ASRS Database Report Set

Altitude Deviations

Report Set Description.................................A sampling of reports referencing altitude deviations for all types of operations

Update Number.............................................31.0

Date of Update............................................October 30, 2018

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

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

Type of Records in Report Set........................For each update, new records received at ASRS will displace a like number of the oldest records in the Report Set, with the objective of providing the fifty most recent relevant ASRS Database records. Records within this Report Set have been screened to assure their relevance to the topic.
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. 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 amplified 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.

Becky L. Hooey, Director
NASA Aviation Safety Reporting System
CAV EAT 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: 1574680 (1 of 50)

Synopsis
B737-700 First Officer reported overshooting an altitude restriction on the RNAV (RNP) Z approach to DEN Runway 16R. Lack of mode awareness was cited as contributing.

ACN: 1574675 (2 of 50)

Synopsis
B737-700 flight crew reported failing to make a crossing restriction on the RNP-Z Runway 20R approach to SNA.

ACN: 1574614 (3 of 50)

Synopsis
BE35 pilot reported encountering thunderstorms enroute that were not displayed in a timely manner on his XM weather datalink.

ACN: 1574150 (4 of 50)

Synopsis
CRJ Captain reported a low altitude alert from ATC while on approach to MSP.

ACN: 1573867 (5 of 50)

Synopsis
B737-800 flight crew reported missing a crossing restriction on descent when an FMC mode change out of LNAV/VNAV PATH was not noticed.

ACN: 1573325 (6 of 50)

Synopsis
CRJ First Officer reported the Captain descended early on a visual approach and failed to follow SOP's on several occasions.

ACN: 1573217 (7 of 50)

Synopsis
Air carrier flight crew reported an encounter with severe turbulence.

ACN: 1572695 (8 of 50)

Synopsis
B737 flight crew reported a TCAS RA with a small aircraft while on approach to EWR.
<table>
<thead>
<tr>
<th>ACN: 1572507 (9 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
<tr>
<td>Pilot reported a confusing depiction of a crossing restriction on the VOR Runway 10 approach plate for CLL airport.</td>
</tr>
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<table>
<thead>
<tr>
<th>ACN: 1571965 (10 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
<tr>
<td>Salt Lake ARTCC Controller reported an aircraft descending below a transition altitude by 2,000 feet.</td>
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<thead>
<tr>
<th>ACN: 1571213 (11 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
<tr>
<td>CE-560XL flight crew reported failing to make a crossing restriction on descent into BOS, citing a late clearance and a wake turbulence encounter.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACN: 1570966 (12 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
<tr>
<td>Embraer Regional Jet First Officer reported an altitude deviation occurred when they encountered wake turbulence in the landing pattern at EWR.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>ACN: 1570795 (13 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
<tr>
<td>A 757 Captain reported that a crossing restriction on the arrival was not meet and the deviation was pointed out to the crew by the FAA Inspector on the observer's seat.</td>
</tr>
</tbody>
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<tr>
<th>ACN: 1570097 (14 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
<tr>
<td>A321 flight crew reported the aircraft failed to honor a properly programmed altitude constraint on descent in managed speed and managed vertical path mode.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACN: 1570088 (15 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
<tr>
<td>A321 First Officer reported that even though the FMS was correctly programmed the aircraft descended below the entered altitude.</td>
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</tbody>
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<thead>
<tr>
<th>ACN: 1569446 (16 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
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</tbody>
</table>
Falcon 2000 flight crew reported that during descent the autopilot failed to capture the preselected altitude.

<table>
<thead>
<tr>
<th>ACN: 1569056 (17 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
<tr>
<td>BGM Controller reported assigning a lower altitude resulting in an aircraft descending below the MVA.</td>
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<thead>
<tr>
<th>ACN: 1568845 (18 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
<tr>
<td>EMB-145 Captain reported a NMAC in the vicinity of BWI airport.</td>
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<tr>
<th>ACN: 1568535 (19 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
<tr>
<td>A319 Captain reported descending early on arrival clearance.</td>
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<tr>
<th>ACN: 1567545 (20 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
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<tr>
<td>Controller reported not listening correctly to a read back which had the pilot descend below the Minimum Vectoring Altitude.</td>
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<tr>
<th>ACN: 1567527 (21 of 50)</th>
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</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
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<tr>
<td>Military Pilot reported a NMAC because they missed an ATC restriction.</td>
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<tr>
<th>ACN: 1567243 (22 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
<tr>
<td>C525 Captain reported failing to meet a crossing restriction during avoidance maneuvers related to a wake turbulence encounter in trail of a B737-900 on arrival into SEA.</td>
</tr>
</tbody>
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<tr>
<th>ACN: 1567233 (23 of 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
<tr>
<td>Lear 60 test pilot reported a 2000 ft altitude excursion due to an autopilot pitch malfunction.</td>
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<tr>
<th>ACN: 1567136 (24 of 50)</th>
</tr>
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<tbody>
<tr>
<td><strong>Synopsis</strong></td>
</tr>
</tbody>
</table>
B737-800 pilot reported diverting with minimum fuel after PHX began experiencing dust storms and microbursts.

**ACN: 1567089 (25 of 50)**

**Synopsis**
CRJ-700 Captain reported an altitude deviation occurred on the STOCR2 RNAV OPD arrival to CLT. Reporter cited unfamiliarity with the procedure as contributing.

**ACN: 1567073 (26 of 50)**

**Synopsis**
CRJ-700 Captain reported an altitude overshoot and GPWS terrain warning on a visual approach to BHM.

**ACN: 1566752 (27 of 50)**

**Synopsis**
CRJ-200 Captain reported a low altitude alert after continuing to descend while extending final for traffic landing on crossing runway.

**ACN: 1566724 (28 of 50)**

**Synopsis**
B767 pilots reported an altitude deviation due to a malfunctioning autopilot.

**ACN: 1566515 (29 of 50)**

**Synopsis**
CRJ-700 Captain reported a NMAC in the vicinity of DSM.

**ACN: 1566345 (30 of 50)**

**Synopsis**
B737 Flight Crew reported the aircraft overshot the altitude restriction because the autopilot disconnected.

**ACN: 1566264 (31 of 50)**

**Synopsis**
EMB-145 Captain reported they got a low altitude alert from ATC during a visual approach to non-towered airport.

**ACN: 1565532 (32 of 50)**

**Synopsis**
AVP TRACON Controller reported an IFR aircraft with avionics trouble descending below the Minimum Vectoring Altitude.

**ACN: 1565394 (33 of 50)**

**Synopsis**
PC-12 pilot reported coming close to another aircraft while descending into an airport.

**ACN: 1565192 (34 of 50)**

**Synopsis**
B737-700 flight crew reported descending below charted altitude on the RNAV (RNP) Y arrival to Runway 8 at BUR. Lack of FMC mode awareness was cited as contributing.

**ACN: 1565146 (35 of 50)**

**Synopsis**
RV10 pilot reported an electrical failure that resulted in a return to the departure airport.

**ACN: 1565123 (36 of 50)**

**Synopsis**
PA28 pilot reported receiving low altitude alert from ATC while in downdraft, below approach altitude.

**ACN: 1565122 (37 of 50)**

**Synopsis**
CL604 flight crew reported altitude and course deviations resulted from an encounter with severe turbulence associated with thunderstorm activity.

**ACN: 1565033 (38 of 50)**

**Synopsis**
Air Carrier Captain reported responding to a RA, making evasive maneuver, while level at 10,000 ft.

**ACN: 1564928 (39 of 50)**

**Synopsis**
B737 Captain reported aircraft showed altitude discrepancy from that displayed by ATC. Pilot reports this anomaly is common at that particular airport.

**ACN: 1564107 (40 of 50)**

**Synopsis**
HUF controller reported a BE40 was issued the wrong approach, sent to the wrong fixes, and descended below the MVA while providing training.

**ACN: 1562809 (41 of 50)**

**Synopsis**
Denver Center Controller and corporate pilot reported a loss of separation due to communication error with pilot and ATC.

**ACN: 1562805 (42 of 50)**

**Synopsis**
TLH TRACON Controller reported an aircraft descending below the Minimum Vectoring Altitude (MVA).

**ACN: 1562774 (43 of 50)**

**Synopsis**
BE 35 pilot reported receiving a low altitude alert from ATC, after mistakenly descending to 7000 feet instead of ATC assigned 9000 feet.

**ACN: 1562764 (44 of 50)**

**Synopsis**
Beechcraft pilot reported an altitude excursion due to an autopilot malfunction.

**ACN: 1562635 (45 of 50)**

**Synopsis**
A320 First Officer reported returning to departure airport after a Flight Attendant was injured during a thunderstorm encounter.

**ACN: 1562489 (46 of 50)**

**Synopsis**
B737NG First Officer reported an altitude deviation resulted when the FMC was improperly set up for the RNAV (RN) Z approach to 34R in DEN. Reporter stated a last minute change to the clearance contributed to the event.

**ACN: 1562217 (47 of 50)**

**Synopsis**
Air carrier First Officer reported the Captain began a descent too early in a high terrain area.

**ACN: 1562196 (48 of 50)**
Synopsis
B747 Captain reported an altitude deviation following confusion regarding the ATC clearance.

ACN: 1561927 (49 of 50)

Synopsis
An instructor pilot reported observing the student descend too low on the approach when ATC issued a low altitude alert.

ACN: 1561873 (50 of 50)

Synopsis
PA28 flight instructor reported a NMAC with a Cessna on short final.
Report Narratives
ACN: 1574680 (1 of 50)

Time / Day
Date: 201808
Local Time Of Day: 1201-1800

Place
Locale Reference: Airport: DEN.Airport
State Reference: CO
Relative Position: Angle.Radial: 225
Relative Position: Distance.Nautical Miles: 2
Altitude.MSL.Single Value: 10800

Environment
Light: Daylight

Aircraft
Reference: X
ATC / Advisory.TRACON: D01
Aircraft Operator: Air Carrier
Make Model Name: B737-700
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 Approach
Airspace.Class B: DEN

Person
Reference: 1
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: Air Transport Pilot (ATP)
Qualification.Flight Crew: Multiengine
Experience.Flight Crew.Last 90 Days: 370
ASRS Report Number.Accession Number: 1574680
Human Factors: Situational Awareness
Human Factors: Distraction

Events
Anomaly.Deviation - Altitude: Overshoot
Anomaly.Deviation - Procedural: Clearance
Detected Person: Flight Crew  
When Detected: In-flight  
Result Flight Crew: Returned To Clearance  
Result Flight Crew: Became Reoriented

Assessments

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

Narrative: 1

Due to the weather in Denver, the last third of the flight was very busy as we were given holding twice, assigned different arrivals, and were coordinating with Dispatch for alternate planning. As we approached Denver, the weather cleared out and the Approach Controller initially told us to expect the Visual to Runway 16R. A few minutes later he offered us the RNAV (RNP) Z to Runway 16R. We accepted his offer and programmed and briefed the approach. We were in visual conditions with good visibility. While we were level at 13,000 FT, I re-cruised the FMC and then we were given a descent to 11,000 FT and cleared for the approach. I selected 11,000 FT and pushed the Altitude Intervention button and the aircraft would not descend. A scratch pad message popped up, but due to the close proximity of the fix, I quickly re-cruised the airplane for 11,000 and 210 kts and the airplane started descending at 1,000 feet per minute. The FMA stated LNAV and VNAV PATH and I selected 10,000 FT as it was the next lower altitude on the approach. I don't recall the VNAV PATH deviation scale appearing and the range to altitude green line was showing us high and missing our mandatory altitude of 11,000 FT at CLFFF intersection. Noticing this, I selected Vertical Speed in order to make the restriction, but I failed to reset the altitude in MCP to 11,000 FT for compliance at CLFFF. ATC had called out Company traffic passing from right to left 1,000 FT below us. We got the traffic in sight and ATC told us to maintain visual separation with the traffic. Locating the traffic got me distracted, and when I went to crosscheck my descent I noticed that we were at 11,000 FT and still descending. I immediately disconnected the autopilot in order to level off the aircraft and we descended approximately 260 FT below our assigned altitude. We were able to climb back up to 11,000 FT and meet our mandatory altitude assignment at CLFFF. ATC did not say anything and the rest of the approach was normal. Any time Vertical Speed is used, the altitude in the MCP needs to be crosschecked and reset if needed in order to be in compliance with altitude restrictions. This will protect the crew from any altitude deviations. Although looking for traffic is important, I should have let the Pilot Monitoring do that as I was busy trying to get the aircraft to comply with the altitude restriction. It was evident that I was not able to divide my attention at the time. I should have gotten the aircraft in order and then helped my Pilot Monitoring look for the traffic. Better division of time and attention would have been beneficial.

Synopsis

B737-700 First Officer reported overshooting an altitude restriction on the RNAV (RNP) Z approach to DEN Runway 16R. Lack of mode awareness was cited as contributing.
**Time / Day**

Date: 201808
Local Time Of Day: 0601-1200

**Place**

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

**Environment**

Light: Daylight

**Aircraft**

Reference: X
ATC / Advisory.TRACON: SCT
Aircraft Operator: Air Carrier
Make Model Name: B737-700
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 Approach
Airspace.Class C: SNA

**Person: 1**

Reference: 1
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: Air Transport Pilot (ATP)
Qualification.Flight Crew: Instrument
Experience.Flight Crew.Last 90 Days: 175
Experience.Flight Crew.Type: 1900
ASRS Report Number.Accession Number: 1574675
Human Factors: Situational Awareness

**Person: 2**

Reference: 2
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.Last 90 Days : 357
ASRS Report Number.Accession Number : 1574727
Human Factors : Situational Awareness

Events

Anomaly.Deviation - Altitude : Undershoot
Anomaly.Deviation - Altitude : Crossing Restriction Not Met
Anomaly.Deviation - Procedural : Published Material / Policy
Anomaly.Deviation - Procedural : Clearance
Detector.Person : Flight Crew
Detector.Person : Air Traffic Control
When Detected : In-flight
Result.Flight Crew : Returned To Clearance
Result.Flight Crew : Became Reoriented
Result.Air Traffic Control : Issued New Clearance

Assessments

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

Narrative: 1

SNA RNP-Z to Runway 20R. The FMC was properly programmed and MCP panel [was] in LNAV/VNAV PATH. Upon crossing KLEVR at 5000 FT IAF, we set zeros in the altitude alerter. The aircraft did not descend to cross MNNIE at 4400 FT, next mandatory altitude. I noticed level flight and immediately selected Vertical Speed to try and meet MNNIE at 4400 feet. About the same time, SoCal Approach asked us if we were descending and flying the RNP-Z. The Pilot Monitoring (PM) said "yes" but asked if we could be cleared the Visual Approach to try and mitigate any problems. SoCal said "no problem" and gave us a "heading of 030 and descend to 3000 FT, call the field in sight." As Pilot Flying (PF), the field was on my side and we had it in sight and called - in sight. At that point we were cleared for the visual and told to contact SNA Tower. The rest of the approach and landing were uneventful and we landed safely on 20R. With short distances between waypoints and mandatory descending altitude restrictions, pilots should be quicker to notice any anomaly and react quickly to stay in/on VNAV PATH even if aircraft does not do it automatically.

Narrative: 2

We were cleared for the RNP RNAV Z 20R Approach and level at 5000 feet. We were in visual conditions, and just using the approach for ease of use. We had zeros set after the initial approach fix and in LNAV/VNAV PATH. After crossing KLEVR, the aircraft did not descend. We noticed it quickly, and the Pilot Flying intervened by using Vertical Speed to catch the profile. Very shortly after we began to intervene, ATC asked us if we were doing the RNP Z Approach. I told him we were, but the aircraft wasn't doing what we were wanting or expecting it to do, and I asked if he could vector us for the visual approach. He gave us a heading and altitude to fly. He asked if we had the airport, which we did, and he cleared us for the visual. We landed without incident. In the future, I need to monitor more closely, and not let the good weather lull me into complacency. If we're cleared for an approach, I will monitor it better.

Synopsis
B737-700 flight crew reported failing to make a crossing restriction on the RNP-Z Runway 20R approach to SNA.
ACN: 1574614 (3 of 50)

Time / Day
Date: 201809
Local Time Of Day: 1201-1800

Place
Locale Reference.ATC Facility: ZFW.ARTCC
State Reference: TX
Altitude.MSL.Single Value: 11000

Environment
Weather Elements / Visibility: Thunderstorm
Weather Elements / Visibility: Windshear
Weather Elements / Visibility: Turbulence
Weather Elements / Visibility.Visibility: 10
Light: Daylight
Ceiling.Single Value: 4000

Aircraft
Reference: X
ATC / Advisory.Center: ZFW
Aircraft Operator: Personal
Make Model Name: Bonanza 35
Crew Size.Number Of Crew: 1
Operating Under FAR Part: Part 91
Flight Plan: IFR
Mission: Personal
Flight Phase: Cruise
Route In Use: Direct
Route In Use.STAR: GREGS8
Airspace.Class E: ZFW

Component
Aircraft Component: Safety Instrumentation & Information
Aircraft Reference: X
Problem: Malfunctioning

Person
Reference: 1
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: Flight Instructor
Qualification.Flight Crew: Commercial
Qualification.Flight Crew: Multiengine
Qualification.Flight Crew: Instrument
Experience.Flight Crew.Total: 6500
Experience.Flight Crew.Last 90 Days: 21
Experience. Flight Crew. Type: 3160
ASRS Report Number. Accession Number: 1574614
Human Factors: Communication Breakdown
Communication Breakdown. Party1: Flight Crew
Communication Breakdown. Party2: ATC
Analyst Callback: Completed

Events
Anomaly. Deviation - Altitude: Excursion From Assigned Altitude
Anomaly. Deviation - Procedural: Published Material / Policy
Anomaly. Deviation - Procedural: Clearance
Anomaly. Inflight Event / Encounter: Weather / Turbulence
Detector. Person: Flight Crew
When Detected: In-flight
Result. Flight Crew: Took Evasive Action
Result. Flight Crew: Returned To Clearance
Result. Flight Crew: Requested ATC Assistance / Clarification
Result. Air Traffic Control: Issued New Clearance

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

Narrative: 1

After deviation for a growing TRW (thunderstorm) around BRK VOR Denver Center had cleared me direct to destination TKI. When entering FTW Center airspace they cleared me direct to GREGS intersection for the GREGS8 arrival. Approximately 100 NM northwest of GREGS second Controller noted moderate rain on my route of flight to which I replied there wasn't any visual or datalink indication of any rain at that time. Controller said the next controller would have more information. I asked that controller if I could proceed direct to TKI as that would take me east of the buildup area and was told, "no I cannot approve that request."

Approaching the area described it appeared that tops were about 15,000' so I wasn't too worried as I was VFR at the time with scattered clouds below. Approximately 40 miles northwest of GREGS next Controller's transmissions were barely readable to me and I told him so but he was so busy with airline traffic diverting to avoid buildups by that time he didn't respond or if he did I couldn't hear him. It appeared the tops were probably about 20,000' but my datalink XM weather showed no rain or lightning and my storm scope showed no lightning in the area but by now I am flying through the area of buildups.

I contacted the controller and asked for deviations to the left of course which he approved and gave me direct to GREGS when able. As I made about a 15 degree to the left to miss a buildup and then started a turn even further the left it appeared I was going to be in cloud in a few seconds and decided to turn off the altitude hold and pitch on the autopilot to hand fly the aircraft and seconds later although still clear of clouds I noted my altitude was about 11,350'. When I pushed the nose down while pulling the power back to 15 in. of MP (Manifold Pressure) [it took some time] to get back to 11,000' because of the thermal I was in.
Shortly thereafter controller cleared me to 7000' and offered a heading of 090 to stay totally clear of the area but by that time I was through the first line of buildups and was able to proceed direct to GREGS. That was about the time the first indication of rain showed up on the XM display. During this whole process the update time on the XM receiver showed an update time of 3 minutes. Since I've been flying for over 50 years and have a lot cross country time I have experienced very rapid buildups of thermal activity before but this was one of the quickest I've seen. I think my decision to turn off the autopilot was a good one but if I could have been able to contact the controller to ask for a 1000' block altitude would have kept me from deviating the 300' rule.

I felt really sorry for the controller involved because there was no way for him to receive all the calls he was getting from the all the pilots and from some of their conversations when they did reach him it was apparent they had made deviations on their own and then checked in with the controller telling him what they had done - all a pretty scary situation. Shortly after being cleared to 6000' and being mostly in the clear on my way to GREGS I noted the controller was offering to vector aircraft on the north side of the line directly to the east as he had offered to me. I'm sure by that time the line had filled in with no gaps and most pilots probably took the offer. I feel that rather than trying to keep aircraft on the arrival route it would have been much better to vector the traffic off the arrival route to a point in space where they could be turned back towards their destination than put everyone through the rapidly building storm. If the Controller I had asked for a deviation direct to TKI had allowed that request it would have been one less aircraft to be in the mix for the last Center Controller.

**Synopsis**

BE35 pilot reported encountering thunderstorms enroute that were not displayed in a timely manner on his XM weather datalink.
**ACN: 1574150 (4 of 50)**

**Time / Day**
- Date: 201809
- Local Time Of Day: 1201-1800

**Place**
- Locale Reference.Airport: MSP.Airport
- State Reference: MN
- Altitude.AGL.Single Value: 1000

**Environment**
- Flight Conditions: VMC
- Weather Elements / Visibility: Haze / Smoke
- Light: Daylight

**Aircraft**
- Reference: X
- ATC / Advisory.TRACON: M98
- Aircraft Operator: Air Carrier
- Make Model Name: Regional Jet CL65, Undifferentiated or Other Model
- 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 B: MSP

**Person**
- Reference: 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
- ASRS Report Number.Accession Number: 1574150
- Human Factors: Distraction
- Human Factors: Workload
- Human Factors: Time Pressure

**Events**
- Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
- Anomaly.Deviation - Procedural: Published Material / Policy
- Anomaly.Inflight Event / Encounter: Unstabilized Approach
- Anomaly.Inflight Event / Encounter: CFTT / CFIT
- Detector.Person: Flight Crew
- Detector.Person: Air Traffic Control
- When Detected: In-flight
- Result.Flight Crew: FLC complied w / Automation / Advisory
Result: Flight Crew: Became Reoriented
Result: Air Traffic Control: Issued Advisory / Alert

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

Narrative: 1
Pilot Flying (PF) descended below the glideslope due to multiple changes from ATC. It was a visual approach and when the Pilot Monitoring (PM) realized we were below the glideslope opted to maintain current altitude until intercepting the glideslope again. ATC called a low altitude alert, but the approach was continued. The aircraft landed without event. ATC changed our arrival below FL180 increasing the workload for the PM. It was a hazy day so visibility was limited. ATC was expecting us to call a visual but the PF was unable to identify the airport. ATC originally had given us direct to a fix, but since we had not called the airport in sight gave us a heading to intercept the ILS and cleared us for the ILS. PF began getting behind the automation but started calling for the flaps at the appropriate time. We were still in white needles to intercept the fix (contrary to our clearance) but the PF found the airport and we were cleared for a visual approach. PF felt behind and pulled the spoilers to slow the aircraft when flaps could have been put in. PF called for gear down prior to flaps 20 and was reminded by PM. While configuring the PF dialed a lower altitude prior to intercepting the FAF. Flaps were called on schedule. When calling for flaps 45 it was discovered by the PF that the spoilers were still out. This was corrected. Upon reaching flaps 45 the PM realized they were descending below the glideslope (full scale). The descent was arrested 1000 ft above field elevation. PM stated to no longer descend. PF opted to re-intercept the GS from our current altitude. ATC stated altitude alert, and we responded we were correcting. The approach was continued though the approach was unstabilized (due to glideslope full scale and below 1000ft). Conditions were visual and no obstacles were anticipated during the approach. The aircraft was never below 800ft AGL prior to re-intercepting the GS. The AC was landed without event.

Switching to green needles (as ATC had originally cleared us) could have mitigated a lot of the errors that came from this event. Better PM skill and scan could have prevented getting too low. A go around upon realization of error.

Synopsis
CRJ Captain reported a low altitude alert from ATC while on approach to MSP.
ACN: 1573867

Time / Day
Date: 201808
Local Time Of Day: 0601-1200

Place
Locale Reference.Airport: ZZZ.Airport
State Reference: US
Altitude.MSL.Single Value: 10000

Environment
Light: Daylight

Aircraft
Reference: X
ATC / Advisory.TRACON: 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
Nav In Use: FMS Or FMC
Flight Phase: Descent
Route In Use.STAR: ZZZ
Airspace.Class B: ZZZ

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

Person : 1
Reference: 1
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: Multiengine
Qualification.Flight Crew: Air Transport Pilot (ATP)
Qualification.Flight Crew: Instrument
Experience.Flight Crew.Last 90 Days: 217
Experience.Flight Crew.Type: 9000
ASRS Report Number.Accession Number: 1573867
Human Factors: Situational Awareness
Human Factors: Workload

Person : 2
Reference: 2
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
Experience.Flight Crew.Last 90 Days: 498
ASRS Report Number/Accession Number: 1573876
Human Factors: Situational Awareness

Events
Anomaly.Aircraft Equipment Problem: Less Severe
Anomaly.Deviation - Altitude: Overshoot
Anomaly.Deviation - Altitude: Crossing Restriction Not Met
Anomaly.Deviation - Speed: All Types
Anomaly.Deviation - Procedural: Clearance
Detector.Person: Air Traffic Control
Were Passengers Involved In Event: N
When Detected: In-flight
Result.General: None Reported / Taken

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

Narrative: 1
Cleared to descend via the RNAV Arrival, we descended from cruise in LNAV/VNAV PATH. Just below 10,000 ft. MSL, we were informed that we had missed [a] restriction and noticed that we were fast, and the speed window was open. As hard to believe as this may sound, we did not do anything to change the mode out of LNAV/VNAV PATH. We were busy in the descent with radio calls, making sure we alerted the flight attendants at 10,000 ft., etc, and failed to monitor the automation, assuming that we were protected. I don't know if there's a way that the coding of the FMC software or some other thing could allow this, but we were perplexed.

Look into whether this has happened with other aircraft, and obviously we need to monitor to make sure the aircraft does what it is supposed to do!

Narrative: 2
Cleared to descend via Arrival for Runway XXL. Captain selected ALT INT to start descent early due to light chop at current altitude. Nearing [the] waypoint, I reviewed STAR/approach plates and FMC LEGS page approach points to confirm points since I was expecting a further approach clearance by now or very soon. I briefly glanced at the altimeter in time for the 1000 ft. prior call then went back to look at the plates. I did not scan aircraft position in relation to the arrival. Leveling at bottom of descent at 9000 ft., Approach Control queried if crew was given a different clearance other than a via clearance. We then realized the crossing restriction was not met and at some point the speed window became open. At no time did I see the Captain select another MCP (Mode
Control Panel) vertical mode.

Ensuring continuous monitoring of the aircraft on the arrival. Don't become distracted too long on reviewing [Approach] plates and FMC LEGS page. After a long uneventful leg, don't be a victim of automation expectation bias and complacency.

Synopsis

B737-800 flight crew reported missing a crossing restriction on descent when an FMC mode change out of LNAV/VNAV PATH was not noticed.
ACN: 1573325  (6 of 50)

Time / Day
Date: 201808
Local Time Of Day: 1201-1800

Place
Locale Reference.Airport: ZZZ.Airport
State Reference: US
Altitude.AGL.Single Value: 8000

Environment
Flight Conditions: VMC

Aircraft
Reference: X
ATC / Advisory.Tower: ZZZ
Aircraft Operator: Air Carrier
Make Model Name: Regional Jet 200 ER/LR (CRJ200)
Crew Size.Number Of Crew: 2
Operating Under FAR Part: Part 121
Flight Plan: IFR
Mission: Passenger
Flight Phase: Initial Approach
Airspace.Class D: ZZZ

Person
Reference: 1
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: Instrument
Qualification.Flight Crew: Multiengine
ASRS Report Number.Accession Number: 1573325
Human Factors: Workload

Events
Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
Anomaly.Deviation - Procedural: Published Material / Policy
Anomaly.Inflight Event / Encounter: CFTT / CFIT
Detector.Automation: Aircraft Terrain Warning
Detector.Person: Flight Crew
Detector.Person: Air Traffic Control
When Detected: In-flight
Result.Flight Crew: Became Reoriented
Result.Air Traffic Control: Issued Advisory / Alert

Assessments
Narrative: 1

While flying the [approach, the] aircraft descended to approximately 800 AGL during visual approach prior to the final segment. Following descent clearance and subsequent clearance to fly the [approach], and on the offshore segment of the approach, tower instructed us to "square off" the turn to final for traffic in the pattern. Additional traffic was called to our 3 o'clock position. At this time I confirmed the instructions to the CA (Captain) (Pilot Flying) and immediately began a visual scan for the traffic. I glanced back to the PFD and called "You're at 1,250 feet," to call attention to the CA that we were getting low for our distance from the airport. I went back outside the aircraft momentarily to scan for the called traffic. Next time I looked inside we were at 800 feet AGL. I immediately called the deviation to the CA, saying, "check altitude - 800 feet." As the CA corrected immediately tower called, "Low altitude alert, 700 feet." The CA regained altitude to approximately 1,200 AGL prior to commencing final descent to the airport. The flight continued without further incident.

The CA had disconnected the AP during the initial descent phase of the visual approach. During the descent, the CA was sequencing waypoints manually on the FMS, including programming and cleaning up the approach. Throughout the flying day, the CA was very hands on and performing several PM (Pilot Monitoring) tasks while he was PF (Pilot Flying). I feel that should SOPs regarding PF/PM duties had been adhered to during the flight the likelihood of the incident occurring would have been significantly reduced. I also feel that disconnecting the autopilot and hand-flying the approach would not have been a bad thing in itself should PF/PM duties had been followed. The CA hand-flying a visual approach while being heads-down into the FMS contributed to the lack of attention to altitude. The adjustment of the approach per ATC instructions was a contributing factor. The additional traffic called by tower (but not depicted on TCAS) at our 3 o'clock (which was in the direction of our turn back to the airport) took my attention as PM from monitoring flight data to an outside visual scan for traffic.

Reinforcement of CRM during critical phases of flight. Reinforcement that hand-flying the aircraft requires complete attention to flight instruments by the PF.

Synopsis

CRJ First Officer reported the Captain descended early on a visual approach and failed to follow SOP's on several occasions.
ACN: 1573217

Time / Day
Date: 201808
Local Time Of Day: 1801-2400

Place
Locale Reference: Airport: MDW.Airport
State Reference: IL
Altitude.MSL.Single Value: 11000

Environment
Flight Conditions: IMC
Weather Elements / Visibility: Turbulence
Light: Night

Aircraft
Reference: X
ATC / Advisory: TRACON: C90
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: Descent
Airspace.Class E: C90

Person: 1
Reference: 1
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.Last 90 Days: 342
ASRS Report Number: Accession Number: 1573217

Person: 2
Reference: 2
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: Instrument
Events
Anomaly.Deviation - Altitude : Excursion From Assigned Altitude
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation - Procedural : Clearance
Anomaly.Inflight Event / Encounter : Weather / Turbulence
Detector.Automation : Aircraft Other Automation
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Took Evasive Action
Result.Flight Crew : Returned To Clearance
Result.Flight Crew : Regained Aircraft Control

Assessments
Contributing Factors / Situations : Weather
Primary Problem : Weather

Narrative: 1
Aircraft encountered severe turbulence over PNT VOR while in the turn to JOT VOR. The aircraft banked 45 degrees due to turbulence, Bank Angle Warning sounded and autopilot disengaged. The aircraft lost 200 feet to 500 feet of altitude, and heading was 30 degrees off course to avoid additional turbulence. ATC was notified of event and further instructions were to fly direct CADON when able. [The] rest of [the] flight was uneventful.

I could see the frontal system ahead of us on radar and it appeared we would stay clear of weather over PNT. Ten miles prior, I queried the First Officer to ask for 20 degrees right. The First Officer was unable to get a clearance due to heavy radio congestion. We stayed on vector and subsequently encountered the turbulence. I should have used my emergency authority to begin the turn prior to ATC clearance but due to compressed vectors in and out of weather, I wasn’t quick enough to react to the situation.

Narrative: 2
[Report narrative contained no additional information.]

Synopsis
Air carrier flight crew reported an encounter with severe turbulence.
ACN: 1572695 (8 of 50)

Time / Day
Date : 201808
Local Time Of Day : 1201-1800

Place
Locale Reference.Airport : EWR.Airport
State Reference : NJ
Altitude.MSL.Single Value : 3300

Environment
Flight Conditions : VMC

Aircraft
Reference : X
ATC / Advisory.TRACON : N90
Aircraft Operator : Air Carrier
Make Model Name : B737 Undifferentiated or Other Model
Crew Size.Number Of Crew : 2
Operating Under FAR Part : Part 121
Flight Plan : IFR
Nav In Use.Localizer/Glideslope/ILS : Runway 22L
Flight Phase : Final Approach
Route In Use : Vectors
Airspace.Class B : EWR

Person : 1
Reference : 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 : Multiengine
Qualification.Flight Crew : Instrument
Experience.Flight Crew.Type : 2683
ASRS Report Number.Accession Number : 1572695

Person : 2
Reference : 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 : Air Transport Pilot (ATP)
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Instrument
Experience.Flight Crew.Total : 2079
ASRS Report Number.Accession Number : 1572702

Events
Anomaly.Conflict : Airborne Conflict
Anomaly.Deviation - Altitude : Excursion From Assigned Altitude
Anomaly.Deviation - Procedural : Clearance
Detector.Automation : Aircraft RA
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Took Evasive Action

Assessments
Contributing Factors / Situations : Airspace Structure
Primary Problem : Airspace Structure

Narrative: 1
While being vectored to ILS 22L at EWR and descending to 3,000, we first received a TCAS TA quickly followed by an RA to level off. I spotted traffic visually, a single engine high wing aircraft traveling northbound along the final approach course. The FO (First Officer) reacted properly to the RA and soon after we got a clear of conflict. I reported the TCAS RA to ATC. The remainder of the approach and landing proceeded without incident.

Narrative: 2
On approach to EWR turning onto localizer for 22L and descending over TEB we received a traffic warning quickly followed by an RA to level off. I was flying and immediately disconnected the autopilot and followed the RA instructions. The Captain looked for the aircraft, a small Cessna, and saw it climbing over TEB toward us. I did not see it myself. We were clear of the conflict in a few seconds and continued the approach and landing. We got within approximately 300-400 feet from the other aircraft. The captain reported the RA to ATC and nothing was said back to us from them, we were soon sent to tower frequency.

Synopsis
B737 flight crew reported a TCAS RA with a small aircraft while on approach to EWR.
ACN: 1572507

Time / Day
Date: 201808
Local Time Of Day: 12:01-18:00

Place
Locale Reference.Airport: CLL.Airport
State Reference: TX
Relative Position.Distance.Nautical Miles: 8
Altitude.MSL.Single Value: 1400

Environment
Flight Conditions: VMC
Weather Elements / Visibility.Visibility: 12
Light: Daylight
Ceiling.Single Value: 6000

Aircraft
Reference: X
ATC / Advisory.TRACON: I90
Aircraft Operator: Personal
Make Model Name: Citation III, VI, VII (C650)
Operating Under FAR Part: Part 91
Flight Plan: VFR
Mission: Training
Nav In Use.VOR / VORTAC: CLL
Flight Phase: Initial Approach
Route In Use.Other
Airspace.Class D: I90

Person
Reference: 1
Location Of Person.Aircraft: X
Location In Aircraft: Flight Deck
Reporter Organization: Personal
Function.Flight Crew: First Officer
Function.Flight Crew: Pilot Flying
Qualification.Flight Crew: Multiengine
Qualification.Flight Crew: Instrument
Experience.Flight Crew.Total: 2300
Experience.Flight Crew.Last 90 Days: 40
Experience.Flight Crew.Type: 35
ASRS Report Number.Accession Number: 1572507
Human Factors: Training / Qualification
Human Factors: Confusion
Human Factors: Situational Awareness
Analyst Callback: Attempted

Events
Anomaly.ATC Issue : All Types
Anomaly.Deviation - Procedural : Published Material / Policy
Anomaly.Deviation - Procedural : Clearance
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Flight Crew : Became Reoriented

Assessments
Contributing Factors / Situations : Airspace Structure
Contributing Factors / Situations : Chart Or Publication
Contributing Factors / Situations : Procedure
Primary Problem : Chart Or Publication

Narrative: 1
The plate profile is confusing as it appears to direct a descent when established to cross the VOR at or above 1,300 feet and the plan view conflicts or is easily misread. The Controller [stated this] is a common mistake on this [VOR Runway 10] approach. The Controller indicated that this issue has been reported on numerous occasions.

Synopsis
Pilot reported a confusing depiction of a crossing restriction on the VOR Runway 10 approach plate for CLL airport.
Aircraft X was cleared for an ILS approach via the SABAT transition. The transition altitude all the way to the localizer is 11,500 feet. The pilot descended to 9,500 feet. I checked the approach plate to see if there was a descending altitude on the transition that I missed,
but I couldn't see one, so I queried the pilot about the procedure. He said I was correct, that the transition altitude remained at 11,500 feet. I gave the pilot a low altitude alert, then climbed him to the MIA [Minimum IFR Altitude] of 10,000 [feet] and vectored the aircraft onto the localizer.

Synopsis
Salt Lake ARTCC Controller reported an aircraft descending below a transition altitude by 2,000 feet.
ACN: 1571213 (11 of 50)

Time / Day
Date: 201808
Local Time Of Day: 0601-1200

Place
Locale Reference.ATC Facility: A90.TRACON
State Reference: NH
Altitude.MSL.Single Value: 12000

Environment
Flight Conditions: VMC
Light: Daylight

Aircraft: 1
Reference: X
ATC / Advisory.TRACON: A90
Aircraft Operator: Fractional
Make Model Name: Citation Excel (C560XL)
Crew Size.Number Of Crew: 2
Operating Under FAR Part: Part 91
Flight Plan: IFR
Nav In Use: FMS Or FMC
Flight Phase: Descent
Route In Use.STAR: ROBUC 3
Airspace.Class B: BOS

Aircraft: 2
Reference: Y
ATC / Advisory.TRACON: A90
Make Model Name: Any Unknown or Unlisted Aircraft Manufacturer
Crew Size.Number Of Crew: 1
Flight Phase: Final Approach
Flight Phase: Descent
Airspace.Class B: BOS

Person: 1
Reference: 1
Location Of Person.Aircraft: X
Location In Aircraft: Flight Deck
Reporter Organization: Fractional
Function.Flight Crew: Captain
Function.Flight Crew: Pilot Flying
Qualification.Flight Crew: Air Transport Pilot (ATP)
Qualification.Flight Crew: Instrument
Qualification.Flight Crew: Multiengine
ASRS Report Number.Accession Number: 1571213
Human Factors: Communication Breakdown
Human Factors: Distraction
Human Factors: Situational Awareness
Communication Breakdown. Party 1: Flight Crew
Communication Breakdown. Party 2: ATC
Analyst Callback: Attempted

Person: 2

Reference: 2
Location Of Person. Aircraft: X
Location In Aircraft: Flight Deck
Reporter Organization: Fractional
Function. Flight Crew: First Officer
Function. Flight Crew: Pilot Not Flying
Qualification. Flight Crew: Air Transport Pilot (ATP)
Qualification. Flight Crew: Multiengine
Qualification. Flight Crew: Instrument
ASRS Report Number. Accession Number: 1571215
Analyst Callback: Completed

Events

Anomaly. Deviation - Altitude: Undershoot
Anomaly. Deviation - Altitude: Crossing Restriction Not Met
Anomaly. Deviation - Procedural: Clearance
Anomaly. Inflight Event / Encounter: Wake Vortex Encounter
Detector. Person: Flight Crew
When Detected: In-flight
Result. General: None Reported / Taken

Assessments

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

Narrative: 1

On ROBUC3 STAR into Boston Logan, ATC gave late descend via instruction, FMS failed to
descend aircraft, we descended then in Vertical Speed mode to try and make PROVI
intersection at 11,000 feet. We were crossing at 12,000 feet when ATC issued a turn and a
lower altitude. Complicating the situation was a wake turbulence encounter and frequency
saturation.

We did our best under the circumstances. In the future I will manually descend when well
inside the STAR and issued a late descend via clearance.

Narrative: 2

On arrival into Boston Logan during the Captain's approach briefing I was given a descent
via the Robuc3 arrival. During the descent I encountered significant wake turbulence. I
immediately disconnected the autopilot and informed the Captain of the situation. After
the aircraft was stabilized we transferred controls but due to the disruption we were
unable to make the next crossing restriction at PROVI. We were approximately 1000 feet
above the altitude. The controller issued instructions for a vector off of the arrival, we
complied and the flight continued without event.

Synopsis
CE-560XL flight crew reported failing to make a crossing restriction on descent into BOS, citing a late clearance and a wake turbulence encounter.
ACN: 1570966 (12 of 50)

Time / Day
Date: 201808
Local Time Of Day: 1801-2400

Place
Locale Reference.Airport: EWR.Airport
State Reference: NJ
Altitude.AGL.Single Value: 2500

Aircraft: 1
Reference: X
ATC / Advisory.TRACON: N90
Aircraft Operator: Air Carrier
Make Model Name: Embraer Jet Undifferentiated or Other Model
Crew Size.Number Of Crew: 2
Operating Under FAR Part: Part 121
Flight Plan: IFR
Mission: Passenger
Flight Phase: Initial Approach
Airspace.Class B: EWR

Aircraft: 2
Reference: Y
ATC / Advisory.TRACON: N90
Make Model Name: Commercial Fixed Wing
Flight Phase: Landing
Airspace.Class B: EWR

Person
Reference: 1
Location Of Person.Aircraft: X
Location In Aircraft: Flight Deck
Reporter Organization: Air Carrier
Function.Flight Crew: First Officer
Qualification.Flight Crew: Multiengine
Qualification.Flight Crew: Instrument
ASRS Report Number.Accession Number: 1570966
Human Factors: Situational Awareness
Analyst Callback: Attempted

Events
Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
Anomaly.Inflight Event / Encounter: Wake Vortex Encounter
Detector.Person: Flight Crew
When Detected: In-flight
Result.Flight Crew: Returned To Clearance

Assessments
Narrative: 1

During approach we were base to final cleared for the ILS approach. We were between TEB and GIMEE at 2500 feet. We encountered what we believe to be wake turbulence. It started to roll the aircraft in one direction then immediately flipped to the other. It was strong enough to disengage the autopilot. While we were recovering the aircraft attitude we dipped down to about 2300 feet MSL. While recovering we informed ATC of the wake and that we could continue visually. We were simultaneously intercepting the localizer, glideslope, and dealing with the upset. We may have dipped below glideslope. After the corrections were made we were able to continue the approach without further issues.

Synopsis

Embraer Regional Jet First Officer reported an altitude deviation occurred when they encountered wake turbulence in the landing pattern at EWR.
**ACN: 1570795 (13 of 50)**

**Time / Day**

Date : 201808

**Place**

Locale Reference : ATC Facility : D01.TRACON
State Reference : CO
Altitude : MSL : Single Value : 9000

**Aircraft**

Reference : X
ATC / Advisory : TRACON : D01
Aircraft Operator : Air Carrier
Make Model Name : B757 Undifferentiated or Other Model
Operating Under FAR Part : Part 121
Flight Plan : IFR
Nav In Use : FMS Or FMC
Flight Phase : Descent
Route In Use : STAR : ANCHR
Airspace.Class E : D01

**Person**

Reference : 1
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)
ASRS Report Number : Accession Number : 1570795
Human Factors : Human-Machine Interface
Human Factors : Training / Qualification

**Events**

Anomaly.Deviation - Altitude : Undershoot
Anomaly.Deviation - Altitude : Crossing Restriction Not Met
Anomaly.Deviation - Procedural : Published Material / Policy
Anomaly.Deviation - Procedural : Clearance
Detector.Person : Observer
Detector.Person : Flight Crew
When Detected : In-flight
Result : Flight Crew : Requested ATC Assistance / Clarification
Result : Flight Crew : FLC Overrode Automation
Result : Flight Crew : Became Reoriented
Result : Air Traffic Control : Provided Assistance

**Assessments**

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

**Narrative: 1**
We were reassigned to the ANCHR 4 RNAV arrival and confirmed that all fixes, altitudes, and speed restrictions were correctly depicted on the CDU. We also loaded the ILS to 35L and selected the BOSSS transition for situational awareness purposes. At approximately 14000 feet, the FAA inspector who was observing from the jumpseat, alerted us that we were not going to make the DOGGG restrictions and we noticed that its altitude and speed restriction were deleted in the CDU, after we confirmed that they were there when we initially loaded the ANCHR 4. The First Officer (FO) informed ATC that we would not make the restrictions and we were re-cleared to 9000 feet with speed at our discretion. I told the FAA inspector that we had the same issue on a previous flight and did not know why it was involuntarily deleted after confirming that it was properly loaded. During the debrief, the FAA inspector realized what caused this and we believe that this should be brought to the attention to all pilots. He told us that by selecting the BOSSS transition, where BOSSS is to be crossed at a higher altitude, took precedence over DOGGG. DOGGG on the RNAV arrival is to be crossed at 210kts and at 11000 feet. On the ILS 35L approach plate, BOSSS is to be crossed at 210kts but at 12000 feet. We had a similar scenario on [a following] flight. Although we selected the PURRL transition for ILS 35R. However, PURRL is to be crossed at 9000 feet, which is lower than DOGGG but nonetheless DOGGG's restrictions were deleted. While the approach transitions are very useful for situational awareness, they caused us to have a possible altitude and speed deviation and we recommend that this be disseminated for safety reasons.

Synopsis

A 757 Captain reported that a crossing restriction on the arrival was not meet and the deviation was pointed out to the crew by the FAA Inspector on the observer's seat.
Time / Day
Date: 201808
Local Time Of Day: 0601-1200

Place
Locale Reference: ATC Facility: ZBW.ARTCC
State Reference: NH
Altitude: MSL: Single Value: 23200

Environment
Flight Conditions: IMC
Light: Daylight

Aircraft
Reference: X
ATC / Advisory Center: ZBW
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
Nav In Use: FMS Or FMC
Nav In Use: GPS
Flight Phase: Descent
Route In Use: STAR: JFUND 2
Airspace: Class A: ZBW

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

Person: 1
Reference: 1
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: Air Transport Pilot (ATP)
Qualification: Flight Crew: Instrument
ASRS Report Number: Accession Number: 1570097
Human Factors: Fatigue
Human Factors: Human-Machine Interface
Human Factors: Confusion
Person : 2
Reference : 2
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 : Instrument
Qualification.Flight Crew : Multiengine
Qualification.Flight Crew : Air Transport Pilot (ATP)
Experience.Flight Crew.Total : 15000
ASRS Report Number.Accession Number : 1570102
Human Factors : Distraction
Human Factors : Confusion
Human Factors : Fatigue

Events
Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Altitude : Overshoot
Anomaly.Deviation - Procedural : Clearance
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Became Reoriented
Result.Flight Crew : Returned To Clearance

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

Narrative: 1
I was Pilot Flying. We were assigned to descend via the JFUND2/Runway 04R transition. We had separately confirmed all constraints in the FMC, and I had briefed the arrival. We had left FL270 prior to the first altitude restriction using managed descent. The first constraint was at or above FL240 at MNSTA. We were in both managed airspeed and managed vertical path. I was reviewing the taxi plan and gate information when we noticed the aircraft had descended below FL240 about 800 feet prior to the fix. I immediately selected VS (Vertical Speed) and then initiated a short climb to FL240. We continued to used managed descent and the aircraft met all [other] constraints.

I have no idea why the aircraft did not perform as expected and desired. This was the way we were trained to fly the Airbus. We were tired and that could have contributed to the problem. Pilots should be trained not to trust the managed descent mode or not use it.

Narrative: 2
I'm aware of some of the weaknesses of the A320 [series] aircraft in managed descent, but I had never seen this happen. However, pilots I've flown with who have much more time on it than I have warned me of this potential. When we left FL270 "ALT CNST" was armed, and we both fully expected the aircraft to honor the FL240 restriction. I do not understand why it did not, but I know why I missed it. Divided attention, combined with fatigue at the end of a trip, and the timing of a frequency change took us both a step
further out of the loop of careful monitoring. We both caught it quickly, and the rest of the arrival the managed descent mode behaved as expected, so it did not appear to be a maintenance problem.

A more careful selection of the time for me to check back for write-ups, while we were still level, would have most likely avoided this problem. Divided attention, especially when tired and already a little slower, created the situation where my monitoring was not up to the requirements. As for the aircraft/PF (pilot flying) interface, I've seen the technique of using VS (Vertical Speed) and setting each individual altitude for at or above restrictions, but that is not the primary method taught on this fleet. I'm still unsure of the technical part of why the aircraft continued below the restriction.

**Synopsis**

A321 flight crew reported the aircraft failed to honor a properly programmed altitude constraint on descent in managed speed and managed vertical path mode.
ACN: 1570088 (15 of 50)

Time / Day
Date: 201808
Local Time Of Day: 1201-1800

Place
Locale Reference. ATC Facility: SCT.TRACON
State Reference: CA
Altitude. MSL. Single Value: 15700

Environment
Light: Daylight

Aircraft
Reference: X
ATC / Advisory. TRACON: SCT
Aircraft Operator: Air Carrier
Make Model Name: A321
Crew Size. Number Of Crew: 2
Flight Plan: IFR
Mission: Passenger
Nav In Use: FMS Or FMC
Flight Phase: Descent
Airspace. Class E: SCT

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

Person
Reference: 1
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: Air Transport Pilot (ATP)
Qualification. Flight Crew: Multiengine
ASRS Report Number. Accession Number: 1570088
Human Factors: Human-Machine Interface
Human Factors: Situational Awareness
Human Factors: Confusion

Events
Anomaly. Aircraft Equipment Problem: Less Severe
Anomaly. Deviation - Altitude: Overshoot
Anomaly.Deviation - Procedural : Published Material / Policy
Anomaly.Deviation - 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 : Human Factors
Primary Problem : Ambiguous

Narrative: 1

During arrival preparation both the Captain and I checked all the crossing altitudes to be correct and verified that there was no discrepancy on predicted flight path. When issued descend via clearance, I put in 4,300 feet. At top of descent I started down. As we approached [the] waypoint I saw that the aircraft was going to fly below the required altitude and immediately hit ALT Hold to stop the descent. Even though the FMC (Flight Management Computer) had the correct altitudes in, AND the PATH showed we would cross in the required altitude window, the aircraft was diving low. ALL was done correctly and the FMA (Flight Mode Annunciator) windows indicated all was correct, the aircraft was doing its own thing. This arrival descends through high rocky terrain. Had this threat not been trapped, a GPWS event was a real possibility. Even though I hit ALT HOLD as soon as I saw what was going to happen, we still went approximately 300 feet low on the crossing window.

Teach aircrews to never trust the Airbus programming and maintain constant vigilance.
Even though I am very comfortable on the Airbus this was a new one on me.

Synopsis

A321 First Officer reported that even though the FMS was correctly programmed the aircraft descended below the entered altitude.
**ACN: 1569446 (16 of 50)**

**Time / Day**
- Date: 201808
- Local Time Of Day: 0601-1200

**Place**
- Locale Reference
- ATC Facility: ZZZ.ARTCC
- State Reference: US
- Altitude.MSL.Single Value: 14400

**Environment**
- Flight Conditions: VMC
- Light: Daylight

**Aircraft**
- Reference: X
- ATC / Advisory.Center: ZZZ
- Make Model Name: Falcon 2000
- Crew Size.Number Of Crew: 2
- Flight Plan: IFR
- Mission: Ferry
- Nav In Use: FMS Or FMC
- Flight Phase: Descent
- Airspace.Class E: ZZZ

**Component**
- Aircraft Component: Altitude Hold/Capture
- Aircraft Reference: X
- Problem: Malfunctioning

**Person: 1**
- Reference: 1
- Location Of Person.Aircraft: X
- Location In Aircraft: Flight Deck
- 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: 1569446
- Human Factors: Situational Awareness

**Person: 2**
- Reference: 2
- Location Of Person.Aircraft: X
- Location In Aircraft: Flight Deck
- Function.Flight Crew: Pilot Not Flying
- Function.Flight Crew: Captain
- Qualification.Flight Crew: Air Transport Pilot (ATP)
Events
Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Altitude : Crossing Restriction Not Met
Anomaly.Deviation - Altitude : Overshoot
Anomaly.Deviation - Procedural : Published Material / Policy
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : FLC Overrode Automation
Result.Flight Crew : Became Reoriented
Result.Air Traffic Control : Issued Advisory / Alert

Assessments
Contributing Factors / Situations : Aircraft
Contributing Factors / Situations : Airspace Structure
Primary Problem : Aircraft

Narrative: 1
Enroute to ZZZ. Was level at 16000 ft and direct to ZZZZZ when event started. ATC cleared us to descend via ZZZZZ1 arrival. I identified [the] lowest altitude 9000 ft at ZZZZZ2. Dialed in 9000 ft and engaged VNAV.

The descent cue came down shortly and autopilot captured VNAV and started its descent. Everything looked normal to me. Crossing altitude at ZZZZZ is 15000 ft. And we had the pink 15000 displayed on PFD (Primary Flight Display) as a restriction. However we crossed below 15000 ft prior to ZZZZZ without me noticing. The PIC called out STOP. By the time I realized what was happening we were 700-800 feet low. I disconnected the autopilot and corrected back to 15000 ft. ATC told us to check our altitude the Minimum Vector Altitude he said was 14400 ft. Rest of flight was uneventful.

I have flown the Falcon for years. I feel totally comfortable with using the VNAV function. I have never seen the autopilot do this before. During our debrief of the event we agreed everything was set up correctly and we had the right indications. However I know my faith in the automation caused me to let my guard down. I should have caught the descent below 15000 ft immediately. This was completely my mistake. The PIC was off getting the latest ATIS as I set it up.

Narrative: 2
We were on ZZZZZ1 arrival. We were at 17000 feet and were asked to descend to 16000 feet overhead traffic. While we were descending we were cleared to descend via arrival. I went off #1 radio to pick up ATIS on #2. I advised PF (pilot flying) of such and it was acknowledged. Once I came back on radio #1 I saw altitude lower than crossing restriction over ZZZZZ intersection. VNAV was active but didn't stop descent below restriction. As we corrected, ATC called low altitude alert. We corrected and nothing else was said.

Synopsis
Falcon 2000 flight crew reported that during descent the autopilot failed to capture the preselected altitude.
Aircraft X was inbound from the southeast. He came over at 080 feet. The MVA he was in was 050 feet; however, it was dropping to 045 feet after 5 miles from his position at the
time of descent, and 6 miles from that it would drop to 030 feet. I gave Aircraft X a
descent to 040 feet in anticipation of him being past the 045 feet MVA by the time he was
at 045 feet. He descended faster than anticipated and when he reached 053 feet, I
amended his altitude to 045 feet to satisfy the MVA. He read back the altitude correctly
and stated that he may go a few hundred feet below while correcting. While the MVA was
045 feet, the aircraft descended to 042 feet, then climbed back to 045 feet. The aircraft
was shortly after cleared for a visual approach and landed without problem.

Synopsis

BGM Controller reported assigning a lower altitude resulting in an aircraft descending
below the MVA.
ACN: 1568845

Time / Day
Date: 201808
Local Time Of Day: 1201-1800

Place
Locale Reference.ATC Facility: PCT.TRACON
State Reference: VA
Altitude.MSL.Single Value: 6000

Environment
Flight Conditions: Marginal
Light: Daylight

Aircraft : 1
Reference: X
ATC / Advisory.TRACON: PCT
Aircraft Operator: Air Carrier
Make Model Name: EMB ERJ 145 ER/LR
Crew Size.Number Of Crew: 2
Operating Under FAR Part: Part 121
Flight Plan: IFR
Mission: Passenger
Flight Phase: Descent
Airspace.Class B: BWI

Aircraft : 2
Reference: Y
Make Model Name: Skyhawk 172/Cutlass 172
Crew Size.Number Of Crew: 1
Airspace.Class B: BWI

Person
Reference: 1
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: Instrument
Qualification.Flight Crew: Multiengine
Qualification.Flight Crew: Air Transport Pilot (ATP)
ASRS Report Number.Accession Number: 1568845
Human Factors: Situational Awareness

Events
Anomaly.Conflict: NMAC
Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
Detector.Automation: Aircraft TA
Detector.Automation : Aircraft RA
When Detected : In-flight
Result.Flight Crew : FLC complied w / Automation / Advisory
Result.Flight Crew : Took Evasive Action

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

Narrative: 1
While in the BWI terminal [area] at 6,000 feet MSL we received a TCAS TA (Traffic Advisory) followed quickly by an RA (Resolution Advisory) to descend. I disconnected the auto pilot and began a descent to comply with the RA. Meanwhile the PM (pilot monitoring) notified ATC of our RA descent. We spotted the traffic (C172), passing nearly overhead at approximately 400 feet above us. ATC advised us that the traffic was supposed to be at 6,500 feet and seemed unsure what the parameters were for RA activation. Once clear of the conflict we returned to our assigned altitude and the flight concluded without any further problems.

I believe we performed a correct TCAS RA procedure. However we discussed how quickly the TA became an RA in this scenario and how we must always be prepared to react.

Synopsis
EMB-145 Captain reported a NMAC in the vicinity of BWI airport.
ACN: 1568535

Time / Day
   Date: 201808
   Local Time Of Day: 1801-2400

Place
   Locale Reference: ATC Facility: ZTL.ARTCC
   State Reference: GA
   Altitude: MSL: Single Value: 22000

Environment
   Flight Conditions: VMC

Aircraft
   Reference: X
   ATC / Advisory: Center: ZTL
   Aircraft Operator: Air Carrier
   Make Model Name: A319
   Crew Size: Number Of Crew: 2
   Operating Under FAR Part: Part 121
   Flight Plan: IFR
   Mission: Passenger
   Nav In Use: FMS Or FMC
   Flight Phase: Descent
   Route In Use: STAR: CHSLY 3

Person
   Reference: 1
   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)
   Experience: Flight Crew: Total: 22000
   ASRS Report Number: Accession Number: 1568535
   Human Factors: Situational Awareness

Events
   Anomaly: Deviation - Altitude: Excursion From Assigned Altitude
   Anomaly: Deviation - Procedural: Published Material / Policy
   Anomaly: Deviation - Procedural: Clearance
   Detector: Person: Flight Crew
   When Detected: In-flight
   Result: Flight Crew: Became Reoriented

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

**Narrative: 1**

Filed cruise [altitude was] FL240. Just north of BURRZ intersection, cleared to descend via CHSLY3 Arrival. Set and confirmed bottom altitude of 6,000 feet. Activated managed flight on FMCG. Aircraft began descending. At approximately FL230, First Officer pointed out that crossing altitude at BURRZ was to be FL240 and that descent should not have started until BURRZ. I began to stop descent using vertical speed zero. At FL220 aircraft leveled off, at which time ATC asked if there was a problem he needed to know about. I told him I miscalculated descent and asked if there was going to be a conflict or problem. He said no [and] told us to contact next frequency for lower. Next frequency said nothing different and then gave us a phone number to call on the ground. Also, he failed to reissue a "descent via" clearance which I had to question immediately because that failure starts a difficult catch up scenario in this airplane.

Once on the ground I contacted ATC by phone. I spoke to Washington Center Operations Manager. I asked if this was a big deal for me and this is what he said exactly. He said NO, it was not because [our company] has been aware of this problem with their Airbus 320 series aircraft for over 2 years now and that this incident happens all the time every day with CHSLY3 Arrival and they are trying to rectify situation. He said he had to report it so it could be added to the database and that all I had to do was file [a report] and notify my Chief Pilot. That's it. My situational awareness is mostly to blame. I'm also very low time in this aircraft and still honing my skill. CRM could also have contributed.

**Synopsis**

A319 Captain reported descending early on arrival clearance.
ACN: 1567545

Time / Day
Date: 201808
Local Time Of Day: 0001-0600

Place
Locale Reference: Airport: CHA.Airport
State Reference: TN
Altitude.MSL.Single Value: 3200

Aircraft
Reference: X
ATC / Advisory.TRACON: CHA
Make Model Name: Small Aircraft, Low Wing, 1 Eng, Retractable Gear
Crew Size.Number Of Crew: 1
Flight Plan: IFR
Flight Phase: Descent
Route In Use: None
Airspace.Class C: CHA

Person
Reference: 1
Location Of Person.Facility: CHA.TRACON
Reporter Organization: Government
Function.Air Traffic Control: Approach
Qualification.Air Traffic Control: Fully Certified
ASRS Report Number.Accession Number: 1567545
Human Factors: Communication Breakdown
Human Factors: Situational Awareness
Communication Breakdown.Party1: ATC
Communication Breakdown.Party2: Flight Crew

Events
Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
Anomaly.Deviation - Procedural: Published Material / Policy
Anomaly.Deviation - Procedural: Clearance
Anomaly.Infight Event / Encounter: CFTT / CFIT
Detector.Person: Air Traffic Control
When Detected: In-flight
Result.Flight Crew: Returned To Clearance
Result.Air Traffic Control: Issued New Clearance

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

Narrative: 1
Aircraft leveled off at 3600 and then told me he was continuing his descent. I believe I misheard him and thought he said he was continuing inbound. The 3600 MVA [Minimum Vectoring Altitude] was busted and I had him climb back to 3600.

Listen actively.

**Synopsis**

Controller reported not listening correctly to a read back which had the pilot descend below the Minimum Vectoring Altitude.
ACN: 1567527 (21 of 50)

Time / Day
- Date: 201808
- Local Time Of Day: 1201-1800

Place
- Locale Reference.Airport: SAN.Airport
- State Reference: CA
- Relative Position.Angle.Radial: 270
- Relative Position.Distance.Nautical Miles: 5
- Altitude.AGL.Single Value: 300

Environment
- Flight Conditions: VMC
- Light: Daylight

Aircraft: 1
- Reference: X
- ATC / Advisory.Tower: SAN
- Aircraft Operator: Military
- Make Model Name: Mentor/Turbo Mentor (T-34)
- Crew Size.Number Of Crew: 2
- Operating Under FAR Part: Part 91
- Flight Plan: VFR
- Mission: Training
- Flight Phase: Cruise
- Route In Use: Direct
- Airspace.Class E: SCT

Aircraft: 2
- Reference: Y
- Make Model Name: Helicopter
- Airspace.Class E: SCT

Person
- Reference: 1
- Location Of Person.Aircraft: X
- Location In Aircraft: Flight Deck
- Reporter Organization: Military
- Function.Flight Crew: Pilot Flying
- Function.Flight Crew: Single Pilot
- Qualification.Flight Crew: Flight Instructor
- Qualification.Flight Crew: Air Transport Pilot (ATP)
- Qualification.Flight Crew: Instrument
- Experience.Flight Crew.Total: 1560
- Experience.Flight Crew.Last 90 Days: 90
- Experience.Flight Crew.Type: 238
- ASRS Report Number.Accession Number: 1567527
- Human Factors: Communication Breakdown
- Human Factors: Situational Awareness
Communication Breakdown. Party1: Flight Crew
Communication Breakdown. Party2: ATC

Events
Anomaly.Conflict: NMAC
Anomaly.Deviation - Altitude: Undershoot
Anomaly.Deviation - Altitude: Crossing Restriction Not Met
Anomaly.Deviation - Procedural: Clearance
Detector.Person: Flight Crew
Miss Distance.Horizontal: 500
Miss Distance.Vertical: 200
When Detected: In-flight
Result.Flight Crew: Took Evasive Action

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

Narrative: 1
Aircraft X was executing a VFR transition from south to north with approval from Lindbergh Tower. There were two other aircraft doing the same thing, another [military trainer aircraft] with [same squadron] callsign and a helicopter. This was in addition to the regular tower communication for their normal operations (takeoff and landing). Tower cleared Aircraft X into the Bravo airspace, but I think he gave me a restriction. I rogered up the clearance but missed the restriction. I was about to come up and ask but at that time had a near- midair with a helicopter coming opposite direction. After that, I heard the tower talking to someone on VHF about my missed restriction of 1,000’ AGL. I’m very sorry about this. I will brief my [team] during our [review] so that everyone is aware of this possibility of happening and the importance of using good CRM with everyone on freq.

Synopsis
Military Pilot reported a NMAC because they missed an ATC restriction.
Time / Day
Date: 201808
Local Time Of Day: 1801-2400

Place
Locale Reference. ATC Facility: S46. TRACON
State Reference: WA
Altitude. MSL. Single Value: 15000

Environment
Flight Conditions: VMC
Weather Elements / Visibility. Visibility: 25
Light: Daylight
Ceiling. Single Value: 25000

Aircraft: 1
Reference: X
ATC / Advisory. TRACON: S46
Aircraft Operator: Corporate
Make Model Name: Citationjet (C525/C526) - CJ I / II / III / IV
Crew Size. Number Of Crew: 2
Operating Under FAR Part: Part 91
Flight Plan: IFR
Mission: Passenger
Flight Phase: Descent
Route In Use. STAR: GLASR1
Airspace. Class E: S46

Aircraft: 2
Reference: Y
ATC / Advisory. TRACON: S46
Aircraft Operator: Air Carrier
Make Model Name: B737-900
Crew Size. Number Of Crew: 2
Operating Under FAR Part: Part 121
Flight Plan: IFR
Mission: Passenger
Flight Phase: Descent
Airspace. Class E: S46

Person
Reference: 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: Instrument
Qualification. Flight Crew: Multiengine
Qualification. Flight Crew : Air Transport Pilot (ATP)
Qualification. Flight Crew : Flight Instructor
Experience. Flight Crew. Total : 14500
Experience. Flight Crew. Last 90 Days : 80
Experience. Flight Crew. Type : 275
ASRS Report Number. Accession Number : 1567243
Analyst Callback : Completed

Events
Anomaly. Deviation - Altitude : Undershoot
Anomaly. Deviation - Altitude : Crossing Restriction Not Met
Anomaly. Deviation - Procedural : Clearance
Anomaly. Inflight Event / Encounter : Wake Vortex Encounter
Detector. Person : Flight Crew
When Detected : In-flight
Result. Flight Crew : Took Evasive Action

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

Narrative: 1
Failed to meet crossing restriction at WOODI intersection due to wake encounter and
evasive action.

Inbound to SEA on GLASR1 STAR, cleared to "descend VIA GLASR1". We were flying a
Citation CJ4, ten miles in trail of a 737-900. Shortly after passing JAKSN intersection, we
began to encounter wake turbulence as buffeting and uncontrollable left/right rolling. I
reduced our descent rate to remain above the path of the preceding 737-900. The
buffeting and rolling stopped and we continued our descent, but were unable to make the
"at or below 14000 feet" crossing restriction over the WOODI intersection. I believe we
crossed WOODI about 1000' high. We reported the wake encounter to the controller and
mentioned our lack of meeting the crossing restriction. The controller said nothing to us
regarding the altitude deviation. The remainder of the STAR and approach continued
behind the 737-900 with occasional wake buffeting.

We are experiencing wake turbulence more frequently, especially on STARs and
approaches. My guess would be due to the accuracy of the GPS/RNAV equipment.

Synopsis
C525 Captain reported failing to meet a crossing restriction during avoidance maneuvers
related to a wake turbulence encounter in trail of a B737-900 on arrival into SEA.
**Time / Day**

Date: 201808  
Local Time Of Day: 0601-1200

**Place**

Locale Reference: ATC Facility: ZZZ.ARTCC  
State Reference: US  
Altitude.MSL.Single Value: 26000

**Environment**

Flight Conditions: VMC  
Light: Daylight

**Aircraft**

Reference: X  
ATC / Advisory.Center: ZZZ  
Aircraft Operator: Corporate  
Make Model Name: Learjet 60  
Crew Size.Number Of Crew: 2

Operating Under FAR Part: Part 91  
Flight Plan: IFR

Mission: Test Flight  
Flight Phase: Descent  
Route In Use: Vectors  
Airspace.Class A: ZZZ

**Component**

Aircraft Component: Autopilot  
Aircraft Reference: X  
Problem: Malfunctioning

**Person**

Reference: 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: Instrument  
Qualification.Flight Crew: Air Transport Pilot (ATP)  
Qualification.Flight Crew: Flight Instructor  
Qualification.Flight Crew: Multiengine  
Experience.Flight Crew.Total: 7000  
Experience.Flight Crew.Last 90 Days: 50  
Experience.Flight Crew.Type: 500  
ASRS Report Number.Accession Number: 1567233  
Human Factors: Situational Awareness

**Events**
Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Altitude : Excursion From Assigned Altitude
Anomaly.Deviation - Procedural : Clearance
Anomaly.Inflight Event / Encounter : Loss Of Aircraft Control
Detector.Person : Flight Crew
Detector.Person : Air Traffic Control
When Detected : In-flight
Result.Flight Crew : Returned To Clearance
Result.Flight Crew : Regained Aircraft Control
Result.Air Traffic Control : Issued Advisory / Alert

Assessments

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

Narrative: 1

I was conducting a stall test flight on a Lear 60 between 15,000 and 17,000 ft MSL. This was a test flight with flight crew only on board following extensive maintenance prior to the aircraft being returned to service. At this time we were operating VFR with Flight Following from Approach. During this time we encountered some issues with the autopilot. The LH side autopilot would not operate properly due to the ALTS (Altitude Select) indicator light being inoperative and therefore we were unable to verify its status. We also noted a red trim message would post occasionally on the autopilot panel with the autopilot engaged, indicating the autopilot servos may not be trimming properly. We did not see this anomaly on the RH side autopilot so we decided to continue with our plan to go to high altitude using only the RH autopilot. After completing the stalls, I activated our IFR flight plan and we climbed to FL410. Note also that we filed non-RVSM.

After completing our systems observations at FL410, we requested a descent and return to [departure airport]. We had been using the autopilot while in Class A airspace with no issues. While descending to an assigned altitude of FL260 with an autopilot connected descent in SPD (Speed) mode at an approximate airspeed of 280 KIAS, we observed the autopilot slowly pulling the nose upwards to begin leveling off, as expected. Suddenly, the autopilot disconnected and the nose went violently downward with a subsequent rapid increase in airspeed. The control yoke snapped almost full forward.

The thrust levers were already at idle so I deployed the spoilers and pulled carefully on the control yoke while monitoring airspeed. It went into overspeed as I began leveling the aircraft. I retracted the spoilers at this point since they create more nose down force when above Vmo/Mmo. I continued to pull the nose upward carefully to avoid over stressing the aircraft. I got the airplane back to level flight and began assessing our situation when ATC called and instructed an immediate climb, which is when I first noted the altitude deviation...we were at about FL240 when we got the airplane back under control. We immediately climbed back to FL260 and did not engage the autopilot for the remainder of the flight. It is likely the red trim light had posted during the descent indicating the autopilot was having trouble with the pitch trim but we did not notice it.

At this time I considered reporting the malfunction to the controller, but since he had already called us I knew we would be having a discussion back on the ground regarding the altitude deviation. Therefore, since we were back in control of the airplane I elected not to advise ATC. During the subsequent phone call, I provided them with details of the
deviation.

In retrospect, the autopilot anomalies observed at low altitude were more serious than originally thought even though the RH autopilot seemed to be functioning normally. In the future, I will give more consideration to possible system malfunctions and plan the remainder of the flight accordingly. I will also keep ATC advised whenever an issue or malfunction develops.

Synopsis
Lear 60 test pilot reported a 2000 ft altitude excursion due to an autopilot pitch malfunction.
**ACN: 1567136**

**Time / Day**
- Date: 201807
- Local Time Of Day: 1801-2400

**Place**
- Locale Reference: ATC Facility: ZAB.ARTCC
- State Reference: NM
- Altitude: MSL. Single Value: 14000

**Environment**
- Weather Elements / Visibility: Thunderstorm
- Weather Elements / Visibility: Haze / Smoke

**Aircraft**
- Reference: X
- 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: Initial Approach
- Route In Use: STAR: EAGUL6

**Person**
- Reference: 1
- Location Of Person: Aircraft: X
- Location In Aircraft: Flight Deck
- Reporter Organization: Air Carrier
- Function: Flight Crew: Pilot Flying
- Qualification: Flight Crew: Air Transport Pilot (ATP)
- Qualification: Flight Crew: Instrument
- Qualification: Flight Crew: Multiengine
- ASRS Report Number: Accession Number: 1567136

**Events**
- Anomaly. Deviation - Altitude: Undershoot
- Anomaly. Inflight Event / Encounter: Weather / Turbulence
- Anomaly. Inflight Event / Encounter: Fuel Issue
- Detector. Person: Flight Crew
- When Detected: In-flight
- Result. Flight Crew: Executed Go Around / Missed Approach
- Result. Flight Crew: Diverted

**Assessments**
- Contributing Factors / Situations: Human Factors
- Contributing Factors / Situations: Weather
- Primary Problem: Weather
Our flight to PHX had been uneventful until we started the EAGUL6 arrival. Our radar started painting a substantial amount of thunderstorm activity between us and the airport. The thunderstorm activity ran basically south to north, east of the field by about 10 miles. ATC rerouted us to the north on a different arrival. I believe it was the DSERT2, but I am not sure. It really does not matter as the thunderstorms prevented us from actually doing this arrival.

We deviated around the storms, following the aircraft in front of us. Once on the backside of the weather, we noticed a substantial amount of dust being kicked up by strong low level winds. Even at 14,000 ft we could see the dust moving rapidly to the west. ATC advised us that the previous aircraft had reported moderate turbulence ahead. In less than 30 seconds we experienced exactly that, with a 45 kt increase and altitude deviations of 200 feet.

As we followed the line of planes to the airport the ride did not improve, with wild fluctuations in speed, pitch and bank. The autopilot kicked off a few times. As we were on downwind for Runway 8 we noticed 2 things. First, we could not see the airport due to the dust. We were in the clear, but the dust was obscuring most of the ground below about 1000 feet. Second, despite having a strong wind from the west at our altitude, you could clearly see the dust moving rapidly from the east below us. We discussed how it didn't look like we could land using Runway 8 since it appeared to be a large tailwind.

Shortly after that conversation, ATC told us they were changing the airport around due to the preceding 4 aircraft going around. We turned around and got set up on a downwind for Runway 26, all the while still getting a very rough ride. As we passed over the city we flew beyond the dust clouds and the ride became smooth. Turning base we could actually make out the runway. We noticed however that the dust "front" was between us and the runway. We discussed go around procedures recognizing that landing might not be possible.

I configured the airplane early so we could be stable and recognize any adverse trends as soon as possible. Just prior to the dust, we got the beginning of a microburst. Power was near idle, airspeed increased (to almost over speeding the flaps), and an increase of altitude putting us way above the glideslope. We could not have landed if we had to. We called for the go around, getting a very rough ride.

We told ATC that we were diverting to our alternate of ZZZ. They advised us it was closed. This was news to us as we had not received any word from Dispatch that our alternate was no longer viable. We asked ATC what was the nearest open airport. After a minute of checking he told us ZZZ1, and one other I can't remember. ZZZ1 was the closest but still 234 miles away with weather between us! We put ZZZ1 in the FMS and it showed us arriving with less than 2,000 lbs of fuel. We declared min fuel and told ATC that after deviating around the storms our route to ZZZ1 would be direct. We notified Dispatch of our diversion and FOB. We climbed fairly high for a short route to save fuel. The Captain did a flaps 15 landing, again to use less fuel. We landed with about 2.7 FOB.

I believe we got "painted into a corner" due to the weather rapidly deteriorating at both our destination and alternate at the same time. Also, this isn't the Midwest or North East. Airports aren't every 50 miles.

My only question is this: why did we not get any notification from Dispatch about our
alternate? Did the weather in ZZZ go downhill and Dispatch not notice? Or, did the weather that closed ZZZ happen so fast that there was no time to notify us? If we had had that one piece of information we would not have tried to land in PHX. We would have gone somewhere else sooner and wouldn't have been in such a low fuel situation.

Synopsis
B737-800 pilot reported diverting with minimum fuel after PHX began experiencing dust storms and microbursts.
**Time / Day**
- Date: 201808
- Local Time Of Day: 1201-1800

**Place**
- Locale Reference.Airport: CLT.Airport
- State Reference: NC
- Altitude.MSL.Single Value: 9000

**Environment**
- Flight Conditions: VMC
- Light: Daylight

**Aircraft**
- Reference: X
- ATC / Advisory.TRACON: CLT
- 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: Descent
- Route In Use.STAR: STOCR 2 RNAV
- Airspace.Class B: CLT

**Person**
- Reference: 1
- 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
- ASRS Report Number.Accession Number: 1567089
- Human Factors: Situational Awareness

**Events**
- Anomaly.Deviation - Altitude: Overshoot
- Anomaly.Deviation - Altitude: Crossing Restriction Not Met
- Anomaly.Deviation - Procedural: Published Material / Policy
- Anomaly.Deviation - Procedural: Clearance
- Anomaly.Inflight Event / Encounter: Weather / Turbulence
- Detector.Person: Air Traffic Control
- When Detected: In-flight
- Result.Flight Crew: Returned To Clearance
Result: Flight Crew: Became Reoriented
Result: Air Traffic Control: Issued Advisory / Alert

Assessments
Contributing Factors / Situations: Human Factors
Contributing Factors / Situations: Weather
Primary Problem: Human Factors

Narrative: 1

After being cleared to descend via the STOCR2 RNAV OPD arrival into CLT, I set 9000 FT into the altitude selector and verified it with the Pilot Monitoring (PM) First Officer (FO). Passing DOOMY between 11000 FT and 9000 FT, I set 8000 FT into the altitude selector and verified it with the PM FO. I incorrectly began a 1000 FPM descent to 8000 FT. At approximately 8600 FT, CLT Approach called us and told us to climb back to 9000 FT, as the profile called for us to maintain 9000 FT until LEEKS. We acknowledged the climb, and reset 9000 FT in the altitude selector, verified it, and climbed back to 9000 FT. Passing LEEKS at 9000 FT per the arrival, we descended to 8000 FT per the procedure and continued the rest of the arrival, approach, and landing on 18L. The biggest threat with this event was that due to enroute weather, we were filed and cleared for an east side arrival into CLT. I had never flown the STOCR2 arrival or landed on 18L in CLT before. Although we took the time to brief the arrival and approach and landing exit, this RNAV OPD was unfamiliar to me. I honestly thought I was flying the procedure properly, and had even told the FO that I was going to start my descent to 8000 FT at DOOMY, which was incorrect. It wasn't until ATC called us in the descent to 8000 FT that I realized my error. I believe the FO was also unfamiliar with this arrival, as we usually get a west side arrival for 18R/36L. We simply missed the requirement to maintain 9000 FT until LEEKS. I am going to start delaying putting in the next lower altitude in the altitude selector (in this case 8000 FT) until after we cross the fix that permits the descent (in this case LEEKS), rather than right after capturing the higher altitude (in this case 9000 FT). I think that will help me to not descend prematurely.

Synopsis
CRJ-700 Captain reported an altitude deviation occurred on the STOCR2 RNAV OPD arrival to CLT. Reporter cited unfamiliarity with the procedure as contributing.
ACN: 1567073 (26 of 50)

**Time / Day**
- Date: 201808
- Local Time Of Day: 1201-1800

**Place**
- Locale Reference: Airport: BHM.Airport
- State Reference: AL
- Altitude.AGL.Single Value: 2000

**Environment**
- Flight Conditions: VMC
- Light: Daylight

**Aircraft**
- Reference: X
- ATC / Advisory.TRACON: BHM
- Make Model Name: Regional Jet 700 ER/LR (CRJ700)
- Crew Size.Number Of Crew: 2
- Operating Under FAR Part: Part 121
- Mission: Passenger
- Flight Phase: Initial Approach
- Airspace.Class B: BHM

**Person**
- Reference: 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: 1567073
- Human Factors: Situational Awareness

**Events**
- Anomaly.Deviation - Altitude: Overshoot
- Anomaly.Deviation - Altitude: Crossing Restriction Not Met
- Anomaly.Deviation - Procedural: Published Material / Policy
- Anomaly.Inflight Event / Encounter: CFTT / CFIT
- Detector.Automation: Aircraft Terrain Warning
- Detector.Person: Flight Crew
- When Detected: In-flight
- Result.Flight Crew: Took Evasive Action
- Result.Flight Crew: Returned To Clearance
- Result.Flight Crew: FLC complied w / Automation / Advisory
- Result.Flight Crew: Became Reoriented
Assessments
Contributing Factors / Situations : Human Factors
Primary Problem : Human Factors

Narrative: 1

Cleared for the visual to runway 24. First Officer (FO) Pilot Flying (PF) during descent set altitude in altitude select to 2,000 feet instead of 2,200 which was what was listed for the FAF. I had him set 2,200 feet in the window however, he did not notice that the aircraft did not capture the altitude & began to go below the altitude at which time the audible "terrain" alert sounded at which time I immediately assumed control of the aircraft and powered/pitched up in VMC conditions to the 2,200 foot altitude at the FAF. I maintained control of the aircraft all the way until landing safely. No further issues occurred. I observed the event beginning to occur and took controls immediately.

Pilot flying got behind the aircraft altitude and configuration during his scan. As a result, he did not notice the aircraft descending which triggered the alert, thereby causing me to take control of the aircraft from him to reestablish safe parameters.

Proper altitude regained on approach in VMC conditions. I continued to fully configure the aircraft for landing and proceeded to land the aircraft safely and without further incident.

Synopsis
CRJ-700 Captain reported an altitude overshoot and GPWS terrain warning on a visual approach to BHM.
**Time / Day**

Date: 201808  
Local Time Of Day: 1201-1800

**Place**

Locale Reference. Airport: ZZZ.Airport  
State Reference: US  
Altitude.AGL.Single Value: 700

**Environment**

Flight Conditions: VMC  
Light: Daylight

**Aircraft : 1**

Reference: X  
ATC / Advisory.Tower: ZZZ  
Aircraft Operator: Air Carrier  
Make Model Name: Regional Jet 200 ER/LR (CRJ200)  
Crew Size. Number Of Crew: 2  
Operating Under FAR Part: Part 121  
Flight Plan: IFR  
Mission: Passenger  
Flight Phase: Initial Approach  
Airspace. Class D: ZZZ

**Aircraft : 2**

Reference: Y  
ATC / Advisory.Tower: ZZZ  
Aircraft Operator: Personal  
Make Model Name: Skyhawk 172/Cutlass 172  
Crew Size. Number Of Crew: 1  
Operating Under FAR Part: Part 91  
Mission: Personal  
Flight Phase: Initial Approach  
Airspace. Class D: ZZZ

**Person**

Reference: 1  
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)  
ASRS Report Number. Accession Number: 1566752  
Human Factors: Communication Breakdown  
Human Factors: Situational Awareness  
Communication Breakdown. Party1: Flight Crew  
Communication Breakdown. Party2: ATC
**Events**

Anomaly.Conflict : Airborne Conflict  
Anomaly.Deviation - Altitude : Excursion From Assigned Altitude  
Anomaly.Deviation - Procedural : Clearance  
Anomaly.Inflight Event / Encounter : CFTT / CFIT  
Detector.Automation : Aircraft Terrain Warning  
Detector.Person : Flight Crew  
Detector.Person : Air Traffic Control  
When Detected : In-flight  
Result.Flight Crew : Took Evasive Action  
Result.Flight Crew : Returned To Clearance  
Result.Flight Crew : Became Reoriented  
Result.Air Traffic Control : Issued Advisory / Alert  
Result.Air Traffic Control : Provided Assistance

**Assessments**

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

**Narrative: 1**

Flying the visual [to] Runway XX at ZZZ. Following the charted points of ZZZZZZ, ZZZZZ1, AND ZZZZZZZZ. Approaching ZZZZZ1 in the turn, ZZZ Tower advised us to square off our base for a Cessna 172 flying an approach to the crossing Runway XY. As Pilot Flying, I was following the advisory snowflake at 1200 feet and in the turn to final when I rolled back to the left to square off the turn and turn away from the runway. Unfortunately, I continued to descend and reference the VNAV snowflake not realizing that it was tracking their descent off azimuth. At 800 feet, I corrected with a generous amount of power as ATC announced a low altitude alert and told me to check my altitude. ATC stated my altitude over the estuary was 700 feet. After correcting back to 1200 feet, we were cleared to rejoin Runway XX final, but not given landing clearance until a 2 mile final, whereupon the crossing traffic Cessna 172 was told to go around. If I had followed the approach as published, this would not have happened. I should have realized the moment I had to turn away from the runway that I would have to stop my descent and no longer follow the advisory VNAV guidance. Simultaneously, my First Officer was clearing traffic, since the runway was on his side of the aircraft and called for me to stop my descent. The descent was very gradual, so it didn't immediately get the First Officer's attention. The subsequent landing was uneventful.

First Officer alerted, [then] followed closely by air traffic controller giving us the low altitude alert. [The cause was the] requirement to extend pattern after cleared for visual approach during turn to final. Controller given priority to GA slower aircraft. Added power and corrected back to pattern altitude. ATC initially asked us to "KEEP OUR SPEED UP" then handed us off to a Tower with three jets going to Runway XX and a Cessna 172 going to the crossing Runway XY. Maybe have the Cessna break off the approach and let the jets land first next time.

**Synopsis**

CRJ-200 Captain reported a low altitude alert after continuing to descend while extending final for traffic landing on crossing runway.
**ACN: 1566724 (28 of 50)**

**Time / Day**
- Date: 201808
- Local Time Of Day: 0001-0600

**Place**
- Locale Reference: ATC Facility: ZZZZ.ARTCC
- State Reference: FO
- Altitude.MSL.Single Value: 34000

**Environment**
- Flight Conditions: VMC

**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
- Flight Phase: Cruise

**Component**
- Aircraft Component: Altitude Hold/Capture
- Aircraft Reference: X
- Problem: Malfunctioning

**Person: 1**
- Reference: 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)
- Experience.Flight Crew.Type: 833
- ASRS Report Number.Accession Number: 1566724
- Human Factors: Troubleshooting

**Person: 2**
- Reference: 2
- 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)
Aircraft was deferred with Thrust Management inoperative. Approximately 40 miles east of ZZZZZ, [we] were given climb to FL340 from FL320. Used FLCH [and] added power manually to QRH climb power for altitude/TAT - observed ALT HOLD annunciation, ALT HOLD light on MCP and aircraft leveled off normally. As I was fine-tuning the N1 to achieve the correct Mach number, I saw the altitude warning light illuminate on the baro altimeter with aircraft descending thru FL33.8 with flight director above, autopilot light was engaged and I think the ALT HOLD light was too but not 100% sure. With assessing situation and reaction time, the plane had descended to 33,700 when I disconnected the autopilot and hand flew to FL340. Lowest altitude deviation was approximately 350. Airspeed was .805 (I know because I was fine-tuning it to try to get to target of .81). I went on break shortly after and Captain had call with Maintenance and they suspected MCP issues based on AP
checks Maintenance asked the Captain and Relief Officer to do. (Aircraft was wandering in altitude with VSI swings of +/- 300-700 with different AP selected). ZZZZ did ask about our altitude deviation and we said we were having flight management issues.

**Narrative: 2**

[Report narrative contained no additional information.]

**Narrative: 3**

[Report narrative contained no additional information.]

**Synopsis**

B767 pilots reported an altitude deviation due to a malfunctioning autopilot.
ACN: 1566515 (29 of 50)

**Time / Day**
Date: 201808  
Local Time Of Day: 1201-1800

**Place**
Locale Reference.Airport: DSM.Airport  
State Reference: IA  
Altitude.MSL.Single Value: 23000

**Environment**
Flight Conditions: VMC

**Aircraft : 1**
Reference: X  
ATC / Advisory.Center: ZMP  
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  
Flight Phase: Descent  
Airspace.Class C: ZMP

**Aircraft : 2**
Reference: Y  
Make Model Name: Commercial Fixed Wing

**Person**
Reference: 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: 1566515  
Human Factors: Situational Awareness

**Events**
Anomaly.Airspace Violation: All Types  
Anomaly.Conflict: NMAC  
Anomaly.Deviation - Altitude: Excursion From Assigned Altitude  
Anomaly.Deviation - Procedural: Published Material / Policy  
Detector.Automation: Aircraft RA  
Miss Distance.Vertical: 300  
When Detected: In-flight
Result. Flight Crew: Took Evasive Action
Result. Flight Crew: FLC complied w/ Automation / Advisory

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

Narrative: 1
ATC gave initial instruction for a descent to an altitude of 11,000 feet by Chicago Center (I believe), and was given a frequency change right away and Minneapolis Center (I believe) said amend altitude and maintain FL200. I believe we were crossing FL230, and shortly after, we got a TCAS RA, and we were close to the traffic by about -300 feet. First Officer clicked off the autopilot, complied with the RA, and I reported the event to ATC. No further incident.

Synopsis
CRJ-700 Captain reported a NMAC in the vicinity of DSM.
ACN: 1566345 (30 of 50)

Time / Day
Date : 201808
Local Time Of Day : 1201-1800

Place
Locale Reference.Airport : ZZZ.Airport
State Reference : US
Relative Position.Distance.Nautical Miles : 7
Altitude.MSL.Single Value : 19000

Environment
Light : Daylight

Aircraft
Reference : X
ATC / Advisory.TRACON : 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 : Descent

Person : 1
Reference : 1
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 : Multiengine
Qualification.Flight Crew : Air Transport Pilot (ATP)
Qualification.Flight Crew : Instrument
Experience.Flight Crew.Last 90 Days : 439
Experience.Flight Crew.Type : 12000
ASRS Report Number.Accession Number : 1566345
Human Factors : Situational Awareness
Human Factors : Time Pressure

Person : 2
Reference : 2
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
Experience: Flight Crew: Last 90 Days: 418
ASRS Report Number: Accession Number: 1566344
Human Factors: Situational Awareness

Events
Anomaly: Aircraft Equipment Problem: Less Severe
Anomaly: Deviation - Altitude: Overshoot
Anomaly: Deviation - Altitude: Crossing Restriction Not Met
Anomaly: Deviation - Procedural: Clearance
Detector: Person: Flight Crew
When Detected: In-flight
Result: Flight Crew: FLC Overrode Automation
Result: Flight Crew: Overcame Equipment Problem

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

Narrative: 1
We were cleared to descend via the RNAV Arrival into ZZZ. While at FL 270, ATC stated "Do me a favor and cross ZZZZZ intersection at FL 190." The FMC wouldn't initially take FL 190 at ZZZZZ intersection because the following waypoint (ZZZZZ1) had a restriction of FL 200A. While working with the FMC to correct this problem, we failed to clarify if ATC wanted us to "descend via, except cross ZZZZZ at FL 190", so with the ZZZZZ 2 crossing restriction of FL 240A (which is only 7.5 miles west of ZZZZZ) it left an extremely steep descent after the ZZZZZ2 intersection. Passing ZZZZZ Pilot Flying (PF) intervened with Vertical Speed and increased the rate of descent to make the crossing restriction. PF failed to immediately reset the MCP altitude to FL 190 for the degrade in automation. Passing FL 197, at a high rate of descent, the altitude window was reset to FL 190, but further intervention and automation degradation was required to keep from busting through FL 190. During this intervention, neither the PF nor the Pilot Monitoring (PM) noticed that the autopilot had disengaged. As a result the aircraft leveled initially at FL 190 and then continued to descend to FL 183. The next waypoint on the arrival is ZZZZZ3, which has an altitude restriction of FL 190. We descended to 18,300 ft before correcting back up to FL 190. The rest of the arrival and landing were uneventful. There were a number of things we could have done to prevent this event from occurring: Clarify the clearance with ATC. The removal of the FL 240A restriction just prior to the ZZZZZ intersection would have allowed us to remain in the highest level of automation and allowed the FMC to correctly program a descent formula. If we had immediately reset the MCP altitude to FL 190, the autopilot could have assisted in leveling off at the proper altitude. Proper phraseology by ATC could have mitigated the problem. Both Pilots should have been more vigilant in monitoring the aircraft to detect that the autopilot had disengaged.

Narrative: 2
[Report narrative contained no additional information.]

Synopsis
B737 Flight Crew reported the aircraft overshot the altitude restriction because the autopilot disconnected.
ACN: 1566264 (31 of 50)

Time / Day
Date: 201808
Local Time Of Day: 1801-2400

Place
Locale Reference.Airport: ZZZ.Airport
State Reference: US
Relative Position.Distance.Nautical Miles: 2
Altitude.MSL.Single Value: 3600

Environment
Flight Conditions: VMC
Weather Elements / Visibility.Visibility: 10
Light: Night

Aircraft
Reference: X
ATC / Advisory.Center: ZZZ
Aircraft Operator: Personal
Make Model Name: EMB ERJ 145 ER/LR
Crew Size.Number Of Crew: 2
Operating Under FAR Part: Part 91
Flight Plan: VFR
Mission: Passenger
Flight Phase: Initial Approach
Route In Use: Direct

Person
Reference: 1
Location Of Person.Aircraft: X
Location In Aircraft: Flight Deck
Reporter Organization: Personal
Function.Flight Crew: Captain
Qualification.Flight Crew: Instrument
Qualification.Flight Crew: Air Transport Pilot (ATP)
Qualification.Flight Crew: Flight Instructor
Qualification.Flight Crew: Multiengine
Experience.Flight Crew.Total: 11000
Experience.Flight Crew.Last 90 Days: 50
Experience.Flight Crew.Type: 6000
ASRS Report Number.Accession Number: 1566264
Human Factors: Communication Breakdown
Human Factors: Situational Awareness
Communication Breakdown.Party1: Flight Crew
Communication Breakdown.Party2: Flight Crew

Events
Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
Anomaly.Deviation - Procedural: Published Material / Policy
Anomaly.Deviation - Procedural : Clearance
Anomaly.Inflight Event / Encounter : CFTT / CFIT
Detector.Person : Flight Crew
When Detected : In-flight
Result.Air Traffic Control : Provided Assistance

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

Narrative: 1
We were cleared direct ZZZZZ and were going to be doing the visual to Runway 28 in ZZZ. We had the beacon and the airport in sight. I thought my First Officer (FO) had cancelled our IFR clearance and we were cleared to do the visual on our own. I started the descent and was maybe around 3000 when ATC said they had a low altitude alert on us. The FO cancelled our IFR immediately and we were on our own to finish the visual. I am used to the FO cancelling the flight plan when we had the airport in sight, and I really thought he had cancelled. I was wrong and I should not have started the descent. It was a misunderstanding between us, but I should have double checked that we were cleared before I started the descent. There were no other aircraft involved and there were no other issues with the flight.

Synopsis
EMB-145 Captain reported they got a low altitude alert from ATC during a visual approach to non-towered airport.
Aircraft X was IFR at 8,000 5NM W of TALLI intersection. Aircraft X advised that his ACARD went out and came back then went out again. Aircraft X said that he did not need to declare an emergency he just needed to descend to VFR conditions to see what the
problem with his equipment was. I descended Aircraft X to 7,000 and then gave him a turn to 320 and continued his descent to 6,000. Aircraft X had some VFR conditions in the area and wanted to continue descent to avoid the clouds. I gave Aircraft X descent to 4,000 and advise me if he needed any other assistance to remain in the VMC conditions during his descent. He then asked to descend to 3,500 and the MVA in the area that was 3,700, I told him about the MVA and descended him to 3,700. I verified that the MVA was at 3,700 and gave Aircraft X the altimeter due to his altitude showing him descending below 3,700 on the scope. Aircraft X responded that he was climbing back up to 3,700 and wanted vectors towards [a nearby] airport. I gave Aircraft X a heading of 150 and maintain 3,700. Position Relieve briefing was started at this time and I gave the next controller all the information about Aircraft X and his intentions to remain in VMC conditions. Before the end of the position relief briefing I gave Aircraft X a heading of 180 and maintain 3,700, vectoring him towards an area with an MVA of 3,400 if he needed to descend anymore. I stayed in the TRACON to see if the next controller needed any assistance with the position.

No recommendations to prevent the re-occurrence of this event due to it being an equipment malfunction.

Synopsis

AVP TRACON Controller reported an IFR aircraft with avionics trouble descending below the Minimum Vectoring Altitude.
ACN: 1565394

Time / Day
Date: 201807
Local Time Of Day: 0601-1200

Place
Locale Reference.Airport: MVY.Airport
State Reference: MA

Environment
Flight Conditions: VMC
Light: Daylight

Aircraft
Reference: X
ATC / Advisory.TRACON: A90
Make Model Name: PC-12
Operating Under FAR Part: Part 91
Flight Phase: Initial Approach
Airspace.Class D: MVY

Person
Reference: 1
Location Of Person.Aircraft: X
Location In Aircraft: Flight Deck
Function.Flight Crew: Pilot Flying
Function.Flight Crew: Captain
Qualification.Flight Crew: Air Transport Pilot (ATP)
ASRS Report Number.Accession Number: 1565394
Human Factors: Situational Awareness

Events
Anomaly.ATC Issue: All Types
Anomaly.Conflict: Airborne Conflict
Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
Anomaly.Deviation - Track / Heading: All Types
Detector.Person: Flight Crew
When Detected: In-flight
Result.Flight Crew: Took Evasive Action

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

Narrative: 1
While descending into MVY Boston Approach issued a traffic advisory at 11 o'clock and climbing, and issued a turn to heading of 150. Upon rolling out on the heading of 150
traffic was sighted directly in front of the aircraft and climbing. At that point the TCAS traffic alert went off and we immediately initiated a left turning climb to avoid climbing traffic converging on our altitude and 1/2 SM or less away. As soon as we initiated our maneuver Boston also issued an immediate climb and turn to the left to avoid traffic. Estimated vertical separation was 250 ft feet and horizontal separation was 1,400 feet. Conflicting traffic maintained course and speed throughout the duration of this event. After the flight passengers inquired as to the reason for the abrupt maneuver and the (small airplane that was really close).

Synopsis

PC-12 pilot reported coming close to another aircraft while descending into an airport.
ACN: 1565192 (34 of 50)

**Time / Day**
- Date: 201807
- Local Time Of Day: 0601-1200

**Place**
- Locale Reference.Airport: BUR.Airport
- State Reference: CA
- Altitude.MSL.Single Value: 6000

**Environment**
- Light: Daylight

**Aircraft**
- Reference: X
- ATC / Advisory.TRACON: SCT
- Aircraft Operator: Air Carrier
- Make Model Name: B737-700
- Crew Size.Number Of Crew: 2
- Operating Under FAR Part: Part 121
- Flight Plan: IFR
- Mission: Passenger
- Nav In Use: FMS Or FMC
- Flight Phase: Final Approach
- Flight Phase: Initial Approach
- Airspace.Class C: BUR

**Person: 1**
- Reference: 1
- 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: Air Transport Pilot (ATP)
- Experience.Flight Crew.Last 90 Days: 180
- Experience.Flight Crew.Type: 1799
- ASRS Report Number.Accession Number: 1565192
- Human Factors: Human-Machine Interface
- Human Factors: Situational Awareness

**Person: 2**
- Reference: 2
- 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)
- Experience.Flight Crew.Last 90 Days: 200
Experience: Flight Crew. Type: 13000
ASRS Report Number. Accession Number: 1565194
Human Factors: Situational Awareness

Events

Anomaly. Deviation - Altitude: Overshoot
Anomaly. Deviation - Procedural: Published Material / Policy
Anomaly. Deviation - Procedural: Clearance
Detector. Person: Flight Crew
Detector. Person: Air Traffic Control
When Detected: In-flight
Result. Flight Crew: Returned To Clearance
Result. Flight Crew: Became Reoriented
Result. Air Traffic Control: Issued Advisory / Alert

Assessments

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

Narrative: 1

I was Pilot Flying (PF), autopilot was engaged, weather was exceptionally clear and radio traffic was pretty light. I briefed the approach RNAV (RNP) Y Runway 8 prior to descent. During the STAR, we were given a few altitude and airspeed restrictions and (maybe) a vector before being cleared direct to WABB T and cleared the RNAV (RNP) Y Runway 8 into BUR. After getting approach clearance, I went through my normal routine, pressed the VNAV button, and verbalized that I was setting 3,000 feet in the altitude window. I then proceeded to monitor the approach and spent a lot of time looking outside for traffic and looking for visual clues to find the runway. After passing WABB T, I checked for the next altitude crossing restriction (5,100 feet at NIBYI) and noticed that we were still descending below that altitude. I also noticed the terrain (3,741 feet) would be a factor if we continued descending. After assessing the situation, I realized the autopilot was still in Level Change with 210 knots selected. I clicked off the autopilot and shallowed the descent rate to ensure terrain clearance and very shortly after, the SoCal Controller advised us of our altitude deviation and then the low altitude alert. The Pilot Monitoring (PM) informed the controller that we had visual contact with the terrain and the runway and requested the visual approach. The rest of the flight was uneventful. We did not receive an EGPWS alert and, because we had visual contact with the terrain, we never felt terrain separation was a factor. I verbalized but we both did NOT verify and therefore we later had to intervene. I pushed the VNAV button but did not verify that VNAV PATH was engaged and that mistake led to our deviation. We could have (and should have) prevented this incident using better crew coordination and adhering to standard operating practices.

Narrative: 2

We were cleared the RNP Y Runway 8 into BUR, to start the approach from WABB T. I was looking outside at the airport and looking out for general aviation traffic when I realized that we appeared lower than normal. At about that same time, SoCal called us with a low altitude alert. SoCal called several times (three I think), with more concern in his voice each time. I saw we were in Level Change and the altitude alerter was set at 3000 ft. VNAV was not engaged. The First Officer reduced the descent. I informed SoCal that we had the airport and terrain in sight. We were then cleared the visual approach. The landing in BUR was uneventful. We had no GPWS alerts on any portion of the flight.
Synopsis

B737-700 flight crew reported descending below charted altitude on the RNAV (RNP) Y arrival to Runway 8 at BUR. Lack of FMC mode awareness was cited as contributing.
ACN: 1565146

Time / Day
Date: 201807
Local Time Of Day: 0601-1200

Place
Locale Reference.ATC Facility: ZZZ.TACON
State Reference: US
Altitude.MSL.Single Value: 8000

Environment
Flight Conditions: Mixed
Weather Elements / Visibility: Rain
Weather Elements / Visibility.Visibility: 10
Light: Daylight
Ceiling.Single Value: 20000

Aircraft
Reference: X
Aircraft Operator: Personal
Make Model Name: RV-10
Operating Under FAR Part: Part 91
Flight Plan: IFR
Mission: Passenger
Flight Phase: Climb
Route In Use: Direct

Component
Aircraft Component: Electrical Power
Aircraft Reference: X
Problem: Failed

Person
Reference: 1
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: Private
Experience.Flight Crew.Total: 307
Experience.Flight Crew.Last 90 Days: 60
Experience.Flight Crew.Type: 200
ASRS Report Number.Accession Number: 1565146

Events
Anomaly.Aircraft Equipment Problem: Less Severe
Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
Results. Flight Crew: Returned to Departure Airport

Assessments

Contributing Factors / Situations: Aircraft
Primary Problem: Aircraft

Narrative: 1

During a climb out I experienced a total electrical failure in my aircraft causing the need to immediately turn back to ZZZ. Since all radios did not work, I was using a handheld backup and Approach Control was able to relay from another aircraft in the vicinity. I stated my location and intention to return to ZZZ but not after deviating from my assigned route and altitude.

Synopsis

RV10 pilot reported an electrical failure that resulted in a return to the departure airport.
**ACN: 1565123 (36 of 50)**

**Time / Day**

Date: 201808
Local Time Of Day: 1201-1800

**Place**

Locale Reference.Airport: SAV.Airport
State Reference: GA
Altitude.MSL.Single Value: 400

**Environment**

Flight Conditions: Marginal
Weather Elements / Visibility: Rain
Weather Elements / Visibility: Windshear
Light: Daylight

**Aircraft**

Reference: X
ATC / Advisory.Tower: SAV
Aircraft Operator: Personal
Make Model Name: PA-28R Cherokee Arrow All Series
Crew Size.Number Of Crew: 1
Operating Under FAR Part: Part 91
Flight Plan: IFR
Mission: Personal
Nav In Use: GPS
Flight Phase: Landing
Route In Use.Other
Airspace.Class C: SAV

**Person**

Reference: 1
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: Air Transport Pilot (ATP)
Qualification.Flight Crew: Multiengine
Qualification.Flight Crew: Instrument
Experience.Flight Crew.Total: 4500
Experience.Flight Crew.Last 90 Days: 180
Experience.Flight Crew.Type: 50
ASRS Report Number.Accession Number: 1565123
Human Factors: Other / Unknown
Human Factors: Situational Awareness
Human Factors: Distraction

**Events**
Assessments
Contributing Factors / Situations: Human Factors
Contributing Factors / Situations: Weather
Primary Problem: Weather

Narrative: 1
While on the GPS approach to Runway 19, there was virga between the FAF and the runway. While entering the precipitation, the plane entered a downdraft of -500 feet per minute. I added power and attempted to maintain a constant rate of descent, and a few seconds later air traffic control called a low altitude alert. The altimeter indicated 400 feet, about 3/4 from the airport. By this point visual contact with the airport was made, I acknowledged the report from air traffic control, and landed without further incident.

Synopsis
PA28 pilot reported receiving low altitude alert from ATC while in downdraft, below approach altitude.
ACN: 1565122 (37 of 50)

Time / Day
Date: 201807
Local Time Of Day: 1201-1800

Place
Locale Reference. ATC Facility: ZID.ARTCC
State Reference: IN
Altitude.MSL.Single Value: 34000

Environment
Flight Conditions: IMC
Weather Elements / Visibility: Rain
Weather Elements / Visibility: Turbulence
Weather Elements / Visibility: Thunderstorm
Light: Daylight

Aircraft
Reference: X
ATC / Advisory.Center: ZID
Aircraft Operator: Corporate
Make Model Name: Challenger CL604
Crew Size.Number Of Crew: 2
Operating Under FAR Part: Part 91
Flight Plan: IFR
Mission: Passenger
Flight Phase: Climb
Route In Use: Direct
Airspace.Class A: ZID

Person: 1
Reference: 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: Multiengine
Qualification.Flight Crew: Air Transport Pilot (ATP)
Qualification.Flight Crew: Flight Instructor
Qualification.Flight Crew: Instrument
Experience.Flight Crew.Total: 14200
Experience.Flight Crew.Last 90 Days: 100
Experience.Flight Crew.Type: 2200
ASRS Report Number.Accession Number: 1565122

Person: 2
Reference: 2
Location Of Person.Aircraft: X
Location In Aircraft: Flight Deck
Events

Anomaly.ATC Issue : All Types
Anomaly.Deviation - Altitude : Excursion From Assigned Altitude
Anomaly.Deviation - Track / Heading : All Types
Anomaly.Deviation - Procedural : Clearance
Anomaly.Inflight Event / Encounter : Weather / Turbulence
Anomaly.Inflight Event / Encounter : Loss Of Aircraft Control
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 : Regained Aircraft Control
Result.Air Traffic Control : Issued New Clearance

Assessments

Contributing Factors / Situations : Weather
Primary Problem : Weather

Narrative: 1

Climbing out of FL330 we requested a deviation from Indianapolis Center right of course for a thunderstorm top. Denied deviation by Center until FL350. Entered tops of thunderstorm. Could not maintain directional control, course, or altitude, due to severe turbulence. ATC questioned us if we had deviated from course and told us to expedite climb to FL350 in 30 seconds or less. We informed unable to comply and reported out of FL340 at ATC request. After being handed to the next Center Controller, Indy Center asked us to contact them after landing.

Narrative: 2

After breaking out of a cloud deck we noticed a thunderstorm build up in front of us. We requested a deviation from Indianapolis Center to the north for the weather but were denied. We informed them we would need a turn soon. They authorized a deviation left of course, however, we informed them that would put us deeper into the storm. We experienced severe turbulence and were unable to maintain altitude or heading control. ATC asked us if we were deviating and we informed them we were not as we attempted to control the aircraft through the turbulence. They asked us to expedite our climb to FL350 and reach it in 30 seconds or less and we told them we were unable. After clearing the weather the controller told us on frequency we couldn't deviate without their permission and we informed them that we hadn't, we were unable to maintain heading due to
turbulence. They gave us a number to talk to them about it after landing, which my Captain did.

**Synopsis**

CL604 flight crew reported altitude and course deviations resulted from an encounter with severe turbulence associated with thunderstorm activity.
ACN: 1565033 (38 of 50)

Time / Day
Date: 201808
Local Time Of Day: 1801-2400

Place
Locale Reference.ATC Facility: ZOB.ARTCC
State Reference: OH
Altitude.MSL.Single Value: 10000

Environment
Flight Conditions: VMC
Light: Daylight

Aircraft
Reference: X
ATC / Advisory.Center: ZOB
Aircraft Operator: Air Carrier
Make Model Name: Widebody, Low Wing, 2 Turbojet Eng
Crew Size.Number Of Crew: 2
Operating Under FAR Part: Part 121
Flight Plan: IFR
Nav In Use: FMS Or FMC
Flight Phase: Initial Approach
Route In Use.STAR: ZABER 6
Airspace.Class B: CLE

Person
Reference: 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: Instrument
Qualification.Flight Crew: Air Transport Pilot (ATP)
Qualification.Flight Crew: Multiengine
ASRS Report Number.Accession Number: 1565033
Human Factors: Communication Breakdown
Human Factors: Situational Awareness
Communication Breakdown.Party1: Flight Crew
Communication Breakdown.Party2: ATC

Events
Anomaly.ATC Issue: All Types
Anomaly.Conflict: NMAC
Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
Anomaly.Deviation - Procedural: Clearance
Detector.Automation: Aircraft TA
Detector.Automation: Aircraft RA
Miss Distance.Vertical: 400
Were Passengers Involved In Event: N
When Detected: In-flight
Result.Flight Crew: Returned To Clearance
Result.Flight Crew: Took Evasive Action

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

Narrative: 1
Level at 10000 ft. near ZABER intersection, ZABER 6 arrival into CLE. Traffic appeared on TCAS at 10 o’clock position and 400 ft. below. Received a traffic advisory from TCAS followed by a "monitor vertical speed" followed by a resolution advisory to climb. PF (Pilot Flying) followed advisory and we climbed to 10,300 ft. Advisory cleared. We returned to 10,000 ft. and I advised ATC of our deviation and a resolution advisory.

Traffic was never reported to us by ATC. Traffic not in communication with ATC.

Synopsis
Air Carrier Captain reported responding to a RA, making evasive manoeuvre, while level at 10,000 ft.
On visual approach 34L, on glideslope, with ATC verified altimeter setting of 30.06, ATC verified altitude of 8300', we showed a difference of about 175'. We verified MALSR and
PAPI lighting on visual approach and landed without incident. Aircraft altimeters checked pre and post flight within AOM limits. We mentioned the difference to Reno Tower, and he indicated that it has happened before. In fact, I have heard Tower say to other carriers, many times, that they were low on approach, when they were showing on glidepath with correct altimeter on Runway 16. There seems to be a known issue regarding disparity between aircraft, ATC, and approach FIX altitudes. If there is a known issue, then I humbly suggest it should be addressed.

**Synopsis**

B737 Captain reported aircraft showed altitude discrepancy from that displayed by ATC. Pilot reports this anomaly is common at that particular airport.
ACN: 1564107 (40 of 50)

Time / Day
Date: 201807

Place
Locale Reference. ATC Facility: HUF.TRACON
State Reference: IN
Altitude.MSL.Single Value: 3000

Environment
Light: Daylight

Aircraft
Reference: X
ATC / Advisory.TRACON: HUF
Make Model Name: Beechjet 400
Crew Size.Number Of Crew: 2
Flight Plan: IFR
Flight Phase: Final Approach
Route In Use: Visual Approach
Airspace.Class E: HUF

Person
Reference: 1
Location Of Person.Facility: HUF.TRACON
Reporter Organization: Government
Function.Air Traffic Control: Approach
Function.Air Traffic Control: Instructor
Qualification.Air Traffic Control: Fully Certified
ASRS Report Number.Accession Number: 1564107
Human Factors: Communication Breakdown
Human Factors: Training / Qualification
Communication Breakdown.Party1: ATC
Communication Breakdown.Party2: Flight Crew

Events
Anomaly.ATC Issue: All Types
Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
Anomaly.Deviation - Procedural: Published Material / Policy
Anomaly.Deviation - Procedural: Clearance
Anomaly.Inflight Event / Encounter: CFTT / CFIT
Detector.Person: Air Traffic Control
When Detected: In-flight
Result.Air Traffic Control: Issued New Clearance

Assessments
Contributing Factors / Situations: ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations: Human Factors
Contributing Factors / Situations : Procedure  
Primary Problem : Human Factors

**Narrative: 1**

I was training a Developmental on arrival radar. Aircraft X inbound to LWV, a satellite airport just outside of our airspace that we sometimes work approaches into. Aircraft was descended to 030 and they requested direct the final approach fix for the RNAV 9 approach to set up for the visual. Developmental first gave the wrong fix to the wrong approach and cleared the aircraft for the RNAV 18. After pilots second request they were given direct the final approach fix. When the aircraft was observed crossing the fix and turning toward the airport the developmental advised them to report the airport in sight, to which they replied they were established on the approach and would call the airport in sight. I questioned the Developmental on the pilot advising they were established on an approach they were not cleared for. Our radar coverage is not good in that area and we lost the track on the aircraft occasionally, but on the next good hit the aircraft was observed at about 020, when the last assigned altitude was 030. I told the Developmental about the altitude discrepancy and at about that time the aircraft reported the airport in sight and cancelled IFR. There was confusion on both sides with the aircraft proceeding to the final approach fix, advising they were established on an approach they were not cleared for, spotty radar coverage and the Developmental not knowing what to do. Also with it being a high performance aircraft all of this happened pretty quickly and before proper instructions could be given the aircraft cancelled IFR and was switched to advisory as they were within 2-3 miles of the airport. Immediately question the pilot when they advised they were established on the approach.

**Synopsis**

HUF controller reported a BE40 was issued the wrong approach, sent to the wrong fixes, and descended below the MVA while providing training.
**ACN: 1562809** (41 of 50)

**Time / Day**
- Date: 201807
- Local Time Of Day: 1201-1800

**Place**
- Locale Reference, ATC Facility: ZDV.ARTCC
- State Reference: CO
- Altitude, MSL, Single Value: 41000

**Aircraft : 1**
- Reference: X
- ATC / Advisory Center: ZDV
- Make Model Name: Citation Latitude (C680A)
- Crew Size, Number Of Crew: 2
- Operating Under FAR Part: Part 91
- Flight Plan: IFR
- Flight Phase: Descent

**Aircraft : 2**
- Reference: Y
- ATC / Advisory Center: ZDV
- Aircraft Operator: Air Carrier
- Make Model Name: MD-90 Series (DC-9-90) Undifferentiated or Other Model
- Crew Size, Number Of Crew: 2
- Operating Under FAR Part: Part 121
- Flight Plan: IFR
- Mission: Passenger
- Flight Phase: Cruise

**Person : 1**
- Reference: 1
- Location Of Person, Facility: ZDV.ARTCC
- Reporter Organization: Government
- Function, Air Traffic Control: Enroute
- Qualification, Air Traffic Control: Fully Certified
- Experience, Air Traffic Control, Time Certified In Pos 1 (yrs): 12
- ASRS Report Number, Accession Number: 1562809
- Human Factors: Communication Breakdown
- Human Factors: Workload
- Human Factors: Situational Awareness
- Communication Breakdown, Party 1: ATC
- Communication Breakdown, Party 2: Flight Crew

**Person : 2**
- Reference: 2
- Location Of Person, Aircraft: X
- Location In Aircraft: Flight Deck
- Function, Flight Crew: Captain
- Qualification, Flight Crew: Air Transport Pilot (ATP)
ASRS Report Number.Accession Number: 1563224
Human Factors: Confusion
Human Factors: Communication Breakdown
Communication Breakdown.Party1: Flight Crew
Communication Breakdown.Party2: ATC

**Events**

Anomaly.ATC Issue: All Types
Anomaly.Conflict: Airborne Conflict
Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
Anomaly.Deviation - Procedural: Published Material / Policy
Anomaly.Deviation - Procedural: Clearance
Anomaly.Inflight Event / Encounter: Weather / Turbulence
Detector.Automation: Air Traffic Control
Detector.Person: Flight Crew
When Detected: In-flight
Result.Flight Crew: Requested ATC Assistance / Clarification
Result.Flight Crew: Rejected Takeoff
Result.Air Traffic Control: Issued New Clearance

**Assessments**

Contributing Factors / Situations: ATC Equipment / Nav Facility / Buildings
Contributing Factors / Situations: Human Factors
Contributing Factors / Situations: Procedure
Contributing Factors / Situations: Staffing
Primary Problem: Procedure

**Narrative: 1**

I think Sector X was red - or close to it - during our noon push. I was also handling multiple deviations for weather. Our staffing is low, so we did not have a D side at the time to offer me and our supervisor was in recurrent training so we had a CIC on the desk, taking one more controller away from the floor. I felt busy - I descended Aircraft X from FL410 to FL390 to start stepping him down through all my traffic. I think I was busy enough that I don't remember the read back. I continued working on other things and saw conflict alert go off as the Aircraft X pilot asked me if he had traffic. I said yes - and told him I thought I had cleared him to FL390 - he said he answered with FL290. He was a few miles - maybe 3.5 miles lateral from Aircraft Y at FL380. I saw more traffic for him at FL360 so I reissued his clearance to descend to FL370. He repeated FL370.

We need better staffing. We shouldn't be allowing controllers or supervisors to attend classes when we are 1 below the minimum safe number of controllers at the start of the shift. If I had a second pair of eyes or ears, maybe they would have caught it. I haven't listened to the FALCON, but I probably did miss his read back. I don't know.

**Narrative: 2**

Just north of Moab, Denver Center cleared [our flight] to descend to FL290. We read back FL290. We descended from FL410 and approx. FL378, I noticed traffic on TCAS around FL370. I stopped descent and told ATC we have traffic on TCAS. [There was] no TA/RA. Controller replied "say altitude", I replied "descending thru FL378 for FL290". Controller replied "I thought I gave you FL390". I said "no you gave us FL290". Controller replied "descend and maintain FL370".
I listened to our onboard playback of ATC transmissions and Controller clearly said descend and maintain FL290. When this event occurred, we were within 6 miles and 700 ft of traffic. No RA occurred. Additionally, I stopped the descent when I realized we were descending on the traffic's altitude.

Synopsis

Denver Center Controller and corporate pilot reported a loss of separation due to communication error with pilot and ATC.
**ACN: 1562805** (42 of 50)

**Time / Day**
- Date: 201807
- Local Time Of Day: 1201-1800

**Place**
- Locale Reference: ATC Facility: TLH.TRACON
- State Reference: FL
- Altitude.MSL.Single Value: 2400

**Aircraft**
- Reference: X
- Make Model Name: Light Transport, Low Wing, 2 Turbojet Eng
- Crew Size.Number Of Crew: 2
- Operating Under FAR Part: Part 91
- Flight Plan: IFR
- Flight Phase: Final Approach
- Airspace.Class C: TLH

**Person**
- Reference: 1
- Location Of Person.Facility: TLH.TRACON
- Reporter Organization: Government
- Function.Air Traffic Control: Approach
- Qualification.Air Traffic Control: Fully Certified
- Experience.Air Traffic Control.Time Certified In Pos 1 (yrs): 4
- ASRS Report Number.Accession Number: 1562805
- Human Factors: Human-Machine Interface

**Events**
- Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
- Anomaly.Deviation - Procedural: Clearance
- Anomaly.Inflight Event / Encounter: CFTT / CFIT
- Detector.Person: Air Traffic Control
- When Detected: In-flight
- Result.Air Traffic Control: Issued Advisory / Alert

**Assessments**
- Contributing Factors / Situations: Human Factors
- Primary Problem: Human Factors

**Narrative: 1**
We have an MVA defined northeast of the field (026 feet) for a group of antennas. Aircraft X was just approaching the depicted antennas at 3000 and was given an approach clearance to maintain 3000 until established. I observed Aircraft X pass the antenna below the MVA at 2400, but past the obstruction. The surrounding MVA being 018, I repeated the clearance. Ref: 7110.65 5-5-9. The skill level of pilots in the ATC system is drastically
declining. I have saves every week. Examiners need to stop handing out certificates like bubble gum in a pack of baseball cards.

Synopsis

TLH TRACON Controller reported an aircraft descending below the Minimum Vectoring Altitude (MVA).
Time / Day
Date: 201807
Local Time Of Day: 0601-1200

Place
Locale Reference.Airport: BJC.Airport
State Reference: CO
Relative Position.Angle.Radial: 140
Relative Position.Distance.Nautical Miles: 50
Altitude.MSL.Single Value: 7200

Environment
Flight Conditions: VMC
Weather Elements / Visibility: Turbulence
Weather Elements / Visibility.Visibility: 15
Light: Daylight
Ceiling.Single Value: 25000

Aircraft
Reference: X
ATC / Advisory.TRACON: D01
Aircraft Operator: Personal
Make Model Name: Bonanza 35
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: D01

Person
Reference: 1
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
Qualification.Flight Crew: Instrument
Experience.Flight Crew.Total: 945
Experience.Flight Crew.Last 90 Days: 37
Experience.Flight Crew.Type: 635
ASRS Report Number.Accession Number: 1562774
Human Factors: Situational Awareness
Human Factors: Communication Breakdown
Communication Breakdown.Party1: Flight Crew
Communication Breakdown.Party2: ATC
Events
Anomaly.Deviation - Altitude : Overshoot
Anomaly.Deviation - Procedural : Clearance
Anomaly.Inflight Event / Encounter : Weather / Turbulence
Anomaly.Inflight Event / Encounter : CFTT / CFIT
Detector.Person : Air Traffic Control
When Detected : In-flight
Result.Flight Crew : FLC complied w / Automation / Advisory
Result.Flight Crew : Became Reoriented
Result.Air Traffic Control : Issued New Clearance
Result.Air Traffic Control : Issued Advisory / Alert

Assessments
Contributing Factors / Situations : Airspace Structure
Contributing Factors / Situations : Human Factors
Primary Problem : Human Factors

Narrative: 1
I was approaching Class B airspace and being vectored to my home airport. There was mild to moderate turbulence at the time. The controller called and instructed me to change heading, descend, and change frequencies. I repeated back the instructions. I was instructed to descend from 10000 feet to 9000 feet and I apparently acknowledged this in the read back, but in my head, I heard 7000 feet. I changed heading and began descending, and called the next frequency.

On that call, I identified my aircraft, assigned heading and stated "out of 9 point 8 for 7." The new controller gave me a brief acknowledgement. It was busy. General Aviation aircraft are frequently instructed to descend low in this area because of landing and departing commercial aircraft. I did notice I seemed lower than usual. When I reached about 7200 feet, I was called by a controller with a low altitude alert. I responded I was cleared to 7000 feet and asked what altitude he would like me at. He stated I was actually cleared to 9000 feet and to climb. I immediately did this, and shortly afterwards, asked to call the TRACON because of a possible pilot deviation (which I did after landing). The rest of the flight and landing were uneventful.

Obviously, a miscommunication was the root of this problem. Because I received multiple instructions from the controller in significant turbulence, I misheard the assigned altitude, though I apparently initially acknowledged the correct altitude. When I called the next controller and stated the altitude I had "heard," which was incorrect, she did not catch the error. This two-part error chain caused the deviation. To prevent an error on my part like this again, writing down the instructions from ATC would allow me to check the instruction and verify it at the time and later. Also, when I noticed that I seemed lower than usual, I should have called ATC and verified the assigned altitude.

Synopsis
BE 35 pilot reported receiving a low altitude alert from ATC, after mistakenly descending to 7000 feet instead of ATC assigned 9000 feet.
ACN: 1562764 (44 of 50)

Time / Day
Date: 201807
Local Time Of Day: 0601-1200

Place
Locale Reference. ATC Facility: ZZZ.TRACON
State Reference: US
Altitude. MSL. Single Value: 5000

Environment
Flight Conditions: VMC
Weather Elements / Visibility. Visibility: 12
Light: Daylight
Ceiling. Single Value: 12000

Aircraft
Reference: X
ATC / Advisory. TRACON: ZZZ
Aircraft Operator: Personal
Make Model Name: Bonanza 36
Crew Size. Number Of Crew: 1
Operating Under FAR Part: Part 91
Flight Plan: IFR
Mission: Personal
Flight Phase: Cruise
Route In Use: Direct
Airspace. Class E: ZZZ

Component
Aircraft Component: Autopilot
Aircraft Reference: X
Problem: Malfunctioning

Person
Reference: 1
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: Commercial
Qualification. Flight Crew: Multiengine
Experience. Flight Crew. Total: 2200
Experience. Flight Crew. Last 90 Days: 12
Experience. Flight Crew. Type: 221
ASRS Report Number. Accession Number: 1562764

Events
Anomaly.Aircraft Equipment Problem : Less Severe
Anomaly.Deviation - Altitude : Excursion From Assigned Altitude
Anomaly.Deviation - Procedural : Clearance
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Overcame Equipment Problem
Result.Flight Crew : Took Evasive Action

Assessments
Contributing Factors / Situations : Aircraft
Primary Problem : Aircraft

Narrative: 1
I was in level flight at 5000 feet MSL on an IFR flight plan talking to Departure Control. The S-TEC autopilot was in altitude hold mode and had been in such for at least a few minutes. Suddenly, the autopilot pitched up the plane. I caught the altitude increase at approximately 5350 feet MSL. There was not a conflict or even any ATC communication. This is the second time, however, this has happened with this autopilot, but it was at least 20 hours ago. I had flown it and others had during this time with no problems. Approximately 20 hours ago, I was in the plane and the same thing happened in cruise. It was [at] a slower altitude increase and I caught it at about 125 feet altitude increase. I am reporting this to see if there have been other problems with S-TEC AP’s in altitude hold mode.

Synopsis
Beechcraft pilot reported an altitude excursion due to an autopilot malfunction.
**ACN: 1562635 (45 of 50)**

**Time / Day**
- Date: 201807
- Local Time Of Day: 1201-1800

**Place**
- Locale Reference.ATC Facility: ZZZ.ARTCC
- State Reference: US
- Altitude.MSL.Single Value: 32000

**Environment**
- Flight Conditions: Mixed
- Light: Daylight

**Aircraft**
- Reference: X
- ATC / Advisory.Center: ZZZ
- Aircraft Operator: Air Carrier
- Make Model Name: A320
- Crew Size.Number Of Crew: 2
- Operating Under FAR Part: Part 121
- Flight Plan: IFR
- Mission: Passenger
- Flight Phase: Cruise
- Airspace.Class A: ZZZ

**Person**
- Reference: 1
- 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: Air Transport Pilot (ATP)
- ASRS Report Number.Accession Number: 1562635
- Human Factors: Communication Breakdown
- Communication Breakdown.Party1: Flight Crew
- Communication Breakdown.Party2: ATC

**Events**
- Anomaly.Conflict: Airborne Conflict
- Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
- Anomaly.Inflight Event / Encounter: Weather / Turbulence
- Anomaly.Inflight Event / Encounter: Loss Of Aircraft Control
- Detector.Person: Flight Crew
- When Detected: In-flight
- Result.General: Physical Injury / Incapacitation
- Result.General: Maintenance Action
- Result.Flight Crew: Landed As Precaution
- Result.Flight Crew: Returned To Departure Airport
Assessments

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

Narrative: 1

While at level cruise of FL320, we approached a very narrow and rapidly developing isolated thunderstorm. Enroute controllers typically do an exceptional job of calling out severe weather and no such callout was made to alert of the weather. Equally important is the failure of this cell to appear on airborne radar until effectively no time remained to steer clear of it.

I was actually sending an ACARS message to Dispatch to query about enroute weather ahead when I heard the Captain call out an area of weather straight ahead. Initially, he verbalized the weather as yellow, which typically denotes light precipitation, but this was strange primarily because it wasn't showing up on radar prior to such close proximity [and] also the fact that light precipitation doesn't typically exist at such altitudes. Almost like a countdown, the intensity of the weather ahead increased from yellow to red to magenta. From first sign of encountering the weather that led to the upset, was less than 10 NM. The Captain attempted to obtain clearance to deviate, but the frequency was cluttered with other aircraft requiring deviations due to the large number of buildups. By the time the severity of the weather (which led to the event) became apparent, a turn would have been impossible and we concluded that the implications on passengers, staff, and the aircraft would have been far worse if we encountered a severe weather upset while in a bank. For better or worse, we also concluded that the event would be over quite quickly.

From start to finish, we estimate that we gained and lost roughly 1,000 feet of assigned altitude. I do know that we came within 300-400 feet and roughly 3-5 NM of [another air carrier] aircraft, who was given a brisk turn (40 degrees) when we were in the downside of the event. The event began with an aggressive altitude gain, followed by an equally aggressive altitude loss. So, the close proximity to the [other] jet was near the conclusion of the event.

As soon as aircraft control and flight path/assigned altitude were reestablished, the Captain called the flight attendants. Initial reports were of no passenger injuries and very minor injuries of one flight attendant. The second call revealed more extensive injuries [involving] the two aft flight attendants. Up to this point, the Lead Flight Attendant played down the injuries (based on statements made by the affected individuals) and that we could continue to destination. The third communication revealed "...one flight attendant was 'out of commission',," at which point the Captain made the decision to return to [departure airport].

Emergency medical staff awaited the arrival of the flight and the aircraft underwent maintenance inspections following such g-loading forces. The deferral of the No 2 Gen, which was a somewhat complicated deferral procedure for required action items each leg, also restricted operations above FL330. Had we not been constrained by this altitude limit, we would have easily topped this convective buildup. Based on the absence of an alternate, I conclude we could have climbed to at least FL360, if not FL380, based on weight.

Synopsis
A320 First Officer reported returning to departure airport after a Flight Attendant was injured during a thunderstorm encounter.
Time / Day
Date: 201807
Local Time Of Day: 0601-1200

Place
Locale Reference.Airport: DEN.Airport
State Reference: CO
Altitude.MSL.Single Value: 11000

Environment
Flight Conditions: VMC

Aircraft
Reference: X
ATC / Advisory.TRACON: D01
Aircraft Operator: Air Carrier
Make Model Name: B737 Next Generation Undifferentiated
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

Person
Reference: 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: Instrument
Qualification.Flight Crew: Air Transport Pilot (ATP)
Qualification.Flight Crew: Multiengine
Experience.Flight Crew.Type: 2828.12
ASRS Report Number.Accession Number: 1562489
Human Factors: Time Pressure
Human Factors: Human-Machine Interface
Human Factors: Situational Awareness

Events
Anomaly.ATC Issue: All Types
Anomaly.Deviation - Altitude: Undershoot
Anomaly.Deviation - Altitude: Crossing Restriction Not Met
Anomaly.Deviation - Procedural: Published Material / Policy
Anomaly.Deviation - Procedural: Clearance
Detector.Person: Air Traffic Control
When Detected: In-flight
Result.Flight Crew: Returned To Clearance
Result: Flight Crew: Became Reoriented
Result: Air Traffic Control: Issued New Clearance

**Assessments**

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

**Narrative: 1**

I was the Pilot Monitoring (PM) when we received a late change to our expected approach into Denver. We were expecting the ILS 34R and we were given a last minute change to the RNAV (RNP) Z 34R. I was busy on the radio and monitoring our descent while the Captain loaded the FMC. The Captain stated the approach was "in the box" and proceeded to disable the DME and VOR's. He also changed the RNP value. He gave a quick brief and we verified that the airplane was set up properly (ie LNAV VNAV and we were in VNAV PATH). Everything checked out but we missed one thing. We didn't connect the HIMOM fix above the discontinuity. So the aircraft never descended like we expected. ATC queried us and realized we were too high for the approach. He canceled our approach and gave us vectors. We got down and shot a visual approach. No traffic conflict was created. The rest of our approach was uneventful.

**Synopsis**

B737NG First Officer reported an altitude deviation resulted when the FMC was improperly set up for the RNAV (RN) Z approach to 34R in DEN. Reporter stated a last minute change to the clearance contributed to the event.
**Time / Day**
- Date: 201807
- Local Time Of Day: 1801-2400

**Place**
- Locale Reference. ATC Facility: SEFG.ARTCC
- State Reference: FO
- Altitude. MSL. Single Value: 17100

**Environment**
- Flight Conditions: VMC

**Aircraft**
- Reference: X
- ATC / Advisory.Center: SEFG
- Aircraft Operator: Air Carrier
- Make Model Name: Large Transport
- Crew Size. Number Of Crew: 2
- Operating Under FAR Part: Part 121
- Flight Plan: IFR
- Mission: Passenger
- Flight Phase: Initial Approach

**Person**
- Reference: 1
- 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: Instrument
- Qualification. Flight Crew: Multiengine
- Experience. Flight Crew. Total: 8000
- ASRS Report Number. Accession Number: 1562217

**Events**
- Anomaly. Deviation - Altitude: Excursion From Assigned Altitude
- Anomaly. Deviation - Procedural: Published Material / Policy
- Anomaly. Inflight Event / Encounter: CFTT / CFIT
- Detector. Person: Flight Crew
- When Detected: In-flight
- Result. Flight Crew: Became Reoriented
- Result. Air Traffic Control: Provided Assistance

**Assessments**
Contributing Factors / Situations : Environment - Non Weather Related
Contributing Factors / Situations : Human Factors
Primary Problem : Human Factors

Narrative: 1

On approach into Quito, SEQM, we were cleared for the ILS Z 36. The approach requires we maintain FL180 until crossing QIT VOR. The Captain was pilot flying. Upon getting cleared for approach and in VNAV PTH he set minimums in the altitude window. He was a little high to make the altitude crossing and the recommended speed of 220 KIAS at QIT. I was looking up our missed, single engine missed, taxi and gate location on my iPad when I looked over to see the CA (Captain) had selected vertical speed mode, 3000 FPM down and was descending through 17,100 ft prior to QIT, instead of maintaining FL180 for terrain clearance as depicted and briefed on approach. I quickly advised him to level off as we were not yet permitted to descend on approach. Quito Approach queried us and we explained we were maintaining 17,000 feet. The remainder of the approach and landing occurred without incident and NO EGPWS EVENT WAS TRIGGERED.

Synopsis

Air carrier First Officer reported the Captain began a descent too early in a high terrain area.


**ACN: 1562196 (48 of 50)**

**Time / Day**
- Date: 201807
- Local Time Of Day: 0001-0600

**Place**
- Locale Reference: ATC Facility: VHHK.ARTCC
- State Reference: FO
- Altitude.MSL.Single Value: 22700

**Environment**
- Flight Conditions: VMC

**Aircraft**
- Reference: X
- ATC / Advisory.Center: VHHK
- Aircraft Operator: Air Carrier
- Make Model Name: B747-400
- Crew Size.Number Of Crew: 3
- Operating Under FAR Part: Part 121
- Flight Plan: IFR
- Flight Phase: Descent

**Person**
- Reference: 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: Instrument
- Qualification.Flight Crew: Air Transport Pilot (ATP)
- Qualification.Flight Crew: Multiengine
- ASRS Report Number.Accession Number: 1562196
- Human Factors: Communication Breakdown
- Human Factors: Confusion
- Communication Breakdown.Party1: Flight Crew
- Communication Breakdown.Party2: ATC

**Events**
- Anomaly.ATC Issue: All Types
- Anomaly.Deviation - Altitude: Excursion From Assigned Altitude
- Anomaly.Deviation - Altitude: Crossing Restriction Not Met
- Anomaly.Deviation - Procedural: Published Material / Policy
- Anomaly.Deviation - Procedural: Clearance
- 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
Assessments
Contribute Factors / Situations : Airport
Contribute Factors / Situations : Environment - Non Weather Related
Contribute Factors / Situations : Human Factors
Primary Problem : Human Factors

Narrative: 1
We arrived at the VHHK FIR from the northeast. Guangzhou Control had cleared us via en route descent from FL410 to cross SIERA at FL230. The PF (pilot flying) set the MCP altitude to 23000 ft and the PM (pilot monitoring) entered a hard altitude restriction in the CDU (Control Display Panel) Legs page.

Based on ATIS, we had preloaded and briefed the SIERA 7C arrival to Runway 07L. We pre-contacted VHHK Radar 3 min prior to SIERA and they said to expect the SIERA 7A arrival, a shorter routing. The PM reloaded the FMC accordingly and briefed the changes.

As we neared SIERA, Guangzhou Control handed us off to VHHK Radar, who said “Cleared the SIERA 7A arrival, Runway 07L”, with no further altitude instructions. The PF then stated we could descend to FL110 per the lowest altitude depicted on the STAR, at MURRY, an intermediate point on the arrival, and set the MCP (Mode Control Panel) altitude to 11000 ft.

The PM checked the pEFB (Jepps page 10-2N, SIERA 7A RWYS 07L/R) for a lower altitude at LIMES, the last point on the STAR and IAF for the ILS Runway 07L approach, but no altitude was depicted there. Realizing “something’s not right”, the PM intended to query VHHK Radar about our altitude clearance before reaching TOD (Top of descent) at SIERA.

But by then the aircraft had already started to descend. The PM noticed this, asked the PF why we were descending, and stated we still needed to honor the assigned FL230 restriction at SIERA. The PF quickly selected ALT HOLD on the MCP and the aircraft leveled off at [approximately] FL227, now past SIERA.

Before we could clarify the clearance with VHHK Radar, they queried us: "What altitude were you assigned?" The PM replied "We were cleared the SIERA 7A arrival" so ATC could instruct us whether to climb back up or continue our descent. At this point they directed us to descend to FL220, after which they vectored us off the arrival.

We were later assigned a different STAR and landed on Runway 07L without further incident.

Our first mistake was initially interpreting the arrival clearance as a "descend-via"--but we hadn't heard that phrase. The combination of VHHK Radar not restating the altitude assigned by Guangzhou, and the PF setting the MCP to 11000 ft, led the PM to temporarily accept this interpretation.

However, feeling an intermediate altitude didn't make sense for a descend-via procedure, and not finding the expected lowest altitude depicted at LIMES (3000-6000 ft per Jepps page 11-2, ILS Rwy 07L), the PM began to recognize our first error.
Unfortunately, we'd already made a second mistake when the PF, unnoticed by the PM, had inadvertently pressed the MCP altitude select knob after setting 11000 ft. This deleted the programmed restriction at SIERA and caused the aircraft to descend before we could discuss, query and/or correct the misinterpreted clearance.

At some point prior to or during these events, the [relief pilot] had left the flight deck after the descent checklist. Thus he wasn't available to help monitor and trap these errors.

Crews should carefully pre-study arrival procedures, including all applicable routing, altitudes, and notes. In our case this would have revealed that the SIERA 7A/C STAR is not designed for a descend-via clearance, both lacking a depicted final descent altitude at LIMES AND featuring a boxed warning "DO NOT DESCEND WITHOUT ATC CLEARANCE". While we initially believed we HAD been cleared to descend, "connecting all the dots" beforehand would have helped avoid this Expectation/Confirmation Bias related error.

Crews must remain aware of the difference between "descend-via" and routing-only arrival clearances, listen carefully to the verbiage, and query ATC for clarification if necessary BEFORE leaving an assigned altitude--especially following a handoff to a new controlling agency.

PFs must remain aware of the effects of pressing the MCP altitude select knob, and both PF and PM must verify after setting it (via PFD, FMA, CDU, etc) that (only) the intended effect was achieved.

[Relief pilots] should plan ahead for the descent, complete all duties, and remain on the flight deck from TOD through the shutdown checklist, per the FOM. In the case of an extended cruise/en-route descent, where final TOD is less clearly defined, a good rule-of-thumb would be to man all duty stations from descent checklist through shutdown.

**Synopsis**

B747 Captain reported an altitude deviation following confusion regarding the ATC clearance.
Time / Day
Date: 201807
Local Time Of Day: 1201-1800

Place
Locale Reference: Airport: TYS.Airport
State Reference: TN
Altitude.MSL.Single Value: 2200

Environment
Flight Conditions: VMC
Light: Daylight

Aircraft
Reference: X
ATC / Advisory.Tower: TYS
Aircraft Operator: Personal
Make Model Name: Cirrus Vision SJ50
Crew Size.Number Of Crew: 1
Operating Under FAR Part: Part 91
Flight Plan: IFR
Mission: Training
Flight Phase: Final Approach
Airspace.Class C: TYS

Person
Reference: 1
Location Of Person.Aircraft: X
Location In Aircraft: Flight Deck
Reporter Organization: Personal
Function: Flight Crew: Instructor
Qualification: Flight Crew: Instrument
Qualification: Flight Crew: Air Transport Pilot (ATP)
Qualification: Flight Crew: Flight Instructor
Experience.Flight Crew.Total: 3400
Experience.Flight Crew.Last 90 Days: 150
Experience.Flight Crew.Type: 500
ASRS Report Number.Accession Number: 1561927
Human Factors: Training / Qualification
Human Factors: Distraction
Human Factors: Situational Awareness

Events
Anomaly.Deviation - Altitude: Overshoot
Anomaly.Deviation - Procedural: Published Material / Policy
Anomaly.Deviation - Procedural: Clearance
Anomaly.Inflight Event / Encounter: CFTT / CFIT
Detector.Person: Flight Crew
Detector.Person: Air Traffic Control
When Detected: In-flight
Result. Flight Crew: FLC complied w/ Automation / Advisory
Result. Flight Crew: Became Reoriented
Result. Air Traffic Control: Issued Advisory / Alert

Assessments
Contributing Factors / Situations: Chart Or Publication
Contributing Factors / Situations: Company Policy
Contributing Factors / Situations: Human Factors
Contributing Factors / Situations: Procedure
Primary Problem: Company Policy

Narrative: 1
My student got very low on an approach. I was hoping he would realize his mistake without my intervention. I forgot that we had picked up an IFR to get through a patch of rain. We were VMC at the time and obstacle clearance was assured. We received a low altitude alert from ATC and at that point, we called off the approach and officially changed it to a Visual Approach and landed.

Synopsis
An instructor pilot reported observing the student descend too low on the approach when ATC issued a low altitude alert.
**ACN: 1561873 (50 of 50)**

**Time / Day**
- Date: 201807
- Local Time Of Day: 0601-1200

**Place**
- Locale Reference.Airport: ZZZ.Airport
- State Reference: US
- Altitude.AGL.Single Value: 400

**Environment**
- Flight Conditions: VMC
- Weather Elements / Visibility: Visibility: 9
- Light: Daylight

**Aircraft: 1**
- Reference: X
- Make Model Name: PA-28 Cherokee/Archer/Dakota/Pillan/Warrior
- Crew Size.Number Of Crew: 2
- Operating Under FAR Part: Other
- Flight Plan: None
- Mission: Training
- Flight Phase: Final Approach
- Route In Use: Visual Approach
- Airspace.Class D: ZZZ

**Aircraft: 2**
- Reference: Y
- Aircraft Operator: Personal
- Make Model Name: Cessna Single Piston Undifferentiated or Other Model
- Crew Size.Number Of Crew: 1
- Operating Under FAR Part: Part 91
- Flight Phase: Cruise

**Person**
- Reference: 1
- Location Of Person.Aircraft: X
- Location In Aircraft: Flight Deck
- Function.Flight Crew: Pilot Flying
- Qualification.Flight Crew: Instrument
- Qualification.Flight Crew: Commercial
- Qualification.Flight Crew: Flight Instructor
- Qualification.Flight Crew: Multiengine
- Experience.Flight Crew.Last 90 Days: 140
- Experience.Flight Crew.Type: 315
- ASRS Report Number.Accession Number: 1561873

**Events**
Anomaly.Conflict : NMAC
Anomaly.Deviation - Altitude : Excursion From Assigned Altitude
Anomaly.Deviation - Procedural : Clearance
Detector.Automation : Aircraft TA
Detector.Person : Flight Crew
Miss Distance.Horizontal : 0
Miss Distance.Vertical : 100
When Detected : In-flight
Result.Flight Crew : FLC complied w / Automation / Advisory
Result.Flight Crew : Took Evasive Action

Assessments
Contributing Factors / Situations : Airspace Structure
Contributing Factors / Situations : Human Factors
Primary Problem : Human Factors

Narrative: 1
I was conducting take off and landing practice with a student, staying in the traffic pattern at ZZZ. At approximately 500 AGL, on short final for 17R my student was flying when I noticed a Cessna at our altitude on a collision course. At the same time the TCAS reported the traffic and I took controls to emergency descend below the traffic. At that time ZZZ Tower reported traffic alert and that he was unaware of where that traffic was going. I completed a normal landing and ended the training flight.

Synopsis
PA28 flight instructor reported a NMAC with a Cessna on short final.