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NASA AVIATION SAFETY REPORTING SYSTEM: EIGHTH QUARTERLY REPORT

January 1 – March 31, 1978

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and

Aviation Safety Reporting System Office
Battelle's Columbus Division
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SUMMARY

During the eighth quarter of ASRS operations, 1223 reports were received. A study of runway incursions was performed in response to requests from NTSB and FAA. The study deals with 165 inadvertent operations on or into inappropriate portions of the aircraft movement areas at controlled airports. Pilot-initiated and controller-initiated incursions are described and discussed. It was found that a majority of the pilot-initiated occurrences involved operation without a clearance: controller-initiated occurrences usually involved failure to maintain assured separation. The factors associated with these occurrences are analyzed.

It appears that a major problem in these occurrences is inadequate coordination among the various system participants. Reasons for this, and some possible solutions to various aspects of the problem, are discussed.

A sample of reports from pilots and controllers is presented. These relate to undesired occurrences in air transport, general aviation, and air traffic control operations; to ATC coordination problems; and to a recurrent problem in ASRS reports, parachuting operations.

A sample of alert bulletins and responses to them is presented.

INTRODUCTION

This is the eighth in a series of reports describing the activities of the NASA Aviation Safety Reporting System (ASRS) (refs. 1–7). It covers the period from January 1 through March 31, 1978, the System's eighth quarter of operation under a Memorandum of Agreement signed on August 15, 1975 by the National Aeronautics and Space Administration and the Federal Aviation Administration.

This report presents an analytic study of reports of runway incursions. A series of reports illustrative of specific problems reported to ASRS is provided. A third section presents a sample of alert bulletins disseminated by ASRS and responses to those bulletins.

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HUMAN FACTORS ASSOCIATED WITH RUNWAY INCURSIONS

Charles E. Billings and Dolores B. O'Hara

Introduction

Though few aircraft collisions have occurred on or immediately above runways at controlled airports, incidents involving incursions of aircraft or surface vehicles into aircraft movement areas have been a continuing source of concern to those responsible for management of the national aviation system. In response to requests from the National Transportation Safety Board and the Federal Aviation Administration, a study has been conducted of ASRS reports relating to such incursions. This study was not designed to provide quantitative data regarding the prevalence of such occurrences; rather, it was focused on the behavioral aspects of potential and actual conflicts on controlled airports. The reports which were used in the study were submitted between July 1, 1976 and June 30, 1978, a period of 24 months. This report is a summary of the findings to date in the study, which is continuing. A final report will be published separately.

Approach

Dimensions of the study– The study examined 165 potential conflicts, actual conflicts, and situations which under other circumstances could have resulted in conflicts on or immediately above the aircraft movement areas of controlled airports in North America. The search of the ASRS data base was not inclusive for such events; it is known that not all reports relating to or describing such events were retrieved by the search strategies employed. Nonetheless, enough relevant reports were retrieved to permit a systematic study of the characteristics and dynamics of such occurrences.

Categorization of occurrences– Each report was categorized as to each of the following characteristics:

1. Month of occurrence
2. Location
3. Reporter
4. Types of aircraft involved
5. Types of operation involved
6. Phase of flight
7. By whom the occurrence was initiated
8. Occurrence type
9. Type of conflict
10. Outcome of occurrence
11. By whom recovery was initiated
12. Recovery actions by each participant
13. Enabling factors

These categories are defined and explained as they are discussed. All occurrences were assumed to involve human error; although there were a few cases in which mechanical or environmental factors were important, the assumption proved to be generally valid.

Analysis of the data– All reports were categorized as described above. After the categorizations were checked for accuracy, the reports were re-read and enabling factors were added. The analysis thereafter was designed to examine associations among descriptive and enabling factors, with the hope of answering the following questions for as many occurrences as possible:

1. Where did the event occur? When? What happened?
2. What errors, by whom, contributed to the occurrence?
3. What were the characteristics of the occurrence?
4. Who first recognized the problem? How was recovery effected?
5. What factors were associated with the occurrence? In particular, did certain human or system factors tend to be associated with particular occurrence characteristics?

Results

Initial evaluation of the reports indicated that 30 of the 165 occurrences involved no conflict. This category was assigned when only one aircraft was involved in the occurrence; there was no potential conflict with another aircraft or vehicle because there was no other vehicle in the vicinity. The remaining 135 reports did involve a threatened or actual conflict.

Month of occurrence– Somewhat more reports were noted during spring, summer and fall months than during the winter. The differences were not striking.

Locations– The 165 occurrences took place at 73 different locations. Five or more occurrences were reported at nine hub airports. Specific location data will be discussed in the final report of this study.

Reporters– Pilots and crewmembers provided 66% of the occurrence reports; controllers reported 32%; other persons provided 2%.

Types of operations– While a simple listing cannot fully account for operational types in those cases involving more than two aircraft or vehicles, table 1 shows types of operations, where known, for the 135 cases involving a potential or actual conflict between aircraft.

TABLE 1.– TYPES OF OPERATIONS IN CONFLICT OCCURRENCES

Operator classes in conflict occurrence	Number of occurrences
Air transport/air transport	41
Air transport/general aviation	29
Air transport/military or government	3
Air transport/other or unknown	36
General aviation/general aviation	7
General aviation/military or government	2
General aviation/other or unknown	13
Other or unknown/other or unknown	4
	135

Initiators of occurrence– As noted above, it was assumed that all these occurrences involved human error. The person believed by the authors to be responsible for the initial error associated with the occurrence was the controller in 54% of 165 occurrences, the pilot in 39% of the occurrences, and the operator of a surface vehicle in 4% of the occurrences. In five cases (3%), the data did not permit categorization.

Outcome– An occurrence was classed as a near collision if, in the opinion of the authors, two vehicles came perilously close to colliding. This, of course, depends on the size, type, and speed of the vehicles, as well as their relative courses, all of which were taken into account. Unless it was fairly certain that the event was a near collision, it was classified as "less than safe separation" if a conflict occurred, or "recognized error" if one or more persons recognized the problem and took action in sufficient time to prevent a conflict. Other cases were classified as "no conflict."

One occurrence involved a collision (wing tip with motor vehicle); 37 involved near collisions; 50 involved less than safe separation. In 47 cases, the problem was recognized before a conflict occurred. There was no actual or threatened conflict in 30 cases, because no other aircraft or vehicle was in the vicinity.

Phase of flight– The flight (or ground operation) phases for the two aircraft principally involved in aircraft/aircraft conflicts are shown in table 2 for all cases in which two aircraft were involved and in which both phases were known.

TABLE 2.– PHASE OF FLIGHT AT TIME OF OCCURRENCE

Flight phase, aircraft 2	Flight phase, aircraft 1[a]					
	Hold	Taxi	Takeoff	Approach	Land	Other
Hold	0	6	1	4	4	0
Taxi		3	21	8	14	1
Takeoff			8	7	11	0
Approach				1	1	0
Land					8	2
Other						0

[a] Figures are percentages of sample.

It is worth noting that the two most frequent categories for both pilot- and controller-initiated incidents were taxi/takeoff and taxi/land. The other major categories were takeoff/land, takeoff/takeoff, land/land, and taxi/approach.

Occurrence types– The 135 occurrences which involved conflicts were classified as shown in table 3. The data are summarized for occurrences initiated by pilots and by controllers.

TABLE 3.– RUNWAY INCURSIONS: OCCURRENCE TYPES

Pilot occurrences		Controller occurrences	
Lack of clearance to:		Failure to insure separation:	
Cross a runway	33%	Intersecting	47%
Take off	23	In trail	24
Land	6	Other	12
Taxi to ramp	2	Confusion	9
Disorientation/confusion	21	Lack of information	4
Confusion about clearance	2	Late clearance change	3
Other	13	Other	1
	100%		100%

Recognition of problem– The problem was first recognized and recovery action initiated, by a pilot in 50% of 135 cases; recognition was by a controller in 25% of the cases. Simultaneous recognition and action by controller and pilot occurred in 3%; there was no recognition of the problem in time to take recovery action in 20%, and in 2% of the cases the data were inadequate to permit categorization.

Enabling and associated factors– The factors that were assigned to reports containing enough data to permit such analysis, together with their frequency of occurrence in events believed to have been initiated by pilots and controllers, are shown in table 4. As many factors as were believed pertinent were assigned to each occurrence.

Occurrences initiated by drivers and those in which the initiators of the occurrence could not be determined are not included in table 4.

It should not be inferred that the factors in table 4 are inclusive of all factors pertinent to the cases under study, nor should it be inferred that each factor listed was necessarily causal in the occurrences. Rather, the factors listed are in the best judgment of the authors, pertinent to the occurrences, based on the information available in the reports.

It is interesting to note certain apparent anomalies in the list. Controller technique was cited as a factor in nine reports in which a pilot error apparently initiated the occurrence. Similarly, pilot technique was cited in 11 controller error reports. These findings and certain others like them are discussed below.

The enabling and associated factors were partitioned by occurrence type and outcome in an effort to find whether certain types of occurrence, or certain outcomes, are associated with particular human and system factors. The results of these analyses are discussed below.

TABLE 4.– ENABLING/ASSOCIATED FACTORS IN RUNWAY INCURSIONS: 65 OCCURRENCES INITIATED BY PILOT, 89 BY CONTROLLERS

Factor	Occurrence initiated by:	
	Pilot	Controller
Coordination problem in cockpit	11	0
Coordination problem between aircraft and ATC	17	19
Coordination problem within tower	3	29
Coordination problem between tower and approach control	1	8
Phraseology	3	2
Language problem	3	1
Frequency congestion	3	3
Similar flight numbers	1	0
Controller technique	9	61
Pilot technique	43	11
Intersection takeoff	2	4
Landing to hold short of intersection	0	2
Airport lighting and markings	4	3
Airport, other factors including staff	3	7
ATC and controller procedures	3	8
Pilot/flight procedures	7	1
Training in progress	0	5
Environment (weather)	4	6
Workload	3	2
Fatigue	0	1
Other factors	0	2
Total factors	120	175

Discussion

Introductory comments– Unplanned incursions onto aircraft movement areas represent a serious potential threat to system integrity. In this sample of occurrences, 82% represented at least a potential conflict; there was an actual conflict in 53%, a near collision in 22%, and an actual collision in 1%. Air carrier aircraft were involved in 81% of the potential and actual conflicts.

Virtually all the occurrences involved human error. In at least 13%, both controller and pilot errors were involved. In 65 occurrences initiated by pilot actions, 64% involved a lack of clearance to perform some maneuver. Eighty-three percent of the 89 occurrences initiated by controller action involved a failure to insure separation.

There was no difference between the two groups with respect to outcome: 22% of both pilot- and controller-initiated occurrences resulted in a near-collision.

There is no question (table 3) that a substantial majority of both pilot- and controller-initiated occurrences involved deficiencies in technique. Failure to obtain a clearance, for whatever reason, is a deficiency in pilot technique; failure to maintain assured separation, for whatever reason, is a deficiency in controller technique. It is hardly surprising, then, that the most commonly cited enabling/associated factor in table 4 is a technique deficiency. This citation, however, is hardly enlightening unless accompanied by information that suggests why the break in technique may have occurred. The remainder of this analysis is devoted to this question.

Pilot-initiated occurrences– Although pilot technique was involved in most of these occurrences (43 of 65), it is necessary to ask what other factors were also present and pertinent to the event (table 4). One notes that coordination problems were cited 32 times; most of these involved within-cockpit or cockpit-ATC coordination, though in 4 cases, there was an associated coordination problem within ATC.

Typical breakdowns in cockpit coordination are illustrated in the following examples.

> On taxi out, we were issued a clearance to taxi to runway 27L. Normal departure runways are 26 and 27R with landings on 26 and 27L. There is extensive airport construction which causes extensive diversions while taxiing. After crossing runway 26 we were given multiple taxi instructions during the process of running the taxi checklist. My attention was evidently diverted when we were given instructions to hold short of runway 27R. The first officer rogered. We were following another aircraft and as we approached 27R we were told to switch to tower frequency. We did so as the aircraft ahead was crossing 27R. I hadn't heard the instructions to hold short, nor had I heard the previous aircraft being cleared to cross. I continued to cross 27R, not thinking of it as an active landing runway, and the first officer didn't caution me to stop.... My first knowledge that we were crossing an active runway came when, just as I was approaching the runway, I looked left and noticed an airliner on about a 1/4-mile final. I could have slammed on the brakes and stopped short of the runway, but feeling that I had plenty of time to cross and not wanting to injure a flight attendant with the sudden stop, I simultaneously asked the first officer if we had been issued clearance to cross (he replied that we had not) and proceeded on across. The tower directed the airliner to go around which I didn't think was necessary but from his vantage point I'm sure he acted according to his own best judgment....

In the following case, the initial portion of the taxi clearance was transmitted during rollout. As we have noted in earlier reports, both cockpit noise levels and flight crew workload are high at this time. ASRS reports continue to describe misunderstandings of clearances delivered during this phase of flight. It appears that some controllers are not sufficiently aware of this problem.

> After landing on runway 10R, we were advised by tower to turn off runway 10R onto runway 5 and to hold short of runway 14. While decelerating the aircraft and turning off runway 10R, I failed to hear the instructions to hold short of 14. As we approached the intersection of runway 14, the first officer said "hold short," and

I stopped the aircraft short of the runway. We would have collided with another airline aircraft had not the first officer advised me to hold short. He later told me that he had also applied brakes. The major factor in this occurrence is that I failed to hear the clearance limitation. Also, I was not completely familiar with the closeness of runway 14, having never landed on 10R before. I am aware that affirmative clearance is required to cross a runway and would have stopped notwithstanding the failure to hear the clearance to hold short had the intersecting runway been clearly recognizable as a runway.

Cockpit-ATC coordination problems usually involved either misunderstandings between pilots and controllers, inadequate information transfer, or nonstandard procedures or phraseology.

The pilot of aircraft A had been issued clearance for takeoff on runway 27 while taxiing out from the loading ramp . . . the A pilot had just completed engine start and was not yet on tower frequency when the clearance was given. The STOL aircraft was on another ramp approximately 250 ft from the taxiway-runway intersection normally used as the initial takeoff position by STOL aircraft. The instructions which were seemingly received were that he was cleared for takeoff. He reached the intersection at approximately the same time as A started its takeoff roll. The tower immediately ordered B to clear the runway and A to abort his takeoff. Reaction was immediate and a collision was averted by a good margin.

* * *

. . . After push-back, I was cleared for taxi with the following phrase: "Cleared to taxi runway 8R via Charlie-4 and hold short of runway 8L." The weather at the time was rain showers and an overhead thunderstorm. Runways were wet. After passing the "Bravo" complex and approaching taxiway C-4, we received further instructions, "go right on out there at Charlie-4." I interpreted this to mean that I was cleared to cross runway 8L and proceed to 8R. However, as a precaution, I asked the copilot to check. He was unable due to frequency congestion. Prior to entering the runway, I checked visually and spotted aircraft B on short final for landing on runway 8L. A panic stop was initiated using brakes and reverse. Due to the wet conditions, the anti-skid cycled continuously. The aircraft was turned slightly to the right to present a smaller target to the landing aircraft. After we came to a complete stop, the controller said something to the effect, "You stopped pretty close to the runway." I repeated his previous instructions regarding going out on Charlie-4 and he replied, "I told you to hold short. . . ."

In one case, it is questionable whether the pilot communicated his intentions, or whether he was affected by a wind shear late in the approach.

We were awaiting departure on runway 8R on taxiway. Airline aircraft B in position on runway holding for takeoff clearance. Flight check aircraft approaching runway on final, checking back course approach. Tower advised aircraft B to hold in position. Flight check aircraft continued approach to end of runway at a low altitude, then suddenly deviated downward from flight path and passed over the top

of aircraft B, clearing the aircraft by about 20 ft; he then executed a pull-up maneuver. Aircraft B was unable to see the incident since it was approached from the rear; our crew felt that an impact was imminent for an instant. . . .

Pilot procedures, especially visual monitoring procedures, were inadequate in seven cases. The following examples are typical of the consequences of failure to monitor outside the cockpit even after receipt of a clearance.

> Airline aircraft B landing on runway 28R; I was landing on 28L. Airline aircraft B was told by tower to use taxiway Echo, hold short of 28L. Aircraft B didn't even slow down but just taxiied across 28L in front of me. If he'd looked out his window, the captain would very easily have seen me boring down on him . . . he should have known from previous conversations with tower that there was traffic on 28L. . . .
>
> * * *
>
> Aircraft A cleared for ILS to runway 25L. ATIS info, 8 broken 1-1/2 smoke and fog. We had the runway at about 500 ft; visibility was about a mile. Landing was routine; rollout was to the high speed exit opposite the XXX airline terminal. Tower cleared out aircraft, A, to cross 25R, "Ground .75 on other side." My first officer's response was "Roger." So I continued my roll across 25R. (The clearance was verified about the time we entered the high-speed from 25L.) As the nose of our aircraft entered the edge of 25R, aircraft B, taking off, passed over us. The clearance could not have been more than 50–75 ft. We had heard no radio clearance or conversation whatsoever about activity on 25R, so aircraft B either took off without clearance or the runways were being handled on separate frequencies. . . . I must accept responsibility for trusting the clearance to cross 25R without asking my copilot to verify that we were clear by looking to the right up runway 25R.

Problems relating to airport lighting and markings appeared in seven reports of pilot- and controller-initiated occurrences.

> Aircraft A was taxied to runway 33L via the outer terminal taxiway to hold short of Charlie taxiway. When next observed, the aircraft was stopped on the centerline of runway 22R, at the approach end of runway 4L. At this time aircraft B was starting to rotate on runway 22R about three-fourths of the way down the runway. Aircraft A was instructed to taxi straight ahead and clear the runway immediately. Controllers feel that field lighting and poorly marked taxiways are the prime reasons for this recurring problem. . . .
>
> * * *
>
> I called for progressive taxi instructions, notifying the tower that I was unfamiliar with the airport. The controller cleared the aircraft to runway 34R. I taxied south following the blue lights until the lights turned west toward the runway, then turned west, held short, and did my run-up. I called "Ready for takeoff," and the tower cleared me into position to hold. As I took the active,

another light aircraft passed me on its takeoff run, deviating to the west side of the runway; our wing-tip clearance was about 20–30 ft. I asked what had happened and the tower told me that they thought I was at the end of the runway and thus would be behind the departing aircraft.

I am responsible for the safe operation of my aircraft, and that includes not taxiing into the path of a departing aircraft, even if cleared by the tower. However, as one high-ranking GADO official once said to me, "A pilot sometimes gets a lot of help going down the tubes." First, I too thought that I was at the end of runway 34R. I had asked, "Do I just follow the blue lights south to the end?" Ground control said, "Yes." When I finally turned west on the taxiway, there were no more blue lights to the south, only to the west (leading to an intersection). As I turned west on the taxiway, I saw a sign pointing to R34R and R32. . . . As I held just east of the hold line, I could see a large painted area on 34R which appeared to be the numbers. . . . When I received clearance into position, I looked to my left. It may be difficult to believe that I looked and did not see an aircraft coming toward me, but as I reconstruct the matter, I looked up for an aircraft on final . . . I should have seen the other aircraft, and I bear the responsibility for not having seen it . . . however, the tower certainly cleared two aircraft to operate on the same runway at the same time. . . .

* * *

I was the captain on flight A departing Atlanta. We were cleared to taxi to runway 27L by runway 15 to hold short of runway 26 and 27R and to follow an aircraft B. Aircraft B ahead held short of 26 and was then cleared across. I asked the first officer to request clearance to cross with the other aircraft; we were advised to hold short. We were holding short of what I believed at the time to be the east-west taxiway. While holding, I saw landing lights on an airplane C in position at the east end of runway 26. At that time I realized I had inadvertently crossed the E-W taxiway and was very close to runway 26. I believed we were too close and immediately had the first officer alert ground control of our position and need to cross. We expedited across the runway when clearance was received. . . . On runway 15 in relation to the east-west taxiway for runway 26 there is a very large concrete area to the east of the position I was holding . . . much of this area is either not lighted or inadequately lighted with respect to designating the edge of the runway. . . . This area did not provide an adequate reference. . . .

Other airport problems were cited in ten cases. They included inadequate taxiways, taxiways too close to runways, parallel runways too close to permit holding between them without intruding on one or the other, and inadequate maintenance. Two reports of pilot-initiated occurrences cited obstructions to tower visibility; one is quoted here.

I was doing touch-and-go practice, and was cleared for touch-and-go runway 31. I was informed aircraft B, a wide-body, was to hold short of runway 31. He was taxiing from the ramp to runway 6R for takeoff. At any rate, he did not hold short. Fortunately, I was practicing zero flap landings, so my airspeed was higher than usual. As soon as we concluded aircraft B was not going to stop, I

applied full flaps, full power and made a hard climbing right turn. I missed B by less than 100 ft . . . part of the problem is that the personnel in the old tower cannot see the activity on runway 31 north of runway 6L, so they were more or less helpless in this situation. . . .

In summary, pilot-initiated occurrences often involved performing some maneuver without clearance (46 of 65 cases). This was often associated with a coordination problem within the cockpit or between flight crew and ATC (22 of 46). Pilot disorientation or confusion was noted in 12 of 65 occurrences.

Controller-initiated occurrences– These occurrences usually involved failure to insure that separation would exist (74 of 89 cases). In 45 of the 74 cases in this category, there were associated coordination problems (with the aircraft in 16 cases, within the tower in 26 cases, and between tower and approach control in 3 cases). Inadequate information transfer within ATC is strongly associated with controller actions involving failure of separation.

Inadequacies in coordination among tower personnel (usually between local and ground controllers) were associated with serious problems relating to runway incursions. Note in the first two reports the role of visual monitoring. In the third report, visibility restrictions were a factor, though there is no question that visual recognition of the conflict led to its resolution.

At about 1215 hours, I was cleared for takeoff on runway 25. As I approached the intersection of runways 25 and 15 during my takeoff roll, aircraft B, which was previously facing west, turned toward runway 25 to taxi north. As B's nose neared the centerline of the runway my position was 100 ft or less from the aircraft and closing with a speed of 55–60 knots. At this point I rotated (at a slightly premature speed) and lifted off. I turned right at about 10 ft of altitude, avoiding the nose of the other aircraft by 10–20 ft. I contacted the tower and was informed that B was cleared by ground control and that the ground controller was in error . . . as a secondary cause, the crew of the air carrier aircraft should have looked both ways prior to taxiing onto runway 7-25.

* * *

We landed on 23L at (a foreign airport). Tower cleared us to turn off on taxiway B and contact ground control. Ground control cleared us across runway 23R to our gate via taxiway A. My first officer rogered and we started to cross 23R. He hollered "Stop, somebody is takeoff!" or words to that effect. We stopped and a corporate jet passed right in front of us. Had we moved 10 ft farther the smaller jet would have hit us. It appeared he was just breaking ground as he passed us. . . .

* * *

(From one pilot) We were a (four-engine jet) ferry, cleared to taxi from the hangar area to the northwest runway, 32L, via the active runway parallel taxiway for an intersection takeoff at T-1 . . . the weather was –X 2⊕ 3/8 fog, ceiling 1⊕VAR3⊕. On reaching the intersection we advised ground control and were cleared to tower.

On initial call, we were number one for takeoff and advised the tower . . . tower cleared us into position and hold. A short time thereafter, tower cleared another aircraft to land. I had taxied onto the runway and was about to make the 90° right turn when landing lights appeared on the left side. Visibility was restricted. I promptly added power to clear the runway instead of turning. I continued straight across onto the continuation of T-1. While waiting for the engines to spool up after throttle application a wide-body in a landing flare appeared with the landing lights on and as we cleared the runway while still moving the wide-body passed behind us.

I cannot say for sure how to detect the fact you have been cleared into position in front of a landing aircraft in restricted visibility especially at an airport with multiple runway operations. . . .

(From the other pilot) We were cleared to land by the tower when we reported Romeo inbound. Weather reported 2⊕ 3/8 fog, RVR 3500 approach 3000 middle and end of runway. Copilot flying, approach normal. About 1,000 ft past threshold at the point where engineer called 30 ft altitude and at the point where I was taking control for touchdown, I saw a heavy jet in the middle of the runway. I applied full power for go-around and started climb. Saw the other airplane clearing so cut power and landed. Our approach speed was 145 knots, weight at landing 478,000 lb.

One coordination problem involved a shift change in the tower.

The visibility was RVR 1200; we had takeoff minimums and were holding short on the taxiway. We called ready for takeoff and received a takeoff clearance. I spooled the engines and started to taxi. Just as we started to move I caught a glimpse of an aircraft passing by and disappearing into the fog on 35R, the runway on which we were cleared for takeoff. I checked with tower; he apparently was taken aback by the event and was unaware the aircraft existed. He did not have him on radar . . . somehow the aircraft, on a Category II approach, had gotten lost in the shuffle of changing shifts. . . .

Phraseology problems were associated with five runway incursions. Examples are shown here.

Aircraft A requested departure clearance on runway 4. I cleared aircraft A for takeoff. Aircraft B was advised to taxi into position and hold runway 7 for traffic departing runway 4. Aircraft A called again for verification of departure clearance. Aircraft A was advised, "Cleared for takeoff, minimum delay, traffic awaiting departure on runway 7." I was then momentarily distracted and when I looked up both aircraft A and aircraft B were airborne and rapidly converging. I gave aircraft A a right turn to avoid traffic. Traffic separated and no further conflict occurred . . . the aircraft came within 500 ft of each other . . . I believe a contributing factor was fatigue. Two of us have worked the day shift without a break; even lunch had to be eaten in position. . . . I am thoroughly bushed, and I still have 1 hr to go. . . .

* * *

Airline aircraft A was told to round a corner of the departure runway and not to plan on stopping. Traffic, aircraft B, was landing on an intersecting runway. I turned my head to look at another of my departure runways and A departed. The landing aircraft stopped short of the runway being used for departure and the pilot called for an explanation . . . better phraseology should have been used to A about holding in position.

ATC and controller procedures were associated with specific problems in 11 reports, not all involving controller-initiated occurrences. The difficulty posed by a hold-point very close to a landing runway was cited in two reports.

After landing on runway 9, tower cleared us to turn off the runway via Romeo and contact ground control. . . . Upon turning off, the after-landing checklist was accomplished. As I adjusted the frequency and volume for ground control, I heard them calling us to hold our position. We were approximately 1,000 ft from the turnoff point when the captain and I heard ground calling us and when we stopped we were in the middle of another active runway (22) and a light airplane was flying at, up and over us . . . the turnoff of runway 9 to 22 is a very short distance and narrow, requiring the full attention of the pilot taxiing. There is no ATIS to warn the crew of multiple active runways and I do not recall the approach or tower controllers advising of this . . . the tower supervisor after the incident advised me that this had happened several times previously. . . .

* * *

After instrument approach, on landing rollout runway 5L, tower instructed aircraft to turn off on runway 10. Instructions were acknowledged by first officer. We changed to ground control and were told to hold short of taxiway N. Taxiway N occurs near the turnoff so aircraft was almost through N at the time of the transmission. Ground control told aircraft both he and tower had instructed the aircraft to hold short of N. . . .

Simultaneous intersecting ILS approaches were cited in one report.

Aircraft A was established on the ILS course for runway 7. We were advised by approach control of traffic at ten o'clock, 4 miles, on an ILS for runway 10. Approximately 2 minutes later I inquired about the traffic and was informed he was "ten o'clock, 3 miles." The first officer informed me that the outer marker light had started blinking just as we broke out of the clouds and saw the traffic, which seemed closer than 3 miles. The distance between the outer markers for runways 7 and 10, according to the scale on the approach plate, is just under 2 miles, but the issue is not whether we were 3 miles or closer. The real issue is that both aircraft were inbound on intersecting localizer courses. To compound the problem, both aircraft were at similar airspeeds. The use of simultaneous ILS on intersecting courses might seem to be efficient and safe to ATC, but it is potentially hazardous. Because of the converging courses which it inherently provides, all the ingredients for a midair collision lie in wait for a triggering last-minute event: a simple controller distraction, or a communications failure, or radio congestion. Procedures should be fail-safe. . . .

The control of intersecting patterns by different control positions was discussed in one report in this sample (other ASRS reports have also cited this problem).

> I was flying airline aircraft A on the above date. Tower issued takeoff instructions and we broke ground off runway 35R . . . at that time I saw corporate jet B cross directly in front of me, having taken off from runway 27. Upon reaching a safe altitude, I asked the tower operator if he was aware that the aircraft were taking off simultaneously. He said "No." Subsequent inquiries . . . indicate that the tower personnel felt nothing of significance occurred. I feel that it was highly dangerous. . . .

A specific procedural problem was cited in several reports, all of which mentioned difficulties associated with simultaneous use of intersecting runways. The issue in these and other reports concerning these procedures is what happens when a problem is encountered by one or the other aircraft if the procedures leave little room for a "fall-back" position.

> Airline captain was cleared to land on runway 14L and at the same time tower cleared another airline aircraft for takeoff on intersecting runway 27L. We were given no warning by approach control or tower of the departing aircraft on the intersecting runway. If we had to make a go-around it would have been very close. We had made a long landing to save taxi time, and had to use heavy braking to avoid the intersection. . . .

* * *

> Tower cleared aircraft A to land on runway 27L and aircraft B to land on 32L at the same time. The runways intersect. Had aircraft A not been able to hold short of the intersection the two aircraft would have collided. When questioned about the practice the tower answered, "I've been directed to use the runways in this manner."

* * *

> As we were cleared to land on 14L the tower asked us to expedite through the intersection of 4L and we agreed. On touchdown we experienced difficulty with the aircraft due to very poor braking action and crosswinds. With this difficulty we did not, in fact, expedite through the intersection. I believe the tower was not observant as they cleared another aircraft for takeoff on 4L before we were through the intersection. . . . I personally believe that this runway configuration is undesirable unless more attention is paid, and the landing aircraft should not be questioned. One week previously, I experienced the same problem departing on 4L. I aborted takeoff due to an aircraft in the intersection of 4L and 14L.

* * *

> We were cleared to land on 27R. Another aircraft was cleared for landing on 22R to hold short of 27R. Both aircraft touched down at nearly the same time. We landed normally on 27R but could not tell for certain that the aircraft on 22R would in fact be able to hold short of the intersection. He did not ever come to a

full stop because he was playing his taxi to expedite traffic (there are no turnoffs on 22R). We braked to a slow taxi to be certain of our clearance and so that we could stop if he couldn't. Tower immediately told us to expedite off the runway for landing traffic. After we turned off a twin and a tri-engine jet touched down on the two runways with the same result, only the trimotor braked heavily. This operation is unsafe; it adds too many additional variables during the critical landing phase.

Training was involved in five controller-initiated occurrences. A typical example follows.

Aircraft A landed on runway 12, then aircraft B was told to taxi into position and hold runway 12, which he did. Aircraft C was on a 3-mile dog-leg to final for 12 at this time. By the time aircraft A cleared the runway aircraft C was on 1-mile final. When aircraft C touched down aircraft B was 3,000 ft ahead of him and just lifting off. Controller training was in progress at the time and the trainee apparently didn't realize it would be that close. By the time I decided to send aircraft C around it was too late; he was already committed to land. The pilot remarked that he should have gone around, but he did not. The trainee should either have sent him around or not taxied B onto the runway but did not. I should have sent C around but I did not. None of us reacted to this situation as we had been trained to and the result was less than standard separation.

Several of the reports in this sample described situations in which a go-around was initiated by the pilot because of a perceived threat to separation. Such an action was taken in 17 cases. In at least some of these, the action produced new problems, although it obviously averted problems in other cases.

We were cleared for immediate takeoff from 'in position' on runway 31 and began our roll without delay. Aircraft B was on final approach to runway 22. Our spacing was slightly less than what we've been used to at this airport, but we felt that we had more than adequate separation. During our takeoff roll aircraft B initiated a go-around. We crossed the runway intersection at about 300 ft AGL and at that time B appeared to be near level with us and perhaps over the approach lights. The fact that he pulled up and possibly accelerated put our aircraft in closer proximity than if he had continued his approach and landed. We would not classify this as a near miss but the potential exists in this situation.

* * *

Aircraft A reported to tower on downwind. I cleared A to land. Aircraft B called for takeoff. B was cleared for takeoff, then cleared for immediate takeoff and given traffic, aircraft A, 1-mile final. A declared the approach too close to departing traffic and went around on the right side of the departure. In my opinion if A had continued his landing I would have had minimum departure separation. However, due to the pilot's initiation of a go-around he reduced longitudinal separation and passed B at midfield.

In 20 occurrences, both the pilot and the controller erred in some manner. Eight, or 40%, of these occurrences involved a near collision. These reports were therefore singled out for

examination. It was found that these occurrences, like the others in this study, involved a variety of factors. One factor noticeable in this subset of reports, however, was very tight spacing of traffic (in eight cases) which produced problems when not all participants behaved as expected. Two examples follow. In both cases, one or more of the pilots, as well as a controller, contributed to the situation.

> Aircraft A, landing 4R, was instructed to roll to the end. Aircraft B was in position runway 8L awaiting the landing A to roll through the intersection. Anticipating separation, the controller instructed B to start a fast taxi since there was a heavy aircraft C on short final for 8L. Aircraft A slowed and tried to use a diagonal taxiway that saves time to the gates. Controller instructed A to cross the intersection without delay; A did so and takeoff clearance was given to the fast-taxiing B. This was not a safe operation by the local controller and will not be tried again. This airport is extremely hard to work because of crossing runways and numerous intersections for takeoff. . . . In the above incident the two aircraft missed by 300 ft or so; too close. . . .

* * *

> Transport aircraft A taxied out and was holding for takeoff. Another flight had landed and was still on the runway. Aircraft A was cleared for something and the transmission ended. Only a couple of seconds later, A was cleared into position and cleared for takeoff. Just as we were about to start our takeoff an aircraft B who was on final said he was going around. As I made the last 90° turn onto the runway I saw lights and he appeared about a mile or so out on final. When he elected to go around I elected not to start my takeoff roll as it appeared that from his position and my takeoff and climb we would be very close (visibility was 1 to 1-1/2 miles, ceiling about 300 ft). Since I had not started to take off, and since aircraft B was not going to land, I made a right turn back off the runway. Aircraft B said he could land but the tower told him to go around, then immediately told him to go ahead and land. Aircraft B advised that he would have a moment earlier but he could not at that time. In aircraft A, we advised that we would continue with our takeoff and that we were starting our takeoff roll. The tower advised to turn left and taxi clear of the runway.

> There is no taxiway off to the left of the runway except at the very end so we did a quick turn and cleared the runway on the east side. As we were clearing, an aircraft C was told to go around. The result of this incident was at no time a hazardous condition, but it did result in two aircraft having to go around . . . air traffic was very heavy at the time . . . during these conditions radio communications are so congested that it leads to misunderstandings and confusion on the part of both the pilot and the controller. Expediting the situation only adds to the confusion. . . .

In summary, controller-initiated occurrences generally involved failure to insure that separation would exist. An important corollary factor was a failure of coordination with other tower positions. Training may have been a factor in a few cases; procedures may also have been a factor in some. Tight traffic spacing appeared to be a factor in cases in which a flight crew error compounded the controller's error, or vice versa.

Other factors– A number of other factors were also present in and pertinent to these occurrences. Environmental factors were cited in 12 cases. Five of these involved restricted visibility; in one, the controller's alertness averted a problem.

> Aircraft A requested taxi clearance from the south ramp to the active runway. Visibility was 3/16 mile in ground fog; taxi instructions were given and the RVR for runway 10. The aircraft advised he was "slightly unfamiliar" with the airport layout and detailed instructions were given. In his taxi, he was required to cross the active runway at midfield. Aircraft B was holding in position for departure and I requested A to report crossing runway 15R at taxiway F, a point that is clear of the active runway 10. From past progress reports, after a sufficient lapse of time, I asked A for a confirmation of his position and was told he had cleared the checkpoint. I had a ground vehicle holding clear for the A on yet ancther taxiway and was awaiting his report of sighting A. Again, from A's past reports and the time lapse, he should have passed the ground vehicle, but had not. Unsure of his position, I elected to advise local control to hold his departure. Upon further inquiry, the pilot of A admitted he was not sure of his location. B was held until A reported sighting an airline ramp, a point known to be clear of the active. . . .

In a second report, a late hand-off and a missed approach presented the controller with a potentially critical situation.

> Aircraft A was on a VOR approach to runway 13L and aircraft B was departing runway 31R with a right turn out northeast-bound. Approach control did not give the tower a hand-off on the VOR approach. The weather was marginal with low ceiling and the VOR approach called well inside the normal hand-off point, after the tower controller had released the VFR 31R departure, not knowing about the opposite direction IFR aircraft. Due to the ceiling coming down, the IFR aircraft executed a missed approach. The tower controller separated the aircraft visually by seeing aircraft B and climbing aircraft A. . . .

Intersecting runway operations in wet weather caused another problem.

> Airline aircraft A on short final for landing on runway 12L made a touch-and-go in order to pass over aircraft B who, after landing on runway 17, could not hold short of the intersection of runway 12L. Runway 17 intersects 12L 3,000 ft from the approach end. The runways were wet at the time.

Several reports discussed controller visual problems; in this case, night compounded the problem.

> Aircraft A was cleared to land on runway 16 with aircraft B cleared for touch-and-go on intersecting runway 30R. At the time both clearances were issued, judgment and experience indicated standard separation would exist. It did not, but due to the angles involved, this less than standard separation situation was not apparent until it was too late to do anything about it. The situation occurred at night, with both aircraft landing toward the tower. As a result, both distance and

speed determinations are extremely difficult. . . . The aircraft involved were not that close, but it was potentially unsafe. A bright display would have helped here. . . .

Frequency congestion was a factor in six reports. It was usually cited as a factor that made it more difficult to confirm unclear or partially missed instructions. Language problems were cited as a factor in four runway incursions; similar flight numbers were a factor in one case. Workload was cited as a contributing factor in five occurrences, fatigue as a factor in one.

When this study was initiated, it was the opinion of the authors that surface vehicles would be found to be an important facet of the runway incursion problem. This proved not to be the case. Motor vehicles were a factor in only 8 of 165 occurrences.

The driver of a vehicle was the initiator of six of the occurrences. In three cases, the driver crossed an aircraft movement area without clearance; the other three involved disorientation or confusion as to his position on the part of a driver. The outcome was a collision in one case, less than safe separation in one, a recognized error in two, and no conflict in two. In one case, a motor vehicle wandered onto an airport from outside; the other cases involved airport service vehicles.

Motor vehicles have been a persistent problem at certain airports that have deficient security fencing; however, they did not appear to be a frequent problem in this sample of reports from controlled airports.

General discussion– What, in summary, can be learned from these data? In particular, do the data suggest any measures that might assist in solving the problem of runway incursions, if these occurrences do represent a problem?

First, while we are uncertain as to the magnitude of the problem, it seems certain that a problem exists. That some of these near collisions were not accidents instead appears to have been due to chance alone (the occurrences in which no recovery action was taken are an example).

Given the existence of the problem, how may it be characterized? The problem appears at first glance to be twofold. One aspect involves pilots who do not have, or who misunderstand, a clearance prior to executing a maneuver. The second aspect involves controllers who fail to insure that separation exists and that it will continue to exist before they issue a clearance. Both problems, however, appear in a large number of cases to involve a common factor: lack of information. In the case of the pilots (and the vehicle operators), the information they lack is a timely, unambiguous clearance. In the case of many of the controllers, the information relates to their or other traffic, or about the intentions of pilots (or drivers).

In many of these reports, it is clear that considerable pacing stress is involved. The pilot has schedule pressures, the need to conserve fuel, and the constant knowledge that he cannot "get there by sitting here." The controller's problem is more pervasive; he must move traffic, simply because he knows there is more coming. One of these reports is illuminating, for it illustrates that controllers will sometimes go further than perhaps they should to provide whatever services are requested of them.

Aircraft B executing practice ILS 31L approach to a full stop . . . aircraft A advised on left base with B in sight. Local control cleared A to land 31R. . . . local control had other distractions and did not continue to watch A . . . radar was not

> painting the aircraft. . . . A stated that an aircraft was on the runway; local control did not observe an aircraft on 31R and checked 31L. I observed A about 20 ft AGL about to land on top of B. I told A to go around. As A started his go-around on 31L additional traffic was C on short final on runway 36. I told C to make an emergency pull-up to avoid A. Contributing factors: poor radar reception and only one local control position. Just prior to this incident I had worked 107 operations using three runways . . . one local controller has difficulty observing all of the critical areas for three different traffic patterns. . . .

Frequency congestion, shortcuts, nonstandard phraseology, unpredictable and unnanounced flight crew actions, visibility restrictions, and other factors all play a part in this problem, but it appears that the information transfer problem, for whatever reasons, is at the heart of a substantial part of it. Given that over half these occurrences involve an aircraft taxiing, and therefore able to stop almost at will, it is suggested that it should be productive to examine closely ways to insure that taxiing aircraft (and motor vehicles) are under all circumstances absolutely certain of what they are supposed to be doing.

There are three facets to this part of the information transfer problem; each is important, but the relative importance will vary as a function of geographic features, airport layout, and procedures in various locations.

Standard operating procedures for taxiing, either system-wide or airport-specific, will help to insure compliance with desired patterns of behavior in most cases, if they are known to all users and if they are simple enough to be understood. Although steps have been taken to clarify taxi clearance limitations, it appears from the number of occurrences involving this factor that additional attention might be helpful.

Taxiway lighting and markings appear to be a problem at a number of locations, especially during periods of construction or repairs. While many improvements have been made in signs over the past several years, markings, especially at night, still appear to represent a deficiency. The problem is most acute at the junctions of taxiways with runways.

Clearances were a problem in a number of reports, particularly when ground control frequencies were congested. The dangers of nonstandard or abbreviated clearances are clear; maintaining clearance discipline under severe time constraints, however, is a constant struggle. One pertinent location-specific situation noted several times in the study involved being directed to "follow another aircraft," then uncertainty as to whether to follow the other aircraft across an active runway. Some pilots did, some pilots did not, and some pilots queried ground control for clarification. It is this sort of ambiguity the system should seek to avoid.

Lack of clearance for takeoff or landing was noted in 14 reports. This can hardly be due to a lack of knowledge of the requirements for such a clearance. Data regarding the four aircraft that landed without clearance indicate two were not in contact with the tower; the reasons why the other two landed are unknown. In the case of takeoffs without clearance, however, a pattern was more evident. In 7 of 10 cases, an aircraft took off immediately after a takeoff clearance was delivered to another aircraft. One case involved similar flight numbers, one involved an incomplete (no aircraft identification) repeat of a previously issued takeoff clearance, after which two aircraft took off simultaneously on intersecting runways. In the other cases, the reason for takeoff was

unknown in one, a probable language problem in a second, and a crew member's misinterpretation of a question from the other pilot in the third.

The tone of several of these reports suggests that pilots already in position and awaiting takeoff clearance may have heard what they expected to hear, without recognizing that the clearance was for another aircraft on another (or even the same) runway. It is in this subset of cases that devices for visual confirmation of takeoff clearance would be useful, but it is also suggested that with the multiple-runway and intersection takeoff operations, which characterize nearly all of our busier airports, a heightened level of caution on the part of pilots, perhaps accompanied by a readback of the flight or aircraft numbers in acknowledgment of the clearance, might accomplish the same thing.

It is clear that problems in coordination between local and ground controllers are a factor in a substantial number of runway incursions. It is equally clear that pacing stress is a contributing factor in these and probably in other failures of coordination. Though a recent FAA directive mandating verbal coordination prior to permitting the crossing of one of two active parallel runways may be of help, a recent ASRS report describes the difficulties associated with implementing this directive at an extremely busy VFR tower serving a multiple parallel runway operation.

Conclusions

The following conclusions are drawn:

1. Incursions of aircraft onto runways at controlled airports represents a significant safety problem

2. An important factor in both pilot-initiated and controller-initiated runway incursions is failure of information transfer among the relevant system participants

3. Taxiing aircraft, a major contributor to these occurrences, represent the most effective single point of attack on the problem, if ASRS data are representative.

This broad category of experiences attempts to highlight some of the undesirable occurrences to which pilots and controllers can be exposed. The first group deals with air carrier situations, the second set deals with general aviation situations, and the final group illustrates that the "there I was" condition is not the sole province of airplane drivers.

The air carrier examples discuss problems associated with getting off the ground (No. 1), and trying to get back on the ground (No. 2). Examples Nos. 3 and 4 involve a normally routine item – landing gear locking pins: sometimes they are nice to have (No. 3), sometimes they are not (No. 4). Example No. 5 reinforces the common theory that big problems are usually the product of more than a single factor.

1. On takeoff roll, runway 36 at DCA, just prior to reaching V1/Vr speed, there was a sound of an explosion and the "engine fail" light came on. At the same time the takeoff was aborted. With immediate full maximum braking, full speed brakes and 90% to 100% reverse thrust, the aircraft failed to stop within the remaining runway length, ran 100 ft or so through an overrun and came to rest with the nose gear in the mud approximately 25 ft from a sharp drop-off into the water. Aircraft weight was approximately 144,000 lb. The runway was damp but not "wet" under the legal definition. Subsequent reports by maintenance indicated a 13th stage bleed duct blew off causing the explosion sound and giving a false indication of engine failure. This meant all three engines were producing reverse thrust as all levers were pulled into reverse.

It would seem that the traditional V1 speed go/no-go concept needs reviewing. This aircraft would have been legal to make the same takeoff on a wet runway (with correspondingly lower braking coefficient), weighing several thousand pounds more (thus giving a higher V1/Vr speed farther down the runway), and upon actual loss of an engine at V1/Vr (thus leaving only two for reverse thrust), according to the "book" could have stopped within the remaining runway length. (As a matter of fact, the "book" does not consider reverse thrust as usable in computing the ability to stop.) Obviously under these more adverse but "legal" conditions, the aircraft would have been well past the runway end and into the water prior to coming to a halt.

Possibly periodic retesting of line aircraft with thousands of hours on them should be required to revalidate accelerate/stop figures under which we operate on a daily basis in the "real world." Another approach might be to develop some sort of "line speed" to check on aircraft acceleration or "runway remaining" system to reflect more accurately the ability of the aircraft to stop within the runway length remaining.

* * *

2. I was cleared for a visual landing after informing the controller I had the Palomar Airport (Carlsbad, Calif.) in sight. I made a right down wind entry to the airport at 1,500 ft MSL. The weather conditions were VFR; however, the sun at that

hour was at such an angle that its glare, with the haze and smog, gave shadows over the ground because of the hilly terrain. I turned a normal base leg and lined up for runway 24. My airspeed was 130 knots indicated. Approximately 25 to 10 ft before touchdown, the captain, who was flying copilot, told me to go around, that I was about to land on the taxiway. At the same time, I noticed VASI lights to my right. I executed a go-around and made a left-hand pattern this time. Turning base leg, I looked for the runway and taxiway, and I noticed that the taxiway was the only one in sight. With the glare of the sun and the haze, the runway was not in sight. I turned final, and this time I was slightly higher and I did notice that the approach lights were visible. They were not visible on my first approach to a landing. The same day, on my departure, I noticed that the taxiway shined more than the runway. The yellow lettered "taxiway" painted on the taxiway was not visible from the air.

I believe with the glare and haze, and the Sun's angle, it made me believe I was lining up on the runway, not the taxiway. With these conditions, even though it is VFR, I believe a higher approach is in order. However, with a high performance aircraft, it is difficult to go down and slow down when you're attempting to land on a 4,700-ft runway. I would recommend the approach lights be on "bright" at early evening, and a caution note be entered on the approach plate describing the difficulty of observing the runway at that time of day. I believe that even if the runway had fresh paint (markings) it would still be difficult to see.

* * *

3. On final approach the gear was extended and final check called for. Upon checking the gear it was found that the three red "unsafe" lights were still on, even though the green "safe" lights were on. The approach was abandoned and the tower was informed of our problem. The tower turned us over to the approach controller again and he put us on vectors while we attempted to isolate the problem. First we went to the abnormal section of the flight manual and performed all procedures listed and from all we could find – the gear was "down and locked." We next called the company and requested a phone patch to Tech Service. We explained our problem to them and indicated the steps we had already taken. (Prior to calling them the flight engineer had gone back and looked at the gear through the floor viewers and visually ascertained that the three gear indicators showed normal and that there was no over-wing damage visible). Tech Service had nothing else to offer or suggest except that we go ahead and land. They would notify maintenance to meet us and put gear pins in when we reached the ramp – we requested that they have maintenance on the runway and install pins before we taxied in.

When we began our approach again there was some discussion with the tower concerning our remaining on the runway until after the pins were installed – they (the tower) did not want us to tie up the runway because of the rush hour and asked if we would clear the runway after landing and then have the pins installed. I agreed to do so in view of all the positive indications that we had provided the landing was uneventful. It was a normal landing and we did exit the runway at the tower's request and install pins.

* * *

4. We were unable to retract the nose gear after takeoff. The flight engineer inspected the nose gear and observed red cloth material through the viewport. The captain assumed the material was associated with some sort of gear lock pin, and that there was no way to remove the lock pin in flight. We dumped fuel (52,000 lb) according to approved procedure and landed without incident. All standard landing gear lock pins were checked for removal and accounted for in the cockpit prior to engine start. After the incident, in a discussion with gate maintenance, we were advised that a "safety pin" was removed from the nose gear drag brace. The pin should have been removed at the hangar and it is not visible on a normal walk around preflight check.

* * *

5. Our initial clearance was to proceed direct to the ABC VOR, flight plan route. Due to severe thunderstorm activity in the vicinity of ABC VOR, course deviations were necessary to penetrate the line which was solid. Immediately after penetration, Center requested that we turn left to heading 010 and proceed direct to the XYZ VOR. . . . Shortly thereafter we were given the following holding instructions: "Hold west at the XYZ VOR on V-400, left-hand turns, 15 DME legs, maintain 11,000 ft. EFC 1845." We entered the hold at 1815. We held there until around 1835, having to increase our airspeed due to the turbulence in and around additional thunderstorm activity moving into the holding area from the west and southwest. . . . Center was advised of our airspeed change. We also requested an altitude change several times as 11,000 ft was running us in and out of the bases of the higher cells. Anyway at 1835 we had just completed the turn outbound at the VOR, the DME indicating 7 to 8 miles, and were paralleling V-400 outbound. At that point, one of the flight attendants came through the cockpit door saying something, I turned my head momentarily to answer her, and when I looked back, another air carrier turbojet was bearing down on our left side from the opposite direction at the same altitude. When we passed each other I could actually see the faces in the windows. The lateral distance apart couldn't have been more than 300 yards at the outside. No evasive action was taken by either aircraft, as I didn't spot him until the last second and I presume that he didn't spot us either until the last second if at all. It was obvious that he was tracking east on V-400.

I called Center immediately . . . after the fifth or sixth call they replied and I then asked them to verify our altitude in the hold which they did – 11,000 ft. I then asked them if they had other aircraft in the area. I think they replied with something to the effect that there was another air carrier turbojet in the area 7 to 8 miles away. I then told them that it had just passed me going the opposite direction down V-400 at 11,000 ft so close that I could see the faces in the window . . . I called it a flyby. Then I asked them for a phone number so the conversation could be continued on the ground . . . they told me to get it from my operations . . . I said I would . . . and the controller then asked me to verify that the supervisor could expect a call from me . . . I said yes.

There was other conversation during this incident, the contents of which I don't exactly recall. However once on the ground, I called the company and talked

to the director of flight training as he was the only supervisor present . . . after a discussion we decided that the company . . . in an official capacity, would get in touch with Center, that the company would also contact the other airline and discuss it with them, and that every effort would be made to keep things at a low profile, without possible official action against the controller . . . whom it appeared at that time was in error.

The other turbojet was not on our frequency at the time of passage having already switched over to the next frequency. I recall hearing him on our frequency before the incident, and today after thinking about it I believe I did hear him being cleared to 11,000 ft . . . however, I wasn't aware of his position at the time, except that he was somewhere doing some deviating around the widespread thunderstorm activity.

This is only conjecture, of course, I couldn't swear to the fact that I heard him. Besides, I had no reason to believe that he was in the immediate area of our holding pattern.

The controller was being pressured greatly by numerous flights continually calling him and asking for different altitudes, different routings, and different holding patterns further east away from the advancing thunderstorm activity. The frequency was so congested that there was continual cutting out of transmissions by different flights.

It's my opinion that the other aircraft was following his assigned clearance, as we were. This points the finger at the controller; however, in all fairness to the man, he was so pressured by the amount of traffic he was working and their continued insistence on new altitudes, routings and the like, which too was justified or understandable in view of the severe thunderstorm activity that permeated the area, that he could easily have made the error he or someone else did, bringing our two aircraft dangerously close to a midair collision over the VOR at 11,000 ft.

This pressure situation could have been avoided if the Center would have refused to accept all inbounds from the west and southwest, except as they could clear them straight into the airfield without having them hold in close proximity to or in front of the advancing line of thunderstorms which covered the entire area northwest and north of the state.

With the exception of the last example all of the following general aviation reports are standard "there I was" circumstances. Example No. 9 is included for its value in establishing a strong case to illustrate how to avoid the "there-I-was" situation before it becomes a reality.

6. I was returning to Lancaster from Phoenix. On the leg from Blythe to Twenty-Nine Palms, instead of tracking outbound on 287°, I used 187°. I do not know why, but I thought I was on the correct heading. Actually I was not holding 187° very well or there was wind; there is an area between Blythe and Twenty-Nine Palms where I expect to lose Blythe and be unable to receive Twenty-Nine Palms, so I was not surprised to have to hold a heading for a while as my navigation reception

has never been very good. When I did not recognize the terrain after I had been outbound for about an hour I realized what heading I had been holding and became upset that I may have crossed over into Mexican airspace. I used the Mexicali VOR and the Blythe VOR (which I was now receiving sporadically) and got a fix over the city of Mexicali. Visually I could see an airport directly ahead, which could only be Calexico. I was under the impression that Calexico was in Mexico because I was using an old Los Angeles sectional chart which I had already drawn course lines on from a previous trip to Phoenix. Directly over the Calexico airport I turned north and held it until I could see the Salton Sea, steering clear of R-2521 and R-2507 I went from North Shore to Twenty-Nine Palms and took on fuel. Leaving Twenty-Nine Palms, I almost went into R-2501, realizing my error over Twenty-Nine Palms airport (with which I was not in radio contact). I then turned south to intercept 268° and had no further difficulty on the rest of my trip home.

Summing up: On my unplanned trip to Calexico I must have penetrated R-2507 and R-2512 on about the 200° radial of Blythe VOR at about 7,500 MSL. I don't think I went into Mexico, but if I did it was not by much. I was over Twenty-Nine Palms at approximately 1,500 AGL without being in radio contact in their airport traffic area.

I feel that these transgressions were due to my inadequate flight planning and being more than usually fatigued and not being very current. Also due to the time of day (approximately 10:45 A.M.) I could not judge my heading by the position of the Sun.

* * *

7. There was one plane on final and another had just reported downwind for runway 12 when I entered downwind and reported. I flew wide of and behind the plane in front of me, declaring my intentions to the traffic on 122.8. The plane in front of me turned base and reported so. I had been slowing as much as possible to obtain separation. I turned base shortly after and reported so. The separation had been just about right and as the plane ahead of me crossed the threshold I turned final. When I was about 2,000 ft from the airport boundary I saw a biplane cropduster come from below me at power-pole level approximately 100 ft AGL. He did not fly a proper pattern. I was forced to go around. When I tried to talk to (the other pilot) on the ground he was extremely arrogant. Two of his comments were, "I guess it is a case of see and avoid," and, when I said that someone could get killed he said, "It probably won't be me because my plane is built to take crashes." Personally I think the cause of this was the attitude of the cropduster pilot and the lack of enforcement of standard traffic pattern.

* * *

8. I allowed a newspaper photographer to install a camera and camera mount on the top wing of my homebuilt aerobatic biplane. The purpose of this operation was to gather inflight photos.

Shortly after takeoff with this device, I noted some burbling and directional instability that had not been present on previous flights. Since the thing was inaccessible in flight, I was obligated to eventually land with it in place.

It then seemed the prudent thing to do was to climb to altitude and make a controllability check. This biplane was never too gentle in the stall and now, with the camera in place, it rolled inverted at the first nibble, there being a distinct lack of rudder authority. Upon recovery and after collecting my thoughts, I realized that I had failed to note the speed at which the uncontrollable roll occurred. Since this value was essential to a successful landing, I repeated the procedure, this time with the camera turned on. The result was the same, I noted the speed, got some spectacular pictures, and learned to never again allow such a device on my aircraft.

* * *

9. I went to rent a light twin-engine aircraft for a flight through Colorado. I needed an aircraft with good high-altitude takeoff and cruise performance. This particular aircraft had been modified with manual turbochargers. Since I was going to fly into airports at elevations of 6,000–7,000 ft, and fly over the Rockies up to 16,500 ft MSL, I needed two-engine and single-engine performance figures to plan my flight. However, with this modification, no figures or charts in the pilot's operations manual were applicable. I did not know my single-engine ceiling for takeoff or cruise conditions. I could not find any power settings to set cruise power at any altitude, using the turbochargers. I was told by the aircraft renter, the FAA, and the manufacturer that they had no legal responsibility to supply this performance data.

Under these conditions, I lost all control of this flight. Adequate flight planning for takeoff weights and cruising altitudes could not be computed. I could not tell if I would exceed the engine's capabilities with any power setting I tried to set up for cruise. I suggest the FAA require additional flight data be added to the pilot's or aircraft operation manual whenever a modification changes the flight characteristics or significant performance parameters of an aircraft. Otherwise, the aircraft should be reclassified as "experimental."

The last three examples in this section provide a very limited glimpse at some of those situations, reported by air traffic controllers, that fall into the "there-I-was" category.

10. At approximately 1115 EDT, a controller entered the operating quarter at the facility with a group of about 15 fourth-grade kids and several adults. The controller with the group advised the kids not to bother the controllers at work and let them have the run of the room while he talked with the adults in the group. No control was exerted to keep the kids together and they all took off for every empty scope in the room, all three sectors. The kids began playing with the computer key pack track balls which disabled several active positions as we share computer packs at most all sectors. Controllers had to leave operating positions to go to the shared position, clear the computer and advise the kids to leave the equipment alone. Two kids came to the scope where I was working three sectors. One kid said, "What's

this?," and pulled my headset jack out of console just after I had issued unknown traffic to an air carrier turbojet. I had to grab the jack from him and plug the headset back in, just in time to hear the turbojet advise he was taking evasive action to avoid the traffic I had called. About this time, the other kid found a spray bottle used to clean the scope and used me as a scope – sprayed with a light chemical on left face and side of head. I sort of asked the kids to kindly move.

At approximately 1150 EDT, the same controller brought another group of about 10 kids and 6 adults into the room and even less control was exerted on this group – however, I had no more problems with them. Most of the supervisors on duty thought it was funny – I didn't!

Visitors should be allowed and encouraged to visit the facility. But they should be of an age and intelligence level to understand what they are seeing. I know why they keep the cockpit door closed in flight. Fourth-grade children, uncontrolled, get nothing out of visits except a day off from school – controller gets headaches.

* * *

11. I am an air traffic controller at the ARTCC. I was working the radar controller position at the XYZ low sector at the Center. Two aircraft under my control were involved in a near-miss situation over the ABC VOR at 6,000 ft. The near miss occurred in a nonradar situation in that the radar coverage at ABC does not extend below about 7,000 to 8,000 ft. The other traffic in the sector at the time made the sector workload about at a moderate level. Aircraft was southbound on V-300 at 6,000 ft and was estimated to be at ABC at 2217Z. This aircraft was under radar control until about 5 miles north of ABC VOR. Aircraft no. 2 was westbound on V-500 at 6,000 ft and was estimated to be at the ABC VOR at 2228Z. At 2218Z I advised the ABC VOR aircraft no. 1 that radar contact was lost and asked him to report his time over VOR ABC. The pilot advised me that he was over ABC VOR at that time.

At 2215Z aircraft no. 2 called in on initial contact at 6,000 ft and I issued the altimeter and asked the aircraft to report his time passing ABC VOR. The aircraft was not DME equipped. The ABC VOR fix posting at this time still showed the aircraft to be estimated over the VOR at 2228Z and based on that estimate I would still have had legal separation between the two aircraft. The same flight progress strip also showed that aircraft no. 2 had passed the previous fix 6 minutes early. I did not note this when the aircraft made his initial call-up. The progress at the previous fix had not been carried forward to update the ABC VOR estimate due to the fact that the manual controller, after receiving the progress report had become involved in a situation involving two other aircraft that required separation. The manual controller was diverted to this situation for an abnormally long period of time because of a problem with the computer not generating flight progress strips on one of the aircraft involved. Aircraft no. 2 reported over ABC VOR at 2219Z at 6,000 ft and asked about the altitude of the aircraft that had just passed under his aircraft. Aircraft no. 1 immediately confirmed that he had passed under the no. 2 by

less than 200 ft and that a near miss had occurred. This was immediately reported to my ATCS Supervisor.

Had the ABC VOR estimate been updated on the flight progress strip of no. 2, we would have noted less than 10 minutes separation and taken action to achieve vertical separation. I have already explained how this updating of the estimate was not done but it should also be noted that even if the estimate had been changed, there still should have been somewhere around 6 minutes separation between the aircraft at the VOR. This would not have been legal separation but the aircraft would not have been placed in the near-miss situation. After the fact, we asked aircraft no. 2 for a confirmation of his filed airspeed and he confirmed that it was correct on his flight plan. The aircraft was quite apparently achieving a considerably greater groundspeed than the computer was using and this fact contributed to loss of legal separation and near loss of physical separation. In nonradar situations, controllers must depend quite heavily on computer-generated estimates and in this situation with a non-DME equipped aircraft and in not noting the progress of aircraft no. 2 at the previous fix, I had no reason to believe that loss of separation was imminent until aircraft no. 2 reported over the VOR 9 minutes earlier than the time posted on the strip.

* * *

12. NXXX was a single-engine IFR overflight: CYN V16 JFK – BDR at 5,000. I took the hand-off on NXXX about 25 southwest of JFK and was advised he was going direct JFK. NXXX appeared to be tracking 340°. I advised NXXX of the error and issued him a heading to fly of 060. I asked him what his heading was and he replied 340 and that he was going direct JFK. This would have been rather hard as he was on the JFK 245/15 and headed through LGA airspace to over EWR. I continued issuing headings – about 2 miles east of JFK, I issued NXXX the BDR VOR frequency and ask him to advise me when he was receiving it. When he was 5 northeast of JFK he stated "I've got BDR." I asked him the radial and he replied 239. I then advised him to proceed direct BDR and issued him the winds aloft at 5,000 that I had obtained from an INS equipped wide-body turbojet (265 true – 25 knots). I went back to my other traffic for a bit and checked on NXXX about 5 miles later and sure 'nuff – he was headed 340 on a ground track again. I asked his heading and he replied 340. I then informed him that not only was he going to miss Bridgeport, he was going to miss the entire state of Connecticut. Pilot became a bit irritated, I suggested he check his VOR equipment next time he was at his home base and, again irritated, he advised me that he was president of such and such electronics company and his equipment was correct. I then put him on radar vectors for BDR and advised HPN approach that he was on vectors and having trouble with his headset separator. About 15 minutes after he was sent over to HPN, the controller at HPN advised me that I was right and thanked me for the help, the only thing NXXX could do right and without any help was go down.

ATC Coordination

One of the common problem areas identified in reports submitted to the ASRS involves coordination, or the lack of it, between two or more air traffic controllers or ATC facilities. The sample reports presented in this section all have "ATC coordination" as the primary or a major contributing factor in the event described.

Each of the examples in this first block of ATC coordination sample reports exhibits some degree of self-analysis of the reporter's human error in conjunction with the description of a specific system occurrence. Note especially the ease with which a nontransponder-equipped aircraft can be forgotten in an automated environment.

13. I assumed the R25 position, traffic was light. During the briefing I was told about aircraft no. 1; he was in the vicinity of V-300 and V-11, at 8,000, computer hand-off and communication transfer had been accomplished.

Shortly thereafter, the data block disappeared. This caught my attention and I mentioned it to my D controller. Without thinking, I did a flight plan readout on code 0522, to confirm it was my southbound traffic at 8,000. The computer response was "No flight identification stored." I understood the response and knew exactly what had happened. I considered starting another track, because the aircraft had no mode "C." I decided not to start a dummy track, but made a mental note at that time to remember that the code 0522 was at 8,000.

Time passes and I am distracted by other traffic. (I think the LDB of 0522 changes to just an untracked target during this time.) My major distraction was aircraft no. 2, southeast bound, at 10,000 and aircraft no. 3 descending to 10,000. I was watching these aircraft closely to insure radar separation. More time passes, the two aircraft are closer but separated by this time. I have totally forgotten about the southbound traffic at 8,000.

At the boundary of the adjoining center, I descend aircraft no. 3 to 7,000 and advise him of westbound traffic at 6,000 (Mode "C"). I handed off aircraft no. 2 to MNO approach and they told me to descend aircraft no. 3 to 4,000.

By now, somehow, I thought that the code 0522 was traffic at 6,000, I had worked about an hour before. I thought they had made an error descending to 4,000, so I questioned them about the aircraft southbound on code 0522. They told me they were not working the 0522 aircraft. I immediately called traffic to aircraft no. 3, "traffic ten o'clock, 1-1/2 miles, southwest bound." I still suspected the 0522 code was at 6,000 and I wasn't going to descend aircraft no. 3 until he was clear of the southbound traffic. Aircraft no. 3 immediately advised me that he saw the traffic and he was just about at his altitude. Right then, I was really glad that I checked out the southbound target and told aircraft no. 3 about it. This feeling didn't last long because another controller was on the line immediately, informing me that I had just descended aircraft no. 3 through the 8,000 traffic that he was

working. That's when I realized that code 0522 was the 8,000 traffic that I was supposed to remember.

* * *

14. NXXX was handed off to the low east sector enroute northbound over the ABC VOR. The flight data strip showed 6,000. No altitude revisions had been received on FDEP. On initial contact NXXX did not say altitude; I requested him to confirm altitude. NXXX, whose transmitter was poor and hard to read, made a transmission which I understood to be good, and made a further request for a routine change through the jet penetration area, which after coordination with that sector, was denied. Approximately 20 miles later I handed NXXX to high west, whose area he was approaching, and the aircraft checked in at 7,000. The high west controller told me on intercom that the aircraft had said 7,000 and I told him I was not aware of an altitude change. After listening to the tape playback, NXXX's transmission was partially blocked by an interphone message, but by listening carefully, you can hear the pilot's rather lengthy transmission, "NXXX 6,000-500 climbing to 7,000." Only the 6,000 registered with me and I did not question him further. The high-west controller continued to work NXXX at 7,000 until hand-off to Center approaching the intersection where he descended NXXX back to 6,000. No conflicts resulted with any other traffic. However, I later learned that another controller had approved 7,000 prior to the hand-off to me, but did not write it on the strip.

* * *

15. At the time of the incident, I was working the manual controller position at the ABC sector in ARTCC.

The aircraft involved in this incident were aircraft no. 1, on an IFR flight plan and aircraft no. 2, on an IFR flight plan. When I signed on the sector I was briefed by the radar controller that he was in radio communications, but did not have radar contact with aircraft no. 1 at 12,000 ft. The flight progress strip on aircraft no. 1 was properly marked to that effect. Based on the ABC VOR estimate on the strip, I mentally plotted aircraft no. 1 to be approximately 60 miles south of the ABC Vortac at that time. Approximately 6 minutes later aircraft no. 2 was handed off to our sector descending to FL240. The radar controller cleared aircraft no. 2 to descend and maintain 11,000 ft. The routing that aircraft no. 2 was on had him approaching the ABC Vortac from the east, while aircraft no. 1 was approaching ABC Vortac from the south.

The radar controller was working several other jet aircraft inbound to the terminal area and became busy with sequencing them for hand-off to approach control. At this point the radar controller was relieved of his position by another radar controller. A briefing was performed between the two controllers about the status of the sector and everything was discussed including the weather and the sequencing of the jet traffic except no mention was made of aircraft no. 1 at 12,000, nonradar. The second radar controller had further difficulties with the sequencing

between a turbojet and a corporate jet and had to vector the corporate jet off course in order to put him in trail behind the turbojet. At the request of approach control, aircraft no. 2 was descended to 7,000 to get below weather and was subsequently handed off to approach control and changed to their frequency just passing over the ABC Vortac. Approximately 1 minute later aircraft no. 1 called on the frequency and requested a lower altitude. The radar controller repeated the call sign of aircraft no. 1 and asked him to "say again." I overheard this transmission and listened to the frequency as the radar controller asked aircraft no. 1 his position. Aircraft no. 1 replied that he was 5 miles northwest of the ABC Vortac still at 12,000 ft. I coordinated with approach control while the radar controller identified aircraft no. 1 and then vectored him to the right, away from approach control's airspace. It has been determined that when aircraft no. 2 crossed ABC Vortac westbound that there was no approved lateral separation with aircraft no. 1 whose airspeed would have put him over ABC Vortac at approximately the same time. And since aircraft no. 2 was descending to 7,000 ft through 12,000 ft the assigned altitude of aircraft no. 1 at the time he crossed the ABC Vortac, vertical separation was not maintained.

I believe, the first radar controller should have made some provision to insure separation from the northbound nonradar-identified aircraft no. 1, and the descending radar-identified aircraft no. 2 by requesting a DME report south of ABC Vortac from aircraft no. 1. This report would have jogged his memory as to the whereabouts of aircraft no. 1 and might have given him an opportunity to radar identify the aircraft. In a near-total radar environment, when things get busy and there are a lot of radar identified aircraft in your sector it is easy to forget about a nonidentified aircraft. Secondly, the first radar controller failed to mention aircraft no. 1 to the second radar controller, even though the strip showed him to be on frequency but not radar-identified. Thirdly, I knew aircraft no. 1 was in the sector, but did not know the second radar controller had not been briefed about him, nor had the second radar controller not seen the flight progress strip showing him on frequency.

We all fell into the same trap – we didn't see aircraft no. 1, so we forgot he was there!

* * *

16. As the controller working the Naval NAS Arrival Sector I "owned" that airspace east of Naval NAS 17,000 and below, which included AARRI IAF HI-TACAN-B. Aircraft no. 1 was enroute to AARRI at 16,000 for a HI-TACAN-B penetration, and was approximately 13 miles west of the IAF when I heard Center Sector 9 call Metro Approach east sector and request control of aircraft no. 2 for vectors direct to JKL Vortac. I "quick-looked" aircraft no. 2, which was then approximately 12 miles south of AARRI, climbing through 10,500, and could see that a vector direct to JKL would take him just east of AARRI. Since the Metro East controller had not coordinated with me for use of my airspace (when he answered Center Sector 9 the conversation was no longer on speaker) I called him and jokingly said I hoped he hadn't approved the vector since I had traffic at 16,000 approaching AARRI. He stated he had approved it because he didn't know I had

traffic. I instructed him to insure that aircraft no. 2 remained clear of my airspace until leaving 17,000.

As aircraft no. 1 approached AARRI, I observed aircraft no. 2 on a course direct to JKL and climbing through 14,400. The projected course of aircraft no. 2 would place it 3 miles east of AARRI at the time aircraft no. 1 would begin his descent at the IAF. I called the Metro East controller to confirm that Center Sector 9 had been told to remain clear of my airspace, and he replied that the Sector 9 Controller had "stopped" aircraft no. 2 at 15,000. I muttered something unprintable about how did he expect aircraft no. 1 to penetrate from 16,000 and remain clear of converging traffic below and terminated the conversation. I issued traffic to aircraft no. 1 at two o'clock, 4 miles, northeast bound, a four-engine turbojet at 15,000." Aircraft no. 1 said he did not see the traffic but was starting his penetration and leaving 16,000. I issued an immediate left-turn heading 270 to avoid traffic and the two aircraft passed within 2-1/2 miles with no. 1 in a left descending turn and no. 2 level at 15,000, heading approximately 030. Mode C readout showed both at 15,000.

Although the Metro East controller was guilty of not coordinating for use of airspace he did not control, I feel I was equally at fault for not calling Center Sector 9 myself to make sure he got the correct message about my traffic. It certainly could have eliminated the confusion, had I done so.

* * *

17. Aircraft A was an overflight at 1,000 MSL from MNO to XYZ. I was working the DR-1 position at approach control which handles IFR departures going west and south out of Metro Airport. Aircraft A was handed off to me on a radar vector west of the airport for XYZ. There was also traffic operating 3–5 miles west of the airport at 8,000 MSL which I had to avoid with my departures. I became very busy for the next 15–20 minutes with 8 or 10 departures coming off in this period approximately 30 seconds apart. I called for a hand-off man as I became busy. It took approximately 3 to 4 minutes before someone arrived to help me out.

In the meantime A was approximately 15 n. mi. north-northwest of Metro Airport and had requested a lower altitude and direct to the XYZ radio beacon. I had no traffic for him and I approved his descent to 8,000 msl and direct to XYZ when my hand-off man arrived. The first thing I told him to do was hand-off A to Center, as the ARTS III automatic hand-off by the computer would not work.

By this time A was entering Center's airspace approximately 30 n. mi. north of Metro airport, which they own 8,000 MSL and below specifically for the NDB approach to XYZ airport. It took approximately 1 minute to effect a manual hand-off on the land line. The center controller had no flight strip on the aircraft and knew nothing about him being inbound to XYZ. He took the hand-off, instructed us to climb A to 9,000 MSL and transfer communications. I did as he asked and A acknowledged the instructions. A while later Center said that they had to take evasive action with A and aircraft B, who was outbound on procedure turn

for the XYZ NDB approach to the north Center's ARTS III. Data extraction showed the two aircraft came within 400 ft and 1/4 mile of each other.

The main cause was that I did not get prior approval to enter Center's airspace at 8,000 MSL as required by LOA. I believe this was because I was saturated with traffic and did not have a hand-off man soon enough.

The following is a report on the same occurrence from the Center controller who was handling XYZ arrivals:

18. Aircraft B was on approach to the XYZ airport. The aircraft was over the NDB and proceeding southbound at 8,000; at this time Metro departure control called Center Sector 14 with a manual hand-off on aircraft A, who was 30 miles north of Metro proceeding direct to the XYZ NDB, at 8,000 ft. The Sector 14 controller could not see the beacon on limited data block on the aircraft. It was not until the code that this aircraft was on was entered into the code list that the beacon appeared. Aircraft A was told to climb and maintain 9,000 ft, both aircraft were given a left turn to avoid a collision and, subsequently, A was in an area of 10,000 MOCA at 9,000 and B was in an area of 8,000 MOCA at 7,000 ft.

The flight plan on A had timed out of the computer because the estimate on the aircraft was an hour early.

The following four reports continue the discussion of occurrences involving ATC coordination; however, these examples go beyond the self-analysis context and look more critically at other elements involved in the events reportedly attributable to coordination problems.

19. At the time of the incident, traffic was moderate. I was working position D/DR-35/36. The major portion of the traffic was a series of aircraft inbound to Big City. Big City ARTCC was utilizing flow metering in conjunction with profile descents at the time of the incident, and the flow manager had specified a required 10-mile spacing in trail between successive arrivals. Therefore, numerous aircraft had been vectored off of their arrival routing for sequencing. One of these, aircraft X, had been turned west on heading 270° to increase spacing behind another aircraft. The aircraft had been handed off to sector 37, and was about to be pointed out to sector 34, when a limited data block was observed entering sector 35, southbound on a course rapidly converging with aircraft X. Both aircraft were at FL390. At this point in time, sector 37 called to ask if we had radio communications with aircraft X. I replied in the affirmative and was told to descend the aircraft immediately to FL370. At this point the radar controller turned X to heading 195°, and told him to descend to FL370.

In my opinion, causes of this incident were as follows:

a. Failure of sector 34 to point out the traffic southbound. The aircraft had entered sector 35's airspace, where the incident actually occurred.

b. The issuing of control instructions of a specific nature by the flow manager working the overhead position. Sector 34, when questioned, advised that their aircraft was on a southbound heading due to instructions from flow management.

c. Failure of conflict-alert feature to display the impending situation to all controllers involved. The sector having control of the track data (hence the sector to whom the conflict alert flashed) was unaware of the true situation until it was too late to prevent it.

d. Failure of the D/DR-35/36 controller to affect a timely point-out on aircraft X to sector 34.

e. Operation of sectors 35 and 36 in a combined mode, causing frequency congestion and unnecessarily complex and heavy traffic.

My recommendations are as follows:

a. An official job description of the flow manager coordinator position is a necessity. This description should outline both responsibilities and jurisdiction. There is a great deal of confusion regarding the duties and responsibilities of this position.

b. Conflict-alert feature should be modified to display alerts to all sectors involved.

c. Sectors 35 and 36 should be de-combined on a regular, rather than intermittent, basis. Sector 36's PVD is used by flow management most of the time, thus preventing the opening of the sector when it is often needed most. Suggest flow management get their own PVD if this is to be a permanent program.

* * *

20. When I de-combined position P from "W/P" at 0915 PST, aircraft no. 2, on V-23 southbound, was flashing in ARTS hand-off mode from approach control approximately 6 miles northwest of XYZ DME fix. Aircraft no. 1, on V-5 at 6,000 ft northbound, was south of ABC Vortac and still on my frequency, although ARTS hand-off had been completed to approach control. I took the hand-off on aircraft no. 2 and the flight progress strip indicated an altitude of 5,000. This was consistent with the Coast Approach Control-Metro letter of agreement for "silent hand-off." At 0919, I instructed aircraft no. 1 to contact approach control, and issued "opposite direction traffic, twelve o'clock, 7 miles, southeast bound at 5,000." This traffic advisory was reference aircraft no. 2, who was then over XYZ. Since I still wasn't talking to aircraft no. 2, I called approach control sector 25 and requested they transfer the aircraft to my frequency. Sector 25 stated he would do so.

At 0921, approximately 4 miles southeast of XYZ, the targets of aircraft no. 1 and aircraft no. 2 merged. Simultaneously, aircraft no. 2 called me and stated he was level at 6,000 ft. I asked the pilot to confirm that his altitude was 6,000 ft. He did, and requested lower altitude because of "A lot of northbound traffic at this altitude." I instructed him to turn right to heading 180, and descend to 5,000 ft. This was to avoid aircraft no. 3, who was at 6000 ft, northbound on V-5 and 6 miles southeast of aircraft no. 2. No separation loss occurred between aircraft no. 2 and aircraft no. 3. At the time of the system error I was working six aircraft. I informed the supervisor of the incident and was relieved from position "P" at 0928.

Since complete information has not been made available to me as to why aircraft no. 2 was at 6,000 ft instead of 5,000 ft, I cannot offer specific recommendations to preclude this from happening again. The initial report, which was incomplete, indicated that approach control cleared aircraft no. 2 to descend and maintain 5,000 ft, but no acknowledgment was received from the pilot. I believe if aircraft no. 2 had been transferred to my frequency prior to entering my airspace at XYZ (the aircraft were then 7 miles apart), the error would have been avoided. Aircraft no. 2 did not show Mode C altitude readout, so as the receiving controller I would have been required to verify his altitude at 5,000 ft.

I believe that only the fact that flight conditions were VMC prevented a midair collision between aircraft no. 1 and aircraft no. 2.

* * *

21. I was briefed and took over sector 6E at 1450L. The relieved controller did not mention anything about traffic holding at ICCEV, nor was anything written about it at the sector.

When coordinating inbound hand-offs with approach control in the vicinity of ICCEV, they wanted to know what altitude the inbounds were out of if they were descending. All inbounds except a light turbojet were below 17,000 but I was never told the reason for their requests.

At 1530, approach control advised me that ICCEV was now clear of holding military fighters. Subsequent investigation revealed that sector 6W had gotten approval at 1430 from a radar trainee on R6E to use ICCEV. The trainee had not marked it down. He left the sector 5 minutes later, and his trainer was relieved 5 minutes later and did not brief the new controller, who in turn was relieved by me 10 minutes later and could not brief me properly.

The problem with ICCEV holding pattern has been reported often, and suggestions made to both temporarily and permanently correct the coordination nightmare that now requires approval of seven different controllers. But no action has been taken to date.

* * *

22. Air carrier X is 10 DME due south of Big City airport at 1,500 ft on heading 270 for vectors to ILS 4R approach. Air carrier A is 14 miles south, heading 260, at 1,500 ft for vectors to the ILS 4R approach. Weather is 10 overcast, visibility 7 miles, with light drizzle. ATIS is broadcasting weather and runway information and both aircraft advise on initial contact that they have ATIS information.

At the point indicated for both aircraft above, the Big City tower advised me that the landing runway was changed to ILS 4L, departure runway 31L. This 4L/31L combination is a standard night noise abatement procedure and nothing else. There was no real quick hurry-up reason to change runway due to weather, winds, or anything else.

Both aircraft were advised of the change of ILS runways to 4L and I continued the vectors to the new runway in use. About 90 seconds later, the tower advised me that they could not get the ILS4L system on the air and to "give those guys 4R." I advised both flights they were once again on vectors to ILS 4R.

Again the tower tells me it's 4L and again I advise the pilots and still again the tower says no good and use 4R. By this time, air carrier X is about 4-1/2 miles from the 4R outer marker when the tower tells me to use 4L again. I told the tower "no," they were too close in and I would continue for 4R as these were the only two aircraft I had. The noise abatement reason for 4L arrivals and 31L departures is due to thrust-stream turbulence due to a blast fence located at the approach end of 31L and its effect on 4R arrivals. It seemed the best thing to do was allow air carrier X and air carrier A to continue for 4R and delay any departures on 31L a couple of minutes until the arrivals were out of the picture.

With X about 4-1/2 miles from the 4R LOM and on a heading of 010 to intercept the LOC, the tower informed me that they would land 4L and shut the ILS system down on 4R.

The only thing left to do was advise the pilots that it would be an ILS to 4L. Aircraft X was about 3 miles from the 4R LOM. I couldn't even use an ILS4R circle to 4L since the ILS system had been shut down. Aircraft X advised me that he had lost the 4R ILS as did A. Aircraft A informed me that the 4LILS was on.

The only thing left to do was vector and clear both aircraft for ILS4L. I apologized for the lack of service and cleared both aircraft for ILS4L approach.

Now back up and put yourself in air carrier X. You have been actual IFR since about 9,000 in the descent. The ATIS gave the weather and runway in use as did the controller on initial contact as ILS4R.

The second officer has computed the landing data chart and passed it up. The captain and the first officer have set the navigation radios for 4R some distance from the airport and have gotten the identification on the ground facilities. Radar

altimeters are set, approach plates are selected, looked over and hung on the yoke clips.

You are now 10 miles south of the airport on heading 270 and level at 1,500 and everything is set up for a seemingly normal approach. The controller broadcasts the weather as the ceiling has changed. You note the ceiling is 1,000 ft overcast, down 500 ft from the last sequence. Still no problem – still basic VFR down there.

A few minutes pass at 180 knots or so and the controller informs you that it will now be an ILS4L approach. Where's that approach plate book now???

The night is dark, the flight condition about 1,500 – solid IFR. Find the book, get out the ILS4L plate, tune the radios, identify the facilities, eyeball the plate – okay we got it set up, ILS4L.

X, runway change, ILS4R in use, tower can't get 4L system up, Over.

Where the hell did I put that 4R plate – re-tune, identify – Okay, do it.

Change again.

Change again!

Yep, Change again – 3 miles from the OM to 4L.

I feel we, the system, did not provide the aircraft with the level of service they were entitled to. Hindsight tells me I should have broken both aircraft off and revectored to the final approach course in use.

Big City tower quite often issues abrupt, NOW, runway changes with no apparent regard for the traffic picture. "NOW" to the tower means now, regardless that aircraft may be close in, at night, and in IFR flight conditions – and all in the interest of noise abatement.

I have reported a serious problem area to my way of thinking and I have editorialized a bit to make the point. I feel there should be a mile/time/distance point where a controller can change the instrument approach in use and anything short of that means the aircraft are pulled off the approach and vectored for the new one in use. All controllers should be briefed about the cockpit workload problems involved when an approach is changed too close in.

Sometimes strange circumstances, nearly identical aircraft call signs, or radar/computer problems tip the scale in favor of coordination problems. Each of the next three reports contains an "extra" factor which does nothing to alleviate the ATC or FSS coordination task.

23. The Small City tower is closed from 10 P.M. until 6 A.M. and during that period the FSS assumed Airport Advisory Service (AAS). An air carrier turbojet used for crew training makes approaches and touch-and-go landings almost nightly.

We also have two other regular air taxi and charter aircraft in addition to local general aviation training flights and an occasional transient.

On this occasion, the turbojet called the FSS radio when 60 miles south at FL200 and asked for a center frequency. On this occasion, Center advised that they would keep the aircraft on their frequency. For almost 3 hours the turbojet made numerous approaches to the airport while at least two other aircraft came in and took off. The FSS could hear the jet but did not have any direct contact nor was any information received from the Center on the aircraft's whereabouts. This was a potentially hazardous situation as the turbojet was making opposite direction approaches to the other landing and departing aircraft.

This situation occurred because the controller decided to keep the aircraft on Center frequency. To prevent recurrences of this nature, it should be mandatory that pilots establish contact with the FSS and at least maintain a listening watch on the frequency other aircraft are using for airport advisory service. The "see and be seen" concept is not feasible when aircraft are closing at such a rapid rate and this is the best method available to keep pilots appraised of other traffic.

* * *

24. FIFI 04 departed Andrews AFB and entered IMC (clouds) soon after takeoff. IMC continued through level-off at FL280. FIFI 04 repeatedly requested higher altitudes due to light icing encountered, but Center was unable to grant this due to traffic. FIFI 04 was finally directed to "contact Washington Center on (VHF) 135.4 or 133.64 with request for higher (altitude)." At this time, VHF radio transmission and/or reception became intermittent due to radio malfunctions aboard FIFI 04. Returning to the previous frequency FIFI 04 was reassigned to UHF frequency 377.1. FIFI 04 reported later that Center called several times during this period, requesting "ident" on his transponder (to which FIFI 04 did not respond due to VHF receiver inoperative; later on, UHF FIFI 04 did reply and "ident"). Guard frequency was also being constantly monitored for any emergency/advisory transmissions. Contacting Center on UHF, FIFI 04 immediately requested higher altitude and confirmed level FL 280.

At this time, Center had lost its altitude readout capability and was operating on broadband radar only. FIFI 04 was advised to "stand by" with his request and was advised FL 280 would be final altitude for now. FIFI 04 then heard transmission from Center, clearing FIFI 40 for descent from FL 330 to FL 280, and, upon reaching FL 280, FIFI 40 requesting "lower" was told to "stand by." Center did not appear to have more than three or four aircraft on frequency at that time, according to the crew of FIFI 04. Shortly after FIFI 40's last transmission, the crew of FIFI 04, aware of another aircraft in their area, spotted FIFI 40, approximately 500–600 ft away, closing very rapidly. The copilot of FIFI 04, flying the aircraft, saw the approaching FIFI 40 (about 300 ft away), but due to rapid closure rates (in excess of Mach 1.2) and short distance of detection (due to IMC conditions), was unable to take evasive action. At no time were any traffic conflict advisories received

by either aircraft. Minimum separation between passing aircraft was approximately 100–200 ft, with minimum estimated of 75 ft and maximums of 300 ft by both crews.

FIFI 04 first reported the encounter via radio transmissions to Center but no reply was received. Querying Center again, the reply was "Roger – stand by." After several other queries, Center acknowledged the report of FIFI 04, and assigned a new frequency with Center no. 2. Center no. 2 inquired whether FIFI 04 had "any complaint about ATC handling in the past 100 miles." FIFI 04's aircraft replies "affirmative" and advised Center of the near miss. Center did not acknowledge the near miss, but in response to FIFI 04's request for higher altitude clearance due to light icing buildup, cleared FIFI 04 for higher altitude.

FIFI 40 judged the aircraft separation distance to be somewhat greater, and that FIFI 04 was having radio problems. For these reasons, FIFI 40 did not report a near miss until returning. FIFI 04 also delayed immediate telephone reporting due to pressing mission requirements after landing, but reported the near-miss situation to the unit safety officer immediately after returning. Both aircraft had been monitoring guard and VHF and were using UHF radios.

* * *

25. Approach handed off aircraft A at TIKIT intersection climbing to 8,000. The individual who took the hand-off had no flight strip on the aircraft so he hand-wrote a strip with aircraft identification and time on it. He understood approach to say he was cleared to 11,000. During this time our TPX-42 equipment was out of service with maintenance working on it. Just a few minutes prior to this I also noticed that our secondary radar was out of service. The individual taking the hand-off on A pointed out the target to me and said he was trying to get a strip. To verify the aircraft had been cleared to 11,000 by the Center I called Sector 52 with a hand-off and requested 11,000. They approved it approximately 10 miles north of ABC. I switched the aircraft to the center. About this time approach again called asking if I could see a code 5262 at ABC. I said no, that my beacon equipment was out of service. Approach said he had one over ABC at 8,000 and wanted to know if I could take it nonradar. I said yes but saw no targets. Soon aircraft B called me at 8,000. I asked him to report over ABC and I also had no strip on this aircraft so I asked my data man to get me one. Aircraft B said he was 10 miles from ABC on the 024 radial. I called Center and asked if they saw him and requested higher altitude. They did see him and gave me 10,000 for his climb. About this time Sector 53 calls and wants to know if aircraft A was climbed to 11,000 ft in their area, I said no, since he was out of their area. At this time our TPX-42 was returning to service and I saw the code for A southwest of ABC at 11,000. I then realized that I had been handed off the wrong aircraft by approach. After talking with approach afterward, they had apparently had the aircraft identifier reversed. Both had departed XYZ via ABC and DEF on northward requesting 11,000. The Center DSS told us that since we were more than 50 miles from XYZ the computer did not generate a strip for us. I also talked to the Center controllers involved and they said no problem was created with other aircraft. When approach lost radar on aircraft B he was already in my

airspace. It appeared to me that the aircraft handed off from approach to be A was in reality B and the reason they lost radar was because he had left their scope and area. I also believe that maintenance disabled our secondary radar without saying anything to the controllers, thus creating a possible bad situation while trying to repair the TPX-42. The traffic situation was also pretty busy at this time especially with the equipment outages.

Skydiving

Occurrences involving skydiving activities have been a continuing source of ASRS reports since the beginning of the program. The following examples provide some insight into the experiences of several controllers and pilots when they encountered skydiving operations.

To date, the ASRS program has received only one report from someone associated with a skydiving operation; that report was from the pilot of an airplane from which parachutists were jumping. Unfortunately that one report lacked sufficient detail to provide even a singular example of the skydiver's position in this sampling of reports on skydiving activities. Because of that lack of reports from skydivers this sampling may appear to be rather biased in favor of controllers and pilots; if a slanted view of the issues does appear to exist, it is the product of circumstance, not one of editorial preference. Readers are encouraged to familiarize themselves with F.A.R. Part 105, the regulation dealing with parachute jumping. As some of these reports – particularly the last one – illustrate, all of us benefit by periodic reviews of the rules that attempt to accommodate the activities of the respective airspace users.

Issues surrounding the interaction of pilots, controllers, and skydivers seem to be quite basic and are certainly very real, as the following seven reports reveal:

26. Corporate pilot on a cross country to Wills Point airport in Texas encountered several parachutists over the airport. He had flown from Breckenridge Airport and through Fort Worth Center utilizing stage three services and was not informed by Center of any jumping activity. Upon arrival at Wills Point, and not having any Unicom but monitoring 122.8 anyway, he circled the airport to check the conditions and traffic. There was a plane preparing to depart from runway 17, so the reporter set up for a right downwind for the active keeping an eye on the departure. The reporter stated "... out of almost nowhere there were three parachutes billowed approximately 50–60 ft above me and directly in front of me. Out of my left eye (I had missed another just above my left side), I saw a blur go by. Prior to encountering them (the parachutists) I feel I had been extremely careful in watching out for other aircraft. Fortunately, I did not come in contact with any of them. However, scared, I landed and after landing received a good cussing from one of the jumpers. I finally found the pilot of the jump plane and he said that he had not told Center of the jumping but information was on Love Field's ATIS." The reporter stated that he did not know if any NOTAMS were listed for the jumpers. After departure from Wills Point, the reporter called Center and asked if they had any information at Wills Point and they said that they were aware of the jumping. Another pilot made a return trip and checked the NOTAMS and asked Center if they had any information at Wills Point and the answer was negative. Upon arrival

the other pilot said that jumping was still in progress. Reporter recommends possible memos to the jump clubs telling of close calls, and additional emphasis on notification of the proper authorities when jumping is in progress even at low traffic airports such as Wills Point.

* * *

27. Our air carrier flight was on radar vectors enroute to ABC at 6,000 MSL. Approach control called traffic at our twelve o'clock position, altitude unknown. The captain was flying our aircraft, the first officer was working the radios, etc. The captain sighted the traffic at about our one o'clock position, at the same time the first officer spotted several parachutes opening at our twelve o'clock position, at our altitude and 200 ft above and below us; the skydivers appeared to be about 1 or 2 miles away. The captain started a climbing left turn to miss the divers. At 7,200 ft msl the divers were below our aircraft and the jump plane appeared to be at about 7,500 to 8,000 ft msl. No advance warning was given to us that skydiving was taking place in the area and that the divers were jumping and away. The pilot of the jump plane should have advised ATC the jumpers were away.

* * *

28. The Richmond airport is the site of a parachute jump competition. Richmond VOR (RID) is located at the airport. RID is a radar hand-off point with Dayton approach control for Dayton inbounds. All types of aircraft fly over Richmond inbound to Dayton. The jump aircraft calls, "Jumpers away," about 10% of the time, and when they do call it is with no forewarning of jumpers away. I understand that the controller is required only to advise of jumpers in the area, to IFR traffic; but with a jumper every minute 15,000 and below, this becomes very dangerous for the jumpers. Policy is: if jumpers cause you problems then vector the inbound's around Richmond. This is fine if traffic is light; if moderate or heavy, too much coordination is required. Some area supervisors, upon controllers request, have set new arrival routes with Dayton approach; some won't do this. Three times I have advised IFR traffic of VFR traffic at Richmond VOR and they advised jumpers in front of them, and took action to avoid them. The controller will take the brunt of this, if a turbojet ingests a jumper into one of its engines because the aircraft was not vectored clear of the area. One hundred percent of the controllers and area supervisors feel this is a very dangerous situation.

* * *

29. Just before the incident I recall hearing another aircraft report that jumpers (parachute) would be dropped momentarily at 6,500 ft. We were climbing through 6,000 at 210 K IAS. Departure control called traffic at 9:00 which diverted our attention momentarily to the left. Just then a yellow and black aircraft (aircraft A) was seen at twelve o'clock flying left to right at about 90° level. Evasive turn was begun to the left that would have cleared the small aircraft easily with plenty of room. However, the small aircraft started a right turn which continued through more than 90° and put our aircraft on opposite (head-on) courses. It also

increased the closure rate. Our aircraft continued to bank steeper and was at a very steep bank (plus or minus 60°) when we passed the other aircraft. Vertical evasion was not attempted because we would have lost sight of the other aircraft. Our new heading was now posing a problem with another light aircraft, so we returned to vector heading (into sun). The pilot of aircraft B complained loudly that "someone flew through my drop zone." (I remember wondering if he had a sales receipt for his drop zone.) Departure control replied that he had plus or minus 21 aircraft within 5 miles of B and didn't have time to call them out. I think that this whole thing could have been avoided if: (1) the pilot of aircraft B had looked before he turned; (2) if departure control had vectored us around drop zone (a falling body is much harder to see than an aircraft); and (3) if we had refused the vector we would have been on the center of the airway, which is ridiculous in today's system. I think that the controller should have had control over the jumpers. All jumps should be in an elsewhere area, IFR or somehow controlled.

* * *

30. Some parachute jumping operations are being allowed (daily) in the Denver area which I feel are extremely dangerous. The most precarious operations are being allowed at Littleton Airport (17 miles southwest of Denver). They are jumping through the TCA, often in the final airspace of Stapleton (when Denver landing north). More importantly, this operation overlies a heavily used departure corridor – DEN R195 and J13 inclusive.

The other area is about 20 miles northwest of Stapleton overlying V-4. Again, this is a busy departure corridor particularly for DEN-LAR traffic.

I don't think parachute jumping should ever be allowed on a Victor airway or radial or a jet airway. I also feel a controller should be able to disapprove any of these operations in the TCA based on traffic. We now only acknowledge the operation, provide traffic information, and oftentimes hold our breath in fear of a jumper going through the windshield of a jet.

* * *

31. At approximately 1400 EDT, XYZ approach called JFK approach on the land-line and advised that aircraft A was climbing to 10,500 ft to drop skydivers some 7 miles southwest of Cassville intersection. XYZ also advised that the aircraft had no transponder and was doing his thing on advisories only. I feel this is a very unsafe practice, both to the skydivers and IFR aircraft operating on V-16 or the CRAN SID out of EWR. The CYN 042R or V-16 is a much-used route southwest bound out of JFK. It is the radial for CYN SID off JFK and V-16 is always busy airway. The MIV 047R which lies 5 miles west of CYN 042R is quite busy with IFR traffic out of EWR and LGA on SID's. The airspace that covers both radials is used by southwest departure control and all airspace between the two is used for vectors. In the area mentioned, NY ARTCC owns 9,000 and above and XYZ approach owns 8,000 and below while the NYCIFRR work traffic through both to hand off with either facility. I don't feel it is a very safe and sane practice to skydive

on or near a federal airway or published SID route. In fact, I feel that anyone who leaves a perfectly functional aircraft in flight is a little loose anyway; but those that perform kami-kaze attacks on aircraft are a little flakey to begin with.

* * *

32. Parachute jumping was in progress 2 miles west of the airport. Approach control was providing advisories to the jump aircraft and traffic overflying the area. Along with the traffic advisory, altitudes were exchanged. It happened that the aircraft with the lowest reported altitude was actually the higher aircraft. This was due to the fact that parachute jump aircraft evidently report their altitude as AGL.

As far as I can determine, FAR 105.25 requires that an aircraft dropping parachutists and receiving traffic advisories report their altitude AGL. The controller manual governing ATC procedures does not bring this point out and as a result any altitude report received is considered to be MSL.

As a result of this incident, controllers are required to determine if an altitude report from a jump aircraft is AGL or MSL.

Although this is necessary in order to issue factual altitude information, it is an additional workload on controllers that should be alleviated.

Suggestion: All altitudes should be reported as MSL and obtained from the same altimeter setting.

ALERT BULLETINS

Introduction

The Alert Bulletin (AB) process represents one of the ASRS program's primary means of drawing timely attention to possible problems reported from the aviation community. As in previous ASRS quarterly reports, examples of Alert Bulletins are included in this report because they and the responses to them often reveal useful information which may be beneficial to individuals and organizations concerned with the National Aviation System. The following examples have been grouped into seven categories to assist in locating Alert Bulletins which may relate to topics of specific interest to the readers.

Flight Operations

The first example in this section warrants some comment beyond simply setting forth the Alert Bulletin and the subsequent response. First, note that AB-1 relates closely to some of the issues discussed in the special study, entitled "Human Factors Associated with Potential Conflicts at Uncontrolled Airports," contained in the ASRS Seventh Quarterly Report.

Second, considering the conclusions stated in the special study referred to above, and by drawing upon the firsthand lessons learned from actual flight experiences, would it not be productive for pilots to consider the respective benefits of communicating fully in the uncontrolled airport environment as opposed to simply fulfilling minimum requirements in order to be "legal"?

1. Text of AB: XYZ Municipal Airport and other locations: Another report has been received involving failure by air carrier pilots to monitor Unicom at uncontrolled airports and failure to clear final approach path before taking active runway. In this case, pilot in air was below 200 ft on final approach when air carrier aircraft turned onto runway for rolling takeoff. Pilots have repeatedly cited problems due to such aircraft receiving clearance from Center for takeoff or approach and executing these maneuvers apparently without recognition of recommended flying and communications procedures for uncontrolled airports.

* * *

Text of FAA Response: The scheduled air carrier serving the XYZ Municipal Airport conducts operations in accordance with Operations Specifications Part B, paragraph 13a. We are informed that the air carrier uses a "ramp mike." Consequently, the air carrier's pilots are not required to monitor Unicom. Enclosed is a copy of the applicable operations specifications.

Operations at Airports without Airport Traffic Control Tower Service

Operations will not be conducted at regular airports located within the 48 contiguous States of the United States and Hawaii without airport traffic control tower service unless flights are furnished local traffic advisory information through at least one of the following sources:

a. An air/ground radio communications facility located in a position from which the operator is capable of observing local traffic and issuing traffic advisories. The air/ground radio communications facility is not required under the following conditions:

1. If a regular airport is equipped with an FAA air traffic control tower, the air/ground radio communications facility is not required during periods that the control tower is not in operation provided that data consisting of active runway(s) identification, wind direction and velocity and reported traffic activity for that airport is obtained from the FAA Flight Service Station or a UNICOM serving that airport.

2. Flight Operations may be conducted during periods of temporary (not over 48 hours) equipment failure of the airline air/ground radio communication facility provided that data consisting of active runway(s) identification, wind direction and velocity and reported traffic for that airport is obtained from the Flight Service Station, UNICOM, or company radio serving that airport.

b. An FAA Flight Service Station may, subject to FAA approval, be used in lieu of the airline air/ground radio communication facility specified in paragraph 13a

above, to provide local traffic advisory information to airline flights. Except as authorized in paragraphs 13a(1) and (2) above, Flight Service Stations authorized to provide this service must be physically located on the airport and have a view of the airport environment at least equal to that of an airline air/ground radio communication facility. The following FSS facilities are approved:

AIRPORT	LOCATION
XYZ	XYZ

2. Text of AB: Rochester, N.Y. Monroe County Airport: Air carrier pilot report describes light aircraft which lined up with runway 4 after being cleared to land on runway 7, and proceeded to altitude of 50 ft before arresting descent and passing over carrier. Carrier had been cleared for takeoff on runway 4 but held just off runway after observing lineup. Incident occurred at night. Reporter states he has observed this error three times and questions wisdom of simultaneous operations on runways 4 and 7.

* * *

Text of FAA Response: The physical layout of runways 4 and 7 at Monroe County Airport restrict these runways to simultaneous use. We do, however, assign aircraft to these runways on an alternating basis as traffic permits. Occasionally, an arrival will mistake one runway for the other and make his approach to the wrong runway. This does not happen frequently. The facility emphasizes to controllers the need to view the airport and airport traffic area to ensure traffic is complying with issued instructions. We believe the alternate use of runway 4 and runway 7 provides safe expeditious service to the user. We will continue to emphasize vigilance by our controllers to observe the traffic under their jurisdiction.

3. Text of AB: Los Angeles, CA, Los Angeles Approach Control: Air Carrier pilot reports that while on an ILS approach to runway 24R at LAX, with the aircraft's instruments indicating a centered position on both the localizer and glide slope, approach control advised on three occasions (prior to the Royal Intersection) that the aircraft was left of the centerline. The aircraft was purposely flown to the right of the 24R centerline from the Royal Intersection until visual contact with the runway was acquired. Visual reference to the runway and a final localizer check confirmed the accuracy of the aircraft's instruments. The reporter suggests that the final controller's map overlay may not have been properly aligned.

* * *

Text of FAA Response: Los Angeles Approach Control received one report in early 1978 about a possible misaligned video map. This report was received from an air carrier pilot flying an ILS approach to runway 24R. A check of the video map alignment for the ILS to runway 24R revealed that it was misaligned. The Airway Facility Sector has corrected this problem.

4. Text of AB: Air carrier aircraft underseat luggage retaining bars: A report has been received of a deficiency in luggage retaining bars under both first class and coach seats which permits luggage placed inboard of the inboard seat support to move centrally into the aisle, thence fore or aft. The report indicates that one brief case which did so moved forward with enough force to strike the

cockpit door, drive it inside the frame and jam it so that egress from cockpit to cabin was prevented.

* * *

Text of FAA Response: This refers to subject bulletin concerning air carrier underseat luggage retaining bars which permit luggage under the aisle seats to move centrally into the aisle, thence fore or aft.

Operations Review Proposal no. 604 contains a provision for lateral restraint for baggage placed under the seats which was not provided for previously.

This proposal is scheduled to be included in a regulatory notice by November 1, 1977. A rule change should be published within 6 to 9 months later.

Navigation

5. Text of AB: Westfield, MA, Barnes VORTAC: A pilot reports being cleared from Worcester, MA to his destination, with Westfield VOR as a departure fix. The pilot could not find Westfield VOR on any navigational charts. A closer look at the charts, and subsequent communications with ATC personnel, confirmed that the intended fix was the Barnes VORTAC located on the airport at Westfield, MA. The reporter noted that while the terminology problem was a relatively minor one, it was nonetheless confusing and resulted in extra communications and pilot workload.

* * *

Text of FAA Response: An investigation of the NASA Aviation Report for Westfield, Mass., revealed the incident did occur as reported. A further study of the problem indicated the Barnes VORTAC was originally named Westfield VORTAC. Although this does not correct the deficiency, it does reveal a problem associated with changing navaid names. Boston ARTCC, the facility responsible for issuing the clearance, has issued a training bulletin reiterating the correct name as Barnes VORTAC.

6. Text of AB: Fort Lauderdale, FL: Kodey Two arrival involves GILBI intersection (328 radial of BSY VOR). DME mileage at GILBI on arrival chart, however, is from MIA VOR (D26, 337 radial), rather than BSY. Recent pilot report involving an error due to this points out the potential for confusion and suggests that DME indication for GILBI should be DME miles from BSY, not MIA, to avoid overshooting the intersection.

* * *

Text of FAA Response: Government charts depict Gilbi as 49-DME from BS (as well as 26-DME MIA), and commercial charts have been reissued to include the 49-DME from BSY in Gilbi depiction.

7. Text of AB: At Hatteras, NC (W72) the Hatteras Inlet RBN with frequency 315 and ident HI is geographically close to Diamond Shoals marine beacon with a new frequency of 321 and an

ident of DS which sounds relatively similar. The possibility of confusion in identifying, and the proximity of frequencies, could cause incorrect position fixing by air or marine craft. Reporter suggests at least a cautionary note on approach plate 16-1.

* * *

Text of FAA Response: Depiction of the Diamond Shoal beacon has been added to the next revision (September 7) of the approach chart. Also, the revised frequencies and identifiers are now shown in the Airport/Facility Director and will appear on the next Charlotte sectional chart. Further, we have requested a frequency change to provide at least 15 kHz spacing between the two facilities.

8. Text of AB: Anchorage, AK, ARTCC: Controller report indicates that three aircraft in past 14 days have appeared on radar substantially west of V-334 centerline approximately 120 miles south of Anchorage. In one case, aircraft course would have taken it to the vicinity of Mt. Iliamna.

* * *

FAA Response to AB: A discrepancy was observed during the time of the alert bulletin. A special flight check was initiated. The flight check confirmed that the facility was well within flight check tolerances for the VOR and radar. No further action was taken.

The following is a list of pertinent facts pertaining to the incident as described in the NASA Alert Bulletin:

1. Aircraft observed flying west of radar map track V-334.

2. VOR facility, Kenai, was checked and found to be within ground check tolerance.

3. A special flight check was called for, and Anchorage radar, Kenai VOR were checked and found within tolerance.

V-334 is a VOR airway predicated on the 192° radial of the Kenai, Alaska VOR extending to intersect the 228° radial of the Homer VOR.

Airports: Facilities and Maintenance

9. Text of AB: St. Louis, MO, Lambert Airport: Recent controller reports describe three occurrences involving aircraft aborting takeoff due to the presence of other traffic on active runways. These reports and others suggest that the problem is at least partially due to construction on taxiways, requiring detours for taxiing aircraft. Pilot reports have also been received regarding taxiing problems, surface vehicles and equipment, and other obstructions in ramp area due to construction.

* * *

FAA Response to AB: Reports involving aborted takeoffs due to traffic and active runways has been identified as an alleged system error and is under investigation. In addition, all pilots are advised to use extreme caution during ground operations due to ramp/taxiway construction and terminal expansion.

10. Text of AB: San Diego, CA, Lindbergh Field runway 27: Pilots report braking poor to nil when runway is wet, especially at far end of runway. Several near overruns are reported. They request that rubber be removed and that runway be considered for grooving.

* * *

FAA Response to AB: Rubber removal is performed four times a year scheduled particularly during historic rainy season.

Grooving has been considered.

Annual rainfall statistics do not appear to justify grooving. Future plans call for possible overlay of runway. It is quite possible that some grooving will be performed at that time.

11. Text of AB: San Diego, CA, Lindbergh Field: Light aircraft taxiing at night under tower control on south taxiway parallel to runway 27 struck unlighted asphalt curb. Pilot and controller were both exercising normal caution. Pilot pleads for adequate lighting/marking of obstructions in the unimproved area or for barriers if this area is not to be used by aircraft.

* * *

FAA Response to AB: The text of this bulletin states that a pilot while taxiing at night at San Diego International/Lindbergh Field Airport struck an unlighted asphalt curb.

The curb, approximately 4 in. high, extends along part of the southern portion of an oval unimproved area that is east to west in the widest area and located in the ramp area of the airport. The entire rim of the oval is striped with yellow color paint to show a hazardous area. Our certification safety inspector inspected the area and markings prior to the incident and was satisfied that the markings were satisfactory. The oval area was inspected after the accident by the same inspector and no change had occurred between visits. In conversation with the air traffic control tower personnel, our inspector was told that the pilot was given adequate verbal instruction and information regarding the area. However, he evidently disregarded the instructions and the markings to proceed through the oval area and make contact with the curb.

This office feels that the markings are sufficient to alert pilots of the area; further, the area is programmed to be brought up to full weight bearing pavement in FY-1978. This will eliminate the oval and the curb.

12. Text of AB: Honolulu, HI, HNL International Airport: A report indicates that portions of new runway 8R/26L are not visible from tower and that on at least one occasion pedestrians were in area of runway when transport aircraft was cleared for takeoff. Report suggests advisability of using special phraseology to alert pilots to possible hazards not visible from tower. Note: October 14,

1977 page 10-5 (Taxiway & Parking Facilities Chart) does not indicate that portions of this runway are not visible from tower.

* * *

FAA Response to AB: Some portions of runway 8R/26L and associated taxiways are blocked from controllers' view by roof peaks of three buildings on the south ramp and by trees located on Hickam AFB.

A full text description of the areas not visible is in the Aerodrome Remarks section of the Pacific Chart Supplement available to all aircrews.

Security people patrol the area 24 hours a day to preclude unauthorized entry, and security fencing to be completed in July will further restrict unauthorized intrusion by swimmers, surfers, etc.

The Air Force is acting to remove the obstructing trees on Hickam AFB.

A new control tower with improved visibility is projected for the 1980/81 time frame.

This condition of restricted visibility is not unusual, is adequately publicized in the chart supplement, and does not warrant special verbal advisories by the tower to each aircraft operating in the affected area.

Airports: Lighting and Approach Aids

13. Text of AB: Sacramento, CA, Sacramento Executive Airport (SAC): A recent controller report alleges that the lack of adequate taxiway lighting at this airport is creating a potentially serious problem for both ground and flight operations. With three crossing runways and only one short segment of taxiway lights, this airport is reported to experience frequent instances of pilots becoming confused, particularly during the heavy fog of winter. The reporter expressed concern for landing or departing aircraft that might encounter disoriented ground traffic that may have strayed onto the active runway.

* * *

FAA Response to AB: A Planning Grant Study is presently in progress for this airport and when completed should recommend installation of taxiway lighting for all taxiways. At the present time all taxiways not lighted have reflectors installed.

14. Text of AB: Jackson, MS, Hawkins Field: Report indicates that all runway lights are fixed on low to medium intensity, which is not controllable to ATCT. Situation has existed since a fire in tower several years ago. Runway lights are difficult to see because of surrounding city lights, and can neither be increased nor decreased in intensity, in response to pilot requests.

* * *

FAA Response to AB: The Southern Region is processing a request to completely rehabilitate the runway lighting at Hawkins Field. This project will be undertaken as soon as possible.

15. Text of AB: Lake Winnebago, MO, Lake Winnebago Muni. Airport: Pilot reports that there are so many runway edge and threshold lights out of service, that it is difficult to identify the airport runway.

* * *

FAA Response to AB: The reported discrepancy is under investigation and corrective action will be initiated if warranted.

16. Text of AB: Dover/Cheswold, DE, Delaware Airpark Airport: Pilot report states rotating beacon had been out of service for over 2 years and only nine runway lights were operative on a recent visit. Sectional charts, AIM, and instrument approach plates all show a rotating beacon and runway lights. No current NOTAMS indicate lights are out of service.

* * *

The following is a copy of a letter dispatched to the owner of the airport from the appropriate FAA office:

The Federal Aviation Administration (FAA) was recently notified of a complaint regarding the Delaware Airport. The complaint was filed through the NASA ASRS. Two problems were identified: The rotating beacon was not operating and the runway lights were in very poor repair.

This office recently inspected the airport and noted the beacon problem. We included in our inspection report a note that the beacon is temporarily out of service, and that note will appear in most Federal publications. We recommend that you repair or replace the runway lights and beacon as soon as possible to enhance the safety of the airport operation. Please notify us when these two conditions have been corrected.

The Delaware State Aviation Director also informs us that efforts are being made to obtain State funds for airport lighting system installations as soon as possible. That program may be of interest to you.

Thank you for your cooperation. Please call this office if you have any further questions.

ATC: Facilities and Procedures

17. Text of AB: Chicago, IL, O'Hare International Airport: A pilot report questions the advisability of ATC clearances for landing on runway 27L with instructions to "hold short of the intersection of runway 32L." Of primary concern is the lack of chart information regarding whether this is an approved procedure and what runway lengths are involved. Citing the fact that the same type of information currently charted for runway 14R landings should be charted for all runways used for landings with "hold short" instructions.

* * *

FAA Response to AB: The procedure for landing on intersecting runways is spelled out in detail on pages 1–44 and 1–45 of Part I of the Airman's Information Manual (AIM) and the instruction issued while landing on 27L at ORD to "hold short of the intersection of runway 32L" is correct. The fact that the information regarding this procedure is or is not expressly noted on taxiway and parking facilities (Jeppesen) charts does not indicate whether the procedure is approved. Approval is based on operational need and the criteria listed in the aforementioned section of the AIM.

This procedure is not a "permanent" procedure and will be used by the controllers when an operational requirement exists. The measured distance from the runway threshold to the intersection is issued if the pilot requests it.

Because of the flexibility inherent in this procedure, the wide diversity of runway combinations, and the chart congestion that would result, it is not recommended that information regarding simultaneous landings on intersecting runways be provided on charts. Accordingly, we are initiating action to remove this kind of information from all charts.

18. Text of AB: Oklahoma City, OK: New LOA between Fort Worth ARTCC and Oklahoma City RAPCON (12/30/76) provides that inbound traffic will cross approach control boundary at 10,000 ft, while departures leaving OKC climb to 11,000 ft. ASRS has received reports of potential conflicts between arriving and departing aircraft due to this; inbounds were still working Ardmore Low Sector and departures were working OKC Departure.

* * *

FAA Response to AB: On June 10, 1976 a system error occurred at Oklahoma City that involved procedures between Oklahoma City RAPCON/Tower and Fort Worth Center concerning transfer of control points and altitudes utilized by arrivals and departures. The region, after reviewing this system error, directed the facilities to change the procedures to correct this deficiency. These procedures were effective on December 30, 1976. The procedures specify separate arrival and departure corridors. If controllers follow the prescribed procedures the conflicts will not occur.

19. Text of AB: Carlsbad, CA, Palomar Airport: A recent report describes an occurrence involving a pilot who requested a special VFR approach to CRQ through SAN Approach Control. He was instructed to "Hold, VFR, east of the Escondido NDB (EKD), standard pattern, right turns at 4,500 ft." Another aircraft was holding at 3,500 ft. Ten minutes after commanding the hold, the pilot heard another aircraft given identical holding instructions at the same altitude of 4,500 ft (two other aircraft were later given the same clearance). The pilot called to remind approach control that he was at the same altitude and was told that he had been given a VFR clearance that the pilots were to maintain their own separation. Weather at the time was 500 overcast, 1 mile visibility, tops were between 1,600 and 1,800 ft. Although the reporter, a highly experienced pilot, recognizes that this was a VFR clearance, he questions the wisdom of providing a standard holding pattern clearance under these conditions and points out that less experienced pilots would be likely to accept suggested altitudes as assigned – in short, to think and act as though they had been given a standard IFR clearance. Further, he notes that information as to other traffic in the same holding pattern at the same altitude was not provided by ATC. Finally, he questions the wisdom of not

providing suggested altitudes and asks whether such suggested altitudes could not provide vertical separation between aircraft.

* * *

FAA Response to AB: In investigating this incident, we were not able to determine what had actually happened. The details of this report suggest that the reporter encountered an abnormal situation. San Diego Approach Control does not provide special VFR service to Palomar Airport. Palomar Tower has been delegated this responsibility. Palomar Tower does not use navigational aids as VFR holding points, also the Escondido NDB is too far away (10-1/2 miles) from Palomar to be of use to the tower as a holding fix. Neither facility assigns mandatory altitudes to VFR aircraft.

Regardless of which facility provided the service in question, the actions described are contrary to standard ATC procedures. Each facility will instruct their personnel in the correct procedures to be used by controllers in handling requests by VFR pilots for special VFR clearances.

20. Text of AB: San Jose, CA, and other possible locations: A recent report describes a pilot on practice IFR flight in VMC who was given SUNOL SEVEN departure, followed by amended clearance and subsequent vectors which took him within 300 ft of Mission Peak. Controller advised of an altitude alert but issued no heading change. Examination of 7110.65, par. 33 a and b indicates that in case of an aircraft conflict advisory, controller is instructed to "... offer the pilot an alternate course(s) of action when feasible." In case of a terrain/obstruction advisory, however, no such instruction is provided. Pilot asks whether an alternate course of action should not be provided to assist pilot when a minimum safe altitude warning is received, if reason for warning is apparent.

* * *

FAA Response to AB: This situation is reported to have occurred at San Jose indicates that ATC cleared a VFR flight at an altitude below those specified in 7110.65A, paragraph 1284; or, if the flight was operating on an IFR clearance, below the altitude specified in paragraph 680 c. In any case, in such a circumstance, rather than issue a low-altitude alert only, ATCC should have immediately issued an appropriate altitude as contained in the aforementioned paragraphs.

Based on information available, we are unable to determine why the aircraft was conducting flight with the stated proximity of Mission Peak. However, despite considerable controversy about the best way to assist the pilot in safe altitude management, we are reviewing existing procedures to ascertain if changes can be made without creating additional safety concerns.

21. Text of AB: Elmira, NY. Chemung County Airport. ATCT: Reports describe "jumping" and blurring of radar targets. This intermittent problem has been present for at least several months and may be due to power surges. It occurs without warning and happens to all scopes but not necessarily at the same time. Blur makes calculation of radar vectors difficult.

* * *

FAA Response to AB: The FAA Eastern Region has provided a temporary solution. A permanent solution will be provided by the Radar Engineering Division, AAF-300. We recognize the

problem to be national in scope and requiring several interrelated solutions. We expect to have all problems of this nature corrected by the end of calendar 1978.

22. Text of AB: Clarksburg, WV, Clarksburg ATCT: Approach control airspace interfaces with three ARTCC's, involving coordination with five sectors, two towers, and two FSS's. Controllers request FDEP equipment to relieve some of existing coordination in view of additional workload involved in aircraft communication in nonradar environment.

* * *

FAA Response to AB: We recognize the need for FDEP equipment at Clarksburg; however, spare equipment is not available nor is the agency purchasing any more of the present FDEP type equipment. Current programs call for improvement of the FDEP system and we have included our requirement for Clarksburg in our budgetary planning.

Hazards to Flight

23. Text of AB: Homestead, FL, Homestead General Airport: Parachute drop zone located southeast of this airport continues to create potential conflicts with aircraft in patterns for runways 18 and 27. Both runways have left-hand patterns which place aircraft and parachutists in extremely close proximity. Previous reporters have suggested changing runways 18 and 27 operations to right-hand patterns, which would alleviate the situation. Reporters also note the need to depict drop zone on both the Miami VFR sectional and IFR local area charts, in addition to present references in AIM 4 and Miami Terminal Area charts. Same reporter asks that notice of drop operations be communicated over airport Unicom frequency. Such operations are presently announced on 118.1 MHz, MIA Approach Control but not on Unicom.

* * *

FAA Response to AB: The drop zone is depicted (3 n. mi. WSW of Florida City and 4-1/3 n. mi. SSE of Homestead General Airport) on the Miami VFR Terminal Area Chart dated March 24, 1977 and on the Miami Sectional Aeronautical Chart dated March 24, 1977.

IFR Local Area Chart information includes the portrayal of L/MF and VHF airways; limits of controlled airspace; position, identification and frequencies of radio aids; selected aerodromes; minimum en route and obstruction clearance altitudes; airway distances; reporting points; restricted, alert and warning areas and related data. The depiction of parachute drop zones on these charts might be appropriate and we recommend that it be considered.

The chief of the Tamiami ATCT coordinated with the airport manager of Homestead General and was advised that the center of the drop zone is only 3,800 ft from the approach end of runway 36. That is approximately 15,000 ft closer to the airport than what is charted. We are following up on this and will initiate a revision to the charting if this is substantiated.

The airport manager advises that the jumps are publicized on UNICOM frequency 122.8 MHz from the fixed base operator at the airport.

24. Text of AB: Half Moon Bay, CA: An encounter with several hang-gliders resulted in the following pilot report: ". . . flying south following coast line toward Half Moon Bay – Section K of the San Francisco TCA – (the reporter) encountered hang gliders at Point San Pedro. Four gliders were operating from 1,000 to 1,300 ft, MSL. Visibility was excellent – gliders were seen in time. In (reduced visibility) conditions a real problem could occur." The reporter suggests that this area, as well as any other areas used extensively for hang glider activity, be noted on applicable aeronautical charts.

* * *

FAA Response to AB: Note: This Alert Bulletin has been forwarded to AAT-20 and AFS 80 for action.

A symbol indicating glider activity has already been developed and published on visual aeronautical charts. AAT-400 will include any high density glider activity area on charts, providing it is received from a reliable source and verified by the FAA region concerned. A note "HANG GLIDERS" could be placed by the glider symbol whenever appropriate.

25. Text of AB: Tanacross, AK, Tanacross Airport: Report from pilot describes telephone wires crossing Tanana River parallel to and just southwest of approach course for Tanacross runway 12. Wires are not described in FAA form 5010-1 dated 7 July 1976, or in AIM, or on ANC sectional. The wires are marked with orange balls, but the reporter states wires are no longer in use and suggests that their removal would enhance safety for aircraft using the airport or landing near it on the river.

* * *

FAA Response to AB: The telephone company advises that the wires described may quite likely be removed sometime within this winter. In the meantime, a corporate pilot, an air taxi operator, and a helicopter operator who was under charter to a government agency all last summer, state that the wires pose no hazard. They cross the Tanana River at a point more than 500 ft northeast of the final approach course to runway 12, range in height only 20–30 ft above river water level below tree-top level on the river bank, and are marked with easily seen large orange balls. There is no designated water landing area on the river nearby, and sandbars in the river in vicinity of the airport preclude safe float-plane operation.

No charting action is contemplated due to possible removal, wires not in close proximity at the R12 final approach, and height of wires well below any minimum safe traffic pattern altitude.

26. Text of AB: Jefferson County, PA, Shirley Field (private airport): Owner cites frequent overflights at extremely low altitude by military aircraft utilizing low-altitude training route 855. He notes that DuBois FSS sometimes does not have correct times of route usage and states that repeated attempts to resolve this problem through FAA have been unsuccessful. It is alleged that Shirley Field is used by military pilots as a check point.

* * *

USAF Response to AB: Investigation: The 108 TFW, McGuire AFB, NJ is OPR for TR855. Due to its relatively low density population, northwestern Pennsylvania offers an ideal area for low-level training for tactical aircrews. TR855 is flown down to 500 ft AGL and at speeds varying between 300 and 600 knots. All TRs are developed in accordance with FAA handbook 7610-4C and are operated IAW DOD flip general planning. The route is not used when weather is less than 3,000 ceiling and 5 miles visibility. All scheduled use of TR855 must be scheduled with the 108 TFW/DO at least 24 hours prior to use and is passed to FSS the evening before intended use. It is noted that "Shirley Field" is not identified in AIM or airport/facility directory. The 108TFW has developed an aggressive low-level information program and midair collision avoidance program. The low-level program is a highlighted area and will remain so in the future.

27. Text of AB: Reykjavik, Iceland, Oceanic Control Center: Controller report cites unreliability and poor quality of land-line communications between Thule Approach Control and Reykjavik Oceanic Control Center. Reporter states that there are eight agencies sharing the SS-1, 0682 line as well as intermittent spurious conversations, and that the circuit is of such poor quality that the two parties must shout to be heard. It is also reported that outage time for 3-month period has exceeded 30% and that maintenance difficulties are compounded by technician availability/qualification.

Activation of the circuit requires a confusing and involved series of mechanical responses which distracts attention of controller.

Only alternate means of communications is via the Autovon lines and this is unsatisfactory because the average time to complete a call is 15–20 minutes and sometimes the controllers are preempted while coordinating movement of air traffic.

(This Alert Bulletin is a reissue of an earlier AB originally addressed to FAA; the FAA response to that AB advised ASRS of their lack of jurisdiction over the land-line communications in Iceland and recommended alternative courses of action.)

* * *

USAF Response to AB: Thule AB, Greenland – NASA/ASRS relayed controller report citing unreliability and poor quality of land-line communications between Thule Approach Control and Reykjavik Oceanic Control Center. Report also stated that the only alternate means of communication is via the Autovon lines and this is unsatisfactory because of line availability and preemptions. Investigation and Action: The ASRS report duplicates almost word for word observation number 3 from the USAF Air Traffic Control Analysis Report of 11 June 77. Plans were formulated to correct the land-line problem. The SS-1 land-line was replaced and the new-line SS-1A was fully

operational at RAPCON, tower and airways on January 1, 1978. All lines in this remote area are hard to maintain due to logistics problems and technician availability. Reports will be made to improve this area. Northern comm area (AFCS) indicates that Autovon will presently remain the backup. Again the remoteness of area precludes other arrangement although satellite communications are under consideration. Indication is that the Autovon backup works satisfactorily if normal ATC priority is exercised.

Ames Research Center
National Aeronautics and Space Administration
Moffett Field, Calif. 94035, October 17, 1978

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*See also TM X-3445, TM X-3494, TM X-3546, TM-78433, TM-78476, TM-78511, and TM-78528

16. Abstract

During the eighth quarter of ASRS operations, 1223 reports were received. A study of runway incursions was performed in response to requests from NTSB and FAA. The study deals with 165 inadvertent operations on or into inappropriate portions of the aircraft movement areas at controlled airports. Pilot-initiated and controller-initiated incursions are described and discussed. It was found that a majority of the pilot-initiated occurrences involved operation without a clearance; controller-initiated occurrences usually involved failure to maintain assured separation. The factors associated with these occurrences are analyzed.

It appears that a major problem in these occurrences is inadequate coordination among the various system participants. Reasons for this, and some possible solutions to various aspects of the problem, are discussed.

A sample of reports from pilots and controllers is presented. These relate to undesired occurrences in air transport, general aviation, and air traffic control operations; to ATC coordination problems; and to a recurrent problem in ASRS reports, parachuting operations.

A sample of alert bulletins and responses to them is presented.

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