

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN21FA215

AIR TRAFFIC CONTROL

Group Chair's Factual Report

August 8, 2022

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A. ACCIDENT

Location: Englewood, Colorado
Date: May 12, 2021
Time: 1023 mountain daylight time (MDT)¹
1623 coordinated universal time (UTC)
Airplane 1: Swearingen SA226TC, N280KL, Key Lime Flight 970 (LYM970)
Airplane 2: Cirrus SR22, N416DJ

B. AIR TRAFFIC CONTROL GROUP

Group Chair	Charles Olvis National Transportation Safety Board Washington, DC
Group Member	Tim Morgan Federal Aviation Administration Ft. Worth TX
Group Member	Dan Carrico National Air Traffic Controllers Association Chicago, IL
Group Member	Kristen McTee National Air Traffic Controllers Association Kansas Cit, KS

C. SUMMARY

On May 12, 2021, at 1023 mountain daylight time (MDT), a Cirrus SR22, N416DJ, and a Swearingen SA226TC, N280KL, collided in flight while approaching to land at Centennial Airport (APA), Englewood, Colorado. There were no injuries on either airplane. N416DJ was operated as a Title 14 *Code of Federal Regulations (CFR)* Part 91 personal flight, and N280KL was operated as a Title 14 *CFR* Part 91 positioning flight.

N416DJ departed APA for a local flight about 0921, and N280KL departed the Salida Airport/Harriett Alexander Field (ANK), Salida, Colorado, about 0956.

¹ All times are in mountain daylight time (MDT) unless otherwise noted.

D. FACTUAL INFORMATION

1.0 History of Flight

At about 0921, N416DJ departed runway 17L at APA and flew northwest toward Fort Collins, CO on a VFR² personal flight before returning to APA. The pilot contacted the APA Airport Traffic Control Tower (ATCT) and was advised by the local control 2 (LC2) controller to expect runway 17R (see figure 1).

At about 0955, LYM970 departed ANK on an IFR³ flight to APA. The pilot contacted Denver Terminal Radar Approach Control (D01 TRACON) and received vectors to a visual approach to runway 17L at APA (see figure 2).

At about 1022, a D01 TRACON air traffic controller cleared LYM970 for the visual approach to runway 17L and instructed the pilot to contact APA tower.

A few seconds later, the APA ATCT LC2 controller issued a traffic advisory to the pilot of N416DJ stating "cirrus six delta juliet traffic at your one two o'clock a mile about to turn base is a skyhawk six thousand eight hundred." The pilot of N416DJ responded "ah looking for traffic six delta juliet". The LC2 controller added "cirrus six delta juliet fly towards the west shore of cherry creek." The pilot replied "west shore of cherry creek for six delta juliet."

At 1022:39, The pilot of LYM970 contacted APA tower and stated "tower good morning key lime nine seventy on the visual one seven left." The local control 1 (LC1) controller responded, "key lime nine seventy centennial tower if you can just maintain that speed there will be traffic in position prior to your arrival." The pilot replied "i will do it key lime nine seventy."

At 1022:49, the LC2 controller advised the pilot of N416DJ "cirrus six delta juliet traffic you are following just turned right base they are ahead and to the right six thousand six hundred cessna." The pilot replied " i have traffic insight six delta juliet." The LC2 controller then instructed the pilot "cirrus six delta juliet follow them runway one seven right cleared to land additional traffic north shore is a metroliner for the parallel." The pilot replied "i have traffic in sight cleared to land one seven right six delta juliet".

² VFR - Visual Flight Rules - Rules that govern the procedures for conducting flight under visual conditions. The term "VFR" is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

³ IFR - Instrument Flight Rules [ICAO]- A set of rules governing the conduct of flight under instrument meteorological conditions.

At 1023:16, the LC1 controller advised the pilot of LYM970, "key lime nine seventy traffic one o'clock one mile six thousand five hundred Cessna for the parallel runway." The pilot responded, "roger key lime nine seventy we are looking."

At 1023:36, the LC1 controller cleared the pilot LYM970 to land stating "key lime nine seventy runway one seven left cleared to land wind calm." The pilot acknowledged the landing clearance.

At 1023:57, the LC2 controller advised and queried the pilot of N416DJ, "cirrus six delta juliet do not overshoot the final cirrus six delta juliet do you require assistance." The pilot did not respond and there were no further communications from the pilot of N416DJ.

At 1024:08, the pilot of LYM970 advised "tower key lime nine seventy declaring an emergency we just ah um looks like the right engine failed so I am going to continue my landing here." The LC1 controller responded, "key lime nine seventy we have crews coming in um continue inbound runway one seven left cleared to land."

At 1024:12, the LC2 controller broadcast "cirrus six delta juliet if you hear this transmission we have emergency vehicles your direction."

At 1024:20, the LC2 controller advised the pilot of N65251, "cessna two five one do not overshoot the final there is an aircraft that is in distress just south of cherry creek reservoir." The pilot of N65251 replied "yeah they just pulled chute two five one." The controller then asked "cessna two five one if you could give me an accurate location we would appreciate it." The pilot replied "they are about two miles by those buildings right off ah three five." An unidentified pilot responded, "yeah i see a parachute." The LC2 controller then asked, "yeah the ah parachute is just south of the reservoir in the ah airport ah vicinity just south of the reservoir correct." The pilot of N65251 replied "yeah about a mile from the reservoir."

At 1024:26, an unidentified pilot transmitted on the LC1 frequency "hey tower there is another one it is probably a cirrus that dropped a parachute on finals for runway one seven." The LC1 controller responded, "thank you."

At 1025:35, an unidentified pilot transmitted on the LC1 frequency "tower that was a definite a midair on short final."

At 1025:41, the LC1 controller asked the pilot of LYM970, "key lime nine seventy do you need any assistance". The pilot responded "i am gonna taxi off here and i think i will just park over at signature i am good though." The LC1 controller replied, "key lime nine seventy roger i appreciate that ah and if you just standby."



Figure 1. Graphic showing the entire flight track N416DJ.

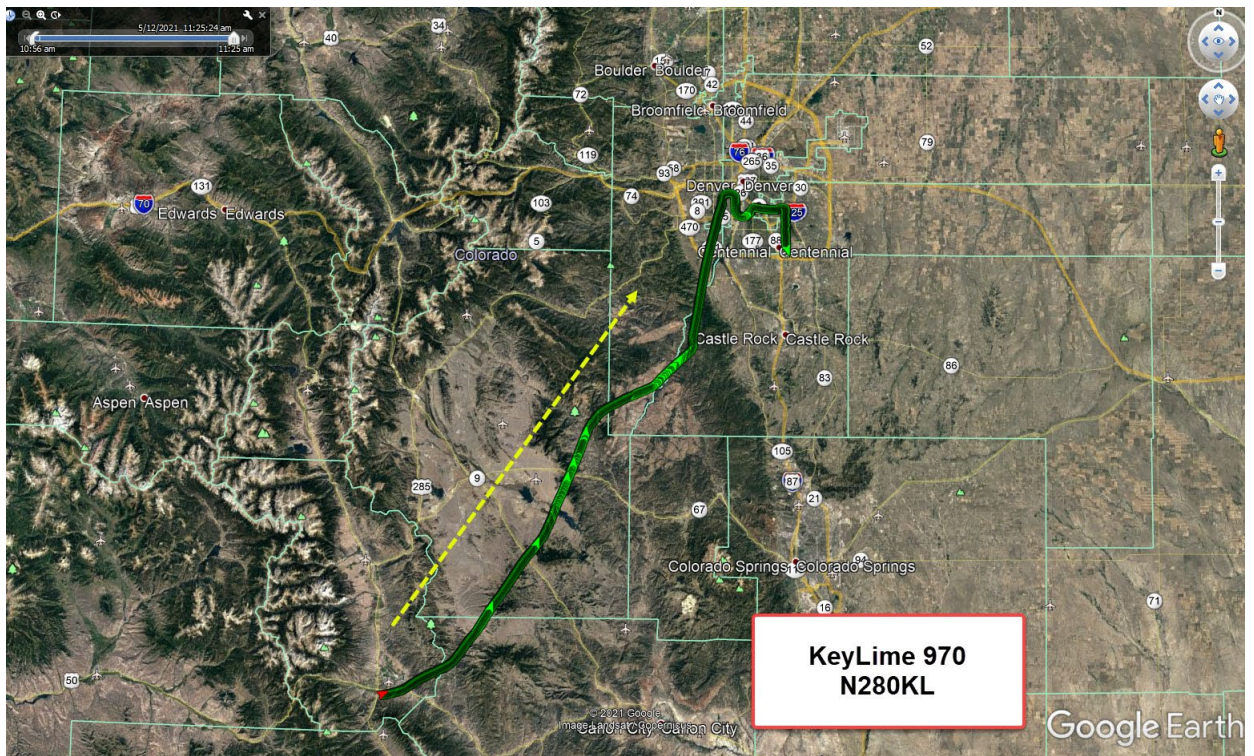


Figure 2. Graphic showing the entire flight track of LYM970. The green arrows are LYM970's ADS-B flight track, and the yellow dashed line and arrow is provided to illustrate the direction of flight.

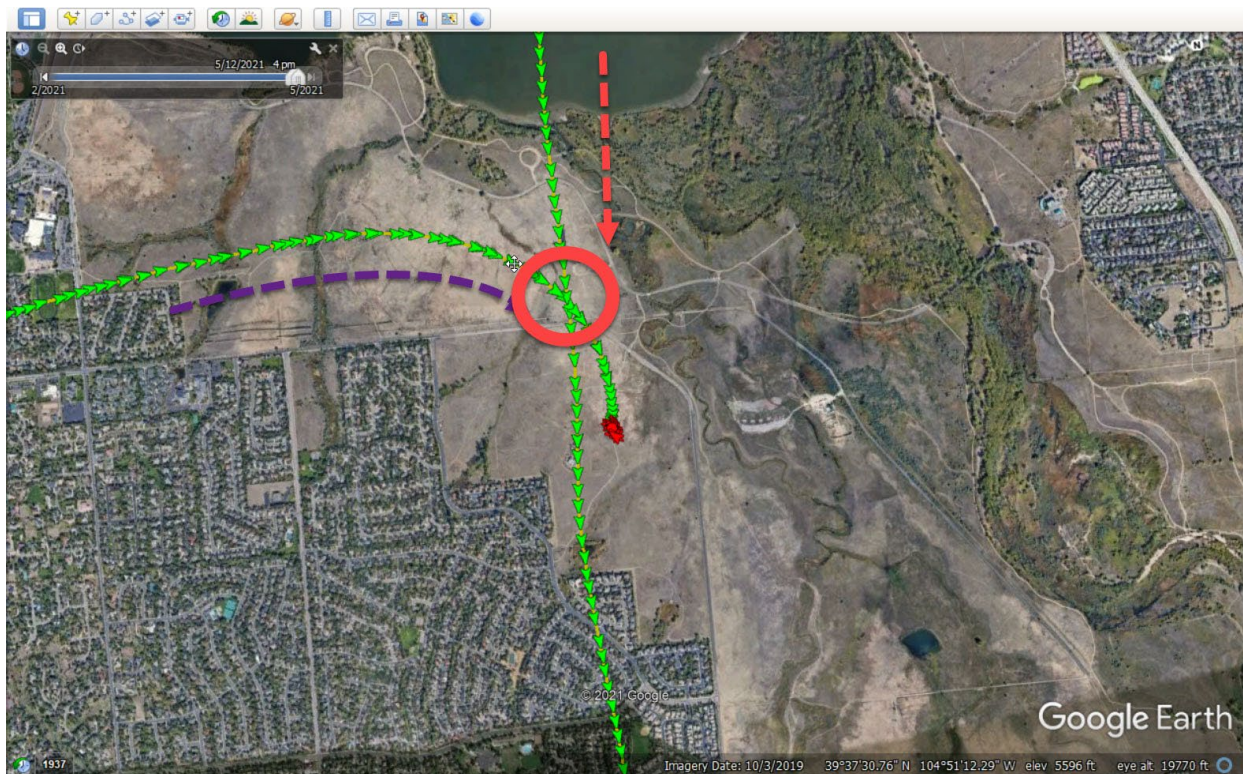


Figure 3. Overview of N416DJ and LYM690 as N416DJ impacted LYM970. The green arrows are the ADS-B flight tracks for both aircraft, and the purple/red dashed lines and arrows are provided to illustrate the direction of flight, and red circle indicates the likely area of the midair collision.

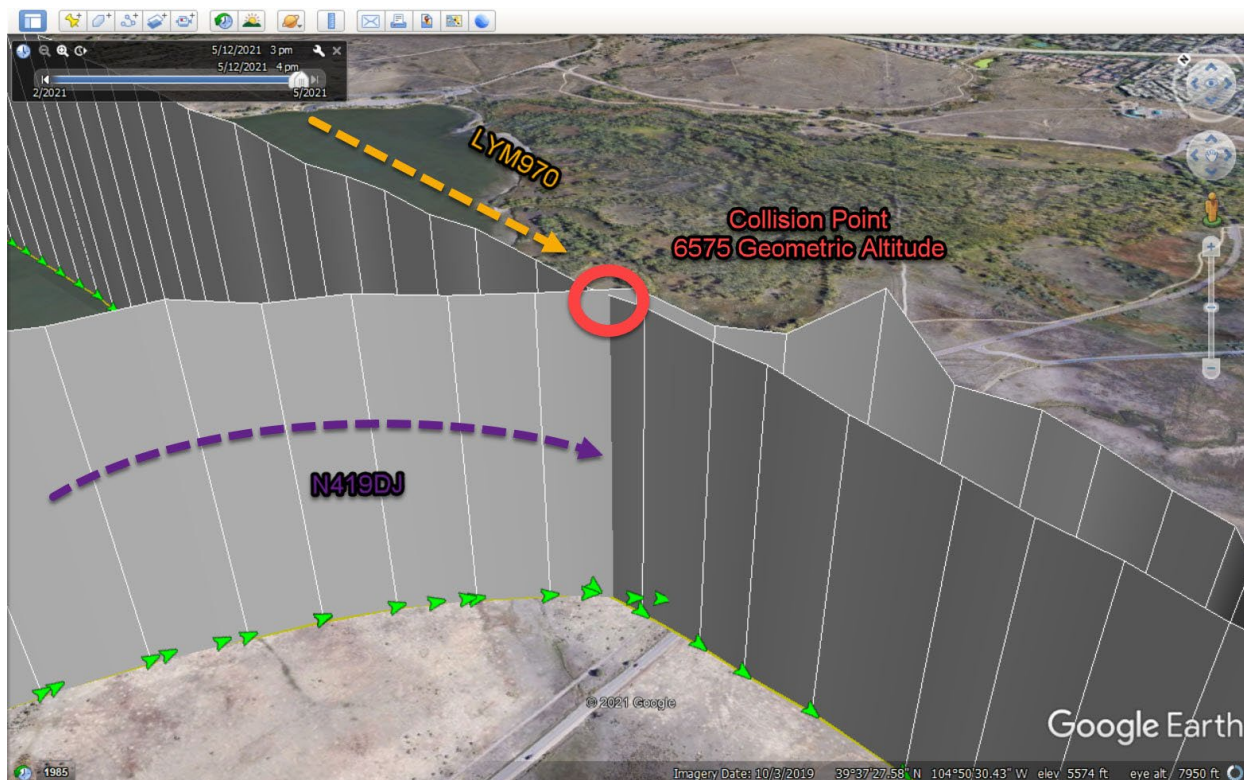


Figure 4. Planview of N416DJ and LYM970 merging along the final approach course of runway 17 Left. The green arrows are the ADS-B flight tracks of each aircraft, orange and purple dashed lines and arrows are provided to illustrate direction of flight, and the red circle indicates the likely area of the midair collision.

2.0 Radar and Surveillance Data

In general, two types of radar are used to provide position and track information for aircraft cruising at high altitudes between airport terminal airspaces, and for those operating at low altitudes and speeds within terminal airspaces. Additionally, surveillance data may be obtained through Automatic Dependent Surveillance-Broadcast (ADS-B).

ADS-B data is aircraft global positioning system (GPS) derived position reports and other aircraft information transmitted by the airplane and received through a ground infrastructure and shared with other users within the national airspace system (NAS). Air traffic controllers are able to monitor aircraft using either ground-based radar or ADS-B.

Airport surveillance radars (ASRs) are short range (60 nm) radars used to provide air traffic control services in terminal areas. ASR antennas rotate at 13 to 14 rpm, resulting in a radar return every 4.6 to 5 seconds. Data for this report was obtained from the FAA D01 TRACON primary ASR sensor and was of good quality and utilized by air traffic control.

To improve the consistency and reliability of ADS-B and radar returns, airplanes are equipped with transponders. For ADS-B equipped airplanes, the transponders are assigned a unique Mode S address for each airplane. The N416DJ assigned Mode S transponder address was A4EABE and was assigned an ATC transponder beacon code of 1200. The LYM970 assigned Mode S transponder address was A2CEE7 and was assigned an ATC transponder beacon code of 5107. The ADS-B data for this report was obtained from the FAA and was of good quality.

3.0 Weather Data

3.1 Surface Observations

The KAPA weather at 0953, wind 150° at three knots, visibility ten statute miles, ceiling unlimited, few clouds at eight thousand, few clouds at one four thousand, temperature of 8° Celsius (C), dew point temperature of -1°C, and an altimeter setting of 30.27 inches of mercury (inHg). Remarks: automated weather observing station with precipitation discriminator.

KAPA 121553Z 15003KT 10SM FEW080 FEW140 08/M01 A3027 RMK AO2
SLP250 T00781011

4.0 Air Traffic Control Personnel

4.1 APA Operations Supervisor in Charge

The Operations Supervisor In-Charge (OSIC) entered onto duty with the FAA in March 2008 reporting to the FAA training facility in Oklahoma City, Oklahoma. He graduated in June 2008 and reported to Roswell (ROW) ATCT. The OSIC left ROW ATCT in August 2011 and reported to Wichita (ICT) TRACON. He left ICT TRACON in June 2015 and reported to Tampa (TPA) TRACON. The OSIC left TPA TRACON in August 2020 and reported to APA ATCT.

The OSIC maintained a current class 2 medical certificate with for a restriction to wear glasses in the performance of his duties; he reported he was wearing them when the accident occurred. He did not hold any other aeronautical licenses.

The OSIC was rated on all operating positions and was certified as an Operations Supervisor (OS). His regular days off were Sunday and Monday. His normal shifts were Tuesday 1230 to 2030, Wednesday a flex before 0900 to 1700, Thursday 0800 to 1600, Friday 0800 to 1600, and Saturday 0700 to 1500.

4.2 APA Local Control 1

The LC1 controller entered onto duty with the FAA in April 2009 reporting to the FAA training facility in Oklahoma City, Oklahoma. She graduated in July 2009 and reported to Lincoln (LNK) ATCT. The LC1 controller left LNK ATCT in October 2015 and reported to APA ATCT in November 2015.

The LC1 controller maintained a current class 2 medical certificate with no restrictions. She earned her private pilot's certificate through Sky Safety at Stinson Airport in San Antonio, Texas. She did not maintain currency or exercise her private pilot privileges.

The LC1 controller's regular days off were Saturday and Sunday. Her normal shift was two evening shifts from 1415 to 2215 (or 1230 to 2030) followed by two day shifts from 0630 to 1430 (or 0530 to 1330), and a mid-watch from 2200 to 0600. She had recently worked an overtime (OT) mid-watch shift two days after the accident but did not mention any OT shifts prior to the day of the accident.

4.3 APA Local Control 2

The LC2 controller entered into duty with the FAA in December 2011, reporting to the FAA training facility in Oklahoma City Oklahoma. He graduated in January 2012 and reported to APA ATCT. He left APA ATCT in May 2017 and reported to D01 TRACON. He left D01 TRACON in January 2019 and returned to APA ATCT as an OS.

The LC2 controller maintained a current class 2 medical certificate with no restrictions. He did not hold any other aeronautical licenses.

The LC2 controller's regular days off were Friday and Saturday. His normal shifts were Sunday 1200 to 2000, Monday 1100 to 1900, Tuesday 0830 to 1630, Wednesday 0630 to 1430, and Thursday 0630 to 1430.

4.4 APA Cab Coordinator

The Cab Coordinator (CC) controller entered onto duty with the FAA in August 2015 reporting directly to Colorado Springs (COS) ATCT. In March 2019, he left COS ATCT and reported to APA ATCT as an OS.

The CC controller maintained a current class 2 medical certificate with no restrictions and did not hold any other aeronautical licenses. He had prior air traffic control experience in the United States Marine Corps serving from May 2006 until June of 2015 at Marine Corps Air Station (MCAS) Futenma, Japan; Kadena Air Base Japan; MCAS Beaufort; and MCAS Miramar.

The CC controller's regular days off were Thursday and Friday. His normal shift was Saturday from 1200 to 2000, Sunday from 0700 to 1500, Monday from 0700 to 1500, Tuesday from 0700 to 1500, and Wednesday from 0700 to 1500 but could flex from 0530 to 1330.

4.5 APA Air Traffic Manager

The Air Traffic Manager (ATM) entered onto duty with the FAA in April 1994 reporting to the Memphis Air Route Traffic Control Center (ZME ARTCC) as an Air Traffic Control Specialist (ATCS). She left ZME ARTCC in December 1998 and reported to Washington (ZDC) ARTCC as an OS. She left ZDC ARTCC in August 2007 and reported to Denver (ZDV) ARTCC as an OS, eventually becoming an Operations Manager (OM) and later, Support Manager (SM). She left ZDV ARTCC in November 2020 and reported to APA ATCT as ATM.

The ATM did not maintain a medical certificate nor was she required to. She did not hold any other aeronautical licenses.

The ATM no longer held any air traffic control ratings nor was she required to. Her regular days off were Saturday and Sunday. Her normal shifts were 0700 to 1530 Monday through Friday.

5.0 Air Traffic Control Procedures

5.1 FAA Order JO 7110.65Y

Chapter 1, section 1, paragraph 1-1-1 *Purpose of this Order*, prescribes the purpose and expectation of FAA JO 7110.65Y, *Air Traffic Control*, and stated [in part]:

1-1-1. PURPOSE OF THIS ORDER

This order prescribes air traffic control procedures and phraseology for use by persons providing air traffic control services. Controllers are required to be familiar with the provisions of this order that pertain to their operational responsibilities and to exercise their best judgment if they encounter situations that are not covered by it.

Chapter 2, Section 1, paragraph 2-1-2 *Duty Priority*, prescribes the duty priorities for air traffic controllers as prescribed by FAA JO 7110.65Y, *Air Traffic Control*, and stated [in part]:

2-1-2. DUTY PRIORITY

- a. Give first priority to separating aircraft and issuing safety alerts as required in this order. Good judgment must be used in prioritizing all other provisions of this order based on the requirements of the situation at hand.

Chapter 2, Section 1, paragraph 2-1-6 *Safety Alert*, prescribes when air traffic controllers shall issue safety alerts as prescribed in FAA JO 7110.65Y, *Air Traffic Control*, and stated [in part]:

2-1-6. SAFETY ALERT

Issue a safety alert to an aircraft if you are aware the aircraft is in a position/altitude that, in your judgment, places it in unsafe proximity to terrain, obstructions, or other aircraft. Once the pilot informs you action is being taken to resolve the situation, you may discontinue the issuance of further alerts. Do not assume that because someone else has responsibility for the aircraft that the unsafe situation has been observed and the safety alert issued; inform the appropriate controller.

Chapter 2, Section 1, paragraph 2-1-21 *Traffic Advisories*, prescribes when air traffic controllers shall issue traffic calls to pilots as prescribed in FAA JO 7110.65Y, *Air Traffic Control*, and stated [in part]:

2-1-21. TRAFFIC ADVISORIES

Unless an aircraft is operating within Class A airspace or omission is requested by the pilot, issue traffic advisories to all aircraft (IFR or VFR) on your frequency when, in your judgment, their proximity may diminish to less than the applicable separation minima. Where no separation minima applies, such as for VFR aircraft outside of Class B/Class C airspace, or a TRSA, issue traffic advisories to those aircraft on your frequency when in your judgment their proximity warrants it.

Chapter 3, Section 1, paragraph 3-1-6 *Traffic Information*, prescribes how air traffic controllers shall describe traffic when issuing traffic calls to pilots as prescribed in FAA JO 7110.65Y, *Air Traffic Control*, and stated [in part]:

3-1-6. TRAFFIC INFORMATION

- b. Describe the relative position of traffic in an easy to understand manner, such as "to your right" or "ahead of you."

Chapter 3, Section 8, paragraph 3-8-1 *Sequencing/Spacing Application*, prescribes how air traffic controllers set the sequence of arriving and departing traffic as prescribed in FAA JO 7110.65Y, *Air Traffic Control*, and states [in part]:

3-8-1. SEQUENCE/SPACING APPLICATION

Establish the sequence of arriving and departing aircraft by requiring them to adjust flight or ground operation, as necessary, to achieve proper spacing.

Chapter 3, Section 8, paragraph 3-8-3 *Simultaneous Same Direction Operation*, prescribes how air traffic controllers may utilize simultaneous operations on parallel runways as prescribed in FAA JO 7110.65Y, *Air Traffic Control*, and stated [in part]:

3-8-3. SIMULTANEOUS SAME DIRECTION OPERATION

Authorize simultaneous, same direction operations on parallel runways, on parallel landing strips, or on a runway and a parallel landing strip only when the following conditions are met:

- a. Operations are conducted in VFR conditions unless visual separation is applied.
- b. Two-way radio communication is maintained with the aircraft involved and pertinent traffic information is issued.

E. LIST OF ATTACHMENTS

Attachment 1: Interview Summaries

Submitted by:

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Senior Air Traffic Control Investigator