Aviation Investigation Final Report

Location:	Compton, California	**Accident Number:**	WPR19FA095
Date & Time:	March 13, 2019, 18:50 Local	**Registration:**	N5440F (A1); N48962 (A2)
Aircraft:	North American T28 (A1); Cessna 152 (A2)	**Aircraft Damage:**	Minor (A1); Destroyed (A2)
Defining Event:	Runway incursion veh/AC/person	**Injuries:**	1 None (A1); 1 Fatal, 1 Serious (A2)
Flight Conducted Under:	Part 91: General aviation - Personal (A1); Part 91: General aviation - Instructional (A2)		

Analysis

The student pilot and flight instructor in the Cessna were landing at the non-tower-controlled airport when a North American T-28 collided with the Cessna from behind, fatally injuring the student. Radar data indicated that the T-28 overflew the airport before joining the downwind leg of the traffic pattern for the landing runway; about this time, the Cessna was on final approach. The pilot of the T-28 reported that the bright sun and the haze created a glare on the windscreen that obscured his forward vision, making it difficult for him to see directly ahead, and the glare became worse as he descended toward the runway on final approach. The T-28 pilot saw the Cessna ahead of him on the runway just before the collision occurred.

The instructor onboard the Cessna could not recall the details of the flight but reported that his student would have made radio calls on the airport's common traffic advisory frequency (CTAF) as they approached the airport for landing. The CTAF was not recorded, and the radio frequency settings of the Cessna could not be determined due to thermal damage. Examination of the T-28 revealed that its radio was not tuned to the airport's CTAF; therefore, the T-28 pilot was neither receiving position reports from other aircraft in the traffic pattern, nor was he broadcasting his position. The circumstances of the accident are consistent with the T-28 pilot's failure to see and avoid the Cessna while landing with reduced visibility due to sun glare, and it is likely that his failure to monitor and use the CTAF contributed to the accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The failure of the T-28 pilot to see and avoid the Cessna while landing with reduced visibility due to sun glare, which resulted in a collision on the runway. Contributing to the accident was his failure to use the airport's common traffic advisory frequency during the approach and landing.

Findings

Personnel issues (A1)	Monitoring communications - Pilot
Environmental issues (A1)	Bright light - Contributed to outcome
Personnel issues (A1)	Monitoring other aircraft - Pilot
Environmental issues (A1)	Glare - Effect on personnel
Personnel issues (A2)	Attention - Pilot of other aircraft

Factual Information

History of Flight

Landing-landing roll (A1)	Runway incursion veh/AC/person (Defining event)
Landing-landing roll (A2)	Runway incursion veh/AC/person

On March 13, 2019, about 1850 Pacific daylight time, a Cessna 152 airplane, N48962, and a North American T-28 Trojan (T-28), N5440F, were involved in an accident near Compton, California. The T-28 sustained substantial damage and the airline transport pilot onboard was not injured. The student pilot onboard the Cessna was fatally injured, and the flight instructor sustained serious injuries; the airplane was destroyed. The T-28 was operated as a Title 14 *Code of Federal Regulations (CFR)* Part 91 personal flight; the Cessna was operated as a Title 14 *CFR* Part 91 instructional flight.

Review of radar data revealed two discrete secondary beacon code targets that were correlated to the two airplanes as they approached Compton/Woodley Airport (CPM); the Cessna from the south-southwest and the T-28 from the north/east. (See figure 1.) The instructor onboard the Cessna stated that he and the student were simulating a diversion to CPM. He was seriously injured during the accident and could not recall the details of the flight but stated that the student would have made all radio calls over the airport's common radio frequency. Radar indicated that the Cessna entered the airport traffic pattern on the downwind leg at an altitude about 950 ft above ground level (agl), then proceeded to fly the base and final legs of the traffic pattern for runway 25 left (25L).

Figure 1. Recorded radar data of both airplanes

The T-28 pilot stated that he was returning the airplane to CPM following maintenance. As he approached the area at an altitude about 1,000 ft above ground level (agl), he began to become concerned, because the haze was extreme and the sun was low and bright, obscuring his forward vision. He was initially unable to find CPM but located an open area without buildings and thought that was likely the airport, which he confirmed as he got closer. In an effort to announce his presence at the airport, he overflew the runway from the southeast, crossing midfield then making left descending turns into the left traffic pattern for runway 25.

Radar data indicated that the T-28 approached CPM from the east, overflew the airport about 700 to 750 ft agl, then entered the left downwind leg of the traffic pattern for runway 25L. (See figure 2.)

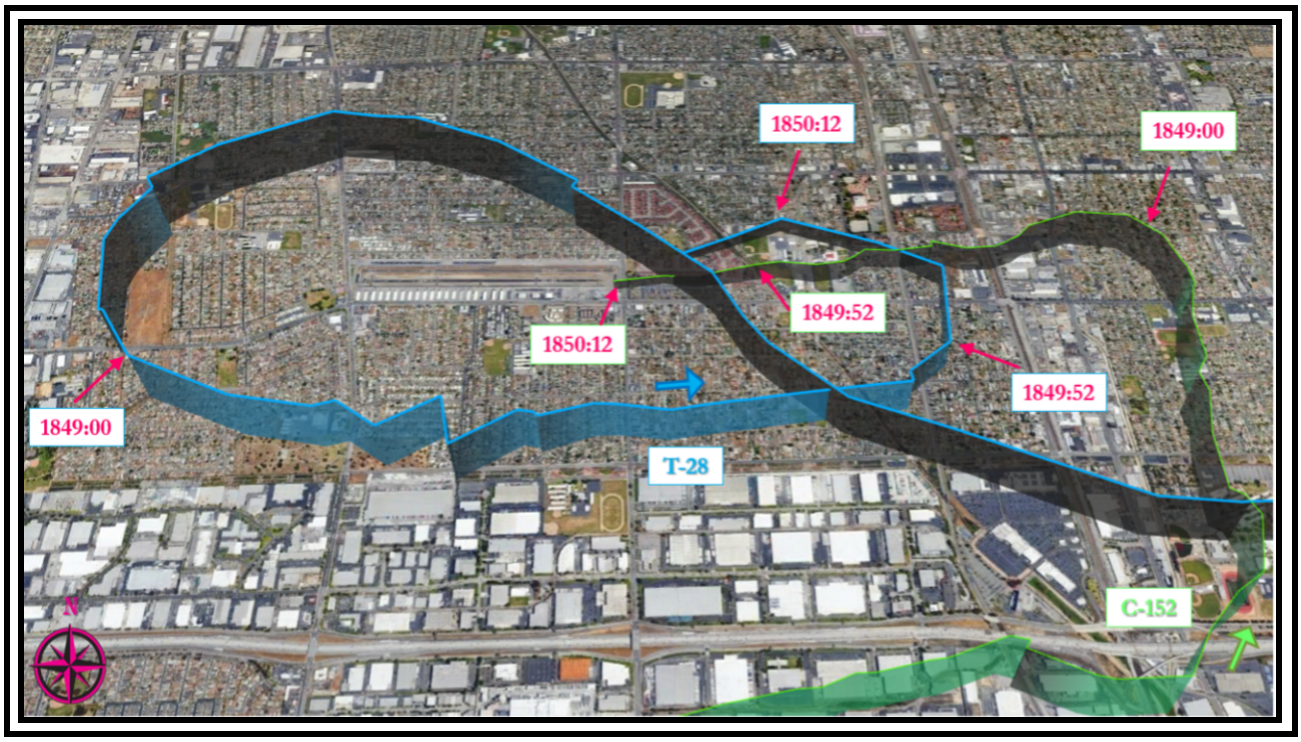

Figure 2. Radar data

The T-28 pilot stated that as he turned from the base to final legs, the bright sun and the haze created a glare on the windscreen that obscured his forward vision, making it difficult for him to see directly ahead. As he descended toward the runway, the glare became worse and he realized he was between runways 25L and 25R. He side-stepped to runway 25L and the airplane touched down on the runway surface. Several seconds later, the pilot saw the Cessna on the runway ahead of him. He applied hard braking and felt the impact with the other plane and resulting explosion immediately thereafter. The T-28 continued about 1,000 ft before coming to rest off the right side of runway 25L. (See figure 3.)

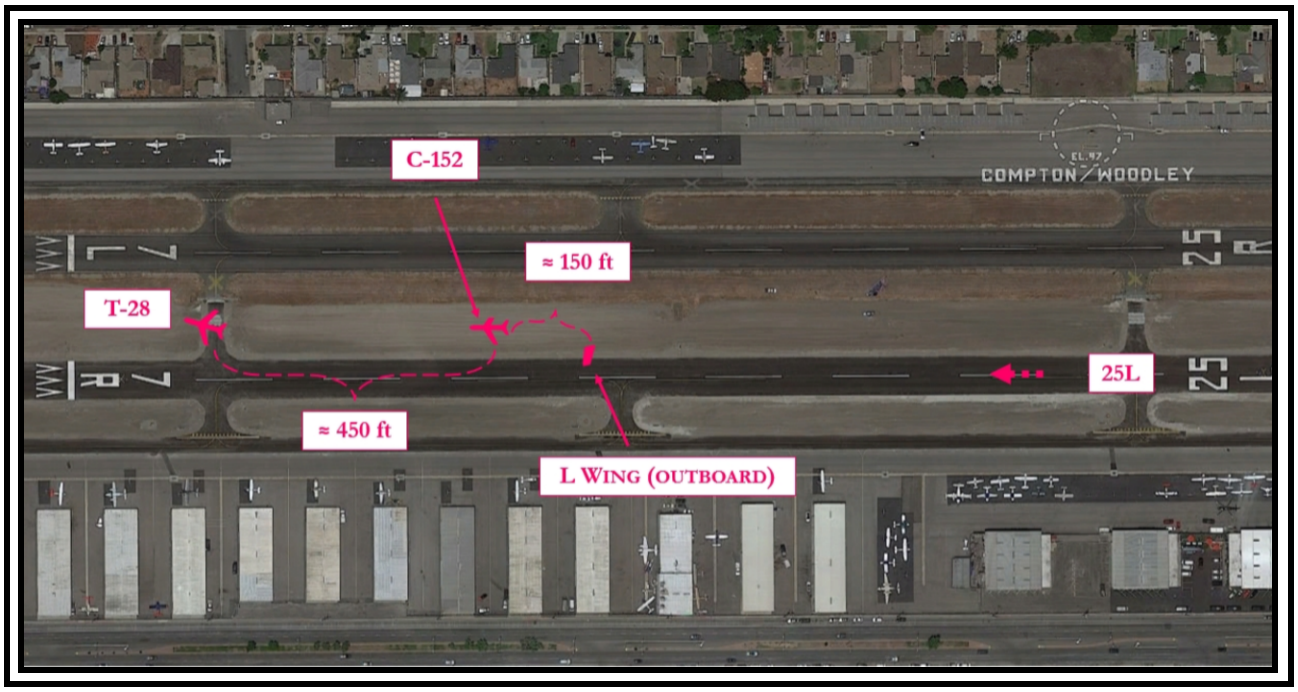

Figure 3. Compton Airport accident diagram

Multiple video recordings captured the accident (see figure 4); review of the footage revealed that the Cessna touched down on runway 25L and continued its landing roll. The T-28 crossed the runway threshold about 10 seconds after the Cessna and subsequently touched down about 1850:36. On the landing roll, adjacent to the runway halfway point sign, the T-28 impacted the Cessna.

Figure 4. Video frames of the airplanes before impact

Pilot Information (A1)

Certificate:	Airline transport; Commercial; Flight engineer; Flight instructor; Military	**Age:**	84,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	December 5, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 15, 2017
Flight Time:	24000 hours (Total, all aircraft), 400 hours (Total, this make and model), 18000 hours (Pilot In Command, all aircraft), 3 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Flight instructor Information (A2)

Certificate:	Airline transport; Commercial; Flight instructor	**Age:**	34,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	August 3, 2018
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 9542 hours (Total, all aircraft), 1674 hours (Total, this make and model), 9402 hours (Pilot In Command, all aircraft), 107 hours (Last 90 days, all aircraft), 55 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Student pilot Information (A2)

Certificate:	Student	**Age:**	40,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	November 7, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 22 hours (Total, all aircraft), 22 hours (Total, this make and model), 1 hours (Pilot In Command, all aircraft), 15 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

T-28 Pilot (A-1)

The 84-year-old pilot was issued a third-class special issuance Federal Aviation Administration (FAA) airman medical certificate with a limitation for glasses for near vision. On his most recent medical exam, his color vision and field of vision were normal, and his uncorrected distant vision was 20/30. At his November 2017 ophthalmology examination, the pilot was diagnosed with age-related cataracts that had both a nuclear and cortical component. He was noted to wear eyeglasses with prism correction, and his uncorrected distant vision was 20/30 in each eye. An ophthalmology exam on October 2019 found a worsening of his cataracts and distant vision.

Review of the pilot's uncorrected vision results from exams spanning over thirty years for first or second-class medical certification showed some gradual decrement of distant vision with aging, which required him to wear corrective lenses when flying.

The T-28 pilot stated that he used his "Flight Guide" book for determining airport frequencies. Examination of the actual guide found at the airplane revealed that the page for CPM was missing; a paper note in place of the page read, "Pg 34, Aug 2017 Compton a/d removed."

Aircraft and Owner/Operator Information (A1)

Aircraft Make:	North American	**Registration:**	N5440F
Model/Series:	T28 B	**Aircraft Category:**	Airplane
Year of Manufacture:	1956	**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	138294
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	850 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Wright
ELT:	Installed	**Engine Model/Series:**	R-1820-86B
Registered Owner:	Tomorrows Aeronautical Museum	**Rated Power:**	1475 Horsepower
Operator:	Tomorrows Aeronautical Museum	**Operating Certificate(s) Held:**	None

Aircraft and Owner/Operator Information (A2)

Aircraft Make:	Cessna	**Registration:**	N48962
Model/Series:	152 No Series	**Aircraft Category:**	Airplane
Year of Manufacture:	1977	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	15281075
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	February 20, 2019 100 hour	**Certified Max Gross Wt.:**	1675 lbs
Time Since Last Inspection:	68 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	20105 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-235-L2C
Registered Owner:	On file	**Rated Power:**	
Operator:	Long Beach Flying CLub	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KHHR,63 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	01:53 Local	**Direction from Accident Site:**	293°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots / 16 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.02 inches Hg	**Temperature/Dew Point:**	17°C / 0°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Los Angeles, CA (WHP) (A1); Long Beach, CA (LGB) (A2)	**Type of Flight Plan Filed:**	None (A1); None (A2)
Destination:	Compton, CA (CPM) (A1); Long Beach, CA (LGB) (A2)	**Type of Clearance:**	None (A1); None (A2)
Departure Time:	18:30 Local (A1); 18:30 Local (A2)	**Type of Airspace:**	

The time of sunset was 1859:24. The sun's azimuth at the time of the accident was 267° (see figure 5) and the elevation was slightly above the horizon at 0.50°.

Figure 5. Sun information

Airport Information

Airport:	Compton/Woodley CPM	**Runway Surface Type:**	Asphalt
Airport Elevation:	98 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	25L	**IFR Approach:**	None
Runway Length/Width:	3322 ft / 60 ft	**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information (A1)

Crew Injuries:	1 None	**Aircraft Damage:**	Minor
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	33.889446,-118.24083

Wreckage and Impact Information (A2)

Crew Injuries:	1 Fatal, 1 Serious	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:		**Aircraft Explosion:**	On-ground
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	33.889446,-118.24083

The Cessna came to rest on the north side of runway 25L, about 150 ft west of the left outboard wing. The T-28 was 450 ft further west of the Cessna. The marks on runway revealed no indications of braking by the T-28 before the collision.

Communications

Neither pilot was in contact with an air traffic control facility, nor were they required to be. CPM's common traffic advisory frequency (CTAF) was not recorded.

The Cessna's radio settings could not be determined due to thermal damage. The T-28 was equipped with a Garmin GTR SL40 communications radio, located immediately below a Garmin 327 transponder mounted to the bottom of the panel. When the electrical system was powered on following the accident, the active radio frequency was 125.00 and the standby frequency was 121.50. The CPM CTAF was 123.05. Commonly referred to as "GUARD," 121.5 MHz is reserved for emergency communications for aircraft in distress, as well as the frequency utilized by earlier generation emergency locator transmitters as a means of locating downed aircraft.

When positioned in the pilot's seat in the T-28, investigators noted that the radio frequencies were partially obscured from the pilot’s field of vision. While in a normal flying position, an investigator of similar height of the T-28 pilot could only see the bottom half of the displayed frequencies.

Additional Information

FAA Advisory Circular (AC) 90-66B, Non-Towered Airport Flight Operations, recommends that:

All traffic within a 10-mile radius of a non-towered airport or a part-time-towered airport when the control tower is not operating should continuously monitor and communicate, as appropriate, on the designated CTAF until leaving the area or until clear of the movement area. After first monitoring the frequency for other traffic present passing within 10 miles from the airport, self-announcing of your position and intentions should occur between 8 and 10 miles from the airport upon arrival. Departing aircraft should continuously monitor/communicate on the appropriate frequency from startup, during taxi, and until 10 miles from the airport, unless 14 CFR or local procedures require otherwise.

Preventing Similar Accidents

See and Be Seen (SA-045)

The Problem

Adequate visual lookout while flying in visual meteorological conditions is critical to avoiding other aircraft. While accidents can occur in high-traffic areas (near airports), they can also occur in cruise flight.

All pilots can be vulnerable to distractions in the cockpit, and the presence of technology has introduced challenges to the see-and-avoid concept. Aviation applications on portable electronic devices (PEDs) such as cell phones, tablets, and handheld GPS units, while useful, can lead to more head-down time, limiting a pilot's ability to see other aircraft.

What can you do?

- Be vigilant and use proper techniques to methodically scan for traffic throughout your flight, not only in high-volume traffic areas.
- Divide your attention inside and outside the aircraft and minimize distractions (including nonessential conversations, photography or sightseeing activities, and PED use) that may degrade your ability to maintain awareness of other aircraft.
- Make your aircraft as visible as possible to other aircraft by turning on available lights, including anticollision lights, and consider using high-intensity discharge or LED lighting.

- Clearly communicate your intentions and use standard phraseology, known distances, and obvious ground references to alert other pilots of your location.
- Recognize that some conditions make it harder to see other aircraft, such as operating in areas where aircraft could be masked by surrounding terrain or buildings and when sun glare is present.
- Encourage passengers to help look for traffic and, during instructional flights, ensure that one pilot is always responsible for scanning for traffic.
- Effectively use on-board traffic advisory systems, when available, to help visually acquire and avoid other aircraft and not as a substitute for an outside visual scan.

See https://www.ntsb.gov/Advocacy/safety-alerts/Documents/SA-045.pdf for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Keliher, Zoe
Additional Participating Persons:	Brad Howard; Federal Aviaiton Administration; Los Angeles, CA
Original Publish Date:	May 27, 2021
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=99107