by Maintenance that the following items failed at Cruise. Autoflight System (AFS): FMGC2 64 AFS 1 Electronic Instrument System (EIS) 2, IR2, IR3, IR1, EIS1 AFS: FMGC1 61. AFS 1 IR3, IR1, EIS1, EiS2 IR2 CAB PR LDG ELEV FAULT FMGC2 (1CA2) BUS FM2/DMC2 (1WT2). EIS2 The above failures began at 28,000 ft. approximately 150-180 miles from ZZZZ. The first indication of any problem was an auditory triple click, followed by GPS Primary lost on both the Captain and First Officer's (FO's) displays. What followed next was an ECAM action to set manual field elevation. I was Pilot Flying and verbalized my aircraft, my radios. At the same time Captain began to run the ECAM actions. Following ECAM actions, it was evident that we were having navigation issues. The primary flight plan and secondary flight plans were gone. While the Captain with his 19 years of Airbus experience worked diligently to re-establish a flight plan, I let ATC know of our issues and requested vectors and a lower altitude. The Captain was able to establish a partial flight plan with ZZZZ as our destination. This allowed points and altitudes to appear back in our MFD. However the aircraft would not manage to any point, any altitude or airspeed. Thus resulting in using HDG, open Decent and manual speeds for the remainder of the arrival and approach. Not being able to arm an approach in either AP1 (Autopilot 1), or AP2

(Autopilot 2) a visual approach to landing was preformed. Approaching 500 ft. from touchdown with 1,100 ft. down on the VSI, Captain calmly said "What do you think about a go around"? I said that sounds like a good idea your call. We did the go around according to the new procedures without event. After vectors for a downwind and base back to Runway XX and fully aware of the aircraft capabilities or lack thereof a visual approach was flown and successfully landed on Runway XX, making the high speed taxi way of X. The successful completion of the flight was made easier by the training received and the adherence to the SOP's established by company. The Captain set expectations the very first time I met him in ZZZ for the start of the sequence. These expectations along with good CRM and the experience of the Captain aided in the successful outcome of the flight. I believe that this was a computer failure in nature.

Narrative: 2

Kudos to Person A. For a probationary pilot to focus on what he was taught to do during training made this a non event. His CRM and flying skills made the events that unfolded seem like a normal flight with 2 FMGCs, 2 Electronic Instrument Systems (EISs) and 3 Inertial Reference Unit (IRU) failures. Despite these issues, he continued to make every altitude and airspeed restriction on the arrival. His CRM skills were timely and spot on. Recognizing we were unstable and deciding to go around showed his situational awareness. The second approach was a visual pattern with ATC assistance. The skills he obtained in training made this hand flown approach the success that it was. We were at 28,000 ft. roughly 180 miles (?) from ZZZZ. It was a beautiful VMC day. The dry riverbed's luminescence perfectly pointed us to the field the closer we proceeded to land. My first recollection was an auditory triple click noting system downgrade. Checking the Flight Management Advisory, FMA, I saw "HEADING" displayed. We tried to push the Navigation button without success. Switching Autopilots multiple times lead to the same result. Person A was the Pilot Flying, PF, and I was the Pilot Monitoring, PM. The next item we verbalized was "GPS" in the scratchpad of the Multi-functional Control Display Unit, MCDU. Finally the first and only Electronic Centralized Aircraft Monitoring, ECAM, was to set the destination elevation. "My aircraft" said the PM. I set the field elevation from my 10-9 page roughly 300 ft. and selected manual. Our next issue was "set offside range". From experience, I knew an FMGC had failed. We coordinated ranges all the way from top of descent to final approach segment. I looked down to see the flight plan was gone and only Present Position, PPOS was displayed. I flipped back and forth between the primary and secondary flight plans and noticed the secondary Line Select Key Right One, LSK R1, showing INIT. I typed in ZZZZ/ZZZZ and actually got a destination. Once a flight plan was built, I activated the secondary. This allowed me to go back to auto for the Cabin Pressure Controller. I verified the field elevation was good and it worked like normal. During this evolution, Person A confessed to ATC we were having navigation issues. He was getting headings and descents. We were cleared to intercept a radial but couldn't. We got some directs at this point but the plane would not allow us to manage the descent. Due to only having open descent available, we set the bottom of each restriction even though we were cleared lower. We hadn't gotten ATIS due to the distance. I obtained the current ATIS and reset the performance page. I made a simple cabin PA and did not advise the flight attendants or passengers of our situation as I felt there was no need to invoke pandemonium. The airplane was flying and operating normal with minor peculiarities that we kept dealing with. We ran the descent checklist on time. We prepared the cabin, activated the approach, did landing lights and sterile all per the FOM. ATC did an excellent job of vectors and altitudes to set us up for the VOR 2 Runway XX. It took a few times to get what we wanted but persistence paid off. Once we were cleared to intercept the VOR the airplane showed "SPECIF VOR/D UNAVAIL". I have never seen this display in 19 years on the Airbus. PF could not Arm the approach! We also tried to manage the speed and it would not arm. The perf page showed no approach speeds. These distractions pushed us

to the high side of the VASI. Approaching 1,000 ft. we were stable but were three white one red on the VASI. Person A was trying his best to correct without exceeding 1,000 ft. per minute. Somewhere below five hundred feet I saw 1,100 down on the VASI. I calmly said, "What do you think about a go Around"? Person A calmly replied "Yeah, that's a good idea". We did the Go Around according to the new procedures. Because the approach had not been armed we did not set the Missed Approach Altitude. On the new go around procedure we caught this threat! We had practiced this on each descent brief the previous two briefs and I feel this helped slow down an already bad situation. The go around allowed is to regroup and be better prepared for the nuances of the second approach. Person A had selected 185 kts. on the go. This was actually good in that we climbed quicker and yet were ahead of the airplane. We stayed at flaps one in the pattern as we discussed the upcoming approach. We ran a descent checklist and a before landing checklist like the first approach. We landed long because we were fast due to a bugged speed verses a managed speed. We had no reference speeds so we set VLS plus 5 which is typically what I have seen. In the uniqueness of the situation we had selected medium auto brakes which I feel was significant to a successful outcome. I verbalized "Full Reverser" to which Person A did per the SOP. Keys to our success: The day one brief helped set the tone for Person A to give inputs in the cockpit. We talked about our expectations of each other to mitigate mistakes. Procedures were written to help us get through this unique scenario. Training makes us fly a hand flown approach in the simulator. Person A showed his comfort with this when he stated "Flight Directors off give me the bird" on final. The simulator pilots did their job well! Standardized procedures cut out any guess work between the two of us. My expectations while in the heat of the battle were met by Person A doing things the company trained way. Person A briefed the approach at 250 miles. Had we not done our briefing early, we could easily have gotten behind the plane. The familiarity with the points in the arrival and final helped us when the secondary flight plan was rebuilt and activated. This could happen again. Would love to see this scenario built for [future] training.

Synopsis

Flight Crew reported failures of numerous systems in cruise. The crew ran the QRH and check lists and reconstructed a flight plan and continued to destination airport. A go around was performed and the approach was accomplished again, allowing for a safe landing at destination airport.

ACN: 1980406 *(12 of 50)*

Time / Day

Date : 202303
Local Time Of Day : 0601-1200

Place

Altitude.AGL.Single Value : 5

Environment

Flight Conditions : Mixed
Weather Elements / Visibility.Visibility : .5
Light : Dawn
Ceiling.Single Value : 300

Aircraft

Reference : X
Aircraft Operator : Government
Make Model Name : Small UAS, Multi Rotor
Crew Size.Number Of Crew : 1
Operating Under FAR Part : Public Aircraft Operations (UAS)
Mission : Public Safety / Pursuit (UAS)
Flight Phase : Takeoff / Launch
Flight Phase : Descent
Flight Phase : Climb
Airspace.Class G : ZZZ
Operating Under Waivers / Exemptions / Authorizations (UAS) : N
Weight Category (UAS) : Small
Configuration (UAS) : Fixed Wing
Control Mode (UAS) : Manual Control
Flying In / Near / Over (UAS) : Emergency Services
Type (UAS) : Purchased
Number of UAS Being Controlled (UAS).Number of UAS : 1

Component

Aircraft Component : GPS Module (UAS)
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person : Outdoor / Field Station (UAS)
Reporter Organization : Government
Function.Flight Crew : Person Manipulating Controls (UAS)
Qualification.Flight Crew : Public Aircraft Operations (UAS)
Qualification.Flight Crew : Remote Pilot (UAS)
Experience.Flight Crew.Total : 0.10
ASRS Report Number.Accession Number : 1980406
Human Factors : Troubleshooting
Human Factors : Situational Awareness
Analyst Callback : Attempted

Events

Anomaly.Aircraft Equipment Problem : Critical
Anomaly.Inflight Event / Encounter : Object
Anomaly.Inflight Event / Encounter : Loss Of Aircraft Control
Detector.Person : UAS Crew
When Detected : In-flight
Result.Flight Crew : Took Evasive Action
Result.Aircraft : Aircraft Damaged

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Software and Automation
Primary Problem : Ambiguous

Narrative: 1

On Day 0 at about XA:40 I responded to the scene to assist members of the Police Department with locating an endangered missing person. Upon arrival, I made contact with the on-scene officers as well as a K-9 unit. Once advised that K-9 was going to begin tracking I began to set up my issued drone for operation to further assist. It should be noted, although the weather report called for fog in the area, the immediate are where we were to be working was clear of fog and I observed a clear ceiling estimated at 200 feet for operation. After obtaining the drone, loading batteries, activating the power up sequence and placing it on the ground I obtained the remote and began the same. Once the remote was powered up and a connection was made with the drone, I began to check its other statuses (gimbal and compass calibrations, GPS stabilization and satellite connections) to ensure it was ready for flight. It was during this time I noted the calibrations were showing connected and receiving great reception, the GPS was illuminated in green (indicating it was connected) and the satellite connection was showing connectivity to 14 satellites. I did not note any discrepancies on or about the drone and began to activate it. Once the remote activated the drone, I began to elevate it to about 10 feet to continue with pre-mission operation checks of the spin and horizontal tests. As the drone began to elevate to the required height, I noted the props of the drone began to accelerate to an abnormal speed. As I began to give the drone commands via the remote to conduct the spin and horizontal checks, I noted an abnormal rattling sound emitting from the drone. It was at this moment I began to give the drone commands via the remote to land. As this occurred, I observed the drone fail to land and it rather began to ascend in altitude (to about 100 feet). As the drone was ascending, I continued to give the drone commands to return to home and land. The drone began to respond and lower its altitude; however, it began to fight the landing orders and began to rapidly ascend a second time upward. I again began to gain control of the drone and bring it down to land. As I continued to hold the remote stick down to bring it back to land, I noted it was traveling downward at an accelerated rate. I began to try and slow the drone by lifting the stick, however, the drone did not respond in a positive fashion. The drone continued to lower itself in a quick fashion until the bottom of the drone struck the left A-pillar of a nearby parked vehicle. The drone vaulted itself from the vehicle, causing it to land up-side-down upon the asphalt parking lot. As I responded to recover the drone, I noted the left front arm had sustained damage as it was broken in half. Several other props had been damaged as well, to include the front right landing leg. After recovering the drone, I began to inspect the above described vehicle. During this inspection I did note a small crack (BB-like impression) upon the lower left corner of the wind shield. I was able to make contact with the owner of the vehicle who confirmed that this crack was pre-existing. No other damage was noted at this time. Both the drone and the vehicle were

photographed. At this time, I believe that the GPS stabilization system was not fully activated and when the drone was elevated it went into a system failure mode, thus causing the drone to climb to a safe "return to home" altitude. It is unknown why the drone proceeded to land at such a high rate of speed and struck the vehicle.

Synopsis

Government UAS pilot reported they lost control of the UAS after launch. The reporter believes a GPS error caused the loss of control.

ACN: 1975037 *(13 of 50)*

Time / Day

Date : 202302
Local Time Of Day : 0601-1200

Place

Locale Reference.Airport : ZZZ.Airport
State Reference : US
Altitude.MSL.Single Value : 5000

Environment

Flight Conditions : Mixed
Weather Elements / Visibility.Visibility : 9
Light : Daylight
Ceiling.Single Value : 4

Aircraft

Reference : X
ATC / Advisory.TRACON : ZZZ
Aircraft Operator : Corporate
Make Model Name : Super King Air 200
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 91
Flight Plan : IFR
Mission : Passenger
Flight Phase : Initial Climb
Airspace.Class D : ZZZ

Component : 1

Aircraft Component : Electrical Distribution
Aircraft Reference : X
Problem : Improperly Operated

Component : 2

Aircraft Component : Engine Starting System
Aircraft Reference : X
Problem : Improperly Operated

Component : 3

Aircraft Component : Other Documentation
Aircraft Reference : X
Problem : Improperly Operated

Person : 1

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Corporate
Function.Flight Crew : Captain
Function.Flight Crew : Pilot Flying

Qualification.Flight Crew : Commercial
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Experience.Flight Crew.Total : 1420
Experience.Flight Crew.Last 90 Days : 39
Experience.Flight Crew.Type : 40
ASRS Report Number.Accession Number : 1975037
Human Factors : Communication Breakdown
Human Factors : Situational Awareness
Human Factors : Training / Qualification
Human Factors : Human-Machine Interface
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : Flight Crew

Person : 2

Location In Aircraft : Flight Deck
Reporter Organization : Corporate
Function.Flight Crew : First Officer
Function.Flight Crew : Pilot Not Flying
Qualification.Flight Crew : Flight Instructor
Qualification.Flight Crew : Commercial
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
Experience.Flight Crew.Total : 1134
Experience.Flight Crew.Last 90 Days : 87
Experience.Flight Crew.Type : 464
ASRS Report Number.Accession Number : 1975259
Human Factors : Training / Qualification
Human Factors : Situational Awareness
Human Factors : Human-Machine Interface
Human Factors : Communication Breakdown
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : Flight Crew

Events

Anomaly.Aircraft Equipment Problem : Critical
Anomaly.Flight Deck / Cabin / Aircraft Event : Illness / Injury
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
Were Passengers Involved In Event : N
When Detected : In-flight
Result.General : Flight Cancelled / Delayed
Result.Flight Crew : Returned To Departure Airport

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Human Factors
Contributing Factors / Situations : Procedure
Primary Problem : Human Factors

Narrative: 1

Shortly after departure during climb-out, ZZZ Approach could not hear our transmissions, we could hear theirs. The last transmission heard was, "Turn back to ZZZ." At that time we had lost GPS, some flight instruments, and all communications. We descended through the clouds to get into VMC. Heading back to ZZZ, we manually extended the landing gear and got a green light gun signal to land. We landed safely back on Runway XX. I immediately called Tower via phone. They just mentioned they were glad we were safe. It was later determined the starter switches were in the "ON" position, which supersedes the generators. This was pilot error.

Narrative: 2

Day 0, Aircraft X, ZZZ. Emergency electrical failure. I arrived at the airport an hour before XA:00 departure. Person A, Equipment Company Captain, arrived 20 minutes later. I then went out to the airplane to start my preflight checks, all were normal. While getting our items situated in the airplane, Person A looked to be in their normal self with mentioning [they] had a head cold and was ready to go home. The passengers arrived out on the ramp, we loaded luggage, and were ready to start up. We did the Before-Start Checklist, then Person A proceeded to start the engines, I programmed the GPS, collected ATIS, and I ran the After-Start Checklist. All systems appeared to be normal. We proceeded to get taxi clearance to Runway XX. Prior to takeoff, Person A did an engine run-up. Everything was normal. I called the Tower, we were cleared for takeoff, I ran the Clear for Takeoff Checklist, and all systems appeared to be normal after Person A's completion of each check. We proceeded with a normal takeoff and climb, and with a positive rate the gear came up, After-Takeoff Checklist was completed, and all was normal at that time. Tower called to hand us over to Departure. I responded and proceeded by switching over to call Departure, "Aircraft X 900 for 2,000 RH." On our first call, Departure said that we were unreadable and to switch to their other frequency. I heard Departure ask another aircraft if they could read us and they said they did not hear anything. I then switched to the new frequency, still unreadable. Person A tried from their side with no response. I dialed up Guard to see if we could get anyone there and at that time we lost communication. Person A was more concerned with the radios than focusing on flying the plane. We lost the autopilot. Person A then leveled off for a brief moment and then began an aggressive left bank followed by an equally aggressive descent. Person A did not verbally communicate their intentions or what they were doing. I then noticed Person A was physically shaking. I attempted to calm them by reassuring them to fly the airplane first. I quickly gave a direct to ZZZ on the GPS calling out the heading, recalling a south-southeast heading, for Person A to take. I then pushed in 7600 on the GPS and the GPS instantly went blank screen. We then descended through a thin cloud layer with the airport approximately 5 miles and to our 10 o'clock. As more electrical failures continued, Person A's body became even more visibly shaken along with the way they started calling out "my gyro failed" [and] "the generators failed." I tried to calm Person A down, asking if all the switches were in the right position. I saw them look over left and move their hand over there telling me, "Yes." I said just fly the airplane, to parallel the runway flying downwind [Runway] XX, and do not lose sight of the airport. I then asked Person A where were they going and what their intentions were. Person A looked at me unresponsive with a blank stare which at that time, I decided to take the flight controls and talk them through the next steps. I told them I have the airport, I am going to level off, circle on base, and all we need is the gear down to land safely. I also asked Person A to briefly inform the passengers of what we are going to do. I was circling southeast of the airport, approximately 4 NM on final for [Runway] XX and 1,000-1,500 ft. I was well above the towers to my north and my south, had 4 white lights on the PAPI, and flying an airspeed between 120-130 kt. I was cleared to land with a steady green light gun. I recall Person A telling me not to over torque the engines, I said they are fine. In my mind I wanted the gear down, the airplane on the ground safely, and out of this situation. I told Person A we needed to manually lower the

gear. They proceeded to do it without the Abnormal Checklist. I called for the checklist once, twice more assertively, and I said very slowly to read and do line-by-line. Person A followed the checklist by putting the gear handle down, lifting the emergency engage handle and turning it clockwise, [and] they then began to pump the manual lever for the landing gear. The gear doors opened and the landing gear came down into place and Person A pumped until they couldn't anymore. I believed that the gear was down and locked but kept in mind the chance of it collapsing upon landing. I then proceeded to the airport on final for [Runway] XX. I talked Person A through my whole landing as they were telling me not to get too slow and not to stall. I told them, we are fine, I have this under control, I'm coming in above glideslope until I know for sure I have the runway made and then I will back off power. My aiming point was for the threshold knowing that I would float longer with no flaps in. I continued talking my way through the landing that once I had the runway made, I was going to land as slow as possible not knowing if the landing gear would collapse, and I would apply my rudder into the crosswind at the last moment. I landed smoothly at about 100 kt., called for forward props, then I reversed thrust, and taxied off of [Taxiway] XX to the FBO Ramp. I debriefed the passengers that we had a total electrical loss and that we would have them go inside while Person A and I debriefed the event. I told Person A to call the Tower to make sure that they didn't need anything from us and to inform them what happened. They said they kept the airspace clear by holding all aircraft on the ground until we got in. They were very nice and happy that we were on the ground safely and didn't need us to do anything. I proceeded with having Person A call Person B with Company Maintenance. I had to step into the conversation to help explain the event as Person A was still shaken and at a loss of words. Also, I believe during Person A's conversation with Person B is when Person A realized that they had the starter switches in the "On" position. I heard Person A make the comment on the phone that in regards to the starter switches being on, the generators still produce power. The cause of the event was confirmed the day after the event, Day 1, with Person A via text message: "Yeah did a lot of King Air reading while sitting in airport. Starter stops actually starting automatically after 50% N even if turned back on. The starter system supersedes generator. Huge lesson learned. I must have flipped back on after hot 5, auto-feather and auto-ignition." This could have been prevented by slowing down the flow in the airplane, making sure all switches are in the proper place, by performing the checklist as a crew by remaining calm, flying the airplane first, calling for the checklist to properly diagnose the electrical failure, and by having a Captain with experience to fly the airplane and handle emergency situations.

Synopsis

BE-200 flight crew reported losing communications and flight instruments after takeoff. The flight crew performed an air turnback. The engine starter system was found to be on the incorrect setting, which overrode the generators.

ACN: 1973446 *(14 of 50)*

Time / Day

Date : 202302

Place

Locale Reference.ATC Facility : ZZZZ.ARTCC
State Reference : FO

Aircraft

Reference : X
ATC / Advisory.Center : ZZZZ
Aircraft Operator : Air Carrier
Make Model Name : B777-300
Crew Size.Number Of Crew : 4
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Cruise
Airspace.Class A : ZZZZ

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Not Flying
Function.Flight Crew : First Officer
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
ASRS Report Number.Accession Number : 1973446
Human Factors : Troubleshooting
Human Factors : Workload
Human Factors : Confusion
Human Factors : Distraction

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Became Reoriented
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Flight Crew : Overcame Equipment Problem

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Environment - Non Weather Related
Contributing Factors / Situations : Human Factors
Primary Problem : ATC Equipment / Nav Facility / Buildings

Narrative: 1

The Captain and I First Officer (FO) were flying while the [Relief Pilots] were on their rest break. After coasting out we received a NAV Unable RNP. It climbed to 4.04 and held there. We contacted ATC (ZZZZ) as well as Dispatch to advise. We called the [Relief Pilots] up to the cockpit to work the problem with us. Upon crossing ZZZ the ANP went up to 6.02. We once again advised ATC (ZZZZ1) on HF as well as Dispatch. It stayed the same until we hit land when it again climbed to around 14.5-15ish. We had a normal departure out of ZZZZ5. Over ZZZZ3 our GPS starting being jammed with some frequency. This was an ongoing problem and lasted almost all the way across ZZZZ4. Once we were over ZZZZ and no longer being jammed everything went back to normal. I don't have a suggestion as to how to stop the bad actors from jamming our GPS. I will suggest however that flight crews be aware it can last a lot longer than 12 minutes which is the latest information I had seen prior to this flight.

Synopsis

B777-300 First Officer reported GPS Jamming in foreign airspace.

ACN: 1971766 *(15 of 50)*

Time / Day

Date : 202302
Local Time Of Day : 1201-1800

Place

Locale Reference.Airport : ZZZ.Airport
State Reference : US
Altitude.MSL.Single Value : 9400

Environment

Flight Conditions : VMC
Light : Daylight

Aircraft

Reference : X
ATC / Advisory.TRACON : ZZZ
Aircraft Operator : Air Carrier
Make Model Name : B757-200
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Cargo / Freight / Delivery
Flight Phase : Descent
Route In Use : Vectors
Airspace.Class C : ZZZ

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Failed

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Captain
Function.Flight Crew : Pilot Flying
Function.Flight Crew : Flight Engineer / Second Officer
Qualification.Flight Crew : Flight Engineer
Qualification.Flight Crew : Flight Instructor
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Air Transport Pilot (ATP)
Experience.Flight Crew.Total : 17500
Experience.Flight Crew.Last 90 Days : 90
Experience.Flight Crew.Type : 2500
ASRS Report Number.Accession Number : 1971766
Human Factors : Confusion
Human Factors : Distraction

Human Factors : Human-Machine Interface
Human Factors : Time Pressure
Human Factors : Workload
Human Factors : Communication Breakdown
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : ATC

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.ATC Issue : All Types
Anomaly.Deviation - Speed : All Types
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Anomaly.Ground Event / Encounter : Ground Equipment Issue
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Flight Crew : Overcame Equipment Problem
Result.Air Traffic Control : Provided Assistance
Result.Air Traffic Control : Issued New Clearance

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Procedure
Primary Problem : Aircraft

Narrative: 1

We had flown to ZZZ the previous day when we experienced an ATC Fail EICAS message and we quickly figured out from ATC that the military was jamming GPS throughout the area. My FO (First Officer) and I discussed our not being able to fly the RNAV GPS arrival. We asked for vectors, which we received and landed uneventfully. The next day the same thing happened and we asked for vectors again on the arrival to ZZZ. We were vectored further north and terrain became a concern, looking at the terrain display and out the windshield. My FO called Approach to confirm we were safe where we were. Finally, I asked the FO to tell Approach we wanted a left turn to the south for more spacing on the terrain. I was descending in flight level change and we were becoming more concerned about the terrain that I failed to slow to 250 kt. below 10,000 ft. I quickly corrected around 9,400 ft. and immediately slowed to 250 or below. Before we got a left turn, the controller informed us the MVA was 9,000 ft. and he cleared us to 8,000 ft. At that point we became very uncomfortable. Also, the controller told us we could climb back to 9,000 ft. if we wanted to, which I didn't feel necessary since we got a left turn. The controller never specifically told us to climb and maintain 9,000 ft. He asked us if we had climbed to 9,000 ft. after we had turned, which I found odd. He then informed us that "now you're in the way of some other traffic." We landed uneventfully and never got a GPWS terrain caution. I believe the jamming of the GPS signals set this in motion, I don't know if it was because of [the event] or not. We were being proactive as my FO and I briefed what we were going to do as far as getting vectors is concerned before we ever left our departing city, and again 250 miles from ZZZ.

Synopsis

B757-200 Captain reported GPS jamming on approach to the airport and requested vectors from ATC. The flight crew expressed concern that vectors from ATC were placing them in unsafe proximity to terrain.

ACN: 1967829 *(16 of 50)*

Time / Day

Date : 202301
Local Time Of Day : 0601-1200

Place

Locale Reference.ATC Facility : ZZZ.ARTCC
State Reference : US

Environment

Light : Daylight

Aircraft

Reference : X
ATC / Advisory.Center : ZZZ
Aircraft Operator : Air Carrier
Make Model Name : B737-800
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Cruise
Airspace.Class A : ZZZ

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person : 1

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Not Flying
Function.Flight Crew : Captain
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
ASRS Report Number.Accession Number : 1967829
Human Factors : Confusion
Human Factors : Distraction
Human Factors : Human-Machine Interface
Human Factors : Troubleshooting
Human Factors : Workload

Person : 2

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier

Function.Flight Crew : First Officer
Function.Flight Crew : Pilot Flying
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Air Transport Pilot (ATP)
ASRS Report Number.Accession Number : 1968111
Human Factors : Workload
Human Factors : Human-Machine Interface
Human Factors : Distraction
Human Factors : Confusion
Human Factors : Troubleshooting

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
Detector.Person : Air Traffic Control
When Detected : In-flight
Result.Flight Crew : Returned To Clearance
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : Became Reoriented
Result.Air Traffic Control : Provided Assistance
Result.Air Traffic Control : Issued New Clearance

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Contributing Factors / Situations : Software and Automation
Primary Problem : Software and Automation

Narrative: 1

After crossing ZZZZZ intersection on our way to ZZZZZ1, the pilot flying noticed on their iPad that the aircraft position was not overlapping the course. While investigating on the FMS the reason for the discrepancy, we got a GPS fail message. I was off the radio number 1 for communication to ZZZZZ2 of my "movement message." When I got back and saw the problem, I tried to update the GPS position with the help from VOR DME near to me. It took too long because ATC issued a heading change to correct the route deviation. Not sure if there was an GPS outage or was a momentary glitch but we didn't have any further problem after that. I wrote up the discrepancy in the logbook for Maintenance to check. We both checked the route on the ground and all the points were in the FMS. If I can make change to my procedure, I will delay my movement message to the company until after level-off at final cruising altitude, to be more present during the climbing phase of the flight.

Narrative: 2

Upon crossing ZZZZZ enroute to ZZZZZ1, I noticed the filed course and aircraft location did not coincide on my iPad's GPS. I rechecked our FMS routing and the Captain announced a GPS fail message. He attempted to update the GPS position with the closest

VOR DME, during which ATC issued an immediate heading change to avoid military airspace. The cause of the initial issue is not immediately apparent as there was a momentary GPS fail/potential FMS glitch but no further navigational issues for the remainder of the flight. The response time to notice and correct the GPS discrepancy/routing resulted in the course deviation. We immediately complied to ATC instructions on heading, updated positioning, reloaded assigned route, and returned on course. The Captain wrote up the GPS fail and RNP increase in the maintenance logbook. He discussed the issue with the maintainers on the ground. Prior to the flight, both pilot flying (me) and pilot monitoring (the Captain) listened to the clearance, reviewed the route prior to execution within the FMS, and sequenced through the legs page during the takeoff/STAR brief. We will continue to follow this procedure but in addition maintain higher amount of situational awareness of the points during entire climb/STAR, delay non-critical communication, and notify ATC immediately of any navigational errors and/or course deviations prior to correction attempts.

Synopsis

B737-800 flight crew reported a course deviation due to a temporary loss of GPS service.

ACN: 1963954 *(17 of 50)*

Time / Day

Date : 202212
Local Time Of Day : 0601-1200

Place

Locale Reference.Airport : ZZZ.Airport
State Reference : US
Relative Position.Distance.Nautical Miles : 13
Altitude.AGL.Single Value : 250

Environment

Flight Conditions : VMC
Weather Elements / Visibility.Visibility : 10
Light : Daylight
Ceiling : CLR

Aircraft

Reference : X
Aircraft Operator : Commercial Operator (UAS)
Make Model Name : FreeFly Systems Alta X
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 107
Mission : Surveying / Mapping (UAS)
Flight Phase : Cruise
Airspace.Class G : ZZZ
Operating Under Waivers / Exemptions / Authorizations (UAS) : N
Weight Category (UAS) : Small
Configuration (UAS) : Multi-Rotor
Flight Operated As (UAS) : VLOS
Flight Operated with Visual Observer (UAS) : Y
Control Mode (UAS) : Waypoint Flying
Flying In / Near / Over (UAS) : Open Space / Field
Type (UAS) : Purchased
Number of UAS Being Controlled (UAS).Number of UAS : 1

Component

Aircraft Component : GPS Module (UAS)
Manufacturer : FreeFly
Aircraft Reference : X
Problem : Failed

Person

Location Of Person : Outdoor / Field Station (UAS)
Reporter Organization : Commercial Operator (UAS)
Function.Flight Crew : Person Manipulating Controls (UAS)
Qualification.Flight Crew : Remote Pilot (UAS)
Experience.Flight Crew.Total (UAS) : 241
Experience.Flight Crew.Last 90 Days (UAS) : 15
Experience.Flight Crew.Type (UAS) : 11

ASRS Report Number.Accession Number : 1963954
Human Factors : Troubleshooting
Analyst Callback : Completed

Events

Anomaly.Aircraft Equipment Problem : Critical
Anomaly.Ground Event / Encounter : Loss Of VLOS (UAS)
Anomaly.Inflight Event / Encounter : Fly Away (UAS)
Anomaly.Inflight Event / Encounter : Loss Of Aircraft Control
Detector.Person : UAS Crew
When Detected : In-flight
Result.Aircraft : Lost / Unrecoverable (UAS)

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Software and Automation
Primary Problem : Ambiguous

Narrative: 1

We were preparing to fly a LiDAR mission using UgCS near ZZZ, my Visual Observer (VO) created the flight plan on his computer while I assembled and inspected the UAV as shown with training received from the manufacturer at their training event I had attended in Month. When my VO had finished his mission planning, I looked it over to ensure mission safety. My VO had set the mission return home altitude to 250 ft., and the failsafes were set to "Do Not Modify". This means that the failsafes are taken from the UAVs native parameters. My VO powered on the Riegl scanner and performed his own visual inspection of the UAV. Once completed, I then prepared to conduct the flight. I armed and launched the UAV and proceeded to take it to our mission altitude in Position Control Mode (GPS Mode) while verifying input and control (Roll, Pitch, Yaw, Throttle). Once at mission altitude, I placed the UAV into Mission Mode. It proceeded along its first pass without issue, and then turned at the end of its area to scan back towards us as planned. Roughly 5 seconds after the turn, the UAV appeared to make a very abrupt stop, then flew several feet off course. My VO called out the issue and asked if I caused the movement, I informed him I did not. In that time, the UAV had begun to rapidly climb altitude and my VO had informed me his computer showed the UAV had lost GPS completely. I switched the UAV into Altitude Control Mode (it uses barometer and IMU for navigation in place of GPS) to regain control of the UAV. However, its behavior did not alter as it continued to climb and fly in a NE direction away from us. I placed my elevation/yaw gimbal in its full downward position, but the UAV seemed to not respond to any control input. I eventually was able to yaw the UAV towards our home location after minutes of the UAV flying uncontrolled in a very aggressive manner, but I was unable to control its Roll/Pitch. My VO and I checked multiple times to confirm we had connection to the UAV, and we appeared to have a strong connection the entire time as it was still within line of sight. After 7 minutes of attempting to regain any kind of control, the UAV was now at a point where it was very far away, and we were losing signal with our first person camera which gave us our only sense of direction. The battery was reading at 45v which is only slightly above our usual landing voltage of 44.5v. Upon loss of signal from our camera, our controller began losing signal and we could no longer see the UAV. We then got in our truck and drove to the top of the nearest hill in the direction the UAV had gone in hopes of gaining signal to recover the UAV. After spending the rest of the day searching, we were unable to locate it. Given the loss of GPS and also the inability to control the UAV in Manual modes, I believe there was a failure in the flight controller which made the UAV misbehave to a point of us

losing it. Upon reviewing telemetry logs from my mission control software, I could see that the UAV was flying in mission mode, had a gps failure, then went to AUTOLAND mode. But at no point did the UAV act as if it were in AUTOLAND mode. Later in the log I could see where it was switching modes as I instructed it to, but its behavior never seemed to alter.

Callback: 1

The reporter indicated the UAS was still lost and they had no further details to add about the lost link and flyaway.

Synopsis

Part 107 UAS pilot reported a loss of UAV control during flight and a subsequent flyaway. During post flight review the UAS crew learned of a GPS failure within the UAS.

ACN: 1963498 *(18 of 50)*

Time / Day

Date : 202301
Local Time Of Day : 0601-1200

Place

Locale Reference.Airport : ZZZ.Airport
State Reference : US
Relative Position.Angle.Radial : 090
Relative Position.Distance.Nautical Miles : 3
Altitude.MSL.Single Value : 1300

Environment

Flight Conditions : IMC
Weather Elements / Visibility : Fog
Weather Elements / Visibility : Icing
Weather Elements / Visibility.Visibility : 0
Light : Daylight
Ceiling.Single Value : 1000
RVR.Single Value : 5000

Aircraft

Reference : X
Aircraft Operator : Air Carrier
Make Model Name : A321
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Initial Climb
Route In Use.SID : ZZZ
Route In Use.Other

Component : 1

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : Autoflight System
Aircraft Reference : X
Problem : Malfunctioning

Person : 1

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : First Officer
Function.Flight Crew : Pilot Not Flying

Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Experience.Flight Crew.Total : 3570
Experience.Flight Crew.Last 90 Days : 130
Experience.Flight Crew.Type : 290
ASRS Report Number.Accession Number : 1963498
Human Factors : Communication Breakdown
Human Factors : Situational Awareness
Human Factors : Troubleshooting
Human Factors : Confusion
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : Flight Crew

Person : 2

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Captain
Function.Flight Crew : Pilot Flying
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
Experience.Flight Crew.Total : 14000
Experience.Flight Crew.Last 90 Days : 100
Experience.Flight Crew.Type : 70
ASRS Report Number.Accession Number : 1963488
Human Factors : Troubleshooting
Human Factors : Situational Awareness
Human Factors : Human-Machine Interface
Human Factors : Communication Breakdown
Human Factors : Confusion
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : Flight Crew

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Altitude : Excursion From Assigned Altitude
Anomaly.Deviation - Altitude : Overshoot
Anomaly.Deviation - Speed : All Types
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : FAR
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Anomaly.Inflight Event / Encounter : Loss Of Aircraft Control
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
Miss Distance.Horizontal : 0
Miss Distance.Vertical : 0
Were Passengers Involved In Event : N
When Detected : In-flight
Result.Flight Crew : Requested ATC Assistance / Clarification

Result.Flight Crew : Regained Aircraft Control
Result.Flight Crew : Overcame Equipment Problem
Result.Air Traffic Control : Provided Assistance

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Human Factors
Contributing Factors / Situations : Procedure
Primary Problem : Aircraft

Narrative: 1

When we got to the plane, Maintenance was there due to an AFCS (automatic Flight Controls System) issue. They told us they were going to reload some software and expect an hour delay. Instead, they re-racked the module and got the system to test. We learned that the previous flight had multiple GPS Primary Lost Messages during their flight, causing the write up. The following is not a perfect recollection, as many things were happening at the same time and I am not able to 100% correctly remember all events as they were happening too quickly. This is my best effort to recall events as accurately as possible. We took off out of ZZZ Runway XX with flaps 3, APU on, and TOGA power. We were within 8,000 lbs. of maximum TO weight. We reached flap retract speed and started retracting flaps. Around 1300 we got the GPS Primary Lost and it kicked us into heading. Neither of us saw this. During this, my attention was on flap retraction to flaps 1. I initially saw the GPS Primary on the nav display (apparently as it came back from saying GPS primary lost), when the CA (Captain) asked me if we were given a heading. I thought he had heard a radio call for someone else, as we hadn't had a heading assigned (at this point I hadn't seen that we were kicked into heading, I was looking at the GPS Primary message). I said that we were not given a heading. I told the CA that the previous issue was back and apparently hadn't been fixed, referring to the GPS issue. He was still trying to figure out why we were in HDG mode, and asked me again if we were given a heading. We each failed to explain our thoughts to the other, and then I saw that we were in heading mode, and my brain made the connection. Unfortunately, my mouth wasn't in the loop, and I was unable to quickly and clearly explain the situation. I said the previous problem (GPS lost) was what kicked us into heading, but successful communication wasn't happening. Around that time, he asked for flaps up, after takeoff checklist. I glanced to make sure speed was good, then went into my flow. Flaps up, spoilers unarmed, APU bleed off, and APU off, grab checklist. During that, I felt a sinking and acceleration, similar to how a heavy A321 sinks when you go flaps 1 to 0. When I looked down from the checklist, I saw our speed increasing quickly, we were in a bank, and I saw our altitude was lower than I was expecting to see at that point. I knew things did not look right, and assumed the GPS issue was somehow to blame. ATC must have seen us not where we should have been, and they called for us. I responded saying we had an issue with one of our computers, and asked for a heading. They gave us present heading and a 3,000-5,000 ft. block altitude. I still had no idea what was going on to cause the speed and aircraft control issues, as the CA was working on pulling power to slow us and leveling the wings. The CA saw that auto thrust was off, and turned it back on. We set the altitude alert to 5,000 ft. and started a climb. We were given a clearance to initially a heading, then direct to a fix. Once we had things under control, the CA told me that the plane had gone into Alpha floor while I was doing my flow. That was what kicked off the auto throttles and gave us the high speed as the power went up and kicked off the auto thrust. The rest of the flight at cruise was uneventful, but the GPS issue came back multiple times on descent. Since were now familiar with it, these next events were non issues, but still luckily didn't happen in IMC. We should have briefed the possibility of the GPS Primary Lost issue coming back on our

flight. It would have been helpful to talk about what it would look like, and how we would handle it. I believe this would have lead us to quickly get the plane back into managed NAV instead of having a communication breakdown while trying to figure out what was going on. It would have been helpful for me to know we went into Alpha Floor when it happened. Instead of saying the previous issue was back, I should have called that we had lost GPS navigation. (this is difficult, since I didn't really know that, I just saw GPS Primary, which is what you would expect, but isn't normally on the NAV Display) Instead of asking if we were given a heading, the CA should have stated that we were in HDG, and asked why, or if I had put us into HDG mode. I don't know what lead us into going to Alpha Floor, and I remember looking at our speed before I went flaps 1 to 0, but I now question what I saw, and wonder if I brought them up early. The CA's and my communication broke down, and was not effective when we were kicked to HDG with GPS Primary Lost. We both should have stated the problem we saw instead of being vague and assuming the other pilot was on the same page with our thought process.

Narrative: 2

Upon arriving to the aircraft, Maintenance was on board fixing a GPS issue which they said they resolved and signed it off. On departure this is what happened with our GPS. On initial climb out, manually flying the airplane, we lost GPS. the aircraft switched from NAV mode to heading mode when I wasn't looking. I asked the first officer why are we in heading mode and he responded because of the previous thing which I did not understand, and I repeated why are we in heading mode, and he repeated because the previous thing I understood I might have missed a radio call or some other system failure, trying to understand what he was saying we were on a NAV departure right as flaps were going from one to up heavy out of ZZZ. while I was communicating with the First Officer (FO), trying to figure out what was going on with the airplane and why the airplane Switched from NAV to heading we lost our GPS and we needed to make an immediate left-hand turn for the nav departure. I told the First Officer to give me a heading from departure and he told Departure Control we had lost navigation at this time, the airplane slowed down to where the auto thrust went into A-Lock. This locked the thrust at full power. I was not sure if the airplane was about to lose other systems so I continued to manually fly the airplane, and I told the First Officer to give me an altitude. Departure Control gave us a block altitude of 3,000 to 5,000 ft. in which the First Officer did not set. Moments later, when I looked back at the altitude, it was at 8,000 ft., and I told him to set 5,000 ft. and I pulled the thrust out of the TOGA detent into manual. We started to accelerate rapidly, passing 300 kts. I pulled up on the nose, reduced power to help slow the airplane down, and shortly after re-automated the airplane and got the plane back under control. In the future I would have told the FO to give me a heading and turned on the auto pilot to figure out why the airplane lost NAV. Later on, the FO told me he was trying to communicate what he was seeing which was Primary GPS Lost message and that is the reason why the airplane switched from NAV to heading, but he did not articulate what he was seeing and created more confusion.

Synopsis

A321 flight crew reported experiencing confusion and difficulty controlling the aircraft when they lost GPS shortly after takeoff.

ACN: 1960050 *(19 of 50)*

Time / Day

Date : 202212
Local Time Of Day : 0001-0600

Place

Locale Reference.Airport : ZZZ.Airport
State Reference : US

Environment

Flight Conditions : VMC
Weather Elements / Visibility : Thunderstorm

Aircraft

Reference : X
ATC / Advisory.Tower : ZZZ
Aircraft Operator : Air Carrier
Make Model Name : Medium Transport, Low Wing, 2 Turbojet Eng
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Initial Approach
Route In Use : Visual Approach
Airspace.Class D : ZZZ

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person : 1

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Not Flying
Function.Flight Crew : Captain
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
ASRS Report Number.Accession Number : 1960050
Human Factors : Communication Breakdown
Human Factors : Time Pressure
Human Factors : Training / Qualification
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : Flight Crew

Person : 2

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Flying
Function.Flight Crew : First Officer
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
ASRS Report Number.Accession Number : 1960052
Human Factors : Training / Qualification

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Altitude : Overshoot
Anomaly.Deviation - Speed : All Types
Anomaly.Inflight Event / Encounter : Weather / Turbulence
Anomaly.Inflight Event / Encounter : Unstabilized Approach
Anomaly.Inflight Event / Encounter : CFTT / CFIT
Detector.Automation : Aircraft Terrain Warning
Detector.Person : Flight Crew
When Detected : In-flight
Result.General : Maintenance Action
Result.Flight Crew : Returned To Clearance
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : FLC complied w / Automation / Advisory

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Human Factors
Contributing Factors / Situations : Procedure
Contributing Factors / Situations : Weather
Primary Problem : Procedure

Narrative: 1

Vectors to GPS XX ZZZ, First Officer (FO) GPS did not display Flight Path Angle (FPA) on Primary Flight Display (PFD). Captain's side displayed what appeared to be correct FPA. Due to varying wind conditions on final, varied VSI was required to maintain FPA. This was briefed and expected. At some point on final with the runway in sight and on FPA on the Captain's aide, we received a terrain caution. Captain saw momentary increase in VSI due to changing winds, and recognizing the aircraft was on glide path in a safe condition, verbally told the FO (hand flying at this point) to level off momentarily. The caution went away and confirmed it was due to changing VSI. We continued the approach at this point. Due to changing wind conditions and gusts in ZZZ, FO was stable within 3 kts of ref approaching the threshold. However due to a shifting aim point and wind gust, speed increased to ref +10 during the round out. Captain should have verbally intervened sooner. End result was a long round out and late touchdown. Captain elected to take the aircraft and get it on the ground. Aircraft was slowed to taxi speed with approximately 1500 ft. remaining. Captain should have verbally intervened sooner to help during challenging wind conditions. Captain was letting newer line FO get experience with an approach into ZZZ. Captain had already taken when they thought would be the hardest leg earlier in the day and tried to give the appropriate legs to the FO. This was one of those times where the Captain should have elected to make the landing.

Narrative: 2

Radar vectors to RNAV XX ZZZ. Flight Path Angle, (FPA) not displayed on First Officer's (FOs) Primary Flight Display (PFD) but, was displayed on captains PFD. The VSI required to maintain FPA varied due to wind conditions and on final received a terrain warning. Was told to level off momentarily and the warning went away. Visual conditions so we continued the approach. Continued a stable approach and with the changing in winds I flared a little too early. Floated a bit and touched down long. Captain elected to take controls to get us stopped in plenty of time.

Synopsis

Air carrier flight crew reported wind gusts on approach, unstable indicated and vertical speeds, PFD display problem, and poor crew coordination resulted in TA and late touchdown.

ACN: 1957100 *(20 of 50)*

Time / Day

Date : 202212
Local Time Of Day : 1801-2400

Place

Locale Reference.ATC Facility : LLLL.ARTCC
State Reference : FO
Altitude.MSL.Single Value : 5000

Aircraft

Reference : X
ATC / Advisory.Center : LLLL
Aircraft Operator : Air Carrier
Make Model Name : B777 Undifferentiated or Other Model
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Nav In Use : FMS Or FMC
Nav In Use : GPS
Flight Phase : Descent
Route In Use : Direct

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Flying
Function.Flight Crew : Captain
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Experience.Flight Crew.Total : 4013
Experience.Flight Crew.Last 90 Days : 138
Experience.Flight Crew.Type : 751
ASRS Report Number.Accession Number : 1957100
Human Factors : Communication Breakdown
Human Factors : Distraction
Human Factors : Situational Awareness
Human Factors : Time Pressure
Human Factors : Troubleshooting
Human Factors : Human-Machine Interface
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : ATC

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.ATC Issue : All Types
Anomaly.Deviation - Track / Heading : All Types

Anomaly.Deviation / Discrepancy - Procedural : Clearance
Anomaly.Ground Event / Encounter : Ground Equipment Issue
Anomaly.Ground Event / Encounter : Loss Of Aircraft Control
Detector.Person : Flight Crew
Were Passengers Involved In Event : N
When Detected : In-flight
Result.Flight Crew : Overrode Automation
Result.Flight Crew : Became Reoriented
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Flight Crew : Overcame Equipment Problem
Result.Air Traffic Control : Issued Advisory / Alert

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

We were descending through 5,000 ft. on the transition to the ILS Runway 21, TLV, when ATC informed us that we were 1 mile off course and asked if we needed vectors. Our Navigation Display showed us on the magenta course line, and we had no indication of a system malfunction at that time. We asked for and received vectors to the ILS final approach course for an uneventful approach and landing. After beginning vectors, we did receive an "UNABLE RNP" EICAS message and on final, we noticed that the magenta line was a little to our left. Upon landing, we contacted ATC, Approach Control, to ask about the event, suspecting a possible system malfunction on our end. He informed us that the Aircraft Y behind us had experienced the same issue and that he suspected interference with the GPS signal, and was looking into it. He also said, and emphasized, that it WAS NOT A DEVIATION, since we were within a mile of our course throughout the event.

Synopsis

B777 Captain reported being informed by ATC that the aircraft was off course on the approach to land. Upon landing, the flight crew discovered through ATC that there may have been interference with the GPS signal. The flight crew also received an "UNABLE RNP" alert on the navigation equipment while on the arrival.

ACN: 1956997 *(21 of 50)*

Time / Day

Date : 202212
Local Time Of Day : 1201-1800

Place

Locale Reference.ATC Facility : ZLA.ARTCC
State Reference : CA
Altitude.MSL.Single Value : 23000

Environment

Flight Conditions : VMC
Light : Daylight

Aircraft

Reference : X
ATC / Advisory.Center : ZLA
Aircraft Operator : Military
Make Model Name : Military
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 91
Flight Plan : IFR
Mission : Training
Flight Phase : Cruise
Route In Use : Direct
Airspace.Class A : ZLA

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Military
Function.Flight Crew : Pilot Flying
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Flight Instructor
Experience.Flight Crew.Total : 2400
Experience.Flight Crew.Last 90 Days : 50
Experience.Flight Crew.Type : 500
ASRS Report Number.Accession Number : 1956997
Human Factors : Distraction

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Altitude : Excursion From Assigned Altitude
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : Overrode Automation
Result.Flight Crew : Returned To Clearance

Assessments

Contributing Factors / Situations : Aircraft
Primary Problem : Aircraft

Narrative: 1

GPS degradation to our system led to a turn in the wrong direction and in an attempt to resume on course made an aggressive turn which lead to an altitude deviation of about 200 ft.

Synopsis

Military pilot reported GPS signal degradation led to an incorrect turn and a subsequent altitude deviation during a heading correction.

ACN: 1956103 *(22 of 50)*

Time / Day

Date : 202212
Local Time Of Day : 1201-1800

Place

Locale Reference.ATC Facility : T75.TRACON
State Reference : MO

Environment

Flight Conditions : Marginal
Light : Daylight

Aircraft

Reference : X
ATC / Advisory.TRACON : T75
Aircraft Operator : Air Taxi
Make Model Name : Light Transport, Low Wing, 2 Turbojet Eng
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 135
Flight Plan : IFR
Mission : Passenger
Nav In Use : GPS
Nav In Use : FMS Or FMC
Nav In Use.Localizer/Glideslope/ILS : ILS
Flight Phase : Initial Approach
Route In Use : Direct
Route In Use.STAR : BOOSH3
Airspace.Class B : STL

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person : 1

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Taxi
Function.Flight Crew : First Officer
Function.Flight Crew : Pilot Not Flying
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Commercial
Qualification.Flight Crew : Instrument
ASRS Report Number.Accession Number : 1956103
Human Factors : Distraction
Human Factors : Human-Machine Interface
Human Factors : Situational Awareness
Human Factors : Time Pressure
Human Factors : Workload

Human Factors : Communication Breakdown
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : ATC

Person : 2

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Taxi
Function.Flight Crew : Pilot Flying
Function.Flight Crew : Captain
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Air Transport Pilot (ATP)
ASRS Report Number.Accession Number : 1956102
Human Factors : Workload
Human Factors : Time Pressure
Human Factors : Human-Machine Interface
Human Factors : Distraction
Human Factors : Communication Breakdown
Human Factors : Situational Awareness
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : ATC

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.ATC Issue : All Types
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Detector.Person : Flight Crew
Were Passengers Involved In Event : N
When Detected : In-flight
Result.Flight Crew : Became Reoriented
Result.Flight Crew : Overrode Automation
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Air Traffic Control : Issued Advisory / Alert

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

The Captain was pilot flying and I was pilot monitoring for this flight. Originally we were given descend via BOOSH3 into STL. Between RRIPP and JBUCK, instructions changed to, "Remain at 6000." Our GPS/automation started turning towards the airport when the Captain quickly took controls/overrode the autopilot and turned back towards JBUCK/heading 302. I inquired to ATC which heading they would like us on at that point to verify and inform them that we were having GPS issues. ATC instructed us, "Heading 300,

descend and maintain 3500." We were then given a series of vectors to join the localizer for [Runway] 9L and continued the ILS 9L approach to land [Runway] 9L. Maybe inform aircraft of nonstandard altitudes a tad earlier if able, at such a busy time in the arrival.

Narrative: 2

At or about XA:00, we were tracking the BOOSH3 Arrival at or about the point where the arrival goes into a heading of 302 degrees, JBUCK. The autopilot was engaged and I noticed the aircraft starting to turn to the right, incorrectly back towards the airport or one of the fixes on the ILS 12L approach. I immediately disconnected the autopilot and course corrected back to the left. The controller queried if we were turning inbound, which we responded that we were correcting back to the left. We were given a course of 300 and a descent to 3500. The flight continued via vectors to the ILS 12L approach and landed at XA:08 without issue.

Synopsis

Air taxi flight crew reported a track deviation while on arrival and noticed the aircraft was not following the assigned heading. The Captain disconnected the autopilot and hand-flew to the correct course.

ACN: 1949738 *(23 of 50)*

Time / Day

Date : 202211
Local Time Of Day : 0001-0600

Place

Locale Reference.ATC Facility : ZWUQ.ARTCC
State Reference : FO
Altitude.MSL.Single Value : 39000

Aircraft

Reference : X
ATC / Advisory.Center : ZWUQ
Aircraft Operator : Air Carrier
Make Model Name : Commercial Fixed Wing
Crew Size.Number Of Crew : 3
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Cargo / Freight / Delivery
Flight Phase : Cruise

Component : 1

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : FMS/FMC
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Check Pilot
Function.Flight Crew : Captain
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Air Transport Pilot (ATP)
ASRS Report Number.Accession Number : 1949738
Human Factors : Troubleshooting

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew

When Detected : In-flight
Result.Flight Crew : Overcame Equipment Problem

Assessments

Contributing Factors / Situations : Aircraft
Primary Problem : Aircraft

Narrative: 1

While operating from ZZZZ to ZZZZ1 we experienced a navigation system anomaly/malfunction which resulted in multiple "unable RNP" EICAS messages and a possible small momentary route deviation after being assigned a route offset by ATC (Urumqi) upon entry into China at point SARIN. System issues appear to have begun while transiting the Black Sea area, South of Crimea when we received an EICAS message for Transponder Right, referenced the checklist, referenced the position reference pages of the FMC, noted GPS was intermittent, and then tried the left transponder with similar results. Per the QRH we determined the issue was related to a GPS outage/jamming issue causing ADS-B to be inoperative (experienced on this route previously). A short time later we received status messages for ATC L and ATC R along with a complete loss of GPS position input to the FMCs however Actual Navigation Performance (ANP) remained well below 1.0 NM while the Required Navigation Performance (RNP) curiously defaulted to 1.0 which is uncommon for most high altitude airway route segments. Approaching point BODSI we initiated a crew swap with the Relief Pilots, conducted a thorough changeover brief (specifically addressing the GPS/Transponder situation) and entered rest (CA (Captain) and FO (First Officer)). Approximately 20 minutes after I started my rest period, the relief FO asked me to come back to the Flight Deck. The aircraft had just given the relief pilots an "Unable RNP" EICAS message due to an increasing ANP (upon my arrival on flight deck it was 2.5 NM). As a crew, we ran the checklist, checked for any popped circuit breakers and verified aircraft position using available conventional NAVAIDs, which the FMC also began using to lower RNP to approximately 0.38 NM. While verifying position we noticed GPS position inputs had returned, however both the GPS position and the IRS position computed by the FMC showed ANP of 16 or more (however, contradicting displayed ANP, GPS coordinates appeared to match radio generated coordinates), at this time the radio position updating indicated an RNP under 1. After discussing the situation for a few minutes I initiated a SATCOM call with the company to seek additional technical expertise, determine/validate proper RNP for the route through China and discuss options/contingencies/recommendations for continuing or possibly diverting prior to entry into China given some of our past concerns/issues in that airspace. We conducted a lengthy conference call with Dispatch, Maintenance, the Duty Pilot and a technical expert. The end result was the recommendation to continue since the ANP issues were attributed to the proximity to GPS jamming mentioned earlier, the ANP was well within limits at this time, route RNP was validated by Dispatch and if we encountered another system problem we would notify ATC of the intermittent navigation system accuracy malfunction and contact the Company as required. I reentered rest at this point, approximately 20-30 minutes prior to our entry into Chinese airspace. Upon entry into Urumqi FIR at point SARIN, ATC assigned a 3 NM right offset. While executing this clearance the Relief Crew encountered a short-lived unable RNP, a rapid rise in ANP to 20 NM while turning to the offset and notified ATC of the degraded navigation capability at that moment. ATC apparently did not seem concerned, notified the crew they were showing the aircraft left of track (unsure if they meant the airway or the offset track) while the crew showed the aircraft was 3 NM right of the airway as directed. ATC approved a request to return to centerline, the ANP reduced to within tolerances and the relief crew continued without further incident, notifying each ATC sector of the degraded navigation accuracy/capability.

The FO and I returned from rest 1 hr 30 minutes prior to our ZZZ ETA, were briefed on what occurred and began preparations for the arrival. As part of our contingency planning we discussed how we would handle an unable RNP message on arrival/approach. As a side note, it was apparent ATC was passing from sector to sector that we had encountered a Nav accuracy issue as each sector queried us upon each radio frequency change. Our reply was that the inaccuracy issue was intermittent. The arrival/approach was normal until we received another unable RNP message while established on the ILS, below 2,000 ft. AGL. The FO was flying, I immediately notified Approach Control and requested alternate missed approach instructions in the event of a missed approach. ATC issued runway heading to 5,000 and we landed uneventfully. We conducted a crew debrief as we went and a brief recap after block in. I told the crew I would take care of reporting, if they felt the need they could also submit [reports] and I recommended we all submit reports. GPS Jamming and a FMC malfunction. Suggestion: Change routing to increase buffer between our routes and conflict related airspace so we are unaffected by GPS jamming. Consider adding FMC reset or de-powering the aircraft to the maintenance transit/Daily checks to clear/reboot FMC memory. Provide additional guidance/checklist info in QRH for handling an unable RNP message during cruise.

Synopsis

Air Carrier Captain reported a track deviation occurred in the vicinity of the Black Sea as a result of GPS jamming and an FMC malfunction.

ACN: 1943790 *(24 of 50)*

Time / Day

Date : 202210
Local Time Of Day : 0601-1200

Place

Locale Reference.ATC Facility : D10.TRACON
State Reference : TX
Altitude.MSL.Single Value : 7000

Environment

Flight Conditions : VMC
Light : Daylight
Ceiling.Single Value : 12000

Aircraft

Reference : X
ATC / Advisory.TRACON : D10
Aircraft Operator : Personal
Make Model Name : Skylane 182/RG Turbo Skylane/RG
Crew Size.Number Of Crew : 1
Operating Under FAR Part : Part 91
Flight Plan : IFR
Mission : Personal
Flight Phase : Descent
Route In Use : Vectors
Airspace.Class E : D10

Component : 1

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : Autopilot
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Personal
Function.Flight Crew : Pilot Flying
Function.Flight Crew : Single Pilot
Qualification.Flight Crew : Flight Instructor
Qualification.Flight Crew : Commercial
Qualification.Flight Crew : Instrument
Experience.Flight Crew.Total : 1200
Experience.Flight Crew.Last 90 Days : 400

Experience.Flight Crew.Type : 106
ASRS Report Number.Accession Number : 1943790
Human Factors : Distraction
Human Factors : Human-Machine Interface
Human Factors : Situational Awareness
Human Factors : Troubleshooting
Human Factors : Workload
Human Factors : Confusion

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Altitude : Overshoot
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
Miss Distance.Vertical : 200
When Detected : In-flight
Result.Flight Crew : Became Reoriented
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : Returned To Clearance

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Primary Problem : Aircraft

Narrative: 1

Was given an altitude. Descended through it by 200 ft. due to autopilot issue likely caused by widespread GPS outage. Disengaged autopilot and hand flew airplane back to assigned altitude.

Synopsis

A small single engine GA pilot reported GPS outage caused their auto pilot to fail and they descended below their assigned altitude.

ACN: 1943682 *(25 of 50)*

Time / Day

Date : 202210
Local Time Of Day : 0001-0600

Place

Locale Reference.Airport : LLBG.Airport
State Reference : FO

Environment

Flight Conditions : VMC

Aircraft

Reference : X
ATC / Advisory.Center : EDGG
Aircraft Operator : Air Carrier
Make Model Name : Boeing Company Undifferentiated or Other Model
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Cargo / Freight / Delivery
Flight Phase : Initial Approach

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Flying
Function.Flight Crew : Captain
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
ASRS Report Number.Accession Number : 1943682
Human Factors : Human-Machine Interface
Human Factors : Workload
Human Factors : Confusion
Human Factors : Distraction

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew

When Detected : In-flight
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : Became Reoriented
Result.Air Traffic Control : Provided Assistance

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Primary Problem : ATC Equipment / Nav Facility / Buildings

Narrative: 1

On the ILS to Runway 12 in Tel Aviv, I was flying in LNAV/VNAV, waiting for the LOC and GS to capture. The PFD showed us on course and we were on VNAV path. an ongoing issue in Tel Aviv is GPS jamming, and we had already had an ATC fault EICAS message. We were aware that we may additional alerts, and had briefed it accordingly. The ILS was followed by the GODED2 star, and out actual navigational performance (ANP) was fine throughout. Then, within less than a minute, the FO (First Officer) noticed the ANP was worsening, we received an UNABLE RNP EICAS message, ATC radioed to tell us that it did not appear that we were established on final, and the LOC still had not captured. Because I was distracted by the RNP messages, I hadn't been looking specifically at the fact that actual localizer was drifting away rather than towards our course. I looked down at the PFD and it still showed us on course. As the weather was VMC, it was a non event, because I immediately acquired the runway, made the adjustment and landed uneventfully, but there was still a short period of complete confusion. I thought it should be reported so crews are even more aware to be cognizant of ANP during the transition from the STAR to the ILS and that they pay close attention to LOC/GS capture. Finally, I'd like to mention that I don't have much experience with the various impacts of GPS jamming on the aircraft's actual performance, but whenever I've had issues in the past with ANP being out of parameters, it is obvious on the PFD that the aircraft is OFF the approach path. Similar to entering an OFFSET, the aircraft is displayed left or right of the centerline. In this case, the PFD consistently showed us on course, which further added to the confusion. GPS jamming. Extra cognizance on STARs and the transition from the STAR to ILS in Tel Aviv.

Synopsis

Air carrier pilot flying into TLV reported GPS Jamming.

ACN: 1940955 *(26 of 50)*

Time / Day

Date : 202210
Local Time Of Day : 0601-1200

Place

Locale Reference.Airport : AAO.Airport
State Reference : KS
Relative Position.Angle.Radial : 120
Relative Position.Distance.Nautical Miles : 10
Altitude.MSL.Single Value : 4000

Environment

Flight Conditions : VMC
Weather Elements / Visibility.Other
Light : Daylight

Aircraft

Reference : X
ATC / Advisory.Tower : BEC
Aircraft Operator : Air Taxi
Make Model Name : Small Transport, Low Wing, 2 Turbojet Eng
Crew Size.Number Of Crew : 1
Operating Under FAR Part : Part 91
Flight Plan : IFR
Mission : Training
Nav In Use : FMS Or FMC
Nav In Use : GPS
Nav In Use.Localizer/Glideslope/ILS : GPS 36
Flight Phase : Final Approach
Route In Use : Vectors
Airspace.Class E : ZZZ

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person : 1

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Taxi
Function.Flight Crew : Pilot Not Flying
Function.Flight Crew : Captain
Function.Maintenance : Other / Unknown
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Multiengine
Qualification.Other
Experience.Flight Crew.Total : 7000

Experience.Flight Crew.Last 90 Days : 150
Experience.Flight Crew.Type : 250
ASRS Report Number.Accession Number : 1940955
Human Factors : Distraction
Human Factors : Situational Awareness
Human Factors : Time Pressure
Human Factors : Troubleshooting
Human Factors : Communication Breakdown
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : Other

Person : 2

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Taxi
Function.Flight Crew : Pilot Flying
Function.Flight Crew : Captain
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Air Transport Pilot (ATP)
Experience.Air Traffic Control.Supervisory : 540
Experience.Flight Crew.Total : 6,000
Experience.Flight Crew.Last 90 Days : 20
Experience.Flight Crew.Type : 50
ASRS Report Number.Accession Number : 1941017
Human Factors : Troubleshooting
Human Factors : Time Pressure
Human Factors : Situational Awareness
Human Factors : Distraction
Human Factors : Communication Breakdown
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : Other

Events

Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Detector.Person : Air Traffic Control
Were Passengers Involved In Event : N
When Detected : In-flight
Result.Flight Crew : Became Reoriented
Result.Air Traffic Control : Issued Advisory / Alert

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Environment - Non Weather Related
Contributing Factors / Situations : Equipment / Tooling
Primary Problem : Ambiguous

Narrative: 1

GPS 36 AAO coupled approach. Autopilot lined us up for final approach and we received a call on UNICOM from Beech Field that we were lined up to land on their field. We landed without issue at AAO. Autopilot seemed to be working flawlessly. There was an FAA flight check Aircraft Y working the ILS approach on the North side of AAO. Also there was a [weather] event happening at that time. Weather was CAVU. Both crew members highly experienced.

Narrative: 2

We were flying the GPS approach to Runway 36 at AAO. FMS programming was completed and verified well in advance (approximately 15 minutes prior to commencing the approach). The Auto-pilot was utilized for the entire approach indicated no sign of malfunctioning. We were cleared to direct Wumpa (IAF) on the approach which basically aligned us on a base turn for the runway. We were then cleared for the approach by approach by ATC, at which time the PF (Pilot Flying) verifed FMS navigation mode on the mode select panel. The aircraft complied with the request and turned inbound to JUNLI then proceeded to the FAF which was YOKJU. Just prior to YOKJU approximately (3 Miles as I recall), We were instructed to contact Tower. We were instructed by Beech Field that we were aligned with the runway at Beech Field and to side step to AAO. We complied with the instruction and landed without event. It should be mentioned that there was a FAA Flight Check Aircraft Y evaluating the ILS system at AAO. Also of note, there was [a weather event] during our flight event. Crewmember level of experience is high.

Synopsis

Flight crew reported on a GPS approach to Runway 36 at AAO airport, the Tower Controller at nearby BEC airport informed them via UNICOM that they were lined up with the BEC runway and to sidestep to AAO. Flight crew landed at AAO.

ACN: 1926048 *(27 of 50)*

Time / Day

Date : 202208
Local Time Of Day : 1201-1800

Place

Locale Reference.ATC Facility : ZAB.ARTCC
State Reference : NM
Altitude.MSL.Single Value : 28000

Environment

Flight Conditions : Mixed
Light : Daylight
Ceiling.Single Value : 14000

Aircraft

Reference : X
ATC / Advisory.Center : ZAB
Aircraft Operator : Air Carrier
Make Model Name : Large Transport, Low Wing, 2 Turbojet Eng
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Cruise
Airspace.Class A : ZAB

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Captain
Function.Flight Crew : Pilot Flying
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Multiengine
Experience.Flight Crew.Last 90 Days : 200
Experience.Flight Crew.Type : 12900
ASRS Report Number.Accession Number : 1926048
Human Factors : Troubleshooting
Human Factors : Workload
Human Factors : Distraction

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Ground Event / Encounter : Ground Equipment Issue
Detector.Automation : Aircraft Other Automation
Detector.Automation : Aircraft Terrain Warning
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Overrode Automation
Result.Flight Crew : Overcame Equipment Problem

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Company Policy
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Procedure
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Aircraft

Narrative: 1

While approaching ABQ on the LZZRD 4 to Runway 3, we received L and R GPS INVALID messages. We knew from the NOTAMs that GPS jamming was occurring in the White Sands Missile Range. We complied with the Operational Information guidance found in the back of the QRH and confirmed our position. Shortly thereafter we noticed an amber TERR POS indication on both NDs. Having experienced this before in ELP during jamming operations, I knew we would receive a PULLUP indication on approach at approximately 500 ft. Fortunately, the weather was VMC below 14,000 ft., so we elected to continue our visual approach with TERR INHIBIT selected. During landing rollout, our GPS's came back online and terrain data was once again displayed on our ND's. My concern is that there is no guidance on what to do for a TERR POS indication in the QRH.

Synopsis

Air carrier pilot reported GPS Jamming. The reporter also reported a lack of guidance in the QRH when receiving a Terrain Alert while encountering known GPS Jamming.

ACN: 1924069 *(28 of 50)*

Time / Day

Date : 202207
Local Time Of Day : 0601-1200

Place

Altitude.AGL.Single Value : 200

Environment

Flight Conditions : VMC
Weather Elements / Visibility.Visibility : 10
Ceiling : CLR

Aircraft

Reference : X
Aircraft Operator : Commercial Operator (UAS)
Make Model Name : UAV: Unpiloted Aerial Vehicle
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 107
Flight Phase : Cruise
Airspace.Class G : ZZZ
Operating Under Waivers / Exemptions / Authorizations (UAS) : N
Weight Category (UAS) : Small
Configuration (UAS) : Multi-Rotor
Flight Operated As (UAS) : VLOS
Flight Operated with Visual Observer (UAS) : Y
Control Mode (UAS) : Transitioning Between Modes
Flying In / Near / Over (UAS) : Critical Infrastructure
Type (UAS) : Purchased
Number of UAS Being Controlled (UAS).Number of UAS : 1

Component

Aircraft Component : GPS Module (UAS)
Manufacturer : Unknown
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person : Outdoor / Field Station (UAS)
Reporter Organization : Commercial Operator (UAS)
Function.Other
Qualification.Flight Crew : Flight Instructor
Qualification.Flight Crew : Private
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Remote Pilot (UAS)
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Commercial
ASRS Report Number.Accession Number : 1924069
Human Factors : Other / Unknown

Human Factors : Troubleshooting
Analyst Callback : Completed

Events

Anomaly.Aircraft Equipment Problem : Critical
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Anomaly.Deviation / Discrepancy - Procedural : FAR
Anomaly.Inflight Event / Encounter : Fly Away (UAS)
Anomaly.Inflight Event / Encounter : Loss Of Aircraft Control
Detector.Person : UAS Crew
When Detected : In-flight
Result.Aircraft : Aircraft Damaged
Result.Aircraft : Lost Link (UAS)

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Human Factors
Primary Problem : Ambiguous

Narrative: 1

UAS aircraft lost communication with the onsite controller - lost GPS suspected. UAS flew away and crashed at an unknown location. The fly-away occurred in an area where low manned air traffic frequently transitions below 500 ft. AGL. The fly-away was not reported to the client, as required, nor was it reported to the FAA. Pilots were firmly told to keep the accident a secret - I was told to keep the accident a secret despite being asked by the client to report all flyaways, and safety issues. The pilots went back to the site on a secret reconnaissance mission and located the drone. The damage the drone suffered was major damage however could be repaired. The pilot and observer were upset about being threatened with their jobs if they reported the flyaway as there had been several other accidents that were not reported to the customer despite the customer being aware there were unreported occurrences they could not prove them. Other remote pilots with the drone company expressed being uncomfortable about the number of accidents, and continual 'cover-ups' by the drone company... Unfortunately, there were several other incidents at the same location that were required to be reported to the client (not reportable by FAA definitions). Unfortunately, this drone operator has an extremely immature safety culture, does not follow the operating conditions in their waivers or exemptions notably following any of FAA [Advisory Circular] 120-92B. Additionally the information contained in their waivers is not accurately. Given the safety culture of this organization this operator presents a risk to their commercial client and the safety of the national airspace. The reporter has encouraged other pilots in the organization to report their incidents, and accidents.

Callback: 1

The reporter indicated they were only an observer of flight operations and not part of the UAS crew. Reporter indicated a lack of safety culture within the Part 107 company.

Synopsis

Part 107 UAS pilot reported learning another UAS pilot had a fly away due to possible GPS issue. The reporter also expressed concerns about the company's safety culture.

ACN: 1922871 *(29 of 50)*

Time / Day

Date : 202208
Local Time Of Day : 0601-1200

Place

Locale Reference.Airport : IND.Airport
State Reference : IN

Aircraft

Reference : X
ATC / Advisory.Tower : IND
Aircraft Operator : FBO
Make Model Name : Small Aircraft, Low Wing, 1 Eng, Fixed Gear
Crew Size.Number Of Crew : 1
Flight Plan : IFR
Mission : Training
Nav In Use : GPS
Flight Phase : Final Approach
Airspace.Class C : IND

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Function.Flight Crew : Instructor
Qualification.Flight Crew : Private
Qualification.Flight Crew : Commercial
Qualification.Flight Crew : Flight Instructor
ASRS Report Number.Accession Number : 1922871
Human Factors : Distraction
Human Factors : Situational Awareness
Human Factors : Time Pressure
Human Factors : Troubleshooting
Human Factors : Workload
Human Factors : Confusion

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
Were Passengers Involved In Event : N
When Detected : In-flight
Result.Flight Crew : FLC complied w / Automation / Advisory
Result.Flight Crew : Overcame Equipment Problem

Assessments

Contributing Factors / Situations : Aircraft
Primary Problem : Aircraft

Narrative: 1

While conducting the ILS 23R approach into IND in and out of IMC, the aircraft experienced a loss of signal on GPS 1 and indicated a GPS LOI and terrain system failure initially. ILS was hand flown after this occurrence. On checking the status of the GPS system, GPS 1 had no satellites connected and GPS 2 was connected to reduced numbers but still sufficient for use.

Synopsis

Flight Instructor reported a loss of GPS signal while on final approach to Runway 23 at IND and hand flew the approach to landing.

ACN: 1909407 *(30 of 50)*

Time / Day

Date : 202206
Local Time Of Day : 0601-1200

Place

Locale Reference.ATC Facility : ZZZ.ARTCC
State Reference : US
Relative Position.Angle.Radial : 166
Relative Position.Distance.Nautical Miles : 35
Altitude.MSL.Single Value : 21000

Environment

Flight Conditions : VMC
Light : Daylight

Aircraft

Reference : X
ATC / Advisory.Center : ZZZ
Aircraft Operator : Air Carrier
Make Model Name : B737 Next Generation Undifferentiated
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 135
Flight Plan : IFR
Mission : Passenger
Nav In Use : GPS
Nav In Use : FMS Or FMC
Flight Phase : Initial Climb
Flight Phase : Cruise
Airspace.Class A : ZZZ

Component : 1

Aircraft Component : Navigational Equipment and Processing
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : FMS/FMC
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : First Officer
Function.Flight Crew : Flight Engineer / Second Officer
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Multiengine

Qualification.Flight Crew : Instrument
Experience.Flight Crew.Total : 4000
Experience.Flight Crew.Last 90 Days : 120
Experience.Flight Crew.Type : 1200
ASRS Report Number.Accession Number : 1909407
Human Factors : Situational Awareness
Human Factors : Time Pressure
Human Factors : Distraction
Human Factors : Workload
Human Factors : Human-Machine Interface
Human Factors : Confusion
Human Factors : Troubleshooting

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Automation : Air Traffic Control
Detector.Person : Flight Crew
Detector.Person : Air Traffic Control
Were Passengers Involved In Event : N
When Detected : In-flight
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : Overrode Automation
Result.Flight Crew : Became Reoriented
Result.Air Traffic Control : Issued New Clearance
Result.Air Traffic Control : Issued Advisory / Alert

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

We had loaded, verified and both checked that the Departure SID was loaded in the FMS and verified against our ATC clearance even before pushback. We again verified the departure SID as part of navigation brief as part of the before T/O checklist. We departed ZZZ on a 160 heading. Shortly thereafter while climbing through approximately 15,000 ft MSL we were cleared direct to the ZZZZZ fix on the Departure. We selected that fix for direct to and executed it in the FMS. We selected LMAV and verified it on the FMA (Flight Mode Annunciator). The aircraft turned and flew to ZZZZZ in a climb while on the autopilot. We were switched from ZZZ1 Departure to ZZZ2 Center enroute to ZZZZZ in climb. After being cleared to climb to FL230 ZZZ2 [Center] asked us to verify what fix we were direct to at that time. We both reviewed the LEGS page immediately and discovered that the FMS had dropped 4 NAV points on the SID after the ZZZZZ fix. The FMS had taken us to ZZZZZ and reverted to heading at some point. The 4 NAV points after ZZZZZ that were dropped were ZZZZZ1, ZZZZZ2, ZZZZZ3 and ZZZZZ4. There was no annunciation that the aircraft had reverted to Heading Mode nor that the NAV points had been dropped from the FMS. Both GPS's appeared normal, there was no traffic conflict reported by ATC. There were no indications of IRS (Inertial Reference System) issues apparent. We were flying near where GPS jamming occurs sometimes but there were no NOTAMS on jamming. We were given a 170 vector for a brief time and then given direct to

ZZZ1 on the SID which was still in the FMS as part of the Departure SID. We continued on in our climb and finished flight to ZZZ3. As additional note we discovered that on beginning the Arrival STAR into ZZZ3 that the preloaded altitudes for the NAV point ZZZZZ5 had dropped from the FMS. I had already verified the altitudes at ZZZZZ5 twice as the FO (First Officer) and the Captain had also verified the altitudes loaded in the FMS prior to descent. There was no annunciation of the altitudes for ZZZZZ5 dropping from the FMS. Luckily we found out ahead of the fix. After the flight we alerted maintenance and made a write up in the maintenance logbook. There were no more issues during the flight.

Synopsis

Air carrier First Officer reported the FMC dropped 4 navigational fixes in the routing, causing a course deviation. The First Officer stated the aircraft was in an area of reported GPS jamming.

ACN: 1908478 *(31 of 50)*

Time / Day

Date : 202205
Local Time Of Day : 1201-1800

Place

Locale Reference.ATC Facility : N90.TRACON
State Reference : NY
Altitude.AGL.Single Value : 800

Environment

Flight Conditions : VMC
Weather Elements / Visibility.Visibility : 10
Light : Daylight

Aircraft

Reference : X
ATC / Advisory.TRACON : N90
Aircraft Operator : Fractional
Make Model Name : Medium Transport
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 135
Flight Plan : IFR
Mission : Passenger
Flight Phase : Initial Climb
Route In Use.SID : WEST7 DEP
Airspace.Class D : HPN
Airspace.Class E : N90

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Failed

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Fractional
Function.Flight Crew : Flight Engineer / Second Officer
Function.Flight Crew : Pilot Flying
Function.Flight Crew : First Officer
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Air Transport Pilot (ATP)
Experience.Flight Crew.Total : 1100
Experience.Flight Crew.Last 90 Days : 118
Experience.Flight Crew.Type : 90
ASRS Report Number.Accession Number : 1908478
Human Factors : Distraction
Human Factors : Human-Machine Interface

Human Factors : Situational Awareness
Human Factors : Troubleshooting
Human Factors : Workload
Human Factors : Confusion

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Altitude : Overshoot
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Became Reoriented
Result.Flight Crew : Overcame Equipment Problem

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Primary Problem : Aircraft

Narrative: 1

Climbing out of HPN on the Westchester 7 departure from Runway 16 we lost navigation guidance from the FMS. I maintained manual control and hand flew the departure without the autopilot. The first deviation on the departure was a late turn to heading 320 which ATC queried us about. The second deviation was while leveling off at 3000 feet which was the maximum altitude on the departure. I deviated + 200 [ft.] to 3,200 feet before correcting back to 3000 feet.

Synopsis

A pilot departing HPN reported loss of GPS signal.

ACN: 1906250 *(32 of 50)*

Time / Day

Date : 202206
Local Time Of Day : 0601-1200

Place

Locale Reference.ATC Facility : LRBB.ARTCC
State Reference : FO

Environment

Flight Conditions : VMC
Light : Daylight

Aircraft

Reference : X
ATC / Advisory.Center : LRBB
Aircraft Operator : Air Carrier
Make Model Name : Commercial Fixed Wing
Crew Size.Number Of Crew : 3
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Cruise

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning
Problem : Failed

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : First Officer
Function.Flight Crew : Pilot Not Flying
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
ASRS Report Number.Accession Number : 1906250
Human Factors : Workload
Human Factors : Troubleshooting

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Detector.Person : Flight Crew
When Detected : In-flight
Result.Aircraft : Equipment Problem Dissipated

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

During a flight of a Commercial Fixed Wing from ZZZZ to OKBK at 39000 ft., Approximately 200 miles from ARTAT in the vicinity of LROP (Bucharest) with a clearance of direct to ARTAT parallel with the P975 airway ATC fault Engine Indicating and Crew Alerting System message illuminated. Non-normal checklists we're completed. It was discovered that both GPS signals were inoperative. ATC was notified. Problem continued intermittently for approximately 15 minutes until the GPS signal was continuously lost and was absent from the vicinity of the Black Sea, across Turkey and part of Iraq, approximately 2 hours, INS/IRUS operated normally and position was independently verified via radial and distance, especially since the flight planned route was within approximately 10 miles of the Iranian border at the closest point. Normal function returned between SOBIL and VAXEN on the UM688 airway. Cause unknown, whether of military interference with GPS or intermittent dual equipment failure. Navigation route and position verified with alternate means. Log book/discrepancy entry made at destination. Monitor and issue warnings to crews if this is a persistent problem in this geographical region.

Synopsis

Air carrier pilot reported a loss of GPS signal for approximately 2 hours while in cruise over Turkey and Iraq.

ACN: 1903210 *(33 of 50)*

Time / Day

Date : 202205
Local Time Of Day : 1801-2400

Place

Locale Reference.ATC Facility : ZZZZ2.ARTCC
State Reference : US

Aircraft

Reference : X
ATC / Advisory.Center : ZZZZ
Aircraft Operator : Air Carrier
Make Model Name : Commercial Fixed Wing
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Failed

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Air Transport Pilot (ATP)
ASRS Report Number.Accession Number : 1903210
Human Factors : Confusion
Human Factors : Distraction
Human Factors : Human-Machine Interface
Human Factors : Situational Awareness

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Person : Air Traffic Control
When Detected : In-flight
Result.Flight Crew : Diverted
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Flight Crew : Became Reoriented
Result.Air Traffic Control : Issued Advisory / Alert

Result.Air Traffic Control : Issued New Clearance
Result.Air Traffic Control : Provided Assistance

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Human Factors
Primary Problem : Aircraft

Narrative: 1

After departing ZZZZ we received a clearance to proceed direct to the ZZZZ1 fix on LXXX. About 40 minutes into the flight ZZZZ2 radio asked us if we were deviating around weather to which we replied no we were proceeding direct ZZZZ1 as instructed. We were then informed that we were 70 miles off course and was given a heading to fly to bring us back on course. We then noticed the message "GPS PRIMARY LOST" on both ND displays. We then contacted Dispatch and Maintenance to try to fix the problem and was told by maintenance that there was no fix while in flight. After discussing a course of action Dispatch and I were in agreement that a diversion to ZZZ was necessary due to the fact that continuing in waters airspace was not an option. ZZZZ2 radio gave us a heading to fly to stay out of waters airspace and remain in radar contact and then handed us off to ZZZ1 radar who gave us a heading to fly to ZZZ..

Synopsis

Air carrier Pilot reported the crew did not notice GPS PRIMARY LOST messages on both displays until ATC asked them why they were 70 miles off course.

ACN: 1902393 *(34 of 50)*

Time / Day

Date : 202205
Local Time Of Day : 1201-1800

Place

Locale Reference.ATC Facility : ZZZ.TRACON
State Reference : US
Altitude.MSL.Single Value : 4000

Environment

Weather Elements / Visibility.Visibility : 20
Ceiling.Single Value : 5000

Aircraft

Reference : X
ATC / Advisory.TRACON : M98
Aircraft Operator : Personal
Make Model Name : Skylane 182/RG Turbo Skylane/RG
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 91
Flight Plan : IFR
Mission : Training
Flight Phase : Initial Approach
Airspace.Class E : ZZZ

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Failed

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Function.Flight Crew : Single Pilot
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Flight Instructor
Qualification.Flight Crew : Commercial
Experience.Flight Crew.Total : 490
Experience.Flight Crew.Last 90 Days : 150
Experience.Flight Crew.Type : 10
ASRS Report Number.Accession Number : 1902393
Human Factors : Distraction

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Altitude : Excursion From Assigned Altitude
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy

Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Overcame Equipment Problem

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

During an IFR flight in VMC conditions with the purpose of becoming familiar with the cockpit automation in a new 182. I experienced a loss of GPS signal while being vectored for the RNAV XX into ZZZ. Prior to the loss of GPS signal, my safety pilot and I successfully flew using the GPS system and completed an instrument approach at ZZZ including a GPS arc. While being vectored all indications were normal including "LPV" indicating we had LPV available. About the time the controller turned me to intercept the final approach course I received an "LPV" in yellow as opposed to green indicating a integrity issue. Shortly after that, all GPS course guidance including glide slope indications disappeared from the Garmin G5. I would estimate they were gone for 20 seconds before returning. Once they returned I appeared to be in the same general point on the approach that I was before they disappeared. Shortly there after, guidance was lost yet again for a shorter interval. After the controller turned me inbound and the issue began to develop I elected to cancel my clearance and proceed visually. Thankfully, I was in total VMC the entire flight as planned. Following the two loss of guidance events, I advised my safety pilot I would follow the approach guidance to minimums but for him to let me know if something looked "off". I was able to receive good guidance from the final approach fix until minimum's. After landing I called approach to advise them of my issue.

Synopsis

C182 Pilot reported a loss of GPS signal while on vectors for approach.

ACN: 1902118 *(35 of 50)*

Time / Day

Date : 202111
Local Time Of Day : 1201-1800

Place

Locale Reference.ATC Facility : ZZZ.TRACON
State Reference : US

Environment

Weather Elements / Visibility.Other

Aircraft

Reference : X
ATC / Advisory.Tower : ZZZ
ATC / Advisory.TRACON : ZZZ
Aircraft Operator : Air Carrier
Make Model Name : Regional Jet 700 ER/LR (CRJ700)
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Takeoff / Launch
Airspace.Class A : ZZZ
Airspace.Class B : ZZZ
Airspace.Class E : ZZZ

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Failed

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Flying
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Air Transport Pilot (ATP)
ASRS Report Number.Accession Number : 1902118
Human Factors : Confusion
Human Factors : Distraction
Human Factors : Situational Awareness
Human Factors : Workload

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Track / Heading : All Types

Anomaly.Deviation / Discrepancy - Procedural : Clearance
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Became Reoriented
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Flight Crew : Overcame Equipment Problem
Result.Air Traffic Control : Issued New Clearance
Result.Air Traffic Control : Provided Assistance

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Software and Automation
Contributing Factors / Situations : Procedure
Contributing Factors / Situations : Chart Or Publication
Primary Problem : Aircraft

Narrative: 1

I was Pilot Flying during the takeoff on ZZZ Runway XX. During the initial phase of climb, the Captain and I noted that the Flight Director/AutoPilot was initiating a turn to the right. The SID called for a straight out and then a left hand turn after a fix. I disengaged the AutoPilot and started hand flying the aircraft on the present heading. During the climb out we noted that the FMS (Flight Management System) was displaying an error and had lost its position. We conferred with ATC who gave us a heading and I continued to hand fly while the Captain tried to sort out the problem. Once we were at a safe altitude, we advised ATC we had lost GPS and needed an updated flight plan for VOR based navigation to ZZZ1. We programmed in the new plan and continued the flight in green needles. During the flight, the Captain was able to reinitialize the FMS position and we switched back to white needles while periodically checking our position against VORs and a General Aviation application on my phone.

Synopsis

An air carrier CRJ-700 Pilot reported a loss of GPS on departure.

ACN: 1896267 *(36 of 50)*

Time / Day

Date : 202204
Local Time Of Day : 0601-1200

Place

Locale Reference.ATC Facility : UBBA.ARTCC
State Reference : FO

Environment

Flight Conditions : VMC

Aircraft

Reference : X
ATC / Advisory.Center : ZZZZ
Aircraft Operator : Air Carrier
Make Model Name : Commercial Fixed Wing
Crew Size.Number Of Crew : 3
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Cargo / Freight / Delivery
Flight Phase : Cruise

Component : 1

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Failed

Component : 2

Aircraft Component : ADS-B (Automatic Dependent Surveillance - Broadcast)
Aircraft Reference : X
Problem : Failed

Person

Location Of Person.Aircraft : X
Reporter Organization : Air Carrier
Function.Flight Crew : Captain
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
ASRS Report Number.Accession Number : 1896267
Human Factors : Distraction

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew

When Detected : In-flight
Result.Flight Crew : Overcame Equipment Problem

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Environment - Non Weather Related

Narrative: 1

Approaching PEMAN lost both GPS and soon after list both ADS [Automatic Dependent Surveillance]. We got GPS back after four minutes. Ground based GPS jamming.

Synopsis

Pilot reported losing GPS and ADS while flying UBBA airspace.

ACN: 1891731 *(37 of 50)*

Time / Day

Date : 202204
Local Time Of Day : 0001-0600

Place

Locale Reference.Airport : LLBG.Airport
State Reference : FO
Altitude.MSL.Single Value : 10000

Aircraft

Reference : X
Aircraft Operator : Air Carrier
Make Model Name : Commercial Fixed Wing
Crew Size.Number Of Crew : 3
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Nav In Use : FMS Or FMC
Nav In Use : GPS
Flight Phase : Climb
Airspace.Class A : LLBG

Component : 1

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : Aircraft Documentation
Aircraft Reference : X
Problem : Design

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Not Flying
Function.Flight Crew : Captain
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
Experience.Flight Crew.Total : 23000
Experience.Flight Crew.Last 90 Days : 141
Experience.Flight Crew.Type : 1820
ASRS Report Number.Accession Number : 1891731
Human Factors : Distraction
Human Factors : Human-Machine Interface
Human Factors : Situational Awareness
Human Factors : Troubleshooting

Human Factors : Workload
Human Factors : Confusion

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Detector.Person : Flight Crew
Were Passengers Involved In Event : N
When Detected : In-flight
Result.Flight Crew : Overrode Automation
Result.Flight Crew : Exited Penetrated Airspace
Result.Aircraft : Equipment Problem Dissipated

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Airspace Structure
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

Flying Aircraft X TLV-ZZZ. During climbout we got ADS-B L EICAS warning. I ran the Non-Normal checklist which had us switch the Transponder to R. Immediately got ADS-B R EICAS. Followed by GPS EICAS. I selected the GPS Interference Supplementary Procedure. Reading through the procedure, it is divided into phase of flight. First DESCENT, then PREFLIGHT, and finally CLIMB. Since I was in the CLIMB phase of flight, I went straight to that section of the procedure. Climbing through FL250 it directs us to select GPS NAV - ON then RAD NAV INHIBIT - ON. This is actually the exact opposite of what we want to do while climbing with GPS Jamming. I had to improvise the procedure by using the DESCENT section (despite climbing) which directs us to correctly select GPS NAV - OFF and RAD NAV INHIBIT - ON. This Supplementary procedure should be assessed by the Fleet and rewritten so that it is usable when needed. The GPS was jammed by the Country X until we were approximately 250 miles west of TLV. At that time, GPS worked normally and the flight proceeded uneventfully.

Synopsis

Air Carrier Captain reported GPS jamming from 50 NM west until 250 NM west of TVL. The Captain states the aircraft eventually left the jamming area. In addition the Captain reported requesting a change to the QRH procedures in order to help overcome the unwanted situation. The request was sent to the Flight Operations Department.

ACN: 1884338 *(38 of 50)*

Time / Day

Date : 202203
Local Time Of Day : 1801-2400

Place

Locale Reference.ATC Facility : MCI.TRACON
State Reference : MO
Relative Position.Angle.Radial : 165
Relative Position.Distance.Nautical Miles : 28
Altitude.MSL.Single Value : 5500

Environment

Weather Elements / Visibility : Turbulence
Weather Elements / Visibility.Visibility : 10

Aircraft

Reference : X
ATC / Advisory.TRACON : MCI
Aircraft Operator : Personal
Make Model Name : Small Aircraft, Low Wing, 2 Eng, Retractable Gear
Crew Size.Number Of Crew : 1
Operating Under FAR Part : Part 91
Flight Plan : None
Mission : Ferry / Re-Positioning
Nav In Use : GPS
Flight Phase : Cruise
Route In Use : Visual Approach
Airspace.Class B : MCI

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Personal
Function.Flight Crew : Single Pilot
Qualification.Flight Crew : Private
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Experience.Flight Crew.Total : 1660
Experience.Flight Crew.Last 90 Days : 0.7
Experience.Flight Crew.Type : 251
ASRS Report Number.Accession Number : 1884338
Human Factors : Situational Awareness
Human Factors : Time Pressure
Human Factors : Human-Machine Interface

Human Factors : Workload
Human Factors : Confusion
Human Factors : Distraction
Human Factors : Troubleshooting

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Detector.Person : Flight Crew
Were Passengers Involved In Event : N
When Detected : In-flight
Result.General : None Reported / Taken

Assessments

Contributing Factors / Situations : Aircraft
Primary Problem : Aircraft

Narrative: 1

Ferry trip home from avionics install. Lost WAAS GPS signal to GTX 335 with loss of altitude reporting for last 16 minutes of flight. This was noticed on FlightAware track and rectified after discussion with Garmin tech support.

Synopsis

Light Twin Engine Pilot reported loss of GPS signal which resulted in loss of altitude reporting.

ACN: 1881639 *(39 of 50)*

Time / Day

Date : 202203

Place

Locale Reference.Airport : ZZZ.Airport
State Reference : US
Relative Position.Distance.Nautical Miles : 9
Altitude.AGL.Single Value : 190

Environment

Flight Conditions : VMC
Weather Elements / Visibility.Visibility : 5
Light : Daylight
Ceiling : CLR

Aircraft

Reference : X
Aircraft Operator : Commercial Operator (UAS)
Make Model Name : DJI Mavic 2 Pro
Crew Size.Number Of Crew : 1
Operating Under FAR Part : Part 107
Flight Plan : None
Mission : Photo Shoot / Video
Flight Phase : Descent
Route In Use : None
Operating Under Waivers / Exemptions / Authorizations (UAS) : N
Weight Category (UAS) : Small
Configuration (UAS) : Multi-Rotor
Flight Operated As (UAS) : VLOS
Flight Operated with Visual Observer (UAS) : N
Control Mode (UAS) : Transitioning Between Modes
Flying In / Near / Over (UAS) : Private Property
Type (UAS) : Purchased
Number of UAS Being Controlled (UAS).Number of UAS : 1

Component

Aircraft Component : GPS Module (UAS)
Manufacturer : DJI
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person : Outdoor / Field Station (UAS)
Reporter Organization : Commercial Operator (UAS)
Function.Flight Crew : Person Manipulating Controls (UAS)
Qualification.Flight Crew : Remote Pilot (UAS)
Experience.Flight Crew.Total : 3220
Experience.Flight Crew.Total (UAS) : 3000
Experience.Flight Crew.Last 90 Days (UAS) : 90

Experience.Flight Crew.Type (UAS) : 30
ASRS Report Number.Accession Number : 1881639
Analyst Callback : Completed

Events

Anomaly.Aircraft Equipment Problem : Critical
Anomaly.Inflight Event / Encounter : Object
Anomaly.Inflight Event / Encounter : Loss Of Aircraft Control
Detector.Person : UAS Crew
When Detected : In-flight
Result.Aircraft : Aircraft Damaged

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

Aircraft had multipath interference from GPS. Drone crashed into building at 13 MPH due to it thinking it was in a different space than it was. No damage to building, ground, nobody was underneath aircraft. Safety protocols reviewed and situation corrected.

Callback: 1

The reporter confirmed the type of UAS, DJI Mavic 2 Pro.

Synopsis

UAS pilot reported that while flying a UAS for a photo mission, a GPS multipath error occurred and the UAS crashed into a building.

ACN: 1881214 *(40 of 50)*

Time / Day

Date : 202203
Local Time Of Day : 0601-1200

Place

Locale Reference.ATC Facility : SMF.Tower
State Reference : CA
Altitude.AGL.Single Value : 1600

Aircraft

Reference : X
ATC / Advisory.Tower : SMF
Aircraft Operator : Personal
Make Model Name : Small Aircraft, Low Wing, 2 Eng, Retractable Gear
Operating Under FAR Part : Part 91
Mission : Personal
Flight Phase : Initial Climb
Route In Use : Direct
Airspace.Class C : SMF

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Personal
Function.Flight Crew : Pilot Flying
Function.Flight Crew : Single Pilot
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Flight Instructor
Qualification.Flight Crew : Multiengine
Experience.Flight Crew.Total : 22000
Experience.Flight Crew.Last 90 Days : 100
Experience.Flight Crew.Type : 300
ASRS Report Number.Accession Number : 1881214
Human Factors : Situational Awareness
Human Factors : Distraction

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Airspace Violation : All Types
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Person : Flight Crew
When Detected : In-flight
Result.General : None Reported / Taken

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Airspace Structure
Contributing Factors / Situations : Environment - Non Weather Related
Contributing Factors / Situations : Human Factors
Primary Problem : Human Factors

Narrative: 1

On initial climbout of MCC the GPS appeared to lose signal, or at least the moving map was not displaying my position as it had been prior to takeoff. I was aware of the Class C airspace above me and turned right to fly out from under the east side of it. The GPS returned moments later, after I thought I had cleared the airspace, but it turned out I had not. I may have entered the far eastern edge of the Class C by a couple hundred feet. I was not talking to NorCal and did not contact them as by the time I dialed in the frequency I was indeed clear of the Class C to the east. More situational awareness on my part would have been beneficial, knowing where the eastern boundary was visually, but I got distracted by the moving map and should have been more careful. Live and learn!

Synopsis

Pilot reported possibly entering the SMF class charlie airspace by mistake after a momentary GPS signal loss.

ACN: 1880420 *(41 of 50)*

Time / Day

Date : 202202

Place

Locale Reference.Airport : SFB.Airport
State Reference : FL
Altitude.MSL.Single Value : 1600

Aircraft

Reference : X
Make Model Name : M-20 Series Undifferentiated or Other Model
Nav In Use : GPS
Flight Phase : Parked

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person : Hangar / Base
Function.Flight Crew : Single Pilot
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Commercial
Experience.Flight Crew.Total : 3500
Experience.Flight Crew.Last 90 Days : 20
Experience.Flight Crew.Type : 1200
ASRS Report Number.Accession Number : 1880420
Human Factors : Confusion
Human Factors : Human-Machine Interface
Human Factors : Troubleshooting
Human Factors : Other / Unknown
Human Factors : Situational Awareness

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Airspace Violation : All Types
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Anomaly.Deviation / Discrepancy - Procedural : FAR
Detector.Person : Flight Crew
Were Passengers Involved In Event : N
When Detected : Routine Inspection
Result.General : None Reported / Taken

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Human Factors
Primary Problem : Ambiguous

Narrative: 1

I departed TIX and was going to ZZZ. I did my flight planning to stay in the corridor South of Sanford and North of Orlando - from East to West. On the way back I saw I was very close to Sanford's airspace under Class B. I do not believe I was in anyone's airspace without a clearance but it was unnerving to see that my track was off my route that I had in my GPS. Could this be a 5G thing?

Synopsis

Single Engine Pilot reported a possible airspace violation. The pilot suspects a GPS error contributed to the event and questions whether it could be 5G related.

ACN: 1880243 *(42 of 50)*

Time / Day

Date : 202202
Local Time Of Day : 1201-1800

Place

Locale Reference.ATC Facility : ZFW.ARTCC
State Reference : TX

Aircraft

Reference : X
ATC / Advisory.Center : ZFW
Aircraft Operator : Air Carrier
Make Model Name : Commercial Fixed Wing
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Descent
Airspace.Class A : ZFW

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Failed

Person

Location Of Person.Aircraft : X
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Flying
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Multiengine
ASRS Report Number.Accession Number : 1880243

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Air Traffic Control : Provided Assistance

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : ATC Equipment / Nav Facility / Buildings

Narrative: 1

NAV GPS1 FAIL NAV GPS2 FAIL Intermittent failures at XA:12z , Aircraft X at FL310. GPS 2 self recovered in Flight. GPS 1 recovered after landing. ATC was notified, and position confirmed. ATC informed us that other Aircraft reported similar GPS problems. IRU's worked normally. Mechanical discrepancy entered in AML. Unknown loss of GPS, IRUs remained operational. And position confirmed with ATC. Unknown loss of GPS. Submitting for tracking purposes.

Synopsis

Pilot reported GPS failure in flight as did other flights in the vicinity.

ACN: 1878184 *(43 of 50)*

Time / Day

Date : 202202
Local Time Of Day : 0601-1200

Place

Locale Reference.ATC Facility : ZZZ.TRACON
State Reference : US
Altitude.MSL.Single Value : 2500

Environment

Flight Conditions : IMC
Weather Elements / Visibility.Visibility : 8
Light : Daylight
Ceiling.Single Value : 600

Aircraft

Reference : X
ATC / Advisory.TRACON : ZZZ
Aircraft Operator : Corporate
Make Model Name : Citation II S2/Bravo (C550)
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 91
Flight Plan : IFR
Mission : Passenger
Flight Phase : Initial Approach
Route In Use : Direct
Route In Use.STAR : ZZZZZ6
Airspace.Class C : ZZZ

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person : 1

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Corporate
Function.Flight Crew : Pilot Flying
Function.Flight Crew : Captain
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Flight Instructor
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Multiengine
Experience.Flight Crew.Total : 5300
Experience.Flight Crew.Last 90 Days : 100
Experience.Flight Crew.Type : 3000
ASRS Report Number.Accession Number : 1878184
Human Factors : Troubleshooting

Human Factors : Workload
Human Factors : Communication Breakdown
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : Other

Person : 2

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Corporate
Function.Flight Crew : First Officer
Function.Flight Crew : Pilot Not Flying
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Flight Instructor
Qualification.Flight Crew : Commercial
Qualification.Flight Crew : Multiengine
Experience.Flight Crew.Total : 1190
Experience.Flight Crew.Last 90 Days : 118
Experience.Flight Crew.Type : 200
ASRS Report Number.Accession Number : 1878162
Human Factors : Workload
Human Factors : Troubleshooting
Human Factors : Communication Breakdown
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : Other

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Altitude : Excursion From Assigned Altitude
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Published Material / Policy
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Person : Flight Crew
When Detected : In-flight
Result.General : Maintenance Action
Result.Flight Crew : Overrode Automation
Result.Flight Crew : Overcame Equipment Problem

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Procedure
Contributing Factors / Situations : Weather
Primary Problem : Aircraft

Narrative: 1

On Date we were arriving in Aircraft X to ZZZ at about XA:30. We were on a flight from ZZZ1 to ZZZ. After we took off from ZZZ1 partway into the flight we discovered an issue with our autopilot. Our autopilot was having trouble maintaining its GPS course. We spent the flight troubleshooting our GPS and trying to correct the heading. We thought we had it corrected and as it would maintain course, but then later went off course again. We were on the ZZZZZ6 arrival for the ILS for [Runway] XXL with the ZZZZZ transition. When we came down to ZZZZZ we were using the GPS until ZZZZZ to transition to the ILS for [Runway] XXL. When I realized the GPS didn't intercept at ZZZZZ I took the autopilot off

to correct it. I was then asked if I could make it down and I replied yes. I then thought I was given a heading of 210 and maintain 2,500 feet. I later realized that I was given a different heading. I was then told to turn to the right and climb to another altitude. We made the turn and got vectors back around for the ILS for [Runway] XXL. We then completed the ILS with no further issues. My First Officer was flying the airplane for most of the flight and it was her first time flying Aircraft X in several months. While I have many hours flying Citations, it was my first day in Aircraft X. We completed 2 other flights that morning with no issues. When I realized the GPS was not making the correct turn at ZZZZZ I took over flight in the aircraft manually to correct the problem. We should have notified ATC that we were having issues with our GPS earlier and asked for a heading to our destination.

Narrative: 2

On Date we were arriving in Aircraft X to ZZZ at about XA:20 am. We were on a flight from ZZZ1 to ZZZ. Partially into our flight we discovered an issue with our autopilot maintaining GPS course. We tried trouble shooting the issue several times and thought upon the time of the arrival we had the situation resolved. (ZZZZZ6 arrival for the ILS Runway XXL with the ZZZZZ transition) I was Pilot Flying until we realized the GSP didn't intercept at ZZZZZ. The Captain disengaged the auto pilot to correct for the error becoming Pilot Flying. We were then asked if we could make it down? The Captain replied "yes". Then ATC gave us a heading/altitude change the caption acknowledged it. He queried me on the heading, and I thought it was 210. In the time compression with high work load we should have slowed down and asked for confirmation instead of rushing. We were then queried about why we turned right instead of left. Then a different controller came on with a different heading and altitude. I replied back with the reminder radio transmission as Pilot Monitoring until landing. We then completed the ILS the second time with no further issues. We have since reached out to our avionics department and are trouble shooting the issue so this doesn't happen going forward. We started early in the morning at XT:30 and had two uneventful flights. When we started the third and final flight of the day and recognized we had an auto pilot problem we should of error on the side of caution, not accepted the arrival, and asked ATC to give us vectors to the ILS. When workloads are high such as with the ILS and making the incorrect turn we should establish checks and balances for example: Pilot Monitoring heading left 220/ Pilot Flying heading left 220/ Pilot Monitoring heading left 220 confirmed to avoid confusion so it is received, accepted, and confirmed. I realized how important crew resource managements is and there was a break down in CRM and this is an area we are going to focus on more going forward.

Synopsis

CE-500 Captain and First Officer reported a breakdown in CRM during troubleshooting a GPS failure resulted in confusion and turn in the wrong direction.

ACN: 1871693 *(44 of 50)*

Time / Day

Date : 202201
Local Time Of Day : 1801-2400

Place

Locale Reference.Airport : DEN.Airport
State Reference : CO

Environment

Flight Conditions : IMC
Light : Daylight

Aircraft : 1

Reference : X
ATC / Advisory.TRACON : D01
Aircraft Operator : Air Carrier
Make Model Name : Commercial Fixed Wing
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Initial Approach
Airspace.Class B : DEN

Aircraft : 2

Reference : Y
ATC / Advisory.TRACON : D01
Aircraft Operator : Air Carrier
Make Model Name : Medium Transport, Low Wing, 2 Turbojet Eng
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Initial Approach
Airspace.Class B : DEN

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Failed

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : First Officer
Qualification.Flight Crew : Air Transport Pilot (ATP)
ASRS Report Number.Accession Number : 1871693

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Conflict : Airborne Conflict
Detector.Person : Flight Crew
When Detected : In-flight
Result.General : None Reported / Taken

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Environment - Non Weather Related

Narrative: 1

No GPS signal on KLN-90B, followed by a confirmation of no GPS via EFB (iPads). Reported to ATC. Other aircraft followed up with more reports. Transponder remained operative but was reported failing in other airplanes. Air Carrier Y aircraft was also seen and reported possibly performing a "resolution advisory". The collision path never appeared to show imminent need for reaction. Our TCAS never indicated closer than 1000' in any direction. Not confirmed if the events were related. Still really strange hearing Air Carrier Y on ATC at the same time as GPS outages. GPS failure in our aircraft as well as other aircraft in vicinity. Other aircraft experienced Transponder and GPS full loss of signal.

Synopsis

Air carrier First Officer reported a possible conflict and loss of GPS on approach to DEN.

ACN: 1871581 *(45 of 50)*

Time / Day

Date : 202201
Local Time Of Day : 1201-1800

Place

Locale Reference.ATC Facility : D01.TRACON
State Reference : CO
Altitude.MSL.Single Value : 12000

Environment

Flight Conditions : VMC

Aircraft

Reference : X
ATC / Advisory.TRACON : D01
Aircraft Operator : Air Carrier
Make Model Name : Commercial Fixed Wing
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Final Approach
Airspace.Class B : DEN

Component : 1

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Failed

Component : 2

Aircraft Component : Transponder
Aircraft Reference : X
Problem : Failed

Person : 1

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Captain
Function.Flight Crew : Pilot Not Flying
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Air Transport Pilot (ATP)
Experience.Flight Crew.Total : 1137
Experience.Flight Crew.Last 90 Days : 96
Experience.Flight Crew.Type : 741
ASRS Report Number.Accession Number : 1871581
Human Factors : Distraction

Person : 2

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Captain
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
ASRS Report Number.Accession Number : 1873228
Human Factors : Distraction
Human Factors : Troubleshooting

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Detector.Person : Flight Crew
When Detected : In-flight
Result.Air Traffic Control : Issued Advisory / Alert

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Environment - Non Weather Related

Narrative: 1

Turning downwind at FFFAT both GPS went out. Turning a 9 mile base, the "Transponder Fail" light illuminated. This was a known problem happening to all aircraft according to Denver Approach.

Narrative: 2

While descending through 14,000 feet into DEN, approximately 3NM North of the DEN airport, we lost both the L and R GPS signals. We also received an amber TERR FAIL message on both ND's. Reported signal loss to DEN approach. They responded "We have had many reports today of GPS signals out". The L and R GPS signals restored 5 min after landing and upon taxing into the gate. Upon departure from DEN, while climbing through 3,000 feet, lost both L and R GPS signals. Reported signal loss to DEN departure. They responded "We have had many reports today of intermittent GPS signal loss." Shortly after the L and R GPS signal loss we also received a "XPDR FAIL" light on the Transponder. Operation of GPS signals and Transponder returned to normal while climbing through 26,000 feet. Determine if GPS outage was related to 5G activation, Note: while in the DEN airport, personal cell phone displayed 5G WB was in use.

Synopsis

Flight crew reported both GPS and transponder failed on approach and departure into and out of DEN.

ACN: 1870567 *(46 of 50)*

Time / Day

Date : 202201
Local Time Of Day : 1201-1800

Place

Locale Reference.ATC Facility : D10.TRACON
State Reference : TX
Relative Position.Angle.Radial : 90
Relative Position.Distance.Nautical Miles : 10
Altitude.MSL.Single Value : 8000

Environment

Flight Conditions : VMC
Weather Elements / Visibility.Visibility : 10
Ceiling.Single Value : 12000

Aircraft

Reference : X
ATC / Advisory.TRACON : D10
Aircraft Operator : Personal
Make Model Name : Small Aircraft, Low Wing, 1 Eng, Retractable Gear
Crew Size.Number Of Crew : 1
Operating Under FAR Part : Part 91
Flight Plan : IFR
Mission : Personal
Flight Phase : Climb
Route In Use : Vectors
Airspace.Class B : DFW

Component

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Personal
Function.Flight Crew : Pilot Flying
Function.Flight Crew : Single Pilot
Qualification.Flight Crew : Instrument
Experience.Flight Crew.Total : 740
Experience.Flight Crew.Last 90 Days : 10
Experience.Flight Crew.Type : 55
ASRS Report Number.Accession Number : 1870567

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation / Discrepancy - Procedural : Clearance
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : Returned To Clearance

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

Cockpit GPS equipment did not link properly causing a slight deviation from course. Problem was corrected with no further problems.

Synopsis

Light aircraft Pilot reported a small course deviation related to a momentary GPS issue.

ACN: 1870527 *(47 of 50)*

Time / Day

Date : 202201
Local Time Of Day : 0601-1200

Place

Locale Reference.Airport : MLB.Airport
State Reference : FL
Relative Position.Angle.Radial : 180
Relative Position.Distance.Nautical Miles : 2
Altitude.MSL.Single Value : 5500

Environment

Flight Conditions : VMC
Light : Daylight

Aircraft

Reference : X
ATC / Advisory.UNICOM : ZZZ
Aircraft Operator : Personal
Make Model Name : M-20 F Executive 21
Crew Size.Number Of Crew : 1
Operating Under FAR Part : Part 91
Flight Plan : VFR
Mission : Personal
Flight Phase : Cruise
Route In Use : Direct
Airspace.Class E : ZJX

Component : 1

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : ADS-B (Automatic Dependent Surveillance - Broadcast)
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Personal
Function.Flight Crew : Single Pilot
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Flight Instructor
Experience.Flight Crew.Total : 8400

Experience.Flight Crew.Last 90 Days : 100
Experience.Flight Crew.Type : 35
ASRS Report Number.Accession Number : 1870527
Human Factors : Confusion
Human Factors : Communication Breakdown
Communication Breakdown.Party1 : Flight Crew
Communication Breakdown.Party2 : Other

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Ground Event / Encounter : Ground Equipment Issue
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Overcame Equipment Problem

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Airspace Structure
Contributing Factors / Situations : Environment - Non Weather Related
Contributing Factors / Situations : Human Factors
Primary Problem : Ambiguous

Narrative: 1

While on personal VFR flight my aircraft ADS-B stopped transmitting over MLB when inbound for ZZZ. Was not aware of it till after landing and reviewing online aircraft tracking and saw tracking data stopped at XA:28 local time about 15 minutes prior to landing. ADS-B Out is provided via Unavonix Skybeacon wingtip strobe. During time from when ADS-B Out tracking stopped, my tablet moving map using a separate ADS-B In receiver lost GPS altitude and indicated 100 ft. GPS altitude when it was previously showing my actual indicated altitude of 5500 FT +/- 100 ft. I still had indications of other ADS-B out aircraft. I did not know my ADS-B Out was not tracking. I thought possibly bad signal to portable ADS-B in receiver or ADS-B tower down. I have utilized the portable ADS-B and tablet previously in aircraft and never had these indications before. The ADS-B Out beacon and the portable IN are separate and do not interact with each other nor does the tablet receive information from the Out beacon. I do not know if the ADS-B towers in the area went down unexpectedly or if other interference caused the OUT and IN to stop transmitting properly. As a result I was flying withing the 30 NM veil from Orlando Class B airspace requiring ADS-B out. I was not flying in or under the Class B however, but ZZZ lies within the 30 NM veil from Orlando. Since I was not on Flight Following with Orlando, I was unaware of the lost of ADS-B out data. I requested a Public ADS-B Performance Report from the FAA after seeing the Data to compare and it showed the same that my ADS-B track log stopped when flying over MLB.

Synopsis

M20 Pilot reported GPS, ADS-B failure which pilot believed was a problem with something other than his aircraft.

ACN: 1870383 *(48 of 50)*

Time / Day

Date : 202201
Local Time Of Day : 0601-1200

Place

Locale Reference.ATC Facility : DEN.Tower
State Reference : CO
Altitude.AGL.Single Value : 400

Environment

Flight Conditions : VMC

Aircraft

Reference : X
ATC / Advisory.Tower : DEN
Aircraft Operator : Air Carrier
Make Model Name : Medium Transport, Low Wing, 2 Turbojet Eng
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Climb
Airspace.Class B : DEN

Component : 1

Aircraft Component : ADS-B (Automatic Dependent Surveillance - Broadcast)
Aircraft Reference : X
Problem : Failed

Component : 2

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Failed

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Captain
Function.Flight Crew : Pilot Not Flying
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Experience.Flight Crew.Total : 17454.30
Experience.Flight Crew.Last 90 Days : 101.17
Experience.Flight Crew.Type : 6215.78
ASRS Report Number.Accession Number : 1870383

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Detector.Person : Flight Crew
When Detected : In-flight
Result.General : None Reported / Taken

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

Approx 400 feet AGL [we received] ECAM for dual ADS-B failure "ADS-B RPTG 1/2 fault". This followed [at] 800 feet [by] GPS lost/failure shortly after. ATC advised, per NOTAM we understood DEN has issues. Dispatch notification after level off.

Synopsis

Air carrier Captain reported loss of ADS-B and GPS departing DEN.

ACN: 1870380 *(49 of 50)*

Time / Day

Date : 202201
Local Time Of Day : 0601-1200

Place

Locale Reference.ATC Facility : D01.TRACON
State Reference : CO
Altitude.MSL.Single Value : 15000

Environment

Flight Conditions : VMC

Aircraft

Reference : X
ATC / Advisory.TRACON : D01
Aircraft Operator : Air Carrier
Make Model Name : Medium Transport, Low Wing, 2 Turbojet Eng
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Descent
Airspace.Class B : DEN

Component : 1

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : Transponder
Aircraft Reference : X
Problem : Malfunctioning

Person : 1

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Pilot Not Flying
Function.Flight Crew : Captain
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Experience.Flight Crew.Last 90 Days : 166
Experience.Flight Crew.Type : 10376
ASRS Report Number.Accession Number : 1870380

Person : 2

Location Of Person.Aircraft : X
Reporter Organization : Air Carrier
Function.Flight Crew : First Officer
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Experience.Flight Crew.Total : 3664.18
Experience.Flight Crew.Last 90 Days : 12.97
Experience.Flight Crew.Type : 177.32
ASRS Report Number.Accession Number : 1870333

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Detector.Person : Flight Crew
When Detected : In-flight
Result.General : None Reported / Taken

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

Upon arrival [into] DEN at 15,000 ft. we lost both GPS signals and transponder fail illuminated. After notifying ATC they confirmed they had our transponder and that they were aware of the GPS failure.

Narrative: 2

Upon arrival to DEN at approximately 15,000', a loss of all GPS signal with corresponding transponder fail light illumination. Upon taxi in, GPS signal was restored and transponder resumed normal operation. Was told by ATC that they were aware of the issue and that it was affecting all aircraft.

Synopsis

Air carrier flight crew reported failure of GPS and transponder on arrival into DEN.

ACN: 1870379 *(50 of 50)*

Time / Day

Date : 202201
Local Time Of Day : 1801-2400

Place

Locale Reference.ATC Facility : D01.TRACON
State Reference : CO
Altitude.MSL.Single Value : 11000

Environment

Flight Conditions : IMC
Weather Elements / Visibility : Rain

Aircraft

Reference : X
ATC / Advisory.TRACON : D01
Aircraft Operator : Air Carrier
Make Model Name : Large Transport, Low Wing, 2 Turbojet Eng
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Mission : Passenger
Flight Phase : Final Approach
Airspace.Class B : DEN

Component : 1

Aircraft Component : GPS & Other Satellite Navigation
Aircraft Reference : X
Problem : Malfunctioning

Component : 2

Aircraft Component : Transponder
Aircraft Reference : X
Problem : Malfunctioning

Person

Location Of Person.Aircraft : X
Location In Aircraft : Flight Deck
Reporter Organization : Air Carrier
Function.Flight Crew : Captain
Function.Flight Crew : Pilot Not Flying
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Qualification.Flight Crew : Multiengine
Experience.Flight Crew.Last 90 Days : 121
Experience.Flight Crew.Type : 3093
ASRS Report Number.Accession Number : 1870379

Events

Anomaly.Aircraft Equipment Problem : Less Severe
Detector.Person : Flight Crew
When Detected : In-flight
Result.Aircraft : Equipment Problem Dissipated

Assessments

Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Environment - Non Weather Related
Primary Problem : Ambiguous

Narrative: 1

Conducting ILS 35L in DEN we lost both GPS receivers, had a map shift, and lost transponder. The aircraft was established on the ILS using the ILS signal and autopilot on. The aircraft responded normally as did the autopilot. The flight landed uneventfully. Taxiing in GPS receivers and transponder recovered and were in a normal state of operation.

Synopsis

Air carrier Captain reported temporary loss of GPS and transponder on approach to DEN. Both systems returned to normal after landing.