Runway Transgressions at Non-Towered and Tower-Closed Airports

July 14, 2003

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EXECUTIVE SUMMARY

The FAA asked the Aviation Safety Reporting System (ASRS) to undertake a "structured callback" study on runway transgression incidents recently reported to the program as having occurred at a non-Towered or Tower-closed airport. A structured callback study is a detailed telephone interview based on a standardized questionnaire. The purpose of the study was to expand the FAA's knowledge of the factors associated with non-Towered airport runway transgressions. The FAA also requested a similar study on runway transgression incidents at Towered airports. A separate document reports the findings from that study.

The ASRS interviewed 51 pilots between September 2000 and August 2001 whose reported incidents met the study criteria for aircraft/aircraft or aircraft/vehicle transgressions. No non-Towered aircraft/pedestrian events were reported during this period. Twenty-two of the respondents were pilots of single-crew aircraft and fourteen were pilots of multi-crew aircraft. The majority of respondents represented General Aviation operators, with air carrier, air taxi, commuter, and corporate operators also included. ASRS subsequently analyzed the study data and developed baseline profiles from the ASRS database.

ASRS Database Baseline Data Findings

Approximately one non-Towered runway transgression event is reported to ASRS for every six events at a Towered airport. ASRS received 627 total reports describing runway transgression events at non-Towered and Tower-closed airports between 1990-2001. Over this 11-year period, the number of ASRS database reports of transgression incidents at airports without an operating Control Tower decreased slightly, in spite of an increase in total reporting to ASRS.

ASRS Structured Callback Study Findings

Respondents were generally experienced pilots who were familiar with the airport at which the transgression occurred. The average and median flight hours for the reporting group were 3,351 and 1,740 hours, respectively. More than 70 percent of the reporters had flown into the airport at which the transgression occurred 5 times or more, and 51 percent had done so within a week prior to the incident. A large majority (82 percent) of respondents described the airport activity level as being "low" to "moderate" at the time of their incident.

Each respondent was asked to assess the severity of the reported transgression event on a scale of 1 to 5, with 1 being "Not Hazardous" and 5 being "Very Hazardous." Seventy-two percent of the study respondents evaluated their incidents in the 1-3 severity range ("low" to "moderate" severity), while the remaining rated their events in the 4-5 severity range (higher severity). This distribution of responses is identical to that for the Towered runway transgression structured callback study.

Respondents were asked what sources alerted them to the runway transgression. Information received by radio (UNICOM, CTAF, etc.) provided an alert in 26 percent of the incidents. Communication from other pilots, and pilots' visual observations were additional alerting sources. In 35 percent of incidents, the pilot was not alerted to the conflict by any source.

More than half of the non-Towered runway transgressions occurred at airports with an intersecting runway or parallel/intersecting runway configuration. Almost three-fourths of the non-Towered incidents involved traffic operations at airports where a single runway was in use, generally because of wind direction or runway use by other traffic. Wind direction was twice as likely to influence pilots' choice of a runway for takeoff or landing as traffic flow.

A geographical or topographical obstruction to pilots' line of sight was a factor in almost 40 percent of the runway transgression events. Runway slope, trees, and rising terrain were the most frequently cited obstructions to vision.

Training activity was taking place in 25 percent of the non-Towered transgression incidents. This most frequently involved training for a rating or proficiency practice.

A large majority of the pilots interviewed felt comfortable with non-Towered airport communication procedures, but alleged that other pilots did not communicate their positions clearly (in 53 percent of incidents) or seemed confused about the proper frequency (12 percent of incidents). Lack of situational awareness was the factor most frequently identified by pilots as contributing to the non-Towered runway transgression event.

Respondents suggested that new technology could help alleviate pilot problems commonly experienced at non-Towered airports. These problems include difficulty identifying the active runway and inability to detect other aircraft on runways with pronounced slopes. The pilots interviewed also suggested practical expedients, such as installing signs at runway ends specifying the CTAF for the airport and the preferred runway.

INTRODUCTION

Since 1990 the FAA has initiated a series of action plans and initiatives to address the problem of runway safety, especially the problem of runway transgressions. Simply stated, a runway transgression occurs when an aircraft, vehicle, or pedestrian encroaches on an active runway while it is being used by another aircraft to land or take off.

The analysis of runway transgression data is a necessary step towards developing approaches that will identify emerging runway safety issues and aid the development of timely and cost-effective prevention measures. The FAA has gathered extensive information on the types and severity of runway transgressions at Towered airports,[1] but has limited access to information on transgression events at non-Towered and Tower-closed airports.

In the light of this information gap, the FAA asked NASA's Aviation Safety Reporting System (ASRS) to undertake a "structured callback" study of runway transgression events at non-Towered and Tower-closed airports. An ASRS structured callback study involves the conduct of detailed telephone interviews by expert aviation analysts with individuals who have submitted a relevant incident report to ASRS and agree to answer supplemental questions about the incident. The information collected is treated confidentially, and any details that can identify an individual or organization are removed prior to data analysis.

Structured callback studies are an ASRS research tool for identifying and exploring the common factors that underlie a group of incidents. Through the telephone callback mechanism it is possible to obtain enhanced information about the factual details surrounding an incident, as well as subjective information that might otherwise remain unknown, such as reporters' decisions, practices and attitudes.

The ASRS expert analyst group consists of experienced pilots and air traffic controllers. Their years of experience are measured in decades and cover the full spectrum of aviation activity: air carrier, military, and general aviation; and Air Traffic Control in Towers, TRACONS, Centers, and Military Facilities.

DEFINITIONS

Runway Transgression

The FAA and ASRS definitions of a runway transgression reflect the unique missions of these organizations.

FAA Runway safety is managed according to rigorous protocols that pilots and air traffic controllers use to control aircraft on runways at all times. The FAA definition of a runway transgression supports the agency's safety management and enforcement goals. A runway transgression is defined by the FAA as follows:

> **"Any occurrence at an airport involving an aircraft, vehicle, or person on the ground that creates a collision hazard or results in a loss of required separation with an aircraft taking off, intending to take off, landing, or intending to land."** [2]

ASRS The ASRS focuses on the collection and analysis of voluntarily reported operational data. The data collected are used to identify deficiencies in the National Aviation System and examine human performance within the aviation system. The ASRS's interest in the events and conditions that lead to human performance decrements are reflected in its definition of a runway transgression:

> **"Any erroneous or improper occupation of a runway or its immediate environs by an aircraft or other vehicle so as to pose a potential collision hazard to other aircraft that could be using the runway, even if no such other aircraft are actually present."**

In this study, the FAA Office of Runway Safety concurred with the application of the ASRS definition of a runway transgression as the basis for incident report selection.

1 *FAA Runway Safety Report: Runway Transgression Severity Trends at Towered Airports in the United States*, 1997-2000. Federal Aviation Administration Office of Runway Safety, June 2001.
2 *FAA Runway Safety Report, p.5.*

Conflicts and NMACs

References to conflicts and NMACs in this report are based on the following criteria:

Conflict/Ground Critical: Severe collision hazard exists as evidenced by a) emergency evasive action, or b) flight crew statement. Where two aircraft are involved (vs. a ground vehicle or pedestrian), one aircraft may be airborne.

Conflict/Ground Less Severe: A collision hazard exists but the conflict could be resolved with less than immediate reaction.

Conflict/Airborne Less Severe: An estimated conflict of 500 or more feet separation both horizontally and vertically between two or more aircraft.

Near Mid-Air Collision (NMAC): An estimated conflict of less than 500 feet separation both horizontally and vertically between two or more aircraft. The ASRS and FAA definitions of an NMAC are identical.

OBJECTIVES

This study has three purposes:

- Develop baseline ASRS database profiles of runway transgression frequency at non-Towered airports.
- Improve the understanding of event dynamics and factors underlying runway transgressions that occur at Non-Towered and Tower-closed airports.
- Present findings in a manner that supports ongoing FAA efforts to address the causal factors of runway transgressions and reduce the risk of pilot operations at non-Towered and Tower-closed airports.

APPROACH

Scope

To be included in the study, an incident was required to meet the following criteria:

- Occurred at a non-Towered or Tower-closed airport;
- Involved an aircraft (or vehicle) that entered, or crossed the hold line of, an active or occupied runway;
- Involved a reporter willing to participate in the study.

The FAA also expressed an interest in reports deemed to be rich in descriptive detail and involving potential criticality. With these additional criteria in mind, ASRS analysts attempted to select reports that fully met both sets of criteria. As a result of the report selection process, the study set of incidents may not be representative of all non-Towered and Tower-closed runway transgressions received during this time period.

Structured Callback Instrument

In the late fall of 2000 ASRS began identifying candidate reports from its incoming report flow and developing a questionnaire for the conduct of "structured callback" telephone interviews. A FAA document detailing the Airport Surface Movement Area (SMA) hazard classification system was used as a resource for development of questions pertaining to topographical and geographical hazards, weather factors, unsafe acts, equipment problems, and procedural issues.[3]

During the questionnaire development phase, ASRS also undertook significant outreach efforts to obtain aviation community input. Representatives of organizations including the Airplane Owners and Pilot Association (AOPA), National Business Aircraft Association (NBAA), National Air Traffic Controllers Association (NATCA), Air Line Pilots Association (ALPA), Regional Airlines Association (RAA), the FAA Office of System Safety, and other aviation and government groups were contacted and asked to review and comment on successive callback questionnaire drafts. These aviation organizations were further requested to disseminate ASRS's request for input to their members and constituents. The collective suggestions of these aviation industry groups were incorporated in the final callback questionnaire. Appendix A contains the callback questionnaire form used for this study.

3 *"Airport Surface Movement Area Data Analysis* (v.2)*,"* Federal Aviation Administration, Office of System Safety, June 2001 (Slide Presentation).

Data

Over the six-month period from September 2000 to August 2001, fifty-one qualifying incident reports were selected as the basis for callback interviews. Forty-nine incidents involved aircraft-to-aircraft transgressions and two incidents involved aircraft-to-vehicle transgressions. ASRS was not able to contact some reporters who had submitted qualifying incidents. However, all reporters that ASRS succeeded in contacting agreed to participate. The reputation of the ASRS in protecting reporter confidentiality was the key factor in this high response rate.

ASRS analysts manually recorded information on question forms as they conducted the telephone interviews with reporters. The data from each structured callback interview was entered into a database for further tabulation and analysis. Appendix B contains a comprehensive data summary for all the questions in the study.

Reports versus Citations

The questionnaire for this study allowed either single (mutually exclusive) or multiple responses to questions. For questions that allowed only one response, the number of total responses is always equal to the total number of unique incident reports, or individual reporters, that provided information on that topic. For questions that allowed multiple responses, findings are described as "citations" and are expressed as the total number of responses for that question. In text references to figures and charts, the number of unique reports on which an observation is based is expressed as (n=x).

Primary versus Secondary Aircraft

In this report, use of the term "primary" aircraft refers to the reporter's aircraft. Use of the term "secondary" aircraft refers to involved aircraft other than the reporter's aircraft.

FINDINGS

ASRS Database Runway Transgression Reports

In addition to the structured callback effort, ASRS extracted runway transgression data from its database that was complementary to data presented in the FAA's Runway Safety Report. Table 1 presents 11 years of ASRS data for runway transgressions for Towered and Non-Towered airports, collectively. Approximately one non-Towered or Tower-closed runway transgression event is reported to ASRS for every six events at a Towered airport. Over the 11-year period from 1990 to 2000, ASRS Database records of runway transgression events at non-Towered airports decreased slightly.

Table 1
ASRS Database Runway Transgression Reports

Year[1]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Total
Towered Airports[2]	403	367	254	249	270	351	235	306	288	421	456	45	**3645**
Non-Towered Airports[3]	76	85	51	67	44	67	44	37	39	42	54	21	**627**
1. ASRS runway transgression data for 2001 are incomplete. 2. Total runway transgressions in ASRS Database with Controller involvement (Local / Ground) 3. Total runway transgressions in ASRS Database with NO Controller involvement (Local / Ground)												**Total**	**4272**

ASRS also extracted database information on the numbers of runway transgression events at each non-Towered airport listed in the database for the four-year period, 1997-2000. Appendix C presents a listing of runway transgressions for this period, with a breakdown by state and airport location.

Reporter and Mission Information

The fifty-one reports used in the callback effort spanned incident dates from September 2000 through August 2001. There were 22 reports from pilots of single-crew aircraft and 14 reports from pilots of multi-crew aircraft. The multi-crew reporter positions consisted of 11 Captains and 3 First Officers. One report was submitted by a Ramp Supervisor.

The majority of reporters represented General Aviation operators (36 reports), with 5 Air Carrier, 4 Corporate, 3 Air Taxi, 2 "Other," and 1 Commuter operator. The mission types flown were most frequently for pleasure and training (32 of 51 reports). There were no multiply-reported incidents (i.e., more than one report of a single event).

Reporter's Severity Assessment

The FAA has developed formal methods of categorizing the relative margin of safety in reported runway transgression events occurring at Towered airports.[4] This process involves detailed reconstruction of individual events and application of defined classification schemes to capture the spectrum of severity.

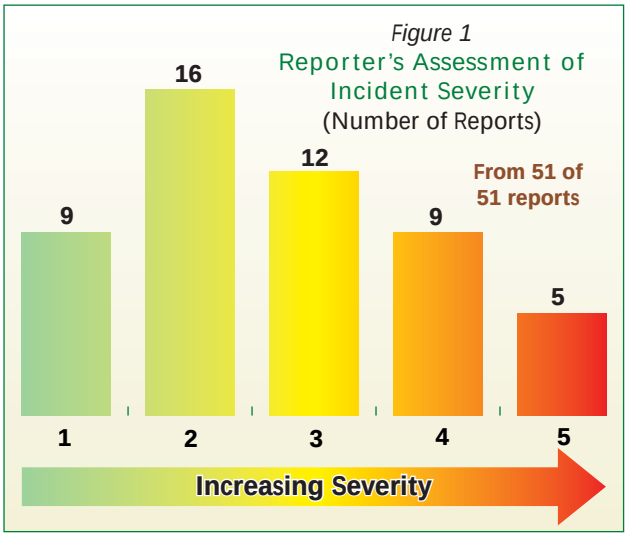
Formal safety estimation methods were beyond the scope of the ASRS study. However, participating reporters were given an opportunity to provide a subjective assessment of the severity of the event in which they were involved. Each reporter was asked the following question:

"On a scale of 1 to 5, with 1 being 'Not Hazardous' and 5 being 'Very Hazardous,' rate the severity of this event."

As shown by Figure 1, seventy-two percent (n=37) of the study reporters evaluated their incident toward the mid- to low end of the severity scale, while the remaining (n=14) assessed their events as higher severity. This general distribution of responses is identical to that for the ASRS Towered runway transgression structured callback study.

Appendix D presents a synopsis for each study report.

Figure 1
Reporter's Assessment of Incident Severity
(Number of Reports)



4 *FAA Runway Safety Report,* p. 8.

ASRS Severity Profiles

The following examples drawn from the ASRS Non-Towered Runway Transgressions data set will help to illustrate the reporters' subjective severity ranges for the events reported.

Profile 1 ..... (Reporter Severity Assessment = 1)

This incident meets the ASRS definition of a runway transgression, but the reporters' assessment is that there is little or no chance of aircraft collision.

Report Narrative

"I was getting ready to depart UIN and a Beech Baron radioed the field stating he had an electrical failure. A Cessna 310 was flying in the area practicing approaches to Runway 04 and he was asked to visually look at the Baron to confirm gear down in the air, and I was asked to taxi to a position off… Taxiway D on Runway 36 so I could watch him on a low pass…. I am on [Runway] 36 pointed towards the active Runway 13 watching the Baron. He landed safely and after I confirmed he was off the active and the 310 was gone and no other aircraft were around, I announced I would be taxiing to 13 for an intersection takeoff. I looked and observed a Piper Cherokee on final [for Runway 13]. I stopped my taxi about 100 yards short of Runway 13 and waited for the plane to land and clear. He never once used the radio to self-announce and as his plane was white and the sky was hazy, he was hard to see until he was on short final." (ACN 501398)

Profile 2 ..... (Reporter Severity Assessment = 2)

In this example, the reporter apparently misjudges traffic spacing, but believes there was little chance for a collision because there was adequate separation and both aircraft were aware of, and could see each other.

Report Narrative

"I taxied from ramp to run-up…a Twin Otter was on final for Runway 29. I proceeded with my run-up then taxied to the hold short lines. The Twin Otter called his position as Clam Cove for Runway 29. At that point the FSS person asked me if I was going to takeoff in front of the Otter or wait for him to land. I took this as an indication that enough separation existed for me to depart. I visually checked final…the Otter appeared to be at least 3 miles out. When I taxied [onto the runway] for departure the pilot of the Otter said he had to make a left turn for spacing…." (ACN 509803)

Profile 3 ..... (Reporter Severity Assessment = 3)

A severity assessment of 3 indicates that the reporter thinks there is a moderate potential for collision. In this instance, traffic landed in opposite directions on the same runway, and the other involved aircraft allegedly did not display position or anti-collision lights.

Report Narrative

"The AWOS broadcast gave winds favoring Runway 6. The CTAF was so crowded that transmissions were impossible to understand. The windsock was showing wind direction variable, but I think still favoring Runway 6. I made blind calls on downwind, base and final for Runway 6 and heard no other traffic. I landed, made the first turnoff and then saw a Tripacer that had landed on 24 turning off the far end of the runway. My aircraft was showing beacon and strobes… [but there were] no lights on the Piper." (ACN 488924)

Profile 4 ..... (Reporter Severity Assessment = 4)

A Reporter Severity Assessment of 4 indicates a relatively high potential for collision. In this example, the reporter believes a serious hazard occurred during an opposite direction operation at a Tower-closed airport with 0 feet lateral and 800 feet vertical separation.

Report Narrative

"…Tower was closed, so we transmitted on CTAF… that we were taxiing from FBO for departure on Runway 12. We heard no reply. We began our taxi and saw our company aircraft take off on Runway 9L, so we decided to taxi to Runway 9L instead. We heard our company [aircraft] radio calls as they left the airport. We did our performance checks holding short at the end of Runway 9L. We then called out that we were *'taking off Runway 9L, any traffic please advise.'* There was no reply…. As we took position we cleared final and departure ends, both seemed clear. We finished our takeoff check and prepared to depart, when the pilot flying saw the anti collision lights of an aircraft approaching us from the opposite end. We then turned to get off the runway as we saw what looked like a Challenger jet take off Runway 27R over us…. We never heard a single radio call from the jet that departed Runway 27R." (ACN 482051)

Profile 5 ..... (Reporter Severity Assessment = 5)

In this incident, the reporter, a Ramp Supervisor, believes a near accident occurred when a commuter aircraft missed a snowplow by an estimated 5 feet. Note in this example of problematic communications that the city-operated snowplows are apparently not able to communicate directly with aircraft via UNICOM.

Report Narrative

"The Airport uses a City and UNICOM radio when snowplows are on the airport grounds. Aircraft radio [using UNICOM] and [company] personnel call the city and advise them of the inbound aircraft. I am the Ramp Supervisor…and was needed at the hanger to pull an aircraft out. When I was done with the job the driver of the snowplow came over and informed me of a near miss with an aircraft. I went in the FBO, where my boss

was supposed to be monitoring the radio in my absence, and she was on the phone oblivious to the situation. I…talked to the pilots of the EMB-120 and they informed me that the snowplow exited the runway and then backed up onto the active while they were landing. The pilot initiated a go-around and missed the plow by an estimated 5 feet…. City plows are not equipped with an aviation radio and when my boss was asked about this she said *'it doesn't do any good because they don't understand aviation jargon.'* This isn't the first time this has happened, however this is the closest we have come to an accident and it is obvious that the current standards of advising aircraft and snowplows does not work." (ACN 496963)

Alerting Source and Evasive Action

Reporters were asked what sources alerted them to the conflict. In 35 percent of incidents, the reporter was not alerted to the conflict by any source. Information received by radio (UNICOM, CTAF, etc.) provided an alert in 26 percent of the incidents. Communication from other pilots was the alerting source in 14 percent of events, and pilots' visual see-and-avoid observations were the alerting source in another 14 percent of incidents.

The following report excerpt shows how a third party intervention on UNICOM helped resolve a traffic conflict:

"While holding short of the runway (single 4000 feet) on the taxiway, my student and I heard an indistinct transmission on the aircraft radio neither of us made out what it was. I instructed the student to visually clear the approach path, which he did. We radioed that we were back taxing on Runway 23 then taxied on to the active. Just as we were on the runway, UNICOM (in the FBO) advised there was an aircraft on final. I looked and saw the T-34 on a close-in base to final. I immediately took control of our aircraft and taxied onto the grass…." (ACN 486069)

As the following report illustrates, pilots comunicating on different frequencies may contribute to traffic conflicts:

"… As I was taxiing the pilot of the other aircraft approached me and became belligerent stating that I crossed in front of him. I informed him that I was on the CTAF and was speaking with other traffic and that we never heard or saw him. He argued that the proper frequency is 122.95, which is the UNICOM for this field. I explained that Orlando Approach told us to contact traffic on the CTAF and that we were speaking with the other traffic…." (ACN 483236)

Pilots of primary aircraft took evasive actions such as aborting takeoff, altering their flight path, or initiating a go-around in 61 percent of events. In 47 percent of responses, the secondary involved aircraft took evasive action. Reporters asserted that they had performed a "clearing maneuver" prior to the transgression incident in 51 percent of events.

Airport Demographics

Airports

Of the 51 runway transgression reports that served as a basis for the Non-Towered Runway Transgressions study, a single reported event occurred at 43 airports. There were three airports with two reported incidents each, and two additional airports were de-identified to protect reporters. In total, there were 48 unique airport locations represented in the data set. Sixteen airports had Control Towers, but the Tower was closed at the time of the incident. Approximately 26 percent of incidents occurred at multi-use airports (i.e., those airports supporting a wide variety of operations such as glider flying and skydiving).

Activity Level

Reporters were asked to evaluate the level of airport traffic activity at the time of the occurrence. Figure 2 shows that 82 percent of incidents (n=42) occurred during "Low" to "Moderate" activity periods. Sixteen percent of incidents (n=8) occurred when the airport activity level was judged to be "High." In one incident the traffic volume was "Unknown."

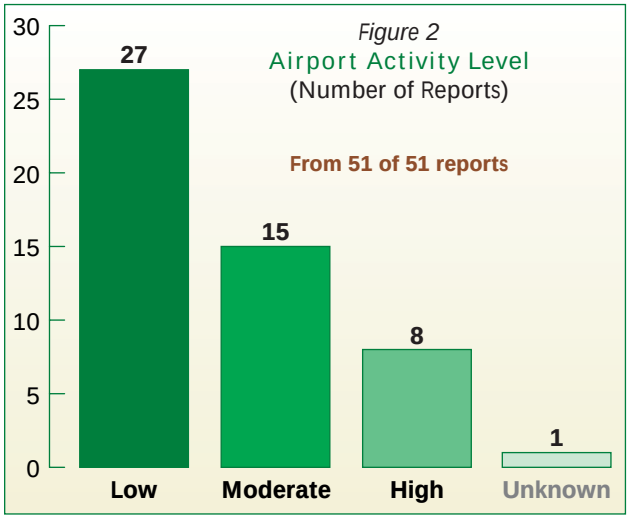


Figure 2
Airport Activity Level
(Number of Reports)
From 51 of 51 reports

Runway Configuration

Sixty-four percent of the transgression events (n=32) occurred at airports with intersecting, or intersecting and parallel runway configurations. Thirty-four percent of events (n=17) occurred at airports with single runways. Figure 3 depicts the runway configurations for the non-Towered transgression data set.

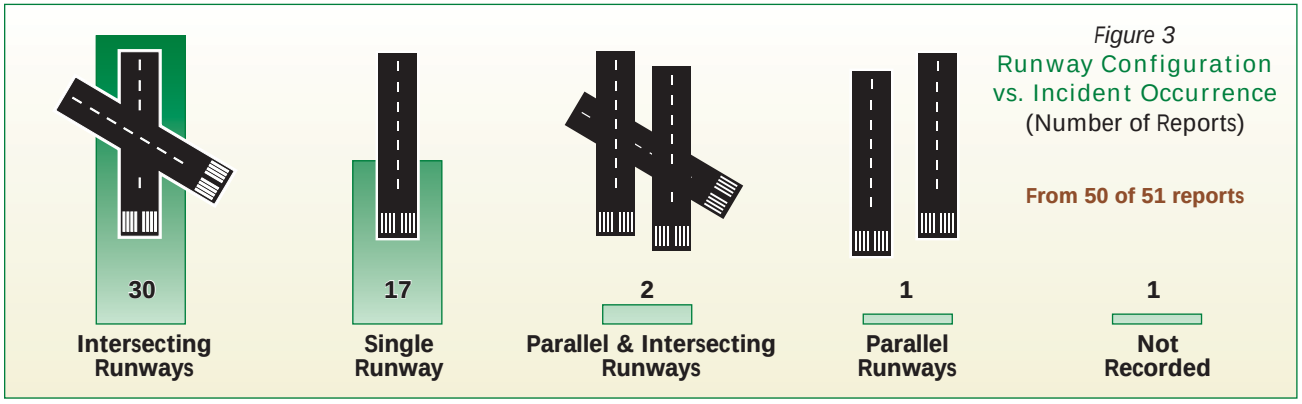


Figure 3
Runway Configuration vs. Incident Occurrence
(Number of Reports)

From 50 of 51 reports

Runway Selection Criteria

Reporters were asked whether factors such as wind direction, runway slope, approach/departure obstacles, or runway(s) in use by other aircraft influenced their choice of a departure or landing runway. They were allowed to identify more than one of these factors, if applicable. Reporters cited wind direction as a selection criteria in 63 percent of citations (n=38), while the runway direction in use by other traffic was cited 32 percent of the time (n=19). Overall, wind direction was twice as likely to influence pilots' choice of a runway for takeoff or landing as traffic flow.

> "The AWOS broadcast gave winds favoring Runway 6. The CTAF was so crowded that transmissions were impossible to understand. The windsock was showing wind direction variable, but I think still favoring Runway 6. I made blind calls on downwind, base and final for Runway 6 and heard no other traffic. I landed, made the first turnoff and then saw a Tripacer that had landed on 24 turning off the far end of the runway…." ACN 488924

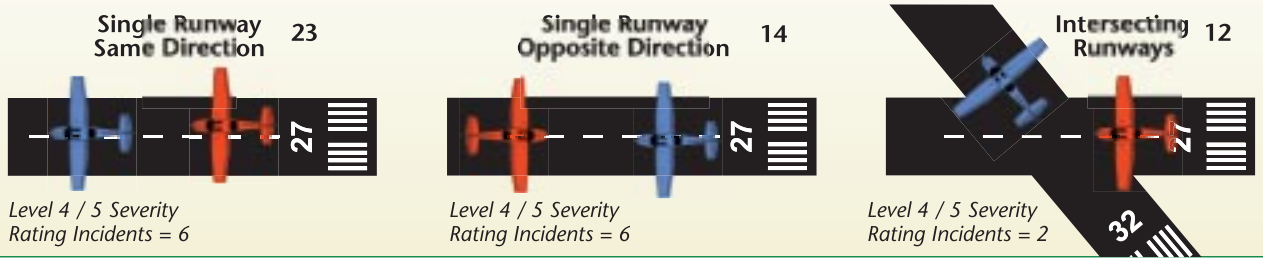
Traffic Direction for Runway(s) in Use

The ASRS structured callback questionnaire asked reporters to describe traffic direction in relation to runway(s) in use at the time of the event. "Runway in use" is a term that generally describes the runway (or multiple runways) favored for takeoffs and landings because of wind direction, although prevailing traffic flow may also dictate runway selection. A non-Towered airport with parallel or intersecting runway configurations will often have just one runway "in use" for takeoffs and landings. In the case of a non-Towered airport with only one runway, takeoffs and landings may occur from opposite ends of the same runway if wind and airport traffic conditions permit.

In the ASRS study data, 45 percent (n=23) of the non-Towered transgression events occurred with traffic operating from a single runway and in the same direction (Figure 4). In 28 percent of events (n=14), the involved aircraft were operating from a single runway but in opposite directions. In 24 percent of events (n=12), aircraft were operating from inter-

Figure 4
Runway Use at Time of Incident
(Number of Reports)

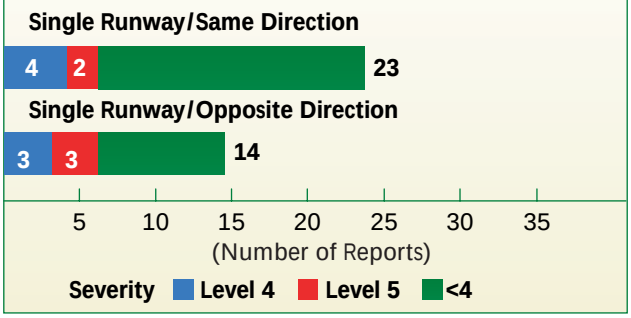
From 50 of 51 reports



secting runways at the time of the event. Overall, almost three-fourths of the non-Towered study incidents involved traffic operations at airports where a single runway was in use.

Incidents assessed by the reporter with a Severity Rating of a level 4 or 5 were compared to the runway in use at the time of the incident. Each traffic configuration, "Single Runway, Same Direction" and "Single Runway, Opposite Direction," comprised of a total of six level 4 or 5 incidents, even though there were 40% fewer "Single Runway, Opposite Direction" reports in the data set (Figure 5).

Figure 5
Traffic Direction for Runway in Use with High Severity Ratings



Geographical and Topographical Factors

Geographical or topographical conditions that obstructed pilots' vision of runway final approach paths or other airport traffic — trees, terrain, runway "humps," or tall buildings — were identified by reporters as contributors to 45 percent (n=23) of the non-Towered runway transgressions. This is in strong contrast to ASRS's finding on the influence of such factors in Towered airport transgressions, where only four percent (n=3) of the Towered study runway transgressions reflected these factors. No geographical or topographical factors were noted in the remainder of the non-Towered incidents.

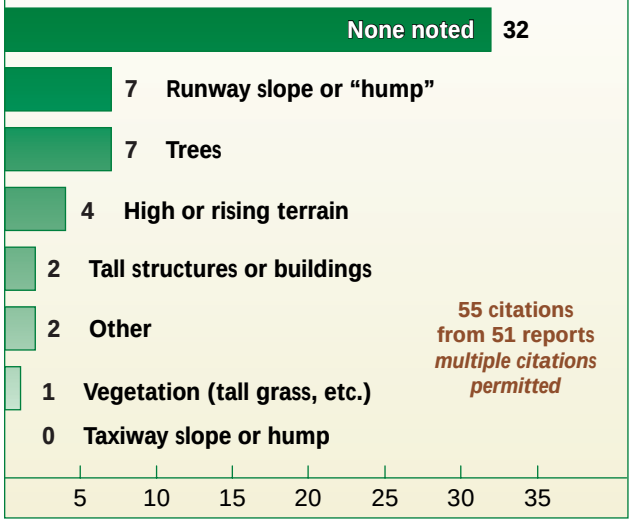
Figure 6 shows that runway gradient, trees, and terrain were the most frequently cited geographical and topographical factors contributing to the runway transgression event.

In the following example, a "runway crown (or hump)" was a major factor affecting visual sighting of runway traffic, and possibly impeding VHF (line of sight) radio communications.

> "… I announced on CTAF that we would be starting our taxi [to Runway 2]. An air carrier (Y) flight stated the same. A Cherokee (Z) stated he was taxiing to Runway 20. The COU FSS called the Cherokee on CTAF to advise him that two commuter aircraft were taxiing to Runway 2, and the winds favored Runway 2. The Cherokee did not reply.... during our taxi the Cherokee made one transmission that was garbled and unreadable.... Upon rolling onto the approach end of Runway 2, prior to applying any takeoff power I asked *'Cherokee at COU, this is Air Carrier (X), we need to know where you are?'* We got no response from him so we applied the brakes and stopped on the runway. After approximately 5 seconds we observed lights and a beacon coming at us. The captain immediately maneuvered the aircraft to the... left. By this time the Cherokee was climbing and passed well overhead. We had a problem with our nose wheel steering and we unable to clear the runway. Had the Cherokee not climbed above us we would not have been able to exit the runway or get out of the way.... A pilot at the end of Runway 2 cannot observe the end of Runway 20 due to a crown in the airfield." (ACN 485874)

In another event, the pilot of a Cessna Citation departing Runway 14 experienced a traffic conflict with a Beechcraft Baron departing on intersecting Runway 22, and notes that trees *"…obstructed visual from departure end Runway 14 to departure end Runway 22...."* (ACN 495574)

Figure 6
Geographical and Topographical Factors
(Number of Citations)



Airport Communications Capability

When reporters were questioned about airport communications capability, they indicated that all airports represented in this data set had some form of radio communications. As Table 2 shows, reporters identified 50 of 51 airports (98 percent) as possessing CTAF and/or UNICOM communications capability.[5] A large majority of reporters (94 percent) also reported feeling comfortable with non-Towered airport communications procedures.

Table 2
Airport Communications Capability

Communications Capability	Citations
CTAF / UNICOM	21
UNICOM only	13
CTAF Only	12
CTAF / UNICOM / FSS	3
CTAF / Multicom	1
FSS	1
TOTAL	51
From 51 of 51 reports	

Pilot Background and Use of Resources

The ASRS questionnaire also probed reporters' backgrounds and use of available resources. Ninety percent of reporters (n=46) had not previously experienced a runway transgression at the airport where the incident occurred.

Pilot Experience

The reporters averaged several thousand hours of flight experience, and most were considered to be experienced pilots. Their total flight time ranged from 75 to 22,549 hours, with an average of 3,350 flight hours and a median of 1,740 flight hours. They also appeared to be current in their flight activities, averaging 83 flight hours within the 90 days preceding the incident, with a median of 40 flight hours in this period.

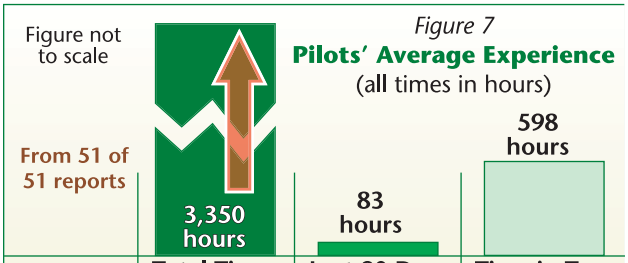
Reporters were also experienced in the aircraft type involved in the incident. Total "time in type" averaged 598 hours, with a median of 269 hours. For multi-crew operators, the duty time in hours prior to the incident averaged 1.5 hours (median 0.9 hours), and ranged from 0 to 8 hours.

In the following example, a commercial cargo aircraft and a large corporate jet experienced a conflict during opposite-direction runway operations. The Captain of the cargo aircraft had 3,000 total hours, 2,600 hours in aircraft type, and 300 hours in the previous 90 days; it is reasonable to assume that the flight crew of the corporate jet was similarly well experienced.

> "…Opa Locka's tower was closed, so we transmitted on the CTAF frequency 120.7 that we were taxiing from FBO for departure on Runway 12. We heard no reply. We began our taxi and saw our company aircraft take off on Runway 9L, so we decided to taxi to Runway 9L instead… we then called out that we 'were taking off Runway 9L any traffic… please advise.' There was no reply… As we took position we cleared final and departure ends, both seemed clear. We finished our takeoff check and prepared to depart, when the pilot flying saw the anticollision lights of an aircraft approaching us from the opposite end. We then turned to get off the runway as we saw what looked like a Challenger jet take off Runway 27R over us…." (ACN 482051)

Figure 7 depicts reporters average hours, time within the 90 days preceding the incident, and total time in type.

Figure 7
Pilots' Average Experience
(all times in hours)



	Total Time	Last 90 Days	Time in Type
Average	3,350	83	598
Median	1,740	40	269
Minimum	75	6	4
Maximum	22,549	350	4,000

Previous Visits to Airport

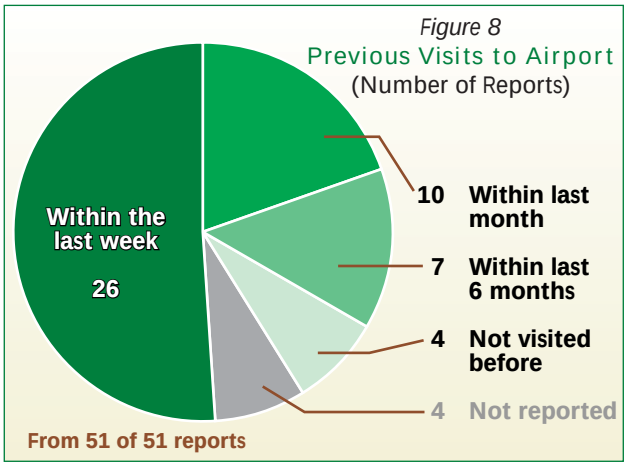
Seventy-one percent (n=36) of the reporters stated they had flown into or out of the airport more than five times prior to the date of event occurrence. This finding is very similar to that of the ASRS Towered runway transgression study, in which 88 percent of pilot reporters (n=72) had visited the airport of incident occurrence more than five times. Fourteen percent (n=7) of the non-Towered study reporters had not previously visited the airport where the incident occurred.

5 As noted in section 4-1-9 of the *Aeronautical Information Manual*, the CTAF is a frequency designated for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating Control Tower. The CTAF may be a UNICOM, MULTICOM, FSS, or Tower frequency and is identified in appropriate aeronautical publications. UNICOM is a non-government air/ground radio communication station that provides airport information at public use airports where there is no Tower or Flight Service Station (FSS).

A report from the ASRS Database provides an example of the problems resulting from a lack of familiarity with the airport.

> "…I was inbound on the localizer [at TEX] when I broke out approximately 2500 feet AGL. As I was attempting to land on Runway 9, another aircraft was taking off of Runway 27. I made a left downwind to land on Runway 27. On my left base for Runway 27, another airplane had landed on Runway 27, but was back taxiing. I aborted the landing and re-entered for a left downwind and had an uneventful landing. I have since learned all landings are to be made on Runway 9 and a right traffic pattern should be used if needed on Runway 27. **What really caused the incident was my unfamiliarity with the airport**…." (ACN 518664)

Figure 8 shows that of the non-Towered study pilots (n=43) who had previous experience flying into the airport, 61 percent (n=26) had arrived at or departed from the airport during the week prior to the event, and another 23 percent (n=10) had operated there within the previous month.



Use of Charts and Training

In 21 percent (n=11) of the non-Towered transgression events, reporters did not refer to a navigation chart or aviation publication prior to the incident. Almost three-fourths of reporters (n=37) did check for NOTAMS before flight. Forty-three of these pilots obtained NOTAMS from Flight Service Stations (FSS). Other NOTAM sources cited were DUATs, company Dispatch, and AWOS.

In another example from the ASRS Database, the reporter failed to either carry or utilize the airport surface chart.

> "On a night training flight with a private pilot working on his commercial certificate, I wanted to see how my student would conduct himself entering the pattern and landing at an unfamiliar airport… the airport's Tower was closed, so my student made all the appropriate calls on the CTAF…. We had a normal landing on the proper Runway 19R and taxied clear…. Unfortunately, not having planned on taxiing at Concord, we did not have an airport diagram with us. Upon taxiing back, we… eventually found ourselves on the middle of another big runway…. We were a little disoriented by the signs and runway markings when my student said, 'this must be it,' meaning our runway… I said, 'let's go.' On the take-off roll, I noticed that those white edge lights were quickly gone and once we were airborne I knew we had done something wrong. I wasn't until back on the ground at our home airport where I looked at an airport diagram and figured out that we had taken off of closed Runway 14L…. (ACN 306694)

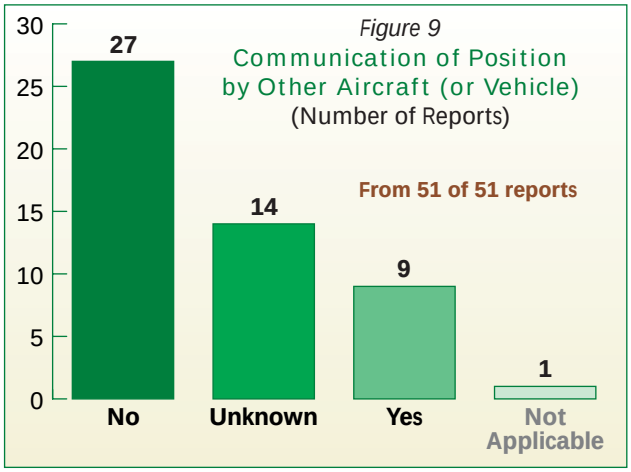
Training activity was cited in 25 percent (n=13) of the non-Towered events. Of the thirteen pilots who reported training activity, four were involved in private pilot instruction, two in instrument training, and seven in other types of proficiency practice.

Aircraft Communications

Ninety-six percent of the study pilots (n=49) were flying radio-equipped aircraft, and ninety-two percent (n=47) were using the radio(s) at the time of the incident. There were few claims of aircraft radio problems, frequency congestion, frequency overlap, or other communications problems. As illustrated in the following narrative, pilots admitted to using the wrong frequency in 12 percent (n=6) of occurrences.

> "… My student announced our departure on UNICOM and started our takeoff roll. Shortly after commencing our roll, I noticed several lights at [our] 2 o'clock position with no relative motion and yelled at my student to stop. He aborted the takeoff and stopped about 500 feet short of Runway 26L (we were on Runway 35) and we watched the C-130 Hercules roll by and stop in another 1000 feet. We then took off and completed the flight without incident, thinking that the C-130 was on the wrong frequency. The next day, I checked the Airport Directory and discovered that the after hours CTAF was not UNICOM…." (ACN 475300)

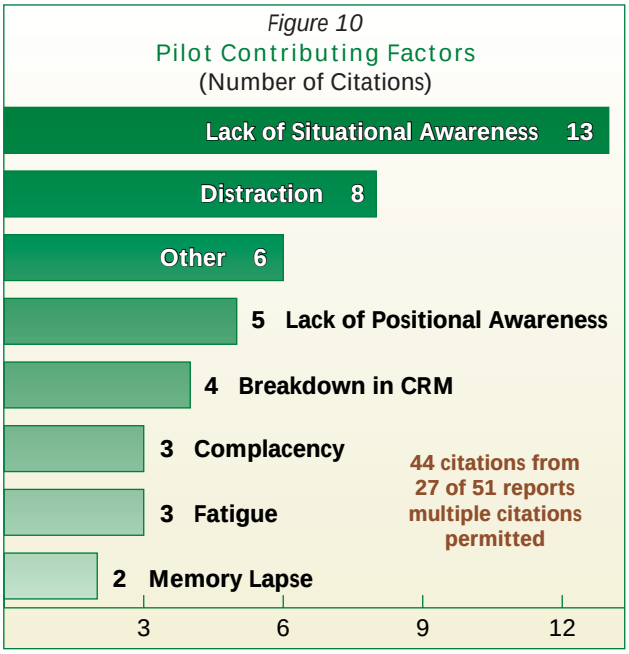
In 18 percent (n=9) of the study incidents, reporters acknowledged they were using or monitoring more than one frequency at the time of the incident. As seen in Figure 9, fifty-three percent (n=27) of the study pilots also insisted that the other aircraft (or vehicle) did not communicate its position clearly. The following report demonstrates the risk associated with losing awareness of another aircraft's position.



"… I announced on CTAF that we would be starting our taxi [to Runway 2 at COU]. An air carrier flight stated the same. A Cherokee stated he was taxiing to Runway 20. The COU FSS called the Cherokee on CTAF to advise him that two commuter aircraft were taxiing to Runway 2, and the winds favored Runway 2. The Cherokee did not reply… during our taxi the Cherokee made one transmission that was garbled and unreadable…. Upon rolling onto the approach end of Runway 2, prior to applying any takeoff power I asked 'Cherokee at COU this is Air Carrier (X), we need to know where you are?' We got no response from him so we applied the brakes and stopped on the runway. After approximately 5 seconds we observed lights and a beacon coming at us. The captain immediately maneuvered the aircraft to the west (left). By this time the Cherokee was climbing and passed well overhead…. (ACN 485874)

Pilot Contributing Factors

Reporters were also questioned about the possible influence on their incident of factors related to attention, aircraft equipment, operational/technical factors, and time pressure. Reporters were allowed to cite more than one factor if it was applicable. Figure 10 shows that lack of situational awareness[6] and distraction were the most frequently cited contributing factors. The "Other" category of contributing factors included "rushing," "visual signature of other aircraft," and an "airsick passenger." Aircraft equipment problems, operational/technical factors, and schedule pressure did not appear to be major contributors.



In one example of problematic situational awareness, the flight crew of a Gulfstream IV taxiied across a runway occupied by a Cessna. The crew of the corporate jet, noting *"high work load immediately after starting the taxi… multiple runways in use,"* and *"13 time zones in 3 days,"* asks the question, *"was our situational awareness at 100%?"* The reporter answers his own question by stating *"be aware of effects that crossing multiple time zones can have on one's body clock, contributing to a lessened situational awareness."* (ACN 493458)

6 "Situational awareness is defined as a continuous extraction of environmental information, integration of this information with previous knowledge to form a coherent mental picture, and the use of that picture in directing further perception and anticipating of future events. Simply put, situational awareness means knowing what is going on around you." (FAA Facility Operation and Administration handbook, 7210.3, Part 2-6-1.)

In another example, an instructor pilot engaged in twin-engine flight training admits that instructional task saturation contributed to distraction:

"… I became extremely occupied with my student's progress throughout the maneuver by ensuring that he was consistently flying the proper airspeed, setting the proper crab angle and managing his altitude effectively, especially for the base to final turn to come. On short final, as I focused my attention on coaching my student with crosswind control inputs and with the decision to use flaps, I noticed the Warrior slowing to turn on a taxiway that is more than halfway down the runway. I made a prediction that by the time we flared, the Warrior should be safely clear. However, momentarily distracted with my student's final flaring inputs, I failed to notice that as we were touching down the Warrior had not cleared the runway…. distraction within the cockpit was a big factor." (ACN 510231)

Environmental and Other Factors

ASRS also captured information on factors that appeared to have a neutral or negligible influence on the event consequences in this study. These factors are discussed in this section of the report.

Day and Time

More events were reported for Saturdays (24 percent, n=12) than other days of the week. Over half of events 51 percent, (n=26) occurred between the hours of noon and 6:00 P.M., while another 37 percent (n=19) took place between 6:00 A.M. and Noon. A greater percentage of General Aviation flights into and out of non-Towered airports tend to occur on weekends and during daylight hours.

Aircraft Involved

A wide variety of aircraft were involved in the study's runway transgression events, ranging from sailplanes and helicopters to transport category jets. The majority of involved aircraft were light single-engine fixed-wing aircraft. There were two encounters between an aircraft and a ground vehicle. Wing configuration (i.e., high wing vs. low wing) was not identified as an event contributor.

Weather

Weather conditions did not play a significant role in runway transgressions at non-Towered airports. The majority of the runway transgressions events occurred in daylight and Visual Meteorological Conditions (VMC).

Runway and Taxiway Conditions

All operations from the study data occurred on runways that were paved, and in 90 percent of the incidents (n=46), the airport had one or more taxiways. Of the 46 airports with taxiways, only one taxiway was reportedly not marked with a hold line.

REPORTERS' COMMENTS

Reporters offered many training, procedural, and technology suggestions for the reduction of runway transgressions at Towered airports. These comments are summarized in Appendix F.

SUMMARY

ASRS Database Baseline Data

- Approximately one non-Towered runway transgression event is reported to ASRS for every six events at a Towered airport. ASRS received 627 total reports describing runway transgression events at non-Towered and Tower-closed airports between 1990-2001. Over this 11-year period, ASRS Database records of runway transgression events at non-Towered airports decreased slightly, in spite of an increase in total reporting to ASRS over this same period.

Structured Callback StudyData

Incident Severity

- Each study respondent was asked to assess the severity of the reported transgression event on a scale of 1 to 5, with 1 being "Not Hazardous" and 5 being "Very Hazardous." Seventy-two percent of the respondents evaluated their incidents in the 1-3 severity range ("low" to "moderate" severity), while the remaining respondents rated their events in the 4-5 severity range (higher severity). This distribution of responses is identical to that for the ASRS Towered runway transgression structured callback study.

Alerting Source

- Pilots were asked what sources alerted them to the runway transgression. Information received by radio (UNICOM, CTAF, etc.) provided an alert in 26 percent of the incidents. Communication from other pilots and pilots' visual observations were the alerting source in an additional 28 percent of incidents. In 35 percent of incidents, the pilot was not alerted to the conflict by any source.

Airport Demographics

- There were 48 unique airport locations represented in the structured callback study data set. Sixteen airports had Control Towers, but the Tower was closed at the time of the incident. Approximately one quarter of the study incidents occurred at multi-use airports – those supporting a wide variety of operations such as glider flying and skydiving. More than three-fourths of the study incidents occurred during periods of airport activity described as "low" to "moderate" by respondents.

Airport Physical Issues

- Almost three-fourths of the non-Towered study incidents involved traffic operations at airports where a single runway was in use, generally because of wind direction or runway use by other traffic. Wind direction influenced pilots' choice of a runway for takeoff or landing twice as much as traffic flow.
- This study found that geographical or topographical obstruction to pilots' line of sight was a factor in approximately 45 percent of the runway transgression events. Runway slope, trees, and rising terrain were the most frequently cited obstructions. While the adverse effect of visual obstructions such as trees and vegetation can be minimized through regular airport maintenance, others such as runway gradient and buildings are more difficult to correct.

Airport Communications

- A large majority of the reporters interviewed said they felt comfortable with non-Towered airport communications procedures and used aircraft radios to self-announce their position and intentions. However, they claimed that other pilots did not communicate their positions clearly (in 53 percent of the incidents), or seemed confused about the proper frequency to use (in 12 percent of incidents).

  Some pilots may not fully understand the differences among all the published communications frequencies for a given airport – UNICOM, Multicom, FSS, Tower, CTAF, etc. – and when it is appropriate to use each frequency. A practical suggestion for alleviating frequency confusion offered by study respondents is the installation of signs at runway ends specifying the CTAF frequency for the airport.

  It is also likely that continuing pilot education is needed in standard communications practices at non-Towered and Tower-closed airports. These educational efforts might include recurrent training (Biennial Flight Reviews); FAA seminars and videos; pilot publications; and internet accessible articles and tutorials.

Pilot Contributing Factors

- Lack of situational awareness was the factor most frequently identified as contributing to the non-Towered runway transgression events. The majority of pilots interviewed for this study could be considered experienced and familiar with the airport. They also enjoyed good weather conditions and low-to-moderate traffic volume. Under these favorable circumstances, it is possible that lowered levels of situational awareness can result from a reduced expectancy level and the lack of attentional stimuli.

  Some of these factors may be best addressed through recurrent training and the dissemination of educational information through publications, videos, and other methods. Several reporters advocated that the FAA focus on runway transgression prevention in the General Aviation community through its "Wings" program and reactivation of the "See and Be Seen" program.

New Technology Solutions for Non-Towered Airports

- A few reporters noted the difficulty of determining the active runway at some non-Towered fields, especially those with multiple runway configurations, and suggested that some method of auto-announcing the active runway (such as a simplified ATIS) would be helpful. Others suggested that a means of auto-detecting other aircraft on a runway with a hump or slope would be helpful.

OPERATIONAL OBSERVATIONS

A thorough review of contributing factors identified in the 51-report Non-Towered Runway Transgressions data set provided the following operational observations:

- A significant number [14] of pilots of radio-equipped aircraft in this data set did not utilize their radios.
- Some pilots experience confusion over whether to use CTAF or UNICOM for traffic advisory communications, or may attempt to use frequencies other than CTAF or UNICOM.
- High traffic volume and radio congestion at non-Towered airports were associated with breakdowns in radio discipline and contribute to confusion and loss of situational awareness.
- FBO and other ground personnel, operating UNICOMs or other advisory frequencies, occasionally attempt to act as "pseudo" air traffic controllers.
- This study confirmed that some pilots continue to ignore AIM/FAR procedures for operations at uncontrolled airports. Non-standard traffic pattern entry and pattern procedures such as straight-in approaches, or "wrong-side" traffic patterns, often led to runway transgression conflicts.
- Non-Towered airport traffic may utilize a runway not favored by wind direction — this can generate a dilemma for other departing or arriving pilots with respect to runway selection. Similarly, pilots can experience confusion with respect to runway selection when the wind is calm.
- Low traffic volume, familiarity with an airport, and favorable flight conditions were factors that contributed to pilot complacency.
- A variety of small general aviation aircraft have small visual signatures, leading to difficulty in detection by other pilots.
- Runway humps and other obstructions can inhibit radio transmissions between aircraft on the opposite ends of a runway, as well as impede visual acquisition of traffic. Similarly, visual obstructions (such as trees) between runway ends can significantly increase risks in intersecting runway operations.
- Pilots of larger aircraft operating under Instrument Flight Rules (IFR) frequently conduct "straight-in" approach and landing operations when in Visual Meteorological Conditions (VMC), often to a runway not in use by other traffic. This can lead to runway conflicts with pilots of other aircraft who anticipate normal traffic pattern entry and procedures by the larger traffic.
- Pilots of IFR departures can experience breakdown's in situational awareness and traffic monitoring tasks when feeling rushed to meet "clearance void" times.
- Breakdown's in CRM and traffic monitoring duties have occurred during flight training operations.
- Preoccupation with GPS programming and other "heads-down" tasks during outbound have resulted in failure to adequately monitor aircraft position and/or other traffic at non-Towered airports.
- Vehicle drivers may fail to observe appropriate procedures when operating their vehicles in aircraft movement areas at non-Towered airports.
- Special events, such as fly-in's, club events, and competitions are often associated with the conduct of non-standard procedures at non-Towered airports.

REFERENCES

Federal Aviation Administration. Office of Aviation Safety. 2001. Runway Transgression Severity Trends at Towered Airports in the United States, 1997-2000.

Federal Aviation Administration. Office of System Safety. 2000. "Airport Surface Movement Area Data Analysis (Version 2)." Slide presentation.

Appendix A

ASRS Non-Tower, and Tower-Closed Airports Structured Callback Study Form

NASA
Aviation Safety Reporting System

Runway Transgressions Structured Callback
Non-Towered and Tower-Closed Airports

Qualifying Statements:	
The answer to the following three qualifying statements must be "Yes," otherwise the report should not be included in the dataset.	
i. Was this an incident at a non-Tower or Tower-closed airport?	◯ Yes ◯ No
ii. Did an aircraft (or vehicle) cross the hold line of, or enter an active or occupied runway?	◯ Yes ◯ No
iii. Does the reporter wish to participate in the study?	◯ Yes ◯ No

Section A

Section A: Administrative

A.1 Accession Number:		
A.2 Callback Date: (MMDDYY)		
A.3 Callback Start Time: (24 hour time)		
A.4 Hazard Notification:	☐ Alert Bulletin (AB) ☐ For Your Information Notice (FYI) ☐ Teleconference (FAA)	
A.5 Analyst Assistant	◯ Autry ◯ Black ◯ Ferguson	◯ Carrillo ◯ Verges ◯ Other _____
A.6 Callback Analyst:	◯ Drew ◯ Fitzgerald ◯ Flanegan ◯ Hauf ◯ Holmes	◯ Jengo ◯ Martin ◯ McElhatton ◯ Ritter ◯ Other _____
A.7 Quality Check:	◯ Autry ◯ Drew	◯ Ferguson ◯ Jengo

Section B

Section B: Reporter Information

B.1 Reporter:	◯ Single Pilot ◯ Captain ◯ First Officer ◯ Second Officer	◯ Pilot Flying ◯ Pilot NOT Flying ◯ Airport Manager ◯ FBO Personnel ◯ Other_____
B.2 Ratings:	☐ Student ☐ Private ☐ Commercial ☐ Instrument	☐ Multi-engine ☐ ATP ☐ CFI ☐ Not Applicable
B.3 Operator:	◯ Air Carrier ◯ Commuter ◯ Air Taxi ◯ Corporate	◯ Other GA ◯ Government ◯ Military ◯ Other
B.4 Mission:	☐ Passenger ☐ Cargo ☐ Ferry ☐ Business ☐ Pleasure	☐ Test Flight ☐ Training ☐ EMS ☐ Maintenance ☐ Other

B.5 Experience:

(a) Total Time.....

(b) Time last 90 Days.....

(c) Total Time in Type.....

Section C

Section C: Date, Time, Location, etc.

C.1 Airport Identifier .....

C.2 Date (MMYYYY): .....

C.3 Day of Week:
- ◯ Sunday
- ◯ Monday
- ◯ Tuesday
- ◯ Wednesday
- ◯ Thursday
- ◯ Friday
- ◯ Saturday

C.4 Quarter of Day:
- ◯ 0001 – 0600
- ◯ 0601 – 1200
- ◯ 1201 – 1800
- ◯ 1801 – 2400

C.5 Weather Conditions:
- ☐ VMC
- ☐ IMC
- ☐ Mixed
- ☐ Marginal
- ☐ Rain
- ☐ Fog
- ☐ Ice

C.6 Ceiling: .....

C.7 Visibility: .....

C.8 RVR: .....

C.9 Lighting:
- ◯ Daylight
- ◯ Night
- ◯ Dawn
- ◯ Dusk

C.10 Flight Plan:
- ◯ None
- ◯ VFR
- ◯ IFR
- ◯ SVFR
- ◯ DVFR
- ◯ Unknown

Section D

Section D: Reporter Aircraft Information

D.1 What was the Make/Model of your (or primary) aircraft at the time of the incident?

D.2 (ASRS Make/Model Code)

D.3 What approach or departure were you on just prior to the incident?
(only if applicable to the incident)

- ◯ Base leg entry
- ◯ Straight-in final
- ◯ Straight-out departure
- ◯ Crosswind departure
- ◯ Other _____

D.4 In what phase of flight were you when the runway transgression occurred?

- ◯ Takeoff / Departure
- ◯ Short final
- ◯ Landing Rollout
- ◯ Partially clear of runway
- ◯ Taxiing

Section E

Section E: Conflict Type and Description

E.1 What type of runway transgression were you involved in?

For	GO TO:
◯ Aircraft / Aircraft	Section F
◯ Aircraft / Vehicle	Section G
◯ Aircraft / Pedestrian(s)	Section H
◯ No actual conflict	Section I

Section F

Section F: Aircraft / Aircraft Conflict

F1. What was the Make/Model of the other (second) aircraft involved, if any?

F.2 (ASRS Make/Model Code)

F.3 If the Make/Model of the other aircraft is unknown, what type of wing configuration did the other aircraft have?

◯ High Wing
◯ Mid Wing
◯ Low Wing
◯ Bi-wing
◯ Rotary Wing
◯ Unknown

F.4 If the Make/Model of the other aircraft is unknown, what type of engine configuration did the other aircraft have?

◯ Single-engine
◯ Multi-engine
◯ No engine
◯ Unknown

F.5 What approach or departure was the other aircraft on just prior to the incident?

◯ Base leg entry
◯ Straight-in final
◯ Straight-out departure
◯ Crosswind departure
◯ Other _____

F.6 In what phase of flight was the other aircraft when the incident occurred?

◯ Takeoff roll
◯ Short final
◯ Landing Rollout
◯ Partially clear of runway
◯ Taxiing

F.7 Where was your aircraft in relation to the other aircraft when the runway transgression occurred?

◯ Taxiing on the active runway
◯ Taxiing across the active runway
◯ Holding in position on the active runway
◯ Arriving same direction
◯ Departing same direction
◯ Arriving opposite direction
◯ Departing opposite direction
◯ Other _____

Section F (continued)

F.8 Did you perform a clearing maneuver before entering the runway?	◯ Yes ◯ No ◯ Not Applicable
F.9 Where was the other aircraft in relation to your aircraft when the runway transgression occurred?	◯ Taxiing on the active runway ◯ Taxiing across the active runway ◯ Holding in position on the active runway ◯ Arriving same direction ◯ Departing same direction ◯ Arriving opposite direction ◯ Departing opposite direction ◯ Other _____
F.10 Did your aircraft come in close proximity with the other aircraft?	◯ Yes ◯ No ◯ Unknown
F.11 What was the estimated miss distance between your aircraft and the other aircraft?	_____ feet Horizontal (F.11.a) _____ feet Vertical (F.11.b)
F.12 What evasive action(s) did you take?	◯ Aborted takeoff ◯ Initiated go-around ◯ Taxied clear of runway ◯ Altered flight path ◯ No evasive action taken ◯ Other _____
F.13 What evasive action(s) did the other aircraft take?	◯ Aborted takeoff ◯ Initiated go-around ◯ Taxied clear of runway ◯ Altered flight path ◯ No evasive action taken ◯ Other _____
F.14 What other sources alerted you to the situation? *(Analyst: check all that apply)*	☐ Crew member action ☐ Passenger action ☐ UNICOM / CTAF / FSS (specify) _____ ☐ Communication from other pilot(s) ☐ None ☐ Other _____

Go To Section I

Section G

Section G: Aircraft / Vehicle Conflict

G.1 If a runway transgression incident with a vehicle occurred, what kind of vehicle was involved?	◯ FBO or airport vehicle ◯ Construction vehicle ◯ Personal (private) car or vehicle ◯ Unknown ◯ Other _____
G.2 Was the vehicle using the airport Common Traffic Advisory (CTAF) or UNICOM frequency?	◯ Yes ◯ No ◯ Unknown
G.3 What was the approximate miss distance between your aircraft and the vehicle?	_____ feet Horizontal (G.3.a) _____ feet Vertical (G.3.b)
G.4 What evasive action(s) did you take?	◯ Aborted takeoff ◯ Initiated go-around ◯ Taxied clear of runway ◯ Altered flight path ◯ No evasive action taken ◯ Other _____
G.5 What evasive action(s) did the vehicle take?	◯ Cleared the runway ◯ Evasive maneuvering ◯ No evasive action taken ◯ Other _____
G.6 What other sources alerted you to the situation? *(Analyst: check all that apply)*	☐ Crew member action ☐ Passenger action ☐ UNICOM / CTAF / FSS (specify) _____ ☐ Communication from other pilot(s) ☐ Communication from vehicle operator ☐ None ☐ Other _____

Go To Section I

Section H

Section H: Aircraft / Pedestrian Conflict

H.1 If a runway transgression incident with a pedestrian occurred, who was involved?	◯ FBO personnel ◯ Construction personnel ◯ Passenger(s) ◯ Casual pedestrian ◯ Unknown ◯ Other _____
H.2 What was the estimated miss distance between your aircraft and the pedestrian(s)?	_____ feet Horizontal (H.2.a) _____ feet Vertical (H.2.b)
H.3 What evasive action(s) did you take?	◯ Aborted takeoff ◯ Initiated go-around ◯ Taxied clear of runway ◯ No evasive action taken ◯ Other _____
H.4 What evasive action(s) did the pedestrian take?	◯ Cleared the runway ◯ Cleared path of aircraft ◯ No evasive action taken ◯ Other _____
H.5 What other sources alerted you to the situation? *(Analyst: check all that apply)*	☐ Crew member action ☐ Passenger action ☐ UNICOM / CTAF / FSS (specify) _____ ☐ Communication from other pilot(s) ☐ None ☐ Other _____

Go To Section I

Section I

Section I: Airport-Specific Information

I.1 What is the runway configuration at the airport where the incident occurred?	◯ Single Runway ◯ Parallel Runways ◯ Intersecting Runways ◯ Parallel & Intersecting Runways ◯ Unknown
I.2 What runway(s) were aircraft using at the time of the incident?	◯ Single Runway, Same Direction ◯ Single Runway, Opposite Direction ◯ Parallel Runways, Same Direction ◯ Parallel Runways, Opposite Direction ◯ Intersecting Runways ◯ Unknown
I.3 Was the active runway paved?	◯ Yes ◯ No ◯ Unknown
I.4 Were there one or more taxiways?	◯ Yes ◯ No ◯ Unknown
I.5 Did the taxiway(s) have hold lines?	◯ Yes ◯ No ◯ Unknown
I.6 Did the incident occur at a multi-use airport (i.e., skydiving, glider ops, etc.)	◯ Yes ◯ No ◯ Unknown
I.7 At the time of the incident, how would you describe the activity level at the airport?	◯ High ◯ Moderate ◯ Low ◯ Unknown
I.8 What communications capability does the airport have? *(Analyst: check all that apply)*	☐ CTAF ☐ UNICOM ☐ FSS ☐ Multicom ☐ None ☐ Unknown
I.9 At the time of the incident, were any of the following geographical or topographical conditions a factor? *(Analyst: check all that apply)*	☐ High or rising terrain ☐ Tall structures or buildings ☐ Vegetation (tall grass, etc.) ☐ Trees ☐ Runway slope of hump ☐ Taxiway slope or hump ☐ None noted ☐ Other _____

Section I (continued)

I.10 Did any of the following conditions impair your taxiing ability? *(Analyst: check all that apply)*	☐ Gusting winds ☐ Driving rain ☐ Icy conditions ☐ Heavy snow ☐ Fog ☐ Low ceilings/visibility ☐ Lighting, (i.e., dusk, sun position, etc.) ☐ None noted ☐ Other _____
I.11 At the time of the incident, was the condition of any of the following airport aids factors in the incident? *(Analyst: check all that apply)*	☐ Taxiway signs ☐ Hold Short lines ☐ Ramp Lighting ☐ Taxiway Lighting ☐ Runway Lighting ☐ Approach Lighting ☐ Runway or Taxiway Lines ☐ None
I.12 Was the Hold Short line clearly marked?	◯ Yes ◯ No ◯ Obscured by rain or snow ◯ None existed ◯ Unknown
I.13 Were the directional signs to the runway illuminated?	◯ Yes ◯ No ◯ Partially lighted ◯ None existed ◯ Unknown / not applicable
I.14 At the time of the incident, did any of the following factors affect your choice of a landing/departure runway? *(Analyst: check all that apply)*	☐ Wind direction ☐ Runway slope ☐ Approach or departure obstacles ☐ Runway direction in use by other traffic
I.15 Does the airport have a communications "blind spot?" that factored into the incident?	◯ Yes ◯ No ◯ Unknown
I.16 Was construction on the airport a factor?	◯ Yes ◯ No ◯ Unknown
I.17 If "Yes" (to I.16), was the construction area lighted or otherwise marked?	◯ NOT marked or lighted ◯ Marked AND lighted ◯ Marked ◯ Lighted ◯ Unknown ◯ Not applicable

Section I (continued)

I.18 Have you experienced a previous runway transgression event at this airport?	◯ Yes ◯ No
I.19 If applicable, what was your duty time in hours prior to this incident?	

Section J

Section J: Reporter Background and Use of Resources

J.1 Have you previously landed / departed this airport?	◯ No ◯ Once before ◯ less than 5 times ◯ more than 5 times
J.2 Prior to this incident, when was your most recent visit to this airport?	◯ Have not visited there before ◯ Within last week ◯ Within last month ◯ Within the last six months
J.3 If this incident occurred at an airport where the Tower was closed, how did you know the Tower was closed? *(Analyst: check all that apply)*	☐ CTAF ☐ Commercial Chart ☐ Government Chart ☐ Company Information ☐ NOTAM ☐ Third-party information ☐ Didn't know ☐ Other _____
J.4 Do you feel comfortable with non-Tower airport communications procedures?	◯ Yes ◯ No
J.5 Does your company provide training and/or publications for operations at non-Tower airports?	◯ Line Training ◯ Ground School ◯ Computer Based Training (CBT) ◯ Publications (inc. FOM, etc.) ◯ None
J.6 Which charts or publications did you utilize prior to or during the incident? *(Analyst: check all that apply)*	☐ Sectional chart ☐ Commercial Instrument Chart ☐ NOAA Instrument Chart ☐ Commercial "Airports" chart ☐ Did not use charts ☐ Other (specify) _____
J.7 Did you review the airport surface diagram before taxiing out or conducting an approach?	◯ Yes ◯ No ◯ Don’t recall ◯ No, I am familiar with the airport

Section J (continued)

J.8 Was the information on the airport surface diagram current and accurate?	◯ Current and Accurate ◯ Current but Inaccurate ◯ Not Current but Accurate ◯ Not Current and Inaccurate ◯ Not Applicable
J.9 Did you check for current NOTAMS prior to flight?	◯ Yes ◯ No ◯ Tried, but was unable ◯ Tried, but NOTAMS were unavailable
J.10 Where did you obtain the NOTAMS? *(Analyst: check all that apply)*	☐ from FSS, by telephone ☐ from FSS, in person ☐ from FSS, by radio ☐ Computer ☐ Not Applicable ☐ Other (specify) _____
J.11 Were you involved in training when the runway transgression incident occurred?	◯ Yes ◯ No
J.12 If you were involved in training, what type of training was going on when the event occurred?	◯ Private pilot instruction ◯ Instrument instruction ◯ Initial Operating Experience (IOE) ◯ Recurrent training ◯ Not applicable ◯ Other _____

Section K

Section K. Communications Capabilities and Practices

K.1 Is your aircraft equipped with a radio?	◯ Yes ◯ No
K.2 Were you using the radio at the time of the incident? (receiving and/or transmitting)	◯ Yes ◯ No
K.3 If you didn't use the radio, why not? *(Analyst: check all that apply)*	☐ Forgot ☐ Aircraft radio problem ☐ Frequency congestion ☐ Poor UNICOM service ☐ Frequency cut out ☐ Frequency overlap ☐ Inadequate signal coverage ☐ Chose not to (no specific reason) ☐ Not Applicable ☐ Other _____

If the reporter <u>DID NOT</u> use the radio, go directly to Section L (page 15)

K.4 What communications frequencies did you use? *(Analyst: check all that apply)*	☐ UNICOM ☐ CTAF ☐ FSS	☐ FSS ☐ MULTICOM ☐ None
K.5 How did you determine what frequency to use? *(Analyst: check all that apply)*	☐ Chart (specify): ☐ Publication (specify) _____: ☐ Word of mouth ☐ Advised on radio ☐ ATC provided it	
K.6 Did you use the wrong frequency?	◯ Yes ◯ No	
K.7 Did you or the other pilot experience confusion over which frequency to use?	◯ Reporter ◯ Other pilot ◯ No confusion was apparent	
K.8 Was there frequency congestion at the time of the incident?	◯ Yes ◯ No	
K.9 Was there frequency overlap (i.e., interference from *another* frequency) at the time of the incident?	◯ Yes ◯ No	
K.10 Were your judgment or actions influenced by any of the following? *(Analyst: check all that apply)*	☐ UNICOM operator ☐ MULTICOM operator ☐ FSS Operator ☐ Another person on CTAF ☐ FAA Controller ☐ Not Affected	

Section K (continued)

K.11 Did the other aircraft involved communicate its position clearly?	◯ Yes ◯ No ◯ Unknown ◯ Not applicable
K.12 Were you on a frequency that was different from the other aircraft?	◯ Yes ◯ No ◯ Unknown
K.13 Were you informed beforehand of the other aircraft from any of the following? *(Analyst: check all that apply)*	☐ FSS ☐ UNICOM ☐ CTAF ☐ ATC Facility ☐ None Given
K.14 Does UNICOM service at this airport include traffic information?	◯ Yes ◯ No ◯ Unknown
K.15 Were you using more than one frequency at the same time? (i.e., company, CTAF, ATC)	◯ Yes ◯ No
K.16 Did multi-frequency use affect your situational awareness or cockpit coordination?	◯ Yes ◯ No ◯ Not applicable

Section L

Section L. Human Factors

L.1 Did any of the following causal factors contribute to the runway transgression? *(Analyst: check all that apply)*	☐ Lack of situational awareness ☐ Lack of positional awareness ☐ Distraction ☐ Breakdown in CRM ☐ Fatigue ☐ Complacency ☐ Memory lapse ☐ Other _____
L.2 Did any of the following aircraft equipment issues contribute to the runway transgression? *(Analyst: check all that apply)*	☐ Equipment configuration or display characteristics ☐ Aircraft systems problems ☐ Engine problems ☐ Not applicable ☐ Other _____
L.3 Did any of the following operational or technical factors contribute to the runway transgression? *(Analyst: check all that apply)*	☐ Insufficient preflight or in-flight planning ☐ Misinterpretation of airport chart ☐ Insufficient training ☐ Not applicable ☐ Other _____
L.4 Did any of the following schedule pressure factors contribute to the runway transgression? *(Analyst: check all that apply)*	☐ A "void if not off by…" ATC clearance ☐ Approaching darkness ☐ Deteriorating weather ☐ Schedule pressure ☐ Personal pressure to reach destination ☐ Not applicable ☐ Other _____

Section M

Section M. Free-Form Questions

M.1 In your mind, what is the single most important factor that caused, or contributed to this runway transgression?

M.2 How could this incident have been avoided?

M.3 Do you have any other recommendations that would help prevent runway transgressions at non-Tower airports or closed-Tower airports?

M.4 On a scale of 1 to 5, with 1 “Not Hazardous” and 5 “Very Hazardous,” rate the severity of this event.

◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5

Section M (continued)

M.5 Analyst Comments:

Section A (end)

Section A: Administrative

A.8 Callback End Time: (24 hour time) .....

A.9 Total Callback Time: (Don't compute total callback time — the computer will supply that automatically.)

ANALYST ASSISTANT: The "Qualifying Questions, and questions A.1, 4, 5; B.1 - 5; C.1 - 10; D.1, and 2 will normally be filed out by the analyst assistant from the information provided on the NASA reporting form (ARC 277B) — these questions are shaded in gray. If the information is not provided on the reporting form, the callback analyst will ask for the data from the reporter during the callback.

Appendix B

Data Summary (Tables)

A: Administrative

A.1 Accession Numbers (range)

A.2 … A.7 (administrative only)

A.9 Average Callback Time (minutes):
Minimum ..... :18
Maximum 1:45
Average ..... :37

B: Reporter Information

B.1 Reporter:
Single Pilot 38
Captain 9
First Officer 3
Other 0
Second Officer 0
Airport Manager 0
FBO Personnel 1
TOTAL 51

B.1 (b) Flying Pilot — Multi-Crew Acft
Pilot Flying 11
Pilot Not Flying 1
Other 0
TOTAL 12

B.2 Ratings:
(Multiple citations permitted)
Commercial 22
ATP 16
Private 13
Student 0
TOTAL 51

B.3 Operator:
Other GA 36
Air Carrier 5
Corporate 4
Air Taxi 3
Other 2
Commuter 1
Government 0
Military 0
TOTAL 51

B.4 Mission:
(Multiple citations permitted)
Pleasure 19
Training 13
Passenger 9
Other 5
(Personal) Business 4
Cargo 1
Ferry 0
Test Flight 0
EMS 0
Maintenance 0
TOTAL 51

B.5 Experience (hours), rounded to closest whole number:

Total Time:
Average 3,350
Median 1,740
Minimum 75
Maximum 22,549

Time Last 90 Days:
Average 83
Median 40
Minimum 6
Maximum 350

Total Time in Type:
Average 598
Median 269
Minimum 4
Maximum 4,000

C: Date, Time, Location

C.1 Airport Identifier:
Forty-seven airports, 4 airports being reported twice each.

C.2 Date:
The date range for incident occurrence runs from February of 2000 through August of 2001.

C.3 Day of Week:
Sunday 7
Monday 5
Tuesday 7
Wednesday 8
Thursday 8
Friday 4
Saturday 12
TOTAL 51

C.4 Quarter of Day:
0001 – 0600 1
0601 – 1200 19
1201 – 1800 26
1801 – 2400 5
SUB-TOTAL 51
TOTAL 51

C.5(a) Weather Conditions:
(Multiple citations permitted)
VMC 47
IMC 1
Mixed 1
Marginal 0
[not reported] 2
TOTAL 51

C.5(b) Weather Conditions:
Rain 2
Fog 0
Ice 0
TOTAL 2

C.6 Ceiling:

C.7 Visibility:

C.8 RVR: (Two reports only)

C.9 Lighting:
Daylight 42
Dusk 4
Night 3
Dawn 2
TOTAL 51

C.10 Flight Plan:
None 24
IFR 17
VFR 10
SVFR 0
DVFR 0
Unknown 0
TOTAL 51

D: Reporter Aircraft Information

D.1, and
D.2Reporter Aircraft Type, and Make/Model:
Breakout by Type:

REPORTER	Recip.	Turboprop	Jet
Single Engine	37	0	0
Multi Engine	2	7	5
TOTAL	39	7	5

D.3 Reporter Aircraft, Approach / Departure:
Straight-out departure 8
Straight-in final 7
Other 6
Base leg entry 2
Crosswind departure 1
[not reported / not applicable] 27
TOTAL 51

D.4 Reporter Aircraft Phase of Flight:
Takeoff / Departure 21
Taxiing 14
Landing Rollout 8
Short Final 7
Partially clear of runway 1
TOTAL 51

E: Conflict Type and Description

E.1 Transgression Type:
Aircraft / Aircraft 49
Aircraft / Vehicle 2
Aircraft / Pedestrian(s) 0
No actual conflict 0
TOTAL 51

F: Aircraft/Aircraft Conflict

F.1, and
F.2 Aircraft 2 Type and Make/Model:
Breakout by Type:

AIRCRAFT 2	Recip.	T-Prop	Jet	Other
Single Engine	27	2	0	—
Multi Engine	2	4	7	—
Helicopter	2	1	0	—
Glider	—	—	—	3
Vehicle	—	—	—	2
Unknown	—	—	—	
TOTAL	31	7	7	6

F.3 Aircraft 2 Wing Configuration:
High Wing 15
Mid Wing 1
Low Wing 10
Bi-Wing 0
Rotary Wing 2
[Unknown / not available] 23
TOTAL 51

F.4 Aircraft 2 Engine Configuration:
Unknown 22
Single-engine 17
Multi-engine 8
No engine 2
[vehicles] 2
TOTAL 51

F.5 Aircraft 2 Approach / Departure:
Straight-in final 15
Unknown 15
Other 12
Straight-out departure 6
Base leg entry 3
TOTAL 51

F.6 Aircraft 2 Phase of Flight:
Short Final 19
Landing Rollout 12
Takeoff roll 7
Taxiing 6
Partially clear of runway 1
Not Stated 4
[vehicle] 2
TOTAL 51

F.7 Reporter Aircraft Position in Relation to Aircraft 2:
Other 10
Arriving same direction 8
Taxiing on the active runway 6
Taxiing across the active runway 6
Holding in position on active runway 6
Departing same direction 5
Departing opposite direction 6
Arriving opposite direction 1
[not available] 3
TOTAL 51

F.8 Did you perform a clearing maneuver…:
Yes 26
No 6
Not applicable 17
[not available] 2
TOTAL 51

F.9 Aircraft 2 Position in Relation to Reporter Aircraft:
Other 15
Arriving same direction 14
Arriving opposite direction 7
Taxiing on the active runway 5
Departing opposite direction 5
Taxiing across the active runway 1
Holding in position on active runway 1
Departing same direction 1
[vehicle, not reported] 2
TOTAL 51

F.10 Aircraft Proximity:
No 27
Yes 19
Unknown 3
SUB-TOTAL 49
[not available] 2
TOTAL 51

F.11a Estimated Miss Distance Horizontal:
Average ..... 1,604 ft
Median ..... 500 ft
Minimum ..... 0 ft
Maximum ..... 10,000 ft
46 citations from 51 reports

F.11b Estimated Miss Distance Vertical:
Average ..... 192 ft
Median ..... 100 ft
Minimum ..... 0 ft
Maximum ..... 1,000 ft
43 citations from 51 reports

F.11c NMAC criteria, i.e., LESS than 500 feet vertically AND horizontally 18
18 citations from 43 of 51 reports

F.12 Reporter Evasive Action:
No evasive action taken 20
Taxied clear of runway 11
Other 10
Aborted takeoff 3
Altered flight path 3
Initiated go-around 2
[not available] 2
TOTAL 51

F.13 Aircraft 2 Evasive Action:
No evasive action taken 26
Initiated go-around 9
Other 6
Taxied clear of runway 3
Altered flight path 3
Aborted takeoff 2
[not available] 2
TOTAL 51

F.14 What sources alerted you (Reporter) to the situation:
(Multiple citations permitted)
None 18
UNICOM / CTAF / FSS 14
Other 10
Com from other pilot(s) 7
Crew member action 3
Passenger action 2
SUB-TOTAL 54
[not available] 2
TOTAL 54

G: Aircraft / Vehicle Conflict

G.1…G.6:
There are only 2 aircraft / vehicle conflicts, summarized as follows: 2 airport vehicles, neither (apparently) using CTAF or UNICOM. In one instance the reporter (aircraft 1) initiated a go-around, and in the other no evasive action was taken. Neither vehicle evidenced evasive action.

G.1 If a runway transgression incident with a vehicle occurred, what kind of vehicle was involved?
FBO or airport vehicle 2
Construction vehicle 0
Personal (private) car or vehicle 0
Unknown 0
Other 0
TOTAL 2

G.2 Was the vehicle using the airport Common Traffic Advisory (CTAF) or UNICOM frequency?
Yes 0
No 2
Unknown 0
Total 2

G.3 What was the approximate miss distance between your aircraft and the vehicle?
496963, 0 ft. horiz. / 5 ft. vert.
498029, 2,500 ft. horiz / 0 ft. vert.

G.4 What evasive action(s) did you take?
Aborted takeoff 0
Initiated go-around 1
Taxied clear of runway 0
Altered flight path 0
No evasive action taken 1
Other 0
TOTAL 2

G.5 What evasive action(s) did the vehicle take?
Cleared the runway 0
Evasive maneuvering 0
No evasive action taken 2
Other 0
TOTAL 2

G.6 What other sources alerted you to the situation? (Multiple citations permitted)
Crew member action 1
Passenger action 0
UNICOM / CTAF / FSS 0
Communication from other pilot(s) 0
Communication from vehicle operator 1
None 0
Other 0
TOTAL 2

H: Aircraft/Pedestrian Conflict

H.1…G.H:
No aircraft / pedestrian conflicts reported.

H.1 If a runway transgression incident with a pedestrian occurred, who was involved?
FBO personnel 0
Construction personnel 0
Passenger(s) 0
Casual pedestrian 0
Unknown 0
Other 0
TOTAL 0

H.2 What was the estimated miss distance between your aircraft and the pedestrian(s)?
Horizontal ..... no reports
Vertical ..... no reports

H.3 What evasive action(s) did you take?
Aborted takeoff 0
Initiated go-around 0
Taxied clear of runway 0
No evasive action taken 0
Other 0
TOTAL 0

H.4 What evasive action(s) did the pedestrian take?
Cleared the runway 0
Cleared path of aircraft 0
No evasive action taken 0
Other 0
TOTAL 0

H.5 What other sources alerted you to the situation?
(Multiple citations permitted)
Crew member action 0
Passenger action 0
UNICOM / CTAF / FSS 0
Communication from other pilot(s) 0
None 0
Other 0
TOTAL 0

I: Airport-Specific Information

I.1 Runway Configuration
Intersecting Runways 30
Single Runway 17
Parallel & Intersecting Runways 2
Parallel Runways 1
Unknown 1
TOTAL 51

I.2 What runway(s) were aircraft using:
Single Runway, Same Direction 23
Single Runway, Opposite Direction 14
Intersecting Runways 12
Parallel Runways, Same Direction 1
Parallel Runways, Opposite Direction ..... —
[not available] 1
TOTAL 51

I.3 Was the runway paved:
Yes 51
No 0
Unknown 0
TOTAL 51

I.4 Were there one or more taxiways:
Yes 46
No 5
Unknown 0
TOTAL 51

I.5 Did the taxiway(s) have hold lines:
Yes 44
Unknown 5
No 2
TOTAL 51

I.6 Did the incident occur at a multi-use airport:
No 29
Yes 13
Unknown 5
TOTAL 51

I.7 Airport activity level (at time of incident):
Low 27
Moderate 15
High 8
Unknown 1
TOTAL 51

I.8 What communications capability does the airport have:
(Multiple citations permitted)
CTAF 37
UNICOM 37
FSS 4
Multicom 1
None 0
Unknown 1
TOTAL 79

I.9 Were any of the following geographical or topographical conditions a factor:
(Multiple citations permitted)
None noted 32
Runway slope or hump 7
Trees 7
High or rising terrain 4
Tall structures or buildings 2
Other 2
Vegetation (tall grass, etc.) 1
Taxiway slope or hump 0
TOTAL 55

I.10 Did any of the following conditions impair your taxiing ability:
(Multiple citations permitted)
None noted 39
Other 4
Lighting, (i.e., dusk, sun, etc.) 3
Low ceilings/visibility 2
Gusting winds 1
Driving rain 1
Heavy snow 1
Fog 1
Icy conditions 0
[not available] 2
TOTAL 54

I.11 Was the condition of any of the following airport aids factors in the incident:
(Multiple citations permitted)
None 50
Taxiway signs 0
Hold Short lines 0
Ramp Lighting 0
Taxiway Lighting 0
Runway Lighting 0
Approach Lighting 0
Runway or Taxiway Lines 0
[not available] 1
TOTAL 51

I.12 Was the hold short line clearly marked:
Yes 41
No 2
Obscured by rain or snow 0
None existed 0
Unknown 7
[not available] 1
TOTAL 51

I.13 Were the directional signs to the runway illuminated:
Unknown / not applicable 22
No 15
Yes 11
None existed 3
Partially lighted 0
TOTAL 51

I.14 Did any of the following affect runway selection /choice:
(Multiple citations permitted)
Wind direction 38
Rwy direction in use by other traffic 19
Approach or departure obstacles 2
Runway slope 1
TOTAL 60

I.15 Does the airport have a communications "blind spot":
No 36
Unknown 15
Yes 0
TOTAL 51

I.16 Was construction on the airport a factor:
No 47
Unknown 3
Yes 1
TOTAL 51

I.17 If "Yes" (to I.16), was the construction area lighted or otherwise marked:
Not applicable 50
Marked AND lighted 1
NOT marked or lighted 0
Marked 0
Lighted 0
Unknown 0
TOTAL 51

I.18 Have you experienced a previous runway transgression event at this airport:
No 46
Yes 5
TOTAL 51

I.19 What was your duty time in hours prior to this incident?
Average ..... 1.5 hrs
Median ..... 1.0 hrs
Minimum ..... 0.0 hrs
Maximum ..... 8.0 hrs

J: Reporter Background and Resource Utilization

J.1 Have you previously landed / departed this airport:
More than 5 times 36
Less than 5 times 8
No 7
Once before 0
TOTAL 51

J.2 Prior to this incident, when was your most recent visit to this airport?
Within last week 26
Within last month 10
Within the last six months 7
Have not visited there before 4
[not available] 4
TOTAL 51

J.3 How did you know the Tower was closed:
(Multiple citations permitted)
CTAF 2
Commercial Chart 2
Government Chart 1
Company Information 2
NOTAM 0
Third-party information 1
Didn't know 0
Other 9
[not available] 35
TOTAL 52

J.4 Do you feel comfortable with non-Tower airport communications procedures:
Yes 48
No 3
TOTAL 51

J.5 Does your company provide training and/or publications for operations at non-Tower airports:
None 14
Ground School 13
Publications (inc. FOM, etc.) 12
Line Training 9
Computer Based Training (CBT) 2
[not available] 1
TOTAL 51

J.6 Which charts or publications did you utilize prior to or during the incident:
(Multiple citations permitted)
Sectional chart 22
Commercial Instrument Chart 14
NOAA Instrument Chart 12
Did not use charts 11
Other (specify) 8
Commercial "Airports" chart 7
TOTAL 74

J.7 Did you review the airport surface diagram before taxiing out or conducting an approach:
Yes 26
No, I am familiar with the airport 20
No 3
Don't recall 0
[not available] 2
TOTAL 51

J.8 Was the information on the airport surface diagram current and accurate:
Current and Accurate 34
Not Applicable 13
Current but Inaccurate 1
Not Current but Accurate 0
Not Current and Inaccurate 0
[not available] 3
TOTAL 51

J.9 Did you check for current NOTAMS prior to flight:
Yes 37
No 12
Tried, but was unable 0
Tried, but NOTAMS were unavailable 0
[not available] 2
TOTAL 51

J.10 Where did you obtain the NOTAMS: (Multiple citations permitted)
from FSS, by telephone 19
from FSS, in person 3
from FSS, by radio 0
Computer 13
Not Applicable 7
Other 8
[not available] 1
TOTAL 51

J.11 Were you involved in training when the runway transgression incident occurred:
Yes 13
No 38
TOTAL 51

J.12 If you were involved in training, what type of training was going:
Not applicable 18
Other 7
Private pilot instruction 4
Instrument instruction 2
Initial Operating Experience (IOE) 0
Recurrent training 0
[not available] 20
TOTAL 51

K: Communications

K.1 Is your aircraft equipped with a radio:
Yes 49
No 2
TOTAL 51

K.2 Were you using the radio at the time of the incident:
Yes 47
No 3
[not available] 1
TOTAL 51

K.3 If you didn't use the radio, why not: (Multiple citations permitted)
Not Applicable 47
Other 3
Chose not to (no specific reason) 1
Forgot 0
Aircraft radio problem 0
Frequency congestion 0
Poor UNICOM service 0
Frequency cut out 0
Frequency overlap 0
Inadequate signal coverage 0
TOTAL 51

K.4 . What communications frequencies did you use: (Multiple citations permitted)
CTAF 33
UNICOM 20
FSS 2
MULTICOM 1
None 0
TOTAL 56

K.5 How did you determine what frequency to use: (Multiple citations permitted)
Chart (specify): 32
Publication 11
Advised on radio 2
ATC provided it 2
Word of mouth 1
[not available] 3
TOTAL 51

K.6 Did you use the wrong frequency:
No 37
Yes 6
[not available] 8
TOTAL 51

K.7 Did you or the other pilot experience confusion over which frequency to use:
No confusion was apparent 36
Other pilot 6
Reporter 0
[not available] 9
TOTAL 51

K.8 Was there frequency congestion at the time of the incident
No 37
Yes 6
[not available] 8
TOTAL 51

K.9 Was there frequency overlap
No 38
Yes 5
[not available] 8
TOTAL 51

K.10 Were your judgment or actions influenced by…: (Multiple citations permitted)
Not Affected 33
Another person on CTAF 5
UNICOM operator 3
FSS Operator 2
FAA Controller 2
MULTICOM operator 0
[not available] 6
TOTAL 51

K.11 Did the other aircraft involved communicate its position clearly
No 27
Unknown 14
Yes 9
Not applicable 1
TOTAL 51

K.12 Were you on a frequency that was different from the other aircraft:
No 23
Unknown 19
Yes 9
TOTAL 51

K.13 Were you informed beforehand of the other aircraft from…:
(Multiple citations permitted)
None Given 31
CTAF 7
FSS 2
UNICOM 2
ATC Facility 2
[not available] 7
TOTAL 51

K.14 Does UNICOM service at this airport include traffic information:
No 22
Yes 16
Unknown 13
TOTAL 51

K.15 Were you using more than one frequency at the same time:
No 34
Yes 9
[not available] 8
TOTAL 51

K.16 Did multi-frequency use affect your situational awareness or cockpit coordination:
Not applicable 34
No 14
Yes 3
TOTAL 51

L: Human Factors

L.1 Did any of the following causal factors contribute:
(Multiple citations permitted)
Lack of situational awareness 13
Distraction 8
Other 6
Lack of positional awareness 5
Breakdown in CRM 4
Complacency 3
Fatigue 3
Memory lapse 2
TOTAL 44

L.2 Did any of the following aircraft equipment issues contribute…:
(Multiple citations permitted)
Not applicable 44
Aircraft systems problems 3
Equip. config. / display characteristics 1
Engine problems 0
Other 0
TOTAL 51

L.3 Did any of the following operational or technical factors contribute…:
(Multiple citations permitted)
Insuf. preflight or in-flight planning 1
Not applicable 45
Other 3
Insufficient training 1
Misinterpretation of airport chart 0
[not available] 1
TOTAL 51

L.4 Did any of the following schedule pressure factors contribute…:
(Multiple citations permitted)
Not applicable 39
Schedule pressure 5
Other 6
A “void if not off by…” ATC clearance 2
Personal pressure to reach destination 2
Approaching darkness 0
Deteriorating weather 0
TOTAL 54

M: Free-Form Questions

M.1 In your mind, what is the single most important factor that caused, or contributed to this runway transgression?

M.2 How could this incident have been avoided?

M.3 Do you have any other recommendations that would help prevent runway transgressions at non-Tower airports or closed-Tower airports?

M.4 On a scale of 1 to 5, with 1 “Not Hazardous” and 5 “Very Hazardous,” rate the severity of this event.
1 (Low) 9
2 (Medium Low) 16
3 (Medium) 12
4 (Medium High) 9
5 (High) 5
TOTAL 51

Appendix C

ASRS Database Listing of Non-Tower and Tower-Closed Airport Runway Transgressions, 1997 – 2000

State		LOCID	Airport Name, City (Airport Code)	Year	Count
Alaska	AK	ANI	Aniak Airport, Aniak, (ANI)	1997	1
	AK	DLG	Dillingham Airport, Dillingham, (DLG)	1997	1
	AK	DLG	Dillingham Airport, Dillingham, (DLG)	1998	1
	AK	ILI	Iliamna Airport, Iliamna, (ILI)	1997	1
	AK	AFE	Kake Airport, Kake, (AFE)	1997	1
	AK	KTN.Airport	Ketchikan International Airport, Ketchikan, (KTN)	2001	1
Alabama	AL	MSL.Airport	Northwest Alabama RGNL, Muscle Shoals, (MSL)	2000	1
Arkansas	AR	HRO.Airport	Boone Co. Airport, Harrison, (HRO)	1999	1
Arizona	AZ	E14	No Match	1998	1
California	CA	UDD.Airport	Bermuda Dunes Airport, Palm Springs, (UDD)	1999	1
	CA	F70.Airport	French Valley Airport, Murrieta, (F70)	2000	1
	CA	L52.Airport	Oceano County Airport, Oceano, (L52)	1999	1
	CA	L67	Rialto Muni Miro Fld Airport, Rialto, (L67)	1998	1
	CA	MHR.Airport	Sacramento Mather Airport, Sacramento, (MHR)	1999	2
	CA	TRK.Airport	Truckee Tahoe Airport, Truckee, (TRK)	2000	1
	CA	VIS.Airport	Visalia Muni Airport, Visalia, (VIS)	2000	1
	CA	WVI	Watsonville Muni Airport, Watsonville, (WVI)	1998	1
Colorado	CO	DRO.Airport	Durango La Plats Co Airport, Durango, (DRO)	2000	1
	CO	GXY.Airport	Greenley Weld Co Airport, Greenley, (GXY)	1999	1
	CO	GUC.Airport	Gunnison Co Airport, Gunnison, (GUC)	1999	1
	CO	TEX	Telluride RGNL Airport, Telluride, (TEX)	1997	1
Florida	FL	CEW.Airport	Bob Sikes Airport, Crestiview, (CEW)	1999	1
	FL	SFD	Bob Wiley Fld Airport, Winner, (SFD)	1998	1
	FL	BCT.Airport	Boca Raton Airport, Boca Raton, (BCT)	1999	1
	FL	PGD.Airport	Charlotte Co Airport, Punta Gorda, (PGD)	1999	1
	FL	X47	Flangler Co Airport, Bunnell, (X47)	1999	1
	FL	LEE.Airport	Leesburg Rgnl. Airport, Leesburg, (LEE)	2000	1
	FL	2R4.Airport	Peter Prince Fld. Airport, Milton, (2R4)	2000	1
	FL	2RR.Airport	River Ranch Resort Airport, River Ranch, (2RR)	2001	1
	FL	ZPH.Airport	Zephyrhills Muni Airport, Zephyrhills, (ZPH)	2000	1
Foreign	FO	RCTP.Airport	Chiang Kai Shek Intl Airport, Taiwan, (RCTP	2000	1
Georgia	GA	BQK	Glynco Jetport, Brunswick, (BQK)	1998	1
	GA	BQK.Airport	Glynco Jetport, Brunswick, (BQK)	2001	1
	GA	SSI	Malcolm McKinnon Airport, Brunswick, (SSI)	1997	1
	GA	ACJ	Souther Fld Airport, Americus, (ACJ)	1998	1
Hawaii	HI	LNY	Lanai Airport, Lanai City, (LNY)	1998	1
Iowa	IA	AMW	Ames Muni Airport, Ames, (AMW)	1997	1
	IA	BRL	Burlington Rgnl. Airport, Burlington, (BRL)	1997	1
Idaho	ID	COE.Airport	Coeur D Alene Air Terminal Airport, Coeur D'Alene, (COE)	2000	1
	ID	U59	Driggs Reed Mem Airport, Driggs, (U59)	1998	1

State		LOCID	Airport Name, City (Airport Code)	Year	Count
Illinois	IL	LOT	Lewis University Airport, Chicago, (LOT)	1998	1
	IL	UIN.Airport	Quincy RGNL Baldwin Fld. Airport, Quincy, (UIN)	2001	1
Indiana	IN	JVY.Airport	Clark Co Airport, Jeffersonville, (JVY)	2001	1
Kansas	KS	PTS.Airport	Atkinson Muni Airport, Pittsburg, (PTS)	2001	1
	KS	GCK	Garden City Rgnl Airport, Garden City, (GCK)	1997	2
	KS	ZZZ	No Match	1997	1
Kentucky	KY	2I0	Mgt Station 2105 Heliport, Hartford, (210)	1998	1
Louisiana	LA	RSN	Ruston Rgnl Airport, Ruston, (RSN)	1998	1
Massachusetts	MA	SFZ	North Central State Airport, Pawtucket, (SFZ)	1998	1
	MA	OWD	Norwood Mem Airport, Norwood, (OWD)	1998	1
	MA	PSF	Pittfield Muni Airport, Pittsfield, (PSF)	1997	1
	MA	2B2.Airport	Plum Island Airport, Newburyport, (2B2)	2000	1
Maryland	MD	FDK.Airport	Frederick Muni Airport, Frederick, (FDK)	1999	1
	MD	3W3.Airport	Ketmorr Airpark Airport, Stevensville, (3W3)	2000	1
Maine	ME	BHB	Hancock Co Bar Harbor Airport, Bar Harbor, (BHB)	1998	2
Michigan	MI	MQI	Dare Co Rgnl Airport, Manteo, (MQI)	1998	1
	MI	MBL.Airport	Manistee Co Blacher Airport, Manistee, (MBL)	1999	1
	MI	MQT	No Matches	1998	1
Minnesota	MN	GHW	Glenwood Muni Airport, Glenwood, (GHW)	1997	1
	MN	GPZ.Airport	Grand Rapids Itasca Co Gordon Newstrom Airport, (GPZ)	2001	1
	MN	LXL	Little Falls Morrison Airport, Little Falls, (LXL)	1998	1
	MN	MKT.Airport	Mankato Rgnl Airport, Mankato, (MKT)	2001	1
Missouri	MO	ESN.Airport	Easton Newnam Fld Airport, Easton, (ESN)	2000	1
North Carolina	NC	SOP.Airport	Moore Co Airport, Pinehurst, (SOP)	2001	1
	NC	DKF	No Matches	1998	1
	NC	UKF	Wilkes Co Airport, Wilkesboro, (UKF)	1998	1
New Jersey	NJ	AIY	Atlantic City Muni Bader Fld Airport, Atlantic City, (AIY)	1997	1
	NJ	AIY	Atlantic City Muni Bader Fld Airport, Atlantic City, (AIY)	1999	1
	NJ	47N	Central Jersey Rgnl Airport, Manville, (47N)	1998	1
	NJ	N81.Airport	Hammonton Muni Airport, Hammonton, (N81)	2001	1
	NJ	MIV	Millville Muni Airport, Millville, (MIV)	1997	1
	NJ	MJX.Airport	Robert J Miller Air Park Airport, Toms River, (MJX)	2000	1
New Mexico	NM	ATS	Artesia Muni Airport, Artesia, (ATS)	1997	1
	NM	AEG.Airport	Double Eagle II Airport, Albuquerqque, (AEG)	2001	1
New York	NY	NY0.Airport	Multiple Matches	2000	1
	NY	MGJ.Airport	Orange Co Airport, Montgomery, (MGJ)	2000	2
	NY	MGJ.Airport	Orange Co Airport, Montgomery, (MGJ)	2001	1

State		LOCID	Airport Name, City (Airport Code)	Year	Count
Ohio	OH	I62	Brookville Air Park Airport, Brookville, (I62)	1998	1
	OH	I69.Airport	Clermont Co Airport, Batavia, (I69)	1999	1
Oregon	OR	UAO.Airport	Aurora State Airport, Aurora, (UAO)	2001	1
Pennsylvania	PA	N99.Airport	Brandywine Airport, West Chester, (N99)	1999	1
	PA	N94	Carlisle Airport, Carlisle, (N94)	1997	1
	PA	AOO	Itoona Blair Co. Airport, Altoona, (AOO)	1998	1
Rhode Island	RI	UUU	Newport State Airport, Newport, (UUU)	1997	1
South Carolina	SC	HXD.Airport	Hilton Head Airport, Hilton Head Island, (HXD)	2000	1
Tennessee	TN	JWN.Airport	John Tune Airport, Nashville, (JWN)	2000	2
Texas	TX	CDS.Airport	Childress Muni Airport, Childress, (CDS)	2000	1
	TX	5T6.Airport	Dona Ane County At Santa Teresa Airport, Santa Teresa, (5T6)	2001	1
	TX	CLL	Easterwood Fld Airport, College Station, (CLL)	1997	1
	TX	GTU.Airport	Georgetown Muni Airport, Georgetown, (GTU)	2000	1
	TX	T72	Hearne Muni Airport, Hearne, (T72)	1997	1
	TX	AXH	Houston Southwest Airport, Houston, (AXH)	1999	1
	TX	JCT.Airport	Kimble Co Airport, Junction, (JCT)	1999	1
	TX	HYI.Airport	San Marcos Muni Airport, San Marcos, (HYI)	2000	2
Utah	UT	PVU	Provo Muni Airport, Provo, (PVU)	1997	1
Virginia	VA	DAN.Airport	Danville Rgnl Airport, Danville, (DAN)	2001	1
	VA	JYO.Airport	Leesburg Executive Airport, Leesburg, (JYO)	2000	2
	VA	JYO.Airport	Leesburg Executive Airport, Leesburg, (JYO)	2001	1
	VA	SHD.Airport	Shenandoah Valley Rgnl Airport, Staunton, (SHD)	1999	1
Vermont	VT	4V8	Mount Snow Airport, West Dover, (4V8)	1998	1
	VT	RV8	No Matches	1998	1
Washington	WA	AWO.Airport	Arlington Muni Airport, Arlington, (AWO)	1999	1
	WA	PWT.Airport	Bremerton National Airport, Bremerton, (PWT)	2001	1
	WA	KLS	Kelso Longview Airport, Kelso, (KLS)	1998	1
	WA	EAT	Pangborn Mem Airport, Wenatchee, (EAT)	1997	1
	WA	EAT.Airport	Pangborn Mem Airport, Wenatchee, (EAT)	1999	1
	WA	76S	Wes Lupien Airport, Oak Harbor, (76S)	1997	1
Wisconsin	WI	EAU.Airport	Chippewa Valley Rgnl Airport, Eau Claire, (EAU)	2000	1
Wyoming	WY	RWL.Airport	Rawlins Muni Airport, Rawlins, (RWI)	2000	1
	WY	SHR.Airport	Sheridan Co Airport, Sheridan, (SHR)	2000	2

Appendix D

Report Synopses

ACN: 474929

Nose wheel of taxiing C-172 entered Runway 36 at ZPH with a sailplane on short final. Sailplane presented small visual target and had no radio; sky obscured by smoke.

ACN: 475300

C-172 on takeoff Runway 35 at PUB aborted takeoff for landing military C-130 on Runway 26L. C-172 training in progress and use of wrong CTAF frequency. Tower closed.

ACN: 479127

Single-engine homebuilt aircraft doing touch-and-go's on Runway 27 at BEH landed over the top of a small jet aircraft holding in position on the runway. Homebuilt did not make radio position reports.

ACN: 482051

SA-227 AC Metro aborted takeoff roll on Runway 09L at OPF for Challenger jet that departed opposite direction on Runway 27R. Challenger made no radio calls. Tower closed.

ACN: 483118

F35 Bonanza initiated takeoff roll on Runway 28 at NYO before landing experimental aircraft was clear of runway, forcing a PA-28 Cherokee on final for Runway 28 to go-around. Bonanza did not make a clearing turn before entering the runway.

ACN: 483236

C-172 on landing roll on Runway 06 at ISM had a critical ground conflict with a Beech King Air C90 rolling out on Runway 23. C-172 was on CTAF and King Air on UNICOM.

ACN: 483428

Piper PA-28T initiated a takeoff at JYO between an aircraft that had just landed and was clearing the runway, and a Socata TB21 on final. TB21 went around. PA-28T was hurrying to meet clearance void time.

ACN: 483539

C-195 landing Runway 22 at RWL advised by UNICOM of C-182 back-taxiing on runway. After aircraft taxied past each other on runway, C-182 made a takeoff over the C-195 before it exited the runway. C-182 made no radio calls.

ACN: 484323

C-152 taxied onto runway at F70 and began takeoff roll with R22 helicopter on short final. C-152 training in progress, English language comprehension problems.

ACN: 485656

C-150 taking off from Runway 19 at COE saw C-182 on Runway 01 holding in position. C-150 initiated evasive action and overflew C-182. C-150 training in progress. C-182 not on correct frequency.

ACN: 485837

PA-28 taxiing to run-up area at 2R4 crossed runway with C-172 on short final. PA-28 made CTAF calls, but did not hear C-172 or see aircraft on final.

ACN: 485874

J41 commuter experienced a critical conflict with PA-28 at COU during opposite direction departures on Runway 02. PA-28 did not respond to FSS traffic advisories or make CTAF calls. Runway crown a contributing factor.

ACN: 486048

PA-24 crossed hold line of runway at CDS as PA-28 initiated takeoff from an intersection ahead of the PA-24.

ACN: 486069

PA-28 back-taxiing on Runway 23 at SUT advised by UNICOM of a T-34 on short final. PA-28 taxied off runway onto grass as T-34 landed. T-34 short final obscured by trees.

ACN: 486772

C-182 taking off from Runway 09 aborted takeoff after a C-182 announced departure opposite direction on Runway 27. Runway crown a contributing factor.

ACN: 486846

C-182RG on final approach to Runway 21 at EYE saw a C550 jet taxi across the active runway as the C-182RG crossed the runway threshold.

ACN: 486971

Turbo Viking taxiing to Runway 22 at HYI crossed Runway 12 while a B35 Bonanza was on a landing roll Runway 12. Both runways were in active use by traffic.

ACN: 488924

C-177RG landed on Runway 06 at MJX at the same time a Piper Tripacer landed opposite direction on Runway 24. CTAF congestion a factor.

ACN: 492300

A sail plane and PA-25 tow plane in an aerobatic competition at AVQ delayed on runway after landing, causing a Gulfstream II to go-around. The sail plane and GII were on different frequencies.

ACN: 492902

DO328 taxied into position for departure on Runway 20 at DRO as a C-208 advised it was still on landing roll from the opposite direction.

ACN: 493161

RV4 on short final to Runway 20 at DAN experienced a conflict with a PA-28 that delayed on runway after landing. PA-28 training in progress.

ACN: 493458

Gulfstream IV crossing the Runway 1/19 intersection at TRK experienced a conflict with a C-172 on landing roll Runway 19.

ACN: 494515

C-340 on IFR approach to Runway 13 at LEE in Marginal VFR conditions cancelled IFR close to airport and landed, conflicting with a C-172RG and C-172 doing touch-and-go's on Runway 31. C-172 training in progress.

ACN: 495574

B58TC Baron departing Runway 14 at EAU heard a Cessna Citation announce aborted takeoff on Runway 22. Blocked CTAF communications and trees obscuring Runway 22 were factors.

ACN: 496963

Brasilia EMB-120 took evasive action and executed a go-around to avoid hitting a snow plow that backed onto the active runway while the EMB-120 was landing.

ACN: 498029

Brasilia EMB-120 on takeoff Runway 25 at BQK saw a car cross the runway prior to rotation. The EMB-120 continued the takeoff.

ACN: 498077

PA-32 taxied into position on Runway 31 at 3O7 before previous landing aircraft had cleared the runway and with a glider on short final. PA-32 training in progress.

ACN: 498641

C-180 taking the active runway at GPZ was overflown by a King Air 100 on low short final. C-180 communication equipment inoperative.

ACN: 501077

PA-28 taxied onto Runway 21 at MGJ for takeoff resulting in a C-172 initiating a go-around on short final. PA-28 com switch incorrectly positioned.

ACN: 501168

LNC-3 homebuilt taking off Runway 24 at X47 was overflown by a C-172 that landed in front of it. LNC-3 had delayed takeoff to allow previous landing traffic to clear runway.

ACN: 501398

C-150 preparing to taxi onto Runway 13 at UIN saw a PA-28 on final for Runway 13. PA-28 did not use radio to self-announce position.

ACN: 501606

PA-28 departing Runway 22 at AEG aborted takeoff when a PA-31 taxied onto Runway 04 and announced opposite direction departure.

ACN: 503047

Rallye Minerva MS-984 in initial climb after takeoff Runway 30 at LRU heard C-177RG on short final to intersecting Runway 04 announce go-around.

ACN: 503573

BE24R landing Runway 03 at N81 saw a PA-30 touching down opposite direction on Runway 21 and moved onto the grass to avoid a collision. PA-30 was on the wrong frequency. BE24R training in progress.

ACN: 504034

B737-500 holding in position for takeoff Runway 35 at Montrose was overflown by a C-120 jet that proceeded to do a go-around. C-120 made no position reports after an initial call.

ACN: 504145

PA-28 landed at UAO before a C-172 had cleared the runway.

ACN: 504624

C-206 in landing flare on Runway 16 at 5T5 observed a B36 Bonanza preparing to taxi onto the departure end of the runway for back-taxi. B36 did not announce intentions.

ACN: 507333

PA-28 landed on Runway 04 at MKT before a C-152 had cleared the runway after landing.

ACN: 507347

PA-28R at hold line for Runway 36 at JVY saw a Gulfstream IV touching down opposite direction on Runway 18. The PA-28R taxied across Runway 36 to a grassy area to avoid obstructing GIV's turn off the runway.

ACN: 507397

C-172 holding in position for takeoff Runway 17 at JYO was overflown by a Cessna Citation that announced go-around. C-172 training in progress.

ACN: 507528

B350 Super King Air on takeoff Runway 05 at SOP experienced a near collision with a PA-28 taking off opposite direction on Runway 23. B350 evasive action. PA-28 did not use radio. Runway crown a factor.

ACN: 508823

PA-25 holding past hold line, but short of Runway 20L, heard a Kit-Fox homebuilt announce final for 20L and land. Runway 20L is the "glider runway" and Runway 20R is the "power runway" at airport.

ACN: 509155

B737-500 delayed takeoff on Runway 14 at MFR after hearing a Cessna announced takeoff opposite direction on Runway 32. Runway 32 was the preferred runway.

ACN: 509557

Small airplane taxiing to fueling across Runway 26 at MGJ saw a helicopter abort final approach to Runway 26. Airplane did not use radio.

ACN: 509559

No-radio small aircraft crossing the hold line to take off on Runway 03 saw a C-172 touch down on Runway 03. Trees and buildings on airport perimeter obstructed view.

ACN: 509803

BN-2A Islander took Runway 29 at KTN with a DHC-6 Twin Otter on estimated 3-mile final. The DHC-6 executed a left turn for spacing. FAA certification in progress in the DHC-6.

ACN: 509820

BE18 on short final to Runway 19 at PWT encountered a C-150 on its climb out from an opposite direction takeoff on Runway 01.

ACN: 510231

C-172 landed Runway 22 at IKK before preceding PA-28 traffic completed its landing rollout and cleared the runway. C-172 training in progress.

ACN: 510822

LR25 landing Runway 14 at FIT had a radio call from a C-182 landing on intersecting Runway 20. C-182 not seen in pattern or heard on UNICOM.

ACN: 510829

King Air C90 back-taxiing to take off on Runway 27 at LNN saw an aircraft on approach end of Runway 27 takeoff or go-around. Runway crown a factor.

ACN: 510996

C-172 taxied onto Runway 17 at UAO for takeoff before preceding Extra 300 traffic had cleared runway and with a light twin-engine aircraft on short final. Light twin executed go-around.

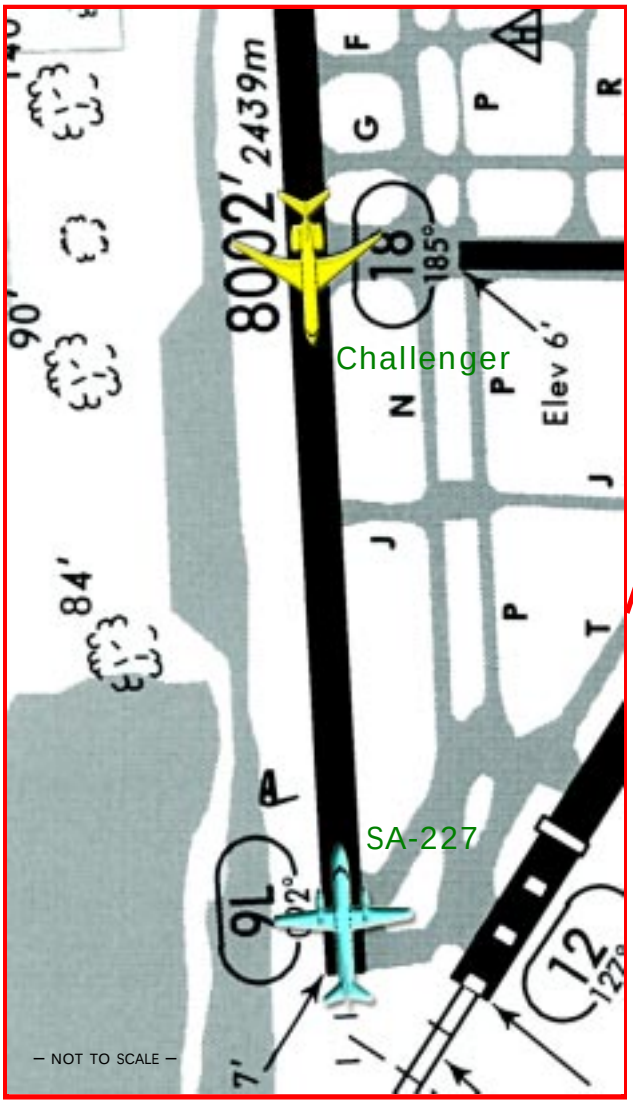
Appendix E

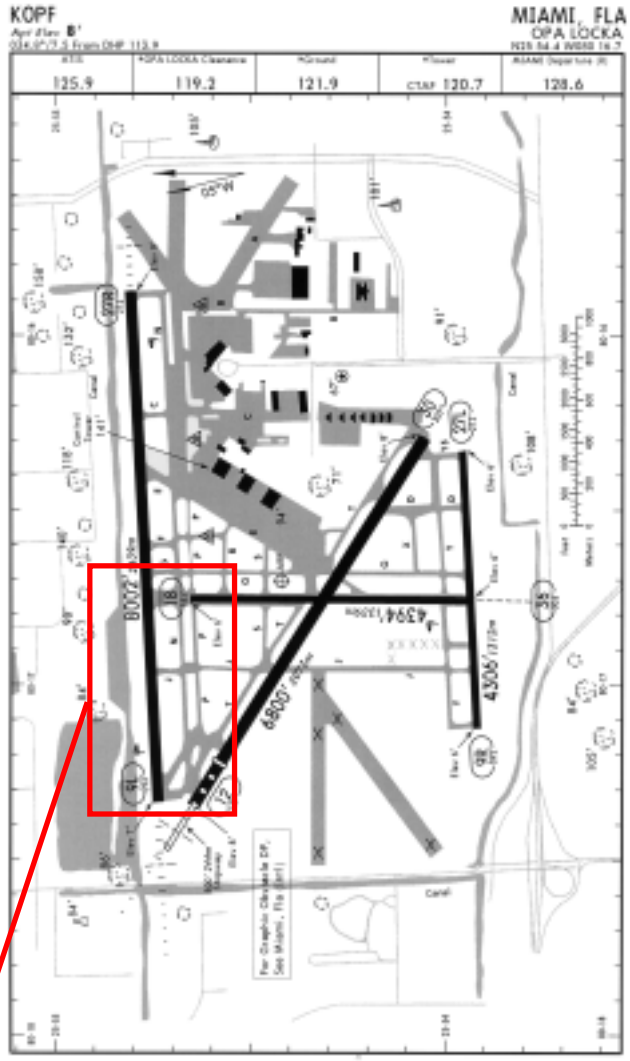
Graphic Depiction of Selected Runway Transgressions

Opa Locka (OPF) SA-227/CL-600 Incident

Sequence of Events (ACN 482051)

- SA-227 flight crew transmits their intention, on the CTAF frequency, to takeoff on Runway 9L.
- SA-227 flight crew visually checks runway clear, announces takeoff on Runway 9L and requests "any traffic."
- After the SA-227 taxies into position on Runway 9L, a Challenger Jet is seen approaching from the opposite end on the runway.
- The Challenger Jet completes its takeoff and flies over the SA-227.





Analyst's Assessment

- Opa Locka Tower was closed at the time of the incident.
- The SA-227 flight crew transmitted their intentions on the correct CTAF frequency and heard a company aircraft transmit on the same frequency.
- A second company aircraft heard all of the SA-227's radio transmissions "clearly."
- It appears the Challenger Jet departed the uncontrolled airport without transmitting their intentions.
- The SA-227 crew saw lights at the opposite end of the runway, but thought that they were "street light signals."

ACN: 482051

Time
- Date : 200008
- Day : Mon
- Local Time Of Day : 0601 To 1200

Place
- Locale Reference.Airport : OPF.Airport
- State Reference : FL

Environment
- Flight Conditions : VMC

Aircraft / 1
- Make Model : SA-227 AC Metro III

Aircraft / 2
- Make Model : Challenger Jet Undifferentiated or Other Model

Aircraft / 3
- Make Model : Light Transport, Low Wing, 2 Turbojet Eng

Aircraft / 4
- Make Model : Light Transport, Low Wing, 2 Turbo-prop Eng

Person / 1
- Function.Oversight : PIC
- Function.Flight Crew : Captain
- Experience.Flight Time.Total : 3000
- Experience.Flight Time.Last 90 Days : 300
- Experience.Flight Time.Type : 2600
- ASRS Report : 482051

Person / 2
- Function.Flight Crew : First Officer

Person / 3
- Function.Oversight : PIC
- Function.Flight Crew : Captain

Person / 4
- Function.Oversight : PIC
- Function.Flight Crew : Captain

Person / 5
- Function.Oversight : PIC
- Function.Flight Crew : Captain

Events
- Anomaly.Non Adherence : FAR
- Independent Detector.Other.Flight CrewA : 1
- Independent Detector.Other.Flight CrewB : 2
- Resolutory Action.Flight Crew : Took Evasive Action
- Resolutory Action.Flight Crew : Rejected Takeoff

Supplementary
- Problem Areas : Flight Crew Human Performance

Narrative

WE BLOCKED OUT OF THE FBO AT XA00 AT THIS TIME OPA LOCKA'S TOWER WAS CLOSED, SO WE XMITTED ON THE CTAF FREQ 120.7 THAT WE WERE TAXIING FROM FBO FOR DEP ON RWY 12. WE HEARD NO REPLY. WE BEGAN OUR TAXI AND SAW OUR COMPANY ACFT TAKE OFF ON RWY 9L, SO WE DECIDED TO TAXI TO RWY 9L INSTEAD. WE HEARD OUR COMPANY'S RADIO CALLS AS THEY LEFT THE ARPT. WE DID OUR PERFORMANCE CHECKS HOLDING SHORT AT THE END OF RWY 9L. WE THEN CALLED OUT THAT WE WERE TAKING OFF RWY 9L ANY TFC. PLEASE ADVISE. THERE WAS NO REPLY. WE TOOK POS ON THE RWY AND FINISHED OUR TKOF CHECK. AS WE TOOK POS WE CLEARED FINAL AND DEP ENDS, BOTH SEEMED CLEAR. WE FINISHED OUR TKOF CHECK AND PREPARED TO DEPART, WHEN THE PLT FLYING SAW THE ANTI COLLISION LIGHTS OF AN ACFT APCHING US FROM THE OPPOSITE END. WE THEN TURNED TO GET OFF THE RWY AS WE SAW WHAT LOOKED LIKE A CHALLENGER JET TAKE OFF RWY 27R OVER US. WE CLEARED THE RWY, TURNED BACK AND I RADIOED ONCE MORE THAT WE WERE TAKING OFF RWY 9L ANY TFC PLEASE ADVISE. NO REPLY. WE THEN TOOK THE RWY AND DEP TO THE E. ANOTHER OF OUR COMPANY ACFT TAXIED OUT BEHIND US AND WE HEARD ALL OF THEIR RADIO CALLS CLEARLY. WE NEVER HEARD A SINGLE RADIO CALL FROM THE JET THAT DEP RWY 27R. OUR COMPANY BEHIND US, NEVER HEARD THEM CALL, BUT THEY HEARD ALL OUR CALLS CLEARLY. I CAN ONLY GUESS AS TO WHY THE JET TFC MADE NO CALL OUTS ON THE CTAF FREQ. THIS SIT COULD HAVE BEEN AVERTED IF THE JET HAD BEEN ON THE PROPER FREQ OR IF THE TOWER WAS OPEN 24 HOURS A DAY. UNFORTUNATELY THIS ALL HAPPENED LESS THAN FIFTEEN MINUTES BEFORE TOWER OPENED. CALLBACK CONVERSATION WITH RPTR REVEALED THE FOLLOWING INFO: RPTR STATED THAT BEFORE TAKING THE RWY, THEY CLEARED BOTH ENDS. LIGHTS WERE SEEN ON THE OPPOSITE END, BUT THE CREW BELIEVED THEY WERE STREET LIGHT SIGNALS. WHEN THE OTHER ACFT TURNED ON HIS LIGHT FOR TKOF, THEY IMMEDIATELY CLEARED THE RWY.

Synopsis

CARGO FLT AT OPF USING CTAF PROCS STARTS TO TAKE OFF ON RWY 09L, BUT CLEARS IMMEDIATELY WHEN TFC IS OBSERVED DEPARTING ON THE OPPOSITE END.

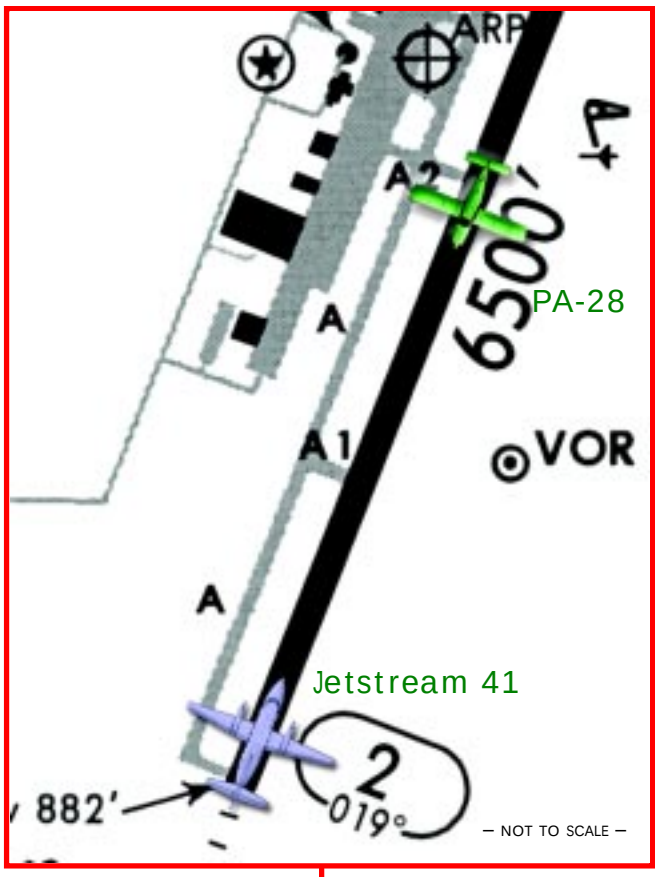
Columbia Regional Airport (COU) BA-41/PA-28 Incident

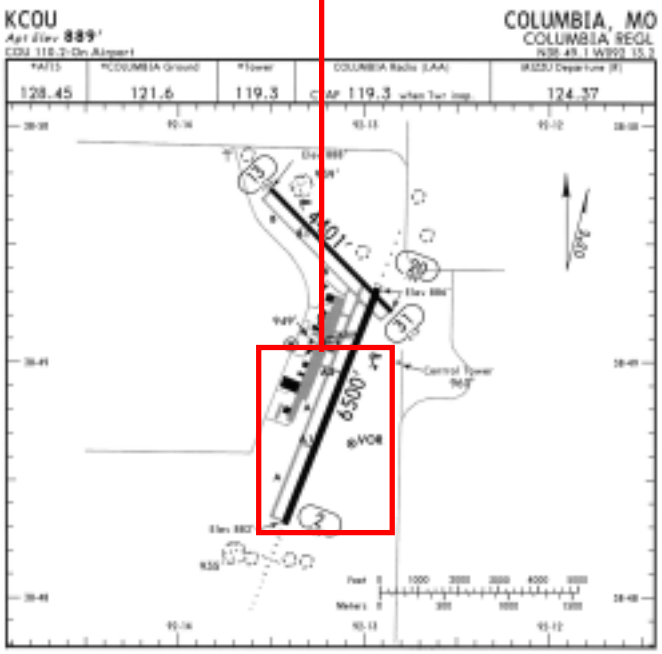
Sequence of Events (ACN 485874)

- Jetstream 41 flight crew announces on CTAF frequency they are taxiing to Runway 2 for takeoff.
- PA-28 pilot announces on CTAF he is taxiing to Runway 20 for takeoff.
- FSS informs the PA-28 pilot that a commuter aircraft is taxiing to Runway 2 and the winds favor Runway 2. PA-28 pilot did not acknowledge this transmission.
- Jetstream flight crew announces on CTAF frequency "taking Runway 2 for takeoff" and "request position of PA-28." No response from PA-28 pilot.
- Jetstream flight crew observes lights and rotating beacon coming towards them. Jetstream attempts to exit runway, but were hindered by a nose wheel steering problem.
- PA-28 observed passing over the Jetstream.

Analyst's Assessment

- COU was uncontrolled at the time the incident took place.
- The Jetstream flight crew communicated their intentions on the CTAF frequency, with no responses.
- Apparently, the PA-28 pilot was not listening to the CTAF frequency, or was unaware of the Jetstream's intentions.
- The airport is a single runway operation. There is a pronounced hump in the middle of the runway that restricts full runway visibility.
- The PA-28 pilot used the wrong runway for the prevailing winds.





ACN: 485874

Time
- Date : 200009
- Day : Wed
- Local Time Of Day : 0601 To 1200

Place
- Locale Reference.Airport : COU.Airport
- State Reference : MO
- Altitude.AGL.Single Value : 0

Environment
- Flight Conditions : VMC

Aircraft / 1
- Make Model : Jetstream 41

Aircraft / 2
- Make Model : Do 328

Aircraft / 3
- Make Model : PA-28 Cherokee/Archer Ii/Dakota/Pillan/ Warrior

Component / 1
- Aircraft Component : Nosewheel Steering
- Aircraft Reference : X
- Problem : Failed

Person / 1
- Function.Flight Crew : First Officer
- Experience.Flight Time.Total : 1900
- Experience.Flight Time.Last 90 Days : 180
- Experience.Flight Time.Type : 840
- ASRS Report : 485874

Person / 2
- Function.Oversight : PIC
- Function.Flight Crew : Captain

Person / 3
- Function.Oversight : PIC
- Function.Flight Crew : Captain

Person / 4
- Function.Flight Crew : Single Pilot

Person / 5
- Function.Other Personnel : FSS Specialist

Events
- Anomaly.Aircraft Equipment Problem : Less Severe
- Anomaly.Conflict : Ground Critical
- Anomaly.Non Adherence : Published Procedure
- Anomaly.Non Adherence : FAR
- Independent Detector.Other.Flight CrewA : 1
- Independent Detector.Other.Flight CrewB : 2
- Resolutory Action.Flight Crew : Took Evasive Action

Supplementary
- Problem Areas : Flight Crew Human Performance
- Problem Areas : Airport
- Problem Areas : Aircraft

Narrative

AT APPROX XA:10 LOCAL WE (ACR X) STARTED OUR TAXI TO RWY 2 AT COU. I ANNOUNCED ON CTAF THAT WE WOULD BE STARTING OUR TAXI. AN AIR CARRIER (Y) FLT STATED THE SAME. A CHEROKEE (Z) STATED HE WAS TAXIING TO RWY 20. THE COU FSS CALLED THE CHEROKEE ON CTAF TO ADVISE HIM THAT TWO COMMUTER ACFT WERE TAXIING TO RWY 2 AND THE WINDS FAVORED RWY 2. THE CHEROKEE DID NOT REPLY. WE CONTINUED TAXI TO RWY 2 DURING OUR TAXI THE CHEROKEE MADE ONE XMISSION THAT WAS GARBLED AND UNREADABLE. WE PERFORMED OUR BEFORE TKOF CHECKLIST. I ANNOUNCED ON CTAF THAT WE WERE TAXIING ONTO RWY 2. UPON ROLLING ONTO THE APCH END OF RWY 2, PRIOR TO APPLYING ANY TKOF POWER I ASKED 'CHEROKEE AT COU THIS IS ACR (X), WE NEED TO KNOW WHERE YOU ARE?' WE GOT NO RESPONSE FROM HIM SO WE APPLIED THE BRAKES AND STOPPED ON THE RWY. AFTER APPROX 5 SECONDS WE OBSERVED LIGHTS AND A BEACON COMING AT US. THE CAPTAIN IMMEDIATELY MANEUVERED THE ACFT TO THE W (L). BY THIS TIME THE CHEROKEE WAS CLIMBING AND PASSED WELL OVERHEAD. WE HAD A PROB WITH OUR NOSE WHEEL STEERING AND WE UNABLE TO CLR THE RWY. HAD THE CHEROKEE NOT CLIMBED ABOVE US WE WOULD NOT HAVE BEEN ABLE TO EXIT THE RWY OR GET OUT OF THE WAY. WE WERE DISABLED ON THE RWY SO WE SHUT OFF THE ACFT. THE STEERING SYSTEMS ON THE J41 ARE REGULARLY 'OFF THE RACK', BUT IT IS USUALLY IN A SAFE 'PARKING' ENVIRONMENT WHERE NO DANGER EXISTS. THIS ACCOUNT DESCRIBES ONE WHERE 'OFF THE RACK' COULD HAVE BEEN DEADLY. THIS SITUATION COULD HAVE BEEN AVOIDED IF THE CHEROKEE PLT (Z) HAD PROPERLY MONITORED AND XMITTED ON CTAF. A PLT AT THE END OF RWY 2 CANNOT OBSERVE THE END OF RWY 20 DUE TO A CROWN IN THE AIR FIELD. THE NOSEWHEEL STEERING PROB COULD HAVE AFFORDED NO WAY OUT HAD THE CHEROKEE'S ENGINE FAILED PRIOR TO PASSING OVERHEAD. CALLBACK CONVERSATION WITH RPTR REVEALED THE FOLLOWING INFO: RPTR NOTED THAT THE RWY CROWN (HUMP) WAS A MAJOR FACTOR IN THIS EVENT, AS WAS THE FAILURE OF THE CHEROKEE (Z) TO EFFECTIVELY UTILIZE AND MONITOR CTAF. RPTR SUGGESTS THAT BOTH INITIAL AND RECURRENT TRAINING SHOULD EMPHASIZE PROPER UNCONTROLLED ARPT PROCS.

Synopsis

COMMUTER FLT CREW (X) EXPERIENCES RWY INCURSION AND CRITICAL CONFLICT WITH CHEROKEE (Z) DURING OPPOSITE DIRECTION DEPS AT COU.

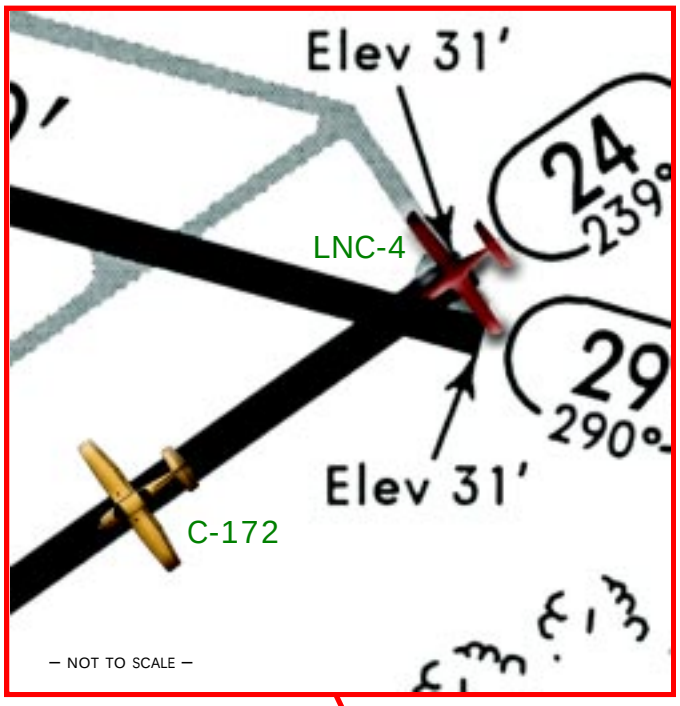
Flagler County Airport (X47), FLA Lancair-4/Cessna 172 Incident

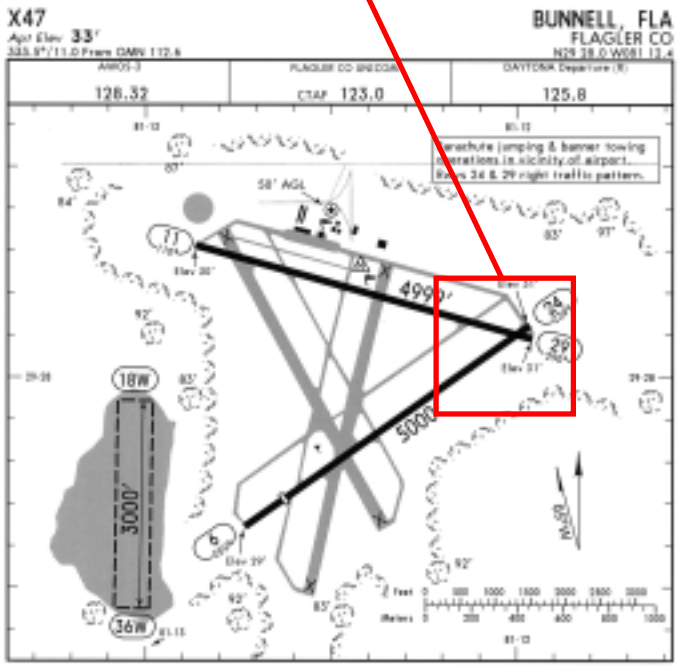
Sequence of Events (ACN 501168)

- Homebuilt LNC-4 aircraft pilot visually checks that the pattern base leg is clear, transmits his intentions, and taxies into position on Runway 24.
- After waiting for a previous arrival to clear the runway, the Homebuilt aircraft pilot transmits "…rolling on 24, westbound departure."
- A Cessna 172 passes "30-40 feet" over the Homebuilt and lands in front of the aircraft on Runway 24.
- The Homebuilt aircraft aborts the takeoff.

Analyst's Assessment

- There were multiple aircraft in the pattern and multiple aircraft waiting for takeoff.
- The Homebuilt aircraft pilot may have felt pressured to take the active runway before it was prudent to do so and not have adequately checked the approach path to Runway 24.
- The Homebuilt delayed takeoff for an aircraft which "took his time clearing" the runway. This may have allowed the Cessna 172 time to approach from a long final.
- No transmissions were heard from the Cessna 172 pilot regarding his intention to land on Runway 24.
- Later, the Cessna 172 pilot told the pilot of the Homebuilt that he saw the LNC-4 on the runway.
- The Cessna 172 pilot did not execute a go-around and landed on an occupied runway.





ACN: 501168

Time
- Date : 200102
- Day : Fri
- Local Time Of Day : 1201 To 1800

Place
- Locale Reference.Airport : X47.Airport
- State Reference : FL
- Altitude.AGL.Single Value : 0

Environment
- Flight Conditions : VMC

Aircraft / 1
- Make Model : Amateur (Home) Built

Aircraft / 2
- Make Model : Skyhawk 172/Cutlass 172

Aircraft / 3
- Make Model : Any Unknown or Unlisted Aircraft Manufacturer

Person / 1
- Function.Flight Crew : Single Pilot
- Experience.Flight Time.Total : 1200
- Experience.Flight Time.Last 90 Days : 20
- Experience.Flight Time.Type : 500
- ASRS Report : 501168

Person / 2
- Function.Flight Crew : Single Pilot

Person / 3
- Function.Flight Crew : Single Pilot

Events
- Anomaly.Conflict : Airborne Critical
- Anomaly.Non Adherence : Published Procedure
- Anomaly.Non Adherence : FAR
- Independent Detector.Other.Flight CrewA : 1
- Independent Detector.Other.Flight CrewB : 2
- Resolutory Action.None Taken : Anomaly Accepted

Supplementary
- Problem Areas : Flight Crew Human Performance

Narrative

ENVIRONMENT: GOOD VFR, BUSY NON-CTLED ARPT (X47) WITH MULTIPLE ACFT IN PATTERN, MULTIPLE PLANES WAITING FOR TKOF ON RWY 24. STUDENT PLT ACTIVITY. BANNER TOWING TRAINING ACTIVITY JUST N OR RWY 24. SIT: AFTER WAITING FOR MULTIPLE ACFT IN PATTERN TO LAND, A BREAK OCCURRENCE AFTER A TAIL DRAGGER LANDED. I CHKED TO SEE THAT NO ONE WAS ON BASE ANNOUNCED THAT I WAS TAKING POS AND HOLD ON RWY 24, UNTIL THE TAIL DRAGGER CLRED THE RWY. HE TOOK HIS TIME CLRING, AND I ANNOUNCED 'ACFT X ROLLING ON 24, WBOUND DEP.' WAS ACCELERATING DOWN THE RWY, WHEN SHADOW APPEARED OVERHEAD A CESSNA 172 PASSED 30 - 40 FT OVERHEAD AND LANDED RIGHT IN FRONT OF ME. I CLOSED THROTTLE, BRAKED AND ABORTED TKOF. CESSNA EXITED AND PARKED NEAR BANNER TOWING OP. I ASKED IF HE SAW ME ON THE TKOF ROLL. AFTER A FEW SECS OF RADIO SILENCE, HE CALLED BACK 'YEAH, I SAW YOU.' IMPRESSION: DISREGARD OF FAR'S AND BASIC AIRMANSHIP OF CESSNA? PERHAPS HOT RODDING FOR HIS FRIENDS ON GND? PERHAPS IN TOO MUCH OF A HURRY TO CONSIDER GOING AROUND WHEN DEP WERE HELD UP BY SLOW ROLL-OUT OF TAIL DRAGGER? MY LESSON: 'POS AND HOLDING' AT A NON-TWR ARPT. CALLBACK CONVERSATION WITH RPTR REVEALED THE FOLLOWING INFO: RPTR STATED THE INCIDENT WAS REVIEWED WITH HIS PLT GROUP AT HIS HOME BASE. HE SAID THE GROUP CONSENSUS WAS THAT PLTS SHOULD NOT TAXI INTO POS AND HOLD UNTIL THE RWY IS CLEAR OF LNDG ACFT.

Synopsis

AT AN UNCTLED ARPT A C-172 LANDS OVER A LNC-4 HOLDING IN POS FOR TFC TO CLR.

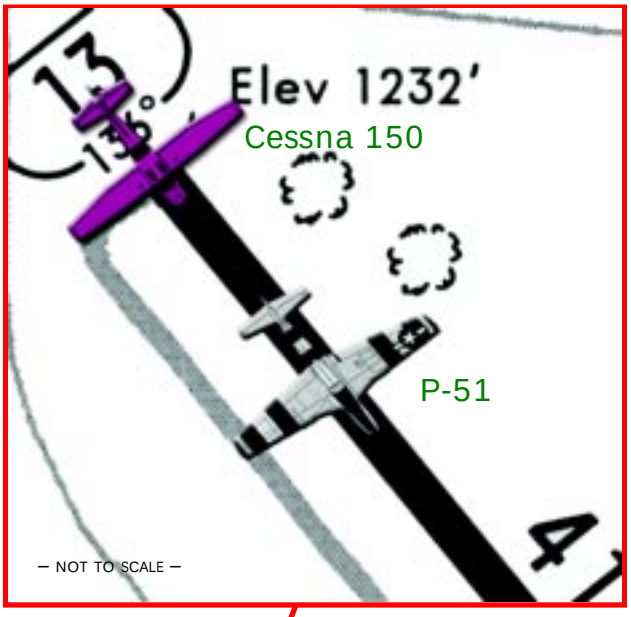
Council Bluffs Muncipal Airport (CBF) Cessna 150/P-51 Incident

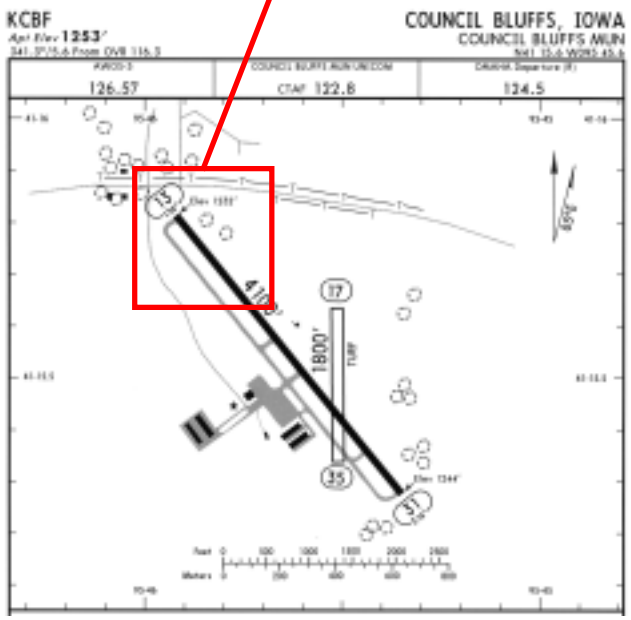
Sequence of Events (ACN 506213)

- Cessna 150 had been practicing touch-and-go landings at CBF.
- As the Cessna 150 turns final for Runway 13, a P-51 passes 100 feet over them and lands on the runway.
- Cessna 150 had to bank violently due to the wake turbulence of the P-51.
- Cessna 150 follows the P-51 and lands within the first 500 feet of the runway behind the P-51.
- P-51 back-taxies on the runway and scrapes the Cessna 150's wing tip.

Analyst Assessment

- P-51 pilot may have used poor judgement in not announcing his position on final on the CTAF.
- P-51 apparently did not see the Cessna 150 on final or elected to overtake and land ahead of the Cessna 150.
- Cessna 150 may have been experiencing radio problems and not heard any transmissions from the P-51.
- The Cessna 150 instructor pilot used poor judgement in landing on the runway with the P-51 still on the runway.
- The P-51 pilot probably was surprised to see the Cessna 150 on the runway as he began back-taxiing.
- The P-51 pilot used poor judgement in trying to pass the Cessna 150 on a 75 foot-wide runway.





ACN: 506213

Time
- Date : 200103
- Day : Wed
- Local Time Of Day : 1801 To 2400

Place
- Locale Reference.Airport : CBF.Airport
- State Reference : IA
- Altitude.AGL.Single Value : 500

Environment
- Flight Conditions : VMC

Aircraft / 1
- Make Model : Cessna 150

Aircraft / 2
- Make Model : Mustang (P51)

Component / 1
- Aircraft Component : Air/Ground Communication
- Problem : Malfunctioning

Person / 1
- Experience.Flight Time.Total : 1100
- Experience.Flight Time.Last 90 Days : 130
- Experience.Flight Time.Type : 500
- ASRS Report : 506213

Person / 2
- Function.Flight Crew : Single Pilot

Person / 3
- Function.Other Personnel : Unicom Operator

Events
- Anomaly.Aircraft Equipment Problem : Less Severe
- Anomaly.Conflict : NMAC
- Anomaly.Conflict : Ground Critical
- Anomaly.Non Adherence : Published Procedure
- Anomaly.Non Adherence : FAR
- Independent Detector.Other.Flight CrewA : 1
- Resolutory Action.Flight Crew : Took Evasive Action

Supplementary
- Problem Areas : Flight Crew Human Performance
- Problem Areas : Aircraft

Narrative

I HAD BEEN IN THE TFC PATTERN FOR ALMOST 1 HR WITH A STUDENT, PRACTICING TOUCH-AND-GO LNDGS. WE HAD BEEN MAKING RADIO CALLS ON EACH LEG OF THE PATTERN, PER STANDARD PROC. WE WERE ALSO HEARING CALLS FROM OTHER ACFT, INCLUDING THE OTHER ACFT INVOLVED, BUT VERY RARELY DID HE XMIT ANYTHING. AS WE TURNED ONTO FINAL FOR OUR LAST LNDG OF THE DAY, THE P51 CAME SWOOPING OVER THE TOP OF US, NO MORE THAN 100 FT AWAY. WE COULD HEAR HIS ENG NOISE OVER OUR OWN NOISE AND THE HEAD-SETS WE WERE WEARING. A FEW SECONDS AFTER HE FLEW OVER, WE ENCOUNTERED HIS WAKE TURB, WHICH RESULTED IN VIOLENT, SUDDEN BANKS OF AT LEAST 45 DEGS IN EACH DIRECTION, ALONG WITH NOSE DOWN PITCH CHANGES. AT NO TIME DID THE OTHER AIRPLANE CALL DOWN-WIND, BASE, OR FINAL. HE CONTINUED HIS LNDG AND SO DID WE, LNDG IN THE FIRST 500 FT OR SO OF THE RWY, WHILE HE WAS FARTHER DOWN THE END (THE RWY IS 4000 FT LONG). AFTER HIS LNDG, INSTEAD OF USING THE PARALLEL TXWY, HE PROCEEDED TO BACK-TAXI WHILE WE WERE STILL ON THE RWY, WITH NO AVAILABLE TURN-OFF BTWN THE TWO OF US. DESPITE OUR EF-FORTS TO MOVE AS FAR TO THE R OF THE RWY AS POSSIBLE, HIS L WINGTIP STRUCK OUR L WING, RESULTING IN A SMALL DENT AND SCRATCHED PAINT. SOME WITNESSES ON THE GND RPTED THAT THEY HAD NOT HEARD OUR CALLS, SO WE EXAMINED THE RADIO AND FOUND THAT THERE WAS A CONDITION WHICH MAY HAVE RESULTED IN THE XMISSIONS NOT GETTING THROUGH ALL THE TIME. WE HAD NO WAY OF KNOWING THIS IN THE AIR, BECAUSE WE WERE RECEIVING AND THE RADIO SOUNDED NORMAL WHEN XMITTING.

Synopsis

C150 PLT HAD AN NMAC ON FINAL AND A GND CONFLICT WITH SAME ACFT WHILE TAXIING.

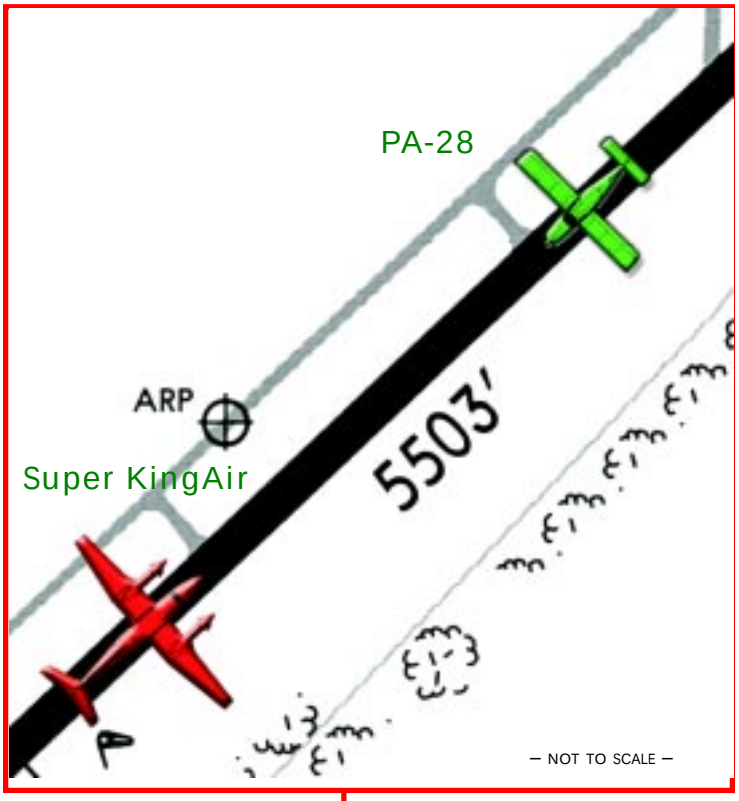
Moore County Airport (SOP) B-350/PA-28 Incident

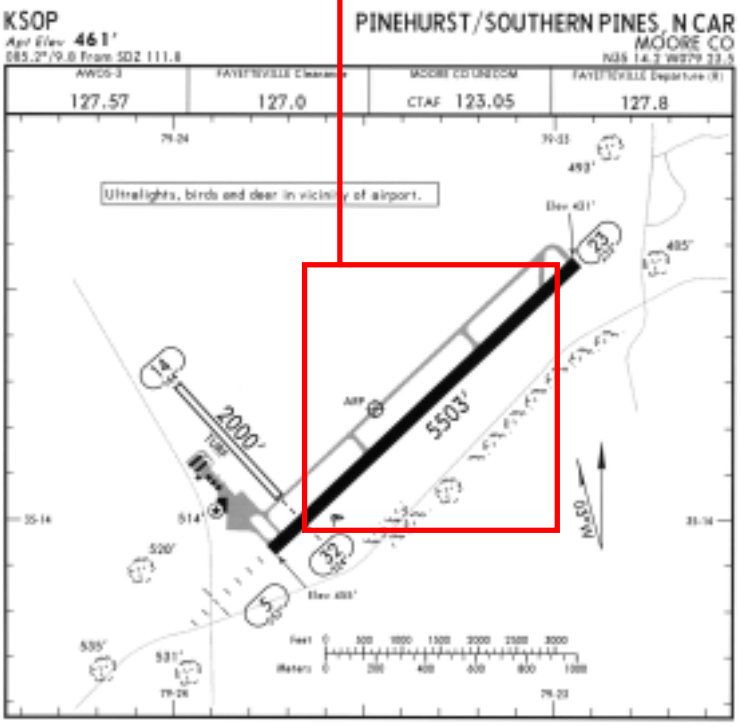
Sequence of Events (ACN 507528)

- B-350 flight crew made "numerous radio calls" regarding their intentions to takeoff on Runway 5.
- Hearing no calls from other aircraft on the ground, the B-350 commenced takeoff roll on Runway 5.
- Approaching V1, the B-350 flight crew observed a PA-28 taking off in the opposite direction on Runway 23.
- The B-350 crew swerved right, aborted the takeoff, and missed the PA-28 by 30 feet.

Analyst's Assessment

- The B-350 aircraft radios were operating normally.
- Runway 5 was the prevailing runway in use due to the calm winds.
- Other aircraft in the traffic pattern were also using Runway 5.
- The PA-28 did not make any transmissions regarding their intentions to depart on Runway 23.
- The PA-28 instructor pilot apparently was "...not looking out the window and did not see them until the last minute."
- A hump in the runway restricts full view of both ends of the runway.





ACN: 507528

Time
- Date : 200104
- Day : Thu
- Local Time Of Day : 1201 To 1800

Place
- Locale Reference.Airport : SOP.Airport
- State Reference : NC
- Altitude.AGL.Single Value : 0

Environment
- Flight Conditions : VMC

Aircraft / 1
- Make Model : Super King Air 350

Aircraft / 2
- Make Model : PA-28 Cherokee/Archer Ii/Dakota/ Pillan/Warrior

Person / 1
- Function.Oversight : PIC
- Function.Flight Crew : Captain
- Experience.Flight Time.Total : 1800
- Experience.Flight Time.Last 90 Days : 90
- Experience.Flight Time.Type : 90
- ASRS Report : 507528

Person / 2
- Function.Flight Crew : First Officer

Events
- Anomaly.Conflict : Ground Critical
- Anomaly.Non Adherence : Published Procedure
- Independent Detector.Other.Flight CrewA : 1
- Resolutory Action.Flight Crew : Took Evasive Action

Supplementary
- Problem Areas : Flight Crew Human Performance
- Problem Areas : Airport

Narrative

WE WERE DEPARTING KSOP ON RWY 5, WIND WERE CALM. MADE NUMEROUS RADIO CALLS THAT OUR KING AIR WAS TAXIING FROM THE RAMP TO RWY 5, DEPARTING RWY 5, ETC.... ARCHER MADE NO RADIO CALLS. WE HEARD OTHER ACFT IN PATTERN USING RWY 5. AS WE WERE ACCELERATING TO V1 THE ARCHER CAME OVER THE HUMP IN THE RWY. HE WAS USING RWY 23. I SWERVED R AND ABORTED THE TKOF. WE MISSED BY 30 FT. THE FACT THAT THE ENDS OF THE RWY ARE NOT VISIBLE FROM ONE ANOTHER WAS A MAJOR FACTOR IN THIS OCCURRENCE. ALSO, THE FACT THAT THE ARCHER MADE NO RADIO CALLS IS THE MOST IMPORTANT FACTOR. THE BEST WAY TO AVOID THIS PROB IN THE FUTURE IS FOR RECREATIONAL FLYERS TO BE MORE PROFESSIONAL AND PROFICIENT IN THEIR FLYING FOLLOWING STANDARD ESTABLISHED PROCS FOR OPERATING IN NON CONTROLLED ENVIRONMENTS. ALSO, FOR LARGER FASTER ACFT TO BE MORE VIGILANT IN THEIR OPS LOOKING FOR THE SMALL SLOWER ACFT. CALLBACK CONVERSATION WITH RPTR REVEALED THE FOLLOWING INFO: RPTR INDICATED THAT THE PA28 DID NOT SEE THEM UNTIL THE LAST MINUTE. IT APPEARED THAT THE INSTRUCTOR PLT WAS NOT LOOKING OUTSIDE THE COCKPIT, BUT DISCUSSING SOMETHING WITH THE STUDENT. ALSO, THE RWY 5/23 HUMP IS VERY DRAMATIC AND FLT CREWS NEED TO PAY SPECIAL ATTENTION TO THIS.

Synopsis

B350 ON ITS TKOF ROLL ON RWY 5 AT SOP, ENCOUNTERS A PA28 TAXIING ON THE RWY TOWARDS THEM. B350 SWERVED TO THE R AND ABORTED THE TKOF, MISSING THE PA28 BY 30 FT.

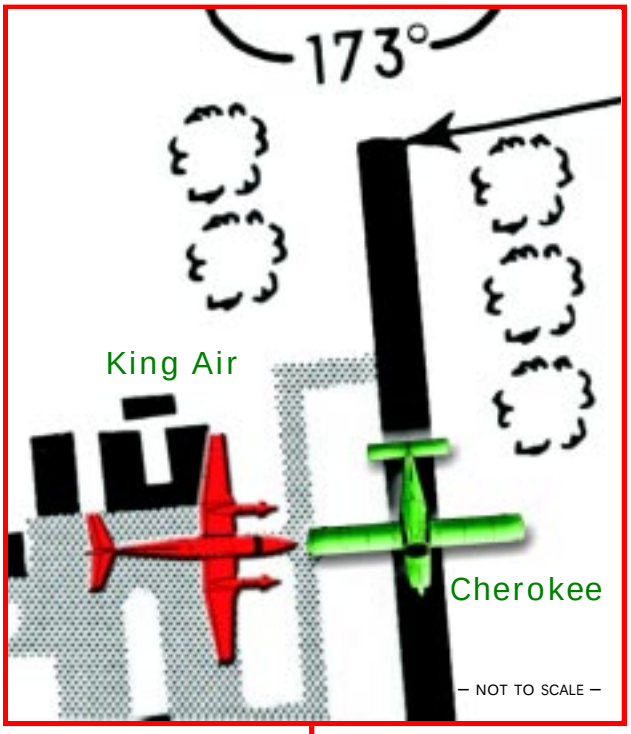
Bruce Campbell Field Airport (MBO), MS
PA-32 Cherokee Six/Super King Air 200 Incident

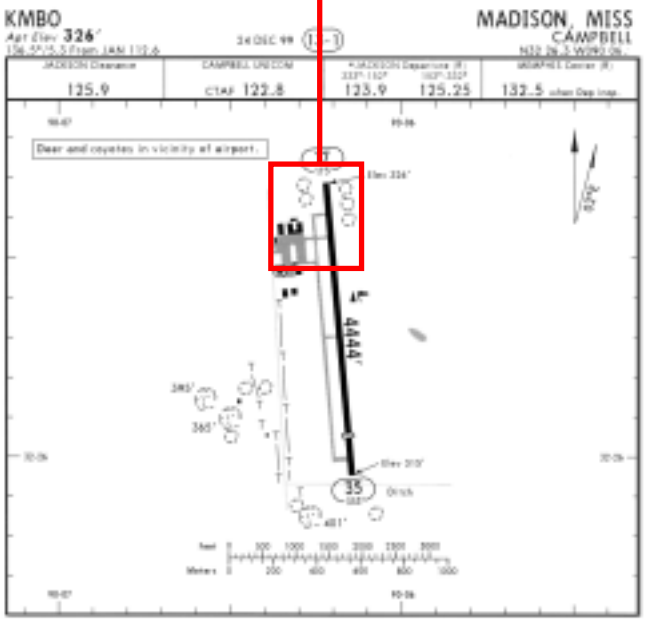
Sequence of Events (ACN 513943)

- PA-32 pilot cancels IFR after visual contact with the field.
- PA-32 calls on CTAF frequency 10 miles NW, inbound for landing.
- King Air called on CTAF frequency that they were taxiing to Runway 17.
- PA-32 calls on CTAF frequency 5 miles NW.
- PA-32 calls 3 mile final, and 1 mile final on CTAF frequency
- As the PA-32 was in the flare, the King Air entered the runway.
- The PA-32 broadcast on the CTAF frequency, "Hold Short, Hold Short."
- The King Air stopped abruptly and the PA-32's right wing missed the King Air's nose by less than 10 feet.

Analyst Assessment

- The PA-32 pilot made several radio calls to alert any traffic of his position on final for Runway 17.
- The King Air pilots were preoccupied with receiving an IFR clearance.
- Apparently the King Air pilots were not monitoring the CTAF frequency and did not make any calls announcing that they were entering the runway.
- The King Air pilots failed to clear the final approach, which is what ultimately led to the near collision.





ACN: 513943

Time
- Date : 200105
- Day : Sun
- Local Time Of Day : 1201 To 1800

Place
- Locale Reference.Airport : MBO.Airport
- State Reference : MS
- Altitude.AGL.Single Value : 5

Environment
- Flight Conditions : VMC

Aircraft / 1
- Make Model : PA-32 Cherokee Six/Lance/Saratoga

Aircraft / 2
- Make Model : Super King Air 200 Hdc

Person / 1
- Function.Flight Crew : Single Pilot
- Experience.Flight Time.Total : 1900
- Experience.Flight Time.Last 90 Days : 165
- Experience.Flight Time.Type : 1000
- ASRS Report : 513943

Person / 2
- Function.Oversight : PIC
- Function.Flight Crew : Captain

Events
- Anomaly.Conflict : Ground Critical
- Anomaly.Non Adherence : Published Procedure
- Anomaly.Non Adherence : FAR
- Independent Detector.Other.Flight CrewA : 1
- Resolutory Action.Flight Crew : Took Precautionary Avoidance Action
- Resolutory Action.Flight Crew : Took Evasive Action

Supplementary
- Problem Areas : Flight Crew Human Performance

Narrative

I CANCELED IFR WITH JACKSON APCH AND CONTINUED TO MBO VISUALLY AFTER I HAD THE FIELD IN SIGHT. AFTER I CALLED '10 NM TO THE NW INBOUND FOR LNDG' THE KING AIR CALLED 'TAXIING TO RWY 17.' I MADE POS RPTS AT 5 NM TO THE NW, 3 MI FINAL, AND 1 MI FINAL. AS I WAS IN THE FLARE, THE KING AIR PULLED OUT IN FRONT OF ME. I SCREAMED 'HOLD SHORT, HOLD SHORT' AS MY R WING MISSED HIS NOSE BY LESS THAN 10 FT. HE DID STOP JUST PRIOR TO A COLLISION. I BELIEVE THE PLT AND COPLT OF THE KING AIR WERE PREOCCUPIED BY COPYING A CLRNC FROM JACKSON WHILE ON THE GND AT MBO. ONE PLT SHOULD GET THE CLRNC WHILE THE OTHER MONITORS UNICOM. IF EITHER KING AIR PLT LOOKED AT FINAL BEFORE TAXIING ONTO AN ACTIVE RWY, THIS WOULD HAVE BEEN AVOIDED. I DON'T BELIEVE FLYING OVERHEAD AND ENTERING A L DOWNWIND FOR RWY 17 WOULD HAVE HELPED BECAUSE ACFT #2 WASN'T LOOKING OR LISTENING FOR OTHER ACFT. MY LNDG LIGHT BLEW WHILE ON CLBOUT FROM MY DEP ARPT. IF IT WERE WORKING THAT DAY, MAYBE THEY WOULD'VE SEEN ME ON FINAL. I MADE A TOTAL OF 5 RADIO CALLS ON UNICOM BEFORE LNDG, AND THE ONLY ONE THEY HEARD WAS 'HOLD SHORT, HOLD SHORT.' A POOR PERCEPTION THAT MULTI-CREW PLTS CAN HAVE IS THAT THE 'OTHER GUY' (COPLT) IS TAKING CARE OF THE SIMPLE NECESSITIES SUCH AS LOOKING FOR TFC. A CORRECTIVE ACTION THAT I NOW TAKE IS TO NEVER CANCEL IFR WHILE FLYING INTO MBO UNTIL I'M ON THE GND. UNFORTUNATELY, THIS KEEPS IFR TFC FROM DEPARTING SOMETIMES, UNTIL I LAND, BUT IT ALSO KEEPS PEOPLE WHO COPY A CLRNC WITHOUT MONITORING UNICOM FROM PULLING OUT IN FRONT OF ME. SOMETHING THAT WOULD HELP THE SIT AT MBO WOULD BE FOR CLRNC TO GIVE A TA OF INBOUND ACFT BEFORE RELEASING AN IFR DEP.

Synopsis

IN LNDG FLARE, PA32 CHALLENGES DEPARTING BE20 TAKING THE RWY AT MBO ARPT TO STOP FURTHER MOVEMENT ONTO THE RWY.

Appendix F

Reporters' Comments

Reporters were asked in a free-form portion of the callback interview to comment on the most important factor that caused or contributed to their event, and to give their recommendations for preventing runway transgressions at non-Tower or Tower-closed airports. Following are selected comments.

Runway Transgression Factors

Reporter's were asked to cite the single most important factor that caused or contributed to the runway transgression.

Airport Factors

- Runway humps or "crowns" that obstruct view of a runway's opposite ends.
- Airport configurations that require back-taxi after landing to access the only taxiway available for runway exit.
- Failure to trim trees and vegetation that obstruct view of the final approach/departure course of the preferred runway.
- Lack of visual indicators such as wind tees to indicate the active runway.

Communications Factors

- Lack of a controlling agency (temporary tower) for high-volume traffic operations or for special activities such as aerobatic competitions.
- Frequency congestion at non-Tower airports.
- Decommissioning of local advisory control frequencies.
- Inaccurate wind reports by AWOS.
- Lack of Unicom radio equipment by attending airport or city vehicles.

Pilot Procedures and Practices (General)

- Other pilots' lack of standard radio technique and failure to self-announce.
- Lack of strict compliance with CTAF procedures by overflying aircraft.
- Failure to make clearing turns and observe the final approach path before taking position on the runway.
- Self-imposed schedule pressure and failure to follow standard non-Tower airport procedures.
- Following other traffic too closely in the pattern to maximize landing practice.
- Inability to obtain IFR clearances on the ground at non-Tower airports.
- Requirement to use multiple frequencies for an IFR operation/departure (AWOS, communications, lighting control, etc.).
- English comprehension problems by non-native pilot trainees.
- Not waiting until sure of the other aircraft's position and intentions.
- Lack of aircraft-to-aircraft communications ability for non-Tower airport operations.
- Back-taxiing on the runway instead of using available taxiways.
- Overflying aircraft holding on the runway and landing instead of going around.

Air Carrier Procedures and Practices

- Split radios and split cockpit coordination.
- Pressure on commercial pilots to keep the operation moving along in deference to commercial operator needs.

Runway Transgression Prevention Recommendations

Reporters were also asked to provide recommendations to prevent runway transgressions. Following are selected comments.

Airport Related

- Install "Stop" signs or "Yield to Aircraft" signs at vehicle crossing areas.
- Install signs at the end of runways giving the airport's proper CTAF frequency and the preferred calm wind runway.
- Install wind tees to indicate the active runway.
- During dusk or night operations, turn off lights for runway(s) not in use.

Communications Related

- Install part-time or fulltime control towers at airports with a large mix of traffic and high activity level.
- For airport Control Towers that have partial hours of operation, add hours of operation to the frequency corner of [sectional] charts.
- Provide a person to staff the Unicom/CTAF frequencies during the busiest hours.
- Give Unicom operators more latitude to declare what the active runway is based on well-defined guidelines.
- Review airport Unicom frequencies and change those that are identical or very similar for nearby airports.

Pilot Education/Training

- Improve initial and recurrent training (Biennial Flight Reviews) for all pilots in non-Tower airport operations and communications procedures.
- Emphasize non-Tower airport runway transgression prevention strategies in the FAA Wings Program.
- Reactivate the FAA's "See and Be Seen" Program.
- Renew emphasis on pilot review of the Aeronautical Information Manual (AIM) sections on non-Tower airport operations.
- Train pilots to be aware of the hazards of airport terrain features, obstructions, and other factors that make approaching aircraft less visible or noticeable.

Pilot Procedures

- Comply with CTAF procedures. Aircraft practicing instrument approaches often neglect traffic pattern/position calls and are heads down in the cockpit.
- Turn on landing lights while in the traffic pattern and on the ground at a non-Tower airport for better aircraft visibility.
- Broadcast position and intentions precisely, and repeatedly, during taxi and as the traffic pattern is flown.
- Fly standard patterns.
- Make clearing turns to view the traffic pattern, the final approach path, and aircraft on runway.
- If aircraft are inbound, don't taxi onto the runway until the inbound traffic is in sight.
- Do not taxi into position and hold on a runway until a landing aircraft has cleared the runway.
- Monitor local frequencies more closely.
- Maintain better situational awareness.
- Involve passengers in traffic watch.

New Technology

- Develop a simplified form of ATIS at non-Tower airports to indicate the active runway.
- Develop low-cost aircraft or external (ground-based) systems for auto-detection of aircraft on runways.
- Develop a system of indicating the active runway at non-Tower airports with multiple runway configurations, where determining the active runway can be especially confusing.