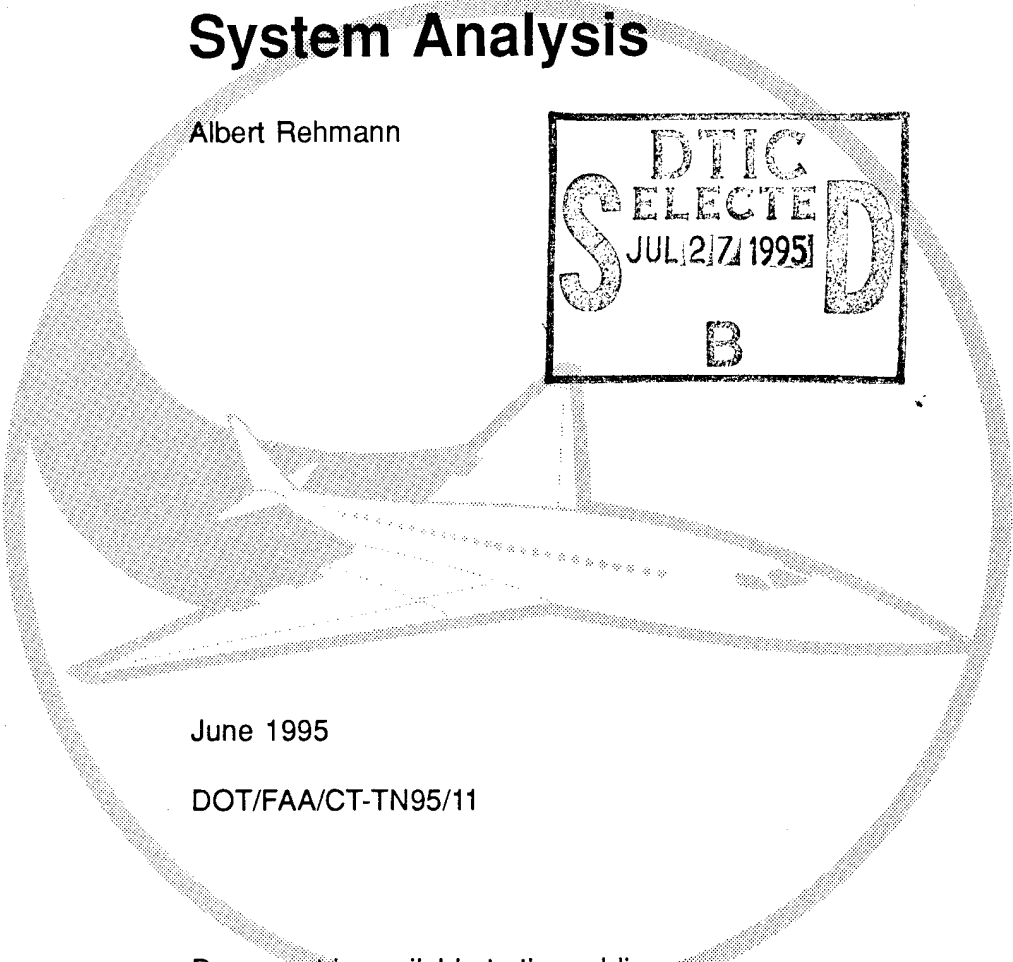
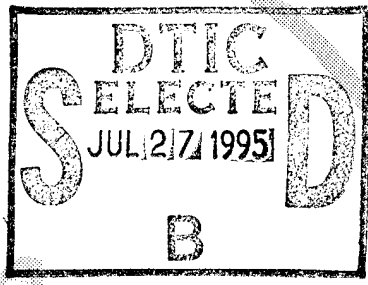


19950724 000 technical note technical

# Flightdeck Automation Issues: An Aviation Safety Reporting System Analysis

Albert Rehmann

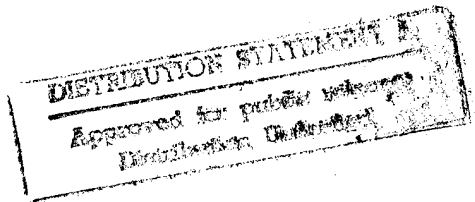


June 1995

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16. Abstract This document describes an analysis of the Aviation Safety Reporting System (ASRS) with regards to human factors aspects concerning the implementation of data link into the flightdeck. The ASRS database contains thousands of reports concerning actual or potential deficiencies which may compromise the safety of aviation operations in the National Airspace System (NAS). The purpose of this study was twofold: first, to provide the Federal Aviation Administration (FAA) an account of the problems associated with today's highly automated aircraft; and secondly, to report the likelihood that these problems may be exacerbated and/or lessened due to the implementation of data link into the flightdeck.  Detailed analysis of the ASRS reports yielded four major automation problems, specifically those attributed to the following: (1) Automation Failure, (2) Programming Errors, (3) Distraction due to Programming, and (4) Mismanagement and Confusion of Automation Systems. Conclusions are drawn from examining each problem area in order to assess both positive and negative aspects pertinent to the addition of data link on the flightdeck.					
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## FOREWORD

This report documents work performed by Crew System Ergonomics Information Analysis Center (CSERIAC) on subtask 2 out of three of the task entitled "Aviation Safety Reporting System Analysis." The task was a provision of an Interagency Agreement between the Federal Aviation Administration (FAA) Technical Center (Department of Transportation (DOT)) and the Defense Technical Information Center (DTIC). It was conducted under DOD Contract Number DLA900-88-D-0393, and the CSERIAC Task Number was 93956-19. The CSERIAC Program Manager was Mr. Don Dreesbach. The CSERIAC Task Leader was Mr. Michael C. Reynolds. The FAA Technical Program Manager (TPM) was Mr. Albert J. Rehmann, and the FAA project engineer was Mr. Pocholo Bravo.

Special thanks to all personnel at the Aviation Safety Reporting System (ASRS), located at National Aeronautics and Space Administration (NASA) Ames Research Center, for their cooperation.

## EXECUTIVE SUMMARY

This document describes the second of three studies relating to the analysis of the Aviation Safety Reporting System (ASRS) with regards to human factors aspects concerning the implementation of data link into the flightdeck. The ASRS database contains thousands of reports concerning actual or potential deficiencies which may compromise the safety of aviation operations in the National Airspace System (NAS). The purpose of this study was twofold: first, to provide the Federal Aviation Administration (FAA) an account of the problems associated with today's highly automated aircraft; and secondly, to report the likelihood that these problems may be exacerbated and/or lessened due to the implementation of data link into the flightdeck.

A list of words relating to automation was provided to National Aeronautics and Space Administration (NASA) Ames ASRS research analysts for the purposes of searching the database. Approximately 300 incident reports were analyzed, of which a third were considered relevant to the task. Additional detailed analysis yielded four major automation problems, specifically, those attributed to the following: (1) Automation Failure, (2) Programming Errors, (3) Distraction due to Programming and, (4) Mismanagement and Confusion of Automation Systems. Each problem area was further magnified by the crew's trust and over-reliance on the automation systems which resulted, e.g., in periods of monitoring complacency. Conclusions are drawn from examining each problem area in order to assess both positive and negative aspects pertinent to the addition of data link on the flightdeck.

## 1. INTRODUCTION.

### 1.1 GENERAL.

The Aviation Safety Reporting System (ASRS) database provides a convenient 'lessons learned' outlook from both a pilots' and controllers' perspective and is used by engineers to design improvements and modifications to existing systems. One of these systems, the flight management system (FMS), is viewed in some sectors, as the heart of the automation explosion; many systems are jointly working together to provide full-flight navigation and thrust management control. In the midst of all this technology are the humans and they are thrust in an ever changing dynamic environment. As one pilot put it:

"No amount of technology relieves the pilots of their duties of basic airmanship. Technological advancements have in my opinion greatly enhanced and improved virtually all facets of aviation. However, errors will still be made by both the machinery and the pilots who control the machinery..."  
[ASRS, 223044]

The narrative above was chosen because it not only describes the general atmosphere portrayed throughout the pilot community, but it also captures the essence of this analysis report. The work described herein is an analysis of information "narratives" obtained from the ASRS database on the errors associated with highly automated, technologically advanced systems.

First, the report will provide a brief introduction of the ASRS reporting system (section 1.2), its history and function within the National Airspace System (NAS). Section 3. (Objective) describes the analysis objective and section 4. (Procedures) provides a comprehensive explanation of the tasks performed to formulate this report, from the initial contact with ASRS to the receiving and analyzing of the incident reports.

Section 5. (Results and Discussion) contains the bulk of the research. Briefly, those issues found to be the most prevalent in the ASRS database search are the following: (1) Automation Failure, (2) Programming Errors, (3) Distraction due to Programming and, (4) Mismanagement and Confusion of Automation Systems. A separate section (Lack of Monitoring/Over-Reliance, section 5.3.1) is provided to discuss the prevalence of monitoring deficiencies exhibited throughout each problem area. Each problem area will be reviewed in detail and supplemented with actual narrative reports provided by the flight crews.

Section 6. (Conclusion) will provide discussion, in the context of the errors reported, on the positive and negative aspects of a coupled automation and data link environment. The report will conclude with some recommendations for future work to further investigate automation issues on the flight deck (section 7.).



## 1.2 ASRS DATABASE.

The ASRS was established in 1975 under a Memorandum of Agreement (MOA) between the Federal Aviation Administration (FAA) and National Aeronautics and Space Administration (NASA). The FAA provides most of the program funding, while NASA administers the program and sets its policies. This cooperative safety reporting program invites pilots, controllers, and other users of the NAS to report to NASA actual or potential deficiencies involving the safety of aviation operations. At the time of this search, the ASRS database contained 48,193 full-form reports received since January 1, 1986.

ASRS data are used to support planning and improvements to the NAS, and strengthen aviation human factors safety research. All submissions to ASRS are completely voluntary and are held in strict confidence. Furthermore, the FAA determined that ASRS would be more effective if receipt, processing, and analysis were performed by NASA. This would ensure the anonymity of all reporters, as well as those involved in the incident. Consequently, this anonymity has increased the flow of information necessary for the effective evaluation of the safety and efficiency of the NAS.

The FAA offers ASRS reporters further guarantees to report safety incidents. It is committed not to use ASRS information in enforcement actions. It has also chosen to waive fines and penalties for unintentional violations of Federal Aviation Regulations (FARs) which are reported to ASRS. The FAA's initiation of ASRS and its agreement to waive penalties prove the importance it puts on gathering information about potential aviation safety deficiencies.

Incident reports are read and analyzed by ASRS aviation safety analysts. Each report is read by at least two analysts. Their first task is to look for any aviation hazards discussed in the reports. When a hazard is identified, an alerting message is sent to the appropriate FAA office. The analyst's next task is to classify reports and determine the causes underlying each reported incident. Once analysis is completed the ASRS reports are ready to be de-identified and entered into the database. The de-identification process involves generalizing or eliminating all information that could be used to infer an identity of the reporter.

## 2. BACKGROUND.

Many aviation accidents that are investigated by the National Transportation Safety Board (NTSB) are caused by breakdowns in information transfer--the communication among crew members and from a larger degree, between aircraft and ground-based facilities. Analysis of these accident reports has resulted in many design changes, from aircraft display issues to changes in communication procedures.

Nonetheless, it is not always the case that the cause of an error is known, thereby robbing the research community of an explanation for such accidents. In an attempt to gain further information with regards to deficiencies and discrepancies in the NAS, the ASRS was established to collect anonymous accounts of incidents that have safety implications that have not, necessarily, resulted in a catastrophic event. The review and analyses of the ASRS data has resulted in a further understanding of the pilot/crew and controller environments and the problems associated with both.

Though, today, the NAS is the safest it has ever been, new and different kinds of errors have arrived. The arrival of the "glass cockpit" and the increased levels of automation have shifted the crews task workload from active participation to passive monitoring. This loss in activity has left the crew "out-of-the-loop" and has resulted in the deterioration of the pilot's situational awareness (SA); degradation in the "pilot's internal model of the world around him at any point in time" (Endsley, 1988).

Simply adding new technology for technology's sake has to be examined carefully; researchers must address, from a system's point-of-view, the overall impact of automation and its apparent effects on the pilot/crew. For example, the advent of digital data communications (data link) into the NAS, in part, may alleviate communication problems by: (1) providing more efficient data routing and increase rates of information transfer, (2) eliminating crowded frequencies and congestion over the airwaves, and (3) reducing ambiguity in communication between pilots and controllers. However, in spite of the many advantages, data link also proposes to increase the crew's visual task workload which, in turn, increases the potential for error and/or cause loss of SA. From the flight deck perspective, the bottleneck is not in the transfer of information but rather, in the receipt and interpretation of the information.

It is well known throughout the data link research community that present flight deck automation systems are ahead of similar ground capabilities. Until modern ground automation systems are implemented, such as those identified under the Advanced Automation System (AAS), flight deck automation systems will not be used to their full potential. For example, with data link, timely transfer of strategic flight information to the crew may better accommodate the capabilities of onboard flight navigation systems by allowing crews to reduce the arduous task of programming them.

Improper integration of data link controls and displays is a prominent human factors concern; simply adding a new device (black box) and/or display requires additional "button pushing" and "heads-down" time already prevalent in today's automated cockpit. Also celebrated in the research literature is the notion that highly automated systems result in boredom and

complacency to the point that crews are "lagging behind" the automation. It is hypothesized that many incidents will reveal such human behavior, and thus, the focus of this report will be to provide data from the pilots perspective of such instances.

### 3. OBJECTIVE.

This subtask takes advantage of the ASRS data base, wherein pilots report incidents or conditions observed in daily operations which may compromise safety of flight. As a result of the anonymity associated with the reports, as discussed earlier, pilots routinely generate reports and the resultant database is current and extensive. Therefore, the ASRS database is valuable to researchers studying problem areas. This report analyzes the results of a search of the ASRS database. The focus was on human factors issues stemming from the crew's interaction with onboard automated systems and what types of flight strategic errors may occur. The extent of these errors will be judged in the context of a data link environment.

### 4. PROCEDURE.

The ASRS analysis of automation problems required a great deal of preliminary research before the actual task began. The initial phase of the research required making contact with ASRS and determining how to go about conducting a search. Contact was made with an ASRS employee, discussion took place with regards to the capabilities of ASRS and how to initiate a search. A list of keywords dealing with automation had to be sent to ASRS to begin the search. The results were forecasted to be delivered in 2-to-3 weeks.

A list of broad keywords was developed by the Crew System Ergonomics Information Analysis Center (CSERIAC) FAA staff from previous knowledge in the area of automation. These keywords were then used to search the Wright-Patterson Air Force Base Technical Library's database of scientific research reports. The Library has a CD-ROM system containing thousands of scientific research reports from a variety of informational databases, i.e., National Technical Information Service (NTIS), Aerospace, Compendex, etc. The broad keywords were used to search the database and produced hundreds of reports dealing in automation topics. A quick review of these reports was done at the CD-ROM workstation, and any relevant reports were downloaded to diskettes.

The reports were searched for relevant keywords that could be used in the ASRS search on automation. After reviewing the research reports, a comprehensive list of keywords was compiled. This list was scrutinized and any overlapping or unnecessary keywords were deleted to generate a more specific list. Finally, a roundtable discussion with group members was used to arrive at a single keyword list to best search the ASRS database. During this discussion, the most important keywords to better specify

the search were determined. Table 1 contains the keyword list as it was sent to ASRS.

TABLE 1. AUTOMATION KEYWORDS

- |                            |                                    |
|----------------------------|------------------------------------|
| - Automation               | - Glass Cockpit                    |
| - Cockpit Automation       | - Automation Failure               |
| - Flight Automation        | - Crew Resource Management         |
| - Automatic Control        | - Flight Management System (FMS)   |
| - Automatic Flight Control | - Flight Management Computer (FMC) |
| - Function Allocation      | - Mode Control Panel (MCP)         |
| - Advanced Technology      | - Boredom                          |
| - Information Management   | - Complacency                      |
| - Systems Monitoring       | - Vigilance                        |

This list was faxed to ASRS along with a cover letter describing that automation was the area of concern for our search. A followup phone call was placed to ASRS to discuss any problems or concerns with the keyword list for the automation search. After receiving our keyword list, ASRS needed 4 weeks to perform our search and send us the results in electronic form.

Upon receipt of the ASRS search results (291 reports), the reports were analyzed according to their relevance to the task. Prior to the detailed analysis, CSERIAC FAA task members agreed to select incident reports that met certain criteria. As the focus of this research was on the pilots' perspective, reports containing narratives from controllers and/or maintenance personnel were automatically discarded. Behaviors such as complacency, boredom, and over-reliance were considered useful if reported in the narratives.

As a general rule, the approach was not to assume that crews were lacking in their monitoring capabilities, unless it was by their own admission. Obvious incidents, such as programming the wrong route of flight in the navigation system, were not necessarily faults of the automation, but nonetheless, they were considered as useful to this research. In these cases, it would be safe to assume that crews exhibited some monitoring deficiency and/or behavior that may lead to the potential for complacency.

Based on this selection criteria, the reports were analyzed and grouped. Out of 291 reports, 100 were considered useful for this study. For the interested reader, the entire list of useful reports is provided in appendix A.

## 5. RESULTS AND DISCUSSION.

The ASRS database is comprised of voluntary reports from aviation system users, e.g., pilots and air traffic controllers. From a statistical point of view, the voluntary nature and sampling characteristics of these reports prevents any inferential analysis of the data. Descriptive statistics are provided and these data are not generalizable to the population of automation incidents. Emphasis will be on providing information from the pilots perspective, through example narratives, without the deluge of statistics.

First, the intent of this report is not to place blame. It is important to note that with any human-machine interface, errors will occur. Secondly, cockpit automation has enabled crews to perform precise flight maneuvers and navigate more efficiently. The availability of automation has resulted in increases in display flexibility, reliability, and economy of cockpit space.

Section 5.1 addresses, from a global perspective, the overall hit rate and additional shortcomings of the ASRS database. Section 5.2 will provide information on the various classifications of the data and section 5.3 will provide more detail on the various automation problems extracted from the ASRS search.

### 5.1 ASRS SEARCH.

Previous searches of the ASRS database resulted in very low hit rates. These rates were attributed to a variety of reasons. For this search, a high hit rate (34 percent) was obtained. This rate may reflect the broader nature of the search topic.

An ASRS requirement that all searches be linked to a major system in the aircraft, e.g., Flight Management System, Mode Control Panel, etc., may have positively affected the results in this search. As mentioned previously, the FMS is considered the heart of automation and has sparked the interest of the aviation community. Pilots are generally intrigued by the capabilities of the system. Airlines conduct training courses specifically for its use. So in some sense, the FMS is at the forefront and its performance is always being complimented or criticized.

### 5.2 ASRS REPORT CLASSIFICATION.

The purpose of this section is to provide a snapshot of the various classification data that was derived from the 100 good reports. Descriptive data will be provided along with a brief discussion for each.

Due to the declassification of incident data, certain results required the author's subjective opinions. Determination of phase of flight (e.g., approach versus descent) data (section 5.2.3) was derived from the report narrative. Interpretation of

the narrative reports was also used to derive the experience level (section 5.2.5) of the flight crews.

#### 5.2.1 Automation Systems.

Automation systems are comprised of two basic functions: control and monitoring. The control function is most often recognized, or associated with "automation." The latter function, monitoring, is the class of systems which provides automatic alerting conditions to the pilot, such as the Ground Proximity Warning System (GPWS). In some sense, the control function is where the flight crew is monitoring the automation, and the monitoring function is where the automation is monitoring the flight crew. The data obtained in this report deals with controlled automation.

All the systems referred to in the report can be labeled as "navigation systems"; 96 percent refer to the FMS, and the rest refer to either the Performance Management System (PMS) or Area Navigation (RNAV) systems. The basic function of the FMS is to provide an integrated, full-flight regime capability to provide automatic navigation and thrust management control.

The FMS is comprised of many interconnecting systems. Figure 1 denotes the breakdown of the ASRS reports into individual FMS components. The FMS Control Display Unit (CDU) was directly involved in over half (58 percent) of the incidents reported. A separate class (FMS/General) was created to indicate those reports where the specific FMS component was inconclusive; 18 percent of the incident reports fell in this category. The remaining reports were directly attributed to either the autopilot (9 percent), autothrottle (8 percent) and flight director (3 percent) systems.

## AUTOMATION

Equipment

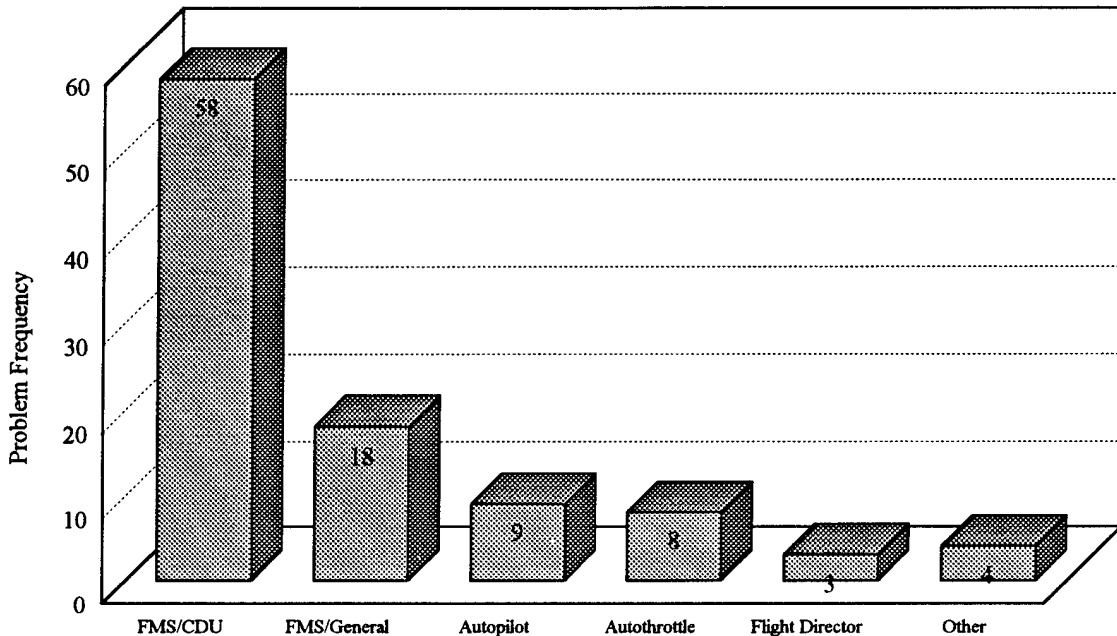


FIGURE 1. AUTOMATION EQUIPMENT

### 5.2.2 Automation Problem.

After initial review of the ASRS report narratives, it was evident that monitoring deficiencies, lack of vigilance, and over-reliance were common behaviors cited by the crews. Research has already shown that these behaviors are common in automated aircraft (Weiner, 1988; Billings, 1991). Though exhibited throughout the reports, our focus was on determining the specific events or situations (automation failure, programming of FMS, etc.) which led to these types of behaviors. Therefore, a subsequent, more detailed analysis was conducted.

Figure 2 illustrates the results of the detailed analysis. Although the problems are separated in unique categories, crews reported monitoring deficiencies, complacency, etc., throughout each problem area. In order of their percentage, the following major problems are noted as follows: (1) Automation Failure (27 percent), (2) Misprogramming (24 percent), (3) Distraction due to Programming (19 percent), and (4) Mismanagement and Confusion (19 percent).

## AUTOMATION

### Problems

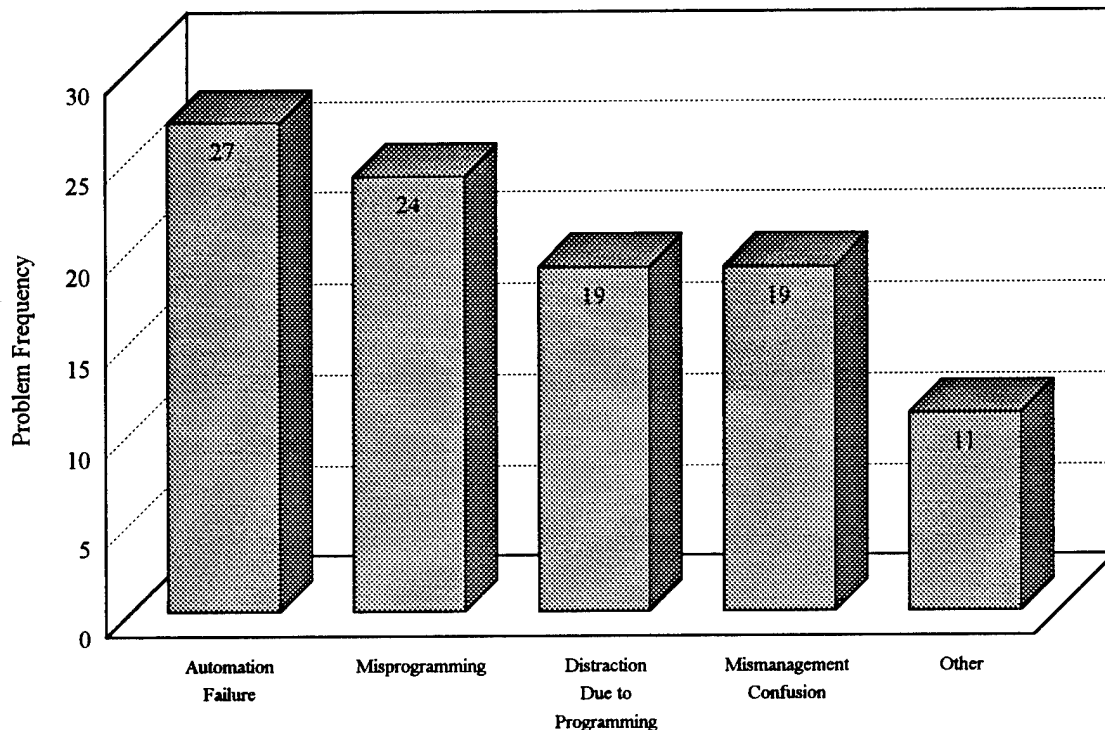


FIGURE 2. AUTOMATION PROBLEMS

In retrospect, observing the various classifications of automation problems (figure 2) one can see the association with related literature. For instance, Sheridan's (Sheridan, 1991) concept of human-centered automation portrays the pilot undergoing four supervisory activities amidst automation. Sheridan addresses each activity in a conceptual framework, where each function is related to and is dependent upon another. The four supervisory activities of human-centered automation are: Planning, Deciding, Monitoring, and Intervening.

Each supervisory activity is represented across the automation problems shown in figure 2. The first two activities, Planning and Deciding, deal with the abilities of the crews to understand the performance characteristics of the navigation systems and how to program them to achieve specified mission goals. Not surprisingly, these behaviors are manifested within the majority of automation incident problems; i.e., approximately 62 percent of the problems reported were directly attributed to the programming (24 percent, Misprogramming; 19 percent, Distraction due to Programming) and overall mismanagement (19 percent, Mismanagement/Confusion) of the navigation systems.



The third supervisory activity, Monitoring, is the ability of the crew to attend to the automation systems, and to derive information about the current state of the aircraft. Although not uniquely addressed in figure 2, each automation problem contained incidents where the crews exhibited monitoring deficiencies.

The fourth activity relates to the crews ability to 'Intervene' when the automation systems are failing; this behavior accounts for 27 percent of the reported automation incidents. One concern among the research industry (SAE, 1991) is the ability of pilots to suddenly take over when automation fails, that is, is there a degradation in basic flying skills because of over-reliance on automation?

### 5.2.3 Incident Error.

This section will describe incident errors which are the byproducts of the automation problems discussed in section 5.2.2. Examples of incident errors are altitude, heading, and speed deviations. The classification of incident errors are provided in figure 3.

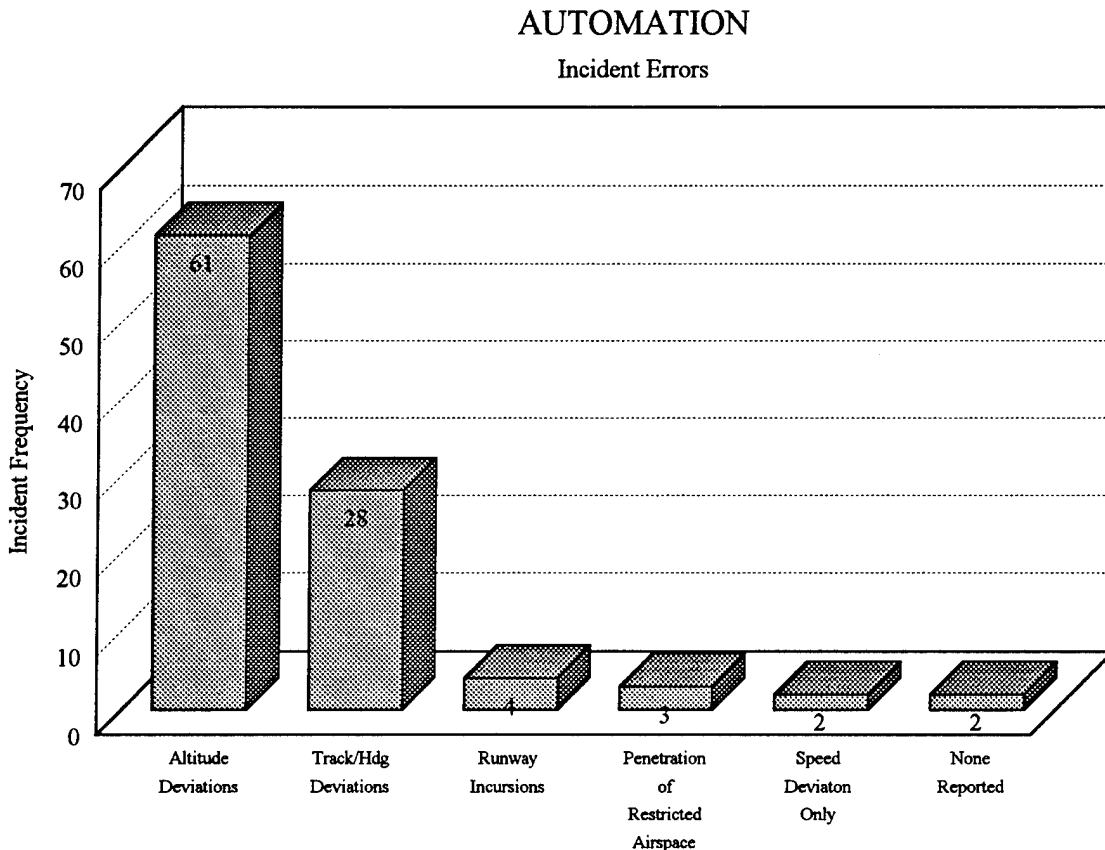


FIGURE 3. INCIDENT ERRORS

The majority (89 percent) of incident errors were a result of an altitude or track deviation. Recognizing that automation systems are designed to maintain controlled flight, the propensity for these types of errors is not difficult to infer. The real question is: What circumstances, under controlled flight, are causing these deviations?

One pilot's response to an altitude deviation was:

"This deviation seems to have been a classic case of being spoiled by the additional avionics and workload reducing niceties provided in the aircraft and with the loss of these aids and the digital display on the flight guidance system the initial lapse that transpired between their loss and flying the aircraft via raw data information resulted in an altitude deviation..." [ASRS, 128888]

yet, another response was:

"Don't know if center saw us going through FL220 or just a friendly reminder. FMC (Flight Management Computer) is smart, breeds complacency -- probably takes as much attention monitoring FMC as it does if you just fly it yourself..." [ASRS, 87287]

The first narrative was a result of an automation failure. The crew spent some time adjusting to flying via raw data and the lapse in time to adjust resulted in the deviation. Section 5.3.2 (Automation Failure) contains many instances where the crews were "behind" the automation and not cross-checking or supplementing raw data information while using the automation system.

The second pilot admitted to complacency and did not monitor the FMC system properly. In this example, the primary causal factor was the pilot's mismanagement of the VNAV (Vertical Navigation) profile; what he/she thought was correct, was in fact not. (See section 5.3.5, for further examples.)

Almost half of the altitude deviations reported dealt with the inability of the crews to make crossing restrictions. The primary causes for missing the crossing restrictions were due to the mismanagement of the VNAV profile descent. Either the crews programmed the descent restrictions incorrectly in the computer or the crews were not properly monitoring the aircraft in the execution of the descent path.

Other types of errors, such as, runway incursion, penetration of restricted airspace, and speed deviations were not as prevalent. However, all of the runway incursion incidents were a result of the crews distraction due to programming of the flight management systems (see section 5.3.4, Distraction due to Programming). With regards to speed deviations, the figure is somewhat misleading. Some incidents reported multiple deviations, such as

altitude and speeds. The first listed incident error was chosen for the analysis.

#### 5.2.4 Phase of Flight.

The ability of pilots to remain vigilant throughout the flight depends on a variety of factors. For example, periods of low workload, such as those endured over long oceanic flights may contribute to a lack of vigilance. Conversely, vigilance may also decrease in periods of extreme workload conditions. To help visualize this, two figures were created and are provided below. The first provides overall error percentages by phase of flight (figure 4), and the second (figure 5), reveals the types of automation problems occurring during each phase.

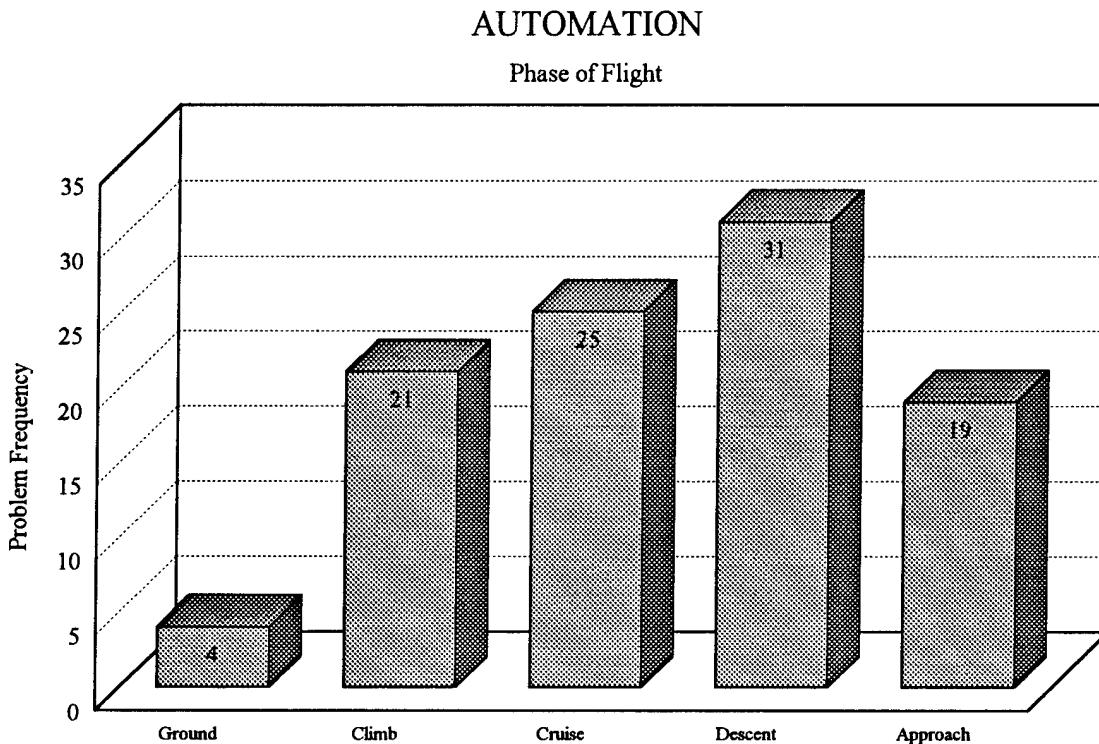


FIGURE 4. PHASE OF FLIGHT

With regards to figure 4, the cruise portion of flight resulted in only 25 percent of the reported incidents. It appears that more incidents (71 percent) were occurring in expected high workload conditions (climb, descent, and approach) than during expected low workload conditions (cruise).

Moreover, almost half of the reported incidents during cruise flight were due to misprogramming of the FMS on the ground (see figure 5, the high peak). The crews were not aware (lack of monitoring?) of the programming error until later in cruise flight. What makes it even more interesting is that the crews were sometimes informed by air traffic control (ATC); almost always resulting in a gross navigational error.

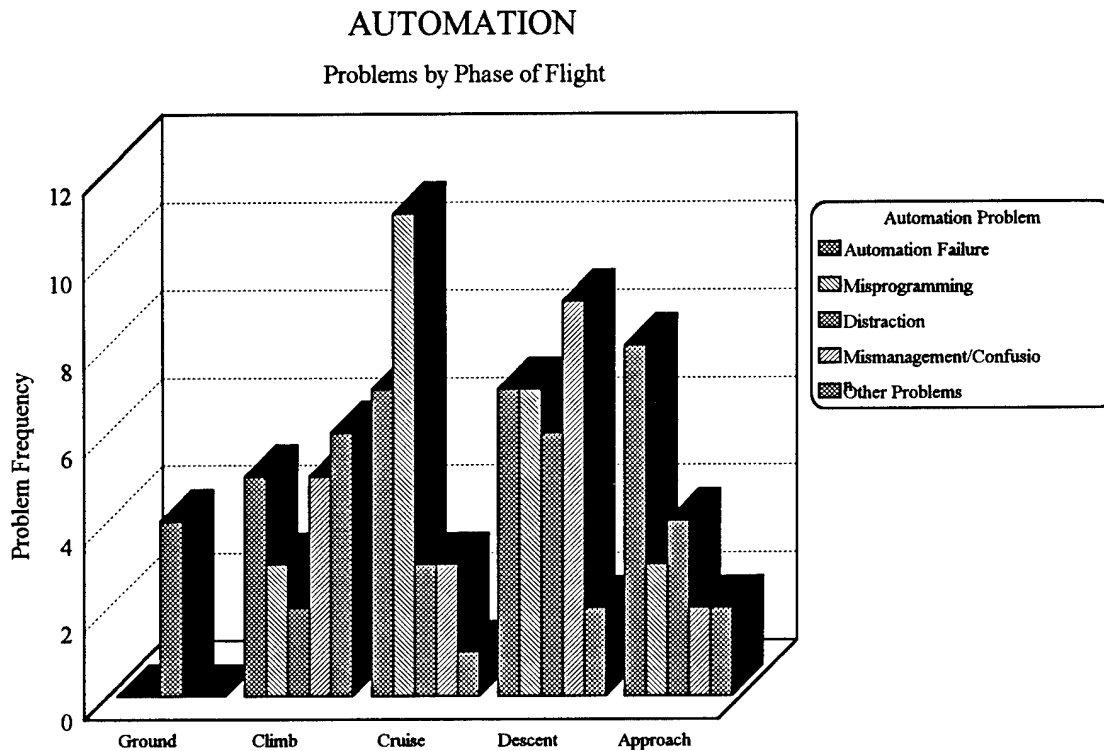


FIGURE 5. PROBLEMS BY PHASE OF FLIGHT

During the descent and approach phase, the crews are working the radios, receiving last minute updates on arrival runways, Automated Terminal Information Service (ATIS), etc., in addition to monitoring the flight management system. It could be quite easy for the crews to ignore the automation in order to attend to other flight duties. However, as reported by the pilots themselves, excessive workload demands were only found in 6 percent of the reports (see section 5.3.6, Further Automation Issues). The factors most responsible for errors occurring in the post-cruise regime were: automation failure (28 percent); mismanagement, confusion (22 percent); misprogramming (20 percent) and distraction due to programming (18 percent).

A point about distraction--through receipt of "party line" information or experience on the route, some alert crews would

program the navigation systems in advance. This would allow the crews enough time to attend to other duties during an important phase of flight. Some crews would become preoccupied with programming the computers, later realizing that if they had taken control of the yoke instead, they would have met the restriction. As one pilot put it:

"VNAV mode did not respond to his inputs, and I let the situation progress too far before intervening.....Company puts too much emphasis on automation. I should have made it clear -- use the automation only when you have plenty of time for it to respond" [ASRS, 213229].

The above example represents an incident where the crew was experiencing difficulty with the vertical profile (VNAV) mode of the FMS. During the climb and descent phases of flight, mismanagement of the VNAV mode was common. Crews were not monitoring the execution of the climb (or descent) which usually resulted in an altitude deviation or missed crossing restriction.

#### 5.2.5 Aircraft Type/Experience Level.

As part of the ASRS declassification procedure, the aircraft type is categorized only by size of aircraft, e.g., wide body, large transport, etc. A compilation of the incident reports into these various classes was performed and is provided in table 2.

TABLE 2. TYPE OF AIRCRAFT

MLG -56%	medium large transport (60,001-150,000 lbs) e.g., Boeing 737, Fokker 100, MD 87
WDB -23%	wide body (over 300,000 lbs) e.g., Airbus A340, Boeing 747, MD 11
LGT -18%	large transport (150,001-300,000 lbs) e.g., MD 88, Boeing 757, Airbus A320

Note: two of the reports received were for the light transport class (14,501-30,000 lbs) and one was a military transport.

Even though over half the incidents were of the medium large transport (MLG) type, one should not infer that aircraft falling in this class are more susceptible to automation problems. The data may simply reflect that this type of aircraft is most prevalent in the fleet.

With regards to experience level, only 27 percent of the incident reports provided the experience level of the flight crews. Of those reports, two-thirds reported low levels (less than 100 hours flight time) of experience attributed to the "glass cockpit" or automation systems aboard their aircraft.

### 5.3 AUTOMATION PROBLEMS--FURTHER DISCUSSION.

This section will expand upon each of the problem areas identified in section 5.2.2 by providing an overview, complete with example narratives from the crews. For the sake of brevity, it is not possible to provide complete excerpts from all of the report narratives, a select few will provide the thrust of the problem area being identified. Appendix A is provided which includes all the full form reports used in the analysis.

Furthermore, the problems that are discussed, although separated in unique categories, are not mutually exclusive. The overlap is primarily due to reasons stated before; i.e., lack of monitoring, over-reliance, etc., were human behaviors exhibited throughout each problem category.

#### 5.3.1 Lack of Monitoring/Over-Reliance.

A number of incidents were caused because of monitoring deficiencies, complacency, etc. The tone of the report narratives is that trust and over-reliance on the automation systems breeds complacency. Even more experienced crews were falling into the trap, for example:

"Both the captain and I have enough FMC experience and in our discussion agreed the system does not seem to function acceptably in descent. The FMC requires monitoring at all times, like any other navigation system. Its unique capabilities and performance can lull the crew into a degree of 'monitoring complacency' which can be insidious....I will be much more vigilant while operating the FMC to ensure the system performs as it is programmed" [ASRS, 110778].

The effects of increased levels of automation also have a profound effect on the pilot's situational awareness. Crews are so reliant on the automation to provide current state information (position, etc.,) that they are failing to cross-check with the raw data. Continued operation in this manner may be acceptable if the automation systems were infallible, but this is unrealistic. Pilots must stay ahead of the automation, not behind it. It appears as if some crews have adopted a "reactive" strategy as opposed to a "proactive" or anticipatory strategy.

After one crew's failure to meet a speed/crossing restriction on descent, they reflected as follows:

"It appeared that there might be several concerns arising out of this incident. First, the 'glass cockpit' environment is pushing more and more toward automating the entire flight and the crews are to a greater or lesser extent being lulled into an operational complacency. Had we not programmed the FMS chances of the SPD reduction occurring would no doubt have been reduced without someone questioning what was going on. This dependence on

automation does two things: (1) It develops a false sense of operational reliance on the equipment to do the job, and (2) it reduces situational awareness....with those crews operating a 'glass cockpit'" [ASRS, 193909].

The following is yet another example of the crews over-reliance on automation--this resulted in missing an altitude/crossing restriction on climbout:

"VNAV was selected and aircraft began accelerating to 310 knots. Rate of climb was reduced. At 14000 ft. Captain went to VOR manual to check distance and discovered he was 3 miles beyond 8 DME fix already. Captain was unsure of altitude when crossing the 8 DME fix. Reduced climb rate due to increasing speed to economy climb was not monitored adequately to assure meeting the crossing restriction. The LAX 041/8 DME fix should have been entered by crew and displayed on map. Crew relied too heavily on 'glass' and for a short period, lost situational awareness. Nothing was said by ATC to indicate that the crossing altitude was not reached, but crew did not monitor position closely enough to be sure." [ASRS, 183689].

The above example clearly shows that if the crew had cross-checked the raw data information (VOR, etc.) sooner, the resultant deviation could have been avoided. In spite of this, the crew stated that an additional fix entry on the map display may have helped. This clearly demonstrates the mind set of the crews and the airlines in general: use the automation to its fullest.

### 5.3.2 Automation Failure.

The previous task on crew alerting identified a class of safety incidents whereby the crews were overwhelmed with multiple alerts and failures in the systems. One could argue that the ability of the pilots to assess the situation in a timely manner is dependent on the number of such failures. Inundated with multiple failures could prevent the crews from maintaining level flight, etc. In this review only six (22 percent) of the incidents were labeled (by ASRS) as critical or resulting in multiple automation failures; the others were less severe. It would appear that the crews are not responding quickly and effectively when confronted with automation failure. These safety incidents could have been avoided if the crews were cross-checking raw data information with the automation prior to onset of failure.

In support of the crews, some modern aircraft are built so aerodynamically clean, that minor malfunctions in the autopilot system are not as noticeable to the crews. Still, this does not remove the crews responsibility of monitoring their altitude, track, etc. In fact, the main problem with automation failure is not so much the monitoring of the automation systems, but rather

in the monitoring of the raw data navigation equipment. In some cases, the lapse in time, from initial recognition of failure to reacquainting oneself with raw data information, was too long and resulted in many deviations. To illustrate, some examples will be provided. Note: the equipment problem will be noted above each narrative example.

FMC dumps departure information:

"....one of the problems was that I was relying on the FMC too much for departure and not x-checking with the departure plate.....In the future I will rely on traditional nav aids for FMC backup. I also made the mistake of using too small a scale for the NAV display. On a larger scale I would have seen the error.." [ASRS, 174632].

Crew experiences inertial reference system (IRS) alignment problem on ground; realizes later they should have backed up the FMS with raw data:

"The copilot and I believe that computer malfunction was responsible for the missed crossing restriction. However, we have learned that backing up the computer with raw data from the NAV receiver could prevent an occurrence of this sort in the future" [ASRS, 81969].

One crew had experienced prior problems with an autoflight system that was disconnecting on level-offs which required manual intervention. Even with this knowledge, a later occurrence (during the same flight) resulted in an altitude bust:

"I believe the automation of some of the elements of flying has taken the pilot out of the 'basic loop', and the human challenge is to now manage the 'electronic assistants' efficiently and safely. One should always question the reliability of this equipment, even if you have no reason to suspect failure." [ASRS, 82921].

The following is an example of the crew experiencing difficulty monitoring the FMS/CDU because of sunlight. The FMC eventually malfunctioned and overshot the top of descent point by 60 DME:

"Both pilots were flying into the sun and wearing sunglasses, which made monitoring my particular FMC even harder. Sometime between 80 DME and 60 DME from the fix, with FMC and MCP accurately programmed and with the appropriate displays in view, the VNAV portion of the FMC/MCP interface malfunctioned and did not command the required descent at the top of descent point (no message was ever displayed on the FMC's to alert us of the malfunction). At 60 DME from the fix I became aware that the FMC was not initiating the expected descent, and advised the caption of the need to get down." [ASRS, 182888].



This example resulted in the aircraft penetrating special use airspace (Military Operation Area (MOA)) because of a malfunctioning FMS:

"...we had possibly entered the Kingsville 1 MOA, which closely paralleled the right side of our course. To guard against further incidents of this nature in the future, we would keep the NAV chart immediately available and closely monitor our position...to insure that we remain well clear of all special use airspace. Be better prepared to switch to secondary NAV sources when it becomes evident that the primary system is malfunctioning." [ASRS, 189056].

Another concern in the research industry is the apparent loss of flying skills. Pilots have grown accustomed to using the automation that they experience a degradation in basic flying skills. Part of basic flying skills, is using the analog instruments. One pilot commented:

"...Go with what you know. The old needle/DME tells you where you are and where you need to go, immediately. After flying the glass cockpit for 15 months, I'm not really sure it's better than the old 'analog' stuff. The analog instruments serve to keep your 'brain engaged to the NAV solution'" [ASRS, 217823].

To a great extent, most of the incidents reported only minor deviations from the flight path. The potential exists, however, that continued disregard of basic flying skills and monitoring of the raw data, may some day result in a major catastrophe. To attest to the severity that this behavior may some day cause, a final narrative is provided.

To set the stage, one crew experienced capture of a "phantom" glide slope (GS) on approach and were following commands of the flight director under IFR conditions:

"As we intercepted the GS the flight director commanded a reverse pitch of 35 deg nose up, the captain initially followed the flight director and we climbed about to 9500-9800 ft. Had we continued to follow the flight director we would have had a full power stall in IFR conditions....Don't trust FMS/FD information without a raw data backup and if one is not immediately available, revert to attitude instrument flying basics. I believe we are slowly working ourselves into 'detrimental reliance' on FMS/Glass Cockpits/Autoflight systems. They will lead you 'down the path' but experience and vigilance will determine if you follow. My forecast: Somebody is going to fly one of these high-tech airplanes into the ground within 3 years because of being out of the loop. 'If they give me one more labor savings device, I won't have time to use it!'" [ASRS, 198371]

### 5.3.3 Misprogramming.

A property of automatic navigation systems is that crews must program them. As with any control device, human error in its operation will occur. Prior to actual programming of the automation systems, crews must plan the appropriate actions to take. The unique capabilities of the flight management system control display unit (FMS/CDU) provides the crews the ability to conduct planning, or "what if" type operations. Unfortunately, the amount of planning the crew has available to them, depends on a number of factors, such as the timeliness of ATC instruction, length of flight, etc. Nonetheless, regardless of how much time they have, simple, thoughtless programming mistakes are occurring.

The breakdown in type and number of misprogramming errors is as follows: (1) Incorrect route of flight entered (46 percent), (2) Inadequate programming of VNAV climb, descent, and approach profile (37 percent), and (3) Wrong fix entered (17 percent).

Unfortunately, programming errors may not be noticed immediately in digital flight guidance systems. This often results in gross navigational errors. Sometimes, the crews are informed by ATC, as to the deviation. The following is an example of such an instance:

"Just after center issued our clearance, I was relieved and went on a rest period in the cabin. Normally this is where somebody would check the FMS route with the book, but with the shift change and some complacency, none of us did. The result was a NAV deviation that center discovered....In the future, I will check our FMS loaded route with the flight plan filed route section and will also make a greater effort to guard against complacency" [ASRS, 237717].

At some airlines, flight plans can be loaded automatically into the flight management systems via the Aircraft Communication Addressing and Reporting System (ACARS) Very High Frequency (VHF) data link. Company routes traveled often can be loaded automatically, by entering route identification names, as opposed to entering manually each waypoint, jet airway, Standard Instrument Departure (SID), etc. Use of these methods alleviates some of the programming errors that may occur. Unfortunately, even these auto-load methods result in errors, as in the example below:

"During preflight, loaded FMC with company route 'DCACLE'. The correct route should have been 'DCACLE1'...Nowhere on the printed flight plan is the company route designated as 'DCACLE' or 'DCACLE1' when multiple choices are available. This problem could have been avoided had a thorough check of the FMC flight plan been accomplished and compared to the printed flight plan which was filed with ATC...It is very easy to fall into the trap of trusting the FMC so much that

cross-checks are not made and complacency sets in" [ASRS, 124225].

Regardless of the labor saving methods available, periods of complacency are still exhibited among the crews. Graphical displays, such as the map display, provide a plan view picture of the route of flight as it is entered into the flight management system. This provides an excellent source of feedback to the crews--that is, if it is used properly:

"The problem arose from an incorrect present position entered in the FMS computer. Apparently, the future destination was entered as our present position, making the map of our route on our NAV display backward. After takeoff, the departure controller cleared us to 10000 ft. and 'cleared on course'. As the PNF, I slued the flight director heading bug toward the first fix on our route of flight as depicted on the NAV display, not realizing it was taking us in the opposite direction of our intended destination. When the departure controller asked us why we were on a S-Westerly course vice a N-Easterly course, we immediately realized our map display was backwards and turned towards our destination using normal NAV means. This is one of those mistakes made by relying solely on computer generated NAV. A computer is only as good as the information it is given (GIGO, Garbage In-Garbage Out)" [ASRS, 228661].

As you can see, no amount of labor savings devices could alleviate some types of programming errors. The flight crews must continually monitor the effect of their programmed inputs, even if the system does not react. Unfortunately, the mindset of many pilots is just that: "If it doesn't complain then it must be OKAY."

It was reported (section 5.2.3) that over half of the altitude deviations were the result of missing a crossing restriction (climb, descent); normally the crews were utilizing the VNAV mode. The FMS VNAV mode is a combined pitch and thrust guidance mode. Pitch axis guidance is provided via the autopilot/flight director and thrust guidance via the autothrottle. The command of this mode is controlled through the Mode Control Panel (MCP) or in some aircraft the Automatic Flight Director System Panel (AFDS).

Key to the performance of VNAV is that altitudes and/or speeds selected and displayed on the MCP have overriding authority over the FMS; that is, regardless of whether the FMS has programmed restrictions along the descent (climb) profile or not. This is but one complexity of the combined FMS/MCP interface. Crews must develop an internal model of the automation system which contains many of these complex interactions and functions.

Over time this internal model will develop, but crews are still exhibiting complacency, for example:

"Flight was enroute to DTW at FL370. Just after passing MKG VOR, flight was cleared to descend to cross 40 miles east of the crossing point with the altitude restriction. Passing through FL290, center asked us if we were going to make our restriction, since we were already 45 miles east of the MKG VOR. We apologized and increased our descent rate to FL240, and switched to assigned frequency. We had somehow entered the wrong information into the FMC. In my opinion, there was too much reliance on the black boxes to successfully plan our descent. Furthermore, we did not back up our FMC NAV. If I had simply tuned in the MKG VOR/DME, I would have been able to realize by looking at the DME that we were not going to make the 40 mile restriction. Too much complacency with the FMC NAV. Never again!!" [ASRS, 181368]

To summarize, the crews were making thoughtless programming mistakes. These types of errors can be controlled through additional training and or experience. Emphasis should be placed on cross-checking programmed inputs with available raw data information.

#### 5.3.4 Distraction Due to Programming.

Reliance on the automation systems can be characterized in two different ways: (1) the crews could either sit back, relax, and monitor their performance--error of omission, or (2) they could try to program themselves out of trouble--error of commission.

To put this in perspective, Hart Langer (United Airlines' senior vice president-flight operations) made the following comment in a 1990 issue of Aviation Week & Space Technology (AW&ST):

"Flight management systems control display units (FMS/CDU) act as 'cockpit vacuum cleaners' -- they suck eyeballs and fingertips right into them...I have given check rides on these aircraft and seen four eyeballs and 10 fingertips caught in two FMS/CDU's at the same time...This is bad enough at cruise altitudes, but it can be lethal in the low-altitude terminal area"[AW&ST, April 30, 1990].

Interestingly enough, over half of the problems reporting distraction due to programming were in the descent and approach phases of flight, less than a fifth were during cruise flight. A look at the reports reveals that during the descent and approach phases crews were sometimes busy receiving multiple altitude, speed, and heading changes (vectors for traffic), communicating with ATIS, and in some instances receiving last minute runway changes. Recognizing this increase in workload, crews would still resort to programming the FMS which caused other important flight duties (looking out for traffic, runways, etc.) to be delayed or overlooked entirely. For example:

"ATIS informed us to plan a visual approach to 18R...The new controller told us to expect 17L and a short final. The time involved with reprogramming everything took me until base leg...I was busy reprogramming the radios and FMS for the third time and did not notice the copilot had lined up on 18R. After checking frequencies and courses very quickly, I looked outside and started to tell the copilot he had lined up on the wrong runway..." [ASRS, 180082].

Furthermore, due to the structure/de-identification of the ASRS reports, it was difficult to infer the experience levels of the crews. Only 3 of the 19 reports in this class reported any experience level at all, all 3 were considered low. One could speculate that low experience levels invite crews to experiment more, when simply turning the automation off would have solved the problem. They are sometimes led into the false perception that automation will solve all their problems. Unfortunately, this should be reserved for training exercises, not during flight.

The next two reports, provide examples of those crews who admitted their unfamiliarity with the FMS and "glass cockpit." The first example demonstrates the need to be "heads up," especially when on final:

"Nearing completion of a 3 hr flight. The flight was cleared for a night visual approach to runway 35 R at DFW. The visibility was exceptionally good. The pilot flying had approximately 100 hrs in the aircraft...The FMS was programmed for runway 35 R and the PF was using the map display on the HSI for lineup as the runway lights were not yet visible. Just as the 36 L/R lights were coming into view, the TWR offered 35 L (no ILS) and the crew accepted...the PF looked out and saw the 36 L/R lights and mistook the runway pair as runway 35 L/R...and a landing was made. The following factors were believed to have contributed to this event: (a) F/O, PF had minimum time in the aircraft, (b) changing of approach from 35R to 35L late on final, thus involving a reprogramming of FMS, diverting needed attention from outside at critical time... most importantly, preoccupation by crew on FMS/instrumentation late in the approach when outside vigilance was necessary/more important" [ASRS, 63447].

The second example:

"The captain was upset, busy trying to program the FMC and didn't think much of my advice. Being new in the automated cockpit, I find that pilots are spending too much time playing with the computers in critical times rather than flying the aircraft. No one looks outside for traffic." [ASRS, 234297]

To summarize, the crew's decision to program the FMS/CDU depends on a variety of factors. At the very least, as crews grow accustomed to the capabilities of the FMS/CDU through continued ground training and more on the job experience, situations like those described above could be avoided. Crews would be able to manage their time more effectively by knowing ahead of time that, in certain situations, resorting to programming of the automation systems would be counterproductive rather than productive.

### 5.3.5 Mismanagement/Confusion.

Section 5.3.3 identified many instances where the crews incorrectly programmed the automation system, such as the route of flight, incorrect waypoint, etc. These all dealt primarily with the CDU interface, and thusly were more focused on one device. The types of errors that were occurring were simple input errors. Changes in the CDU interface design may reduce the chances of these errors occurring.

The operation of the FMS deals with more than just the interaction with the CDU; it involves the understanding and interaction of a variety of onboard systems. The autopilot, autothrottle, and flight director systems together provide various modes/submodes of operation, that are controlled, e.g., through the MCP. Some modes are more intuitive than others, whereas others require more thought and preplanning to execute them effectively.

The mismanagement of the automation is more than just simple programming errors (typos, etc.). It is the confusion of, or expectations of the way the system is working--a much deeper cognitive demand on the crews. Moreover, the use of automation increases the demand for systems awareness; asking fundamental questions about the performance of the automation in order to stay on top of it.

The state and behavior of the automation depends, in part, on the feedback that is provided to the crews. The feedback, e.g., must supplement the feel that is inherent with manual control. Feedback designs, whether good or bad, are insignificant if the crews are not closely coupled with the automation in the first place. Also, sharing and communicating information about the current behavior of the automation could supplement otherwise poor feedback designs.

In general, the types of errors reported in this section can be summarized into three categories resulting from (1) the crews expectation of the system (42 percent), (2) improper decision making (42 percent) and (3) total misuse or lack of training on the systems (16 percent).

Crew expectations deal with the crew's false perceptions or misinterpretations of what the automation systems are doing or not doing. Sometimes the crew expected, because of selecting a

mode of operation, that the system would perform a certain way. What happens, e.g., is the automation system suddenly performs an unexpected control move. Sometimes, if the crew was alert and monitoring the outcome of their inputs, they would arrest the automation and revert to manual flying. Regardless of whether the crew seized the automation at the proper time, or not, it was still the crews misunderstanding of the system which caused the error in the first place. The following example resulted in a 700-foot altitude deviation which summarizes the essence of this type of problem:

"We had received a clearance to climb to 16000', direct to the SRP VORTAC on the 23-minute flight from TUS to PHX...As is standard practice at our company, I set the new clearance limit altitude (10000') in the altitude selector of the autopilot/flight director system mode control panel, mentally assuring myself that the autopilot would level the aircraft at 16000' since that was the clearance altitude programmed in the FMC...Normally, we don't receive descent clearances before reaching the assigned cruise altitude. Normally, we set the altitude selector or alerter to the new clearance limit altitude as soon as we receive it. I did this automatically without considering that it might be an invalid response. We're psychologically programmed to expect things to happen with a machine based on our experience with what usually happens. With this airplane's EFIS during a climb or descent in the VNAV mode, the airplane will level off at the cruise altitude programmed in the FMC even if the altitude selector is set at a higher (during climb) or lower (during descent). Altitude Ex: FMC cruise altitude FL330, cleared to FL370, altitude selector set to 370, autopilot levels the airplane at FL330..... Happens all the time, so I knew the autopilot would level the aircraft at 16000'. Wrong! what I did, in fact, was tell it to stop at an altitude I wasn't on the way to. The autopilot then reverted to the CWS pitch mode, in which the airplane keeps on going in the last direction it was pointed, until the pilot points it somewhere else with the yoke. There is no aural warning when this happens, the autopilot hasn't disconnected, it's just holding a pitch attitude. There's a small yellow CWS pitch warning on the EADI, but it has to be looked at to be seen...I also knew that I'd have time to stow my departure plates before approaching 16000', as the autopilot starts a smooth level off as a function of rate of climb and would be reducing its rate out of about 13000'. Wrong Again!..."[ASRS, 77914].

In fairness to the above crew, the autopilot system had reverted to a pitch mode (CWS) that was not obvious to the crew. However, the crew later reflected:

"The new technology machinery (FMS, EFIS, etc.) is marvelous, but it suckers us into complacency...In my experience, there's a much higher incidence of

altitude/spd/route busts in the FMC-equipped aircraft, largely (I think) because the system is so complex that there are many opportunities for faulty programming...Continually emphasize the importance of devoting your full attention to monitoring the flight...Always follow up any changes in autopilot/flight director mode with a check of the mode annunciator. In new technology aircraft, this means every time you push a button" [ASRS, 77914].

To reiterate, the ability of the crew to plan ahead and anticipate is essential to effective operation of onboard automation systems. Secondly, crews must allow ample amount of time to program the systems in order to meet flight restrictions, speeds, altitudes, etc. The deciding or decision making stage deals with this aspect. Effective decision making also involves knowing when to revert from automation control to manual control, even when there is no reason to suspect failure. For example, crews would be so preoccupied with using the automation (not necessarily the FMS/CDU, as discussed in the previous section) that turning the system off and resorting to manual flying would have been the correct choice. A case in point follows:

"Finally I shut off the autothrottle.....At this point, I finally wised up and decided to quit battling the autoflight system (which I obviously was not really in command of at this time). Almost immediately, I was able to get the airplane on heading, on airspeed, on altitude and in the configuration I desired....I was obviously unable to make the aircraft do what I wanted it to do using the autoflight system. I waited too long to disconnect the autoflight system and to hand fly the aircraft...make the decision to fly manually as soon as I feel myself getting behind or am unable to get the desired results from the autoflight system" [ASRS, 209690].

Although the majority of problems noted in this section could be attributed to lack of training and/or total confusion only a few crews (3 of 19) admitted to it. Expressions such as "...more thorough training" were used to describe the incidents, for example:

"As the captain added power we tried to climb and got the initial stall buffet. At about the same time we were cleared for lower by center. He told us his altitude alarm had sounded but didn't mention it again. The captain was surprised the power had come back as he didn't make any inputs to the PMS to make it start down. I am new in the airplane and have not had much experience with the PMS as it is only installed in a few of our aircraft and is not stressed much in ground school...Perhaps, more thorough training with the PMS system could have help avoid this" [ASRS, 70681].



To summarize, crews must understand completely the capabilities of the automation systems. Some time should be set aside to plan and decide the course of action or the programming steps to take. In addition, crews should always anticipate the effects of their programmed inputs as well as know the implications of such actions.

#### 5.3.6 Further Automation Issues.

The majority of the reports fell into one of the four previously mentioned categories: Automation Failure, Misprogramming, Distraction due to Programming, and Mismanagement/Confusion. The performance exhibited by the crews was directly related to the incident errors. The remaining reports, however, resulted from distractions effecting the ability of the crews to perform appropriately. More specifically, 6 percent of the reports were attributed to increases in the level of workload which reduced the ability of the crews to effectively monitor the systems and 5 percent were the result of system deficiencies.

All of the workload reports occurred during expected high workload conditions; i.e., during climbout or in descent. As one pilot put it:

"The workload in a 2-man, hi-technology airplane can get very, very high at times -- especially on approach." [ASRS, 228355]

During peak workload conditions, crews should stay closely coupled with the automation system in the event of a system failure, or unsuspected mode change. For example, a crew experiencing heavy workload during descent experienced an unwanted autopilot mode change, and reported the following:

"The cause of this uncommanded climb was never determined by crew and did not result in any traffic conflict to our knowledge. Taking into account the complexity of the MLG FMC and its ability to revert automatically from one mode to another as well as the high cockpit workload at this point, one has no time to try and diagnose the reason behind and unwanted autopilot action and disconnection is the only prudent action" [ASRS, 192224].

With regards to system deficiencies, on some occasions the crews would realize that certain fix points called out by ATC were not in the database and would try to create one, thus causing a distraction of their primary duties of flying the airplane (section 5.3.4). For example:

"I would recommend that on automated cockpits, the necessary checkpoints be in the FMC data base, or ATC not use points not programmed into the data base. Also, both these situations could have been prevented if we had not depended

so much on the automation and gone back to basic flying"  
[ASRS, 128735].

and another:

"This event involves a feeling of complacency brought on by the latest generation of highly automated, glass cockpit airplanes...The capability to fully program complex procedures (SIDS, STARS, transitions, approaches) can lead to a perception on the part of the flight crew that the FMS, once programmed, will follow a particular procedure fully and completely...Our sense of 'automated complacency' lead us to believe that a heading of 226 deg was correct as we busied ourselves with approach briefings and checklists...We know that the chart is gospel and that the FMS should always be verified against the charts, yet we allowed ourselves, during a busy work period, to fully trust the automated system, which we erroneously assumed was complete and correct" [ASRS, 210639].

To summarize, although these examples resulted from workload and system deficiencies, crews still reported a sense of complacency and over-reliance on the automation systems.

## 6. CONCLUSIONS.

The objective of this research was to search the Aviation Safety Reporting System (ASRS) database for occurrences of automation induced problems and, secondly, to investigate the likelihood that these errors would be intensified or lessened due to the implementation of data link into the flight deck.

First, the reader must keep in mind that the conclusions drawn are purely speculative in nature. They are derived, solely in the context of the types of errors reported in this ASRS search and analysis and are not based on rigid scientific research.

Secondly, with or without data link, the types of automation problems noted in this report can be alleviated through additional training on the part of the crews. Increased awareness through ground simulation exercises or through crew resource management (CRM) training are excellent examples.

This section will be broken up into two parts: The first part will be a discussion on the potential negative impact that data link may have on automation; and, the second part will be a discussion on the positive impact that data link may have on automation.

### 6.1 DATA LINK--NEGATIVE IMPACT ON AUTOMATION.

Section 5. discussed problems induced by highly automated flight decks. Through the words of the pilots, the most salient behavior exhibited throughout all the classes of problems was

complacency. In turn, this behavior was intensified by the apparent trust and over-reliance of the automation systems, normally resulting in monitoring deficiencies.

These deficiencies may manifest themselves more so in a data link environment. Taking away the majority of voice communication could result in a flight deck that is too quiet, thereby increasing the likelihood of boredom and complacency. This could be construed as taking the pilot "further out of the loop," not only from the flight deck perspective, as is evident with the effects of automation, but also from a system perspective--changing the way that pilots and controllers have communicated since the dawn of aviation.

It was also argued (section 5.3.3, 5.3.4) that digital systems invite certain types of errors. Replacing "human voice" with digital transmissions carries with it these same classes of problems. To illustrate, the present voice system provides checks and balances between controllers and pilots; readbacks are made to ensure understanding of flight clearances, etc. A sense of security is provided which adds to the level of overall situation awareness. Removal of these aides in the form of "error tolerant" digital data link systems, may foster the same kinds of "trust and over-reliance" behaviors apparent with automation systems.

With data link, programming errors induced into the navigation systems (section 5.3.3) could originate with the sending facility. This could extend the latency period between the origination of the error and the recognition of the error on the flight deck, and introduces a new component into the class of automation induced errors.

Another fault of digital systems is the programming of a device, as was experienced with the flight management system control display unit (FMS/CDU) in the ASRS reports. The monitoring of the automation systems may degrade if pilots are suddenly required to program responses into a separate "data link box," that is not integrated functionally with current and/or future automation systems (see section 6.2, Data link--Positive Impact on Automation).

The removal of some voice communications may eliminate valuable "party line" information, regarding, e.g., early or late descents exhibited by other aircraft. This information could be used to plan ahead of time. The loss of this information may decrease the amount of time that crews have to program onboard navigation systems and increase the likelihood of programming errors and distractions of primary flight duties.

## 6.2 DATA LINK--POSITIVE IMPACT ON AUTOMATION.

The positive contributions possible with a digital data link system are many. Foremost is the increased rates in information

transfer. This will improve the timeliness of air traffic control (ATC) instructions. The crews could devote more time to: (1) monitoring the performance of the automation systems, (2) programming the various modes/submodes of the automation systems, and (3) plan future anticipated modes of operation.

If data link is integrated properly into the flight deck, additional benefits can be realized. Data link could be integrated directly into the flight management system. Not only functionally, but physically. Training requirements could be reduced because crews are accustomed to the interface of the FMS.

At the crew's discretion, strategic flight information can be gated automatically to onboard systems. For example, half of the altitude incidents were a result of missing a crossing restriction. The gating of this information to the appropriated CDU page or pages could reduce the potential of programming errors. The ease in which information could flow from ground-based facilities to onboard navigation systems could reduce overall situation awareness. The goal of designers then is to supplement this loss, by providing effective feedback channels in a form readily discernible by the crews.

To conclude, the presence of data link on the flight deck can improve or worsen the automation problems identified in this report. Regardless of the advantages or the disadvantages of a combined data link--automation flight deck, increased awareness on the part of the crews is essential to the safety of flight.

#### 7. RECOMMENDATIONS FOR FUTURE WORK.

The review and analysis just completed on Aviation Safety Reporting System (ASRS) reports dealing with automation problems provided valuable information to be considered when implementing data link into the flight deck. The ASRS reports described pilot experiences and operational problems associated with highly automated systems. Foremost in the reports was the effects of complacency exhibited by the crews.

It is recommended that further studies be conducted to provide additional information on the prevalence of automation induced errors in the cockpit. Data link implementation on the flight deck may increase the likelihood of complacent behavior and incite additional automation induced errors not found in this study.

The interaction of data link with onboard automation systems should be evaluated in medium-high fidelity simulator environments. At a minimum, these simulators should provide full automation flight control, including the interaction of flight management system, mode control panel, and autopilot flight director systems.

The complex nature of some modes of automation are not as intuitive as others to the flight crew, and could cause considerable confusion on the flight deck as to their operation. Informational gathering exercises in the form of questionnaires, surveys, etc., should be conducted to investigate the causes of such confusion. The results may reveal "party line" elements that are used by the crews to help plan and program the various automation modes.

Results of the simulator evaluations and informational gatherings may reveal weaknesses in the system design. If so, suggested improvements to the designs should be made and based, in part, on concepts of human-centered automation and literature on human-computer interaction (HCI). Designs should reflect a system-level perspective, by taking into account, e.g., how ground-based controller workstations impact flight deck operations.

To summarize, this collection of information should be used to determine the best design for implementing data link into the flight deck of today's highly automated aircraft.

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## 9. ACRONYMS AND ABBREVIATIONS.

AAS	Advanced Automation System
ACARS	Aircraft Communication Addressing and Reporting System
AFDS	Automatic Flight Director System
ALT	Altitude
ARTCC	Air Route Traffic Control Center
ASRS	Aviation Safety Reporting System
ATC	Air Traffic Control
ATIS	Automated Terminal Information System
CDU	Control Display Unit
CRM	Crew Resource Management
CSERIAC	Crew System Ergonomics Information Analysis Center
CTR	Center
CWS	Control Wheel Steering
DEV	Deviation
DME	Distance Measuring Equipment
DOD	Department of Defense
DTIC	Defense Technical Information Center
EADI	Electronic Attitude Director Indicator
EFIS	Electronic Flight Instrument System
EICAS	Engine Indication and Crew Alerting System
EMER	Emergency
FAA	Federal Aviation Administration
FARS	Federal Aviation Regulations
FD	Flight Director
FMC	Flight Management Computer
FMS	Flight Management System
GIGO	Garbage-In, Garbage-Out
GPWS	Ground Proximity Warning System
GS	Glide Slope
HCI	Human Computer Interaction
HSI	Horizontal Situation Indicator
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IRS	Inertial Reference System
LNAV	Lateral Navigation
MCP	Mode Control Panel
MLG	Medium Large Transport
MOA	Memorandum of Agreement
MOA	Military Operation Area
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NAV	Navigation
NAVAID	Navigational Aid
NTIS	National Technical Information Service
NTSB	National Transportation Safety Board
PF	Pilot Flying
PMS	Performance Management System
PNF	Pilot Not Flying
RNAV	Area Navigation
SA	Situational Awareness

9. ACRONYMS AND ABBREVIATIONS (cont'd).

SAE	Society of Automotive Engineers
SELCAL	Selective Call
SID	Standard Instrument Departure
SPD	Speed
TCAS	Traffic Alert and Collision Avoidance System
TPM	Technical Program Manager
TRACON	Terminal Radar Control
TWR	Tower
VHF	Very High Frequency
VNAV	Vertical Navigation
VOR	VHF Omnidirectional Range
VORTAC	VHF Omnidirectional Range/Tactical Air Navigation



APPENDIX A

ASRS FULL FORM REPORTS

The full form reports as received from ASRS are provided in this appendix. Each problem area is listed separately and ordered by accession number. Refer to the following guide for help in locating the various problem categories:

AUTOMATION FAILURE	A-2
MISPROGRAMMING	A-37
DISTRACTION DUE TO PROGRAMMING	A-64
MISMANAGEMENT/CONFUSION	A-87
FURTHER AUTOMATION ISSUES - WORKLOAD	A-111
FURTHER AUTOMATION ISSUES - INCOMPLETE NAV DATABASE	A-118

**AUTOMATION FAILURE**

ACCESSION NUMBER : 57698  
DATE OF OCCURRENCE : 8609  
REPORTED BY : FLC; FLC;  
PERSONS FUNCTIONS : FLC,CHKPLT.FO; FLC,PIC.CAPT;  
FLIGHT CONDITIONS : MXD  
REFERENCE FACILITY ID : ATL  
FACILITY STATE : GA  
FACILITY TYPE : ARTCC;  
FACILITY IDENTIFIER : ATL;  
AIRCRAFT TYPE : WDB;  
ANOMALY DESCRIPTIONS : IN-FLT ENCOUNTER/WX; ACFT EQUIPMENT  
PROBLEM/LESS SEVERE; ALT DEV/UNDERSHOOT ON CLB OR DES; NON  
ADHERENCE LEGAL RQMT/CLNC;  
ANOMALY CONSEQUENCES : NONE;  
SYNOPSIS : ACFT CLEARED TO DESCEND TO 240 AND  
DEVIATE TSTM AS NECESSARY. FLT MANAGEMENT SYSTEM PROGRAMMED FOR  
DESCENT AND FLT CREW NOTICED THROTTLES RETARD AND DESCENT BEGIN.  
CTLR QUERIED FLT AS TO ALT AND AT THAT TIME NOTED ACFT IN A SLOW  
CLIMB. NO ALT ALERT ACCOUNT SET FOR 240. DISCONNECTED AUTOPLT AND  
DESCENDED TO 240 MANUALLY. LOGBOOK WRITE-UP AT DESTINATION. ACFT  
EQUIPMENT PROBLEM FMS VNAV. FLT CREW VIGILANCE LACKING. FLT CREW  
DISTR WX AVOIDANCE TSTM.  
REFERENCE FACILITY ID : ATL  
FACILITY STATE : GA  
DISTANCE & BEARING FROM REF. : 130,,SE  
MSL ALTITUDE : 32500,34000

ACCESSION NUMBER : 81969  
 DATE OF OCCURRENCE : 8802  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : BLD  
 FACILITY STATE : NV  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZLA;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : NOT RESOLVED/DETECTED AFTER-THE-FACT;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : FLT WAS ASSIGNED A CROSSING RESTRICTION  
 OF 35 SW OF BLD VORTAC AT 15000'. I PROGRAMMED THE FMC (FLT  
 MANAGEMENT COMPUTER) FOR THIS CROSSING RESTRICTION AND VERIFIED  
 THIS INFO ON THE FMC CDV. THE COPLT ALSO CONFIRMED THE CORRECT  
 DATA ENTRY. AT APPROX 35.5 DME SW OF BLD VORTAC, LAX CENTER ASKED  
 US OUR DME FROM BLD. (NOTE: THE FMC INDICATED 42 MI SW OF BLD,  
 IE, 6 MI FROM THE FIX.) WE TOLD THE CTLR TO STANDBY SO WE COULD  
 VERIFY THE DME DISTANCE WITH RAW DATA DIRECTLY FROM THE NAVIGATION  
 RECEIVER. UPON ACCOMPLISHING THIS, THE DME INDICATED WAS ACTUALLY  
 35.5 MI, A DISCREPANCY OF 6.5 MI FROM WHAT THE FMC WAS INDICATING.  
 WE TOLD THE CTLR WE WERE 35.5 DME FROM BLD. THE CTLR THEN ASKED US  
 OUR ALT. WE RESPONDED, "WE ARE PASSING THROUGH 18000' (THE CTLR  
 THEN HANDED US OFF TO LAS VEGAS APCH). THE COPLT AND I BELIEVE THE  
 PROB WAS CAUSED BY THE COMPUTER MALFUNCTIONING. THE TRIP HAD  
 ORIGINATED IN ONTARIO, CA. IT TOOK THE COPLT AND I 1 HR TO ALIGN  
 THE IRS SYS. WE BELIEVE THAT THIS DIFFICULTY COULD HAVE HAD AN  
 EFFECT ON THE ERRONEOUS DME INFO THE COMPUTER WAS GENERATING. IN  
 SUMMARY, THE COPLT AND I BELIEVE THAT COMPUTER MALFUNCTION WAS  
 RESPONSIBLE FOR THE MISSED CROSSING RESTRICTION. HOWEVER, WE HAVE  
 LEARNED THAT BACKING UP THE COMPUTER WITH RAW DATA FROM THE NAV  
 RECEIVER COULD PREVENT AN OCCURRENCE OF THIS SORT IN THE FUTURE.  
 INCIDENTALLY, FLT DID NOT POSE ANY CONFLICT TO OTHER ACFT AS A  
 RESULT OF THIS ERROR AND WE WERE NOT ASKED TO CONTACT ANYONE WITH  
 REGARD TO THIS INCIDENT.  
 SYNOPSIS : ACR MLG ALT DEVIATION UNDERSHOT ALT  
 CROSSING RESTRICTION DURING DESCENT.  
 REFERENCE FACILITY ID : BLD  
 FACILITY STATE : NV  
 DISTANCE & BEARING FROM REF. : 35,,SW  
 MSL ALTITUDE : 15000,18000

ACCESSION NUMBER : 82921  
 DATE OF OCCURRENCE : 8803  
 REPORTED BY : FLC; FLC;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : CVG  
 FACILITY STATE : OH  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : CVG; CVG;  
 AIRCRAFT TYPE : LTT;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE; ALT  
 DEV/OVERSHOOT ON CLB OR DES;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE;  
 ANOMALY CONSEQUENCES : OTHER;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT;  
 NARRATIVE : AFTER DEPARTING LUNKEN FIELD WE

SWITCHED TO DEP AND WERE GIVEN HDG VECTORS, A 250 KT SPD  
 RESTRICTION AND A CLB TO 12000'. THE AUTOPLT WAS COUPLED, AND THE  
 MODE CONTROL PANEL WAS PROGRAMMED FOR ALT CAPTURE AND HDG TRACK.  
 WE ENCOUNTERED MODERATE RAIN FREEZING AND TEMPS, SO ANTI-ICE WAS  
 SELECTED. MAINTAINING 250 KTS RESULTED IN APPROX 4000' PER MIN  
 RATE OF CLB. WE WERE GIVEN A CHANCE TO CTR FREQ. AT THAT MOMENT  
 THE F/O CALLED "12000" AND I SAW THAT THE ACFT WAS PASSING 12500  
 AND CLBING. THE ALT SELECT HAD NOT CAPTURED. I IMMEDIATELY  
 DISCONNECTED THE AUTOPLT AND PUSHED OVER TO DESCENDED TO 12000'  
 MSL. I ALSO INSTRUCTED THE F/O TO RPT "DESCENDING TO 12000" TO THE  
 DEP CTLR. HE DID SO. WE LEVELED AT THE ASSIGNED ALT AND WERE AGAIN  
 INSTRUCTED TO CONTACT CTR. CTR GAVE US ANOTHER ALT AND WE  
 PROCEEDED ENROUTE. ON THE PREVIOUS LEG AS WELL AS THE LEG TO  
 FOLLOW, THE ALT SELECT CAPTURED AND THEN DISCONNECTED ON 2  
 LEVEL-OFFS INVOLVING DSNT. NEITHER INVOLVED DEVIATION FROM  
 ASSIGNED ALT. BOTH REQUIRED MANUAL LEVEL OFF. DISCUSSION WITH THIS  
 F/O INDICATED 2 OTHER OCCASIONS ON WHICH HE HAD SIMILAR  
 EXPERIENCES WITH THIS PARTICULAR AIRPLANE. I PERSONALLY RECALL  
 ANOTHER INSTANCE WITH THIS SYS NEAR ORL FL, IN JANUARY, WHICH  
 COULD HAVE BEEN ANOTHER FAILURE OF THE SAME TYPE. ACFT COMPANY  
 ISSUED A SVC LETTER FOR 4 SPECIFIC ACFT, WHICH WHEN COMPLIED WITH,  
 RESULTED IN WIRING SOME FMS MODES INCORRECTLY TO THE AUTOFLT SYS.  
 THIS LTT ACFT IS SCHEDULED FOR REWIRING ON 3/TH/88 AT THE FACTORY  
 SVC CENTER. A TEST FLT WILL FOLLOW INVOLVING AUTOMATIC LEVEL-OFFS  
 FROM HIGH AND LOW RATES OF CLB AND DSNT. I BELIEVE THE AUTOMATION  
 OF SOME OF THE ELEMENTS OF FLYING HAS TAKEN THE PLT OUT OF THE  
 "BASIC LOOP," AND THE HUMAN CHALLENGE IS TO NOW MANAGE THE  
 "ELECTRONIC ASSISTANTS" EFFICIENTLY AND SAFELY. ONE SHOULD ALWAYS  
 QUESTION THE RELIABILITY OF THIS EQUIP, EVEN IF YOU HAVE NO REASON  
 TO SUSPECT FAILURE. CALLBACK CONVERSATION REVEALED THE FOLLOWING.  
 THE MAIN REASON THIS RPT WAS SENT WAS THE RPTR'S CONCERN ABOUT THE  
 MANUFACTURER'S SERVICE LETTER THAT SET UP THE PROBLEM. THIS CORP  
 OWNS THREE OF THE FOUR ACFT THAT RECEIVED THE SERVICE LETTER AND  
 ALL HAVE BEEN MODIFIED AND THE PROBLEM APPARENTLY CORRECTED. RPTR  
 SAID HE WAS CONCERNED ABOUT THIS ACFT MANUFACTURER'S RESPONSE TO  
 CUSTOMER PROBLEMS AND THINKS THEY SEEM MORE ATTUNE TO SMALL ACFT  
 OWNER PROBLEMS AND TEND TO IGNORE THE CORPORATE SECTOR.

(REPORT CONTINUED)

SYNOPSIS : CPR LTT ALT DEVIATION OVERSHOT DURING  
CLIMB.  
REFERENCE FACILITY ID : CVG  
FACILITY STATE : OH  
DISTANCE & BEARING FROM REF. : 25,,E  
MSL ALTITUDE : 12000,12500

ACCESSION NUMBER : 128888  
 DATE OF OCCURRENCE : 8911  
 REPORTED BY : FLC; FLC;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : IAH  
 FACILITY STATE : TX  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : IAH; IAH;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE; ALT  
 DEV/OVERSHOOT ON CLB OR DES; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR; COCKPIT/FLC;  
 ANOMALY RESOLUTION : CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT;  
 NARRATIVE : ON TKOF LEG WITH F/O FLYING WE WERE

ASKED TO RESET XPONDER, IMMEDIATELY THEREAFTER WE RECEIVED A TURN  
 AND AUTHORIZATION TO CONTACT DEP. DURING THE TURN AND APCHING  
 INITIAL LEVEL OFF ALT THE CAPT LOOKED DOWN TO ADJUST RADIOS. AT  
 THIS TIME, F/O STATED THAT HE HAD LOST HIS FLT DIRECTOR (WHICH HAD  
 PLACED THE ACFT INTO AN INCREASING INSIDIOUS CLIMB. CAPT ASSUMED  
 CONTROL AND STARTED A DSNT TO 4000' AS THE ACFT "BUSTED" THIS ALT  
 ON CLIMBOUT. HOWEVER, AS THE TOP OFF OF 4500' TO 4700' WAS  
 ATTAINED AND A DSNT BEGAN, ATC AUTHORIZED A NEW CLRNC ALT OF  
 5000'. LEVEL OFF ACCOMPLISHED UNEVENTFULLY AT THIS TIME. ALTHOUGH  
 THE LOSS OF THE F/O'S FLT DIRECTOR WAS THE PRIMARY CULPRIT IN THIS  
 ALT DEVIATION, THIS DEVIATION WAS AGGRAVATED BY THE SIMULTANEOUSLY  
 FAILING OF THE DIGITAL FLT GUIDANCE SYSTEM CONTROL PANEL,  
 ANNUNCIATOR PANEL LIGHTS FOR YAW DAMPER OFF, MACH TRIM INOP, AND  
 THE POWER MANAGEMENT SYSTEM INDICATING AN ENGINE HAD FAILED (IN  
 ADDITION TO AN UNUSUAL "POP" SOUND IN THE COCKPIT AT THE SAME  
 TIME). UNFORTUNATELY THIS ALL OCCURRED WITHIN SECONDS OF ONE  
 ANOTHER AND MOST UNFORTUNATELY, AT THE START OF THE LEVEL OFF.  
 ATTITUDE AND FLT DIRECTOR FAILURE FLAGS APPEARED SHORTLY AFTER THE  
 F/O VERIFIED THIS CONDITION TO THE CAPT. THIS ACFT HAD F/O FLT  
 DIRECTOR PROBLEMS ON THE PREVIOUS DAY, BUT NONE ON THE PREVIOUS  
 TWO FLTS WHICH WERE FLOWN BY THIS CREW. SUPPLEMENTAL INFORMATION  
 FROM ACN 128874: THIS DEVIATION SEEMS TO HAVE BEEN A CLASSIC CASE  
 OF BEING SPOILED BY THE ADDITIONAL AVIONICS AND WORKLOAD REDUCING  
 NICETIES PROVIDED IN THE ACFT AND WITH THE LOSS OF THESE AIDS AND  
 THE DIGITAL DISPLAY ON THE FLT GUIDANCE SYSTEM THE INITIAL LAPSE  
 THAT TRANSPIRED BETWEEN THEIR LOSS AND FLYING THE ACFT VIA RAW  
 DATA INFO RESULTED IN AN ALT DEVIATION. LESSON LEARNED: DON'T  
 FORGET THE BASICS OF INSTRUMENT FLYING JUST BECAUSE THE ACFT IS  
 EQUIPPED WITH LABOR SAVING DEVICES THAT AS THIS CASE SHOWS YOU  
 CAN'T ALWAYS COUNT ON.

SYNOPSIS : MULTIPLE FAILURE OF INSTRUMENTATION AND  
 COMPUTERIZATION IN ADVANCED MLG.  
 REFERENCE FACILITY ID : IAH  
 FACILITY STATE : TX  
 DISTANCE & BEARING FROM REF. : 10,,SE  
 MSL ALTITUDE : 4000,4700

ACCESSION NUMBER : 174632  
 DATE OF OCCURRENCE : 9104  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : LAX  
 FACILITY STATE : CA  
 FACILITY TYPE : ARTCC; ARPT;  
 FACILITY IDENTIFIER : ZLA; ZLA;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE;  
 TRACK OR HDG DEVIATION; ALT DEV/UNDERSHOOT ON CLB OR DES; NON  
 ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE; CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : AFTER TKOF FROM LAX WBND, WE WERE CLRED  
 LEFT TURN DIRECT LAX VOR, AS FILED. PASSING LAX, THE FMC CALLED  
 FOR A RIGHT TURN TO SLI VOR. F/O HAND-FLYING. I NOTICED ON MAP  
 DISPLAY AFTER SLI RTE WAS ALMOST 90 DEG LEFT TURN TO DAG.  
 REQUESTED DIRECT DAG AND RECEIVED DIRECT. MOMENTS LATER ATC ASKED  
 IF WE KNEW WHERE WE WERE, AND THAT WE WERE 15 MI S OF LOOP 8 DEP  
 RTE. WE WERE TOLD TO TURN LEFT TO 330 DEG HDG AND THEN CLRED  
 DIRECT DAG. SOMEHOW THE FMC HAD DUMPED OUT THE LOOP 8 DEP AND HAD  
 US GOING TO SLI AND THEN DAG. WHILE WE WERE DOING THIS CLRNC AND  
 TRYING TO FIGURE OUT WHAT MAY HAVE GONE WRONG, WE PASSED 18000'  
 AND DIDN'T SET ALTIMETERS TO 29.92. AFTER LEVEL OFF AT 37000', ATC  
 ASKED OUR ALT AND I REPLIED 37000'. WE WERE TOLD MODE C HAD US  
 300' LOW. ALTIMETER WAS 30.23". SET ALTIMETER AND REMAINDER OF FLT  
 WAS NORMAL. ONE OF THE PROBS WAS THAT I WAS RELYING ON THE FMC TOO  
 MUCH FOR DEP AND NOT X-CHKING WITH DEP PLATE. NEW, FIRST GLASS  
 COCKPIT. SUPPLEMENTAL INFO FROM ACN 174704: CAPT AND I REVIEWED  
 THE SID SEVERAL TIMES AND THE MADE CHANGES IN THE PROC WHEN WE  
 WERE GIVEN A RWY CHANGE. WE WERE EXPECTING LAX 24L AND WE TOOK OFF  
 ON 25R. I MADE THE CHANGES IN THE FMC AND EVERYTHING PROCEEDED  
 NORMALLY. WE BRIEFED THE CHANGES AND INSTALLED A FIX IN THE FMC TO  
 AID IN THE DEP. LATER FOUND OUT THERE IS A SOFTWARE GLITCH IN THE  
 LOOP 8 SID THAT HAS NOT BEEN CORRECTED. THIS OCCURS WHEN THERE IS  
 A RWY CHANGE, WHICH IS WHAT HAPPENED TO US. ONE CAN GET LOST OR  
 MISDIRECTED, EVEN WITH ALL THE LATEST NAV TECH. IN THE FUTURE I  
 WILL RELY MORE ON TRADITIONAL NAVAIDS FOR FMC BACKUP. I ALSO MADE  
 THE MISTAKE OF USING TOO SMALL A SCALE FOR THE NAV DISPLAY. ON A  
 LARGER SCALE I WOULD HAVE SEEN THE ERROR AND WOULD NOT HAVE FLOWN  
 TO THE S.  
 SYNOPSIS : ADVTECH ACR WDB EXPERIENCES MINOR FMS  
 PROBLEM, BUT FAILS TO CATCH ERROR AND SUFFERS TRACK DEVIATION AND  
 ALT UNDERSHOOT DUE MISSET ALTIMETER.  
 REFERENCE FACILITY ID : LAX  
 FACILITY STATE : CA  
 DISTANCE & BEARING FROM REF. : 0,360  
 MSL ALTITUDE : 11000,37000



ACCESSION NUMBER : 177588  
 DATE OF OCCURRENCE : 9104  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,DC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : SNA  
 FACILITY STATE : CA  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : SNA; SNA;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : OTHER; ACFT EQUIPMENT PROBLEM/LESS  
 SEVERE; ALT DEV/OVERSHOOT ON CLB OR DES; NON ADHERENCE LEGAL  
 RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/UNABLE;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT;  
 NARRATIVE : AFTER TKOF AT APPROX 400' AGL, ALL INFO  
 RE: CURRENT FLT DUMPED FROM THE FMC EXCEPT THE DEP ARPT AND THE  
 DEST ARPT IN THE RTE. AFTER GEAR UP AND THROUGH 400', NOTICED NO  
 MAGENTA LINE AND ADVISED CAPT. HE PROCEEDED TO FLY THE DEP PROC  
 NOISE ABATEMENT VISUALLY. ALSO AFTER CALLING CLB DERATE 2, THE FMC  
 WOULD NOT CTL THE AUTO THROTTLE, SO CAPT MANUALLY PULLED THROTTLES  
 TO WHAT HE THOUGHT WAS A DERATED CLB. FURTHER WE WERE BOTH  
 DISTRACTED BY THIS MISHAP AND WE WENT 250' ABOVE ASSIGNED ALT, BUT  
 IMMEDIATELY RECAPTURED 3000'. I DON'T BELIEVE ANOTHER CREW COULD  
 HAVE HANDLED THE SITUATION MUCH DIFFERENTLY. PERSONALLY I HAD  
 NEVER BEEN TO SNA PRIOR TO THIS--THE CAPT HAD. IF WE WERE NOT VFR,  
 WE WOULD HAVE HAD NO WAY TO NAV. LUCKILY, THE CAPT KNEW WERE THE  
 VIS REFS WERE TO THE SID. I HAD LESS THAN 60 HRS IN TYPE AS WELL  
 AS THE CAPT. ALTHOUGH I DON'T KNOW IF THIS WAS CONTRIBUTING,  
 PERHAPS A MORE EXPERIENCED CREW COULD HAVE REACTED FASTER? PS: THE  
 CAPT NOTIFIED SCHEDULING PRIOR TO THE TRIP SEQUENCE ABOUT THE LACK  
 OF CREW EXPERIENCE. HE WAS ASSURED IT WAS LEGAL, BUT IN MY OPINION  
 IT WAS NOT SAFE.  
 SYNOPSIS : ALT DEVIATION ALT OVERSHOT ON SID WHEN  
 FMC DROPS SID AND ROUTE OUT OF DATA BASE.  
 REFERENCE FACILITY ID : SNA  
 FACILITY STATE : CA  
 MSL ALTITUDE : 400,3250

ACCESSION NUMBER : 182888  
 DATE OF OCCURRENCE : 9107  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : BWZ  
 FACILITY STATE : NJ  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZNY;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/ANOMALY ACCEPTED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WHILE CRUISING AT FL370 IN VMC  
 CONDITIONS, ZNY ISSUED US A XING RESTRICTION (30 W OF SWEET INTXN  
 AT FL180). AT THIS TIME WE WERE ABOUT 800 DME FROM THE FIX. THE  
 XING RESTRICTION AND ALT WERE CORRECTLY PROGRAMMED INTO THE FMC.  
 THE NEW ALT WAS SELECTED INTO THE ALT ALERT WINDOW OF THE MCP, AND  
 VNAV WAS SELECTED AND VERIFIED OPERATIONAL (VNAV LIGHT ON). THE  
 CAPT'S FMC WAS IN THE "LEGS" PAGE (FLT PLAN) AND MY FMC WAS  
 DISPLAYING THE "DSNT" PAGE (FLT PATH ANGLE, RATE OF DSNT REQUIRED  
 ARE DISPLAYED ON THIS PAGE). MY PARTICULAR FMC DISPLAY ON THIS  
 ACFT WAS VERY DIM AND THE LIGHT INTENSITY COULD NOT BE INCREASED  
 AND FURTHER. BOTH PLTS WERE FLYING INTO THE SUN AND WEARING  
 SUNGLASSES, WHICH MADE MONITORING MY PARTICULAR FMC EVEN HARDER.  
 SOMETIME BTWN 80 DME AND 60 DME FROM THE FIX, WITH FMC AND MCP  
 ACCURATELY PROGRAMMED AND WITH THE APPROPRIATE DISPLAYS IN VIEW,  
 THE VNAV PORTION OF THE FMC/MCP INTERFAC MALFUNCTIONED AND DID NOT  
 COMMAND THE REQUIRED DSNT AT THE TOP OF DSNT POINT (NO MESSAGE WAS  
 EVER DISPLAYED ON THE FMC'S TO ALERT US OF THE MALFUNCTION). AT 60  
 DME FROM THE FIX I BECAME AWARE THAT THE FMC WAS NOT INITIATING  
 THE EXPECTED DSNT, AND ADVISED THE CAPT (WHO WAS FLYING) OF THE  
 NEED TO GET DOWN. THIS DAY WE HAD IN EXCESS OF 80 KTS OF WIND ON  
 THE TAIL. THE CAPT INITIATED A HIGH RATE OF DSNT, AND I ADVISED  
 ZNY IMMEDIATELY THAT WE WERE UNABLE TO COMPLY WITH THE  
 RESTRICTION. ZNY DID NOT RESPOND, EVEN AFTER A SECOND RADIO CALL.  
 EVENTUALLY WE WERE VECTORED (CENTER DID NOT SEEM ALARMED). THE  
 FAILURE OF THE VNAV MODE W/O A STATUS (MALFUNCTION) DISPLAY EITHER  
 IN THE FMC OR MCP, IN CONJUNCTION WITH THE "DIM" FMC DISPLAY ON  
 THE COPLT'S SIDE CONTRIBUTED TO THE "TOP OF DSNT" POINT BEING  
 OVERFLOWN W/O THE REQUIRED DSNT BEING INITIATED.  
 SYNOPSIS : ACR MLG ALT DEVIATION UNDERSHOT ALT  
 CROSSING RESTRICTION.  
 REFERENCE FACILITY ID : BWZ  
 FACILITY STATE : NJ  
 DISTANCE & BEARING FROM REF. : 65,302  
 MSL ALTITUDE : 20000,37000

ACCESSION NUMBER : 189056  
 DATE OF OCCURRENCE : 9109  
 REPORTED BY : FLC; FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR; ARTCC,  
 SUPVR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : MFE  
 FACILITY STATE : TX  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZHU;  
 AIRCRAFT TYPE : LTT;  
 ANOMALY DESCRIPTIONS : NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC; NON ADHERENCE LEGAL RQMT/FAR;  
 ERRONEOUS PENETRATION OR EXIT AIRSPACE;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : FAA INVESTIGATORY FOLLOW-UP;  
 NARRATIVE : AFTER DEP, WE WERE INITIALLY ASSIGNED A

VECTOR HDG OF 240 DEG, FOLLOWED SHORTLY THEREAFTER BY A HDG OF 305  
 DEG. PASSING APPROX 18000 FT, ON THIS HDG, WE WERE CLRED DIRECT TO  
 LRD. I WOULD ESTIMATE OUR POS AT THIS TIME TO BE APPROX 15 MI NNW  
 OF THE MFE VORTAC. I ENGAGED THE FLT MGMNT SYS AND COUPLED THE  
 UNIT TO THE AUTOPLT/FLT DIRECTOR SYS, STILL PROCEEDING DIRECT TO  
 LRD. AFTER A SHORT PERIOD OF TIME, I OBSERVED THAT WE APPEARED TO  
 BE DRIFTING OFF TRACK TO THE R, AND THAT THE HDG HAD INCREASED TO  
 APPROX 350 DEG. IT BECAME EVIDENT THAT THE FMS WAS MALFUNCTIONING  
 SO I IMMEDIATELY DISCONNECTED THE FLT DIRECTOR AND BEGAN A TURN TO  
 THE L TO RETURN TO THE ASSIGNED DIRECT COURSE TO LRD. DURING THE  
 TURN, HOUSTON CENTER REQUESTED OUR PRESENT HDG. THE FO REPLIED  
 THAT WE WERE TURNING L THROUGH 320 DEG. THE CTLR THEN INSTRUCTED  
 US TO TURN L TO A HDG OF 260 DEG (NO REASON WAS GIVEN FOR THE HDG  
 CHANGE). SHORTLY THEREAFTER, WE WERE GIVEN A CLRNC TO PROCEED  
 DIRECT TO LRD. THE NEW SECTOR CTLR INSTRUCTED US TO CALL HOUSTON  
 CENTER BY TELEPHONE TO DISCUSS 'A POSSIBLE MOA INCURSION'. THE FO  
 IMMEDIATELY DIALED THE NUMBER GIVEN. HE SPOKE WITH QUALITY  
 ASSURANCE MGR AT THE CENTER. HE STATED THAT WHILE WE WERE TURNING  
 R (DURING THE PERIOD THE FMS WAS NAVIGATING THE ACFT), WE HAD  
 POSSIBLY ENTERED THE KINGSVILLE 1 MOA, WHICH CLOSELY PARALLELED  
 THE R SIDE OF OUR COURSE. TO GUARD AGAINST FURTHER INCIDENTS OF  
 THIS NATURE IN THE FUTURE, WE WOULD KEEP THE NAV CHART IMMEDIATELY  
 AVAILABLE AND CLOSELY MONITOR OUR POS (ESPECIALLY DURING RADAR  
 VECTORS), TO INSURE THAT WE REMAIN WELL CLR OF ALL SPECIAL USE  
 AIRSPACE. BE BETTER PREPARED TO SWITCH TO SECONDARY NAV SOURCES  
 WHEN IT BECOMES EVIDENT THAT THE PRIMARY SYS IS MALFUNCTIONING  
 (ALTHOUGH I DID SO IN THIS CASE IN A MIN OF TIME). REGARDLESS OF  
 CREW POS, WE WILL BE MORE ASSERTIVE IN POINTING OUT POSSIBLE DEVS  
 FROM THE PLANNED FLT TRACK WHICH COULD POSSIBLY COMPROMISE AIR  
 SAFETY. SUPPLEMENTAL INFO FROM ACN 189145: I WAS THE FO PNF AND I  
 WAS TALKING ON THE RADIO WITH HOUSTON CENTER AND ALSO BACKING UP  
 THE PRIMARY NAV SYS WITH THE #2 NAV RADIO. WHEN HOUSTON CENTER  
 CLRED US DIRECT TO LRD I NOTICED OUR #2 NAV SYS SHOWED 305 DEG  
 DIRECT TO LRD. THE AUTOPLT ALONG WITH THE PRIMARY NAV SYS TURNED  
 OUR ACFT TO THE R TO A HDG OF 350 DEG. I MENTIONED TO THE CAPT  
 THAT LRD WAS AT 305 DEG NOT 350 DEG. WE CONTINUED HDG 350 DEG AND  
 I MENTIONED LRD WAS ABOUT OUR 10 O'CLOCK POS. AT THIS TIME THE

(REPORT CONTINUED)

CAPT REALIZED THE UNS WAS MALFUNCTIONING AND TURNED THE ACFT DIRECT TOWARDS LRD. THE MALFUNCTION OF OUR PRIMARY NAV SYS CAUSED OUR ACFT TO CHANGE HDG OF ABOUT 50 DEG. EVEN THOUGH I STATED TWICE WE WERE OFF HDG MAYBE I SHOULD HAVE BEEN MORE FORCEFUL IN THE COCKPIT. ON ALL DEPS OUT OF HRL, ESPECIALLY WHEN THE MOA IS HOT, ALL ACFT SHOULD BE CLRED ON V17 ONLY, NOT VECTORED E OF MFE. THIS LEAVES VERY LITTLE ROOM FOR ERRORS.

SYNOPSIS : CPR X NON ADHERENCE TO ATC CLRNC  
UNAUTHORIZED AIRSPACE ENTRY. PLTDEV.

REFERENCE FACILITY ID : MFE  
FACILITY STATE : TX  
DISTANCE & BEARING FROM REF. : 10,,NE  
MSL ALTITUDE : 18000,18000

ACCESSION NUMBER : 190642  
 DATE OF OCCURRENCE : 9110  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : MXD  
 REFERENCE FACILITY ID : SRP  
 FACILITY STATE : AZ  
 FACILITY TYPE : ARTCC; ARPT;  
 FACILITY IDENTIFIER : ZAB; PHX;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE; NON  
 ADHERENCE LEGAL RQMT/CLNC; ALT DEV/XING RESTRICTION NOT MET;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC OVERCAME EQUIP PROBLEM;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : ALBUQUERQUE CTL GAVE US TO CROSS TONTO  
 AT 12000 FT. AT 16000 FT AND 8 NM FMC FROM TONTO, THE CTLR ASKED  
 US IF WE WOULD MAKE THE RESTRICTION. WE TOLD HIM YES, TELLING HIM  
 WE STILL HAD 8 MI TO GO ON THE COMPUTER (FMC). HE TOLD US THAT WE  
 WERE ONLY 3 MI FROM TONTO INSTEAD OF 8 MI. WE PASSED TONTO AT  
 12000 FT REF THE FMC. SUPPLEMENTAL INFO FROM ACN 190979: AFTER  
 TKOF (100 FT OR LESS) FROM DEN 35L THE TAT/SAT INDICATOR WENT  
 BLANK. AUTO THROTTLES STARTED REDUCING PWR WHICH WAS WRONG.  
 DISCONNECTED AUTO THROTTLE AND SET ESTIMATED TKOF PWR. THIS  
 MALFUNCTION WAS A 'SEAT- OF-THE-PANTS' THING. I DID NOT KNOW WHAT  
 WAS WRONG UNTIL MUCH LATER DURING CLBOUT. DENVER WX, ENRTE WX AND  
 PHX WX WERE ALL SEVERE CLR OR I WOULD HAVE RETURNED TO DEN. I  
 ELECTED TO CONTINUE TO PHX WHICH IS ALSO A MAINT STATION.  
 SYNOPSIS : FMC IN ACFT GAVE ERRONEOUS POS. FLC  
 MISSED XING FIX.  
 REFERENCE FACILITY ID : SRP  
 FACILITY STATE : AZ  
 DISTANCE & BEARING FROM REF. : 41,10  
 MSL ALTITUDE : 12000,16000

ACCESSION NUMBER : 192628  
 DATE OF OCCURRENCE : 9110  
 REPORTED BY : FLC; FLC;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : SAN  
 FACILITY STATE : CA  
 FACILITY TYPE : ARPT; TWR;  
 FACILITY IDENTIFIER : SAN; SAN;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : CONTROLLED FLT TOWARD TERRAIN; ALT  
 DEV/EXCURSION FROM ASSIGNED; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC; NON ADHERENCE LEGAL RQMT/FAR;  
 ANOMALY DETECTOR : ATC/EQUIPMENT;  
 ANOMALY RESOLUTION : CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : TWR CALLED ACFT TO WARN OF A LOW ALT  
 ALERT OUTSIDE THE FINAL APCH FIX. THE FMS MAP MODE SHOWED US  
 INSIDE 'REEBO' THE FAF AND THEREFORE WE WERE DSNDING TO LOC MINS.  
 TWR ADVISED US THAT WE WERE LOW. THERE SEEMED TO BE A DIFFERENCE  
 OF 2 MI BTWN LOC FAF AND FMS FAF. SOLUTION SHOULD BE 1 PLT MUST  
 DISPLAY RAW DATA ON HSI FOR ALL NONPRECISION APCHS. SUPPLEMENTAL  
 INFO FROM ACN 192724. USED DIR/INTC PAGE ON FMS TO CLEAN UP MAP  
 DISPLAY. REEBO (THE FAF) DROPPED OFF THE MAP DISPLAY AND F/A  
 APPEARED. (F/A IS PRESET FIX THE COMPUTER SHOWS 8 MI FROM SELECTED  
 RWY). REEBO (FAF) IS 5.1 MI FROM RWY. WE STARTED TO MDA 2.9 MI  
 EARLY AND THE APCH CTLR CALLED IT.  
 SYNOPSIS : ACR LGT ALTDEV EXCURSION FROM CLRNC  
 ALT. THE FLC STARTED A DSCNT TO MDA BEFORE XING THE FAF AT SAN.  
 REFERENCE FACILITY ID : SAN  
 FACILITY STATE : CA  
 DISTANCE & BEARING FROM REF. : 8,92,E  
 MSL ALTITUDE : 1800,2000

ACCESSION NUMBER : 195708  
 DATE OF OCCURRENCE : 9111  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TRACON,AC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : LGA  
 FACILITY STATE : NY  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : N90; LGA;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE; ALT  
 DEV/OVERSHOOT ON CLB OR DES; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC OVERCAME EQUIP PROBLEM;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE WERE IN THE ARR PHASE DSNDRG TO

10000 MSL. ATC HAD BEEN REQUESTING HIGH SPD IN DSCNT THROUGHOUT  
 THE ARR FOR SPACING. WE WERE INDICATING 330 KTS PASSING 12000 FT  
 MSL AT APPROX 3500 FPM. THE FMCS WERE BEING PROGRAMMED FOR A VOR  
 APCH TO RWY 22 LGA. AT THIS POINT WE WERE GIVEN A FREQ CHANGE TO  
 APCH CTL. THE NEW CTLR ASKED FOR AN IMMEDIATE REDUCTION TO 250  
 KIAS AND 'CUT THE CORNER' WITH A DIRECT ROUTING. AS THE PNF  
 REPROGRAMMED THE FMC, THEY WENT TO A RESYNC MODE AUTOPLT AND  
 AUTOTHROTTLERS AUTO DISCONNECTED. THE L FMC WENT BLANK, PF FD  
 DISAPPEARED ON THE ADI AND THE HSI WENT BLANK THEN TO CLUTTER WITH  
 WAYPOINT SYMBOLS. I SUSPECTED WE HAD OVERLOADED THE SYS AND DUMPED  
 DATA INCLUDING THE PERFORMANCE DATA BASE (WHICH WE HAD). AS I  
 INSTRUCTED THE PNF TO CHK THESE DATA AND SUBSEQUENTLY RELOAD  
 BEFORE PROCEEDING AND I SET MANUAL RAW DATA WHILE HAND FLYING AND  
 SLOWING WITH FULL SPD BRAKES, I OVERSHOT THE ALT RESTRICTION  
 (10000 FT) BY SEVERAL HUNDRED FT. RECOVERY WAS IMMEDIATE IN CAVU  
 CONDITIONS AND WERE BACK WITHIN ALT PARAMETERS WHEN COVERED BY THE  
 CTLR. THE ABRUPT CHANGE IN FLT REGIME COUPLED WITH A TOTAL LOSS OF  
 AUTOMATION AS A CRITICAL POINT CONTRIBUTED TO THE INCIDENT. IT  
 TOOK A FEW MINS TO RESTORE EVERYTHING (WHICH WE DID ) BUT LESS  
 THAN 30 SECONDS TO LEVEL OFF AND RESTORE MIN NAV AIDS.

SYNOPSIS : REPROGRAMMING OF THE FMC CAUSE  
 MOMENTARY LOSS OF SOME DATA. FO MANAGED TO REPROGRAM WHILE CAPT  
 WENT TO RAW DATA MOMENTARILY FOR NAV AND ACFT CTL.

REFERENCE FACILITY ID : LGA  
 FACILITY STATE : NY  
 DISTANCE & BEARING FROM REF. : 30,40  
 MSL ALTITUDE : 9500,10000

ACCESSION NUMBER : 196449  
 DATE OF OCCURRENCE : 9112  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : CLE  
 FACILITY STATE : OH  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZOB;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE; ALT  
 DEV/OVERSHOOT ON CLB OR DES; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR; COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC REGAINED ACFT CONTROL; FLC RETURNED  
 ACFT TO ORIGINAL CLNC OR INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : AN ACFT TYPE; ACFT EQUIPMENT;  
 NARRATIVE : WE WERE GIVEN A DSCNT TO 17000 FT.

AFTER THE DSCNT WAS INITIATED AND WE WERE PASSING THROUGH APPROX  
 FL190, WE WERE GIVEN 13000, WHICH I DIALED IN. BOTH THE CAPT AND I  
 WERE LOOKING IN OUR FLT BAGS TO SET UP FOR OUR ARR AT OUR DEST.  
 SUDDENLY ATC CAME BACK AND ASKED US OUR ALT. WE BOTH LOOKED UP AND  
 DISCOVERED THAT THE AUTOPLT HAD CHANGED FROM A DSCNT MODE TO A CLB  
 AND WAS CLBING THROUGH FL185. THE AUTOPLT WAS DISCONNECTED AND THE  
 DSCNT CONTINUED. DURING THIS TIME, THE AUTOPLT WAS OPERATING OFF  
 OF THE VNAV PORTION OF THE FMS (PROFILE) AND WE WERE ON AN  
 ASSIGNED HDG. WHEN THE AUTOPLT WAS REENGAGED, IT TRIED TO CLB  
 AGAIN. WE SWITCHED THE AUTOPLT TO 'LEVEL CHANGE', WHICH TOOK THE  
 FMS OUT OF THE LOOP AND EVERYTHING RETURNED TO NORMAL. WE NEVER  
 DISCOVERED WHY THE FMS DID THIS, SO WE WROTE IT UP UPON LNDG. THE  
 TRANSITION FROM DSCNT TO CLB WAS SO SMOOTH AND GRADUAL THAT  
 NEITHER ONE OF US FELT IT. SOMEONE SHOULD HAVE BEEN MONITORING THE  
 AUTOPLTS PERFORMANCE INSTEAD OF BOTH OF US HAVING OUR HEADS IN OUR  
 BAGS.

SYNOPSIS : FLC OF MLG IN DSCNT ALLOWED AUTOPLT TO  
 LEVEL AND START CLB BEFORE CORRECTING.  
 REFERENCE FACILITY ID : CLE  
 FACILITY STATE : OH  
 MSL ALTITUDE : 13000,18500



ACCESSION NUMBER : 198371  
 DATE OF OCCURRENCE : 9201  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,OTH; FLC,PIC.CAPT; FLC,FO; TRACON,  
 AC;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : SEA  
 FACILITY STATE : WA  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : SEA; SEA;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/CRITICAL; ALT  
 DEV/EXCURSION FROM ASSIGNED; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC REGAINED ACFT CONTROL; OTHER;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : PROC OR POLICY/COMPANY; ACFT EQUIPMENT;  
 AN ACFT TYPE;  
 NARRATIVE : WE HAD JUST COMPLETED THE CRUISE  
 PORTION OF OUR 8 HR 'ALL NIGHTER' FROM NARITA, JAPAN AND WERE  
 COMMENCING THE APCH. THE CAPT WAS HAND FLYING THE ACFT AND THE FO  
 WAS ACTING AS PNF AND WORKING THE RADIOS, I WAS IN THE JUMPSEAT AS  
 FO B OR INTL RELIEF OFFICER. I WAS HAVING A HARD TIME IDENTING THE  
 LOC FOR RWY 16 AND THE LOM FOR 16 AND 34 (FOR THE MISSED APCH). WE  
 WERE ABOUT 20 MI N OF SEATAC WHEN THE CAPT INTERCEPTED THE LOC FOR  
 RWY 16 AND WAS CLRED FOR THE APCH. I GOT A SUCCESSFUL IDENT ON RWY  
 16 AS WE WERE CLRED FOR THE APCH, ALTHOUGH WE WERE A BIT HIGH (2  
 DOTS ABOVE). AS WE INTERCEPTED THE GS THE FLT DIRECTOR COMMANDED A  
 REVERSE PITCH OF 35 DEG NOSE UP, THE CAPT INITIALLY FOLLOWED THE  
 FLT DIRECTOR AND WE CLBED ABOUT TO 9500-9800 FT. HAD HE CONTINUED  
 TO FOLLOW THE FLT DIRECTOR WE WOULD HAVE HAD A FULL PWR STALL IN  
 IFR CONDITIONS. I BELIEVE THAT WE WERE QUITE HIGH AND CAPTURE A  
 FALSE OR PHANTOM GS AND WHEN THE SOFTWARE ON THE ACFT FIGURED THAT  
 OUT IT GAVE US THE 'MOTHER OF ALL GARS.' DON'T TRUST FMS/FD INFO  
 WITHOUT A RAW DATA BACKUP AND IF ONE IS NOT IMMEDIATELY AVAILABLE,  
 REVERT TO ATTITUDE INST FLYING BASICS. I BELIEVE WE ARE SLOWLY  
 WORKING OURSELVES INTO 'DETRIMENTAL RELIANCE ON FMS/GLASS  
 COCKPITS/AUTOFLT SYSTEMS. THEY WILL LEAD YOU 'DOWN THE PATH' BUT  
 EXPERIENCE AND VIGILANCE WILL DETERMINE IF YOU FOLLOW. MY  
 FORECAST: SOMEBODY IS GOING TO FLY ONE OF THESE HIGH TECH  
 AIRPLANES INTO THE GND WITHIN 3 YRS BECAUSE OF BEING OUT OF THE  
 LOOP. 'IF THEY GIVE ME ONE MORE LABOR SAVING DEVICE, I WON'T HAVE  
 TIME TO USE IT!' CALLBACK CONVERSATION WITH RPTR REVEALED THE  
 FOLLOWING INFO. RPTR IS THE INTL FLT RELIEF PLT AND WAS OBSERVING.  
 BELIEVES INTERCEPT WAS APPROX 2 DOTS HIGH AT APPROX 8500 (20 MI  
 OUT). (ANALYST JUDGES THIS WOULD BE APPROX CORRECT) CAPT NOSED  
 DOWN APPROX 5 DEGS TO CATCH THE GS AND UPON INTERCEPT THE FLT  
 DIRECTOR INDICATED NOSE UP AND CAPT FOLLOWED THE FLT DIRECTOR TO  
 35 DEG UP. AT URGING OF FO AND RPTR CAPT LEVELLED -- ABANDONING  
 THE FLT DIRECTOR AND ACCEPTING VECTORS FOR ANOTHER APCH WHICH WAS  
 NORMAL. RPTR IS PROTESTING TRAINING AND WHERE A PLT WILL BLINDLY  
 FOLLOW THE PROGRAMMED GUIDANCE SYS AND IGNORE BASICS. GS RAW DATA  
 WAS ON THE DISPLAY BUT CAPT WAS NOT ADEPT OR PROFICIENT ENOUGH IN  
 INST FLYING (POSSIBLY NUMBED BY FATIGUE) TO OBSERVE THE

(REPORT CONTINUED)

CONFLICTING SIGNALS ON HIS DISPLAY. RPTR HAD MUCH TO SAY  
NEGATIVELY REF THE SO CALLED ADVANCE TECHNOLOGY. TOO MUCH HEAD IN  
COCKPIT PROGRAMMING AND XCHKING.

SYNOPSIS : FOLLOWING FLT DIRECTOR ON APCH AND  
CAPTURE OF GS. FLT DIRECTOR LED CAPT TO 35 DEG NOSE UP ATTITUDE  
UNTIL FLT DIRECTOR ABANDONED. ACFT LEVELLED FOR VECTORS TO ANOTHER  
APCH.

REFERENCE FACILITY ID : SEA  
FACILITY STATE : WA  
DISTANCE & BEARING FROM REF. : 20,340  
MSL ALTITUDE : 8500,9800

ACCESSION NUMBER : 200621  
 DATE OF OCCURRENCE : 9202  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : JAX  
 FACILITY STATE : FL  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZJX;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE; ALT  
 DEV/EXCURSION FROM ASSIGNED; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC OVERCAME EQUIP PROBLEM; FLC  
 RETURNED ACFT TO ORIGINAL CLNC OR INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : PROC OR POLICY/COMPANY; AN ACFT TYPE;  
 ACFT EQUIPMENT;  
 NARRATIVE : WE WERE ENRTE FROM DCA TO MCO APPROX 30  
 MINS PRIOR TO LNDG WHEN JAX CENTER ASK US TO DNSD FROM OUR CRUISE  
 ALT TO FL310. THIS WAS ACCOMPLISHED USING THE FMS AND A VNAV  
 DSCNT. THE ACFT SMOOTHLY DSNDDED TO FL310 AND LEVELED  
 AUTOMATICALLY. VNAV LVL WAS DISPLAYED ON THE FLT MODE ANNUNCIATOR.  
 FL310 WAS ALSO DISPLAYED IN THE ALT ALERT ADVISORY WINDOW. A FEW  
 MINS LATER THE FLT ATTENDANT KNOCKED AT THE DOOR AND I TURNED TO  
 LET HER IN. AT THAT MOMENT THE FO SAID WE ARE DSNDING AND HE  
 IMMEDIATELY PRESSED THE ALT HOLD BUTTON. WE DSNDDED ABOUT 100-150  
 FT BEFORE WE RETURNED TO FL310. WE DID NOT DEV MORE THAN 150 FT  
 AND THERE WAS NOT A TFC CONFLICT. THIS PROBLEM OCCURRED BECAUSE I  
 HAD ALREADY ENTERED XING RESTRICTIONS INTO THE FMS THAT WERE  
 DISPLAYED ON THE ARR WE WERE USING INTO MCO. THE FMS BEGAN A DSCNT  
 TO MEET THESE XING RESTRICTIONS WITH COMPLETE DISREGARD FOR THE  
 ALT DISPLAYED IN THE ALT ALERT WINDOW. THIS IS A SOFTWARE PROBLEM  
 THAT HAS RESULTED IN MANY ALT VIOLATIONS. I STRONGLY SUGGEST THAT  
 A CHANGE BE MADE TO THE SOFTWARE PACKAGE. THE FMS SHOULD LOOK AT  
 THE ALT IN THE ALT SELECT WINDOW AS IT'S PRIMARY REF AND THEN  
 OTHER RESTRICTIONS AS SECONDARY REFS. THIS WOULD PREVENT THE ACFT  
 FROM AUTOMATICALLY DEPARTING PRESELECTED ALTS.  
 SYNOPSIS : ALTDEV ALT EXCURSION.  
 REFERENCE FACILITY ID : JAX  
 FACILITY STATE : FL  
 DISTANCE & BEARING FROM REF. : 50,,N  
 MSL ALTITUDE : 30850,31000

ACCESSION NUMBER : 207997  
 DATE OF OCCURRENCE : 9204  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,DC;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : DCA  
 FACILITY STATE : DC  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : DCA; DCA;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/CRITICAL; TRACK  
 OR HDG DEVIATION; OTHER;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC OVERCAME EQUIP PROBLEM; CTLR ISSUED  
 NEW CLNC; OTHER;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT;  
 NARRATIVE : WE WERE CLR OF TKOF ON RWY 36 AT DCA,  
 APPARENTLY WE LOST OUR INSTS ON TKOF HSI, ADI, AND VHF NAV CAPT'S  
 AND FO'S. THESE INSTS ARE ALL IN CONJUNCTION WITH THE IRS SYS ON  
 THE ACFT. WE ADVISED DEP CTL OF OUR SITUATION. WE WERE GIVEN TURNS  
 UNTIL WE COULD INPUT A MAGNETIC COURSE FROM THE COMPASS INTO THE  
 FMC. ONCE THE INPUTS WERE EXECUTED WE HAD NORMAL INST AND VHF NAV  
 CAPABILITY. EMPHASIS SHOULD BE DIRECTED IN TRAINING PERTAINING TO  
 HUMAN FACTORS RELATED TO BEING DEPENDENT UPON ADVANCED/AUTOMATED  
 COCKPITS.  
 SYNOPSIS : HDG TRACK DEV BY DEP ACR MLG WHEN ACFT  
 EQUIP PROBLEM OF LOSS OF FLT INSTS OCCURS ON TKOF.  
 REFERENCE FACILITY ID : DCA  
 FACILITY STATE : DC  
 DISTANCE & BEARING FROM REF. : 1,,N  
 MSL ALTITUDE : 500,500

ACCESSION NUMBER : 208548  
 DATE OF OCCURRENCE : 9204  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,DC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : CRI  
 FACILITY STATE : NY  
 FACILITY TYPE : ARPT; TRACON; TWR;  
 FACILITY IDENTIFIER : JFK; N90; JFK;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/CRITICAL; TRACK  
 OR HDG DEVIATION; NON ADHERENCE LEGAL RQMT/CLNC; NON ADHERENCE  
 LEGAL RQMT/PUBLISHED PROC; OTHER;  
 ANOMALY DETECTOR : ATC/CTLR; COCKPIT/FLC;  
 COCKPIT/EQUIPMENT;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE; ACFT EQUIP PROBLEM RESOLVED ITSELF; CTLR ISSUED  
 NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;

NARRATIVE : WE DEPARTED RWY 31L AT JFK ON THE  
 KENNEDY 5 DEP BREEZY POINT CLB. AFTER TKOF, I CALLED FOR 'DIRECT  
 INTERCEPT, LNAV' TO CRI VOR. BEING CLOSE TO CRI PLUS THE SLOWER  
 COMPUTER IN THE X FMS, RESULTED IN THE APPEARANCE OF SUBSEQUENT  
 MAP SHIFTING. WE WERE CONCERNED WITH ENCROACHING ON THE CRI 039  
 DEG RADIAL AND TURNED TO A 220 DEG HDG. BY THE TIME WE RE-ORIENTED  
 OURSELVES TO BASIC VOR NAV, WE FOUND OURSELVES 2 MI S OF CRI VOR.  
 ATC QUERIED AND ASSIGNED A 260 DEG HDG TO INTERCEPT THE CRI 223  
 DEG RADIAL OUTBOUND. QUITE FRANKLY, I'M NOT QUITE SURE HOW TO  
 PREVENT THESE KINDS OF SITUATIONS DUE TO THE MANY ANOMALIES AND  
 COMPLEXITY OF THE OP. THE ANSWER MAY BE TO GO BACK TO BASIC NAV IN  
 THE TERMINAL ENVIRONMENT AND USE THE FMS ONCE ESTABLISHED ENRTE.  
 IN MY OPINION, THE WHOLE CONCEPT OF GLASS COCKPIT FLYING LOOKS A  
 WHOLE LOT BETTER ON PAPER THAN IT DOES OPERATIONALLY. NOTE: A  
 POSSIBLE EXPLANATION TO THE MAP SHIFT ANOMALY DESCRIBED ABOVE IS  
 THE VOR-DME UPDATING THAT OCCURS AFTER THE ACFT BECOMES AIRBORNE.  
 AGAIN, PERHAPS BASIC NAV IS THE ANSWER. (THIS WAS EXPLAINED TO ME  
 AFTER THE FACT). SUPPLEMENTAL INFO FROM ACN 208260: UPON LEAVING  
 500 FT AGL FO, WHO WAS FLYING, CALLED FOR LNAV DIRECT TO CRI VOR.  
 I THEN SELECTED AND EXECUTED FMC TO THE CALLED FOR PROC. THE  
 SCREEN THEN WENT BLANK FOR APPROX 10 SECONDS AND THEN SAID STANDBY  
 FOR ANOTHER 20 SECONDS BEFORE FINALLY GIVING THE COURSE TO CRI. BY  
 THIS TIME, WE WERE GETTING CLOSE TO THE 036 DEG RADIAL. A HARD  
 TURN WAS EXECUTED TO SOUTHEASTERLY HDG TO REMAIN S OF 039 DEG  
 RADIAL WITH OUR CLOSE PROX TO CRI WE ENDED UP 2 MI S OF CRI AND  
 WERE THEN VECTORED TO INTERCEPT THE 223 DEG RADIAL OUTBOUND. I  
 BELIEVE OUR MISTAKE WAS NOT FLYING THE DEP PROC MANUALLY. THE X  
 FMC IS EXTREMELY SLOW COMPARED TO THE Y WHICH WE FLY ALMOST  
 EXCLUSIVELY. ALSO CONTRIBUTING IS THE HIGH WORKLOAD ON 2 MAN  
 COCKPIT ON TKOF AND LNDG.

SYNOPSIS : ACR WDB FLC HAD AN FMC PROBLEM RIGHT  
 AFTER TKOF THAT CAUSED THEM TO BE OFF TRACK ON DEP. ATC GAVE THE  
 ACFT A VECTOR AND THE FMS CAME BACK TO LIFE.

REFERENCE FACILITY ID : CRI  
 FACILITY STATE : NY  
 DISTANCE & BEARING FROM REF. : 2,,SO

(REPORT CONTINUED)

MSL ALTITUDE : 5000,5000

ACCESSION NUMBER : 208788  
 DATE OF OCCURRENCE : 9204  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : RIC  
 FACILITY STATE : VA  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZDC;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE; ALT  
 DEV/UNDERSHOOT ON CLB OR DES; ALT DEV/XING RESTRICTION NOT MET;  
 NON ADHERENCE LEGAL RQMT/CLNC; OTHER;  
 ANOMALY DETECTOR : ATC/CTLR; COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/INSUFFICIENT TIME; NOT  
 RESOLVED/ANOMALY ACCEPTED;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT;  
 NARRATIVE : WHILE ENRTE FROM TAMPA, FL, TO  
 WASHINGTON DC, IN AN MLG, THE FLT HAD BEEN UNEVENTFUL UNTIL THE  
 INITIAL DSCNT FROM THE CRUISING ALT OF FL370. CTR ISSUED A XING  
 RESTRICTION OF FL270 AT 80 NM S OF RICHMOND VOR (RIC). I  
 PROGRAMMED THE FMC FOR THE DSCNT AND ALLOWED IT TO INITIATE THE  
 IDLE-PWR DSCNT FOR THE INTERCEPT IN VNAV MODE. SPD DURING DSCNT  
 WAS MACH .75 AND APPROX 260 KIAS WITH THE KIAS SLOWLY INCREASING  
 TOWARD THE CROSSOVER FIGURE OF 293 KTS AS PROGRAMMED FOR ECONOMY  
 PROFILE. DURING THE DSCNT, ATC STATED THAT 'WHEN ABLE,' WE SHOULD  
 MAINTAIN 300 KTS. AT THIS TIME, WE WERE PASSING APPROX FL320 WITH  
 MACH .75, INCREASING THROUGH ABOUT 285 KTS. I CALLED UP THE  
 'CRUISE' PAGE ON THE CDU AND ENTERED '300' INTO THE CRUISE AIRSPD  
 LINE, EXPECTING THE COMPUTER TO CONTINUE THE DSCNT AND 'TRAP' THE  
 300 KT CRUISE SPD AT LEVEL-OFF. AS SOON AS I 'EXECUTED' THIS  
 INSTRUCTION, THE THROTTLES ADVANCED AND THE ACFT BEGAN TO LEVEL  
 OFF AT ABOUT FL300 MAINTAINING 300 KIAS. I SPENT ABOUT 8 SECONDS  
 SAYING 'WHAT'S GOING ON' AND TRYING TO GET A 'LEVEL CHANGE' IDLE  
 DSCNT GOING BEFORE REALIZING IT WAS TOO LATE -- I DISCONNECTED THE  
 AUTOPLT AND MANUALLY REESTABLISHED A 3000 FPM DSCNT BUT CROSSED  
 THE RIC 80 NM ARC AT ABOUT FL285 (1500 FT HIGH) AND LEVELED OFF AT  
 FL270 AT APPROX 77 NM S OF RIC (3 NM LATE). I STILL DO NOT KNOW  
 WHY THE FMC 'CAPTURED' THE BOOK AND LEVELED OFF EARLY. A LOGICAL  
 EXPLANATION WOULD BE THAT I ENTERED '300' INTO THE 'CRUISE ALT'  
 LINE INSTEAD OF THE 'CRUISE AIRSPD' LINE, BUT I KNOW I DIDN'T DO  
 THAT. THE FMC 'NAILS' THESE XING RESTRICTIONS VERY WELL MOST OF  
 THE TIME, BUT I WOULD LIKE TO SEE A 5 NM OR SO 'PAD' THAT WOULD  
 GIVE US A LITTLE MARGIN FOR ERROR IN THAT 1/10 PERCENT OCCURRENCE  
 OF WINDS NOT BEING QUITE AS FORECAST, LATE DSCNT INITIATION, ETC.  
 I AM GOING TO BEGIN PROGRAMMING THE FMC TO BE DOWN 5 NM EARLY  
 EFFECTIVE IMMEDIATELY.  
 SYNOPSIS : ALT BUST. XING RESTRICTION NOT MET.  
 REFERENCE FACILITY ID : RIC  
 FACILITY STATE : VA  
 DISTANCE & BEARING FROM REF. : 80,,SO  
 MSL ALTITUDE : 27000,28500

ACCESSION NUMBER : 210056  
 DATE OF OCCURRENCE : 9205  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TRACON,AC;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : LGA  
 FACILITY STATE : NY  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : N90; LGA;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE;  
 TRACK OR HDG DEVIATION; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : AN ACFT TYPE; ACFT EQUIPMENT;  
 NARRATIVE : DUE TO HVY WX ON NORMAL ARR RTE (NANCI  
 ARR) WE WERE RE- RTED TO THE EXTOL ARR TO AVOID THE WX. DURING  
 DSCNT, APCHING THE HARRP INTXN, I EXPERIENCED FMC FAILURE. IN A  
 FEW SECONDS, THE FMC CAME BACK ON AND SHORTLY THEREAFTER, THE FLT  
 DIRECTOR (ON MY SIDE ALSO) FAILED. -- I WAS TRYING TO LOCATE THE  
 PROPER CIRCUIT BREAKERS TO RESET THE FLT DIRECTOR WHEN IT SUDDENLY  
 CAME BACK ON. THE ACFT HAD FAILED TO MAKE THE TURN AT HARRP TO LGA  
 AND BOTH THE FO AND I FAILED TO NOTICE DUE TO THE DISTR. APCH CTL  
 POINTED THIS OUT TO US AND THEN GAVE US A VECTOR. THESE TYPE OF  
 ELECTRICAL GLITCHES SEEM QUITE COMMON ON THE MLG, ALTHOUGH I AM  
 NEW ON THE TYPE I'VE ALREADY SEEN SEVERAL. CALLBACK CONVERSATION  
 WITH RPTR REVEALED THE FOLLOWING INFO: RPTR NOW AS 400 HRS ON  
 ACFT. HE SAID THE 'NERVOUS SYS ON THE ACFT IS LOUSY.' A COMMON  
 PROBLEM: THE FMC IS PROGRAMMED TO CROSS A POINT AT AND INTERCEPT  
 AN ALT. IT MAKES THE XING RESTRICTION BUT FAILS TO CAPTURE THE  
 ALT. OFTEN, WHEN A RTE IS RE-ENTERED OR AMENDED, THE FMC SEEMS TO  
 BE OVERLOADED AND IS LOST. HE ADDED THAT THE NAV CTL SYS IS  
 WRITTEN UP ABOUT ONCE PER LEG ON AVERAGE.  
 SYNOPSIS : FMS FAILED TO MAKE PROGRAMMED TURN AT  
 HARRP INTXN.  
 REFERENCE FACILITY ID : LGA  
 FACILITY STATE : NY  
 DISTANCE & BEARING FROM REF. : 24,44  
 MSL ALTITUDE : 4000,4000



ACCESSION NUMBER : 210339  
 DATE OF OCCURRENCE : 9204  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : MKC  
 FACILITY STATE : MO  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZKC;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : OTHER; ACFT EQUIPMENT PROBLEM/CRITICAL;  
 NON ADHERENCE LEGAL RQMT/PUBLISHED PROC; NON ADHERENCE LEGAL  
 RQMT/FAR;  
 ANOMALY DETECTOR : COCKPIT/FLC; COCKPIT/EQUIPMENT;  
 ANOMALY RESOLUTION : NOT RESOLVED/UNABLE;  
 ANOMALY CONSEQUENCES : FAA INVESTIGATORY FOLLOW-UP; OTHER;  
 SITUATION REPORT SUBJECTS : AN ACFT TYPE; ACFT EQUIPMENT; PROC OR  
 POLICY/COMPANY;

NARRATIVE : ON A SCHEDULED FLT FROM PHX TO IND AT  
 FL370, ON J-80 AFTER PASSING HLL. THE MAIN DIST CIRCUIT BREAKER ON  
 #1 GENERATOR BUS PANEL OPENED. THIS PWR INTERRUPTION CAUSED THE  
 LOSS OF ALL CAPT'S FLT INSTS, FMC'S RADAR, TCASII, ACARS, AND MANY  
 PARTIAL SYS. THE CIRCUIT BREAKER WAS RESET AND SYS RETURNED. 30  
 MINS LATER, THE CIRCUIT BREAKER OPENED AGAIN. SAME FAILURES, WHICH  
 INCLUDED AUTOPLT. THERE WERE NO EMER CHKLISTS FOR THIS PARTICULAR  
 PROBLEM. NO DEVS AND ATC WAS ADVISED BOTH TIMES. DUE TO THE AMOUNT  
 OF FAILED ITEMS, THE CIRCUIT BREAKER WAS RESET. THIS AGAIN  
 RESTORED THE SYS. 10 MIN LATER, AN ADJACENT CIRCUIT BREAKER, #1  
 TRANSFER CIRCUIT BREAKER OPENED. THE SAME SYS ALL FAILED--AUTOPLT,  
 CAPT'S INSTS, RADAR, TCASII, ACARS, AUTO THROTTLES, YAW DAMPER,  
 FMC'S, ETC. ATC WAS ADVISED. ATC ASKED FOR A TURN DIRECT CAP AND A  
 DSCNT TO FL290. A DSCNT WAS STARTED BY THE FO, HE HAD THE ONLY  
 WORKING INSTS, BUT THE PRESSURE CTL WAS INOP. THE CABIN ALT  
 WARNING HORN SOUNDED WHEN THE CABIN EXCEEDED 10000 FT. THE ACFT  
 WAS LEVELED OFF TO CTL THE PRESSURE AND MANUAL PRESSURIZATION WAS  
 USED TO CTL THE CABIN PRESSURE. ATC ASKED IF WE WOULD MAKE THE  
 FL290 ALT AT CAP. I ADVISED THEM I WAS HAVING PROBLEMS WITH THE  
 PRESSURIZATION AND NEEDED VECTORS TO IND AND A GRADUAL DSCNT BELOW  
 FL180. I DECLARED AN EMER TO AVOID ANY MORE ATC PROBLEMS. THE  
 DSCNT AND LNDG AT IND WERE COMPLETED NORMALLY. A 2 MAN CREW IS  
 VERY BUSY WHEN AN ACFT PROBLEM IS ENCOUNTERED. COMPOUND THIS WITH  
 A MAJOR LOSS OF NAV AND FLT SYS AND THROW IN SOME ATC RESTRICTIONS  
 AND THERE IS A CHANCE FOR A MAJOR ERROR. WHEN ATC IS ADVISED OF A  
 PROBLEM, THEY SHOULD MAKE SURE, ASK, GET THE FACT, AND HELP. DO  
 NOT GIVE ALT RESTRICTIONS UNTIL THE CREW HAS DEFINED THE PROBLEM.  
 WORKING TOGETHER IS VERY IMPORTANT. WE CREWS COUNT ON ATC TO HELP  
 WHEN THINGS AREN'T NORMAL. WE WILL DO ANYTHING TO HELP ATC WHEN WE  
 ARE ABLE, BUT WITH THE NEW, HEAVILY COMPUTER DEPENDENT ACT, THE  
 LOSS OF 1 NAV AID OR COMPUTER CAN CAUSE BIG POS PROBLEMS. THE MORE  
 OR BIGGER THE PROBLEM GETS, THE MORE DISTRACTED THE CREW BECOMES.  
 WE ALL HAVE TO LEARN HOW MUCH HELP A 2 MAN CREW NEEDS WHEN THEY  
 START TO HAVE PROBLEMS.

SYNOPSIS : REPEATED LOSS OF ESSENTIAL FLT INSTS  
 DUE TO REPETITIVE OPENING OF MAIN CTL CIRCUIT BREAKERS INDUCES PIC  
 OF AIR CARRIER MLG TO DECLARE AN EMER.

(REPORT CONTINUED)

REFERENCE FACILITY ID : MKC  
FACILITY STATE : MO  
DISTANCE & BEARING FROM REF. : 100,,NE  
MSL ALTITUDE : 29000,37000

ACCESSION NUMBER : 217870  
 DATE OF OCCURRENCE : 9207  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : FIM  
 FACILITY STATE : CA  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : LAX; LAX;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/CRITICAL; ALT  
 DEV/EXCURSION FROM ASSIGNED; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE;  
 ANOMALY CONSEQUENCES : OTHER;  
 NARRATIVE : ACFT WAS ON AUTOPLT, RTE WAS PROGRAMMED

INTO FMC THROUGH ILS 24R APCH. CROSSED FIM ON PROFILE APPROX 16000  
 FT. SET 12000 IN ALT AND STARTED SLOWING TO PROFILE SPD 280 KTS.  
 ON REACHING SPD AND ON PROFILE (ABOVE 12000) AT SYMON FO SET 10000  
 IN ALT FOR BAYST. I RESELECTED VNAV AND THE ACFT RESPONDED WITH A  
 VERY DRAMATIC NOSE DOWN PITCH. I PUNCHED THE AUTOPLT OFF AND  
 STARTED PULLING THE NOSE BACK UP. ALT WAS APPROX 11500, VERT SPD  
 PEGGED ON 6000 DOWN, SPD WITH SPOILERS UP WAS GOING THROUGH 300  
 KTS. OUTSIDE VIEW LOOKED LIKE A HIGH DIVE. I WAS PULLING A VERY  
 GOOD G LOAD TO REGAIN LEVEL FLT. FULL RECOVERY WAS REACHED ABOUT  
 9780. NO ALT ALERT SOUNDED IN COCKPIT. I HAND FLEW THE BAL OF THE  
 FLT. AFTER SMO ON ASSIGNED HDG THE FO TRIED TO EXTEND THE OM  
 (ROMEN) FOR INTERCEPT FOR ILS 24R (ARPT WAS 500 OVCST, TOPS ABOUT  
 1500). WHEN ROMEN WAS TAKEN FROM SCRATCH PAD TO INTERCEPT BOX, THE  
 WHOLE THING WENT BLANK. HE SELECTED ANOTHER FMC AND RE-INSTALLED  
 THE APCH FOR A HAND FLOWN ILS. FLT WAS MET BY R AND E'S THAT  
 VERIFIED THE R FMC HAD FAILED. NO INDICATION OF FAILURE BEFORE  
 GOING BLANK, BUT IT SURE WANTED TO DO SOMETHING (PITCH-WISE) THAT  
 WASN'T PROGRAMMED. YOU CAN GET BUSY REAL FAST WHEN ALL THE MAGIC  
 FAILS THAT CLOSE TO LNDG. I HOPE NEW LOW TIME PEOPLE MOVING ALMOST  
 DIRECTLY INTO GLASS COCKPITS DON'T RELY TOO MUCH ON AUTOMATION AND  
 FORGET HOW TO FLY. MY OPINION -- IT'S GREAT BUT DON'T EVER TRUST  
 IT.

SYNOPSIS : LGT WITH GLASS COCKPIT, AUTOPLT ON HAS  
 ABRUPT NOSE PITCH DOWN WHEN SELECTING VNAV. AUTOPLT TURNED OFF BUT  
 VERY DIFFICULT TO PULL NOSE BACK UP. FO PROGRAMMING FOR APCH AS  
 SCREEN GO BLANK.

REFERENCE FACILITY ID : FIM  
 FACILITY STATE : CA  
 DISTANCE & BEARING FROM REF. : 12,148  
 MSL ALTITUDE : 9800,10000

ACCESSION NUMBER : 219222  
 DATE OF OCCURRENCE : 9208  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ADM  
 FACILITY STATE : OK  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZFW;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : OTHER; ALT DEV/UNDERSHOOT ON CLB OR  
 DES;

ALT DEV/XING RESTRICTION NOT MET; ACFT EQUIPMENT PROBLEM/LESS  
 SEVERE; NON ADHERENCE LEGAL RQMT/CLNC;

ANOMALY DETECTOR : COCKPIT/FLC; COCKPIT/EQUIPMENT;  
 ANOMALY RESOLUTION : NOT RESOLVED/OTHER;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : AN ACFT TYPE; ACFT EQUIPMENT;  
 NARRATIVE : AFTER VECTORS OFF FILED RTE A NEW STAR

WAS ISSUED. ATC REQUESTED A XING OF THE 50 DME OF BPR AT FL240.  
 DSCNT FROM FL350 WAS BEGUN WHILE THE FO DID THE REQUIRED FMS  
 ENTRIES. ENCOUNTERING DIFFICULTY WITH THE FORMAT FOR ENTRY MY ATTN  
 WAS DIVERTED TO EXPLAIN THE FORMAT FOR FMS TO THE FO. UPON  
 COMPLETION OF THE ENTRY THE DSCNT INFO WAS SLOW BEING DISPLAYED  
 (AN UNFORTUNATE CHARACTERISTIC OF THE WDB ACFT FMS). MEANWHILE,  
 MENTAL CALCULATIONS INDICATED THE XING RESTRICTION COULD NOT BE  
 MADE BUT REPEATED ATTEMPTS TO NOTIFY ATC OF THE PROBLEM WAS  
 RENDERED IMPOSSIBLE BY FREQ CONGESTION. WHEN ATC WAS FINALLY  
 CONTACTED, WE WERE INSTRUCTED TO CONTINUE DSCNT TO A LOWER ALT AND  
 TOLD THE XING WAS OF NO CONSEQUENCE. WHILE ALL SEEMED TO END WELL,  
 I WAS VERY UNSETTLED BY THE EVENT, IN THAT SUCH XING RESTRICTIONS  
 I TRY TO LEAD BY A COMFORTABLE MARGIN. MY OWN INEXPERIENCE WITH  
 THIS ACFT SIMPLY DID NOT ALERT ME TO THE DIFFICULTY IN COMPLYING  
 WITH THE CLRNC WHEN FIRST ISSUED AND THE FMS FORMAT PROBLEM  
 ENCOUNTERED BY THE FO ARE ALL TOO COMMON ON THIS ACFT IN THAT THE  
 FMS IS LESS 'USER FRIENDLY' THAN MY PREVIOUS ACFT, THE WDB/LGT  
 ACFT. I HAVE INCORPORATED A PROC THAT ALL CLBS AND DSCNTS BE  
 CONDUCTED WITH RAW DATA FOR THE 'ON RTE.' VORS WILL BE CONTINUALLY  
 DISPLAYED TO AVOID THIS PROBLEM. THE FMS ON THE WDB ACFT DOES NOT  
 NORMALLY USE ON RTE VORS FOR POS UPDATING OF THE FMS SO IT BECOMES  
 A CREW FUNCTION TO OVERRIDE AUTOMATIC TUNING IN ORDER TO BE  
 PREPARED FOR SUCH 'POP-UP' CLRNCs. I HAVE CONTACTED MY CHIEF PLT  
 ADVISING HIM OF THE PROBLEM AND MY SUGGESTED PROCEDURAL FIX. IN  
 ADDITION, I ADVISED THAT TRAINING BE ADVISED TO SUGGEST THIS PROC  
 BE INCLUDED IN THE TRAINING SYLLABUS, FOR RAW DATA DISPLAY TO TOP  
 OF CLB AND FROM BEGINNING OF DSCNT.

SYNOPSIS : FLC OF WDB ACFT UNDERSHOT A DSCNT ALT  
 DUE THE COMPUTER FMS BEING SLOW TO RESPOND TO THE NEW DATA INPUT.

REFERENCE FACILITY ID : ADM  
 FACILITY STATE : OK  
 MSL ALTITUDE : 24000,26000

ACCESSION NUMBER : 219689  
 DATE OF OCCURRENCE : 9208  
 REPORTED BY : FLC; FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; FLC,SO;  
 ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : LAX  
 FACILITY STATE : CA  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZLA;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE;  
 TRACK OR HDG DEVIATION; ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : ATC/CTLR; COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE; FLC BECAME REORIENTED; CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT; PROC OR POLICY/COMPANY;  
 NARRATIVE : CLRED FOR THE CIVET. CIVET 3 PROFILE  
 DSCNT INTO LAX I STARTED TO FLIP MY VOR FROM AUTO-TUNE TO ILS/DME  
 FREQ 109.9 ILAX AND BACK TO AUTO-TUNE AT ABOUT 160 NM FROM LAX  
 ACCORDING TO THE FMS. THE FIRST TIME I SWITCHED, THE DME SHOWED  
 ABOUT 110 IN THE OVERRIDE MODE AND SINCE WE WERE 160 OUT ACCORDING  
 TO THE FMS/RNAV I ASSUMED THE DME WAS FROM SOME OTHER 109.9. I  
 FLIPPED BACK AND FORTH SEVERAL MORE TIMES IN THE NEXT FEW MINS AND  
 BECAME VERY CONCERNED WHEN THE DME FINALLY SHOWED 56 AND THE  
 FMS/RNAV SAID 106, SINCE I KNEW THERE COULD BE NO OTHER ILS/DME  
 WITHIN 100 OF LAX ON FREQ 109.9. AT THAT POINT, I TOLD THE CAPT  
 THERE WAS SOMETHING SCREWY GOING ON WITH MY DME VERSUS RNAV. WE  
 STARTED TO COMPARE HIS VOR TO MINE AND THE RNAV, BUT WITHIN 30  
 SECONDS, CTR CALLED TO CONFIRM OUR CLRNC ON THE CIVET 3 PROFILE.  
 WE AGREED WE HAD BEEN CLRED FOR IT AND HE REPLIED WE WERE S OF  
 COURSE, GAVE US A VECTOR TO INTERCEPT THE LOC AND ASSIGNED A XING  
 ALT AT ARNES. SINCE WE WERE AT 49 DME WHEN THE CONVERSATION  
 STARTED, WE WERE ALREADY INSIDE CIVET AND LATER ESTIMATED WE MUST  
 HAVE BEEN AT LEAST 1500 FT HIGH XING ABEAM IT. WE WERE BACK ON THE  
 PROFILE BY ARNES. WE DON'T KNOW WHERE OR WHEN THE RNAV GOT LOST,  
 BUT WE DO KNOW THE WAYPOINT COORDINATES WERE CORRECT. THE BOTTOM  
 LINE IS THE OVERALL SYS WORKED. WHILE WE TRUSTED THE RNAV, WE DID  
 START TO XCHK IT, THEN QUESTION IT, AND THE MOMENT THE CTLR  
 CONFIRMED OUR SUSPICIONS, CORRECTED IT BY SWITCHING BACK TO THE  
 OLD- FASHIONED, MANUAL METHOD. SUPPLEMENTAL INFO FROM ACN 219990:  
 I ESTIMATE WE WERE 2-3 MI S WHEN CALLED. EVIDENTLY OUR AUTO NAV  
 SYS HAD MALFUNCTIONED ALTHOUGH WE HAD NO FLAGS. AFTER LNDG WE  
 CHKED OUR INS COORDINATES AND BOTH INS WERE CORRECT. WE SUSPECTED  
 PROBLEM IN RNAV SYS AND ADVISED MAINT TO CHK IT OUT. ONE METHOD OF  
 PREVENTION OR CORRECTION WOULD BE TO XCHK MANUAL SYS A BIT FARTHER  
 AWAY AND MAYBE XCHK MORE THAN ONCE. IN MY 4 YRS AND OVER 2800 HRS  
 USING INS NAV, I'VE ALWAYS FOUND THE SYS TO BE VERY ACCURATE UNTIL  
 THIS INSTANCE.  
 SYNOPSIS : HDG TRACK POS DEV IN A GROSS NAV ERROR  
 DURING APCH PROC STAR.  
 REFERENCE FACILITY ID : LAX  
 FACILITY STATE : CA

(REPORT CONTINUED)

DISTANCE & BEARING FROM REF. : 56,,E  
MSL ALTITUDE : 18000,19500

ACCESSION NUMBER : 219816  
 DATE OF OCCURRENCE : 9206  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : LAS  
 FACILITY STATE : NV  
 FACILITY TYPE : TWR; ARPT;  
 FACILITY IDENTIFIER : LAS; LAS;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : SPEED DEVIATION; OTHER;  
 ANOMALY DETECTOR : COCKPIT/FLC; COCKPIT/EQUIPMENT;  
 ANOMALY RESOLUTION : FLC OVERCAME EQUIP PROBLEM; FLC  
 RETURNED ACFT TO ORIGINAL CLNC OR INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : AN ACFT TYPE; ACFT EQUIPMENT; OTHER;  
 NARRATIVE : FO WAS PF, HIGHLY EXPERIENCED WITH

ADVANCED COCKPITS (LGT AND MLG) AND ABOUT 2 MONTHS EXPERIENCE ON THE MLG, WAS HAND FLYING ACFT WITH AUTO THRUST ACTIVE IN THE SPD MODE. INTERCEPTED GS FROM ABOVE IN LNDG CONFIGN AND MANAGED AIRSPD (FMS CALCULATED). ENGS WERE AT FLT IDLE BECAUSE ACTUAL AIRSPD WAS HIGHER THAN FMS APCH SPD. AUTO THRUST WAS ACTIVE AND IN THE SPD MODE. ONCE GS WAS CAPTURED, AIRSPD BLED OFF AND WENT BELOW APCH SPD AND VLS (FMS MIN SPD). FO LOOKED AT ENG INSTS TO SEE WHAT THE ENGS WERE DOING (THRUST LEVERS DON'T MOVE WITH AUTO THRUST ACTIVE) AND THERE WAS NO INDICATION OF THEM SPOOLING. TO MAINTAIN AIRSPD, HE LOWERED NOSE AND GAVE UP FOLLOWING GS. HE AGAIN CHKED ENG INST, BROUGHT UP NOSE, AGAIN WENT BELOW VLS WITH NO APPARENT RESPONSE FROM AUTO THRUST. HE AGAIN LOWERED NOSE TO GET BACK TO VLS AND BECAME PUZZLED WITH WHAT TO DO WITH THE THRUST LEVERS. WE WERE NOW APPROX 1000 FT AGL, FULLY CONFIGURED, ENGS AT IDLE AND SINKING 2000 FPM. JUST PRIOR TO THE FO FIRE WALLING THRUST LEVERS, I TOOK CTL OF THE ACFT, BROUGHT THE THRUST LEVER BACK TO AN INTERMEDIATE POS AND DISCONNECTED AUTO THRUST. THE ENGS SPOOLED UP, I LEVELED OFF AND THEN CAPTURED GS FROM BELOW AND COMPLETED THE APCH. THE NONMOVING THRUST LEVERS ARE A TERRIBLE DESIGN WHICH HAS CONTRIBUTED TO AT LEAST 1 ACCIDENT. I RECOMMEND: 1) WHEN HAND FLYING, AUTO THRUST ON THIS ACFT MUST BE OFF, IE, THROTTLES ARE NOW CONVENTIONAL. THIS SHOULD BE A LIMITATION. 2) FAA SHOULD DENY CERTIFICATION OF ANY FUTURE ACFT WITHOUT MOVING AUTO THROTTLES (IE, LGT). AIRWORTHINESS DIRECTIVE SHOULD ALSO BE ISSUED TO MODIFY THE MLG AS WELL. I SENT IN A RPT TO YOU REGARDING INADVERTENT RUDDER TRIM ACTIVATION ON THE MLG 1 YR PRIOR TO THE MLG ACCIDENT AT LA GUARDIA. BUT NOTHING WAS DONE AND THE RUDDER TRIM CONTRIBUTED TO NUMEROUS DEATHS IN THAT ACCIDENT. PLEASE DON'T OVERLOOK THIS PROBLEM. I AM PRO-TECHNOLOGY BUT WHEN 3 MLG'S CRASH IN ITS VERY SHORT HISTORY, IT MAKES A STRONG STATEMENT ABOUT THE HUMAN INTERFACE WITH THIS TECHNOLOGY, ESPECIALLY WITH THE MLG/LGT LONG HISTORY OF ALMOST ACCIDENT FREE FLYING AS A COMPARISON. IT'S NOT ASKING THAT MUCH TO PUT MOVING AUTO THROTTLES BACK INTO COCKPITS. CALLBACK CONVERSATION WITH RPTR REVEALED THE FOLLOWING: THE RPTR VERY STRONGLY BELIEVES THAT SOMETHING MUST BE DONE TO FIX THIS PROBLEM AS HE BELIEVES THAT AT LEAST 2 ACFT HAVE CRASHED BECAUSE OF THIS DESIGN. HE POINTS OUT THAT NONE OF THE AMERICAN MADE ACFT WITH AUTO THROTTLES HAVE HAD THIS KIND OF PROBLEM. THE RPTR ALSO BELIEVES THAT MORE TRAINING CANNOT BE THE WHOLE ANSWER

(REPORT CONTINUED)

TO THE PROBLEM, A DESIGN FIX WILL BE REQUIRED, AND THE SOONER THE BETTER.

SYNOPSIS : THIS RPTR WATCHED HIS FO STRUGGLE WITH  
AUTO THROTTLES TO THE POINT THAT THE RPTR HAD TO TAKE THE ACFT  
AWAY FROM THE FO TO PREVENT A POSSIBLE CRASH.

REFERENCE FACILITY ID : LAS  
FACILITY STATE : NV  
DISTANCE & BEARING FROM REF. : 4,,E  
AGL ALTITUDE : 1000,1000



ACCESSION NUMBER : 220575  
 DATE OF OCCURRENCE : 9209  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TRACON,AC; MISC,  
 ACI;  
 FLIGHT CONDITIONS : MVF  
 REFERENCE FACILITY ID : ADW  
 FACILITY STATE : MD  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : BWI; ADW;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : SPEED DEVIATION; ACFT EQUIPMENT  
 PROBLEM/LESS SEVERE; NON ADHERENCE LEGAL RQMT/PUBLISHED PROC; NON  
 ADHERENCE LEGAL RQMT/FAR;  
 ANOMALY DETECTOR : COCKPIT/FLC; OTHER;  
 ANOMALY RESOLUTION : OTHER;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : THIS WAS A SIMPLE MISTAKE OF DSNDING  
 BELOW 10000 FT AT 310 KIAS. UNFORTUNATELY FOR ME, AN FAA INSPECTOR  
 ON OUR JUMPSEAT WAS THE ONE WHO POINTED OUT THE VIOLATION TO ME.  
 THE WX WAS VERY HAZY WITH SCATTERED TO BROKEN SMALL CLOUDS, THE  
 TYPE OF WX THAT COULD PASS FOR VFR. WHEN DSNDING INTO SUCH AN  
 ENVIRONMENT, I SPEND MORE TIME LOOKING OUT THAN LOOKING IN. THE  
 AUTOPLT WAS ON AND THE VNAV AND HDG SELECT MODES WERE ON. I HAD  
 FORGOTTEN THAT I HAD OPENED THE AIRSPD WINDOW SEVERAL MINS BEFORE  
 WHEN ATC INSTRUCTED US TO KEEP OUR IAS ABOVE 300 KTS. WHEN THE SPD  
 WINDOW IS OPEN, THERE IS NO AUTOMATIC SLOWING OF THE ACFT TO 250  
 KTS AT 10000 FT. THE COPLT WAS BUSY LISTENING TO A NEW ATIS AND  
 LOOKING UP THE GS HELP ON THE ACTIVE RWY WHICH WAS A NON-INST APCH  
 RWY. THE ATIS WAS BROADCAST OVER A LOW PWR VOR WHICH WE COULDN'T  
 RECEIVE UNTIL VERY CLOSE TO THE ARPT. I WAS SPENDING MORE TIME  
 LOOKING OUT THAN LOOKING AT THE INSTS AND DID NOT CATCH THE SPD  
 LIMIT BUST. I SLOWED TO 250 KTS IMMEDIATELY, BUT I WAS ABOUT 8800  
 FT WHEN THE SPD SLOWED TO 250. ATC DID NOT MENTION OUR SPD, JUST  
 THE FAA INSPECTOR. SIMPLE MISTAKE -- I GOOFED. IF I HAD CALLED OUT  
 11000 FT FOR 10000 FT FOR 8000 FT THIS PROBABLY WOULD NOT HAVE  
 HAPPENED. IF I HAD SPENT MORE TIME INSIDE THE COCKPIT THAN OUTSIDE  
 THE COCKPIT, THIS PROBABLY WOULD NOT HAVE HAPPENED. IF THE COPLT  
 HAD NOT BEEN COPYING THE ATIS AND LOOKING UP RWY DETAILS, THIS  
 PROBABLY WOULD NOT HAVE HAPPENED. THE ABOVE HAS HAPPENED BEFORE  
 (NOT TO ME, HOWEVER) AND WILL CERTAINLY HAPPEN AGAIN. NO LIVES  
 WERE THREATENED AND NO NEAR MISSES OCCURRED. HOWEVER, WHAT  
 HAPPENED AFTER THIS OVERSPD WAS NOT A VIOLATION OF ANYTHING, BUT  
 GOOD SENSE, AND WAS A THOUSAND TIMES MORE DANGEROUS. ATIS, AS  
 MENTIONED, WAS BEING BROADCAST OVER A WEAK STATION AND WE HAD TO  
 SPEND TIME UNDER 10000 FT COPYING INFO. THE ACTIVE RWY ON THE ATIS  
 WAS 19L (NO INST APCH) AND 19R WAS RPTED CLOSED, BUT WE WERE  
 EVENTUALLY CLRED TO 19R. THE ACFT IN FRONT OF US WAS CLRED FOR AN  
 ADF APCH TO 19R. WE WERE NOT INFORMED TO WHAT RWY WE WERE BEING  
 VECTORED (WE ASSUMED 19L AS STATED ON THE ATIS UNTIL WE HEARD THE  
 ADF APCH CLRNC). THE ARPT WAS NOT IN OUR DATA BASE. AT 3000 FT  
 APCH CTL ASKED US TO CONTACT AN ARPT FREQ AND GIVE THEM OUR LNDG  
 PERMISSION NUMBER OF WE COULD NOT LAND (NOW TURNING ON BASE LEG).  
 THE COPLT WAS NOW COMPLETELY OUT OF THE LOOP LOOKING UP THE NUMBER  
 IN THE FLT PAPERS AND TALKING TO THE FIELD. AT THIS TIME MY FMC

(REPORT CONTINUED)

DECIDED TO QUIT AND MY HSI WENT BLANK. WE WERE STILL ON AUTOPLT. I SWITCHED TO THE OTHER FMC BUT HAD TO LEAN OVER TO THE COPLT'S SIDE AND SWITCH HIS HSI RANGE TO EQUAL MINE SO THAT I WOULD HAVE AN HSI PRESENTATION. I WAS ALSO PUTTING DOWN THE FLAPS AND SLOWING THE ACFT WHILE THE COPLT DEALT WITH THE LNDG PERMIT NUMBER. WE WERE THEN GIVEN A LOC INTERCEPT HDG AND CLRED FOR AN ILS APCH TO 19R. THANK GOD I HAD ENTERED THE ILS FREQ FOR THE SUPPOSEDLY CLOSED RWY AND I SWITCHED TO MANUAL ILS AND MADE AN UNEVENTFUL APCH AND LNDG TO 19R. WE HAD THE RWY AT 1000 FT. THIS IS NOT AN ISOLATED CASE. I HAVE EXPERIENCED SIMILAR SCENARIOS BEFORE. WE SPEND HRS DOING NOTHING AT CRUISE WHILE THE ELECTRONIC WONDERWARE DOES ALL. NEAR THE ARPT, THE WONDERWARE FAILS, THE ARPT EQUIP AND PERSONNEL PUT UNNECESSARY BURDENS ON US AND THE 2-MAN COCKPIT CONCEPT BECOMES FRAYED WHICH CAN LEAD TO VERY SERIOUS CONSEQUENCES. THE 2 PLTS INVOLVED HERE ARE VERY EXPERIENCED, BUT WHAT WOULD HAVE HAPPENED TO 2 NEW GUYS WHO WERE NOT FAMILIAR WITH GLASS COCKPIT PROCS? THINGS COULD GET OUT OF HAND VERY, VERY FAST. AS ONE GAINS EXPERIENCE WITH THE GLASS COCKPIT, ONE USES OLD PROVEN CONCEPTS SUCH AS PLANNING AHEAD FOR ALL THE PROBLEMS ONE CAN THINK OF, SUCH AS SETTING UP THE MANUAL BACKUPS IN CASE THE MAGIC FAILS. SO MUCH TIME IN TRAINING IS SPENT ON LEARNING THE NEW GLASS COCKPIT PROCS, THAT VERY LITTLE TIME IS SPENT ON COMMON SENSE TRAINING SUCH AS BACKUPS AND WHAT TO DO WHEN THE ELECTRONICS FAIL.

SYNOPSIS : LGT EXCEEDS SPD BELOW 10000 FT. ACI ON  
BOARD.  
REFERENCE FACILITY ID : ADW  
FACILITY STATE : MD  
DISTANCE & BEARING FROM REF. : 10,,SE  
MSL ALTITUDE : 9000,9000

ACCESSION NUMBER : 223579  
 DATE OF OCCURRENCE : 9210  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,AC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : DCA  
 FACILITY STATE : DC  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : DCA; DCA;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE;  
 TRACK OR HDG DEVIATION; ALT DEV/EXCURSION FROM ASSIGNED; NON  
 ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR; COCKPIT/EQUIPMENT;  
 ANOMALY RESOLUTION : CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : ON OUR THIRD LEG OF OUR DAILY TRIP WE  
 WERE APCHING BILIT INTXN (BOS TO DCA) ENRTE TO DCA. JUST PRIOR TO  
 BILIT INTXN BOTH OUR FMC'S BLANKED AND FINALLY RECOVERED. OUR  
 ROUTING/CLRNC WAS TO GO FROM BILIT TO DCA. ON TOP OF OUR FMC'S  
 GOING INOP, THE ACFT BEGAN TO SLOWLY DSND UNCOMMANDED OUT OF OUR  
 SELECTED ALT. I WAS FLYING THE ACFT AND HAD TO DISCONNECT THE ACFT  
 FROM THE AUTOPLT AND MANUALLY FLY THE ACFT UNTIL WE COULD GET THE  
 COMPUTERS BACK UP. AT THE SAME TIME THE DCA/WASHINGTON CTLR ASKED  
 US WHAT OUR ROUTING WAS AND I ASKED HIM WHAT HE WANTED AND HE  
 STATED THAT WE WERE SUPPOSED TO BE GOING TO DCA DIRECTLY. BOTH THE  
 CAPT AND I FELT THAT WE WERE HEADED TO DCA DIRECTLY, BUT FOLLOWING  
 THE FMC FAILURE, THE COMPUTER WAS COMMANDING THE AUTOPLT TO STEER  
 SLIGHTLY OFF COURSE TO AN UNKNOWN POINT. WE AGAIN SELECTED DCA  
 DIRECT AND THERE WAS A SLIGHT TURN. THE CTLR STATED THAT THIS AREA  
 BTWN BILIT AND DCA HAS MANY RTE DEVS FROM ALL AIRLINES ON THIS  
 SEGMENT. OUR TCASII HAD NO ACFT IN THE LCL AREA AT ANY ALT AT THE  
 TIME OF THIS EVENT. IT DID NOT APPEAR THAT WE WERE OFF COURSE THAT  
 MUCH IF ANY, BUT THE CTLR ACTED CONCERNED. THROUGHOUT THIS LEG WE  
 HAD BEEN REQUESTED BY BOS, NY, AND WASHINGTON CTLRS TO CARRY OUT  
 MANY HDG, ALT AND AIRSPD CHANGES THROUGHOUT THIS 1:39 HR FLT WHICH  
 DEMANDED AN ABNORMAL AMOUNT OF ATTN. CALLBACK CONVERSATION WITH  
 RPTR REVEALED THE FOLLOWING INFO. RPTR STATES THAT THEY WERE ABOUT  
 30 MI E OF ARPT WHEN INCIDENT OCCURRED. RPTR IS NEW TO THIS ACFT,  
 HAS ONLY BEEN FLYING IT FOR ABOUT 4 WKS. HOWEVER, HE HAS A LOT OF  
 EXPERIENCE IN GLASS COCKPIT ACFT. HE SAID THAT FMC PROBLEMS ARE  
 NOT NEW THESE ACFT. DOES NOT KNOW WHAT THE PROBLEMS ARE. HE  
 MENTIONED THAT AROUND THIS TIME THEIR MAINT PEOPLE WERE HAVING A  
 LABOR DISPUTE AND ALLEGEDLY, SOME HAD EMPTIED ALL INFO FROM THE  
 FMC. THIS LASTED FOR ABOUT 1 WK. THE CTLR MENTIONED TO THEM THAT  
 THERE HAVE BEEN MANY ACFT OFF COURSE APPARENTLY REFERRING TO  
 EITHER FMC PROBLEMS OF FLCS NOT PAYING ATTN.  
 SYNOPSIS : ACR INBOUND TO DCA EXPERIENCES LOSS OF  
 FMC'S AND DEVIATES OFF COURSE. CTLR CATCHES ERROR.  
 REFERENCE FACILITY ID : DCA  
 FACILITY STATE : DC  
 DISTANCE & BEARING FROM REF. : 30,,E  
 MSL ALTITUDE : 10000,10000

ACCESSION NUMBER : 226700  
 DATE OF OCCURRENCE : 9211  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : SEL  
 FACILITY STATE : FO  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : SEL; SEL;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/CRITICAL; OTHER;  
 ANOMALY DETECTOR : COCKPIT/FLC; COCKPIT/EQUIPMENT;  
 ANOMALY RESOLUTION : FLC OVERCAME EQUIP PROBLEM; FLC

RETURNED ACFT TO ORIGINAL CLNC OR INTENDED COURSE;

ANOMALY CONSEQUENCES : NONE;

SITUATION REPORT SUBJECTS : ACFT EQUIPMENT; OTHER;

NARRATIVE : WE WERE FLYING FROM TAIPEI TO SEOUL,

KOREA, SCHEDULED AT XA15 BLOCK TO BLOCK. PERIODICALLY, I WOULD  
 NOTICE ON THE NAV DISPLAY (ND) THAT WE WERE NOT GETTING VOR/DME  
 UPDATING TO THE FMC. A CHK OF OUR RAW DATA CONFIRMED THAT WE WERE  
 SLIGHTLY OFF TRACK. (1/2 TO 1 DOT DEV ON VOR CDE NEEDLE.) ALL  
 PROCEEDED SMOOTHLY UNTIL WE WERE GIVEN A TURN TO FINAL APCH TO  
 INTERCEPT THE LOC AND SHOOT THE ILS 14R AT SEL. I WAS FLYING THE  
 ACFT. ON OUR MAP DISPLAY, IT APPEARED THAT HE (THE CTLR) WAS  
 TAKING US THROUGH THE LOC TO REJOIN THE APCH. IN ACTUALITY, WE HAD  
 SUFFERED A NAV DISPLAY MAP SHIFT, PROBABLY DUE TO THE FACT THAT WE  
 WERE NOT GETTING CONSISTENT UPDATES FROM VORS TO THE FMC. WE  
 ACTUALLY TURNED A PARALLEL COURSE TO THE R OF THE LOC BEFORE THE  
 CAPT PICKED UP THE RWY VISUALLY ABOUT 4 MI FROM TOUCHDOWN. ONCE I  
 VISUALLY ACQUIRED THE RWY, I MADE A CORRECTIVE COURSE CHANGE TO  
 THE L AND MADE A SMOOTH, UNEVENTFUL LNDG. TO PRECLUDE THIS PROBLEM  
 IN THE FUTURE, WE DECIDED THAT IT IS EXTREMELY IMPORTANT TO HAVE  
 THE PNF BACK UP THE PF WITH RAW DATA, ESPECIALLY IF A POTENTIAL  
 MAP SHIFT OF THE NAV DISPLAY IS POSSIBLE. AS ROUTINE AS THIS  
 FLYING BECOMES, IT IS EASY TO GET IN A TRAP OF TRUSTING THE  
 'MAGIC' OF THE GLASS COCKPITS INSTEAD OF THE OLD RELIABLE RAW  
 DATA. BUT I ALSO FEEL CREWS OF THESE ACFT MUST BE REPEATEDLY MADE  
 AWARE TO MAP SHIFTS THAT CAN BE CAUSED BY LACK OF DME OR VOR  
 UPDATING, DUE TO SOME FAULT IN THE SOFTWARE OF THE FMC. IT IS EASY  
 TO MISS AND A FALSE RELIANCE ON THE NAV DISPLAY PICTURE CAN LEAD  
 TO CONFUSION AT INOPPORTUNE TIMES, ESPECIALLY ON APCH.

SYNOPSIS : AN ACR WDB HAD AN FMC MAP SHIFT OF

ABOUT 4 MI. THEY NOTICED THIS AFTER INTERCEPTING THE ILS.

REFERENCE FACILITY ID : SEL

FACILITY STATE : FO

DISTANCE & BEARING FROM REF. : 6,,NW

MSL ALTITUDE : 2000,2000

ACCESSION NUMBER : 232228  
 DATE OF OCCURRENCE : 9301  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : MIA  
 FACILITY STATE : FL  
 FACILITY TYPE : ARTCC; ARPT;  
 FACILITY IDENTIFIER : ZMA; MIA;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE; NON  
 ADHERENCE LEGAL RQMT/CLNC; SPEED DEVIATION; OTHER;  
 ANOMALY DETECTOR : COCKPIT/FLC; COCKPIT/EQUIPMENT;  
 ANOMALY RESOLUTION : FLC OVERCAME EQUIP PROBLEM; CTLR  
 INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : ACFT CRUISING AT FL410 DIRECT COLLIER

COUNTY VORTAC FOR THE COLLIER 3 ARR TO MIAMI INTL. ZMA BEGAN OUR  
 DSCNT ROUGHLY 50 MI W OF COLLIER DOWN TO FL310, THEN FL240, AND  
 EVENTUALLY TO FL210. AS THE DSCNT BEGAN WE LOST OUR FMC. COCKPIT  
 NAV INFO (LNAV) WAS UNRELIABLE. THE FO WENT TO RAW DATA TO NAV  
 DIRECT TO CCE, STILL DSNDING AS REQUESTED BY CTR. THE FMC CAME  
 BACK UP AND THE DATA LOOKED GOOD. TOLD TO EXPECT SNOKE AT 11000  
 FT, 250 KTS THE FMC WAS THEN PROGRAMMED TO FLY A VERT NAV PATH  
 (VNAV) TO MAKE THE XING. WE WERE ALSO TOLD TO DSND AT 300 KTS  
 WHICH WAS ALSO ENTERED IN THE FMC. THEN THE FMC 'DUMPED' AGAIN.  
 THE FO WENT TO RAW DATA ONCE AGAIN. WHEN THE FMC CAME BACK UP (2-3  
 MINS) THE RTE HAD BEEN DEACTIVATED. THE CAPT REACTIVATED THE RTE  
 AND THE COLLIER 3 ARR. LNAV AND VNAV WERE REENGAGED FOR COMPUTER  
 OP. WE WERE NOW CLRED TO CROSS SNOKE AT 11000 FT, 250 KTS. THE  
 ACFT WAS NOW ROUGHLY AT FL215. THE HSI PICTORIAL DISPLAY INDICATED  
 TOP-OF-DSCNT IN ROUGHLY 15 MI. CTR INQUIRED WHY WE WERE DELAYING  
 OUR DSCNT. A QUICK REEXAMINATION OF THE HSI SCREEN SHOWED SNOKE 15  
 MI AWAY. IDLE PWR AND SPD BRAKES WERE IMMEDIATELY APPLIED. THE  
 ACFT MADE THE ALT RESTRICTION, ALBEIT A LITTLE FAST. WE WERE  
 SUBSEQUENTLY DIRECTED TO INTERCEPT THE 9R LOC FOR APCH AND AN  
 UNEVENTFUL LNDG AT MIAMI. LATER, WE REALIZED WHAT HAD HAPPENED.  
 WHEN THE FMC 'DUMPED' THE SECOND TIME IT ALSO DUMPED THE XING  
 RESTRICTIONS AS WELL AS THE RTE. OUR TOP- OF-DSCNT GUIDANCE FOR  
 THE BEST ECONOMICAL PROFILE WAS NOW BASED ON THE ELEVATION OF THE  
 TOUCHDOWN ZONE FOR RWY 9R NOT SNOKE 250 KTS, 11000 FT. SWITCHING  
 BTWN RAW NAV DATA AND COMPUTER DATA DURING A DSCNT WAS NOT WISE.  
 WE WERE LUCKY. OUR EXPERIENCE IN THE ACFT ENABLED US TO ET DOWN TO  
 11000 FT. A LESS EXPERIENCED CREW WOULD CERTAINLY HAVE HAD  
 TROUBLE. FOR THE REMAINDER OF OUR TRIP SEQUENCE THE CAPT AND FO  
 BRIEFED THAT IF ANOTHER FMC MALFUNCTION WERE TO OCCUR, THE PF  
 WOULD SWITCH TO RAW DATA, AND STAY ON RAW DATA UNTIL THE PNF  
 REPROGRAMS THE FMC AND VERIFIES THAT ALL ALT/SPD ENTRIES HAVE BEEN  
 REENTERED AND CONFIRMED.

SYNOPSIS : FLC OF ACR WDB ACFT DEVIATED FROM  
 ASSIGNED STAR CLRNC BY NOT STARTING DSCNT AT THE DESIGNATED FIX  
 AND SUBSEQUENTLY EXCEEDING DSCNT SPD DUE TO AN FMC PROB.

REFERENCE FACILITY ID : MIA  
 FACILITY STATE : FL  
 MSL ALTITUDE : 11000,21500

# MISPROGRAMMING

ACCESSION NUMBER : 65552  
DATE OF OCCURRENCE : 8703  
REPORTED BY : FLC; ;  
PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO;  
FLIGHT CONDITIONS : VMC  
REFERENCE FACILITY ID : EEY  
FACILITY STATE : VA  
FACILITY TYPE : ARTCC;  
FACILITY IDENTIFIER : ZDC;  
AIRCRAFT TYPE : MLG;  
ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
ANOMALY DETECTOR : ATC/CTLR;  
ANOMALY RESOLUTION : CTLR ISSUED NEW CLNC; NOT  
RESOLVED/ANOMALY ACCEPTED;  
ANOMALY CONSEQUENCES : NONE;  
NARRATIVE : WASHINGTON ATC CLEARED FLT TO CROSS 50  
MI W OF EEY VOR AT 25000 WHICH WE WERE UNABLE TO DO. AS A NEW CAPT  
IN THIS TYPE OF EQUIPMENT AND NAVIGATION EQUIPMENT I ALLOWED THE  
COPLT, WHO WAS AN EXPERIENCED CAPT DOWN BIDDING TO COPLT FOR THIS  
TRIP, TO ENTER THE CROSSING FIX INTO THE RNAV. HE ENTERED THE FIX  
IN THE WRONG POSITION. IT INDICATED TO ME ON THE CDU AS EEY01 AND  
I HAD 30 MI TO MAKE THE CROSSING RESTRICTION. THE FMC WAS  
PROGRAMMED TO CROSS. THIS WAS WRONG BECAUSE THE FIX WAS ENTERED IN  
THE WRONG PLACE AND WHAT HE HAD PUT IN WAS A FIX THAT WAS A  
RECIPROCAL OF WHAT WAS REQUIRED. I WOULD HAVE CAUGHT IT IF THE  
SCRATCH PAD SHOWED WHAT EEY01 WAS OR IF THE FLT MANAGEMENT SYSTEM  
WAS A COMPLETE SYSTEM WITH CRTS OR IF I BACKED UP THIS SYSTEM WITH  
A DME VOR. WHEN ATC ADVISED OF THIS DISCREPANCY I ASKED IF THEY  
WANTED A 180 DEG TURN THEY INDICATED NO PROBLEM BUT MADE US AWARE  
THAT WE WERE HAVING A PROBLEM. (FIX RNAV SHOULD BE USED A A BACK  
UP FOR NEW PLTS UNTIL THEY HAVE A HANDLE ON IT -- AND DON'T EXPECT  
MORE EXPERIENCED CREW MEMBERS TO BE RIGHT.)  
SYNOPSIS : ACR MLG ALT DEVIATION UNDERSHOT ALT  
CROSSING RESTRICTION.  
REFERENCE FACILITY ID : EEY  
FACILITY STATE : VA  
DISTANCE & BEARING FROM REF. : 50,,W  
MSL ALTITUDE : 25000,33000

ACCESSION NUMBER : 67628  
 DATE OF OCCURRENCE : 8704  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : CNS  
 FACILITY STATE : VA  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZDC;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
     LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; FLC RETURNED ACFT TO  
     ORIGINAL CLNC OR INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : CENTER (NY) SAID WE WERE WEST OF THE  
     AIRWAY (J-48) AND ASKED OUR ROUTING. WE SAID FLYPI DIRECT TO PSK  
     VOR. THEY ASKED WHO GAVE US THAT CLRNC AND WE SAID JFK CLRNC  
     DELIVERY. A FURTHER REVIEW OF OUR PAPERWORK SHOWED WE WERE CLEARED  
     VIA THE AIRWAY (J-48) FROM FLYPI TO PSK VOR. WE DID NOT HAVE  
     CANNED FLT PLAN IN OUR FMC AND HAD ENTERED THE ROUTE MANUALLY. OUR  
     FLT PLAN WAS VERY LIGHT AND HARD TO READ. WE MAY NOT HAVE ENTERED  
     THE ROUTING AND BOTH THE FO AND MYSELF HAD CHECKED IT AND EVEN  
     AFTER CENTER HAD SAID SOMETHING TO US WE STILL DID NOT CATCH THE  
     MISTAKE UNTIL READING THE FLT PLAN ROUTE FOR THE FOURTH TIME.  
 SYNOPSIS : ACR MLG ENTERED WRONG ROUTE IN FMC  
     RESULTING IN TRACK DEVIATION.  
 REFERENCE FACILITY ID : CNS  
 FACILITY STATE : VA  
 DISTANCE & BEARING FROM REF. : 25,,NE  
 MSL ALTITUDE : 31000,31000

ACCESSION NUMBER : 124225  
 DATE OF OCCURRENCE : 8910  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : DCA  
 FACILITY STATE : DC  
 FACILITY TYPE : ARPT; ARTCC;  
 FACILITY IDENTIFIER : DCA; ZOB;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
 LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/FAR;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : DURING PREFLT, LOADED FMC WITH COMPANY  
 ROUTE 'DCACLE'. THE FLT WAS A TURN (IE, CLEVELAND, WASHINGTON  
 NATIONAL, CLEVELAND) AND ALLOWED MINIMUM GND TIME. THE CORRECT  
 ROUTE SHOULD HAVE BEEN 'DCACLE1'. COMPARED INITIAL ENRTE FIX WITH  
 FLT PLAN. THIS FIX IS COMMON TO BOTH 'DCACLE' AND 'DCACLE1'.  
 DURING CRUISE, AT JUNCTION OF J211 AND J64, WE TURNED TOWARDS  
 ELLWOOD CITY ALONG J64 RATHER THAN CONTINUING ALONG J211 TOWARDS  
 YOUNGSTOWN. UPON NOTICING OUR DEVIATION FROM OUR FILED FLT PLAN,  
 ZOB ASKED WHERE WE WERE GOING. THEY THEN CLEARED US DIRECT NOELS,  
 THEN ON TO CLEVELAND. THE MAJORITY OF COMPANY ROUTES WHICH ARE  
 ENTERED INTO THE FMC HAVE NO TWINS FOR A PARTICULAR CITY-PAIR.  
 WASHINGTON NATIONAL TO CLEVELAND DOES HAVE TWO ROUTES, 'DCECLE'  
 AND 'DCACLE1'. ZOB SAID ONE ROUTE WAS USED DURING HIGH DENSITY TFC  
 AND THE OTHER DURING OFF HRS. NOWHERE ON THE PRINTED FLT PLAN IS  
 THE COMPANY ROUTE DESIGNATED AS 'DCACLE' OR 'DCACLE1' WHEN  
 MULTIPLE CHOICES ARE AVAILABLE. THIS PROBLEM COULD HAVE BEEN  
 AVOIDED HAD A THOROUGH CHECK OF THE FMC FLT PLAN BEEN ACCOMPLISHED  
 AND COMPARED TO THE PRINTED FLT PLAN WHICH WAS FILED WITH ATC.  
 THIS SHOULD HAVE BEEN DONE BY THE PLT WHO 'LOADED' THE ROUTE, AND  
 BACKED UP BY THE OTHER PLT. ALSO, PRINTING THE COMPANY ROUTE ON  
 THE PLT'S COPY OF THE FLT PLAN WOULD HELP AVOID REPETITIONS OF  
 THIS PROBLEM. IT IS VERY EASY TO FALL INTO THE TRAP OF TRUSTING  
 THE FMC SO MUCH THAT CROSSCHECKS ARE NOT MADE AND COMPLACENCY SETS  
 IN. SUPPLEMENTAL INFORMATION FROM ACN 124262: FACTORS AFFECTING  
 THE QUALITY OF HUMAN PERFORMANCE WAS EATING OF CREW MEALS ON THE  
 GND AND NOT LEAVING ENOUGH TIME FOR PROPER COCKPIT SETUP.  
 SYNOPSIS : ACR MLG DEVIATED FROM CLRNC ROUTE. FMC  
 PROGRAMMED INCORRECTLY AND NOT VERIFIED BY PNF AS REQUIRED BY  
 AIRLINE OPERATING PROC.  
 REFERENCE FACILITY ID : DCA  
 FACILITY STATE : DC  
 AGL ALTITUDE : 0,0



ACCESSION NUMBER : 176552  
 DATE OF OCCURRENCE : 9104  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : BXK  
 FACILITY STATE : AZ  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZAB;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ERRONEOUS PENETRATION OR EXIT AIRSPACE;  
 TRACK OR HDG DEVIATION; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE; CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE RECEIVED THAT ARLIN 8 STAR INTO  
 PHOENIX, IT WAS MY LEG THE AUTOPLT WAS ON. WE WERE IN AN MLG  
 ADVTECH NON EFIS ACFT. IN THE ACFT OUR PRIMARY MODE OF NAV IS AN  
 INERTIAL NAV SYS WITH A FLT MGMT COMPUTER (FMC) AND A COMPUTER  
 DISPLAY UNIT (CDU) FOR ENTERING COMMANDS INTO THE FMC. ON THE  
 ARLIN 8 YOU PROCEED OUTBND FROM MOHAK INTXN TO A FIX THAT IS  
 DESIGNATED BY ONLY LATITUDE AND LONGITUDE COORDS FOLLOWED BY A  
 TURN TO HYDRR INTXN. PRIOR TO MOHAK I WENT TO THE ARR PAGE ON THE  
 CDU TO PUT IN THE ACTIVE RWY AT PHOENIX. FROM THERE YOU GO TO THE  
 LEGS PAGE, THIS IS WHERE THE ORDER AND THE NAME OF ALL FIXES THAT  
 WILL BE FLOWN ARE LISTED. THE LEGS PAGE SHOWED A GAP PRIOR TO  
 HYDRR, WHAT IS CALLED A "RTE DISCONTINUITY" THIS IS NORMAL AFTER  
 SELECTING A DIFFERENT RWY OR PATH THEN WHAT WAS PREPROGRAMMED AT  
 OUR DEP ARPT. SINCE THAT LAT/LONG FIX DID NOT HAVE A NAME IT WAS  
 NOT LISTED ON THE LEGS PAGE. THE CDU SHOWED US GOING TO OUR ACTIVE  
 FIX MOHAK THEN A ROW OF EMPTY BOXES (RTE DISCONTINUITY) THEN HYDRR  
 INTXN, PAYNT, ARLIN AND SO ON. SO INSTICTIVELY, I CLOSED UP THE  
 GAP BY SELECTING THE NEXT FIX AFTER THE EMPTY BOXES, HYDRR INTXN,  
 THIS WAS INCORRECT. WHAT THE AUTOPLT FLEW WAS FROM MOHAK DIRECT TO  
 HYDRR INTXN BYPASSING THE LAT/LONG FIX. WE WENT ABOUT 8 MI N OF  
 COURSE WHEN ATC ADVISE US OF OUR PATH AND GAVE US A HDG TO GET  
 BACK ON COURSE. AS WE WERE MAKING THE TURN THE CTLR SAID WE HAD  
 JUST ENTERED RESTRICTED AIRSPACE. THERE ARE SEVERAL FACTORS I FEEL  
 THAT CAUSED THIS DEV. THE FIRST BEING NO NAME ON THAT LAT/LONG FIX  
 AFTER MOHAK, EVERY OTHER FIX ON THIS STAR HAD COORDS AND A NAME,  
 WHY NOT THIS ONE. IF THERE WAS A NAME FOR THIS FIX IT WOULD HAVE  
 BEEN ENTERED INTO THE FMC'S DATA BASE. SECONDLY, OUR FLT OPS  
 MANUAL DOES NOT REQUIRE THE PNF TO BACK UP THE INERTIAL NAV  
 COMPUTER WITH RAW DATA. IF THE CAPT WOULD HAVE HAD HIS VOR  
 RECEIVER TUNED FOR THAT OUTBND R FROM MOHAK WE WOULD HAVE CAUGHT  
 THE ERROR.  
 SYNOPSIS : ACR MLG EXPERIENCES TRACK DEVIATION ON  
 ARLIN EIGHT STAR TO PHX THROUGH MISPROGRAMMING OF FMC.  
 REFERENCE FACILITY ID : BXK  
 FACILITY STATE : AZ  
 DISTANCE & BEARING FROM REF. : 58,215  
 MSL ALTITUDE : 28000,28000

ACCESSION NUMBER : 180744  
 DATE OF OCCURRENCE : 9106  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ATL  
 FACILITY STATE : GA  
 FACILITY TYPE : ARTCC; ARPT;  
 FACILITY IDENTIFIER : ZTL; ATL;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; ALT  
     DEV/UNDERSHOOT ON CLB OR DES; ALT DEV/XING RESTRICTION NOT MET;  
     NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : NOT RESOLVED/DETECTED AFTER-THE-FACT;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : HAD BEEN HAVING DIFFICULTY GETTING THE  
     FMC TO TAKE THE RTE CHANGES. TCAS CONSTANTLY BLARING RA'S, NEW  
 F/O,  
     HEAVY WORKLOAD. CENTER ISSUED THE CLNC TO CROSS 35 SW AT 10000'.  
     NEW FMC UPDATE WOULDN'T ACCEPT RESTRICTION ON FIRST 2 TRIES.  
     FINALLY GOT IT TO ACCEPT BY PUTTING RADIAL "TO" IN FIRST. IN DOING  
     THIS, I XPOSED 030 DEG R (210) "TO" AND 35 MI TO 030 DEG R "TO"  
     (215) AND 30 MI. AT 35 MI OUT, OF 11500' DSNDING, THE CENTER  
     BROUGHT THE ERROR TO MY ATTN. NEXT TIME THE FMC DOES THAT, I'M  
     GOING TO A SLASH ALFA CONFIN AND FORGET THE MAGIC OF AREA NAV. I  
     LEARNED THAT THE MORE GIZMOS INSTALLED (FMC, TCAS, ACARS, ETC),  
     THE LESS TIME YOU HAVE TO DEVOTE TO THE PRIMARY JOB OF FLYING THE  
     ACFT. HOW MUCH MORE BEFORE WE BECOME TOTALLY SATURATED?  
 SYNOPSIS : ACR MLG FLT CREW ENTERS INCORRECT  
     CROSSING RESTRICTION #S IN FMS WHILE IN DESCENT TO ATL.  
 REFERENCE FACILITY ID : ATL  
 FACILITY STATE : GA  
 DISTANCE & BEARING FROM REF. : 35,35  
 MSL ALTITUDE : 10000,11500

ACCESSION NUMBER : 181368  
 DATE OF OCCURRENCE : 9106  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : MKG  
 FACILITY STATE : MI  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZAU;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : FLT WAS ENRTE TO DTW AT FL370. JUST  
 AFTER PASSING MKG VOR, FLT WAS CLRED TO DSND TO CROSS 40 MI E OF  
 MKG AT FL240. WE BEGAN OUR DSNT AND THE CAPT ENTERED INTO THE FMC  
 THE XING POINT WITH THE ALT RESTRICTION. PASSING THROUGH FL290,  
 CENTER ASKED US IF WE WERE GOING TO MAKE OUR RESTRICTION, SINCE WE  
 WERE ALREADY 45 E OF THE MKG VOR. WE APOLOGIZED AND INCREASED OUR  
 DSNT RATE TO FL240, AND SWITCHED TO ASSIGNED FREQ. WE HAD SOMEHOW  
 ENTERED THE WRONG INFO INTO THE FMC. IN MY OPINION, THERE WAS TOO  
 MUCH RELIANCE ON THE BLACK BOXES TO SUCCESSFULLY PLAN OUR DSNT.  
 FURTHERMORE, WE DID NOT BACK UP OUR FMC NAV. IF I HAD SIMPLY TUNED  
 IN THE MKG VOR/DME, I WOULD HAVE BEEN ABLE TO REALIZE BY LOOKING  
 AT THE DME THAT WE WERE NOT GOING TO MAKE THE 40 MI RESTRICTION.  
 TOO MUCH COMPLACENCY WITH THE FMC NAV. NEVER AGAIN!!  
 SYNOPSIS : WDB FLT CREW MISSES CROSSING  
 RESTRICTION.  
 REFERENCE FACILITY ID : MKG  
 FACILITY STATE : MI  
 DISTANCE & BEARING FROM REF. : 45,,E  
 MSL ALTITUDE : 24000,29000

ACCESSION NUMBER : 181926  
 DATE OF OCCURRENCE : 9106  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TRACON,DC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : PHX  
 FACILITY STATE : AZ  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : PHX; PHX;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
     LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE WERE USING THE NEW ACARS AUTOMATED  
     CLRNC SYS WHICH SHOWS OUR CLRNC ON THE ACARS TOUCH SCREEN, ALONG  
     WITH THE SQUAWK. NO CALL TO CLRNC DELIVERY IS REQUIRED TO VERIFY  
     WE PROPERLY RECEIVED IT. THIS IS BAD. ALSO NO HARD COPU IS  
     GENERATED. ALSO BAD. THE F/O WAS FLYING AND HAD SET-UP THE COCKPIT  
     FOR THE DRAKE 4 DEP. OUR FLT PLAN (FILED CLRNC) WAS OHX DIRECT  
     DRAKE AS FILED TO SFO. THE ACARS SCREEN MODIFIED THIS CLRNC BY  
     SAYING DRAKE 4... AS FILED, BUT IT ALSO DISPLAYS THE ORIGINAL  
     UNMODIFIED CLRNC (ALSO BAD). AS THE F/O HAD THE FMC SET-UP FOR THE  
     DRAKE 4, I THOUGHT HE KNEW OF THE MODIFICATION. AT THE 13 MI FIX  
     WHERE WE TURN TO 360 DEG, HE WOULD NOT TURN, EVEN WHEN I TOLD HIM  
     TO DO SO. HE SAID WE WERE NOT CLRED FOR THE DRAKE 4. I LOUDLY AND  
     FIRMLY COMMANDED HIM TO TURN, AND HE SLOWLY AND BEGRADINGLY  
     STARTED A VERY SLOW TURN AND SAID HE DIDN'T HAVE A DRAKE 4 PAGE.  
     AND THEN SAID WE WERE SUPPOSED TO DO THE PAYSO DEP. I WAS TRYING  
     VERY HARD TO CONTACT DEP BUT DUE TO LIGHT ACFT FREQ CONGESTION HAD  
     TROUBLE. FINALLY DID AND THEY ISSUED AN IMMEDIATE TURN TO 050 DEG.  
     CANNOT EXPLAIN F/O ACTIONS. ANY TIME THERE IS A MODIFICATION TO  
     AUTOMATED CLRNC, THE MODIFICATION TO RTE SHOULD BE REQUIRED TO BE  
     READ BACK.  
 SYNOPSIS : TRACK DEVIATION FOR ACR ADVTECH MLG DEP  
     PHX.  
 REFERENCE FACILITY ID : PHX  
 FACILITY STATE : AZ  
 DISTANCE & BEARING FROM REF. : 13,,W  
 MSL ALTITUDE : 8000,8000

ACCESSION NUMBER : 183049  
 DATE OF OCCURRENCE : 9107  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,OTH; FLC,FO; ARTCC,  
 MANUAL;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ORF  
 FACILITY STATE : VA  
 FACILITY TYPE : ARTCC; ARTCC; COMRDO;  
 FACILITY IDENTIFIER : ZDC; ZNY; JFK;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
 LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/FAR; NON ADHERENCE LEGAL  
 RQMT/OTHER;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : NOT RESOLVED/DETECTED AFTER-THE-FACT;  
 OTHER;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT; DESIGN/ROUTE; PROC OR  
 POLICY/COMPANY;  
 NARRATIVE : THE DEST WAS PUERTO PLATA, DOMINICAN  
 REPUBLIC. THE FIELD RTE WAS DIRECT WHITE, J209 ORF, J174 DIW, AR7  
 PANAL AR3 BARTS, BRIL BENIE, BRIL GTK, A554 PTA. THE ACFT WAS AN  
 MLG, R EQUIPPED WITH INERTIAL REFERENCE SYS AND A FMC WITH STORED  
 RTES. DURING PREFLT, A RTE DIFFERENT FROM OUR FILED RTE WAS  
 SELECTED FROM THE DATA BASE AND ENTERED INTO THE COMPUTER. THIS  
 RTE ALSO TOOK US S OVER NORFOLK, BUT THEN FLEW OFF SHORE VIA AR8  
 TO BACUS, R763 GTK, A554 PTA. JUST PAST NORFOLK, WA, CENTER ASKED  
 US WHY WE WERE DEVIATING FROM OUR FILED RTE, WHEN HE READ OUR  
 FILED RTE WE BECAME AWARE OF THE PROBLEM. WE HAD SELECTED RTE 1  
 INSTEAD OF RTE 2 IN THE COMPUTER. BOTH RTES ARE APPROVED COMPANY  
 RTES FOR THE MLG AND CAN BE FOUND BOTH IN THE COMPUTER DATA BASE  
 AND IN THE COMPANY MANUAL. SINCE WE WERE WELL ON OUR WAY TOWARDS  
 OUR NEXT WAYPOINT FOR OUR SELECTED RTE (#1) WE ASKED CENTER TO  
 REVISE OUR FILED RTE TO MATCH OUR SELECTED RTE. HE DID SO AND  
 RECLRED US. WE CONTINUED OUT AR8 TO BACUS INTXN WHERE CENTER  
 TERMINATED OUR CTL AND ASSIGNED US AN HF FREQ TO TALK WITH NEW  
 YORK OCEANIC VIA COMRDO. OUR MLG'S ARE NOT HF EQUIPPED. WE ASKED  
 FOR A VHF FREQ AND WERE ASSIGNED 129.90. FOR 10 MINS WE TRIED BUT  
 COULD NOT REACH ON 129.90. WE ATTEMPTED TO REESTABLISH CONTACT  
 WITH WASHINGTON CENTER BUT WERE UNABLE. WE DECIDED THAT OUR ONLY  
 COURSE OF ACTION WAS TO TRY AND RELAY OUR POS THROUGH OTHER ACFT.  
 WE DID SO WITH ANOTHER AIRLINES FLT AND RPTED POSITIONS CORAN,  
 SARGE, AND ELKAS. ALL ESTIMATES WERE MADE EXACTLY. AT FOORD INTXN,  
 MIAMI RADAR TOLD US WE WERE ON COURSE AND ON TIME. THE REMAINDER  
 OF THE FLT WAS UNEVENTFUL. OUR ACFT WAS EQUIPPED WITH ALL SURVIVAL  
 EQUIP (RAFTS, VESTS) REQUIRED FOR EXTENDED OVERWATER. HOWEVER, IT  
 WAS NOT EQUIPPED WITH HF RADIOS WHICH ARE REQUIRED TO MAINTAIN  
 COMS EVEN THOUGH THE RTE IS AN APPROVED RTE FOR THE MLG.  
 NEVERTHELESS, I WILL BE CERTAIN TO CLOSELY VERIFY THE SELECTED RTE  
 AGAINST THE FILED RTE IN THE FUTURE. SUPPLEMENTAL INFO FROM ACN  
 183046. SUGGESTIONS: ENTIRE FMC RTE SHOULD ALWAYS BE MATCHED WITH  
 FLT PLANNED RTE. DATA BASE IN FMC SHOULD NOT HAVE OPTIONAL RTES  
 STORED THAT DO NO MEET COM REQUIREMENTS. THE COMPANY SHOULD HAVE  
 THESE RTES DELETED. OUR CHART REVISIONS SHOULD NOT SHOW 'MLG FMC

(REPORT CONTINUED)

COMPANY RTES' THAT THE ACFT CANNOT FLY BECAUSE OF COM PROBLEMS. CALLBACK CONVERSATION WITH RPTR REVEALED THE FOLLOWING INFO. RPTR, THE IRO, STATED THAT THE FO ASKED THE CAPT IF HE HAD CHKED THE FILED RTE AGAINST THE FMC SELECTED RTE AND THE CAPT ANSWERED IN THE AFFIRMATIVE. THE CAPT WAS NEW TO THE BASE AND NOT TOO FAMILIAR WITH THE RTES USED. THE RTE STRUCTURE USED HAD THE FIRST EIGHT POINTS IN COMMON WITH THE FILED FLT PLAN SO IRO FELT THAT CAPT ASSUMED THE REST WAS THE SAME. IRO ALSO FELT THAT THE FREQ CONGESTION AND GENERAL ATMOSPHERE WAS DISTR LATER WHILE ENRTE PRIOR TO COM PROBLEMS WITH COMRDO ON HF.

SYNOPSIS : HDG TRACK RTE DEV BY ACR MLG WHICH FINDS ITSELF IN A NORAC TFC SITUATION ACCOUNT LACK OF REQUIRED COM EQUIP PROBLEM.

REFERENCE FACILITY ID : ORF  
FACILITY STATE : VA  
DISTANCE & BEARING FROM REF. : 50,,SE  
MSL ALTITUDE : 33000,33000

ACCESSION NUMBER : 183465  
 DATE OF OCCURRENCE : 9107  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; FLC,SO; ARTCC,  
 MANUAL;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ECG  
 FACILITY STATE : NC  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZNY;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
 LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : NOT RESOLVED/ANOMALY ACCEPTED;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT; AN ACFT TYPE;  
 DESIGN/ROUTE;  
 NARRATIVE : IN THE VICINITY OF ORF, WASHINGTON  
 CENTER ASKED WHERE WE WERE GOING. I REPLIED TO THE BACUS INTXN. HE  
 SAID HE DID NOT SHOW THAT AS OUR FLT PLAN, BUT THAT THE RTE WE HAD  
 WOULD BE FINE. THE 3 OF US HAD A CONVERSATION IN THE COCKPIT AND  
 DETERMINED THE CAPT HAD ENTERED THE WRONG RTE IN THE FMC. HE  
 ELECTED TO CONTINUE ON THE ROUTE HE HAD ORIGINALLY ENTERED.  
 UNFORTUNATELY THIS BROUGHT US APPROX 425 NM OFF THE COAST LINE,  
 WELL BEYOND THE CERTIFIED LIMIT. IN THE VICINITY OF THE BACUS  
 INTXN, WASHINGTON CENTER ADVISED US TO SWITCH TO NEW YORK OCEANIC  
 GIVING US THE HF FREQS. AS WE HAD NO HF RADIO WE ASKED FOR THE  
 ARINC FREQ WHICH THEY FORWARDED. UNABLE TO MAKE CONTACT ON ARINC  
 WE TRIED TO CALL WASHINGTON BACK BUT COULD NOT. WE THEN CONTACTED  
 ANOTHER AIRLINE'S FLT WHICH RELAYED POS RPTS TO NEW YORK OCEANIC  
 UNTIL MIAMI CENTER GAINED RADAR CONTACT WITH US IN THE VICINITY OF  
 FOORD INTXN IN THE CARIBBEAN. THE FLT PROCEEDED WITHOUT INCIDENT.  
 SYNOPSIS : FLC OF MLG INSERTED WRONG ROUTE FOR  
 OVER WATER FLT, DRIFTED INTO OCEANIC RTE AND LOST COM WITH ZNY.  
 REFERENCE FACILITY ID : ECG  
 FACILITY STATE : NC  
 DISTANCE & BEARING FROM REF. : 158,140  
 MSL ALTITUDE : 33000,33000

ACCESSION NUMBER : 183488  
 DATE OF OCCURRENCE : 9107  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : MXD  
 REFERENCE FACILITY ID : PIT  
 FACILITY STATE : PA  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZOB;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WAS ASKED TO KEEP SPEED UP AND GIVEN A  
 VECTOR TOWARD BUT NOT DIRECTLY TO THE VOR. WAS TOLD TO CROSS 30  
 DME OUT AT 10000 FT AT 250 KTS. PROGRAMMED FMC FOR XING  
 RESTRICTION FOR DSCNT GUIDANCE. WAS STILL NOT CLRED TO FIX SO  
 STAYED IN HDG MODE. AT 35 MI OUT WAS ASKED IF ABLE TO MAKE  
 RESTRICTION. I ASKED IF I WAS CLRED TO THE VOR. CTLR GAVE US A  
 VECTOR AWAY FROM FIX AND TOLD US WE WERE TOO HIGH (16000 FT) FOR  
 APCH TO ACCEPT. OUR DSCNT PAGE DATA WAS BASED ON AN ARCING COURSE  
 TO FIX. CTLR FORGOT TO CLR US DIRECT AND WE SAT THERE AND ALLOWED  
 THE MACHINE TO BRING US IN TOO HIGH. BACK TO BASICS IS THE ANSWER.  
 SYNOPSIS : FLC MISPROGRAMMED THEIR FMC FOR DSCNT  
 AND XING RESTRICTION.  
 REFERENCE FACILITY ID : PIT  
 FACILITY STATE : PA  
 DISTANCE & BEARING FROM REF. : 35  
 MSL ALTITUDE : 10000,16000



ACCESSION NUMBER : 184380  
 DATE OF OCCURRENCE : 9107  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,AC;  
 FLIGHT CONDITIONS : MXD  
 REFERENCE FACILITY ID : LAX  
 FACILITY STATE : CA  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : LAX; LAX;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : SPEED DEVIATION; OTHER; ALT  
 DEV/OVERSHOOT ON CLB OR DES; ALT DEV/XING RESTRICTION NOT MET; NON  
 ADHERENCE LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/PUBLISHED  
 PROC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE;  
 ANOMALY CONSEQUENCES : EMOTIONAL TRAUMA;  
 SITUATION REPORT SUBJECTS : PROC OR POLICY/COMPANY; AN ACFT TYPE;  
 NARRATIVE : THE CAPT WAS FLYING THE ARR TO LAX

DSNDING ON THE 25 L CIVET PROFILE APCH. THE CAPT ENTERED THE ARR  
 IN THE FMS. AFTER WE PASSED CIVET I NOTICED THAT THE NAV DISPLAY  
 CRT DEPICTED A STRONG TRIANGLE LEAVING LIMMA INTXN TO SANTA MONICA  
 VOR TO RONEN INTXN. I THEN SAID I WOULD CLEAN UP THE FMS AND CLR  
 THE FALSE TRIANGLE. THE CAPT SAID HE WOULD CONTINUE TO FLY THE  
 APCH AND HANDLE THE RADIOS. I CLRED THESE FALSE POSITIONS FROM THE  
 FMS AND NOTICED THAT ARNES WAS NOT DISPLAYED OR FUELR AND SUZZI OR  
 BASET. I THEN MADE A LATERAL REVISION AND SELECTED STAR ON THE FMS  
 TO FIND OUT THAT THE CAPT HAD SELECTED THE 25L ILS BUT NOT THE  
 PROFILE ARR. AT THIS TIME I NOTICED THE RADIO TFC WAS QUIET. I  
 ASKED THE CAPT WHO HE WAS TALKING TO AND HE SAID APCH CTL. I TRIED  
 CONTACTING APCH CTL, THERE WAS NO CONTACT. I SWITCHED BACK TO THE  
 OLD FREQ AND FOUND THAT THE NEW ONE WAS ONE DIGIT OFF. I GOT IN  
 CONTACT WITH APCH. WE NOW WERE PASSED ARNES INTXN. APCH SAID SLOW  
 TO 170 KTS AND DSND TO 3500 FT. WE WERE AT 270 KTS GOING THROUGH  
 9700 FT HDG TO FUELR. I TOLD THE CAPT WE NEEDED TO BE AT 8000 FT  
 AT FUELR AND I HAD TO ENTER IT IN THE FMS DISPLAY WHICH I DID. WE  
 MADE 8000 FT, BUT HAD NOT SLOWED DOWN. I THEN ENTERED SUZZI AND  
 BASET. APCH KEPT ASKING US TO SLOW AND THEN GAVE US A L TURN. I  
 SELECTED THE HDG. AT THIS POINT THE CAPT HAD DISCONNECTED THE  
 AUTOPLT AND AUTOTHROTTLES. I WAS TOO BUSY TO NOTICE THIS AND IT  
 WAS NOT CALLED OUT. HE ALSO HAD FULL SPDBRAKES AND SLATS EXTENDED.  
 I CALLED PASSING 4500 FT AND WE NEED TO SLOW TO 170 KTS. AS WE  
 APCHED 3500 FT WE KEPT GOING DOWN TO 3200 FT WHEN I CALLED OUT WE  
 ARE BELOW OUR ALT. APCH CTL ALSO CALLED US. THE CAPT LEVELED OFF.  
 I THEN NOTICED THE AUTOTHROTTLES WERE DISCONNECTED AND WE WERE  
 GOING BELOW 170 KTS. AT THIS POINT I RECONNECTED THE AUTOTHROTTLES  
 AND RETRACTED THE SPDBRAKES ON THE CAPT AND HAD 170 KTS SPD  
 SELECTED ON THE FMS AND TOLD HIM TO HOLD THAT SPD. WE WERE THEN  
 GIVEN A TURN BACK TOWARDS LIMMA. WE WERE STILL NOT AT 3500 FT.  
 APCH CTL TOLD US TO INTERCEPT FINAL AT 3500 FT AND THEN CLRED FOR  
 APCH. THE CAPT WAS STILL HAND FLYING AND HAVING A HARD TIME TRYING  
 TO CTL HIS ALT. WE INTERCEPTED OUR FINAL APCH WITH GEAR DOWN AND  
 FULL FLAPS AND CHKLIST COMPLETE. WE THEN BECAME HIGH ON FINAL. WE  
 BROKE OUT AT 1900 FT AND COULD SEE THE ARPT. WE WERE 3 1/2 MI FROM  
 THE END OF THE RWY. THE CAPT CONTINUED THE APCH AT 1000 FT ABOVE



(REPORT CONTINUED)

THE ARPT. WE REDUCED SINK RATE TO 1000 FPM ABOUT 2 1/2 MI OUT FROM THE END OF THE RWY. WHILE ON SHORT FINAL I CALLED ANY DEV FROM COURSE CENTERLINE AND WAS PREPARING FOR A GAR. WHEN WE ARRIVED AT THE GATE THE CAPT APOLOGIZED AND SAID HE HAS NOT FLOWN MUCH ON RESERVE. I SHOULD HAVE MONITORED MORE CLOSELY ON HOW THE CAPT HAD LOADED THE FMS ON ARR. AFTER I FOUND THE DISCREPANCIES I BECAME OVERLOADED ON KEEPING UP ON WHAT THE CAPT WAS DOING AND WHAT WAS NEEDED TO CORRECTLY FLY THE APCH AND DO ALL THE CHKLIST ITEMS.

SYNOPSIS : ACR WDB EXPERIENCES INADEQUATE FMC PROGRAMMING, NON ADHERENCE TO ATC PROC INSTRUCTION CLRNC SPD RESTRICTION AND NON COMPLIANCE WITH THE STABILIZED APCH CONCEPT.

REFERENCE FACILITY ID : LAX  
FACILITY STATE : CA  
DISTANCE & BEARING FROM REF. : 25,69  
MSL ALTITUDE : 126,8000

ACCESSION NUMBER : 187201  
 DATE OF OCCURRENCE : 9108  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,DC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : SRP  
 FACILITY STATE : AZ  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : PHX; PHX;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; ALT  
 DEV/OVERSHOOT ON CLB OR DES; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : DEPARTED PHX ON A MOBILE 1 DEP TO SAN.  
 DEP CTL ISSUED US A 180 HDG TO INTERCEPT THE DEP (GBN 055 INBOUND  
 RADIAL) AND CLB TO 13000. ATTEMPTED TO ENTER AN 'INTERCEPT LEG.'  
 ENTRY INTO THE FMC WHEN IT WAS DISCOVERED THAT THE FMC RTE HAD  
 BEEN ENTERED INCORRECTLY. THE CAPT REENTERED THE RTE WHILE I  
 CONTINUED TO HAND FLY THE ACFT. I SELECTED VOR/LOC MODE ON THE FLT  
 DIRECTOR AND THE CAPT ALSO CHKED THIS TO ENSURE I WAS NOT USING  
 BAD FMC INFO. I INTERCEPTED THE RADIAL AND REALIZED MY MISTAKE  
 JUST AS DEP CALLED. I HAD NEVER SWITCHED THE VOR FREQ AND HAD  
 INTERCEPTED THE SRP 235 RADIAL. DEP HAD US STOP OUR CLB AT 10000  
 FT, WHICH WE WERE JUST PASSING THROUGH. WE PEAKED OUT AT ABOUT  
 10200. WE PASSED UNDERNEATH A COMPANY ACFT ON DOWNWIND AT 11000.  
 WE BOTH HAD EACH OTHER IN SIGHT. DEP THEN ISSUED US A 160 HDG TO  
 JOIN THE RADIAL, WHICH WE DID RIGHT THIS TIME. A COUPLE OF  
 MISTAKES ON MY PART: 1) MISENTERED THE RTE IN THE FMC ON THE GND  
 IN PHX. 2) GOT DISTR WHILE THE CAPT FIXED MY ORIGINAL MISTAKE AND  
 THEN MADE A BIGGER, STUPIDER MISTAKE. THE ONLY OTHER COMMENT I  
 WOULD ADD IS ABOUT DEP PROCS. THIS IS NOT AN UNCOMMON MISTAKE.  
 DURING THIS 3 DAY TRIP I WILL FLY 13 DEPS INCLUDING 10 DIFFERENT  
 SIDES. TOO MANY DIFFERENT DEPS WITH TOO MANY DIFFERENT VORS, ALTS,  
 RESTRICTIONS, ETC, ETC. SOME ARE SO COMPLEX THEY ARE VERY HARD TO  
 READ AND EXTRAPOLATE THE IMPORTANT INFO. THIS WASN'T THE FIRST  
 TIME THIS HAS HAPPENED, IT WON'T BE THE LAST.  
 SYNOPSIS : FLC OF MLG OVERSHOT ASSIGNED ALT.  
 REFERENCE FACILITY ID : SRP  
 FACILITY STATE : AZ  
 DISTANCE & BEARING FROM REF. : 25,235  
 MSL ALTITUDE : 10000,10200

ACCESSION NUMBER : 187300  
 DATE OF OCCURRENCE : 9108  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TWR,LC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : LAX  
 FACILITY STATE : CA  
 FACILITY TYPE : ARPT; TWR; TRACON;  
 FACILITY IDENTIFIER : LAX; LAX; LAX;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
 LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : PREPARING FOR DEP LAX-ORD, RECEIVED  
 CLRNC FOR LOOP 8 DEP. DAGETT TRANSITION. WE PLANNED DEP ON RWY  
 25R. UPON RECEIVING PUSHBACK CLRNC WE WERE TOLD TO EXPECT RWY 24.  
 THE FO REPROGRAMMED THE FMC FOR A 24L DEP. WHEN CALLING FOR TAXI  
 CLRNC WE WERE GIVEN RWY 25R. DURING TAXI OUT THE FO REENTERED RWY  
 25R IN THE FMC. AFTER DEP ON 25R WE WERE CLRED L TURN TO LAX ON  
 COURSE. THE CAPT WAS FLYING USING FLT DIRECTOR AND LNAV GUIDANCE.  
 AFTER PASSING THE VOR AND MAKING A R TURN ON COURSE I (CAPT)  
 NOTICED SLI COMING INTO VIEW ON MY HSI. IT IS NOT PART OF THE DEP.  
 I SWITCHED MY HSI TO VOR MODE AND STARTED A L TURN BACK TO THE LAX  
 041 DEG RADIAL. ABOUT THAT TIME LAX DEP CTL GAVE ME A VECTOR TO  
 INTERCEPT THE RADIAL. WHILE ENRTE TO ORD WE REENTERED OUR CLRNC ON  
 RTE 2 PAGES IN THE SAME SEQUENCE AS DEP AND FOUND THAT WHEN WE  
 CHANGED RWYS THE FMC DROPPED THE KEGGS AND COOPP INTXNS AND ADDED  
 SLI ON THE LEGS PAGE. THE DEP AND RTE PAGES STILL INDICATED LOOP 8  
 - DAGGETT TRANSITION.  
 SYNOPSIS : ACR LGT TRACK HDG DEV ON SID OUT OF  
 LAX.  
 REFERENCE FACILITY ID : LAX  
 FACILITY STATE : CA  
 AGL ALTITUDE : 0,12000

ACCESSION NUMBER : 196343  
 DATE OF OCCURRENCE : 9112  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : SPA  
 FACILITY STATE : SC  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZTL;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
     LEGAL RQMT/OTHER;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; FLC RETURNED ACFT TO  
     ORIGINAL CLNC OR INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : THE FLT WAS FROM ATL TO GSO WITH A FLT  
     PLAN ROUTING OF ATL...SPA...SPA041/GSO281...GSO. IT WAS THE CAPT'S  
     LEG AND FOLLOWING OUR COMPANY PROCS HE LOADED THE RTE INTO THE NAV  
     COMPUTER (FMS). THIS WAS THE CAPT'S SECOND TRIP SINCE UPGRADE AND  
     HE HAD JUST COME OFF 2 WKS VACATION. HE OMITTED THE SPA041/GSO281  
     WAYPOINT AND INSTEAD ENTERED ATL...SPA...GSO-30...GSO USING THE  
     FIX 30 MI PRIOR TO GSO AS A DSCNT REF POINT. AS THE FO I CHKED THE  
     RTE AND SAW THAT THE THIRD POINT WAS GSO-01 WHICH I ASSUMED WAS  
     THE SPA041/GSO281 WHEN IT WAS REALLY THE POINT 30 MI PRIOR TO GSO.  
     ON THE DIRECT COURSE FROM SPA TO GSO. (THE FMS WE USE ASSIGNS AN  
     ARBITRARY NUMERICAL DESIGNATION TO ANY WAYPOINT NOT ENTERED IN  
     IT'S DATA BASE, IE, GSO-01). IT IS NECESSARY TO PULL THE POINT  
     DOWN TO THE BOTTOM OF THE PAGE TO VERIFY THE CORRECT RADIAL/DME  
     WAS ENTERED AND I FAILED TO DO THIS. I HAVE BEEN FLYING THIS RTE  
     FOR SEVERAL MONTHS AND SEEING THE GSO-01 DESIGNATION EACH TIME LED  
     ME TO COMPLACENCY. AS THE ACFT PASSED OVER SPA AND TURNED TO GSO  
     RATHER THAN OUT THE 410 RADIAL. ATC ADVISED US TO TURN TO A 030  
     DEG HDG. I THEN FOUND OUR MISTAKE AND WE REPROGRAMMED THE FMS.  
     HUMAN FACTORS CONSIDERATIONS: EARLY PICK-UP. INEXPERIENCE ON ACFT  
     TYPE. AUTOMATION, FMS DOES NOT SHOW ACTUAL RADIAL/DME ON RTE PAGE.  
     COMPLACENCY.  
 SYNOPSIS : MLG GETS OFF COURSE WHEN FMS COMPUTER  
     IS LOADED INCORRECTLY.  
 REFERENCE FACILITY ID : SPA  
 FACILITY STATE : SC  
 DISTANCE & BEARING FROM REF. : 10,59  
 MSL ALTITUDE : 27000,27000

ACCESSION NUMBER : 197145  
 DATE OF OCCURRENCE : 9112  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TRACON,AC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : LAX  
 FACILITY STATE : CA  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : LAX; LAX;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; ALT  
 DEV/EXCURSION FROM ASSIGNED; ALT DEV/XING RESTRICTION NOT MET; NON  
 ADHERENCE LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/PUBLISHED  
 PROC;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : FLT WAS IN CRUISE AT FL390 INBOUND TO

LAX. FMCS WAS PROGRAMMED FOR CIVET 2 PROFILE DSCNT RWY 25L APCH.  
 AS ACFT NEARED DSCNT POINT ATC CLRED FLT TO FL350. THE CRUISE PAGE  
 ON FMC WAS SELECTED AND FL350 ENTERED. ACFT STARTED DSCNT FURTHER  
 CLRNCs TO FL310, FL290 AND FINALLY FL240 WERE ISSUED AND SPD  
 REDUCTIONS TO 280 KTS AND 250 KTS WERE ALSO ISSUED. ACFT THEN  
 CLRED FOR CIVET 2 PROFILE DSCNT. 8000 FT WAS SELECTED ON MASTER  
 CTL PANEL. THIS WAS THE FINAL ALT IN THE DSCNT PROFILE ALL OTHER  
 XING ALTS WERE ALREADY PROGRAMMED IN THE FMCS AND THEREFORE SHOULD  
 HAVE BEEN MET BY THE ACFT SINCE THE SPD OF 250 KTS WAS ISSUED BY  
 ATC SPD INTERVENTION WAS SELECTED AND ACFT DSNDDED. AS ACFT NEARED  
 10000 FT I DESELECTED SPD INTERVENTION BUT INSTEAD OF 250 KTS  
 BEING SELECTED THE ACFT BUG WENT TO 320 KTS. I RESELECTED SPD  
 INTERVENTION AND 250 KTS. WHEN ACFT LEVELED AT 10000 FT NEAR ARNES  
 I DESELECTED SPD INTERVENTION AND SPD REMAINED AT 250 KTS. ABOUT 3  
 MI FROM ARNES THE FMC SPD BUG SUDDENLY SLOWED TO 180 KTS. I CALLED  
 OUT SPD 180 AND RESELECTED 250 KTS. AS I WAS DOING THAT THE COPLT  
 NOTICED THE ACFT SUDDENLY NOSE OVER AND START DSNDING AT 2000 FPM.  
 HE CALLED OUT THAT WE WERE STILL 3 MI FROM ARNES AND SHOULD BE AT  
 10000 FT. MY ATTN WAS STILL FIXED ON THE AIRSPD BUG AND IT TOOK ME  
 A FEW SECONDS TO REALIZE WHAT WAS HAPPENING. ABOUT THIS TIME, LAX  
 APCH CTL CALLED AND ASKED US IF WE KNEW WE WERE DSNDING EARLY. I  
 REACHED UP AND PRESSED, THE ALT HOLD BUTTON STOPPING THE DSCNT AT  
 9300 FT. ATC RECLRED US TO MAINTAIN 9000 FT TO ARNES AND THEN TOLD  
 US TO CONTINUE THE APCH. I FEEL THE REASON FOR THIS ALT ERROR WAS  
 A PROBLEM IN THE FMC CTLR AND ALSO BECAUSE WE HAD SELECTED 8000 FT  
 IN THE ALT SELECTOR. IF WE HAD SELECTED EACH XING ALT IN THE  
 PROFILE WE WOULD NOT HAVE DSNDDED EARLY AND WOULD HAVE A BETTER  
 PICTURE OF OUR POS ON THE PROFILE. INSTEAD OF HAVING TO DEAL WITH  
 MULTIPLE PROBLEMS WE WOULD ONLY HAVE HAD A SPD PROBLEM TO DEAL  
 WITH.

SYNOPSIS : ACR WDB ALTDEV OVERSHOT DURING DSCNT  
 INTO LAX ON CIVET PROFILE TRYING VERY HARD TO ANALYZE AUTO APCH  
 RESPONSE TO PRESENT PROFILE.

REFERENCE FACILITY ID : LAX  
 FACILITY STATE : CA  
 DISTANCE & BEARING FROM REF. : 55,68  
 MSL ALTITUDE : 9300,10000





ACCESSION NUMBER : 201587  
 DATE OF OCCURRENCE : 9202  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ZOB  
 FACILITY STATE : OH  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZOB;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
 LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : PROC OR POLICY/COMPANY; ACFT EQUIPMENT;  
 NARRATIVE : RTE FROM MSP TO PIT LOADED INTO FMC'S  
 VIA COMPANY RTE. DATA BASE WAS CONFIRMED TO BE CURRENT Y FEB-Y  
 MAR. FLOWN RTE DEVIATED FROM ACTUAL FILED FLT PLAN PRIOR TO DTB AT  
 JUNCTION OF J34 AND J90. CONTRIBUTING FACTORS -- NOTICE ON RELEASE  
 WAS MISINTERPRETED AS X FEB NOT X MAR FOR EFFECTIVE DATE OF  
 COMPANY RTE CHANGE. PDC WAS NOT THOROUGHLY CHKED AGAINST FMC TO  
 INSURE ROUTING. DATE OF DATA BASE. ATC NOTED DEV OF RTE AND  
 DIRECTED FLT TO TURN S FOR VECTORS. A RECHK BY BOTH PLTS  
 DISCOVERED VARIATION IN FLT PLANS. RECOMMEND IN FUTURE: BOTH PLTS  
 CHK RELEASE AFTER CAT OBTAINS RELEASE FROM OPS. BOTH PLTS CONFIRM  
 FMC FLT RTE VERSUS PDC ROUTING (AND PDC VERSUS FLT RELEASE).  
 DELETE OUT-OF-DATE OR OTS RTES FROM FMC DATA BASE UNTIL THEY'RE  
 ACTIVE.  
 SYNOPSIS : HDG TRACK DEV RESULTS FROM FLC  
 TECHNIQUE NAV WHEN WRONG FLT PLAN INSERTED INTO FMC.  
 REFERENCE FACILITY ID : ZOB  
 FACILITY STATE : OH  
 MSL ALTITUDE : 29000,29000

ACCESSION NUMBER : 202785  
 DATE OF OCCURRENCE : 9202  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : MGW  
 FACILITY STATE : WV  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZDC;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/ANOMALY ACCEPTED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : OUR FLT WAS ENRTE DTW-BWI AT FL370.

CAPT WAS FLYING. WE WERE CLRED DIRECT LIZZIO INTERSECTION (I HAD REDIAL <101 DEG> AND DME <34> OFF OF NEW VOR SET UP AS A BACKUP.) ATC CLRED US TO FL350. WE DSNDED AND LEVELED. RECEIVED A FREQ CHANGE, THEN RECEIVED A CLRNC TO CROSS LIZZIO AT FL270. CAPT PROGRAMMED THE XING RESTRICTION INTO THE FMC CORRECTLY, HE PLANNED TO WAIT UNTIL WE REACHED THE TOP OF DSCNT POINT SHOWN ON THE FMC DSCNT PAGE TO BEGIN OUR IDLE PWR DSCNT. PRIOR TO THE FMC COMPUTED TOD POINT, ATC REQUESTED THAT WE BEGIN OUR DSCNT. CAPT USED V/S MADE OF AUTOPLT AND STARTED DOWN. (IF HE HAD ENGAGED THE 'CAPTURE' MODE/FUNCTION ON THE DSCNT PAGE, WE WOULD HAVE BEGUN A 1000 FPM DSCNT UNTIL WE CAPTURED THE PROFILE.) WHILE IN THE DSCNT CAPT CHKED OUR PROFILE ON DSCNT PAGE OF FMC - WE'D GOTTEN BEHIND (IT SHOWED US HIGH) ON THE PROFILE. CAPT EXTENDED THE SPD BRAKES, INCREASED OUR SPD AND OUR RATE OF DSCNT. FMC SHOWED THAT WE CROSSED LIZZIO AT FL279. (WE REACHED FL270 APPROX 2-3 MI E OF LIZZIO INTERSECTION.) NO TFC ADVISORIES WERE ISSUED BY TCASII IN OUR DSCNT, AND ATC DID NOT QUESTION OUR ALT OVER LIZZIO. IN RETROSPECT, THE CAPT KNEW WHAT OUR XING RESTRICTION WAS, PROGRAMMED THE FMC CORRECTLY, MONITORED OUR PROGRESS IN THE DSCNT - HE JUST WAITED TOO LONG TO CORRECT OUR PROFILE. THIS OCCURRED ON THE LAST LEG OF OUR 3 DAY TRIP. PRIOR TO OUR DEP ON THE FIRST DAY OF THE TRIP, THE CAPT INFORMED ME THAT HE LIKED TO TREAT THE 'CAPTURE' BUTTON ON THE DSCNT PAGE AS IF IT WERE BROKEN - HE LIKED TO MAKE IDLE PWR DSCNT.

SYNOPSIS : ACR MISSES XING RESTRICTION ON DSCNT.  
 REACHES PROPER ALT IN 2-3 MI.  
 REFERENCE FACILITY ID : MGW  
 FACILITY STATE : WV  
 DISTANCE & BEARING FROM REF. : 34,101  
 MSL ALTITUDE : 27000,27900

ACCESSION NUMBER : 205488  
 DATE OF OCCURRENCE : 9203  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TRACON,AC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : SJC  
 FACILITY STATE : CA  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : SJC; OAK;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : SPEED DEVIATION; OTHER; ALT  
 DEV/OVERSHOOT ON CLB OR DES; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR; COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/INSUFFICIENT TIME;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : PROC OR POLICY/ATC FACILITY; AN ACFT  
 TYPE; ACFT EQUIPMENT;  
 NARRATIVE : THIS WAS OUR THIRD LEG OF THE MORNING.  
 DURING APCH, WE WERE CLRED TO DSND AND MAINTAIN 8000 FT MSL.  
 APCHING THE LEVEL-OFF AT 8000 FT, THE CTLR ISSUED US A SPD  
 REDUCTION FROM 250 KTS TO 180 KTS, IF WE'RE ABLE. THE CTLR  
 REPEATED THE INSTRUCTIONS AS THE FO WAS A LITTLE SLOW IN VERBALLY  
 RESPONDING. SUDDENLY, THE WORKLOAD INCREASED. WE HAD TO QUICKLY  
 RECONFIGURE THE ACFT IN ORDER TO SLOW TO 180 KTS, AS THERE WAS A  
 SENSE OF URGENCY IN THE CTLR'S VOICE. THE COMS WITH ATC BECAME A  
 LITTLE DISJOINTED AS WE ATTEMPTED TO ADVISE THE CTLR THAT WE  
 UNDERSTOOD AND COULD COMPLY WITH THE SPD REDUCTION. THIS DISTR  
 COMPOUNDED THE WORKLOAD. DURING THIS PERIOD, THE ACFT'S ALT ARM  
 FEATURE BECAME DISARMED. WE DSNDDED 200 FT BELOW OUR ASSIGNED ALT  
 AND WE CORRECTED UPON NOTICING THE DEV. THE CTLR ASKED US IF WE'RE  
 LEVEL AT 8000 FT. BY THE TIME WE RESPONDED, WE WERE JUST LEVELING  
 AT 8000 FT. SEVERAL FACTORS WERE RESPONSIBLE FOR THIS OCCURRENCE.  
 FIRST THE SUDDEN INCREASE IN WORKLOAD. SECOND, A POORLY DESIGNED  
 FLT GUIDANCE SYS THAT ALLOWS FOR EASY PLT INDUCED DISARMING OF ALT  
 HOLD SYS. I SUSPECT THAT I MAY HAVE SELECTED A REDUCED VERT SPD  
 (TO ASSIST IN REDUCING ACFT SPD) JUST AS THE ACFT WAS ENTERING THE  
 'ALT CAPTURE' PHASE, THUS DISARMING THE ALT CAPTURE. SOME OF MY  
 COMPANY'S ACFT CONTINUE TO UTILIZE AN OLD FLT GUIDANCE SOFTWARE  
 PROGRAM THAT HAS THIS DESIGN FLAW. THIRDLY, FATIGUE PLAYED SOME  
 PART. WE HAD A SHORT LAYOVER, AND I HAD TROUBLE SLEEPING THE  
 PREVIOUS NIGHT. THIS WAS COMPOUNDED BY AN EARLY MORNING DEP.  
 HAVING FLOWN WITH IRS'S FMC'S FOR OVER 7 YRS, I FEEL REASONABLY  
 COMFORTABLE IN COMMENTING ABOUT OUR USER UNFRIENDLY SYS. THE SYS  
 IS GREAT (FMS/IRS) AT MIDNIGHT, WHEN NO ONE ELSE IS AROUND, BUT  
 OTHER THAN GOING SOMEPLACE DIRECT (COAST TO COAST) THE SYS  
 PROVIDES US WITH A MAGNIFICENT PLATTER OF INFO, BUT OPERATIONALLY,  
 IN CANNOT BE USED. THEY TEACH NOTHING BUT USING THE FMS FOR ALL  
 'IN FLT' CHANGES FROM SPDS TO CLBS TO DSCNTS, ETC. IN THE CHKRIDES  
 I HAVE OBSERVED, 90% OF THE PLTS OF THESE NEW FANGLED SYS SEEM TO  
 LOVE THE GLASS COCKPITS/FMS/IRS/TCASII ET AL. BUT -- THEY CANNOT  
 SAFELY OPERATE THEM, NOR ARE THEY AT ALL PROFICIENT IN OPERATING  
 THEM. LET'S FACE IT, IT TAKES TIME TO ENTER AN ALT CHANGE IN THE  
 COMPUTER. IF IT IS ASSOCIATED WITH AN AIRSPD CHANGE, AND AN  
 IMMEDIATE DSCNT, ANOTHER PAGE MUST BE SELECTED AND THE COMPUTER  
 SEEMS TO BE QUITE SLOW IN THIS REGIME. SOMETIMES OVER 1 MIN

(REPORT CONTINUED)

ELAPSES BEFORE THE AIRCRAFT FINALLY RESPONDS. TO ME, THIS IS UNACCEPTABLE IN TODAY'S CROWDED AIRSPACE.

SYNOPSIS : ALTDEV ALT OVERSHOT IN DSCNT. POSSIBLE  
SPD DEV.  
REFERENCE FACILITY ID : SJC  
FACILITY STATE : CA  
DISTANCE & BEARING FROM REF. : 30,,SE  
MSL ALTITUDE : 7800,8000

ACCESSION NUMBER : 206459  
 DATE OF OCCURRENCE : 9204  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : CZQX  
 FACILITY STATE : NF  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : CZQX;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
 LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE; CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : I WAS THE SECOND FO ON AN INTL TRIP. I  
 WAS RELIEVING THE FO WHO WAS ASLEEP IN THE BACK. I WAS 'FLYING' IN  
 THE R SEAT, THE CAPT WAS 'NOT FLYING' IN THE L SEAT. APPROX 13 NM  
 FROM DOTTY INTXN OUR NEXT FIX, CTR GAVE US A RERTE. THE CAPT  
 ATTEMPTED TO ENTER THE RTE IN THE FMC AND COULDN'T GET THE FMC TO  
 'TAKE' IT. HE DETERMINED THE FIRST FIX ON THE RERTE WAS 'MILLS'  
 INTXN. BY THIS TIME WE WERE OVER THE FIX DEFINING THE BEGINNING OF  
 THE RERTE (DOTTY INTXN) AND WE FELT PRESSURED TO GET SOMETHING IN  
 THE COMPUTER SO WE COULD INITIATE A TURN IN THE PROPER DIRECTION.  
 THE CAPT PUT DIRECT 'MILLS' RATHER THAN 'MILLS' IN THE FMC TO GET  
 US GOING AND WE THEN BEGAN TO SORT OUT THE REST OF THE RERTE.  
 NEITHER OF US SAW HIS TYPING ERROR OR SAW THE DISTANCE TO 'MILLS'  
 WHICH WAS OBVIOUSLY NOT REASONABLE. WHEN THE RADAR CTLR SAW US HDG  
 THE WRONG DIRECTION HE GAVE US A CALL AND WE CAUGHT HIS TYPING  
 ERROR. WHEN IN A HURRY ONE MUST XCHK EVERYTHING.  
 SYNOPSIS : HDG TRACK DEV OCCURS AFTER AMENDED  
 CLRNC RTE CHANGE WAS RECEIVED BY ACR WDB OVER MARITIMES.  
 REFERENCE FACILITY ID : CZQX  
 FACILITY STATE : NF  
 DISTANCE & BEARING FROM REF. : 110,,NW  
 MSL ALTITUDE : 39000,39000

ACCESSION NUMBER : 207110  
 DATE OF OCCURRENCE : 9204  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : CHS  
 FACILITY STATE : NC  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZJX;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
 LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR; ATC/EQUIPMENT;  
 ANOMALY RESOLUTION : CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : LEG: BWI - MCO. I WAS "PROGRAMMER" OF

THE FMC THIS LEG. COMING DOWN FROM BWI, I PROGRAMMED THE RTE AS FILED, BRINGING US TO CHS ON J121. AFTER CHS, I TYPED IN "J79," THEN, MISTAKENLY, "ONM." SEEING MY ERROR, I TYPED IN "OMN" (ORMOND BEACH), AND BROUGHT IT UP TO REPLACE "ONM" (I DIDN'T WANT TO GO TO SOCORRO, NM!). THAT FIXED (SO I THOUGHT), I CONTINUED TO TYPE IN THE "BITHO 6" ARR TO RWY 18R AT ORLANDO. EVERYTHING IN THE "BOX" LOOKED SHIPSHAPE, SO I ACTIVATED THE FLT PLAN. I DID NOT XCHK AGAINST THE FLT PLAN, WAYPOINT-BY-WAYPOINT, VERIFYING THE "LEGS PAGE" AND FLT PLAN AGREED. I "KNEW" I HAD CAREFULLY ENTERED THE RTE OF FLT, LEG-BY-LEG, IN THE "RTE PAGE" -- I'D EVEN CAUGHT THE "ONM" (SOCORRO) "OMN" (ORMOND BEACH) MISTAKE, SO I KNEW I HAD PUT IT IN RIGHT. SO I THOUGHT...WHAT I DIDN'T REALIZE WAS, THE COMPUTER HAD DUMPED "J79" ON ME -- WHEN I MISTAKENLY TYPED IN "ONM" (IT KNEW J79 DOES NOT LEAD TO SOCORRO, NM). WHEN I TYPED OVER THE CORRECT FIX, "OMN," THE COMPUTER MADE IT DIRECT, ELIMINATING J79 AND ITS CRUCIAL FIX "STARY," WHICH PUTS A BEND IN THE JETWAY TO AVOID W-137/W157A. SURE ENOUGH, AFTER CHS, THE LNAV HEADED US TOWARDS OMN DIRECT. IT WAS THE CAPT'S LEG, AND HE KNEW I WAS A SHARP YOUNG COMPUTER WHIZ, SO HE DIDN'T DOUBT THE ACCURACY OF THE PROGRAMMING. ABOUT 45 MI SSW OF CHS, ZJX CALLS UP AND GIVES US A FAIRLY NONCHALANT "20 DEG R STEER TO AVOID RESTRICTED AIRSPACE." CAPT SAYS, "WHAT'S UP?" I BACKTRACK, FIGURE OUT MY ERROR (AND THE COMPUTER'S LOGIC) ON RTE 2 PAGE (RECREATING MY PROGRAMMING SEQUENCE, INCLUDING THE ONM/OMN MIS- ENTRY/CORRECTION THAT CAUSED J79 TO DUMP OUT, AND "DIRECT OMN" TO TAKE ITS PLACE. LESSONS LEARNED: 1) ALWAYS XCHK THE RTE OF FLT ON THE LEGS PAGE AGAINST THE FLT PLAN. 2) NEVER TRUST THE LOGIC OF THE FMC COMPUTER -- IT DOES WHAT IT DOES, AND CAN SCREW YOU. 3) NEVER TRUST THE PROGRAMMING OF YOUR FO (CAPT) -- HE MAY HAVE BEEN "TRICKED" BY THE FMC!

SYNOPSIS : FO OF ACR LGT ACFT INADVERTENTLY MISPROGRAMMED THE FMC RESULTING IN MISSING AN IMPORTANT TURNING POINT TO AVOID A WARNING AIRSPACE AREA. ATC INTERVENED AND "SAVED THE DAY."

REFERENCE FACILITY ID : CHS  
 FACILITY STATE : NC  
 DISTANCE & BEARING FROM REF. : 45,220  
 MSL ALTITUDE : 35000,35000

ACCESSION NUMBER : 209413  
 DATE OF OCCURRENCE : 9205  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : SIE  
 FACILITY STATE : NJ  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZDC;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC; COCKPIT/EQUIPMENT;  
 ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 FLC RETURNED ACFT TO ORIGINAL CLNC OR INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : PROBLEM: MISSED XING RESTRICTION ALT.  
 SUCCESSIVE DSCNTS AND XING RESTRICTIONS WITH EACH CHANGING CTLR.  
 HAD BEEN CLRED TO FL190, TO CROSS 30 NM S OF SIE VOR AT 15000 FT.  
 RESTRICTION HAD BEEN PROGRAMMED INTO FMC COMPUTER, BUT I MUST NOT  
 HAVE PROPERLY ENGAGED THE COMPUTER. WHEN CHANGED TO FREQ 127.70,  
 THE CTLR QUERIED OUR CLRNC TO 15000 FT. I CONFIRMED IT --  
 BELIEVING I STILL HAD APPROX 30 MI TO GO -- BUT IN FACT, I WAS  
 ABOUT 3 MI FROM THE XING. CTLR SAID OK -- JUST DSND TO 15000 FT,  
 WHICH I DID. CONTRIBUTING FACTORS: REPEATED DIFFICULTY HAD BEEN  
 EXPERIENCED WITH SETTING LOWER ALTS INTO THE FMC TO SATISFY EACH  
 NEW RESTRICTION. SOMETIMES WITHOUT SUCCESS. OFTEN WHEN MAKING  
 DSCNTS WITH RAPIDLY CHANGING PARAMETERS, THE AUTOMATED COCKPIT  
 BECOMES UNWIELDY -- AND BECOMES A DISTR TO FLYING THE ACFT. HUMAN  
 PERFORMANCE CONSIDERATIONS: FLT WAS LAST LEG OF A 4-DAY TRIP --  
 ACCUMULATING 25+ HRS IN THE LAST 80 HRS. A LAYOVER OF ABOUT 3 HRS  
 WAS EXPERIENCED BTWN PREVIOUS AND CURRENT FLT. A CERTAIN AMOUNT OF  
 FATIGUE WAS FELT -- PLUS ANGER AT KNOWING CREW WAS SUBJECT TO  
 POSSIBLE DRUG TEST ON ARR -- COMBING WITH FRUSTRATION AND  
 INABILITY TO MANAGE THE FMC -- ADDED TO THE DISTR OF ADHERING TO  
 THE CLRNC.  
 SYNOPSIS : CAPT OF MLG ACR ACFT ALLOWED THE ACFT  
 TO UNDERSHOOT DURING DSCNT CAUSING AN ALT XING RESTRICTION NOT TO  
 BE MET. THERE WAS NO KNOWN CONFLICT WITH OTHER TFC.  
 REFERENCE FACILITY ID : SIE  
 FACILITY STATE : NJ  
 DISTANCE & BEARING FROM REF. : 30,,SO  
 MSL ALTITUDE : 15000,19000

ACCESSION NUMBER : 226706  
 DATE OF OCCURRENCE : 9211  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : ABE  
 FACILITY STATE : PA  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZNY;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE;  
 TRACK OR HDG DEVIATION; NON ADHERENCE LEGAL RQMT/CLNC; OTHER;  
 ANOMALY DETECTOR : ATC/CTLR; ATC/EQUIPMENT;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : I HAD THE SAME ACR ACFT FLT FROM PHL TO  
 ORH AND THEN BACK TO PHL. INSERTED RTE 1 FROM PHL TO ORH AND  
 COMPUTER WOULD NOT ACCEPT RTE. I THEN INSERTED JET AIRWAY MANUALLY  
 AND IT WOULD NOT ACCEPT THAT EITHER. IT FINALLY ACCEPTED POINT TO  
 POINT WHICH MATCHED THE AIRWAY. ON THE NEXT LEG (ORH-PHL) I AGAIN  
 INSERTED RTE 1 PER THE FLT RELEASE. UPON CLOSER EXAMINATION, I  
 DISCOVERED THAT THE FMC RTE AND DISPATCH RELEASE HAD 2 DIFFERENT  
 INITIAL POINTS AND VICTOR AIRWAYS. ONE WENT TO BAF, THE OTHER WENT  
 TO CTR. I CORRECTED THE RTE AND PROCEEDED ON. THE CORRECTED RTE  
 LATER HAD US GOING ON V147 FROM AVP OVER ETX TO MAZIE INTXN. AFTER  
 AVP THE ACFT PROCEEDED DIRECT TO MAZIE. ATC PICKED UP THE DEV  
 FIRST AND THEN CLRED US DIRECT TO MAZIE. THE COMPANY LATER  
 CONFIRMED THE RTE DISCREPANCY AND ISSUED A NOTICE TO FUTURE CREWS  
 TO IGNORE THE FMC RTE. WHY THE ACFT WENT TO MAZIE I'M STILL NOT  
 SURE. ONE THING I AM SURE IS THAT MANUAL VOR BACKUP IS STILL A  
 NECESSITY.  
 SYNOPSIS : FLC OF ACR MLG ACFT DEVIATED FROM  
 ASSIGNED RTE DUE TO AN ERROR IN THE ACFT FMC PREPROGRAM RTE.  
 REFERENCE FACILITY ID : ABE  
 FACILITY STATE : PA  
 MSL ALTITUDE : 29000,29000



ACCESSION NUMBER : 228661  
 DATE OF OCCURRENCE : 9212  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,DC;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : FWA  
 FACILITY STATE : IN  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : FWA; FWA;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : OTHER; TRACK OR HDG DEVIATION; NON  
     ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : FLC BECAME REORIENTED; FLC RETURNED  
     ACFT TO ORIGINAL CLNC OR INTENDED COURSE; CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : THE PROBLEM AROSE FROM AN INCORRECT  
     PRESENT POS ENTERED IN THE FMS COMPUTER. APPARENTLY THE FUTURE  
     DEST WAS ENTERED AS OUR PRESENT POS, MAKING THE MAP OF OUR RTE ON  
     OUR NAV DISPLAY BACKWARD. AFTER TKOF, THE DEP CTLR CLRED US TO  
     10000 FT AND 'CLRED ON COURSE.' AS THE PNF, I SLUED THE FLT  
     DIRECTOR HDG BUG TOWARD THE FIRST FIX ON OR RTE OF FLT AS DEPICTED  
     ON THE NAV DISPLAY, NOT REALIZING IT WAS TAKING US IN THE OPPOSITE  
     DIRECTION OF OUR INTENDED DEST. WHEN THE DEP CTLR ASKED US WHY WE  
     WERE ON A S- WESTERLY COURSE VICE A N-EASTERLY COURSE, WE  
     IMMEDIATELY REALIZED OUR MAP DISPLAY WAS BACKWARDS AND TURNED  
     TOWARDS OUR DEST USING NORMAL NAV MEANS. THIS IS ONE OF THOSE  
     MISTAKES MADE BY RELYING SOLELY ON COMPUTER GENERATED NAV. A  
     COMPUTER IS ONLY AS GOOD AS THE INFO IT IS GIVEN (GIGO). SOME  
     CONTRIBUTING FACTORS INVOLVED WERE; IT WAS THE LAST LEG OF A 5  
 LEG,  
     12 HR DAY. BOTH OF US WERE TIRED AND READY TO GET TO OUR LAYOVER.  
     BEING A VERY QUICK TURN AROUND, THE CAPT LOADED THE FMS WHILE I  
     DID THE WALKAROUND. GETTING BACK IN THE COCKPIT, I WAS IN A HURRY  
     TO GET THINGS READY FOR OUR DEP AND DIDN'T BOTHER CHKING THE FMS  
     PROGRAM. ANOTHER FACTOR WHICH CAME INTO PLAY WAS A RWY CHANGE ON  
     TAXI OUT. I PUT THE NEW DEP RWY IN THE FMS BUT DID NOT HIT 'RWY  
     UPDATE' UPON TAKING THE RWY, THEREBY STILL LETTING THE COMPUTER  
     THINK IT WAS AT OUR DEST. ALTHOUGH THERE WAS NO CONFLICT, IT WAS  
     EMBARRASSING TO TURN IN THE TOTAL OPPOSITE DIRECTION THAN WE WERE  
     EXPECTED. IN THE FUTURE I WILL ALWAYS CHK THE FMS AND CORRELATE IT  
     WITH THE MAP DISPLAY, NO MATTER HOW TIRED I AM OR HOW QUICK THE  
     TURN AROUND.  
 SYNOPSIS : HDG TRACK DEV.  
 REFERENCE FACILITY ID : FWA  
 FACILITY STATE : IN  
 DISTANCE & BEARING FROM REF. : 5,140  
 MSL ALTITUDE : 5000,5000

ACCESSION NUMBER : 237717  
 DATE OF OCCURRENCE : 9303  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; FLC,OTH; ARTCC,  
 RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : CZQX  
 FACILITY STATE : NF  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : CZQX;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
 LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE; CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE HAD FLOWN W ON A NAT TRACK (N  
 ATLANTIC TRACK) WITH AN INLAND FIX AT LAKES INTXN. THE CAPT HAD  
 ENTERED OUR RTE PRIOR TO TKOF AND I CHKED IT BY GOING DOWN OUR FLT  
 PLANNING FORM AND ENTERING THE WINDS ALOFT AT THE FLT PLAN FIXES.  
 THE CAPT HAD ENTERED THE RTE AS LAKES DIRECT MOFAT, OUR FILED AND  
 SUBSEQUENTLY CLRED RTE WAS LAKES NA 316 MOFAT. THESE 2 RTES WERE  
 NOT THE SAME -- THE CLRED RTE WENT LAKES-HINGE-TEALS-MOFAT. MY  
 CHKING THE RTE WITH THE FLT PLAN FORM DID NOT CATCH THE ERROR  
 SINCE HINGE AND TEALS WERE NOT ON THE FORM. OUR FLT WAS AN ETOPS  
 FLT, WITH A RELIEF PLT. JUST AFTER CTR ISSUED OUR CLRNC, I WAS  
 RELIEVED AND WENT ONTO A REST PERIOD IN THE CABIN. NORMALLY THIS  
 IS WHERE SOMEBODY WOULD DOUBLECHK THE FMS RTE WITH THE BOOK, BUT  
 WITH THE SHIFT CHANGE AND SOME COMPLACENCY, NONE OF US DID. THE  
 RESULT WAS A NAV DEV THAT CTR DISCOVERED, WITH NO APPARENT  
 COMPROMISE OF SEPARATION. IN THE FUTURE, I WILL CHK OUR FMS LOADED  
 RTE WITH THE FLT PLAN FILED RTE SECTION AND WILL ALSO MAKE A  
 GREATER EFFORT TO GUARD AGAINST COMPLACENCY. A COPY OF THIS  
 (DE-IDENTED, OF COURSE) WILL GO TO OUR TRAINING PEOPLE SO THAT  
 MAYBE OTHERS WILL NOT BE CAUGHT BY THE METHOD I USED TO CHK OUR  
 RTE.  
 SYNOPSIS : NAV ERROR ADMITTED IN HDG TRACK POS  
 DEV.  
 REFERENCE FACILITY ID : CZQX  
 FACILITY STATE : NF  
 MSL ALTITUDE : 37000,37000

## DISTRACTION DUE TO PROGRAMMING

ACCESSION NUMBER : 63447  
DATE OF OCCURRENCE : 8701  
REPORTED BY : FLC; FLC; ;  
PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TWR,LC;  
FLIGHT CONDITIONS : VMC  
REFERENCE FACILITY ID : DFW  
FACILITY STATE : TX  
FACILITY TYPE : TWR; ARPT;  
FACILITY IDENTIFIER : DFW; DFW;  
AIRCRAFT TYPE : WDB;  
ANOMALY DESCRIPTIONS : RWY TRANSGRESS/OTHER; NON ADHERENCE  
LEGAL RQMT/CLNC;  
ANOMALY DETECTOR : COCKPIT/FLC;  
ANOMALY RESOLUTION : NOT RESOLVED/UNABLE; NOT  
RESOLVED/DETECTED AFTER-THE-FACT; NOT RESOLVED/INSUFFICIENT TIME;  
ANOMALY CONSEQUENCES : NONE;

NARRATIVE : NEARING COMPLETION OF A 3 HR FLT. THE FLT WAS CLEARED FOR A NIGHT VISUAL APCH TO RWY 35R AT DFW. THE ACFT WAS HIGH ON DOWNWIND, W OF THE ARPT. TFC WAS LIGHT AND THE VISIBILITY WAS EXCEPTIONALLY GOOD. THE PLT FLYING (F/O) HAD APPROX 100 HRS IN THE ACFT. A SHORTENED APCH WAS COMMENCED WITH AN ANGLING LEFT TURN NEBND. THE FMS WAS PROGRAMMED FOR RWY 35R AND THE PF WAS USING THE MAP DISPLAY ON THE HSI FOR LINEUP AS THE RWY LIGHTS WERE NOT YET VISIBLE. JUST AS THE 36 L/R LIGHTS WERE COMING INTO VIEW, THE TWR OFFERED 35L AND THE CREW ACCEPTED (NO ILS ON 35L). AFTER FURTHER CHECKING THE HSI DISPLAY FOR LINEUP, THE PF LOOKED OUT AND SAW THE 36 L/R LIGHTS AND MISTOOK THE RWY PAIR AS RWY 35 L/R. THE LACK OF ILS INFO AND THE INTENSE LIGHTING OF A RELATIVELY NEW RWY (31L) ADDED TO THE CONFUSION. THE PF LINED UP ON 36L AND AS CLRNC TO LAND (ON 35L) HAD ALREADY BEEN GIVEN, A LNDG WAS MADE. NOTHING FURTHER WAS HEARD FROM THE TWR. JUST PRIOR TO TOUCHDOWN, BOTH PLTS REALIZED THE ERROR, BUT A GO-AROUND WAS NOT FEASIBLE AT THAT POINT. THE TWR OPERATOR THEN CLEARED THE ACFT TO TAXI ACROSS 36R AND TO THE GATE. THE FOLLOWING FACTORS WERE BELIEVED TO HAVE CONTRIBUTED TO THIS EVENT: A) F/O, PF, HAD MINIMUM TIME IN THE ACFT. B) CHANGING OF APCH FROM 35R TO 35L LATE ON FINAL, THUS INVOLVING A REPROGRAMMING OF FMS, DIVERTING NEEDED ATTENTION FROM OUTSIDE AT CRITICAL TIME. C) ATTEMPTING TO CALL RAMP FREQ ON FINAL TO GET GATE ASSIGNMENT AND ADVISE OF ETA FOR RIGHT CONNECTIONS EQUALS DISTRACTION. D) UNUSUALLY CLEAR VISUAL CONDITIONS AND FAMILIAR ARPT WHICH SEEMED TO UNDERMINE THE NORMAL LEVEL OF ALERTNESS OF CREW. E) MINIMUM NIGHTTIME STAFFING OF TWR. ONE MAN CONTROLLING TWR, GND CTL AND CLRNC DELIVERY DIVERTED HIS ATTENTION FROM LINE-UP. F) MOST IMPORTANTLY, PREOCCUPATION BY CREW ON FMS/INSTRUMENTATION LATE IN THE APCH WHEN OUTSIDE VIGILANCE WAS NECESSARY/MORE IMPORTANT. G) SINCE THE ACFT NEVER CAPTURED THE EXISTING ILS LOCALIZER (35L) THE RAW DATA AVAILABLE SEEMED TO INDICATE "LINED UP LEFT" WHICH WAS COMPATIBLE WITH THE SITUATION, THEREFORE DISREGARDED. IN CONCLUSION IT IS ALMOST INCOMPREHENSIBLE THAT 2 EXPERIENCED COMMERCIAL PLTS COULD LAND VFR AT A FAMILIAR ARPT, WITH NO ATC COMMENTS, ON THE WRONG RWY. THE HUMAN TENDENCY TO LET YOUR GUARD DOWN IN GOOD WX IN FAMILIAR SURROUNDINGS IS, RESULTANTLY, A VERY DANGEROUS FACTOR IN AVIATION. THE LESSON HERE



(REPORT CONTINUED)

IS THAT WE ALL NEED TO BE EXTRA VIGILANT DURING THESE PERIODS AND PERHAPS MORE EMPHASIS PLACED ON THIS REALM DURING OUR TRAINING FOR THESE SITUATIONS SEEM TO HAPPEN FREQUENTLY AND WE SEEM TO BE ILL PREPARED WHEN THEY DO OCCUR.

SYNOPSIS : WDB LANDED ON THE WRONG PARALLEL RWY.  
REFERENCE FACILITY ID : DFW  
FACILITY STATE : TX  
DISTANCE & BEARING FROM REF. : 5,,SO  
MSL ALTITUDE : 603,1500

ACCESSION NUMBER : 85835  
 DATE OF OCCURRENCE : 8804  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TWR,LC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : PIT  
 FACILITY STATE : PA  
 FACILITY TYPE : TWR; ARPT;  
 FACILITY IDENTIFIER : PIT; PIT;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : RWY TRANSGRESS/OTHER; NON ADHERENCE  
     LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : RECEIVED TAXI CLRNC TO "TAXI TO RWY 28  
     CENTER," AND CAPT BEGAN TAXI AS I READ AFTER START AND BEFORE TKOF  
     CHKLISTS. MY ATTN WAS DIVERTED INSIDE COCKPIT AS NEW WT AND  
     BALANCE INFO WAS RECEIVED FROM COMPANY VIA ACARS. AS I ENTERED NEW  
     DATA INTO FMC, RECEIVED FOLLOWING MESSAGE FROM GND CTL, "YOU WERE  
     CLRED TO RWY 28C WHICH YOU ARE CROSSING NOW. BACK TAXI INTO POS  
     AND HOLD." I ACKNOWLEDGED AND THE CAPT BACK TAXIED INTO POS. THE  
     REMAINDER OF THE FLT WAS NORMAL. I BELIEVE GREATER VIGILANCE ON  
     THE PART OF THE CAPT IS NECESSARY DUE TO THE COCKPIT DUTIES  
     REQUIRED OF THE F/O WHILE TAXIING (READ CHKLIST, RECEIVED COMPANY  
     MESSAGES AND TALK TO BOTH COMPANY AND GND, AND ENTER DATE INTO  
     FMC'S WHILE MONITORING ACFT PROGRESS).  
 SYNOPSIS : ACR MLG TAXIED TOWARD WRONG RWY AND  
     MADE UNAUTH RWY ENTRY.  
 REFERENCE FACILITY ID : PIT  
 FACILITY STATE : PA  
 AGL ALTITUDE : 0,0

ACCESSION NUMBER : 180082  
 DATE OF OCCURRENCE : 9106  
 REPORTED BY : FLC; FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TRACON,AC;  
 TWR,LC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : DFW  
 FACILITY STATE : TX  
 FACILITY TYPE : TRACON; ARPT; TWR;  
 FACILITY IDENTIFIER : DFW; DFW; DFW;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; OTHER; NON  
 ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE WERE APCHING DFW FOR THE SW ON THE

ACTON ARR. ATIS INFORMED US TO PLAN OF A VIS APCH TO 18R. WHEN WE  
 TURNED N (ON DOWNWIND) WE WERE GIVEN DSNT AND A FREQ CHANGE. THE  
 FMS AND MCP WERE SET FOR 18R. THE NEW CTLR TOLD US TO EXPECT 17L  
 AND A SHORT FINAL. THE TIME INVOLVED WITH REPROGRAMMING EVERYTHING  
 TOOK ME UNTIL BASE LEG, WHILE THE COPLT FLEW THE ACFT (DSNDING  
 FROM 11000 TO 3000'). UPON TURNING BASE, THE CTLR ASKED IF WE HAD  
 THE FIELD IN SIGHT. THE COPLT SAID HE DID AND THEN THE CTLR CLRED  
 US FOR A VIS TO 17L AND SWITCHED US TO TWR. AT THIS POINT WE BEGAN  
 CONFIGURING THE ACFT FOR LNDG AND RUNNING THE LNDG CHKLST. WHEN  
 WE CAME UPON TWR'S FREQ HE OFFERED US 17R AND WE ACCEPTED IT. AS  
 WE ROLLED OUT ON FINAL, I WAS BUSY REPROGRAMMING THE RADIOS AND  
 FMS FOR THE THIRD TIME AND DID NOT NOTICE THE COPLT HAD LINED UP  
 ON 18R. APPROX 1 MI LATER I FINISHED SETTING UP THE COCKPIT AND  
 SAW ON THE NAV DISPLAY THAT ACFT WAS DISPLACED TO THE RIGHT OR W  
 OF COURSE. AFTER CHKING FREQS AND COURSES VERY QUICKLY, I LOOKED  
 OUTSIDE AND STARTED TO TELL THE COPLT HE HAD LINED UP ON THE WRONG  
 RWY. AT THAT MOMENT THE TWR CALLED TO CONFIRM WE HAD THE ARPT IN  
 SIGHT--WE WERE APCHING THE OM--AND WE TURNED TOWARD 17R. THE  
 REMAINDER OF THE APCH WAS UNEVENTFUL. CONTRIBUTING FACTORS WERE  
 THE FADING DAYLIGHT AND THE COPLT HAD BEEN OUT OF THIS COCKPIT FOR  
 2 MONTHS WHILE TRANSITIONING TO ANOTHER AFT WHICH LEFT HIM A  
 LITTLE BEHIND AND PREOCCUPIED. THERE WERE NO OTHER ACFT ON APCH TO  
 EITHER SIDE OF DFW. CHANGING APCHS AND RWYS INSIDE OF 10 MI (EVEN  
 IN VMC) IN THIS HIGH WORKLOAD 2-M COCKPIT ACFT REPRESENTS A  
 CHALLENGE, EVEN WHEN BOTH PLTS ARE EXPERIENCE AND CURRENT, MUCH  
 LESS IF ONE IS NOT.

SYNOPSIS : ACR MLG FLT CREW MAKES WRONG RWY APCH  
 AT DFW.

REFERENCE FACILITY ID : DFW  
 FACILITY STATE : TX  
 DISTANCE & BEARING FROM REF. : 7,,N  
 MSL ALTITUDE : 3000,3000

ACCESSION NUMBER : 183679  
 DATE OF OCCURRENCE : 9107  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TWR,LC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : MIA  
 FACILITY STATE : FL  
 FACILITY TYPE : TWR; ARPT;  
 FACILITY IDENTIFIER : MIA; MIA;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : RWY TRANSGRESS/OTHER; NON ADHERENCE  
     LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
     NOT RESOLVED/DETECTED AFTER-THE-FACT;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : PHYSICAL FACILITY/ARPT;  
 NARRATIVE : AFTER PUSHBACK FROM OUR GATE WE WERE

INSTRUCTED TO TAXI TO RWY 27L BY MIA GND. TAXI FROM A GATE TO AIRPLANE TAXI OUT IS A VERY SHORT TAXI AND AS F/O ON A GLASS AIRPLANE TAXI OUT IS A VERY BUSY TIME. BEFORE A TKOF CHKLST CAN BE DONE WE MUST ENTER OUR FINAL WEIGHTS INTO OUR COMPUTER. OUR WEIGHTS WERE SENT TO US OVER OUR ACARS BUT THERE WAS A DISCREPANCY BTWN THE PAX COUNT OUR F/AS GAVE US AND THE COUNT OUR LOAD PLANERS HAD. THIS IS NOT A BIG DEAL JUST A QUICK CALL TO LOAD PLANNING AND IT'S TAKEN CARE OF BUT IT WAS ONE MORE THING FOR ME TO DO IN AN ALREADY BUSY TIME COMPOUNDED BY THE SHORT TAXI THAT WOULD KEEP ME BUSY INSIDE THE AIRPLANE AND NOT ABLE TO LOOK OUTSIDE. OUR NEW WEIGHTS WERE SENT TO US AND I ENTERED THEM INTO THE COMPUTER AND MADE THE CHANGES TO OUR TKOF TRIM AND TKOF SPDS AND THEN BEGAN TO READ THE TKOF CHKLST. DURING THE TKOF CHKLST GND INSTRUCTED US TO CONTACT TWR. WE CONTACTED TWR AND HE INSTRUCTED US TO FOLLOW THE SEC ACR X AIRPLANE (THERE WERE 3 OF THEM). WE COMPLETED OUR TKOF CHKLST AND THE AIRPLANE THAT WE WERE INSTRUCTED TO FOLLOW WAS ON RWY 27L PULLED UP CLOSE BEHIND HIS COMPANY AIRPLANE THAT WAS HOLDING SHORT OF RWY 30. WELL THE LINE MOVED UP JUST SECS LATER AND MY CAPT MOVED UP R BEHIND THE ACR X AIRPLANE AND XED THE HOLD SHORT LINE. THIS IS WHEN THE TWR ADVISED ACR X THAT HE WAS ON AN ACTIVE RWY AND ADVISED US THAT WE WERE PASSED THE HOLD SHORT LINE. AS THE LINE MOVED UP THE MISTAKE THAT ACR X MADE SNOWBALLED AND WE TOO WERE NOW ON THE RWY. ACR X MAKING THIS MISTAKE IS NO EXCUSE FOR US TO MAKE THE SAME MISTAKE. I ALSO FEEL THAT IF I WAS NOT AS BUSY AS I WAS WITH MY EYES MOSTLY INSIDE THE AIRPLANE, I MAYBE COULD HAVE HELPED PREVENT THIS. I ALSO FEEL THAT MY CAPT MAY HAVE BEEN A LITTLE BIT CONFUSED AND MAY NOT HAVE REALIZED THAT HE WAS ON AN ACTIVE RWY BECAUSE THE AREA AROUND RWY 27L AND RWY 30 IS SUCH A WIDE OPEN AREA WITH NOT MUCH DEFINITION BTWN RAMP AREA, TXWY AND RWY. ALSO HAVING AN AIRPLANE DIRECTLY AHEAD OF HIM ON THE RWY AND BEING INSTRUCTED TO FOLLOW HIM DEFINATELY ADDED TO THE PROB. I FEEL THAT THEY SHOULD BETTER MARK THE AREA AROUND RWY 27L AND RWY 30 WITH SIGNS TO HELP DIFFERENTIATE BTWN RAMP AREA, TXWY AND RWY. CALLBACK CONVERSATION WITH RPTR REVEALED THE FOLLOWING INFO. CALLBACK PLACED IN CONJUNCTION WITH STRUCTURED CALLBACK ON RWY INCURSIONS. RPTR SAID THAT HE CONSIDERED THE GND CTLR'S INSTRUCTION TO FOLLOW TFC TO BE AMBIGUOUS BECAUSE THAT TFC WAS NOT



(REPORT CONTINUED)

GOING TO THE SAME RWY, ALTHOUGH HE WAS FOLLOWING THE SAME RTE. HE SUGGESTED THAT WHEN MULTIPLE RWY OPS ARE IN EFFECT, CTRLRS BE MORE CAREFUL ABOUT THE PHRASEOLOGY AND THE CLARITY OF THEIR CLRNCs. HE FELT THAT THE CAPT WAS PROBABLY UNAWARE THAT HE HAD ENCROACHED THE RWY BECAUSE THE MARKINGS ARE FADED AND THERE ARE NOT GOOD SIGNS AT THE LOCATION OF THE INCURSION. CAPT PROBABY THOUGHT THAT THE ACFT HE WAS FOLLOWING WAS ALSO GOING TO RWY 27L. RPTR SAID THAT CAPT WAS AWARE THAT F/O WAS OUT OF THE LOOP BECAUSE THE F/O ALWAYS ANNOUNCES "HEAD DOWN" IN ACCORDANCE WITH TRNING SUGGESTION.

SYNOPSIS : FLC OF MLG ACR IS TOLD TO FOLLOW OTHER ACFT TO RWY 27L AT MIA. CAPT INADVERTENTLY FOLLOWS ACFT AHEAD TAXIING TO RWY 30, AND FAILS TO HOLD SHORT OF RWY 27L. FO IS HEAD DOWN CONFIGURING FMC DURING SHORT VERY SHORT TAXI OUT.

REFERENCE FACILITY ID : MIA  
FACILITY STATE : FL  
DISTANCE & BEARING FROM REF. : 0  
AGL ALTITUDE : 0,0

ACCESSION NUMBER : 191561  
 DATE OF OCCURRENCE : 9110  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : CLT  
 FACILITY STATE : NC  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : CLT; CLT;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : NOT RESOLVED/DETECTED AFTER-THE-FACT;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : I WAS RECEIVING EXTENSIVE VECTORS FROM  
 CENTER WHEN PASSING THROUGH FL180 AND QNH WAS NOT SELECTED. CENTER  
 HAD TOLD US TO INTERCEPT A RADIAL OFF THE CLT VOR. THE RADIAL WAS  
 SEVERAL MI BEHIND US AND IN OUR RUSH TO PUNCH IN ALL THE DATA  
 REQUIRED TO INTERCEPT A SIMPLE RADIAL, WE OVERLOOKED THE CHANGE.  
 LCL ALTIMETER SETTING WAS HIGH AND WE CROSSED SHINE APPROX 400 FT  
 HIGH. SOLUTION: COULD HAVE GONE DIRECT TO SHINE WITH 3 BUTTON  
 PUSHES, (TOTAL TIME = 2 SECONDS AND SIMPLE PROC), WHICH IS WHAT  
 THE CTLR REALLY WANTED AS SHINE IS ON THE RADIAL. FREQ WAS TOO  
 CONGESTED TO REQUEST THIS. RADIAL SETUP REQUIRES 20 SEPARATE,  
 ACCURATE KEYSTROKES, ASSUMING FMC IS HAPPY WITH THE PACE OF DATA  
 INPUT AND ASSUMING 1 OF THE 2 POINTS IS NOT BEHIND YOUR ACFT.  
 CTRLRS NEED MORE EDUCATION CONCERNING AUTOMATED ACFT. '/R' AS AN  
 ACFT CODE SHOULD BE DIFFERENT FOR AUTOMATED ACFT. THIS WOULD HELP  
 THE CTRLRS, PARTICULARLY DEP AT LGA. BETTER COCKPIT DISCIPLINE.  
 BETTER SOFTWARE.  
 SYNOPSIS : ACR ALTDEV UNDERSHOT XING RESTRICTION  
 BECAUSE THE FLC FAILED TO SET ALTIMETERS TO QFE XING THE  
 TRANSITION LEVEL.  
 REFERENCE FACILITY ID : CLT  
 FACILITY STATE : NC  
 DISTANCE & BEARING FROM REF. : ,,NW  
 MSL ALTITUDE : 10000,10400

ACCESSION NUMBER : 193405  
 DATE OF OCCURRENCE : 9111  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : VHP  
 FACILITY STATE : IN  
 FACILITY TYPE : ARPT; ARTCC;  
 FACILITY IDENTIFIER : IND; ZID;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; ALT  
 DEV/UNDERSHOOT ON CLB OR DES; ALT DEV/XING RESTRICTION NOT MET;  
 NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : FLT FROM LAX-IND. APCHING INDIANAPOLIS  
 ON RNAV WITH CLRNC TO DSND TO 240 WITH XING RESTRICTION. DURING  
 DSCNT COPLT DISCONNECTED AUTOPLT BECAUSE OF A STABILIZER OUT OF  
 TRIM LIGHT AND MANUALLY LEVELED AT 240. I WENT OFF FREQ TO GET  
 ATIS. WHEN I RETURNED, FO HAD REENGAGED AUTOPLT AND STATED CENTER  
 HAD CLRED US TO 'CROSS 35 FROM INDIANAPOLIS AT 11000.' HE THEN  
 PROGRAMMED THE FMC FOR THE XING RESTRICTION USING DOWN TRK FIX  
 MODE FROM IND. SHORTLY THEREAFTER, DURING THE DSCNT, WE NOTICED  
 THE DME TO THE XING FIX WAS MOVING FROM 35 TO 34, SO FO  
 REPROGRAMMED IT AGAIN. CENTER INQUIRED IF WE WERE GOING TO MAKE  
 THE XING RESTRICTION. THE FMC SHOWED US WELL WITHIN PARAMETERS ON  
 BOTH DSCNT AND LEGS PAGES, SO I ASKED THE CENTER HOW FAR HE SHOWED  
 US FROM THE XING FIX. HE STATED HE SHOWED US '35 MI FROM THE  
 INDIANAPOLIS VOR.' WE WERE PASSING 18000 FT AT THAT TIME, AND I  
 STATED WE COULD NOT MAKE IT, AND WE WERE TRACKING TO KIND (AS  
 CLRED) VICE VHP. HE STATED THAT HE HAD CLRED US TO CROSS FROM VHP,  
 AND TO DROP THE RESTRICTION. THE ACFT THEN BEGAN AN UNCOMMANDED L  
 TURN, DURING WHICH THE CTLR ISSUED A CORRECTION TO MAKE A R 270  
 DEG TURN. AFTER WE LANDED, WE REALIZED THAT 2 THINGS OCCURRED. WE  
 WERE GIVEN A VORTAC XING NOT COLOCATED WITH OUR ASSIGNED DEST, AND  
 THE FO HAD INADVERTENTLY PLACED THE DOWN TRK FIX BEHIND, RATHER  
 THAN IN FRONT OF, AN INTERIM FIX (KELLY), CAUSING AN APPROX 12-15  
 MI ERROR, AND ALSO THE UNCOMMAND TURN AS THE FMC ATTEMPTED TO  
 RETURN TO XING FIX AFTER KELLY. THIS WAS CLRLY A CASE OF PLT  
 OVERLOAD FOR THE FO, WITH NO BACKUP FROM ME AT A TIME WHEN IT WAS  
 NEEDED. THE FO DID NOT HEAR THE CLRNC TO 'INDIANAPOLIS VOR', AND  
 SINCE VHP WAS NOT ON OUR FLT PLAN, HAD NO REASON TO ASSUME A XING  
 RESTRICTION WOULD BE ISSUED FROM IT. I WAS NOT ON FREQ TO BACK HIM  
 UP. WHEN I DID GET BACK, WE BECAME ABSORBED IN  
 PROGRAMMING/REPROGRAMMING FMC, WHICH WAS PROGRAMMED INCORRECTLY,  
 WHILE DOING ARR CHKLIST, DISCUSSING THE STABILIZER TRIM LIGHT, AND  
 DISCUSSING THE APCH. IN RETROSPECT, THE PRUDENT ACTION WOULD HAVE  
 BEEN FOR THE PNF (ME) TO GO TO A MANUAL BACKUP MODE, AND ALLOW THE  
 PF TO HANDLE THE FMC CHORES (AUTOPLT ENGAGED). 2 HEADS BURIED IN  
 THE FMC WAS NOT BETTER THAN 1, PARTICULARLY WHEN 1 (MINE) WAS NOT  
 IN THE LOOP WHEN CLRNC ISSUED. IF VORTACS ARE NOT COLOCATED, DON'T  
 ISSUE XING RESTRICTIONS FROM THEM UNLESS THEY ARE PART OF THE NAV  
 PROCESS. BETTER STILL, CHANGE THE NAMES.  
 SYNOPSIS : ACR MLG ALTDEV UNDERSHOT ALT XING

(REPORT CONTINUED)

RESTRICTION.

REFERENCE FACILITY ID : VHP  
FACILITY STATE : IN  
DISTANCE & BEARING FROM REF. : 40,,SW  
MSL ALTITUDE : 11000,18000

ACCESSION NUMBER : 199170  
 DATE OF OCCURRENCE : 9201  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ABE  
 FACILITY STATE : PA  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZNY;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; NON  
 ADHERENCE LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/FAR;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : PROC OR POLICY/COMPANY;  
 NARRATIVE : CLRED BY ZNY TO CROSS FIX W OF  
 ALLENTOWN AT 13000. ALTIMETER WAS 29.05 (LOW) CAPT (FLYING)  
 ATTEMPTED TO PUT XING RESTRICTION IN FMC AFTER SETTING ALT IN MCP.  
 COMPUTER WOULD NOT ACCEPT XING RESTRICTION AND WE WERE COMING UP  
 ON FIX SO I PRESSED LEVEL CHANGE AND CONTINUED TO ATTEMPT TO  
 PROGRAM THE COMPUTER. COPLT ASKED 'HAVE YOU BEEN CLRED LOWER, AND  
 I LOOKED UP AND SAW US DSNDING THROUGH 13000 ON HIS ALTIMETER.  
 DISCONNECTED AUTOPLT AND LEVELED AT 12500 AND RETURNED TO 13000. I  
 HAD NOT CALLED FOR THE IN-RANGE CHK AND COPLT HAD NOT INITIATED IT  
 BUT HAD RESET HIS ALTIMETER WITHOUT CALLING FOR OR CHKING MINE. I  
 FEEL 2 FACTORS CONTRIBUTED TO THIS INCIDENT: 1) COPLT WAS FROM  
 ANOTHER AIRLINE IN A MERGER AND FELT HE HAD BEEN 'SCREWED' IN THE  
 SENIORITY INTEGRATION. HIS ATTITUDE WAS BAD AND HE IS RESENTFUL IN  
 HAVING TO FLY WITH YOUNGER CAPTS. HE DOES HIS JOB IN AN EXTREMELY  
 PASSIVE MANNER AND IS QUITE CAPABLE OF QUIETLY WATCHING SOMEONE  
 BUST AN ALT, IN FACT, DESCRIBED DOING SO IN THE PAST. (THIS IN NO  
 WAY DIMINISHES MY RESPONSIBILITY FOR WHAT HAPPENED.) 2) OUR  
 AIRLINE HAS RECENTLY TERMINATED CREW MEALS AS A COST SAVINGS  
 MEASURE, AND NEITHER OF US HAD EATEN IN SEVERAL HRS.  
 SYNOPSIS : MLG FLT HAD ALTDEV.  
 REFERENCE FACILITY ID : ABE  
 FACILITY STATE : PA  
 DISTANCE & BEARING FROM REF. : ,,W  
 MSL ALTITUDE : 12500,13000

ACCESSION NUMBER : 199986  
 DATE OF OCCURRENCE : 9201  
 REPORTED BY : FLC; FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; FLC,SO; TRACON,AC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : LHR  
 FACILITY STATE : FO  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : LHR; LHR;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; NON  
 ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR; COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE; CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT; PROC OR POLICY/COMPANY;  
 NARRATIVE : DURING DSCNT THE LCL ALTIMETER SETTING

GIVEN BY ATC 1059MB WAS SET IN THE STANDBY (3RD) ALTIMETER TO GET THE QNH EQUIVALENT (IN INCHES OF HG) INPUT INTO ACARS FOR CHANGE OVER. SIMULTANEOUSLY ATC GAVE US DSCNT AND HOLDING INSTRUCTIONS DISRUPTING THE MENTAL FLOW OF EVENTS, RESULTING IN THE FAILURE TO RESET THE STANDBY ALTIMETER TO 29.92/1013MB. WE WERE THEN GIVEN NUMEROUS ALT CLRNC CHANGES DURING A CONTINUOUS DSCNT TO FL80. WITH THE AUTOPLT ENGAGED, THE FO NOTICED ON HIS ALTIMETER (29.92) THAT THE ACFT DID NOT LEVEL OFF AT FL80. BY FL78 HE ANALYZED THE PROBLEM AND TOOK CORRECTIVE ACTION BY PRESSING FL CHANGE ON THE AFDS PANEL WHICH SHOULD HAVE CORRECTED THE ACFT BACK TO FL80. IT WAS DURING THE CORRECTIVE CLB THAT ATC QUESTIONED OUR ALT. AFTER RETURNING TO FL80 THE CREW DEDUCED THAT THE MISSET STANDBY ALTIMETER RESULTED IN THE AUTOPLT NOT CAPTURING FL80. THE STANDBY ALTIMETER WAS THEN RESET TO 29.92/1013MB AND A CATIII ILS APCH WAS FLAWLESSLY ACCOMPLISHED. IN CONCLUSION, THE PROBLEM WAS CAUSED BY A MISSET STANDBY ALTIMETER WITH THE AUTOPLT ENGAGED. I BELIEVE THE CREW ANALYZED THE PROBLEM AND TOOK CORRECTIVE ACTION IN AN EXPEDITIOUS MANNER WITHOUT JEOPARDIZING SAFETY. SUPPLEMENTAL INFO FROM ACN 199976. COMPANY PROC IS TO SET CAPT AND FO ALTIMETERS TO AFL (QFE) BELOW 10000 FT, DOMESTIC FLYING WITH THIRD ALTIMETER TO QNH. MY HABIT PATTERN HAS BEEN TO FLY THE THIRD ALTIMETER (QNH) BELOW 10000 FT FOR 24 YRS. ON THIS DAY APCHING LHR THE INTL OFFICER (10) ASKED ME TO SET (1059MB) THE LCL ALTIMETER SETTING GIVEN IN MB INTO THE THIRD ALTIMETER TO GET ONH (11 MERCURY) FOR REQUIRED INPUT INTO ACARS. I RESET THE THIRD ALTIMETER AS REQUESTED. AT THE SAME TIME WE WERE CLRED TO DSND TO 13000 FT. I WAS WORKING THE RADIO AND BECAME INVOLVED WITH THE DSCNT PROCS, CHANGE OF RADIO FREQS, ADDITIONAL DSCNT CLRNCs, AND A HOLD CLRNC. I FAILED TO RESET THE THIRD ALTIMETER TO QNE (1013MB, 29.92). THE FO FLYING QUESTIONED THE ACFT ALT. MY FIRST ACTION OUT OF HABIT WAS TO LOOK AT THE THIRD ALTIMETER SHOWING US STILL ABOVE 8000 FT DSNDING (BECAUSE IT WAS MISSET). SINCE WE WERE STILL ABOVE TRANS LEVEL THE CORRECT ALT WAS DISPLAYED ON THE CAPT'S AND FO'S ALTS (29.92, 1013MB). DO NOT ALLOW HABIT PATTERNS OF DOMESTIC FLYING INTERFERE WITH EUROPEAN PROCS. DO NOT BECOME HEAD IN THE GLASS COCKPIT INVOLVED WITH FMC PROCS AND NEGLECT BASIC ALT MONITORING ETC.

(REPORT CONTINUED)

SYNOPSIS	:	ALTDEV ALT OVERSHOT IN DSCNT PROC.
REFERENCE FACILITY ID	:	LHR
FACILITY STATE	:	FO
DISTANCE & BEARING FROM REF.	:	8,,SO
MSL ALTITUDE	:	7700,8000

ACCESSION NUMBER : 200958  
 DATE OF OCCURRENCE : 9202  
 REPORTED BY : FLC; FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO.ISTR; FLC,PIC.CAPT;  
     FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : MGM  
 FACILITY STATE : AL  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZJX;  
 AIRCRAFT TYPE : MLT; ;  
 ANOMALY DESCRIPTIONS : CONFLICT/AIRBORNE LESS SEVERE; LESS  
     THAN LEGAL SEPARATION; ALT DEV/OVERSHOOT ON CLB OR DES; NON  
     ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : FAA INVESTIGATORY FOLLOW-UP;  
 NARRATIVE : MLT X DURING CLBOUT FROM TYNDALL AFB,  
     FL, AND AFTER PASSING FL180 WE REQUESTED FL220 FOR A FINAL ALT AND  
     THE CTLR TOLD US TO STANDBY ON FL220. THE L SEAT PLT WAS FLYING  
     THE ACFT ON AUTOPLT AND I WAS IN THE R SEAT WORKING THE RADIOS AND  
     PROGRAMMING THE SCNS WHICH IS OUR NAV SYS WITH A KEYPAD AND CRT.  
     AT SOME POINT DURING THE CLBOUT, WHILE PROGRAMMING THE SCNS AND  
     MAKING A CALL TO CONFIRM A FREQ CHANGE, I THOUGHT WE HAD BEEN  
     CLRED TO FL220. AFTER THE L SEAT PLT LEVELED THE AIRPLANE AT  
     FL200, I TOLD HIM 'I THINK HE CLRED US TO 220.' THE FLT ENGINEER  
     HAD JUST COME BACK ON HEADSET AND HEARD ME SAY '...CLRED TO 220.'  
     AS WE PASSED THROUGH FL205 ATC CALLED AND ASKED ABOUT OUR ALT. WE  
     SAID WE WERE PASSING 205 FOR 220 AND ATC SAID NEGATIVE TURN R  
     IMMEDIATELY AND DSND TO 200, TFC 12 O'CLOCK AND 5 MI, FL210. WE  
     SAW THE TWIN ENG COMMUTER ACFT PASS ABOVE US AND OFF TO OUR L. I  
     THINK MY PREOCCUPATION WITH THE SCNS SYS AND THE FACT THAT OUR  
     AIRPLANE HAS NO SORT OF AN ALT REMINDER WERE 2 CONTRIBUTING  
     FACTORS TO THIS INCIDENT. SUPPLEMENTAL INFO FROM ACN 201213: WE  
     WERE CLRED TO FL200 AND REQUESTED FL220. AFTER I LEVELED AT FL200  
     THE COPLT STATED WE HAD BEEN CLRED TO FL220. I ASSUMED I HAD  
     MISSED THAT CLRNC AND STARTED A CLB TO FL220. PASSING THROUGH 205  
     THE CTLR ASKED US OUR ALT AND WHEN WE TOLD HIM, HE TOLD US WE WERE  
     ONLY CLRED TO FL200 TO TURN R.  
 SYNOPSIS : MLT X NON ADHERENCE TO ATC CLRNC  
     UNAUTHORIZED CLB FROM ASSIGNED ALT HAD LTSS FROM Y.  
 REFERENCE FACILITY ID : MGM  
 FACILITY STATE : AL  
 DISTANCE & BEARING FROM REF. : 70,165  
 MSL ALTITUDE : 22000,26000



ACCESSION NUMBER : 202041  
 DATE OF OCCURRENCE : 9202  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TWR,GC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ORF  
 FACILITY STATE : VA  
 FACILITY TYPE : TWR; ARPT;  
 FACILITY IDENTIFIER : ORF; ORF;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/FAR; RWY TRANSGRESS/OTHER;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : I TAXIED ONTO THE ACTIVE RWY BELIEVING  
 WE HAD A CLRNC FOR TKOF. I ASKED THE FO TO CONFIRM THAT CLRNC AND  
 WAS INFORMED THAT IT WAS THE FIRST CONTACT WITH THE TWR AND WE  
 WERE CLRED FOR TKOF. CONTRIBUTING FACTORS: 1) TIRED CREW (MIN  
 LAYOVER) 2) EARLY DEP. 3) FMS NEEDED REPROGRAMMING DURING TAXI (A  
 DISTRACTING SITUATION). 4) EXTRANEIOUS COCKPIT CONVERSATION.  
 CALLBACK CONVERSATION WITH RPTR REVEALED THE FOLLOWING INFO: RPTR  
 STATES FLT WAS CLRED TO TAXI TO RWY 5 WHICH INDICATED CLRNC TO  
 INTERSECTING RWY. HOWEVER, THE FMS DUMPED SOME FLT INFO AND CREW  
 DISTRACTED TRYING TO REPROGRAM. WHEN CAME TO INTERSECTING RWY,  
 CAPT ASKED FO TO GET CONFIRMATION FOR XING. WHEN ARRIVING AT  
 ACTIVE RWY CAPT REALLY THOUGHT CLRNC WAS CLRNC FOR TKOF.  
 ATTRIBUTES PROBLEM TO FATIGUE AS HOTEL WAS POOR AND SO WAS THE  
 QUALITY OF SLEEP. BOTH PLTS CLRED FINAL BEFORE RWY ENTRY. GND CTLR  
 WAS ALSO CLRNC DELIVERY AND POSSIBLY LCL AS WELL. NEVER RECEIVED  
 INSTRUCTIONS TO SWITCH FROM GND TO TWR SO DID ON THEIR OWN JUST  
 PRIOR TO CONTACTING AS TAXI ONTO RWY. NO OTHER MOVING TFC ON THE  
 ARPT AT THAT TIME.  
 SYNOPSIS : ACR TAXIES ONTO ACTIVE WITHOUT CLRNC.  
 REFERENCE FACILITY ID : ORF  
 FACILITY STATE : VA  
 DISTANCE & BEARING FROM REF. : 5  
 AGL ALTITUDE : 0,0

ACCESSION NUMBER : 202697  
 DATE OF OCCURRENCE : 9202  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ZAB  
 FACILITY STATE : NM  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZAB;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/EXCURSION FROM ASSIGNED; NON  
 ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/DETECTED AFTER-THE-FACT;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : AN ACFT TYPE; ACFT EQUIPMENT;  
 NARRATIVE : WE WERE ON THE FOSSL 3 ARR TO PHX,

ABOUT 25 NM E OF FOSSL INTXN. EARLIER WE HAD DSNDED FROM FL350 TO  
 FL310. WE WERE THEN CLRED TO CROSS TONTO INTXN AT 12000 FT. I  
 ENTERED THE XING RESTRICTION IN THE FMCS. THE CAPT THEN WENT OFF  
 FREQ TO GET THE ATIS. WE WERE THEN CLRED DIRECT MAZAT INTXN, AND  
 ADHERE TO THE XING RESTRICTION. I ENTERED THIS IN THE FMCS AND WAS  
 TRYING TO FIGURE WHEN TO DSN TO MEET THE RESTRICTION WHEN THE  
 CAPT THEN SAID 'WHERE ARE WE GOING.' I STARTED TO TELL HIM WHEN HE  
 SAID 'WATCH YOUR ALT.' I GLANCED AT MY ALTIMETER TO CONFIRM LEVEL  
 AT FL310, THE CAPT SAID 'YOU'RE AT FL320' AND PUSHED THE NOSE DOWN  
 AND STARTED A DSCNT. I LOOKED AGAIN AND NOTED WE WERE INDEED AT  
 FL319. SINCE WE WERE JUST UNDER FL320, THE NUMBERS IN THE WINDOW  
 WERE '31' AND THE POINTER WAS APPROX VERT. I HAD MISREAD THE  
 ALTIMETER. WE HAD INDEED BEEN LEVEL AT FL310 PRIOR TO THIS, AS  
 CONFIRMED BY BOTH PLTS. THE AUTOPLT WAS SET IN ALT HOLD, BUT FOR  
 REASONS UNKNOWN TO ME HAD STARTED A SLOW CLB. I WAS SO ENGROSSED  
 IN THE FMCS ENTRIES THAT I HAD NOT NOTICED IT. THE ALT ALERter HAD  
 NOT GONE OFF SINCE IT WAS ALREADY SET AT 12000 FT FOR THE DSCNT.  
 THE SOLUTION IS NOT TO GET SO ENGROSSED IN THE FMCS THAT YOU  
 FORGET TO SCAN. ALSO, HAVING BOTH PLTS IN THE LOOP WHEN  
 PROGRAMMING THE FMCS WOULD HELP. FINALLY, AUTOMATION THAT IS MORE  
 RELIABLE WOULD HELP.

SYNOPSIS : ALTDEV ALT EXCURSION.  
 REFERENCE FACILITY ID : ZAB  
 FACILITY STATE : NM  
 MSL ALTITUDE : 31000,31900

ACCESSION NUMBER : 203467  
 DATE OF OCCURRENCE : 9203  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,AC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : SLC  
 FACILITY STATE : UT  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : SLC; SLC;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; OTHER;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE WERE TRACKING INTO SLC ON THE OGDEN

153 DEG RADIAL. IN SHORT ORDER, WE WERE GIVEN A HDG, ALT, AND RWY CHANGE FROM 16R TO 16L. AT THE SAME TIME WE WERE TRYING TO SLOW DOWN, CONFIGURE AND RUN THE CHKLISTS. PASSING 7700 MSL, THE CTLR TOLD US TO LEVEL AT 8000 FT. THE CAPT STOPPED THE DSCNT AND I INFORMED THE CTLR THAT WE WERE NOW AT 7500 MSL BUT WOULD CLB BACK TO 8000. THE CTLR THEN ASKED IF HE HAD GIVEN US 8000 INITIALLY. I TOLD HIM THAT WE UNDERSTOOD 6000. NOTHING MORE WAS SAID. I STILL DON'T KNOW IF WE WERE INITIALLY GIVEN 6000 OR 8000 BECAUSE NEITHER THE CAPT NOR I CAN SPECIFICALLY REMEMBER THAT INSTRUCTION. I DO KNOW THAT WITH 6000 THE GS INTERCEPT FOR 16L -- WE BELIEVED WE WERE GOING TO THE CORRECT ALT. SUPPLEMENTAL INFO FROM ACN 203278: WE BECAME PREOCCUPIED WITH REPROGRAMMING THE FMS, SELECTING, TUNING AND IDENTING THE NEW ILS FREQ, SLOWING THE ACFT DOWN, AND DSNDING THE ACFT TOWARD THE RWY. AFTER LNDG THE FO AND I DISCUSSED THE INCIDENT AND NEITHER COULD REMEMBER SPECIFICALLY ALL THE ATC COMMANDS THAT WERE GIVEN IN THAT TRANSMISSION. HOWEVER, I (THE CAPT) WAS HAND FLYING THE ACFT AND THE FO WAS PROGRAMMING THE INSTRUCTIONS IN MODE CTL PANEL. ATC COMMANDS WHICH INVOLVE RWY CHANGES, HDG CHANGE, ALT CHANGE, ILS APCH CHANGE, FREQ CHANGE ALL IN THE SAME TRANSMISSION TO A 2-MAN ADVANCED TECHNOLOGY ACFT CAN LEAD TO CONFUSION, ESPECIALLY TO A CREW EITHER NEW TO ACFT OR ARPT.

SYNOPSIS : CLRNC CONFUSION ABOUT WHETHER ACR LGT  
 FLT WAS CLRED TO 6000 OR 8000 FT IN DSCNT TO SLC.

REFERENCE FACILITY ID : SLC  
 FACILITY STATE : UT  
 DISTANCE & BEARING FROM REF. : 15,,N  
 MSL ALTITUDE : 6000,8000

ACCESSION NUMBER : 204928  
 DATE OF OCCURRENCE : 9203  
 REPORTED BY : FLC; FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; MISC,GNDCREW;  
 TRACON,DC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ORD  
 FACILITY STATE : IL  
 FACILITY TYPE : ARPT; TRACON; TRACON;  
 FACILITY IDENTIFIER : ORD; ORD; ORD;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : ACFT EQUIPMENT PROBLEM/LESS SEVERE; ALT  
 DEV/OVERSHOOT ON CLB OR DES; NON ADHERENCE LEGAL RQMT/CLNC; OTHER;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE; CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT;  
 NARRATIVE : PREFLT AND THE BEFORE STARTING ENGS

CHKLST, PWR WAS ACCIDENTALLY REMOVED FROM ACFT BEFORE APU  
 GENERATOR CAME ON LINE. THIS CAUSED A 10 SECOND (APPROX) LOS OF  
 ACFT PWR WHICH DUMPED MOST FMC AND ACARS DATA WHICH HAD BEEN  
 LOADED. WE THEN RELOADED AND RECHKED ALL FMC INPUTS, CAUSING A 10  
 MIN DEP DELAY. ON TAXI OUT WE COMPLETED THE REMAINING CHKLST,  
 BUT FAILED TO NOTICE THAT THE PWR LOSS HAD CHANGED THE TKOF ALT ON  
 THE AFDS PANEL. THE PWR LOSS CHANGED OUR ALT ON THE AFDS PANEL  
 FROM THE PREVIOUSLY SET 5000 FT TO 10000 FT. WHEN DOING CHKLST I  
 CALLED FOR THE CHKLST ITEM AFDS PANEL ON THE BEFORE TKOF CHKLST.  
 THE CAPT READ OFF WHAT WAS IN AFDS WINDOWS V2 OR 135/RWY HDG OF  
 090/AND ALT 10000 AND EVERYTHING SEEMED TO REGISTER AS CORRECT,  
 BUT PART OF MY CONCENTRATION WAS DISTR BY DUMPED ACARS DATA. I WAS  
 ATTEMPTING TO RELOAD, RADIO CALLS, CLRING FOR TAXIING ACFT ON A  
 VERY BUSY NIGHT. SHORTLY THEREAFTER WE WERE CLRED FOR TKOF. I WAS  
 FLYING THE LEG AND I NOTICED THE CAPT CALLED DEP ABOUT 4 TIMES  
 WITH NO LUCK IN GETTING THROUGH. WHEN HE FINALLY GOT THROUGH I WAS  
 FLYING THROUGH 6000 FOR 10000 WHEN THE CTLR ASKED WHAT WE WERE  
 DOING. THE CAPT REPLIED THAT 10000 WAS OUR CLRED ALT. I FEEL THAT  
 THIS PROBLEM WAS CAUSED BY THE PWR LOSS WHICH CHANGED THE ALT FROM  
 5000 TO 10000 ON THE AFDS PANEL AND DISTRS CAUSED BY THE INCREASED  
 WORKLOAD GENERATED BY RELOADING AND RECHKING ALL FMC AND ACARS  
 DATA AFTER DEP TIME AND DURING TAXI OUT. SUPPLEMENTAL INFO FROM  
 ACN 204942. WHEN DOING AFDS PANEL CHK I CALLED OUT ALT 10000 FT  
 BUT THIS DID NOT REGISTER AS INCORRECT AS I ASSUMED COPLT HAD  
 RESET NEW ALT. THE ERROR, IN MY OPINION, WAS GENERATED BY THE ALT  
 SHIFT FROM 5000 TO 10000 CAUSED BY THE ELECTRIC PWR SHIFT AND OUR  
 DISTR CAUSED BY THE INCREASED WORKLOAD AND BEING UNABLE TO CONTACT  
 DEP CTL IMMEDIATELY.

SYNOPSIS : ALTDEV ALT EXCURSION OVERSHOT.  
 REFERENCE FACILITY ID : ORD  
 FACILITY STATE : IL  
 DISTANCE & BEARING FROM REF. : 10,,SE  
 MSL ALTITUDE : 5000,6000

ACCESSION NUMBER : 205146  
 DATE OF OCCURRENCE : 9203  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : CCC  
 FACILITY STATE : NY  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZBW;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; NON  
 ADHERENCE LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT; OTHER;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : FLC BECAME REORIENTED; FLC RETURNED  
 ACFT TO ORIGINAL CLNC OR INTENDED COURSE; CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : PROC OR POLICY/COMPANY;  
 NARRATIVE : OUR FLT WAS CLRED TO DSND FROM 24000 FT  
 SO AS TO CROSS CCC (CALVERTON VOR) AT 12000 FT AND 250 KTS. THE  
 CTLR GAVE THE CCC ALTIMETER SETTING AS 29.21. WE NOTED THE LOW  
 ALTIMETER AND REQUESTED VERIFICATION, THEN SET THE STANDBY  
 ALTIMETER TO THIS SETTING. WE THEN BECAME PREOCCUPIED WITH  
 PROGRAMMING THE VERT DSCNT MODE OF THE FMC SO AS TO MAKE THE CCC  
 RESTRICTION. THE DSCNT HAD TO BE MANUALLY CTLED TO MAKE THE XING  
 AND IN DOING SO, WE PASSED 18000 FT WITHOUT RESETTING OUR  
 ALTIMETERS TO 29.21. THUS THE ACFT LEVELED OFF AT 12000 FT (OR 600  
 FT LOW 11400 MSL). THE ZBW CTLR ASKED US TO CHK OUR ALT AND WE  
 THEN RESET THE ALTIMETERS TO 29.21 AND CLBED BACK TO 12000 FT.  
 CONTRIBUTING TO THIS INCIDENT WAS THAT THE CREW HAD SPENT THE LAST  
 6 DAYS FLYING IN EUROPE, WHERE ALTIMETERS ARE RESET AT LOW ALTS  
 (IE, TRANSITION LEVELS 3000-5000 FT) SO A READJUSTMENT TO UNITED  
 STATES RULES HAD TO BE MADE. ALSO, THE PREOCCUPATION OF  
 PROGRAMMING THE VNAV COMPUTER WAS A LARGE FACTOR. RECOMMENDATIONS:  
 CHANGE UNITED STATES RULES TO ALLOW ALTIMETERS TO BE SET IN  
 ADVANCE TO LCL SETTINGS IF DSNDING TO A LEVEL BELOW FL180, FROM A  
 LEVEL ABOVE FL180, AND STRESS THAT 1 PLT FLIES, THE OTHER PLT  
 TALKS ON THE RADIO, PROGRAMS THE COMPUTER, AND WATCHES FOR TFC.  
 SUPPLEMENTAL INFO FROM ACN 204745: DISCOVERED RAPIDLY FALLING  
 ALTIMETER PRESSURE HAD PUT US AT AN ACTUAL ALTIMETER READING OF  
 11500 FT AS DISCOVERED FROM LATEST PVD ATIS. IMMEDIATELY WENT BACK  
 TO 12000 INDICATED. NO ALT COMMENT FROM EITHER ZBW OR PVD APCH.  
 CANNOT REMEMBER GETTING ALTIMETER UPDATE FROM ZBW.  
 SYNOPSIS : ALTDEV ALT OVERSHOT IN DSCNT. ALT XING  
 RESTRICTION NOT ADHERED TO.  
 REFERENCE FACILITY ID : CCC  
 FACILITY STATE : NY  
 MSL ALTITUDE : 11400,12000

ACCESSION NUMBER : 218329  
 DATE OF OCCURRENCE : 9208  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : EKN  
 FACILITY STATE : WV  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZDC;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC; COCKPIT/EQUIPMENT;  
 ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 FLC RETURNED ACFT TO ORIGINAL CLNC OR INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT; OTHER; PROC OR  
 POLICY/COMPANY;  
 NARRATIVE : AT FL290, APPROX 10 NM SW OF EKN, CLRNC  
 WAS RECEIVED TO CROSS 30 NM SW OF MGW AT FL240. PNF ACKNOWLEDGED  
 CLRNC AND PF ENTERED RESTRICTION IN FMC. (FLT WAS OPERATING IN  
 VNAV AND LNAV MODES OF AUTOPLT.) AFTER ENTRY IN FMC, PF NOTICED A  
 'BYPASS' ANNUNCIATION IN FMC ROUTING IN ASSOCIATION WITH THE ENTRY  
 OF '30 SW OF MGW' FIX. THIS WAS DUE TO IMPROPER ENTRY OF THIS FIX  
 BTWN MGW AND 'ROTON' INTXN. AS OPPOSED TO WHERE IT REALLY WAS,  
 BTWN EKN AND 'TYGAR' INTXN. PF WAS ATTEMPTING TO RESOLVE THIS  
 PROBLEM WHEN IT BECAME APPARENT THAT INITIATION OF DSCNT WAS  
 NECESSARY TO MEET RESTRICTION. PF ATTEMPTED TO USE VERT SPD TO  
 INITIATE DSCNT BUT ACFT REMAINED AT FL290. IT WAS THEN NOTICED  
 THAT ALT 'SET' WINDOW WAS STILL AT FL290, DISALLOWING AUTOPLT TO  
 DSND. ALT WAS RESET TO FL240, DSCNT WAS INITIATED CONCURRENT WITH  
 INQUIRY FROM CTR AS TO ABILITY TO MEET RESTRICTION. WE RESPONDED  
 'UNABLE' AND FLT WAS GIVEN A 50 DEG R TURN, PRESUMABLY TO AVOID A  
 POTENTIAL CONFLICT. AT FL250, FLT WAS CLRED DIRECT MGW TO RESUME  
 ROUTING. THIS SITUATION OCCURRED BECAUSE OF PF'S FAILURE TO FOLLOW  
 HIS OWN SOP IN SUCH A CIRCUMSTANCE WHICH IS TO 1) RESET ALT, 2)  
 MAKE A QUICK DETERMINATION IF ACFT IS NEAR THE REQUIRED DSCNT  
 POINT AND INITIATE A DSCNT USING VERT SPD OR LEVEL CHANGE IF  
 NECESSARY, 3) MAKE APPROPRIATE ENTRIES IN FMC AND USE VNAV FOR  
 DSCNT IF APPROPRIATE. PF DID THESE OUT OF SEQUENCE AND BECAME  
 DISTRACTED BY AN FMC IRREGULARITY, THUS OVERSHOOTING DSCNT POINT.  
 SYNOPSIS : AN MLG ACR MISSED A XING ALT.  
 REFERENCE FACILITY ID : EKN  
 FACILITY STATE : WV  
 DISTANCE & BEARING FROM REF. : 10,,SW  
 MSL ALTITUDE : 24000,29000

ACCESSION NUMBER : 218806  
 DATE OF OCCURRENCE : 9208  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ZID  
 FACILITY STATE : IN  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZID;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : OTHER; ACFT EQUIPMENT PROBLEM/LESS  
 SEVERE; TRACK OR HDG DEVIATION; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC; NON ADHERENCE LEGAL RQMT/FAR;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; FLC RETURNED ACFT TO  
 ORIGINAL CLNC OR INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : AN ACFT TYPE;  
 NARRATIVE : DURING CRUISE FLT, MY COPLT NOTICED  
 THAT THE FMS DISPLAY WAS CALCULATING THE WIND SPD AT ALMOST 300  
 KTS, OBVIOUSLY TOO HIGH TO BE CORRECT. WE THEN SPENT SEVERAL MINS  
 'PLAYING' WITH THE FMS COMPUTER, TRYING TO DETERMINE AND CORRECT  
 THE PROBLEM. DURING THIS TIME, THE AUTOPLT WAS FLYING AND NAVING.  
 AFTER SEVERAL MINS OF INVOLVEMENT WITH THE COMPUTER, CTR QUERIED  
 US ON OUR RTE OF FLT. UPON CHKING OUR FLT INSTS, WE REALIZED THAT  
 THE FMS HAD REVERTED TO 'DEAD RECKONING' AND THAT THE ACFT HAD  
 DRIFTED OFF THE AIRWAY. WE EXPLAINED OUR NAVIGATIONAL PROBLEM TO  
 CTR, WHILE WE RETURNED TO TRACKING THE CORRECT RADIAL WITH THE VOR  
 AND CDI. NEXT TIME THAT THE FMS IS GIVING US WINDS OF 300 KTS, WE  
 WILL IMMEDIATELY THINK ABOUT RETURNING TO BASIC NAV, BEFORE WE  
 WORRY ABOUT WHAT'S WRONG WITH THE COMPUTER!  
 SYNOPSIS : HDG TRACK DEV.  
 REFERENCE FACILITY ID : ZID  
 FACILITY STATE : IN  
 MSL ALTITUDE : 31000,31000

ACCESSION NUMBER : 234297  
 DATE OF OCCURRENCE : 9302  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,AC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : FIM  
 FACILITY STATE : CA  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : LAX; LAX;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : COCKPIT/FLC; COCKPIT/EQUIPMENT;  
 ANOMALY RESOLUTION : NOT RESOLVED/ANOMALY ACCEPTED;  
 ANOMALY CONSEQUENCES : FLC/ATC REVIEW;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT; OTHER; PROC OR  
 POLICY/COMPANY;  
 NARRATIVE : CLRED TO CROSS SADDE AT 12000. I TOLD  
 THE CAPT THAT WE WERE NOT GOING TO MAKE IT. HE WENT BACK TO  
 PROGRAMMING THE FMC SAYING WE WERE ALRIGHT. WE MISSED XING BY 1000  
 FT. WE HAD BEEN GETTING MANY CHANGES IN CLRNC AND THE ARR. THE  
 CAPT WAS UPSET AND, BEFORE THE INCIDENT, TOLD ME TO GET A PHONE  
 NUMBER TO CALL CLRNC WHEN HE GOT ON THE GND. THE CAPT WAS UPSET,  
 BUSY TRYING TO PROGRAM THE FMC AND DIDN'T THINK MUCH OF MY ADVICE.  
 BEING NEW IN AN AUTOMATED COCKPIT, I FIND THAT PLTS ARE SPENDING  
 TOO MUCH TIME PLAYING WITH THE COMPUTER IN CRITICAL TIMES RATHER  
 THAN FLYING THE ACFT. NO ONE LOOKS OUTSIDE FOR TFC.  
 SYNOPSIS : AN ACR MLG CREW FAILED TO MAKE ITS  
 ASSIGNED ALT ON DSCNT.  
 REFERENCE FACILITY ID : FIM  
 FACILITY STATE : CA  
 DISTANCE & BEARING FROM REF. : 20,148  
 MSL ALTITUDE : 12000,13000



ACCESSION NUMBER : 236228  
 DATE OF OCCURRENCE : 9303  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TRACON,AC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : DAY  
 FACILITY STATE : OH  
 FACILITY TYPE : TRACON;  
 FACILITY IDENTIFIER : DAY;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : OTHER; ALT DEV/OVERSHOOT ON CLB OR DES;  
     NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC BECAME REORIENTED; FLC RETURNED  
     ACFT TO ORIGINAL CLNC OR INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE WERE DSNDING INTO DAY OUT OF FL180  
     TO 11000 FT. WE WERE GIVEN A CLRNC TO GO DIRECT TO DAY VOR. WE  
     WERE ATTEMPTING TO PUT DIRECT TO DAY VOR IN THE FMC WHEN I NOTICED  
     OUR ALT AT 7700 FT DSNDING, AIRSPD AT 280 KTS. I KICKED OFF THE  
     AUTOPLT AND BEGAN A CLB, ASKING THE FO TO CHK WITH ATC ON OUR  
     CLRED ALT. I CHKED THE ALT WINDOW ON THE FLT MODE PANEL AND  
     INSTEAD OF 11000 FT I SAW 7700 FT. WHEN WE WERE CLRED TO 11000 FT,  
     I SET THAT IN THE ALT WINDOW, SAID '11000 FT,' AND POINTED TO IT.  
     THE FO POINTED AND RESPONDED. '11000 FT.' SOMEHOW THE ALT GOT  
     CHANGED (OR CHANGED ITSELF) AND WE DID NOT NOTICE IT UNTIL PASSING  
     BELOW 8000 FT, DUE TO BEING DISTRACTED BY PROGRAMMING THE FMC.  
 SYNOPSIS : ALTDEV DUE TO PROGRAMMING FMS AND NOT  
     MONITORING ALT.  
 REFERENCE FACILITY ID : DAY  
 FACILITY STATE : OH  
 DISTANCE & BEARING FROM REF. : 25,,NE  
 MSL ALTITUDE : 7700,11000

ACCESSION NUMBER : 237487  
 DATE OF OCCURRENCE : 9303  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TRACON,AC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : TUS  
 FACILITY STATE : AZ  
 FACILITY TYPE : ARPT; TRACON; TRACON;  
 FACILITY IDENTIFIER : TUS; TUS; TUS;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
 LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/PUBLISHED PROC; OTHER;  
 ANOMALY DETECTOR : ATC/CTLR; COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC BECAME REORIENTED; FLC RETURNED  
 ACFT TO ORIGINAL CLNC OR INTENDED COURSE; CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : PROC OR POLICY/ATC FACILITY;  
 NARRATIVE : SCHEDULED FLT FROM PHX TO TUS. APPROX

AIR TIME ONLY 18 MINS. WE LEFT PHX ON A SOMEWHAT COMPLICATED SID  
 -- THE PICAH 5 DEP AND THEN WERE CLRED ONTO ANOTHER SOMEWHAT  
 COMPLICATED STAR INTO TUS -- THE DINGO 5 ARR. MY COPLT WAS FLYING  
 AND I WAS WORKING THE RADIOS. WITH BASICALLY A '0' TIME CRUISE, WE  
 WERE BOTH VERY BUSY WITH NAVING AND COMMUNICATING WITH ATC. I GOT  
 THE ATIS FOR TUS AND HONESTLY THINK I LISTENED TO THE ENTIRE ATIS,  
 AND HEARD NO MENTION OF RADAR OTS. IN SEQUENCE THE NEXT THINGS TO  
 HAPPEN WERE: ZAB DECLARED 'RADAR SVC TERMINATED, CONTACT TUS  
 APCH.' TUS APCH MADE NO MENTION OF RADAR OTS OR OF WHAT TO EXPECT.  
 WAS BUSY WITH SEVERAL ACFT. WE WERE ASKED TO RPT MAVVA INTXN,  
 WHICH WE DID. COPLT SWITCHED TO THE ILS FOR RWY 11L AND I HAD TUS  
 VOR WITH 123 DEGS DIALED IN. COPLT GOT A FLAG ON THE LOC FOR RWY  
 11L -- TURNED IN VISUALLY WITH 'THE' RWY STRAIGHT AHEAD. I TOLD  
 APCH WE WERE INBOUND FOR RWY 11L. APCH CTL INQUIRED IF I WAS NOT  
 HOLDING AT WASON INTXN AS INSTRUCTED. I TOLD APCH THAT I HAD NOT  
 RECEIVED OR ACKNOWLEDGED ANY HOLDING CLRNC. THEN TOLD TO PROCEED  
 RNAV TO WASSON AND HOLD AS DEPICTED. WE HAD TO REINSERT WASSON IN  
 FMC, SWITCH TO NAV AND PROCEED BACK TO WASSON TO HOLD. (THERE WAS  
 A LOT OF HEADS DOWN AND CHART FLIPPING AT THIS POINT). I BELIEVE  
 THIS ALL HAPPENED FOR SEVERAL REASONS: LATE ATC CLRNC. LOC FLAG  
 WHEN WE SHOULD HAVE BEEN INTERCEPTING FINAL. I DON'T THINK THE  
 ACFT EVER WAS IN THE RIGHT HOLDING PATTERN. OUR EYES WERE  
 OVERCOMING OUR INSTS WHEN WE HAD THIS NICE RWY IN FRONT OF US. I  
 THINK THIS WOULD HAVE BEEN PREVENTED IF: WE HAD GOTTEN ADVANCE  
 NOTICE FROM ATC OF NON RADAR AND HOLDING IN PROGRESS. WE HAD LEFT  
 THE FMC ALONE AND FLOWN TO WASSON WITH RAW DATA AND WE HAD KEPT  
 OUR HEADS OUT OF THE COCKPIT.

SYNOPSIS : WRONG ARPT APCH IN A NIGHT OP. HDG  
 TRACK DEV IN A NON COMPLIANCE WITH ATC CLRNC INSTRUCTION.  
 REFERENCE FACILITY ID : TUS  
 FACILITY STATE : AZ  
 DISTANCE & BEARING FROM REF. : 13,303  
 MSL ALTITUDE : 5000,6000

**MISMANAGEMENT/CONFUSION**

ACCESSION NUMBER : 66805  
DATE OF OCCURRENCE : 8704  
REPORTED BY : FLC; ; ;  
PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
FLIGHT CONDITIONS : VMC  
REFERENCE FACILITY ID : ALS  
FACILITY STATE : CO  
FACILITY TYPE : ARTCC;  
FACILITY IDENTIFIER : ZDV;  
AIRCRAFT TYPE : MLG;  
ANOMALY DESCRIPTIONS : ALT DEV/EXCURSION FROM ASSIGNED; NON  
ADHERENCE LEGAL RQMT/CLNC;  
ANOMALY DETECTOR : COCKPIT/FLC;  
ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
INTENDED COURSE;  
ANOMALY CONSEQUENCES : NONE;  
NARRATIVE : WHILE IN CRUISE FLT AT FL350 WITH THE  
AUTOPLT BEING OPERATED BY THE PERFORMANCE MANAGEMENT SYSTEM (PMS),  
I TURNED THE AUTO THROTTLES OFF IN ORDER TO ACCOMPLISH ENGINE  
PERFORMANCE CHECKS. AS I WAS RECORDING THE DATA, I RECEIVED AN ALT  
DEVIATION WARNING. BY THE TIME I RETURNED THE ACFT TO LEVEL FLT, I  
HAD DEVIATED (+400'). THE PMS, WHEN TURNED OFF, REVERTS TO A MACH  
HOLD FUNCTION AND DUE TO AN INCREASING PRESSURE LEVEL THE ACFT  
BEGAN TO CLIMB RAPIDLY. I WAS UNABLE TO FIND THIS INFORMATION IN  
THE PMS MANUAL. I NOW UNDERSTAND THAT THE LATEST EDITION OF THE  
COMPUTER CONTROLLING THE PMS SYSTEM HAS BEEN CHANGED TO DIRECT THE  
PMS TO ENTER AN ALT HOLD FUNCTION WHEN TURNED OFF IN CRUISE FLT.  
THIS SHOULD CORRECT THE PROBLEM. THE BOTTOM LINE IS -- ANY TIME  
YOU CHANGE A SYSTEM IN THE ACFT, MONITOR THE ACFT TO INSURE IT  
REMAINS IN THE CORRECT FLT MODE. THERE WAS NO RESPONSE FROM ATC  
DURING THIS MANEUVER. ALT DID NOT EXCEED 400' DEVIATION.  
SYNOPSIS : ALT EXCURSION WHEN AUTO THROTTLES  
DEACTIVATED TO RECORD ENGINE READING.  
REFERENCE FACILITY ID : ALS  
FACILITY STATE : CO  
DISTANCE & BEARING FROM REF. : 60,,E  
MSL ALTITUDE : 35000,35400

ACCESSION NUMBER : 70681  
 DATE OF OCCURRENCE : 8706  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; FLC,PIC.CAPT;  
     ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : FMG  
 FACILITY STATE : NE  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZOA;  
 AIRCRAFT TYPE : MLG; ;  
 ANOMALY DESCRIPTIONS : CONFLICT/AIRBORNE LESS SEVERE; LESS  
     THAN LEGAL SEPARATION; ALT DEV/EXCURSION FROM ASSIGNED; NON  
     ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE WERE AT FL370 PREPARING TO DESCEND  
     INTO RENO. I WAS WORKING THE RADIOS AND THE CAPT WAS FLYING. I  
     ASKED FOR A LOWER ALT AND CTR TOLD US "UNABLE" AS WE HAD TFC  
     PASSING FROM LT TO RT AT FL350. AS I WAS LOOKING FOR THE TFC I WAS  
     ALSO WRITING DOWN THE RENO ATIS. THE ACFT WAS BEING FLOWN ON  
     AUTOPLT IN THE PMS CRUISE MODE. THE PMS HAD INDICATED WE WERE AT  
     LEAST 15 NM 'LONG' ON THE DESCENT THE LAST TIME I HAD LOOKED AT  
     IT. AT ABOUT THE SAME TIME I HEARD THE CTR ASK US OUR ALT I HEARD  
     THE CAPT MAKE AN EXCLAMATION. I LOOKED UP AND OUR ALT WAS 36600  
     AND THE POWER WAS AT FLT IDLE AND THE AIRSPD WAS BACK TO ABOUT  
     225-230 KTS INDICATED. IT WAS AT THAT TIME I ALSO RPTED SEEING THE  
     TFC CROSSING BELOW US (ACTUALLY ALREADY PAST OUR POSITION TO THE  
     RT.) WE TOLD THE CTR FL370 WAS OUR ALT AND WE'D CHANGE  
     TRANSPONDERS. AS THE CAPT ADDED POWER WE TRIED TO CLIMB AND GOT  
     THE INITIAL STALL BUFFET. AT ABOUT THE SAME TIME WE WERE CLRD FOR  
     LOWER BY CTR. HE TOLD US HIS ALT ALARM HAD SOUNDED BUT DIDN'T  
     MENTION IT AGAIN. THE CAPT WAS SURPRISED THE POWER HAD COME BACK  
     AS HE DIDN'T MAKE ANY INPUTS TO THE PMS TO MAKE IT START DOWN. I  
     AM NEW IN THE AIRPLANE AND HAVE NOT HAD MUCH EXPERIENCE WITH THE  
     PMS AS IT IS ONLY INSTALLED IN A FEW OF OUR ACFT AND IS NOT  
     STRESSED MUCH IN GND SCHOOL. THOUGH I KNOWN WE SHOULDN'T HAVE  
     "LIED" ABOUT OUR ALT, WE DID HAVE THE OTHER ACFT IN SIGHT AND WERE  
     CONFUSED AS TO EXACTY WHAT WAS HAPPENING. PERHAPS MORE THOROUGH  
     TRAINING WITH THE PMS SYSTEM COULD HAVE HELPED AVOID THIS, PERHAPS  
     NOT. IT MAY BE A PROBLEM WITH THE SYSTEM (PMS) WHICH HAS TO BE  
     STRAIGHTENED OUT.  
 SYNOPSIS : ALT EXCURSION FROM ASSIGNED BY ACR MLG  
     CAUSED POTENTIAL CONFLICT.  
 REFERENCE FACILITY ID : FMG  
 FACILITY STATE : NE  
 DISTANCE & BEARING FROM REF. : 85,,NW  
 MSL ALTITUDE : 36600,37000

ACCESSION NUMBER : 77914  
 DATE OF OCCURRENCE : 8711  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : TUS  
 FACILITY STATE : AZ  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZAB;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; NON  
     ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
     INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE HAD RECEIVED A CLRNC TO CLB TO  
     16000', DIR TO THE SRP VORTAC ON THE 23 MIN FLT FROM TUS TO PHX.  
     SOMEWHERE BTWN 11000' AND 15000' (SLIGHTLY LESS THAN 1 MIN'S TIME)  
     WE WERE CLRD TO CROSS 35 SE OF SRP AT OR BELOW 14000', 250 KTS,  
     MAINTAIN 10000'. AS IS STANDARD PRACTICE AT OUR COMPANY, I SET THE  
     NEW CLRNC LIMIT ALT (10000') IN THE ALT SELECTOR OF THE  
     AUTOPLT/FLT DIRECTOR SYSTEM MODE CTL PANEL, MENTALLY ASSURING  
     MYSELF THAT THE AUTOPLT WOULD LEVEL THE ACFT AT 16000' SINCE THAT  
     WAS THE CRS ALT PROGRAMMED IN THE FLT MANAGEMENT COMPUTER (FMC). I  
     REACHED INTO MY FLT BAG TO PULL OUT A BINDER TO STOW MY TUCSON  
     PLATES, AND WAS JUST OPENING IT WHEN THE ABQ CENTER CTLR CALLED,  
     "PHX ALTIMETER 29.84." I RESET THE ALTIMETER AND NOTED THAT THE  
     INDICATED ALT WAS NOW 16400' AND CLBING RAPIDLY. I DISCONNECTED  
     THE AUTOPLT AND MANUALLY LEVELED AT 16000'. THE MAX INDICATED ALT  
     WAS 16700'. COMMON PRACTICES CAN LEAD TO CRITICAL ERRORS UNDER  
     SITUATIONS ONLY SLIGHTLY DIFFERENT FROM THE NORM. NORMALLY, WE  
     DON'T RECEIVE DES CLRNCs BEFORE REACHING THE ASSIGNED CRS ALT.  
     NORMALLY, WE SET THE ALT SELECTOR OR ALERTER TO THE NEW CLRNC  
     LIMIT ALT AS SOON AS WE RECEIVE IT. I DID THIS AUTOMATICALLY W/O  
     CONSIDERING THAT IT MIGHT BE AN INVALID RESPONSE. WE'RE  
     PSYCHOLOGICALLY PROGRAMMED TO EXPECT THINGS TO HAPPEN WITH A  
     MACHINE BASED ON OUR EXPERIENCE WITH WHAT USUALLY HAPPENS. WITH  
     THIS AIRPLANE'S EFIS DURING A CLB OR DES IN THE VNAV MODE, THE  
     AIRPLANE WILL LEVEL OFF AT THE CRS ALT PROGRAMMED IN THE FMC EVEN  
     IF THE ALT SELECTOR IS SET AT A HIGHER (DURING CLB) OR LOWER  
     (DURING DES) ALT. EX: FMC CRS ALT FL330, CLRD TO FL370, ALT  
     SELECTOR SET TO 370, AUTOPLT LEVELS THE AIRPLANE AT FL330. HAPPENS  
     ALL THE TIME, SO I KNEW THE AUTOPLT WOULD LEVEL THE ACFT AT  
     16000'. WRONG! WHAT I DID, IN FACT, WAS TELL IT TO STOP AT AN ALT  
     I WASN'T ON THE WAY TO. THE AUTOPLT THEN REVERTED TO THE CWS PITCH  
     MODE, IN WHICH THE AIRPLANE KEEPS ON GOING IN THE LAST DIRECTION  
     IT WAS POINTED, UNTIL THE PLT POINTS IT SOMEWHERE ELSE WITH THE  
     YOKE. THERE IS NO AURAL WARNING WHEN THIS HAPPENS, THE AUTOPLT  
     HASN'T DISCONNECTED, IT'S JUST HLDG A PITCH ATTITUDE. THERE'S A  
     SMALL YELLOW CWS PITCH WARNING ON THE EADI, BUT IT HAS TO BE  
     LOOKED AT TO BE SEEN (MUCH LIKE TFC AND ALTIMETERS). I ALSO KNEW  
     I'D HAVE TIME TO STOW MY DEP PLATES BEFORE APCHING 16000', AS THE  
     AUTOPLT STARTS A SMOOTH LEVEL OFF AS A FUNCTION OF RATE OF CLB AND  
     WOULD BE REDUCING IT'S RATE OUT OF ABOUT 13000'. WRONG AGAIN!

(REPORT CONTINUED)

SINCE IT DEFAULTED TO CWS PITCH AND I DIDN'T NOTICE IT, WE WERE STILL CLBING AT 4 TO 6000 FPM. NO TIME FOR ANY INATTN OR DISTR. SO WHERE WAS THE NFP WHO WOULD NORMALLY BE CROSSCHECKING ALT AND MAKING APPROPRIATE CALLOUTS? THE SAME PLACE HE ALWAYS IS DURING MOST OF THE TIME SPENT ABV 10000' ON THIS RUN: DEEP IN THE MIDDLE OF COPYING ATIS AND MAKING REQUIRED FLT-FOLLOWING RADIO CALLS TO THE COMPANY. IT'S COMMON KNOWLEDGE THAT THE PF HAS LITTLE BACKUP ON A SHORT FLT LIKE THIS, BECAUSE THERE IS SO MUCH RADIO WORK TO DO. ALL THE MORE REASON FOR THE PF TO DO NOTHING BUT FLY (OR, THESE DAYS, MONITOR). SOMEWHERE IN ABQ CTR THERE WAS AN ALERT CTLR WHO TACTFULLY BROUGHT MY ATTN BACK WHERE IT SHOULD HAVE BEEN IN THE FIRST PLACE. MY HAT IS OFF TO HER! THE NEW TECHNOLOGY MACHINERY (FMC, EFIS, ETC) IS MARVELOUS, BUT IT SUCKERS US INTO COMPLACENCY. IN THE OLDER SERIES AUTOPLT, THE CWS MODE WAS THE NORM, RATHER THAN THE EXCEPTION. THIS WAS FINE, AS YOU KNEW YOU WERE IN IT. IN MY EXPERIENCE, THERE'S A MUCH HIGHER INCIDENCE OF ALT/SPD/ROUTE BUSTS IN THE FMC-EQUIPPED ACFT, LARGELY (I THINK) BECAUSE THE SYSTEM IS SO COMPLEX THAT THERE ARE MANY OPPORTUNITIES FOR FAULTY PROGRAMMING. SUGGESTIONS: ALT AWARENESS! ALT ALERTERS ARE WONDERFUL, BUT WE'VE BECOME TOO DEPENDENT ON THEM. LET'S ALL TAKE A HARD LOOK AT OUR PROCS FOR THEIR USE AND BE SURE THEY'RE VALID FOR THE INTENDED RESULT. CONTINUALLY EMPHASIZE THE IMPORTANCE OF DEVOTING YOUR FULL ATTN TO MONITORING THE FLT WHENEVER THE OTHER CREWMEMBERS ARE INVOLVED WITH OTHER DUTIES. TRY TO MINIMIZE DISTRS DURING CLBS/DES, NOT JUST BELOW 10000'. ALWAYS FOLLOW UP ANY CHGES IN AUTOPLT/FLT DIRECTOR MODE WITH A CHK OF THE MODE ANNUNCIATOR. IN NEW TECHNOLOGY ACFT, THIS MEANS EVERY TIME YOU PUSH A BUTTON. FOR R & D: IF WE MUST HAVE AN AURAL WARNING FOR AN AUTOPLT DISCONNECT, IS IT ANY LESS DANGEROUS TO HAVE IT REVERT TO A CWS MODE W/O THE PLT BEING AWARE? THIS IS A VERY COMMON OCCURRENCE. A CANCELLABLE AURAL WARNING AFTER, SAY, 3 SECS OF CWS WOULD DO THE TRICK. PERHAPS IF THE MACHINE CAN LEAD US ASTRAY, IT SHOULD WARN US. IS IT ACCEPTED PRACTICE FOR ATC TO GIVE DES CLRNCs PRIOR TO REACHING THE ASSIGNED CRS ALT? THIS COULD LEAD TO VARIOUS ERRORS AND CONFUSION.

SYNOPSIS : ALT OVERSHOT ON CLIMBOUT WHEN DESCENT  
CLRNC WITH ALT RESTRICTION GIVEN BEFORE REACHING ASSIGNED ALT AND  
FMC REPROGRAMMED.

REFERENCE FACILITY ID : TUS  
FACILITY STATE : AZ  
DISTANCE & BEARING FROM REF. : 30,315,NW  
MSL ALTITUDE : 16000,16700

ACCESSION NUMBER : 87287  
 DATE OF OCCURRENCE : 8805  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : SCY  
 FACILITY STATE : TX  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZFW;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : CLRED OUT OF FL260 "CROSS SCY AT FL220,  
 GLADD AT 11000'." CAPT FLYING, I SET ALT SELECTOR/ALERTER ON  
 11000'. FMC SET FOR RESTRICTION SCY AT 220, GLADD AND 250 KT,  
 11000'. CAPT TOOK MCP OUT OF VNAV INTO LVL CHG. DSNDING OUT OF  
 21700' APPROX 10-15 DME BEFORE SCY, CENTER STATED "CROSS SCY AT  
 FL220." I ALERTED CAPT TO ALT BUST, DSNT STOPPED AT 21500', HE  
 CLBED BACK TO FL220, MAINTAINED UNTIL SCY VOR. REMAINDER OF FLT  
 UNEVENTFUL. DON'T KNOW IF CENTER SAW US GOING THROUGH FL220 OR  
 JUST A FRIENDLY REMINDER. FMC IS SMART, BREEDS COMPLACENCY --  
 PROBABLY TAKES AS MUCH ATTENTION MONITORING FMC AS DOES IF YOU  
 JUST FLY IT YOURSELF. WOULD NOT HAVE OCCURRED IF 1) EITHER OF US  
 HAD WATCHED MORE CLOSELY, 2) VNAV LEFT ENGAGED 3) ALT SELECTOR/MCP  
 SET AT FL220 INSTEAD OF 11000'. CONTRIBUTING FACTOR, SHORT LEG,  
 AMOUNT OF WORK SAME AS LONGER LEG, TIME COMPRESSED, LESS TIME TO  
 MONITOR PLT FLYING. SUPPLEMENTAL INFO FROM ACN 87367. I FAILED TO  
 SELECT THE MODE CONTROL PANEL ALT WINDOW BACK TO FL220 INSTEAD OF  
 11000'.  
 SYNOPSIS : PROGRAMMING THE FMC FAILED TO MAKE  
 CROSSING RESTRICTION.  
 REFERENCE FACILITY ID : SCY  
 FACILITY STATE : TX  
 DISTANCE & BEARING FROM REF. : 15,,SE  
 MSL ALTITUDE : 21500,22000

ACCESSION NUMBER : 183689  
 DATE OF OCCURRENCE : 9107  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : LAX  
 FACILITY STATE : CA  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZLA;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC; ALT DEV/XING RESTRICTION NOT  
 MET;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/DETECTED AFTER-THE-FACT;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : HVY WDB. CAPT NEW TO GLASS COCKPIT. FO  
 ON FIRST TRIP AFTER IOE. LOOP 8 DEP WAS DISPLAYED AND FLOWN.  
 AIRSPEED RESTRICTED BY ATC TO 250 KNOTS. LAX 041/8 DME WAS NOT IN  
 DATA BASE AND WAS NOT DISPLAYED ON MAP. UPON REACHING 10000 FT  
 JUST PRIOR TO XING THE LAX VOR, ATC GAVE INSTRUCTION TO RESUME  
 NORMAL SPEED. 'VNAV' WAS SELECTED AND ACFT BEGAN ACCELERATING TO  
 310 KNOTS. RATE OF CLB WAS REDUCED. AT 14000 FT CAPT WENT TO VOR  
 'MANUAL' TO CHK DISTANCE AND DISCOVERED HE WAS 3 MI BEYOND 8 DME  
 FIX ALREADY. CAPT WAS UNSURE OF ALT WHEN XING THE 8 DME FIX.  
 REDUCED CLB RATE DUE TO INCREASING SPEED TO ECONOMY CLB WAS NOT  
 MONITORED ADEQUATELY TO ASSURE MEETING THE XING RESTRICTION. THE  
 LAX 041/8 DME FIX SHOULD HAVE BEEN ENTERED BY CREW AND DISPLAYED  
 ON MAP. CREW RELIED TOO HEAVILY ON 'GLASS' AND FOR A SHORT PERIOD,  
 LOST SITUATIONAL AWARENESS. NOTHING WAS SAID BY ATC TO INDICATE  
 THAT THE XING ALT WAS NOT REACHED, BUT CREW DID NOT MONITOR POS  
 CLOSELY ENOUGH TO BE SURE.  
 SYNOPSIS : FLC IN ADVANCED COCKPIT HVT ACFT  
 MISINTERPRETED FMC DISPLAY, MISSED XING ALT.  
 REFERENCE FACILITY ID : LAX  
 FACILITY STATE : CA  
 DISTANCE & BEARING FROM REF. : 8,41  
 MSL ALTITUDE : 13000,14000



ACCESSION NUMBER : 188375  
 DATE OF OCCURRENCE : 9108  
 REPORTED BY : FLC; ; ; ;  
 PERSONS FUNCTIONS : FLC,OTH; FLC,PIC.CAPT; FLC,FO; TWR,LC;  
 TRACON,DC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : JFK  
 FACILITY STATE : NY  
 FACILITY TYPE : ARPT; TRACON; TWR;  
 FACILITY IDENTIFIER : JFK; N90; JFK;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : CONFLICT/AIRBORNE LESS SEVERE; OTHER;  
 ALT DEV/OVERSHOOT ON CLB OR DES; NON ADHERENCE LEGAL RQMT/CLNC;  
 NON ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : CTLR ISSUED NEW CLNC; NOT  
 RESOLVED/ANOMALY ACCEPTED;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : PROC OR POLICY/ATC FACILITY; PROC OR  
 POLICY/COMPANY;  
 NARRATIVE : FIRST OF ALL, MY PRESENCE IN THE

COCKPIT FOR DEP WAS NOT REQUIRED SINCE I WAS THE RELIEF PLT.  
 HOWEVER, GENERALLY SPEAKING, MOST RELIEF PLTS SIT IN THE COCKPIT  
 FOR TKOF AND LNDG. THE CAPT HAD JUST COME OFF OF NEWLY QUALIFIED  
 STATUS WHEREAS THE FO WAS STILL NEWLY QUALIFIED. OUR FLT HAD BEEN  
 CLRED THE KENNEDY 5 DEP WITH A CARNARSIE CLB WHICH INCLUDES A  
 MAINTAIN 5000 FT ALT. JUST PRIOR TO TKOF THE ALT WAS CHANGED TO  
 4000 FT. AFTER TKOF I HEARD DEP CTL ISSUE A 90 DEG HDG. HOWEVER,  
 THE SOFT-SPOKEN AND APPARENTLY SLOW TO COMPREHEND FO READ BACK  
 9000 FT AND 90 DEG (ACCORDING TO HIM) OF WHICH I ONLY HEARD 90  
 DEG. HE SUBSEQUENTLY RESET THE ALT ALERTER TO 9000. DURING THIS  
 PERIOD OF TIME MY ATTN WAS FOCUSED ON THE CAPT'S FLYING SINCE HE  
 WAS ATTEMPTING TO NAV TO CARNARSIE VOR WITHOUT THE FMS BEING  
 PROGRAMMED IN NAV OR ANY SPECIFIC HDG SELECTED. CONSEQUENTLY, I  
 FOUND MYSELF DISTR BY LOOKING OUTSIDE TO VERIFY OUR GND TRACK  
 SINCE THE CAPT NEVER REALLY BRIEFED HOW HE WAS GOING TO FLY THE  
 DEP TO CARNARSIE VOR. ALSO, WHILE THE FO WAS OCCUPIED WITH HIS  
 SLOW RESPONSE TO DEP CTL, I NOTICED THE AIRSPD RAPIDLY APCHING THE  
 SLAT LIMIT SPD TO WHICH I CALLED OUT 'SLATS'. BOTH CAPT AND FO  
 SEEMED TO BE BEHIND THE AIRPLANE. I FELT OVERWHELMED BY THE AMOUNT  
 OF XCHKING I WAS DOING. ANYWAY, AS WE TURNED TO THE 90 DEG HDG,  
 DEP CTL CALLED OUT TFC AT 4500 FT WHICH WE SAW, ACKNOWLEDGED AND  
 RECKONED TO BE NO FACTOR. AS WE WENT THROUGH ABOUT 5000-6000 FT  
 DEP ASKED WHAT ALT WE WERE CLBING TO. WHEN THE FO RESPONDED 9000  
 FT, WE WERE TOLD THAT 4000 FT WAS OUR CLRED ALT, HOWEVER, CONTINUE  
 CLB TO 9000 FT. IN HINDSIGHT, AN OBVIOUS CAUSE OF THIS PROBLEM WAS  
 THE PAIRING OF A CAPT WITH JUST OVER 100 HRS AND A FO WITH LESS  
 THAN 100 HRS IN AN ADVANCED/AUTOMATED 2 PLT ACFT. MORE FLT TIME IN  
 ACFT TYPE SHOULD BE REQUIRED BEFORE SUCH PAIRINGS ARE ALLOWED.  
 ALSO, CHANGING THE ALT OF THE SID JUST PRIOR TO DEP TO ALLOW FOR  
 TCA TFC AT 500 FT INTERVALS IS ASKING FOR PROBLEMS DURING THIS  
 CRITICAL PHASE OF FLT. SUCH OTHER TFC SHOULD HAVE BEEN CLRED  
 OUTSIDE OUR WINDOW OF 2500- 5000 FT ON THIS DEP AND FINALLY, IF  
 THE CAPT HAD USED ALL AVAILABLE NAVAIDS, MORE ATTN COULD HAVE BEEN  
 GIVEN TO OTHER ASPECTS OF THE DEP BY EXTRA CREW MEMBERS.

(REPORT CONTINUED)

SYNOPSIS : ALT DEV ALT OVERSHOT.  
REFERENCE FACILITY ID : JFK  
FACILITY STATE : NY  
DISTANCE & BEARING FROM REF. : 8,,SE  
MSL ALTITUDE : 4000,9000

ACCESSION NUMBER : 193600  
 DATE OF OCCURRENCE : 9111  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TWR,LC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : DCA  
 FACILITY STATE : DC  
 FACILITY TYPE : ARPT; TWR;  
 FACILITY IDENTIFIER : DCA; DCA;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; SPEED DEVIATION;  
 NON ADHERENCE LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/PUBLISHED  
 PROC;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE WERE BEING VECTORED FROM THE NW FOR  
 A MOUNT VERNON VISUAL APCH TO RWY 36 DCA. THE WDB WAS BEING FLOWN  
 ON AUTOPLT WITH INPUT THROUGH THE FCU. I WAS EXPECTING A TURN ON  
 THE S SIDE OF P-73 TO JOIN THE DCA 10.1 AT 2500 FT. INSTEAD WE  
 WERE GIVEN A TURN TO THE E A FEW MI N OF P-73 AT A HIGHER THAN  
 NORMAL ALT (A 'SLAM DUNK') TRYING TO DSND AND DIRTY UP WHILE  
 TRYING TO KEEP UP WITH THE AUTOFLT BEGAN TO FALL APART. AT THAT  
 POINT I SHOULD'VE DISENGAGED THE AUTOFLT AND FLT DIRECTOR AND  
 FLOWN THE WDB LIKE A NORMAL AIRPLANE. FOR REASONS I'M NOT  
 COMPLETELY SURE OF, THE ACFT BEGAN TO ADD PWR AND ACCELERATE WHILE  
 I WAS DIALING IN A SLOWER SPD ON THE FCU. (I THINK THE FLT  
 DIRECTOR MAY HAVE GONE INTO ALT CAPTURE THUS CAUSING PWR TO  
 INCREASE IN ORDER TO CLB BACK TO THE DIALED IN ALT.) AT THAT POINT  
 WE WERE HDG E ACROSS THE POTOMAC RIVER AND WERE TOLD TO HEAD N TO  
 REINTERCEPT THE MOUNT VERNON APCH. AT THAT POINT I DISENGAGED ALL  
 AUTOFLT AND FLT DIRECTOR AND FLEW THE AIRPLANE BACK WHERE IT  
 SHOULD'VE BEEN. TRYING TO UTILIZE ALL THE MAGIC OF THE WDB. WHILE  
 INEXPERIENCED IN THE WDB (1 MONTH ON THE LINE) LED TO ME BEING  
 BEHIND THE AIRPLANE DURING THE CRUCIAL APCH PHASE. IN THE FUTURE  
 WHEN I AM 'SLAM-DUNKED' ON A VISUAL APCH I AM GOING TO FLY THE WDB  
 AS A NORMAL PLANE RATHER THAN TRYING TO FLY THE COMPUTER, SO THAT  
 THE COMPUTER CAN FLY THE PLANE.  
 SYNOPSIS : ACR WDB SPD DEV AND TRACK HDG DEV AS  
 INEXPERIENCED FO TRIES TO FLY THE ACFT USING THE FMS.  
 REFERENCE FACILITY ID : DCA  
 FACILITY STATE : DC  
 DISTANCE & BEARING FROM REF. : ,,SO  
 MSL ALTITUDE : 3000,3000

ACCESSION NUMBER : 193909  
 DATE OF OCCURRENCE : 9111  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ORD  
 FACILITY STATE : IL  
 FACILITY TYPE : ARPT;  
 FACILITY IDENTIFIER : ORD;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : SPEED DEVIATION; NON ADHERENCE LEGAL  
 RQMT/CLNC; NON ADHERENCE LEGAL RQMT/FAR;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : NOT RESOLVED/ANOMALY ACCEPTED; NOT  
 RESOLVED/DETECTED AFTER-THE-FACT;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : APPROX 110 NM SE OF ORD, ATC COMMENCED  
 OUR DSCNT WITH THE KNOX 1 ARR. ANTICIPATING THE XING AND SPD  
 RESTRICTIONS AT HALIE INTXN THE FMS WAS PROGRAMMED FOR A KNOX VOR  
 XING OF 16000 FT AND A HALIE INTXN XING OF 11000 FT AND 250 KIAS.  
 ULTIMATELY, THE KNOX XING WAS REMOVED AS FURTHER CLRNC REMOVED ITS  
 APPLICABILITY. ATC ISSUED CLRNC TO MAINTAIN 300 KIAS WHICH WAS  
 ACCOMPLISHED TO WITHIN APPROX 5 NM OF HALIE AT WHICH POINT THE  
 ACFT WAS SLOWED TO 250 KIAS. THIS SPD WAS MAINTAINED XING HALIE  
 AND UNTIL HDOF TO ORD APCH CTL. PASSING HALIE THE CTLR INQUIRED AS  
 TO OUR SPD AND I REPLIED '250 KTS.' THE CTLR STATED, 'WEREN'T YOU  
 GIVEN 300 KIAS TO MAINTAIN.' I REPLIED, 'WE SLOWED FOR THE HALIE  
 INTXN SPD RESTRICTION.' NOTHING MORE WAS SAID UNTIL THE CTLR  
 HANDED US OFF TO ORD APCH CTL WITH THE PARTING COMMENT OF 'THANKS  
 FOR THE HELP.' THIS COMMENT CAUSED THIS RPT TO BE FILED, AFTER  
 SOME INTERNAL SOUL- SEARCHING, INASMUCH AS THERE APPEARED TO BE  
 SOME QUESTION IN THE MIND OF THE CTLR AS TO THE CIRCUMSTANCES  
 SURROUNDING THE SPD CHANGE. ON INITIAL CONTACT WITH ORD APCH WE  
 WERE SLOWED TO 210 KIAS AND CONTINUED TO LAND UNEVENTFULLY ON RWY  
 27L. IT IS UNKNOWN WHETHER, IN FACT, ATC HAD A PROBLEM WITH THE  
 SPD REDUCTION OR NOT. THERE APPEARED TO BE SOME CONCERN, BUT NOT  
 DYNAMICALLY STATED. HOWEVER, ON REFLECTION, IT APPEARED THAT THERE  
 MIGHT BE SEVERAL CONCERNS ARISING OUT OF THIS INCIDENT. FIRST, THE  
 'GLASS COCKPIT' ENVIRONMENT IS PUSHING MORE AND MORE TOWARD  
 AUTOMATING THE ENTIRE FLT AND THE CREWS ARE TO A GREATER OR LESSER  
 EXTENT BEING LULLED INTO AN OPERATIONAL COMPLACENCY. HAD WE NOT  
 PROGRAMMED THE FMS THE CHANCES OF THE SPD REDUCTION OCCURRING  
 WOULD NO DOUBT HAVE BEEN REDUCED WITHOUT SOMEONE QUESTIONING WHAT  
 WAS GOING ON. THIS DEPENDANCE ON AUTOMATION DOES 2 THINGS: 1) IT  
 DEVELOPS A FALSE SENSE OF OPERATIONAL RELIANCE ON THE EQUIP TO DO  
 THE JOB, AND 2) IT REDUCES SITUATIONAL AWARENESS OWING TO COMFORT  
 WITH 1) ABOVE. SECOND, THOSE CREWS OPERATING A 'GLASS COCKPIT'  
 ALMOST INVARIABLY WANT TO UTILIZE THE NEW EQUIP TO ITS FULLEST AND  
 TO BECOME THAT MUCH MORE COMFORTABLE WITH THE NEW DEVICES AND  
 TECHNIQUES. CONSEQUENTLY, IF THE CREW PROGRAMS THE FMS TO CARRY  
 OUT RESTRICTIONS CONTAINED IN AN ARR PROC, AS AN EXAMPLE, THE ROTE  
 CARRYING OUT OF THIS PROC BY THE COMPUTER MAY DRAW THE CREW INTO  
 INADVERTENT DEVS FROM PRIOR CLRNCs. THIRDLY, IT IS POSSIBLE THAT  
 THE PORTRAYAL ON ARR AND APCH PROCS OF 'EXPECT CLRNC TO CROSS'  
 PROCS MAY FURTHER DRAW THE 'GLASS' CREWMEMBER INTO THE TRAP.

(REPORT CONTINUED)

PERHAPS, A DIFFERENT METHOD OF PROVIDING THE CREWS WITH OPERATIONAL POTENTIALS WOULD BE APPROPRIATE. THE RESTRICTIONS APPEARING ALONGSIDE THE RTE MAY BE INAPPROPRIATE AND SOME ATTN SHOULD BE GIVEN TO PLACING INFORMATIONAL DATA ELSEWHERE ON THE CHART.

SYNOPSIS : ACR MLG SPD DEV. FMS PROGRAMMING  
CONTRIBUTED TO THE ERROR.  
REFERENCE FACILITY ID : ORD  
FACILITY STATE : IL  
DISTANCE & BEARING FROM REF. : 50,,SE  
MSL ALTITUDE : 11000,11000

ACCESSION NUMBER : 194964  
 DATE OF OCCURRENCE : 9111  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : LAL  
 FACILITY STATE : FL  
 FACILITY TYPE : ARTCC; ARPT;  
 FACILITY IDENTIFIER : ZJX; MCO;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ALT DEV/XING RESTRICTION NOT MET; NON  
     ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/ANOMALY ACCEPTED;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : PROC OR POLICY/COMPANY; ACFT EQUIPMENT;  
 NARRATIVE : WE WERE DSNDING INTO MCO AND WERE TOLD  
     BY ZJX TO CROSS 60 SW OF LAL AT 23000 FT. THE CAPT WAS FLYING,  
     MISREAD HIS DISTANCE ON THE FMS AND MISSED THE ALT BY AT LEAST  
     3000 FT HIGH. I ASKED THE CAPT IF HE WANTED THE ALT RESTRICTION  
     LIFTED BY CENTER, BUT HE THOUGHT HE COULD MAKE IT. CONTRIBUTING  
     FACTORS: 1) FMS IS NOT USER FRIENDLY (NEW WDB). 2) CAPT AND FO LOW  
     TIME IN ACFT. 3) FO HAS NOT FLOWN THE ACFT ON THE LINE SINCE JULY.  
 SYNOPSIS : NEW MODEL WDB MISSED ALT XING  
     RESTRICTION ON DSCNT.  
 REFERENCE FACILITY ID : LAL  
 FACILITY STATE : FL  
 DISTANCE & BEARING FROM REF. : 30,,SW  
 MSL ALTITUDE : 23000,26000

ACCESSION NUMBER : 197036  
 DATE OF OCCURRENCE : 9112  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : JAX  
 FACILITY STATE : FL  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZJX;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; ALT  
 DEV/EXCURSION FROM ASSIGNED; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR; COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE; NOT RESOLVED/ANOMALY ACCEPTED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE WERE RAPIDLY CLBING (2500 FPM)

THROUGH FL290 WHEN WE HAD BEEN CLRED TO FL310. WE DECIDED TO GO  
 BACK DOWN TO FL280 TO TAKE ADVANTAGE OF LIGHTER HEADWINDS. THE  
 CAPT WAS FLYING AND I SET OUR NEW CLRED ALT OF 28000 IN THE ALT  
 WINDOW. THE CAPT ASSUMED THE PLANE WOULD NOW DSND TO THAT ALT, BUT  
 INSTEAD IT CONTINUED TO CLB BECAUSE WE HAD NOT REPROGRAMMED THE  
 FMC. WITH THE AUTOPLT STILL ENGAGED THE ACFT CONTINUED TO CLB AND  
 EVENTUALLY LEVELED AT FL315 WITH ATC ASKING WHAT OUR ALT WAS. WE  
 THEN DSNDDED UNEVENTFULLY BACK TO OUR CLRED ALT OF FL280. OBVIOUSLY  
 THIS INCIDENT WAS CAUSED BY AN OVER RELIANCE IN AUTOMATION. ALL  
 THIS COMPUTER CRAP IS WONDERFUL -- BUT IT STILL TAKES YOU 'OUT OF  
 THE LOOP' AND YOU ASSUME ALL IS WELL. MY SOLUTION ON MY LEGS THAT  
 I FLY IS TO HAND FLY THE ACFT FROM TKOF TO CRUISE ALT LEVEL OFF  
 AND THEN BACK DOWN AGAIN. I ONLY USE THE AUTOPLT IN CRUISE UNLESS  
 I AM TIRED. I AM A 'COMPUTER NUT' AND I LOVE THE AUTOMATION -- BUT  
 I CAN STILL FLY A HELL OF A LOT SMOOTHER AND I CAN ANTICIPATE. THE  
 COMPUTER HAS MANY SHORTCOMINGS, BUT WE ARE TAUGHT TO FLY BY  
 COMPUTER. THIS PRACTICE IS DANGEROUS AND POORLY THOUGHT OUT.  
 THANKS FOR YOUR EXCELLENT CALLBACK PUBLICATION AND A GREAT SYS TO  
 HELP ALL PLTS.

SYNOPSIS : FLC OF ADVANCED WDB FAILED TO PROGRAM  
 FMC FOR DSCNT, ACFT CONTINUED CLB.  
 REFERENCE FACILITY ID : JAX  
 FACILITY STATE : FL  
 DISTANCE & BEARING FROM REF. : 80,,SO  
 MSL ALTITUDE : 28000,31500

ACCESSION NUMBER : 199948  
 DATE OF OCCURRENCE : 9201  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : MXD  
 REFERENCE FACILITY ID : ZOB  
 FACILITY STATE : OH  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZOB;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : OTHER; ALT DEV/OVERSHOOT ON CLB OR DES;  
 NON ADHERENCE LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/PUBLISHED  
 PROC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE; CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : AN ACFT TYPE; ACFT EQUIPMENT;  
 NARRATIVE : FOLLOWING A DSCNT CLRNC FROM FL220, I  
 BEGAN A DSCNT TO 10000 FT MSL TO CROSS THE GRACE INTXN AT 10000  
 FT/250 KTS. OUR ACFT HAS 2 ALTIMETER ADJUSTMENT KNOBS AND AN EFIS  
 PUSH BUTTON (2) WHICH GIVES A READING OF 'STD' (OR 29.92) OR  
 ACTUAL BAROMETRIC SETTING IN INCHES (E.G. 29.31). WE COMPLETED THE  
 PRELIMINARY LNDG CHKLST JUST PRIOR TO 18000 MSL AS RECOMMENDED IN  
 THE PLT'S HANDBOOK. THE FIRST STEP ON THIS CHKLST IS 'ALTIMETERS'  
 WHICH BOTH PLTS RESET TO 29.31 INCHES ON THE ROTARY KNOB ABOVE THE  
 FMC COMPUTER. NEITHER OF US SWITCHED THE PUSH BUTTONS ON THE GLARE  
 SHIELD EFIS PANELS OUT OF 'STD' (29.92) TO LCL PRESSURE QNH OF  
 29.31 FOR REASONS NEITHER OF US CAN ASCERTAIN. (I AM NEW TO THE  
 EFIS COCKPIT WHILE MY CAPT HAD FLOWN IT OVER A YR). IN AUTOPLT  
 FLT, THE SYS WAS FLYING IN REF TO 29.92 AND INDICATED 'STD' ON THE  
 PRIMARY FLT DISPLAY WHILE WE WERE REALLY FLYING IN LCL PRESSURE OF  
 29.31. RIGHT AS WE LEVELED OFF AT 10000 FT INDICATED APCHING THE  
 GRACE INTXN, CLEVELAND CENTER RADIOED TO CONFIRM OUR ALT READOUT.  
 WE BOTH CAUGHT OUR 600 FT ERROR AND QUICKLY GOT BACK TO 10000 FROM  
 9500 FT TRUE ALT. I FEEL THE CHKLST SHOULD ADD A PARENTHESIS WITH  
 'QNH/STD' IMMEDIATELY AFTER THE FIRST STEP CALLING FOR ALTIMETER  
 SETTING, SINCE PLTS NEW TO EFIS COCKPITS ARE USED TO SETTING  
 ALTIMETERS IN ONLY 1 LOCATION, ON THE ALTIMETER ITSELF. DURING SIM  
 TRAINING, WE DIDN'T CROSS FL180 ENOUGH TIMES FOR THIS SYS DESIGN  
 TO REALLY SINK IN AS TO POTENTIAL ALT ERRORS IN HUMAN OP.  
 SYNOPSIS : WRONG ALT SETTING CREATES AN ALT DEV  
 ALT OVERSHOT IN DSCNT.  
 REFERENCE FACILITY ID : ZOB  
 FACILITY STATE : OH  
 MSL ALTITUDE : 9500,10000



ACCESSION NUMBER : 200534  
 DATE OF OCCURRENCE : 9201  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : MXD  
 REFERENCE FACILITY ID : ZDC  
 FACILITY STATE : DC  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZDC;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/INSUFFICIENT TIME;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : AN ACFT TYPE; ACFT EQUIPMENT;  
 NARRATIVE : ON FLT FROM MSP-DCA, POS NW OF BUCKO  
 INTXN ON J-34 WITH RTING OF J-34 TO BUCKO, THEN BUCKO THREE ARR TO  
 DCA. AT CRUISE AT FL370, GIVEN CLRNC TO CROSS 25 MI W OF ESL AT  
 FL240. AFTER INITIATING DSCNT, DETERMINED THAT XING RESTRICTION  
 WOULD NOT BE MADE, INFORMED ATC, AND WERE GIVEN NEW ALT  
 RESTRICTION FURTHER E. CONTRIBUTING FACTORS TO THIS INABILITY TO  
 MAKE THE XING RESTRICTION WERE: 1. HAD COMPLETED ABOUT 1/2 OF THE  
 'ENCON' DATA FOR THIS LEG (THAT IS CRUISE ENG PARAMETERS WHICH WE  
 RECORD IN OUR ACFT LOGBOOK FOR MAINT TRACKING). THE ACFT IS  
 REQUIRED TO BE IN LEVEL FLT WITH AUTOTHRUST OFF AND ENGS  
 STABILIZED WHILE WE RECORD THIS DATA. WE OPTED TO FINISH THIS  
 RECORDING BEFORE BEGINNING OUR DSCNT WHICH CONSUMED 1-2 MINS  
 ADDITIONAL TIME. 2. STRONG TAILWINDS. 3. 'CLEAN' NATURE OF OUR  
 ACFT AND RESULTANT SLOWER RATES OF DSCNT AT NORMAL SPDS AND  
 CONFIGNS (AS OPPOSED TO OLDER TYPES). 4. AUTOMATED NATURE OF FMS  
 SYS. WE BEGAN OUR DSCNT WHICH INITIALLY WAS AT A SLOWER RATE THAN  
 WE DESIRED. AFTER A MIN OR SO, WE REALIZED THAT OUR AUTOTHRUST SYS  
 WAS STILL DISENGAGED AFTER OUR 'ENCON' PROC (2 ABOVE) UPON  
 RE-ENGAGEMENT, NORMAL DSCNT RATE WAS RESTORED. HOWEVER, WE NOW  
 WERE BEHIND A DSCNT SCHEDULE WHICH WOULD ALLOW US TO MAKE OUR XING  
 RESTRICTION. WHILE THIS INABILITY TO MAKE THE XING RESTRICTION WAS  
 A RESULT OF THE CREW'S ACTIONS, I WANT TO MAKE TWO POINTS WHICH  
 CONTRIBUTED TO THIS: 1. THE FMS IN THIS AIRPLANE OFTEN DOES LEAD  
 TO MOMENTARY MISUNDERSTANDING OR QUESTIONS CONCERNING THE  
 PROGRAMMING OF THE SYS. WE ARE TRAINED TO USE THE AUTOMATIC OR  
 PROGRAMMED SYSTEMS. WHEN THE AIRPLANE DOES NOT IMMEDIATELY RESPOND  
 AS THE CREW INTENDED, THE TYPICAL RESPONSE IS TO PONDER WHAT  
 PROGRAMMING STEPS WERE DONE INCORRECTLY, RATHER THAN JUST FLY IT  
 MANUALLY WHICH OF COURSE CONSUMES TIME. 2. NEWER GENERATION ACFT  
 DO NOT DSND AS RAPIDLY IN NORMAL CONFIGNS AS DO OLDER TYPES.  
 SYNOPSIS : ALT XING RESTRICTION NOT MADE IN AN  
 ALTDEV ALT UNDERSHOT INCIDENT.  
 REFERENCE FACILITY ID : ZDC  
 FACILITY STATE : DC  
 MSL ALTITUDE : 24000,30000

ACCESSION NUMBER : 206118  
 DATE OF OCCURRENCE : 9203  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,DC;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : DCA  
 FACILITY STATE : DC  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : DCA; DCA;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : ERRONEOUS PENETRATION OR EXIT AIRSPACE;  
 TRACK OR HDG DEVIATION; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC; NON ADHERENCE LEGAL RQMT/FAR;  
 ANOMALY DETECTOR : ATC/CTLR; COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC BECAME REORIENTED; FLC RETURNED  
 ACFT TO ORIGINAL CLNC OR INTENDED COURSE; CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : DEP FROM RWY 36 (DCA) CALLS FOR A  
 COMBINED VISUAL/INST SEQUENCE. THE CAPT (LESS THAN 100 HRS IN TYPE  
 AND NEW TO DCA OP) WAS HESITANT ABOUT THE PROC FOR DEP. WE HELD  
 SHORT OF RWY 36 FOR 10 MIN TO DISCUSS THE PROC. THIS MY 5TH TRIP  
 OUT OF DCA FOR THE MONTH. IT WAS MY OPINION THAT HE FINALLY  
 UNDERSTOOD AND WAS REASONABLY COMFORTABLE WITH THE DEP PROC  
 SEQUENCE (NOTE: LIGHT LOADED LGT, MAX PWR TKOF SETTING -- HI  
 PWR/THRUST PERFORMANCE) ON TKOF THE ACCELERATION OF THE ACFT AND  
 CLB PERFORMANCE OF THE ACFT WAS MORE THAN THE CAPT HAD  
 ANTICIPATED. IN HIS EFFORT TO FOCUS ON THE MASSIVE CLB PERFORMANCE  
 AND GETTING THE ACCELERATION AND CLB RATE UNDER CTL, HE FLEW  
 THROUGH THE INTERCEPT RADIAL, ENGAGED LNAV (SHOULD HAVE STAYED IN  
 MANUAL INTERCEPT AND HDG SELECT) AND THE FMC COMMANDED A R TURN.  
 (THE FMC ON THIS DEP WILL NOT SLOW RADIAL INTERCEPT). THE TURN  
 SHOULD HAVE BEEN TO L TO INTERCEPT, AS WELL AS RE-INTERCEPT DUE TO  
 OVERSHOOT, BUT FOLLOWED THE FMC WHICH COMMANDED THE R TURN. THIS  
 CAUSED A 65 DEG OFF COURSE AWAY FROM THE INTERCEPT HDG TO  
 INTERCEPT. NOW WE ARE APCHING LEVEL OFF (5000 FT) AND PENETRATION  
 OF PROHIBITED/RESTRICTED AIRSPACE. I WAS IN PROCESS OF RESPONDING  
 TO HIS (CAPT) OTHER COMMANDS FOR ENGAGEMENT OF OTHER FUNCTIONS ALL  
 FO DUTIES. I FINALLY NOTICED THE FMC COMMANDED R AND IMMEDIATELY  
 CALLED FOR A HARD L TURN TO BACK ON COURSE. BY THIS TIME, ATC ALSO  
 CALLED FOR THE TURN. THE CAPT WAS ALL CONSUMED WITH THE HIGH  
 ACCELERATION AND CLB PERFORMANCE AND WAS OVERWHELMED BY THE EVENTS  
 AND STUNNED/CONFUSED. APPARENTLY, WE DIDN'T PENETRATE THE P/R  
 AIRSPACE, BUT THE CONFUSION ON THE CAPT'S PART OF THE DEP SEQUENCE  
 CREATED THE INSUFFICIENT FMC/PLT INTERFACE -- RESULTING IN OUR  
 DEV. SOLUTION: ENSURE THAT ALL FACTORS ARE UNDERSTOOD BY BOTH  
 PLTS,  
 PLAN OF ACTION ESTABLISHED AND UNQUESTIONABLE PERCEPTION OF WHAT  
 THE FMC IS DOING FOR US.  
 SYNOPSIS : LGT FLC MAKES WRONG DIRECTION TURN,  
 ENTERS PROHIBITED AREA.  
 REFERENCE FACILITY ID : DCA  
 FACILITY STATE : DC  
 MSL ALTITUDE : 3000,3000

ACCESSION NUMBER : 209690  
 DATE OF OCCURRENCE : 9205  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,AC;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : LAX  
 FACILITY STATE : CA  
 FACILITY TYPE : ARPT; TRACON; TWR;  
 FACILITY IDENTIFIER : LAX; LAX; LAX;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : SPEED DEVIATION; OTHER; ALT  
     DEV/UNDERSHOOT ON CLB OR DES; ALT DEV/XING RESTRICTION NOT MET;  
     NON ADHERENCE LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/PUBLISHED  
     PROC;  
 ANOMALY DETECTOR : ATC/CTLR; COCKPIT/FLC;  
     COCKPIT/EQUIPMENT;  
 ANOMALY RESOLUTION : FLC BECAME REORIENTED; FLC RETURNED  
     ACFT TO ORIGINAL CLNC OR INTENDED COURSE; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE WERE CLRED TO LAX VIA THE CIVIT 2  
     PROFILE DSCNT TO MAINTAIN 250 KTS. BEFORE REACHING FUEL, WE WERE  
     CLRED FOR THE ILS 25L UPON REACHING FUEL. THE LGT WAS IN THE  
     AUTOFLT AUTOTHROTTLE MODE NAVING VIA THE FMC. UPON REACHING FUEL  
     I SELECTED APCH. THE LOC CAPTURED, HOWEVER, I WAS A LITTLE SLOW  
     SELECTING APCH, AND WE WERE ALREADY 1 DOT HIGH ON THE GS.  
     THEREFORE, THE GS DID NOT CAPTURE, AND WE REMAINED AT 8000 FT. I  
     SELECTED VERT SPD TO START THE DSCNT, BUT WE WERE ALREADY 2 DOTS  
     HIGH. AS WE WERE NOW HIGH AND FAST, I EXTENDED THE SPD BRAKES AND  
     THE CAPT STARTED ADDING FLAPS. WE RECEIVED A RESTRICTION IN OUR  
     DSCNT TO 3500 FT, AND WE WERE HIGH ENOUGH NOW, THAT GEAR DOWN WAS  
     SELECTED. TO ADD TO OUR PREDICAMENT, THE AUTOTHROTTLE WAS ADDING  
     PWR, AND I WAS FIGHTING IT AND PULLING THE THROTTLE BACK. FINALLY,  
     I SHUT OFF THE AUTOTHROTTLE. WE ARRIVED AT HUNDA AT 4500 FT (1000  
     FT HIGH AND AT A HIGH RATE OF DSCNT). THE CAPT ASKED FOR LOWER AND  
     WE WERE GIVEN 3200 FT. AS WE LEVELED AT 3200 FT (WELL INSIDE  
     HUNDA) THE CAPT ASKED FOR LOWER AGAIN. AT THIS POINT, I WAS WELL  
     BEHIND THE ACFT AND FULL FLAPS AND GEAR WERE STILL OUT. IT TOOK ME  
     A MOMENT TO REALIZE THAT THE AUTOTHROTTLE WAS NOT ENGAGED AND THE  
     ACFT SLOWED TO THE STICKSHAKER AS WE LEVELED. I CALLED FOR GAR  
     THRUST AND FLAPS 20. AT THIS SAME TIME, APCH CLRED US FOR A DSCNT  
     TO 2500 FT AND GAVE US A L TURN TO A HDG (180 DEGS, I BELIEVE,  
     THEN 160 DEGS, THEN 080 DEGS). AS WE DSNDED AND TURNED, THE ACFT  
     RAPIDLY ACCELERATED TO 220 KTS AT GAR THRUST. AT THIS POINT, I  
     FINALLY WISED UP AND DECIDED TO QUIT BATTLING THE AUTOFLT SYS  
     (WHICH I OBVIOUSLY WAS NOT REALLY IN COMMAND OF AT THIS TIME).  
     ALMOST IMMEDIATELY, I WAS ABLE TO GET THE AIRPLANE ON HDG, ON  
     AIRSPD, ON ALT AND IN THE CONFIG I DESIRED. AN UNEVENTFUL VECTOR  
     TO FINAL WAS FOLLOWED BY A NORMAL ILS AND LNDG. I DON'T BELIEVE WE  
     BROKE ANY FARS, BUT OBVIOUSLY, THE WHOLE SCENARIO WAS COMPLETELY  
     UNSATISFACTORY. I ATTRIBUTE THIS INCIDENT TO THE FOLLOWING: 1) I  
     WAS BEHIND THE ACFT AFTER PASSING FUEL. 2) I WAS OBVIOUSLY UNABLE  
     TO MAKE THE ACFT DO WHAT I WANTED IT TO DO USING THE AUTOFLT SYS.  
     3) I WAITED TOO LONG TO DISCONNECT THE AUTOFLT SYS AND TO HAND FLY  
     THE ACFT. THE ABOVE WAS COMPLICATED BY: 1) I AM VERY NEW ON THE  
     ACFT. 2) WE WERE GIVEN AN APCH BY ATC WHERE WE WERE KEPT FAST

(REPORT CONTINUED)

UNTIL INTERCEPTING THE GS. THEN, WE WERE GIVEN FURTHER ALT RESTRICTIONS, PLACING US HIGH ON THE GS EVEN WHEN I FINALLY GOT US BACK IN THE BALL PARK. TO ALLEVIATE THIS SITUATION IN THE FUTURE, I PLAN TO: 1) LEARN MORE ABOUT THE AUTOFLT SYS. 2) MAKE THE DECISION TO FLY MANUALLY AS SOON AS I FEEL MYSELF GETTING BEHIND OR AM UNABLE TO GET THE DESIRED RESULTS FROM THE AUTOFLT SYS.

SYNOPSIS : THE COPLT FLYING AN LGT ACR ACFT WITH ADVANCED COCKPIT GOT WAY BEHIND IN HIS APCH USING ALL OF THE FANCY AUTOPLT AIDS. WITH THE HELP OF HIS CAPT AND THE APCH CTLR, HE WAS ABLE TO LAND SAFELY AFTER TURNING OFF THE AUTOPLT AND AUTOTHROTTLES.

REFERENCE FACILITY ID : LAX  
FACILITY STATE : CA  
DISTANCE & BEARING FROM REF. : ,250  
AGL ALTITUDE : 0,8000

ACCESSION NUMBER : 211936  
 DATE OF OCCURRENCE : 9206  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TRACON,DC;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : DCA  
 FACILITY STATE : DC  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : DCA; DCA;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ERRONEOUS PENETRATION OR EXIT AIRSPACE;  
 TRACK OR HDG DEVIATION; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; CTLR ISSUED NEW CLNC;  
 FLC BECAME REORIENTED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : DEP CLRNC STATED 'FLY THE DCA 328 DEG

RADIAL FOR VECTORS.' I PROGRAMMED THE MCDU AND BUILT A FIX AFTER  
 THE DCA ARPT ON THE 328 DEG RADIAL AT 20 MI. THE FLT PLAN THEN HAD  
 A DISCONTINUITY BTWN THAT FIX (PBD04, IN THIS CASE) AND THE FIRST  
 FIX ON THE AIRWAY. I TOOK OFF IN MANAGED NAV AND ARC MODE.  
 IMMEDIATELY AFTER LIFTOFF, THE 'TO' POINT (PBD04) DISAPPEARED FROM  
 MY MAP AND DROPPED OUT OF THE FMGC. I HAD HAND-TUNED THE DCA VOR  
 AND THE 328 DEG RADIAL ON THE NAV RAD PAGE BEFORE DEP AND SWITCHED  
 TO ROSE VOR MODE ON MY NAV DISPLAY. BY THAT TIME, I WAS ALREADY E  
 OF THE 328 DEG RADIAL AND UNCERTAIN AT THIS POINT WHETHER A  
 RESTRICTED ZONE WAS ACTUALLY VIOLATED. I CORRECTED L (W) TO  
 INTERCEPT THE RADIAL. THE FO AND I HAD HAD SOME BRIEF AND HARRIED  
 DISCUSSION ABOUT THE DISAPPEARANCE OF THE COURSE, AND HE SAID  
 'I'LL FIX IT.' HE PROGRAMMED THE FMGC TO GO DIRECT TO PBD04  
 (INCORRECT, BUT I DIDN'T SEE WHAT HE WAS DOING, AND HE DIDN'T TELL  
 ME) AND REACHED OVER AND SWITCHED MY NAV DISPLAY TO ARC, THEREBY  
 WIPING OUT THE ONLY FORM OF NAV WE ACTUALLY HAD AT THAT POINT. I  
 SWITCHED BACK TO VOR AND, FOR SOME REASON, DIDN'T HAVE A CDI. I  
 SWITCHED OUT OF VOR, BACK AGAIN, AND THE CDI REAPPEARED,  
 INDICATING THAT WE WERE CONSIDERABLY W OF COURSE BY THAT TIME. ATC  
 ASKED US WHERE WE WERE GOING (GOOD QUESTION) AND I TOLD THE FO TO  
 TELL THEM WE HAD LOST OUR PRIMARY NAV. THE CTLR GAVE US A HDG OF  
 330 DEG AND A HDOF TO CTR. NOTHING FURTHER WAS SAID BY ATC ABOUT  
 THE OCCURRENCE.

SYNOPSIS : AN MLG CREW MISMANAGED THEIR NEW FANCY  
 FMC AND GUIDANCE SYS TO THE POINT THAT THEY MAY HAVE VIOLATED A  
 RESTRICTED AREA.

REFERENCE FACILITY ID : DCA  
 FACILITY STATE : DC  
 DISTANCE & BEARING FROM REF. : 10,328  
 MSL ALTITUDE : 2000,2000

ACCESSION NUMBER : 213229  
 DATE OF OCCURRENCE : 9206  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; ARTCC,RDR;  
 FLIGHT CONDITIONS : MVF  
 REFERENCE FACILITY ID : BNA  
 FACILITY STATE : TN  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZME;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : OTHER; ALT DEV/UNDERSHOOT ON CLB OR  
 DES; ALT DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL  
 RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : NOT RESOLVED/INSUFFICIENT TIME;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : ON GEETR 1 ARR TO BNA, TOLD TO CROSS 65  
 MI OUT AT 16000. FO FLYING. USED VERT NAV MODE OF FMS NAV SYS TO  
 DSND FROM FL260 TO 16000. SYS MUST HAVE A FIX SO HE USED GROAT  
 INTXN, 72 MI FROM BNA. VERT NAV MODE DID NOT RESPOND TO HIS  
 INPUTS, AND I LET THE SITUATION PROGRESS TOO FAR BEFORE  
 INTERVENING AND MISSED XING ALT. FO NEW ON ACFT AND WANTED TO USE  
 AUTO VERT NAV SYS. DID NOT RECOGNIZE HE WAS TOO CLOSE, AND WHEN I  
 RESPONDED, IT WAS TOO LATE TO MAKE THE ALT. I LET THE SITUATION GO  
 TOO FAR. FIRST TIME IN MY CAREER. COMPANY PUTS TOO MUCH EMPHASIS  
 ON AUTOMATION. I SHOULD HAVE MADE IT CLR -- USE THE AUTOMATION  
 ONLY WHEN YOU HAVE PLENTY OF TIME FOR IT TO RESPOND.  
 SYNOPSIS : LGT FLC MISSES XING RESTRICTION DUE  
 TRYING TO PROGRAM VERT NAV MODE.  
 REFERENCE FACILITY ID : BNA  
 FACILITY STATE : TN  
 DISTANCE & BEARING FROM REF. : 100,,NE  
 MSL ALTITUDE : 16000,26000

ACCESSION NUMBER : 217823  
 DATE OF OCCURRENCE : 9208  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,AC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : MRB  
 FACILITY STATE : WV  
 FACILITY TYPE : TRACON;  
 FACILITY IDENTIFIER : IAD;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
 LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; FLC RETURNED ACFT TO  
 ORIGINAL CLNC OR INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : INBOUND TO IAD ON THE ESL ARR WE GOT TO  
 11000 FT AND WERE TURNED TO A 360 DEG HDG BECAUSE 'DULLES WAS  
 BACKED UP AND COULDN'T TAKE US.' THE CAPT WAS FLYING (NEW CAPT ON  
 THE WDB FIRST TRIP OFF OF IOE). THEN THE CTLR GAVE US THE  
 FOLLOWING CLRNC. 'HOLD 15 DME W OF MARTINSBURG. HOLD W L TURNS,  
 MAINTAIN 11000, EXPECT FURTHER CLRNC, XA30.' AS MARTINSBURG WAS  
 NOT ON OUR ARR, I PULLED OUT MY CHART TO FIND THE IDENTIFIER FOR  
 MARTINSBURG. AS WE TRIED TO GET ORIENTED TO 'MRB' THE CAPT CALLED  
 AND ASKED FOR THE RADIAL THEY WANTED US ON. I THEN TYPED IN TO THE  
 FMC HOLD BLOCK MRB 280/015. THE FMC RESPONDED 'HOLD AT MRB  
 280/15.' AS I EXPECTED THE 'HOLD PAGE' TO COME UP, I WAS  
 MOMENTARILY BAFFLED THAT I DIDN'T GET THE HOLD PAGE ON THE FMC.  
 BUT, I RESORTED TO WHAT I KNEW WOULD WORK. I TUNED IN MRB, LOOKED  
 AT THE TAIL OF THE NEEDLE AND THE DME. I QUICKLY RECOGNIZED THAT  
 WE WERE ALREADY E OF THE FIX AND 'DIRECTED' THE CAPT TO TURN R TO  
 INTERCEPT THE 280 DEG RADIAL OUTBOUND TO THE DME FIX. ABOUT THAT  
 TIME, DULLES APCH ASKED THE INFAMOUS 'WHERE ARE YOU GUYS GOING!' BY  
 THAT TIME WE WERE 6 MI E OF THE FIX. I ALSO FIGURED OUT ABOUT  
 THEN THAT YOU CAN'T GET THE HOLD PAGE UNLESS YOU'VE GOT AN 'ACTIVE  
 WAYPOINT' OR AT LEAST SOMETHING THAT THE FMC IS ALREADY AWARE OF.  
 WHEN I WRITE THESE RPTS, I USUALLY TAKE 'FULL BLAME' FOR THE  
 FOUL-UP. THIS TIME, I'LL GIVE SOME TO ATC FOR 1) NOT CLRING US TO  
 THE FIX AT WHICH THEY WANTED US TO HOLD, 2) GIVING US AN ILLEGAL  
 CLRNC BY NOT IDENTING THE FIX BY RADIAL AND DME AND NOT CLRING US  
 TO GO THERE. I'LL GIVE SOME MORE TO ATC BY GIVING US A HOLD AT A  
 POINT IN SPACE ABOUT 5 MI FROM WHERE WE WERE, NOT ON OUR RTE AND  
 NOT IDENTED BY THE ARR PLATE WE WERE FLYING. I'LL GIVE SOME TO OL'  
 CAPT FOR NOT REVERTING TO THE OLD NEEDLE DME WHILE I MESSED WITH  
 THE FMC. OK, I'LL TAKE SOME TOO, FOR NOT FIRST GOING DIRECT THE  
 FIX IN THE FMC THEN PULLING UP THE HOLD PAGE! THE BIG LESSON  
 LEARNED: GO WITH WHAT YOU KNOW. THE OLD NEEDLE/DME TELLS YOU WHERE  
 YOU ARE AND WHERE YOU NEED TO GO, IMMEDIATELY. AFTER FLYING THE  
 GLASS COCKPIT FOR 15 MONTHS, I'M NOT REALLY SURE IT'S BETTER THAN  
 THE OLD 'ANALOG' STUFF. THE ANALOG INSTS SERVED TO KEEP YOUR BRAIN  
 ENGAGED TO THE NAV SOLUTION!  
 SYNOPSIS : WDB FLC ASSIGNED HOLD AT NAVAID NOT  
 SHOWN ON ARR. DIG OUT CHART, TRY TO PROGRAM FMC. CAN'T GET INFO TO  
 COME UP ON COMPUTER. FLY PAST FIX.  
 REFERENCE FACILITY ID : MRB

(REPORT CONTINUED)

FACILITY STATE : WV  
DISTANCE & BEARING FROM REF. : 15,280  
MSL ALTITUDE : 11000,11000



ACCESSION NUMBER : 223044  
 DATE OF OCCURRENCE : 9209  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ARD  
 FACILITY STATE : NJ  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZDC;  
 AIRCRAFT TYPE : WDB;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE; CTLR ISSUED NEW CLNC;  
 ANOMALY CONSEQUENCES : FLC/ATC REVIEW;  
 NARRATIVE : AT FL260 CTR GAVE US A RESTRICTION TO  
 CROSS SOMTO INTXN AT 11000 FT. THE FO WAS FLYING (MYSELF) AND THE  
 CAPT READ BACK THE RESTRICTION. I PROGRAMMED THE FMS TO CROSS  
 SOMTO AT 11000. AT THE TIME THE CLNC WAS RECEIVED, WE WERE APPROX  
 40 MI S OF SOMTO. THE FMS CAPTURED VNAV PATH AND BEGAN TO DSND.  
 THE CAPT EXCUSED HIMSELF TO USE THE LAVATORY DSNDING. WHILE HE WAS  
 AWAY, I BEGAN TO PROGRAM THE APCH INTO LGA. WHEN I WAS FINISHED, I  
 WENT TO THE DSCNT PAGE ON THE FMC IN ORDER TO CHK THE PROGRESS OF  
 OUR DSCNT. I NOTICED THAT THE FMC WAS PREDICATING THE DSCNT ON  
 DIALS AT 2500 FT, AN ALT WHICH I HAD PROGRAMMED IN FOR THE APCH.  
 AT THAT MOMENT, I TURNED TO THE DIRECT INTERCEPT TO SEE DISTANCE  
 FROM SOMTO. I OBSERVED THAT WE WERE 13 MI S OF SOMTO AT FL210. I  
 IMMEDIATELY CALLED CTR TO CONFIRM SOMTO AT 11000 FT. THE CTLR  
 ISSUED AN IMMEDIATE TURN TO HDG 180 DEGS. DURING THIS CLNC THE  
 CAPT RETURNED TO THE COCKPIT. I IMMEDIATELY MADE A R AND INCREASED  
 THE RATE OF DSCNT TO OVER 6000 FPM. AFTER ABOUT 30 DEGS OF TURN,  
 CTR TURNED US BACK TO THE N TO INTERCEPT THE Nanci ARR N OF SOMTO.  
 ONE OF THE MISTAKES I MADE WAS ASSUMING THAT AFTER THE ACFT  
 CAPTURED VNAV PATH IN THE DSCNT THAT IT WOULD MAKE THE XING  
 RESTRICTION AND REQUIRE NO SUPERVISION. WHEN I PUT THE 2500 FT ALT  
 AT DIALS IN, SOMEHOW THE FMC ACCEPTED THAT AS ITS XING  
 RESTRICTION. IT IS POSSIBLE THAT I MAY HAVE ERRED WITH MY INPUT,  
 BUT I DON'T KNOW HOW. ANOTHER MISTAKE WAS CHANGING FROM THE MAP  
 DISPLAY TO THE PLAN DISPLAY IN PROGRAMMING THE APCH. WITH 1 PLT  
 OUT OF THE SEAT AND THE OTHER IN THE PLAN MODE, THERE IS CERTAINLY  
 DIMINISHED POS AWARENESS. NO AMOUNT OF TECHNOLOGY RELIEVES THE  
 PLTS OF THEIR DUTIES OF BASIC AIRMANSHIP. TECHNOLOGICAL  
 ADVANCEMENTS HAVE IN MY OPINION GREATLY ENHANCED AND IMPROVED  
 VIRTUALLY ALL FACETS OF AVIATION, HOWEVER, ERRORS WILL STILL BE  
 MADE BY BOTH THE MACHINERY AND THE PLTS WHO CTL THE MACHINERY AND  
 IN THIS PARTICULAR INCIDENT, COMPLACENCY WAS CERTAINLY A FACTOR.

SYNOPSIS : WDB ACFT ON DSCNT MISSES XING  
 RESTRICTION.

REFERENCE FACILITY ID : ARD  
 FACILITY STATE : NJ  
 DISTANCE & BEARING FROM REF. : 52,233  
 MSL ALTITUDE : 11000,21000

ACCESSION NUMBER : 233050  
 DATE OF OCCURRENCE : 9301  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : MCO  
 FACILITY STATE : FL  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZJX;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/INSUFFICIENT TIME;  
 ANOMALY CONSEQUENCES : FLC/ATC REVIEW;  
 NARRATIVE : ATC -- ZJX FREQ, CAPT FLYING A DSCNT  
 INTO MCO. HE MISSED THE ALT RESTRICTION AT LAMMA INTXN BY 4000 FT.  
 DSCNT AND ACFT WAS ON AUTOPLT PATH DSCNT. THE CTR CTLR GAVE US  
 CROSS LAMMA INTXN AT 12000 FT AT 250 KTS. I BELIEVE THE CTLR GAVE  
 US THIS CLRNC TOO CLOSE INTO LAMMA INTXN TO MAKE IT IN TIME. I  
 ASKED FOR RELIEF AND TOLD ATC WE WOULD BE HIGH AND FAST, THE CTLR  
 DID NOT RESPOND. NO OTHER ATC DIRECTIVES WERE THEN HEARD TO OTHER  
 ACFT. I REPEATED MY REQUEST AND STATEMENT, THE CTLR THEN RESPONDED  
 BY AN ANGRY STATEMENT AND STATING THAT WE SHOULD HAVE MADE THE  
 RESTRICTION. THE CAPT THEN REQUESTED A TURN OFF THE ARR -- AGAIN  
 NO RESPONSE. HE REPEATED HIS REQUEST, THE CTLR TOLD US TO FLY A  
 HDG AND REDUCE SPD FIRST THEN MAKE A DSCNT TO 12000 FT. I BELIEVE  
 THE CAPT FLYING DID NOT ACT QUICKLY ENOUGH TO MAKE THE RESTRICTION  
 OR NOTE HIS HIGH GNDSPD. I TOLD HIM 2 TIMES THAT HE WAS TOO HIGH.  
 HE SEEMED DISTRACTED BY COM AND WHAT THE FLT FMC COMPUTER WAS  
 TELLING HIM. ALSO, THE CTLR GAVE US THE ALT RESTRICTION TOO CLOSE  
 TO LAMMA INTXN. ALSO THE CTLR DID NOT RESPOND WHEN I TOLD HIM WE  
 WERE TOO HIGH. TO PREVENT A RECURRENCE, CAPT BE MORE VIGILANT TO  
 ACFT GNDSPD, PROGRAMMING FMC AND ACT SOONER TO ATC INSTRUCTIONS.  
 SYNOPSIS : MLG FLC UNABLE TO MAKE XING  
 RESTRICTION.  
 REFERENCE FACILITY ID : MCO  
 FACILITY STATE : FL  
 DISTANCE & BEARING FROM REF. : 40,,NE  
 MSL ALTITUDE : 12000,16000

**FURTHER AUTOMATION ISSUES - WORKLOAD**

ACCESSION NUMBER : 61073  
 DATE OF OCCURRENCE : 8612  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,DC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : DEN  
 FACILITY STATE : CO  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : DEN; DEN;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; NON  
 ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE; CTLR INTERVENED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : SHORTLY AFTER TAKEOFF FROM DENVER  
 STAPLETON ARPT, WITH THE AUTOPLT AND AUTOTHROTTLES ENGAGED, WE  
 WERE CLIMBING TO OUR ASSIGNED ALT OF 10000' MSL. OUR AIRSPEED WAS  
 250 KTS AND OUR RATE OF CLIMB WAS APPROX 2500 FPM. PRIOR TO  
 TAKEOFF, OUR ASSIGNED ALT OF 10000' HAD BEEN SET AND ARMED FOR AN  
 AUTO CAPTURE. AT 9000' MSL, I TOLD THE CAPT "9 FOR 10". APPROX  
 9500', THE CAPT CALLED FOR THE "AFTER TAKEOFF CHECKLIST", WHICH I  
 PROCEEDED TO DO. AS WE APPROACHED OUR ASSIGNED ALT OF 10000' MSL,  
 THE FMA ON OUR ACFT INDICATED A NORMAL ALT CAPTURE. THE CAPT WAS  
 MAKING A POWER ADJUSTMENT TO THE LEFT ENGINE BECAUSE IT WAS APPROX  
 .20 EPR LOW. AT APPROX 10300' MSL, I HEARD THE ALT WARNING GO OFF.  
 I ASKED THE CAPT IF WE HAD BEEN GIVEN A HIGHER ALT. THE CAPT  
 IMMEDIATELY DISCONNECTED THE AUTOPLT, AUTOTHROTTLES, PULLED THE  
 SPEED BRAKE, AND PUSHED THE NOSE DOWN! AT ABOUT THIS TIME, DENVER  
 DEPARTURE CONTROL TOLD US TO DESCEND BACK TO 10000'. THE ACFT  
 REACHED A MAXIMUM ALT OF 11100' BEFORE IT STARTED BACK DOWN. THIS  
 WAS A RESULT OF OUR BODY ANGLE, RATE OF CLIMB, COLD OUTSIDE AIR  
 TEMP, AND A LIGHT ACFT WEIGHT. AS FOR CORRECTIVE ACTIONS, I FEEL  
 THAT ADVANCED/AUTOMATED COCKPITS (FMS) ARE GREAT, BUT THAT PLTS  
 MUST CONTINUALLY MONITOR THEIR ENTIRE OPERATION BECAUSE THEY  
 CERTAINLY ARE NOT FAIL SAFE. SINCE THIS OCCURRENCE, I HAVE BECOME,  
 MORE SO THAN EVER, AWARE OF WHAT THE FMA SAYS IT IS DOING AND WHAT  
 THE ACFT IS REALLY DOING.  
 SYNOPSIS : INITIAL CLIMBOUT TO ASSIGNED ALT 10000,  
 ACFT OVERSHOT ALT BY 1100'.  
 REFERENCE FACILITY ID : DEN  
 FACILITY STATE : CO  
 DISTANCE & BEARING FROM REF. : 10,,NE  
 MSL ALTITUDE : 10000,11100

ACCESSION NUMBER : 63574  
 DATE OF OCCURRENCE : 8702  
 REPORTED BY : FLC  
 PERSONS FUNCTIONS : FLC, FO; FLC, PIC. CAPT; TRACON, DC  
 FLIGHT CONDITIONS : VMC  
 AIRCRAFT TYPE : MLG  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; ACFT  
 EQUIPMENT PROBLEM/LESS SEVERE; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT;  
 NARRATIVE : DURING CLIMBOUT FROM BUR AND AFTER  
 TURNING N TO INTERCEPT THE PMD 218 DEG R A LEVELOFF ALT OF 8000'  
 MSL WAS OVERSHOT BY 500' MSL. I WAS HAND FLYING AN MLG WITH AUTO  
 THROTTLES ENGAGED AND FLT DIRECTOR COMMANDS. VISIBILITY WAS  
 UNRESTRICTED AND BOTH THE CAPT AND MYSELF WERE TRYING TO MAINTAIN  
 A GOOD TFC WATCH. THE ALT WARNING CHIMED AT WHICH TIME I REALIZED  
 WE WRE CLBING THROUGH 8250' MSL. I PUSHED THE NOSE OVER AND  
 DISENGAGED THE AUTO THROTTLES BUT WAS AT 8500' MSL BEFORE I  
 ARRESTED THE ASCENT. AT THE SAME TIME THE ALT OVERSHOOT WAS  
 REALIZED WE ALSO NOTICED THAT THE ALT CAPTURE MODE OF THE FLT  
 GUIDANCE SYSTEM HAD NOT CAPTURED THE ALT WHICH HAD BEEN SET AND  
 ARMED. I STILL DON'T KNOW WHY THIS OCCURRED. THE ALT HAD BEEN SET  
 AND ARMED PRIOR TO TKOF AND NOT TOUCHED BEFORE THE INCIDENT. I  
 BELIEVE ADDITIONAL CONTRIBUTING FACTORS TO THIS INCIDENT INCLUDED:  
 ALLOWING THE ACFT TO CLIMB AT FULL CLIMB POWER TO A RELATIVELY LOW  
 ALT WHICH RESULTED IN AN EXCESSIVE CLIMB RATE. BOTH PLTS TRYING TO  
 WATCH FOR TFC WHICH CAUSED THE 1000' PRIOR TO LEVEL OFF CALL TO BE  
 MISSED. HAND FLYING THE AIRPLANE IN A HIGH DENSITY AREA WHICH  
 INCREASED THE WORKLOAD ON ME TO A POINT I DID NOT MONITOR THE FLT  
 MANAGEMENT SYSTEM. IF I WAS GOING TO HAND FLY THE ACFT, DO NOT  
 ALLOW MY BASIC INSTRUMENT SCAN TO BE BROKEN DOWN BY A RELIANCE OF  
 THE FLT DIRECTOR COMMAND BARS. INCLUDE THE FLT MANAGEMENT  
 ANNUNCIATOR PANEL INTO MY BASIC SCAN. OUR NEW TECHNOLOGY ACFT DO  
 NOT HAVE THE 1000' PRIOR TO LEVEL OFF CHIME INSTALLED AS DID OUR  
 OLDER ACFT. WHY? I AM STILL FAIRLY NEW TO THE ACFT AND AS A  
 RESERVE PLT I AM ONLY FLYING AN AVERAGE OF 15 HRS PER MONTH.  
 SYNOPSIS : MLG OVERSHOT ASSIGNED ALT DURING DPTR  
 FROM BUR.  
 CALLBACK/COMMENTS : NONE  
 LOC ID (LOCATION IDENTIFIER) : ;PMD

ACCESSION NUMBER : 110778  
 DATE OF OCCURRENCE : 8905  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; ARTCC,RDR;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : ESL  
 FACILITY STATE : WV  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZDC;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : NOT RESOLVED/ANOMALY ACCEPTED;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : AN ACFT TYPE; ACFT EQUIPMENT;  
 NARRATIVE : ACFT AT FL370 CRUISE ON FLT PLAN ROUTE,

KESSEL 2 ARR. AUTOPLT IN COMMAND MODE LNAV AND VNAV ENGAGED. FMC PROGRAMMED TO CROSS DRUZZ INTXN AT 11000' AND 250 KTS. THIS CLRNC HAD NOT BEEN GIVEN, BUT IT WAS EXPECTED WE WOULD GET IT. ABOUT 70 MI W OF KESSEL ATC ISSUED THIS CLRNC: "CROSS 25 MI W OF KESSEL AT AND MAINTAIN 25000'." I MENTIONED TO THE CAPT THAT I HAD EXPERIENCED PROBS WITH THE FMC'S ON SOME OTHER OF OUR ACFT STARTING DSNT LATE. WE EACH AGREED "TO SEE HOW THIS ONE DOES." I SAID THERE WAS SOMETHING SCREWY--THE FMC SAID "DISTANCE TO TOP OF DSNT," AND "DISTANCE TO FIX" ONLY 2 MI APART--HOW COULD THAT BE? ABOUT THIS TIME ATC TOLD US TO "START YOUR DSNT NOW," FIRST HINT OF POSSIBLE PROB. USING THE "OLD" 3 FOR 1 DSNT FORMULA, IT LOOKED AS THOUGH WE HAD OUR WORK CUT OUT FOR US TO MAKE THE RESTRICTION 25 W OF KESSEL. ATC AGAIN, "YOU DID GET 25 W OF KESSEL AT FL250?" I STATED THAT IF WE CAN'T MAKE IT, WE SHOULD TELL THEM. WE CROSSED THE VOR AT 26100' AND LEVELED AT FL250 ABOUT 15 SECS LATER. BOTH CAPT AND I HAVE ENOUGH FMC EXPERIENCE AND IN OUR DISCUSSION AGREED THAT THE SYS DOES NOT SEEM TO FUNCTION ACCEPTABLY IN DSNT. THE FMC REQUIRES MONITORING AT ALL TIMES, LIKE ANY OTHER NAV SYS. ITS UNIQUE CAPABILITIES AND PERFORMANCE CAN LULL THE CREW INTO A DEG OF "MONITORING COMPLACENCY," WHICH CAN BE INSIDIOUS. FOR MY PART (AS I DID EARLY IN MY FMC FLYING EXPERIENCE), I WILL BE MUCH MORE VIGILANT WHILE OPERATING THE FMC TO ENSURE THE SYS PERFORMS AS IT IS PROGRAMMED. AS FOR THE REASON FOR THE PROB IN THIS CASE, I AM AT A LOSS TO EXPLAIN IT. HOWEVER, THIS IS LIKELY TO OCCUR AGAIN AND I PLAN TO RPT IT TO THE COMPANY SO THAT THE SITUATION CAN BE RECTIFIED.

SYNOPSIS : FLT CREW OF MLG DEPENDED ON AUTO NAVIGATION AND FMC TO ACCOMPLISH CROSSING ALT, BUT EQUIPMENT WAS SLOW TO START DESCENT AND CROSSING RESTRICTION NOT MET.

REFERENCE FACILITY ID : ESL  
 FACILITY STATE : WV  
 DISTANCE & BEARING FROM REF. : 25,,W  
 MSL ALTITUDE : 25000,26100

ACCESSION NUMBER : 192224  
 DATE OF OCCURRENCE : 9110  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : SFO  
 FACILITY STATE : CA  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZOA;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; ALT  
 DEV/EXCURSION FROM ASSIGNED; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
 INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : MLG WITH FMC-EFIS DSNDING INTO SFO FROM  
 IAH. CAPT FLYING, FO PERFORMING ALL OTHER PNF DUTIES. ACFT JUST  
 LEVELED AT 240 AFTER DSCNT FROM FL280. FO 'OFF THE AIR' GIVING  
 FINAL PA ANNOUNCEMENT TO PAX. UPON RETURNING TO THE FREQ, FO HEARD  
 CAPT ACKNOWLEDGE ATC TRANSMISSION FOR CLRNC TO 11000 FT. AUTOPLT  
 WAS ENGAGED THROUGHOUT ENTIRE FLT WITH NAV AND LNAV MODES ENGAGED.  
 UPON CLRNC TO 11000 FT, CAPT POINTS TO ALT SELECTOR WINDOW AND FO  
 SELECTS 11000. THEN FOLLOWED A BRIEF DISCUSSION AS TO FACT THAT  
 FL240 SHOULD BE MAINTAINED UNTIL PASSING A FIX ABOUT 3 MI IN FRONT  
 OF ACFT AT WHICH POINT FO SELECTS FL240 ON ALT SELECTOR ALTHOUGH  
 MOMENTARILY OVERSHOOTING SELECTED ALT TO FL250. DURING THIS TIME,  
 ACFT HAD BEGUN DSCNT FROM FL240 TO ABOUT FL236 AT WHICH TIME  
 AIRSPD DROPPED ABRUPTLY FROM 280 KIAS TO 210 KIAS AND NOSE PITCHED  
 SHARPLY UP TO 15 DEG. ACFT BEGAN RAPID CLB OF ABOUT 2500-3000 FPM  
 AND REACHED 24800 FT, BY THE TIME CAPT DISCONNECTED THE AUTOPLT TO  
 LEVEL ACFT AND BEGIN DSCNT TO APPROPRIATE ALT. THE CAUSE OF THIS  
 UNCOMMANDED CLB WAS NEVER DETERMINED BY CREW AND DID NOT RESULT IN  
 ANY TFC CONFLICT TO OUR KNOWLEDGE. TAKING INTO ACCOUNT THE  
 COMPLEXITY OF THE MLG FMC AND ITS ABILITY TO REVERT AUTOMATICALLY  
 FROM ONE MODE TO ANOTHER AS WELL AS THE HIGH COCKPIT WORKLOAD AT  
 THIS POINT, ONE HAS NO TIME TO TRY AND DIAGNOSE THE REASON BEHIND  
 AN UNWANTED AUTOPLT ACTION AND DISCONNECTION IS THE ONLY PRUDENT  
 ACTION.  
 SYNOPSIS : ACR MLG ALTDEV EXCURSION FROM CLRNC ALT  
 THEN ALT OVERSHOOT WHEN RETURNING TO CLRNC ALT. ALL WITH THE  
 'HELP' OF FMC AND AUTOPLT.  
 REFERENCE FACILITY ID : SFO  
 FACILITY STATE : CA  
 DISTANCE & BEARING FROM REF. : 100,,SE  
 MSL ALTITUDE : 23600,24800

ACCESSION NUMBER : 211600  
 DATE OF OCCURRENCE : 9206  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TRACON,AC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : PBI  
 FACILITY STATE : FL  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : PBI; PBI;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; NON  
     ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : ATC/CTLR; ATC/EQUIPMENT; COCKPIT/FLC;  
 ANOMALY RESOLUTION : FLC RETURNED ACFT TO ORIGINAL CLNC OR  
     INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : TAKING OFF OUT OF PBI. I READ BACK 7000  
     FT 250 KTS. DEP AGAIN GAVE ME THE WHOLE CLRNC. WE WENT THROUGH  
     PROCS (EVERYTHING HAPPENING AT ONCE) WHEN I HIT 'CLB 2' BUTTON  
     COMPUTER DID NOT SWITCH OVER AND REMAINED AT TKOF PWR. FO THOUGHT  
     AUTOTHROTTLES WERE MALFUNCTIONING. WE WERE CLBING LIKE A ROCKET  
     BECAUSE WE WERE VERY LIGHT (PBI-MCO). I CALLED 1000 FT TO GO BUT  
     FO WAS DISTR AND WHEN I REPEATED 7000 FT, HE PUSHED OVER WE  
     BALLOONED TO 7500 FT WHICH DEP BROUGHT TO OUR ATTN. THIS WAS A  
     PROBLEM AGGRAVATED BY ANOTHER CHANGE OF PROC, A NON-STANDARD DEP  
     AND A FLT SYS THAT WAS CAUSING US MORE PROBLEMS THAN IT WAS  
     'LIGHTENING OUR WORKLOAD.'  
 SYNOPSIS : FLC OF ACR LGT ACFT OVERSHOT ALT DURING  
     INITIAL CLB.  
 REFERENCE FACILITY ID : PBI  
 FACILITY STATE : FL  
 DISTANCE & BEARING FROM REF. : 5,,NE  
 MSL ALTITUDE : 7000,7400

ACCESSION NUMBER : 228355  
 DATE OF OCCURRENCE : 9212  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TWR,LC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : JFK  
 FACILITY STATE : NY  
 FACILITY TYPE : ARPT; TRACON; TWR;  
 FACILITY IDENTIFIER : JFK; N90; JFK;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : CONTROLLED FLT TOWARD TERRAIN; ALT  
 DEV/EXCURSION FROM ASSIGNED; NON ADHERENCE LEGAL RQMT/CLNC; NON  
 ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : COCKPIT/FLC; ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR INTERVENED; FLC RETURNED ACFT TO  
 ORIGINAL CLNC OR INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT; OTHER; PROC OR  
 POLICY/COMPANY;  
 NARRATIVE : WE WERE TOLD TO EXPECT A VOR APCH TO  
 22L AT JFK IN EXCELLENT VFR CONDITIONS. AS THE APCH IS NOT IN OUR  
 DATA BASE, WE 'CONSTRUCTED' IT USING VOR/DME FIXES. WE INSERTED  
 ALL FIXES FROM CAPIT (JFK 052/10.0) THROUGH THE MISSED APCH POINT  
 AND ON TO THE MISSED APCH FIX (CHANT). WHEN FIXES ARE INSERTED IN  
 THIS MANNER, OUR DATA DISPLAY IDENTIFIES THEM BY THE VOR AND A NUMERAL  
 (E.G., JFK13, JFK14, JFK15, ETC, WITH JFK 13 BEING CAPIT, JFK 14  
 WUGAL, ETC). THE APCH WAS BRIEFED AND FLOWN AS PER COMPANY POLICY  
 WITH 1 PLT DISPLAYING RAW DATA. WE WERE RADAR VECTORED ONTO FINAL  
 AND CLRED FOR THE APCH TO CROSS RUSHY AT OR ABOVE 1400 FT MSL.  
 APCHING THE FINAL FIX IS A VERY BUSY PART OF THE APCH. IN THIS  
 HIGH WORKLOAD ENVIRONMENT, I MISIDENTIFIED JFK14 (WUGAL) AS JFK15  
 (RUSHY) AND BEGAN MY DSCNT FROM 1400 FT TO 600 FT AT WUGAL. I WAS  
 ATTEMPTING TO XCHK MY POS WITH RAW DATA, BUT WAS HAVING DIFFICULTY  
 FOCUSING ON THE TINY NUMBERS ON THE COMMERCIAL APCH CHART. THE PNF  
 ALSO MISIDENTIFIED THE FIX. WE NOTICED THAT THE APCH LOOKED VERY FLAT  
 AND LEVELED ABOUT 900 FT MSL. VERY SHORTLY AFTER LEVELING, THE TWR  
 ISSUED A LOW ALT ALERT. AFTER LNDG, WE DISCUSSED THE APCH TO TRY  
 TO FIGURE OUT WHY THE LOW ALT ALERT HAD BEEN ISSUED. WE THEN  
 REALIZED WE HAD BEGUN OUR DSCNT FROM 1400 FT AT WUGAL AND CROSSED  
 RUSHY ABOUT 900 FT. WE MAINTAINED 900 FT UNTIL INTERCEPTING A  
 VISUAL GS AND WE CROSSED THE 3 DME FIX ABOVE 600 FT. LESSONS: THE  
 WORKLOAD IN A 2-MAN, HI-TECHNOLOGY AIRPLANE CAN GET VERY, VERY  
 HIGH AT TIMES -- ESPECIALLY ON APCH. WE MUST ALWAYS KEEP THIS IN  
 MIND WHEN PLANNING AND TAKE ALL POSSIBLE STEPS TO MINIMIZE  
 CONFUSION. IN THE FUTURE I WILL CAREFULLY ANNOTATE COMMERCIAL APCH  
 CHARTS WITH NICE, BIG, EASY-TO-SEE-IN-DIM-COCKPITS NUMBERS. I  
 WOULD LIKE TO SEE OUR DATA SYS CHANGED SO WE CAN GET BETTER FIX  
 NAMES. JFK14 IS NOT VERY USEFUL. FORTUNATELY, WE WERE VISUAL AT  
 ALL TIMES AND NO HARM WAS DONE, BUT PLTS, ATC CTLRS, ENGINEERS,  
 MGRS, ETC, MUST REALIZE HOW BUSY A 2- MAN COCKPIT CAN GET AND DO  
 EVERYTHING THEY CAN TO REDUCE THE WORKLOAD AT CRITICAL TIMES.  
 SYNOPSIS : AN ACR LGT CREW WITH A 'GLASS COCKPIT'  
 ATTEMPTED TO BUILD A VOR APCH IN THEIR FMC. THEY DSNDED BELOW THE  
 PUBLISHED PROFILE.  
 REFERENCE FACILITY ID : JFK



(REPORT CONTINUED)

FACILITY STATE : NY  
DISTANCE & BEARING FROM REF. : 7,232  
MSL ALTITUDE : 900,1400

**FURTHER AUTOMATION ISSUES - INCOMPLETE NAVIGATIONAL DATABASE**

ACCESSION NUMBER : 128735  
 DATE OF OCCURRENCE : 8911  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : DXO  
 FACILITY STATE : MI  
 FACILITY TYPE : ARTCC;  
 FACILITY IDENTIFIER : ZOB;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : ALT DEV/UNDERSHOOT ON CLB OR DES; ALT  
 DEV/XING RESTRICTION NOT MET; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/ANOMALY ACCEPTED;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : TOLD TO CROSS 60 MI W OF FNT AT FL230.  
 FNT WAS NOT ON OUR ROUTE, NOR HAD TI BEEN PROGRAMMED INTO THE FMC.  
 BY THE TIME WE HAD PROPERLY PROGRAMMED THE FMC, WE WERE ONLY ABLE  
 TO DSND TO 23900' AT 60 ME W OF FNT. FLT PLAN HAD US FILED TO A  
 POINT FORMED BY V450 AND THE DXO 342 DEG R, THEN DIRECT POLAR. THE  
 POINT FORMED BY V450 AND THE DXO 342 DEG R WAS NOT PROGRAMMED IN  
 THE FMC DATA BASE. WHEN I INSERTED THE ORIGINAL ROUTE, I SKIPPED  
 THE POINT, INTENDING TO FIGURE THE PROPER PROGRAMMING WHILE ENRTE,  
 AND THEN FORGOT ABOUT IT. TO CORRECT BOTH THESE SITUATIONS, I  
 WOULD RECOMMEND THAT ON AUTOMATED COCKPITS, THE NECESSARY  
 CHKPOINTS BE IN THE FMC DATA BASE, OR ATC NOT USE POINTS NOT  
 PROGRAMMED INTO THE DATA BASE. ALSO, BOTH THESE SITUATIONS COULD  
 HAVE BEEN PREVENTED IF WE HAD NOT DEPENDED SO MUCH ON THE  
 AUTOMATION AND GONE BACK TO BASIC FLYING.  
 SYNOPSIS : ACR LGT ALT DEVIATION UNDERSHOT ALT  
 CROSSING RESTRICTION BECAUSE FIX WAS NOT IN THE FMC.  
 REFERENCE FACILITY ID : DXO  
 FACILITY STATE : MI  
 DISTANCE & BEARING FROM REF. : 60,342  
 MSL ALTITUDE : 23000,23900

ACCESSION NUMBER : 195280  
 DATE OF OCCURRENCE : 9111  
 REPORTED BY : FLC; FLC; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TWR,LC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : PIE  
 FACILITY STATE : FL  
 FACILITY TYPE : ARPT; TWR;  
 FACILITY IDENTIFIER : PIE; PIE;  
 AIRCRAFT TYPE : MLG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; RWY  
 TRANSGRESS/OTHER; NON ADHERENCE LEGAL RQMT/CLNC;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/DETECTED AFTER-THE-FACT;  
 ANOMALY CONSEQUENCES : NONE;  
 NARRATIVE : WE WERE CLRED FOR TKOF ON RWY 35R AT  
 PIE. WE MISTAKENLY LINED UP FOR AND DEPARTED ON RWY 4. TKOF WAS  
 UNEVENTFUL, BUT WE REALIZED OUR ERROR WHEN WE NOTICED OUR DEP HDG  
 WAS WRONG. I FEEL THE FOLLOWING FACTORS CONTRIBUTED TO THIS  
 INCIDENT: 1) WE WERE ON A CHARTER FLT, OPERATING OUT OF AN  
 OFF-LINE ARPT. BECAUSE OF THIS THE ARPT WAS NOT IN THE ACFT'S FLT  
 MGMNT COMPUTER DATA BASE, NECESSITATING A CHANGE IN OUR NORMAL  
 PROC OF ENTERING THE TKOF RWY IN THE COMPUTER FOR A VISUAL  
 DEPICTION ON OUR EFIS DISPLAY. THIS ALSO CHANGED OTHER ACFT PROCS  
 AND DISPLAYS, WHICH CAUSED A DISTR TO MY NORMAL HABIT PATTERNS. 2)  
 THE FACT THAT THE APCH ENDS OF RWY 4 AND 35R ARE VERY CLOSE TO ONE  
 ANOTHER. THE LESSON I HAVE LEARNED FROM THIS ISN'T A NEW ONE. NO  
 MATTER HOW TECHNICALLY ADVANCED YOUR ACFT IS, NEVER FORGET THE  
 BASICS. THE OLD HABIT OF CHKING THE HDG WHEN LINED UP ON THE RWY  
 FOR TKOF SHOULD NOT BE REPLACED BY CHKING THE FANCY DISPLAYS FOR  
 PRETTY PICTURES. ALSO, WHEN THINGS ARE OUT OF THE ORDINARY AND  
 DISTRS ARE POSSIBLE, SLOW DOWN AND DOUBLECHK YOURSELF.  
 SYNOPSIS : ACR MLG WRONG RWY TKOF.  
 REFERENCE FACILITY ID : PIE  
 FACILITY STATE : FL  
 AGL ALTITUDE : 0,0

ACCESSION NUMBER : 198783  
 DATE OF OCCURRENCE : 9112  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,DC;  
 FLIGHT CONDITIONS : IMC  
 REFERENCE FACILITY ID : SNA  
 FACILITY STATE : CA  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : SNA; SNA;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : ALT DEV/OVERSHOOT ON CLB OR DES; SPEED  
 DEVIATION; OTHER;  
 ANOMALY DETECTOR : COCKPIT/FLC;  
 ANOMALY RESOLUTION : NOT RESOLVED/ANOMALY ACCEPTED;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : PROC OR POLICY/ATC FACILITY; PROC OR  
 POLICY/ARPT; PROC OR POLICY/COMPANY;

NARRATIVE : MAX PWR 1.42 EPR TKOF WAS MADE USING  
 THE AUTOTHROTTLE. FLT DIRECTOR WAS OFF BECAUSE NORMAL TKOF PITCH  
 COMMAND OF 17.5 DEGS WAS BELOW THE QUIET PROFILE TARGET PITCH OF  
 25 DEGS REQUIRED TO MAINTAIN V2+15. AT APPROX 800 FT ON THE  
 SPECIAL SNA NOISE ABATEMENT PROFILE, A SPECIAL PRESELECTED QUIET  
 CLB #2 EPR OF 1.25 USING THE TMSP THRUST MODE SELECTOR PANEL IS  
 MANUALLY PUSHED BY THE PNF TO COMMAND THE AUTOTHROTTLE TO  
 AUTOMATICALLY SET THAT PWR. THE PF NEEDS TO IMMEDIATELY LOWER THE  
 PITCH FROM 25 DEGS TO 15 DEGS TO STAY ON PROFILE AND MAINTAIN  
 V2+15 AND CONTINUES THE SID DEP CLB TO 3000 FT AS ASSIGNED BY ATC.  
 IN ADDITION TO THESE NONSTANDARD PWR AND PITCHES, YOU ARE TO TRACK  
 OUTBOUND ON THE BACK COURSE LOC TO THE 1 DME FIX AND TURN TO THE  
 175 DEG HDG. IT WAS A DARK AND STORMY NIGHT. THE CAPT REACHING  
 ACROSS THE COCKPIT IN TURB PUSHED THE WRONG BUTTON ON THE  
 TMSP/AUTOTHROTTLE. THE LARGE REDUCTION IN PWR FROM MAX 1.42 TO  
 QUIET 1.25 DID NOT TAKE PLACE. NORMAL CLB PWR OF 1.35 WAS SET AND  
 CRZ WAS DISPLAYED ABOVE THE EPR SYMBOL ON THE EICAS ENG INDICATING  
 CAUTION ADVISORY SYS. AT QUIET PROFILE PITCH OF 15 DEGS THE AIRSPD  
 AND RATE OF CLB BECAME EXCESSIVE. PWR WAS FIRST MANUALLY REDUCED  
 AND THEN MANUALLY DISCONNECTED USING THE AUTOTHROTTLE DISCONNECT  
 BUTTON, WHICH CAUSED A WARNING ON THE MASTER CAUTION AND EICAS  
 SYS. WITH LITTLE OR NO TIME FOR RECOGNITION, REACTION, OR  
 RECOVERY, WE HAD OUR HANDS FULL TRYING TO MAKE THE LEVEL OFF AT  
 3000 FT AT AN AIRSPD BELOW 250 KTS. CREW PROFICIENCY IS DIFFICULT  
 IN A PROFILE THAT IS RADICALLY DIFFERENT FROM STANDARD. THERE IS  
 NO ROOM FOR ERROR UNDER NORMAL CONDITIONS AND IS UNSAFE IN  
 ABNORMAL SITUATIONS. UNDER NONSTANDARD PROCS, THE AUTOMATED SYS  
 WERE NEVER DESIGNED FOR, WORKLOAD IS INCREASED. I WOULD RECOMMEND  
 ONLY MINOR CHANGES TO THE NORMAL TKOF PROFILE OR FLY THE ENTIRE  
 PROC USING RAW DATA WITH ALL AUTOMATED SYS MANUALLY SET. I HAVE  
 ALMOST A YR ON THE LGT AND ALMOST 2 YRS ON ANOTHER ACFT BEFORE  
 THAT. THE AUTOMATION IS GREAT UNDER NORMAL CONDITIONS AND WORKS  
 WELL WHEN YOU HAVE THE TIME TO MONITOR. WHEN THERE ISN'T THE TIME  
 TO MONITOR, YOU NEED TO FLY THE AIRPLANE WITHOUT DELIBERATELY  
 TRYING TO OVERRIDE SYS THAT WERE NEVER DESIGNED TO PERFORM THESE  
 NONSTANDARD TKOF PROFILES.

SYNOPSIS : FLC OF ADVANCED LGT EXCEEDED SPDS,  
 ALTS, AND PWR SETTINGS ON SNA NOISE ABATEMENT SID.

(REPORT CONTINUED)

REFERENCE FACILITY ID : SNA  
FACILITY STATE : CA  
DISTANCE & BEARING FROM REF. : 1,,SO  
AGL ALTITUDE : 1000,3000

ACCESSION NUMBER : 200768  
 DATE OF OCCURRENCE : 9202  
 REPORTED BY : FLC; ; ;  
 PERSONS FUNCTIONS : FLC,FO; FLC,PIC.CAPT; TRACON,DC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : PHX  
 FACILITY STATE : AZ  
 FACILITY TYPE : TRACON; ARPT;  
 FACILITY IDENTIFIER : PHX; PHX;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
 LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : NOT RESOLVED/DETECTED AFTER-THE-FACT;  
 ANOMALY CONSEQUENCES : FLC/ATC REVIEW;  
 NARRATIVE : COPLT FOR LGT BUCKEYE 9 SID RWY 8L AT  
 KPHX. ACFT HAD JUST GOTTEN AIRBORNE, WAS ON AUTOPLT AND IN MANAGED  
 (COMPUTER) NAV. PROBLEM: ACFT TURNED 4 NM E OF KPHX (RWY) VICE 4  
 NM E OF PXR (VOR) TO 190 DEG HDG AS REQUIRED BY SID. OBVIOUS  
 MISTAKE, CTLR QUESTIONED TURN, IMMEDIATE INVESTIGATION BY PLTS SAW  
 ERROR AND MADE APOLOGY. CTLR REPLIED 'NO PROBLEM' IN THE FUTURE  
 USE PXR VICE PHX FOR REFING TURN TO S. REST OF SID FLOWN WITHOUT  
 INCIDENT. IN RECONSTRUCTION OF WHY COMPUTER NAV MADE TURN, ONLY  
 CONCLUSION DRAWN WAS THAT DATABASE WHEN SELECTING BUCKEYE 9 SID AT  
 KPHX, PROVIDED ALL POINTS AND COURSE LEGS BUT PXR NAV POINT WAS  
 NOT IN FLT MGMNT CTL UNIT FLT PLAN PAGE AS A POINT. REASON FOR  
 OMISSION IS UNKNOWN. NAV DISPLAY 'LOOKED' CORRECT (PLAN FORM) WHEN  
 VISUALLY COMPARED TO COMMERCIAL CHART. IN FACT, TURN OCCURRED SO  
 QUICK THAT PROPER REFING TO VOR (RAW DATA) WAS NOT DONE. ACFT FLEW  
 WHAT WAS IN THE COMPUTER BUT WHAT WAS IN THE COMPUTER (FLT PLAN)  
 WAS WRONG. AGAIN REASON FOR OMISSION OF PXR POINT IS UNKNOWN.  
 FUNDAMENTALLY, LGT AIR CREWS ONLY HAVE TO BE ABSOLUTELY 100% SURE  
 THAT EACH LEG OF FMC FLT PLAN IS CORRECT FROM 'POINT TO NEXT  
 POINT.' NO SAFETY OF FLT CONCERN AROSE FROM THIS SITUATION.  
 SYNOPSIS : ACR ACFT WITH AUTOMATED COCKPIT TURNS  
 EARLY ON SID. CTLR CATCHES ERROR.  
 REFERENCE FACILITY ID : PHX  
 FACILITY STATE : AZ  
 DISTANCE & BEARING FROM REF. : 4,,E  
 MSL ALTITUDE : 1000,1000

ACCESSION NUMBER : 210639  
 DATE OF OCCURRENCE : 9205  
 REPORTED BY : FLC; ;  
 PERSONS FUNCTIONS : FLC,PIC.CAPT; FLC,FO; TRACON,AC;  
 FLIGHT CONDITIONS : VMC  
 REFERENCE FACILITY ID : MEM  
 FACILITY STATE : TN  
 FACILITY TYPE : ARPT; TRACON;  
 FACILITY IDENTIFIER : MEM; MEM;  
 AIRCRAFT TYPE : LRG;  
 ANOMALY DESCRIPTIONS : TRACK OR HDG DEVIATION; NON ADHERENCE  
 LEGAL RQMT/CLNC; NON ADHERENCE LEGAL RQMT/PUBLISHED PROC;  
 ANOMALY DETECTOR : ATC/CTLR;  
 ANOMALY RESOLUTION : CTLR ISSUED NEW CLNC; FLC RETURNED ACFT  
 TO ORIGINAL CLNC OR INTENDED COURSE;  
 ANOMALY CONSEQUENCES : NONE;  
 SITUATION REPORT SUBJECTS : ACFT EQUIPMENT;  
 NARRATIVE : THIS EVENT INVOLVES A FEELING OF  
 COMPLACENCY BROUGHT ON BY THE LATEST GENERATION OF HIGHLY  
 AUTOMATED, GLASS- COCKPIT AIRPLANES (IN THIS CASE, AN LGT). THE  
 CAPABILITY TO FULLY PROGRAM COMPLEX PROCS (SIDS, STARS,  
 TRANSITIONS, APCHS) CAN LEAD TO A PERCEPTION ON THE PART OF THE  
 FLC THAT THE FLT MGMT SYS, ONCE PROGRAMMED, WILL FOLLOW A  
 PARTICULAR PROC FULLY AND COMPLETELY. OUR FLT INVOLVED AN ARR TO  
 MEMPHIS INTL. WE WERE CLRED FOR A 'MIDDY 8' (ARR FROM OVER PXU).  
 WE HAD DSNDND TO 10000 FT AT 'MIDDY' INTXN. THE ATIS INDICATED  
 APCHS IN PROGRESS TO 36L, 36R, AND 27. AFTER SOME DISCUSSION WITH  
 THE CTLR, WE WERE TOLD TO EXPECT AN ILS TO 36R. OUR PARTICULAR  
 PROBLEM AROSE IN THAT AS WE APCHED 'CLARK' INTXN (8 DME FROM MEM)  
 WE WERE NOT AWARE OF OUR NEED TO TURN TO A 175 DEG HDG FOR LNDG TO  
 THE N. ONE REASON FOR THIS WAS THAT WE WERE IN THE MIDST OF A  
 COCKPIT BRIEFING AND AN APCH CHKLIST FOR AN AUTOLAND TO 36R. BUT  
 THE MAJOR REASON FOR OUR LACK OF AWARENESS WAS OUR PRESENTATION OF  
 THE MIDDY ARR ON OUR DISPLAY UNIT'S (MCDU) FLT PLAN PAGE. THE  
 WAYPOINTS DISPLAYED WERE: MIOLA, MIDDY, H226 MANUAL, ----- FLT  
 PLAN DISCONTINUITY. THAT IS, AFTER 'MIDDY' INTXN, OUR FMS HAD US  
 FLYING A HDG OF 226 DEG (INDICATED BY 'H226 MANUAL') WITH NO  
 MENTION BEING MADE OF 'CLARK' INTXN, OR THE REQUIRED TURN TO 175  
 DEG. OUR SENSE OF 'AUTOMATED COMPLACENCY' LEAD US TO BELIEVE THAT  
 A HDG OF 226 DEG WAS CORRECT AS WE BUSIED OURSELVES WITH APCH  
 BRIEFINGS AND CHKLISTS. WE THUS FLEW PAST 'CLARK' INTXN UNTIL  
 ROUGHLY 6 DME FROM MEM, WHEN THE CTLR REALIZED WE HAD NOT TURNED  
 AND TOLD US WE SHOULD BE ON A HDG OF 175 DEG. WE THEN TURNED,  
 CHKD THE CHART, AND REALIZED WE HAD, IN FACT, MISSED THE TURN  
 POINT. WE KNOW THAT THE CHART IS THE GOSPEL AND THAT THE FMS  
 SHOULD ALWAYS BE VERIFIED AGAINST THE CHARTS, YET WE ALLOWED  
 OURSELVES, DURING A BUSY WORK PERIOD, TO FULLY TRUST THE AUTOMATED  
 SYS, WHICH WE ERRONEOUSLY ASSUMED WAS COMPLETE AND CORRECT. THIS  
 BRINGS UP 2 POINTS REGARDING HIGHLY-AUTOMATED SYSTEMS: WHY WAS  
 'CLARK' INTXN NOT IN THE DATA BASE PROGRAM? BECAUSE OF CAPACITY  
 CONSTRAINTS? IF SO, WHY NOT INCREASE CAPACITY? IT SEEMS TO CREATE  
 CONFUSION WHEN SOME, BUT NOT ALL, INTXNS ARE INCLUDED IN PROCS.  
 SYNOPSIS : AN ACR LGT CREW, WITH ALL OF THE MOST  
 ADVANCED FLT GUIDANCE EQUIP, FAILED TO FLY A STAR AS PUBLISHED.  
 REFERENCE FACILITY ID : MEM

(REPORT CONTINUED)

FACILITY STATE : TN  
DISTANCE & BEARING FROM REF. : 8,46  
MSL ALTITUDE : 10000,10000