

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: February 24, 1950

Released: February 27, 1950

STANDARD AIRLINES, INC., CHATSWORTH, CALIFORNIA, JULY 12, 1949

The Accident

Standard Airlines' Flight 897R of July 11, 1949, a Curtiss C-46-E, N-79978, crashed and burned near Chatsworth, California, at approximately 0743,² July 12, 1949. Of the 48 occupants, 35, including both pilot and copilot were killed, and 13 received serious injuries. The aircraft was destroyed.

History of the Flight

Flight 897R originated at New York, New York, for Long Beach, California, with stops at Chicago, Illinois, Kansas City, Kansas, Albuquerque, New Mexico, and Burbank, California. A crew change was made at Kansas City. Departure from Kansas City was at 2321, July 11, and the flight proceeded through thunderstorm conditions to Albuquerque. Departure from Albuquerque, New Mexico, was at 0424, with 44 passengers, including two infants; 4 crew members, 875 gallons of gasoline, and 60 gallons of oil, and with a visual flight rules clearance. The total weight at time of departure was 39,746 pounds, which was within the certificated gross weight of the aircraft, and all disposable load was properly distributed so that the center of gravity of the aircraft was within the certificated limits.

After leaving Albuquerque, considerable turbulence and thunderstorm conditions were encountered before clear weather was entered. At 0722 the flight contacted Riverside, California, INSAC,¹ advised that at 0720 it was over Riverside at 9,000 feet, 500 on top, and requested a top report² for the vicinity of Burbank (about 67 miles to the west) which was given as 2,200 feet MSL.³ The flight then filed an Instrument Flight

Rules plan from its position direct to Burbank estimating arrival there at 0740. Clearance was issued by the Los Angeles Air Route Traffic Control Center as follows: "ATC clears N 978 from present position to Simi Intersection direct cruise 500 on top, maintain 500 on top until advised by Burbank Control on 248 Kcs., no delay—contact Burbank Approach Control when approaching Burbank." The first radio contact with the Burbank Tower was at 0735, at which time the flight reported its position as west of Riverside, and upon request the latest (0725) Burbank weather observation was given the pilot as "measured ceiling 800 overcast, thin obscurement, visibility two miles, smoke." The tower advised the flight that another aircraft, a Cessna, was then over Chatsworth⁴ inbound and that no delay was anticipated. At 0736 the Cessna reported that it was contact and was cleared to land. Immediately N 978 was contacted "cleared to make straight-in approach to the aerodrome, Runway 7, Burbank altimeter three zero zero two, time check three six." The pilot acknowledged and advised that his position was "approaching Burbank Range," but did not give his altitude. This was the last radio contact with the flight. No position report was made as actually over Burbank Range. At 0745, a California Central Airlines' DC-3, Flight 81, reported over the Burbank Range, and was directed to hold north-west of Simi, 500 on top, pending the landing of N978. When N978 failed to arrive, several calls were initiated to it by the tower but no response was heard. California Central's flight was then requested to search for the aircraft and sighted the burning wreckage about three miles west of the town of Chatsworth, California, in the Santa Susana Mountains at 0800. At that

^{*}All times referred to herein are Pacific Standard and based on the 24-hour clock.

¹Interstate Airways Communications.

²Altitude of top of cloud layer.

³Mean Sea level.

⁴Chatsworth Fan Marker and Compass Locator, 10.6 miles west-northwest of Burbank Range Station

time, 17 minutes after the accident, the weather at the crash site was clear with a former cloud layer rapidly dissipating.

Investigation

The aircraft struck the side of a mountain 2,320 feet high at a point 430 feet lower than its crest, or at an altitude of 1,890 feet MSL. At the moment of impact it was traveling in a direction of 239 degrees magnetic, and was level laterally. At the point of initial contact the ground slopes upward at about 30 degrees. This contact was a brushing movement only, as evidenced by the clipped greasewood bushes close to the ground and the absence of any aircraft parts or pieces. Sixty feet from this first contact, the right propeller struck an eight-foot boulder. Portions of the right wing leading edge were under this boulder which was displaced downhill a few feet. (The hillside is strewn with scattered large boulders, some the size of a small house.) Beyond the boulder which was sixty feet from the first contact, there was an elliptical area extending for 150 feet, showing terrific ground impact. Here were the right propeller blades, right engine cowl flaps, right aileron, right flap, right wing tip, and gas tanks from the right wing. At the far end of this impact area and adjacent to a very large boulder were a 35-foot section of the top of the right wing and the third right wing gas tank. Ground marks indicate a skipping and upward clockwise movement of the aircraft in this area. About 100 feet from the right wing section was the inboard section of the right wing, from the fuselage to the wing tip attachment angle. Almost complete disintegration of the right wing had occurred. The remainder of the wreckage, fuselage and left wing, came to rest, topside up, with the nose pointing up a 60-degree slope after a 90-degree clockwise turn from the heading at the time of first ground contact. The distance from the first contact to the tail of the aircraft, on a heading of 239 degrees magnetic, was 360 feet. The right engine accessory section was found 580 feet from first ground contact. The nose of the aircraft, in coming to rest, struck a large rock 80 feet higher than the point of first ground contact. There was a backward movement from this large rock which damaged the previously

undamaged left wing. Both engines rolled downhill from this point a distance of 70 feet from the tail of the aircraft into the bottom of a draw. The extended main landing gear and tail wheel had been broken off before the aircraft came to a stop. Fire occurred immediately after the aircraft came to rest.

One altimeter was recovered. It was set to 30 08" and read 1940 feet. Investigation disclosed that both pilots were in their respective seats, with their safety belts fastened, at the time of impact. There was no evidence of any malfunctioning of the aircraft or its power plants. There was ample fuel as determined by computation of fuel consumption against the amount on board at Albuquerque and also by the fact that a considerable gasoline fire followed the crash.

Testimony of pilots of other aircraft in the vicinity at the time shows that the height of the top of the cloud layer, in the vicinity of the crash site, was about 2,400 feet MSL as compared to that of 2,200 feet given to the pilot at 0720. This was just enough to cover the top of the 2,320-foot mountain that the aircraft struck. This stratus cloud layer lay quite evenly over the entire Los Angeles area including the San Fernando Valley where the Chatsworth Fan Marker is located. Such type of cloud layer exists frequently in this region. The cloud layer was dissipating rapidly and only a few minutes after the crash it started to break up and shortly disappeared. Evidence from surviving occupants also shows that the aircraft crashed within two or three minutes after starting descent into the overcast. The cloud layer was of a temperature so that ice would not have formed on the aircraft during the descent.

Testimony by CAA personnel in charge of radio facilities in the Burbank area shows that all such facilities were operating normally at the time of the accident, as demonstrated when they were checked immediately after the accident and also by the fact that other aircraft approaching Burbank at about that time experienced no difficulty.

Approximately 40 minutes before the crash, an altercation occurred between two male passengers aboard the aircraft. One blow was struck, whereupon a stewardess separated the two and

informed the captain. He came aft, talked with both parties and then returned to the cockpit. This incident was reported to Riverside at 0722. The captain did not again leave the cockpit, although some eight minutes before the crash he informed the Burbank Tower of the incident and requested that police meet the aircraft. The chief stewardess, who survived, testified that at no time during the flight did any passenger enter the cockpit.

The method of letting down to the Burbank Airport during instrument weather is well established and is set forth in a Civil Aeronautics Administration publication called "Instrument Approach Procedure" (for Lockheed Air Terminal, Burbank).⁵ Evidence indicated that the captain had this particular publication with him although other evidence indicates that he was familiar enough with it so that he may not have referred to it. As a part of his company route check, the captain took a written examination on November 12, 1948, on this procedure and displayed complete knowledge of it. His experience included 6,038 total hours of piloting, of which 140 hours had been on C-46's, and according to the president of Standard Airlines, he had made an estimated 100 instrument approaches to Burbank. The copilot, although having less general experience than the captain, had also made a large number of instrument approaches to Burbank.

The instrument approach procedure for a westbound aircraft is from Riverside (which the flight reported as over at 0720) proceed at 500 feet on top to the Burbank range station, which is 3 miles west-northwest of the Burbank Airport, from there proceed out the west-northwest leg of the Burbank range until beyond the Chatsworth Fan Marker, which is 10.6 miles beyond the range station; then make a standard procedure turn (shown on the attachment). This procedure requires a left turn to a heading of 232 degrees magnetic and the aircraft is held on this heading for approximately one minute, when a standard rate 180-degree turn to the right is executed to a heading of 52 degrees magnetic. This (inbound) heading is held until the west leg of the Burbank range is intercepted.

A further right turn to 97 degrees to line up with the inbound course of the west leg of the Burbank range is then executed and followed to the Chatsworth Fan Marker. No part of this procedure turn may be lower than 500 feet above the overcast and when the turn is completed, the aircraft must remain at least 500 feet above the overcast until the Chatsworth Fan Marker is again reached. Then descent may be started toward the Burbank Airport at such a rate that the aircraft will pass over the Burbank range station, 10.6 miles in, at an altitude of 1,700 feet MSL.

The time of the crash was fixed at approximately 0743. This was computed from the aircraft's probable cruising speed and the distance from its last reported position to the site of impact, based on the execution of an authorized standard instrument approach.

The geographical coordinates of the crash site are latitude 34 degrees, 15 minutes, 30 seconds north, and longitude 118 degrees, 38 minutes, 15 seconds west. This position is almost exactly on the outbound leg of the prescribed procedure turn as is plotted on the attachment. Further, the direction of initial impact was estimated to be 239 degrees magnetic or within 7 degrees of the prescribed direction of 232 degrees magnetic for the outbound leg of that procedure turn. The altitude of the crash site is 1,890 feet MSL, and according to survivors, the aircraft had been in the overcast for an estimated two or three minutes before it struck.

Analysis

It is evident from a study of the several factors involved that this accident was caused solely by the pilot voluntarily going below the prescribed minimum altitude, and descending into the overcast, either before or during the procedure turn preparatory to a straight-in approach. That he did this is evident from the fact that the crash occurred in the proper location for the execution of a procedure turn except that it was low by about 1,000 feet, presuming the altitude of the top of the cloud layer to have been at 2,400 feet MSL. There is excellent evidence that the top of the cloud layer was at about 2,400 feet MSL.

⁵ Attached

One possible reason for the captain going below his prescribed altitude is based on the fact that the cloud layer through which he descended was dissipating rapidly. This meteorological phenomenon is quite common in the area but such cloud layers melt away with great speed from the influence of the morning sun. As the captain had made a considerable number of instrument approaches during similar weather conditions, it is possible that he anticipated a slightly faster dissipation of this cloud layer and went into it believing that it would not last. On the other hand, there is the possibility that he descended through a hole in the cloud layer and that once in that hole he was unable to maintain visual reference, and reverting to instrument flight at too low a level, struck the hillside. In this connection there is a large lake quite close to where the crash occurred, which, had he sighted it, may have given him a false idea as to whether or not he could continue visually.

A second possibility is the fact that there had been a tiring and extensive period of turbulence and thunderstorms during the flight from Kansas City. This undoubtedly caused a certain amount of crew fatigue, which, coupled with the length of the flight (eight hours and 22 minutes from Kansas City) may have induced a deviation from precise letdown procedures.

A third possible reason for the captain going below the prescribed altitude is his questionable concern over the passenger altercation. He had asked that police meet the aircraft at Burbank and it is thus evident that the subject was on his mind. However, he had returned to the cockpit some 40 minutes before the accident and did not leave it again, and no passenger entered the cockpit at any time. It is, therefore, difficult to reconcile the captain's premature descent with any possible worry on his part over the passenger altercation, this possibility is remote.

Some combination of the above factors, of course, may be held responsible for the captain's flying as he did. As stated, there was no mechanical interruption to the flight, no shortage of fuel, no declared emergency, nor did the captain report any irregularities which he surely would have done had there been any malfunctioning sufficient to have forced him to be lower than where he

normally would be. That he knew, or should have known, his altitude is evident from the fact that the one recovered altimeter was set within .06 inches, corresponding to 50-60 feet of altitude, of the correct altimeter setting as radioed to him only a few minutes before the crash.

Therefore, the Board concludes that this accident resulted from a deviation from the prescribed and established instrument approach procedure.

Findings

1. The carrier, the aircraft and the crew were currently certificated.
2. There was no evidence of mechanical malfunctioning or structural defect prior to impact.
3. There was no evidence of any malfunctioning of the aircraft's, or ground radio facilities.
4. The passenger altercation had no direct effect on the safe operation of the aircraft.
5. The flight descended below the prescribed minimum altitude just before starting, or during, a procedure turn preparatory to letting down to Burbank Airport.
6. The aircraft struck terrain during the procedure turn while it was approximately 1,000 feet lower than it should have been under the prevailing weather conditions.
7. The site of impact was almost exactly on the outbound leg of the procedure turn from the Chatsworth Fan Marker and the flight's direction at the time of impact was almost exactly as prescribed for that leg of the procedure turn.
8. The crash resulted in destruction of the aircraft and the death of 35 of its 48 occupants.

Probable Cause

The Board determines that the probable cause of this accident was the pilot's action in descending below the prescribed minimum altitude while executing an instrument approach to the Burbank Airport.

BY THE CIVIL AERONAUTICS BOARD:

/s/ JOSEPH J. O'CONNELL, JR
 /s/ OSWALD RYAN
 /s/ JOSH LEE
 /s/ HAROLD A. JONES
 /s/ RUSSELL B. ADAMS

Supplemental Data

Investigation and Hearing

The Civil Aeronautics Board received notification of the accident at 0820, July 12, 1949, from the CAA's Regional Office at Los Angeles and immediately initiated an investigation in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. As part of the investigation a public hearing was held at Santa Monica, California, on July 25, 1949.

Air Carrier

Standard Airlines, Inc., a California Corporation, has its principal place of business at the Long Beach Municipal Airport, Long Beach, California. At the time of the accident the company held an operating certificate No. 6-14, issued February 10, 1947, authorizing the carriage of passengers and cargo within the Continental United States. It also held a letter of registration as an irregular carrier No. 826 issued by the Civil Aeronautics Board on March 19, 1948.

Flight Personnel

Captain Roy G. White, age 33, held a valid airman certificate with an airline

transport rating and at the time of the accident had a total of 6,038 flying hours. Of this, 2,760 hours had been in twin engine aircraft and 140 hours had been in C-46 aircraft. His last physical examination was on May 26, 1949.

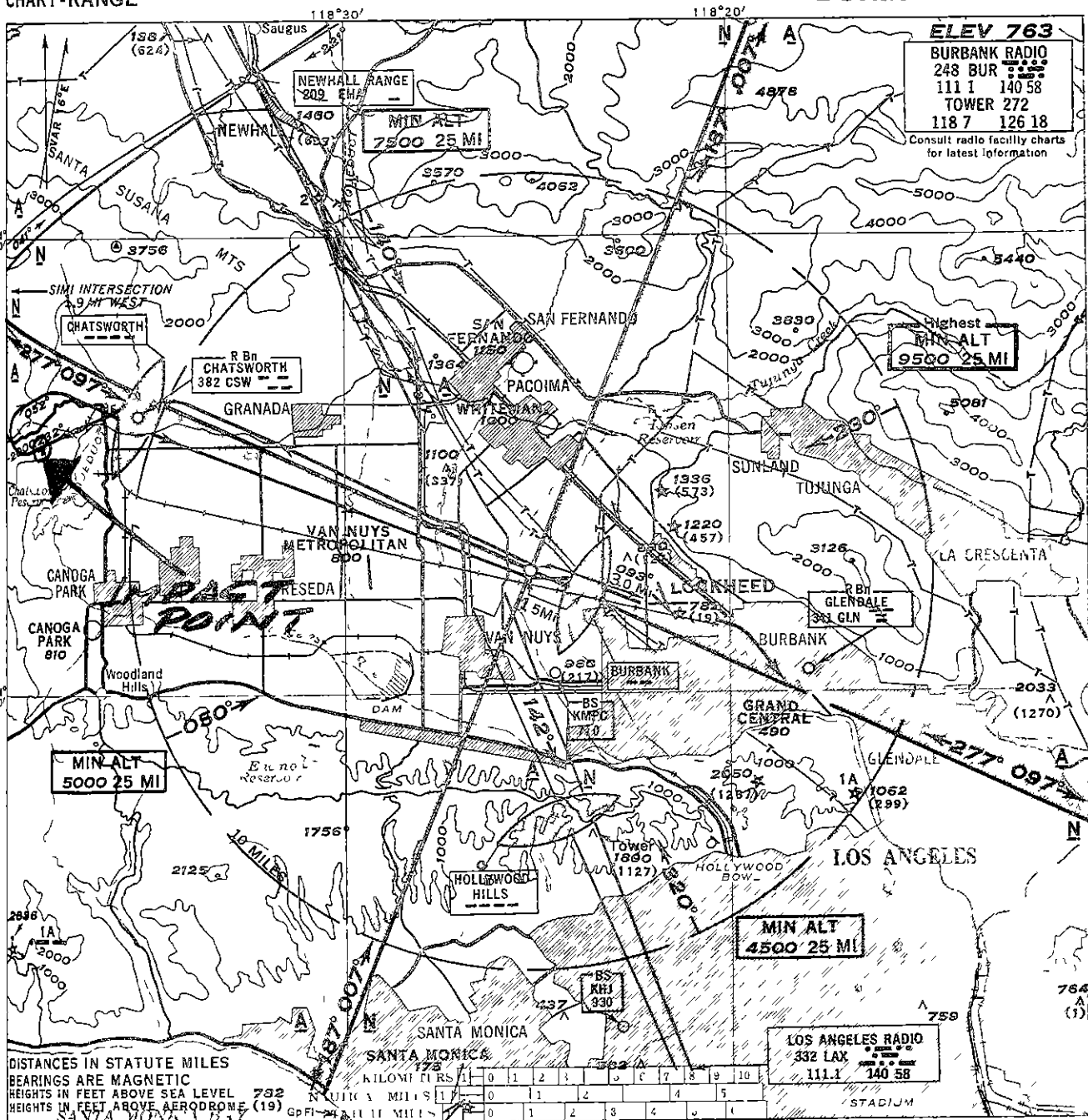
Copilot Harold Tucker, age 29, held a valid airman certificate with an airline transport rating and at the time of the accident had a total of 4,445 flying hours. He had had 30 hours in C-46 aircraft and was last physically examined on December 9, 1948.

The Aircraft

The aircraft, a Curtiss Model C-46-B, N79978, military identification 43-47410, was owned by Standard Airlines and was currently certificated by the Civil Aeronautics Administration. It was manufactured as a military transport and acquired by Standard Airlines, through the War Assets Corporation during April 1948. It had been flown a total of 1,515 hours, and was equipped with two Pratt and Whitney R-2800-75-5E-8 engines and Hamilton Standard Hydromatic propellers.

**INSTRUMENT APPROACH
CHART-RANGE**

**LOCKHEED AIR TERMINAL
BURBANK CALIF**



DISTANCES IN STATUTE MILES
BEARINGS ARE MAGNETIC
HEIGHTS IN FEET ABOVE SEA LEVEL
HEIGHTS IN FEET ABOVE AERODROME (19) GPFI-24

STANDARD INSTRUMENT APPROACH PROCEDURE

INITIAL APPROACH

NE course min enroute altitude
 * SE course 5000 from int NE course LGB Range
 * SW course 5000 from int W course LAX Range
 * NW course 5000 from int SW course EHA Range
 1700 from Chatsworth FM (Final)

PROCEDURE TURN

For USAF use only
 Min Alt over Aerodrome 1653
 Ceiling over Aerodrome (900) **CONC OF SILENCE**

Procedure Mar 1948

Procedure diagram showing courses: 277°, 097°, 093°, 1700, and 093°. Includes R Bn and FM symbols.

LOS ANGELES RADIO
 332 LAX
 111.1 140.58

LOS ANGELES

MIN ALT 4500 25 MI

MIN ALT 5000 25 MI

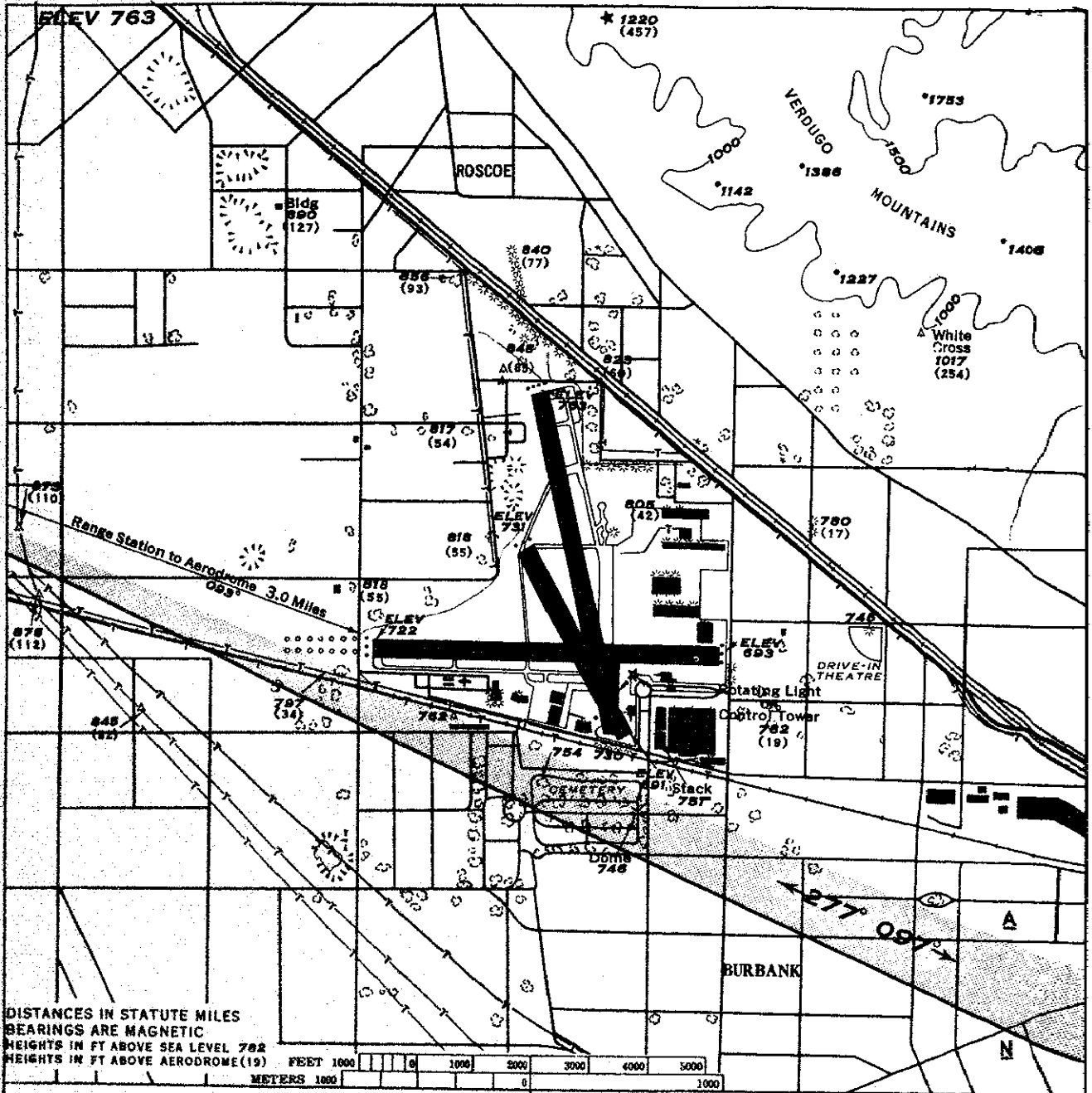
MIN ALT 7500 25 MI

MIN ALT 9500 25 MI

ELEV 763

BURBANK RADIO
 248 BUR
 111.1 140.58
 TOWER 272
 118.7 126.18
 Consult radio facility charts for latest information

NW		Statute Miles										ELEV 763		SE										
		11	10	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	10	11
		10	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	10	11	10
		TIME TO POINT OF VISUAL CONTACT DISTANCE 1.5 STAT 1.3 NAUT MILES																						
CEILING AND VISIBILITY MINIMA																								
TAKE OFF	DAY	NIGHT	100 M P H	120 M P H	140 M P H	160 M P H	90 KNOTS	100 KNOTS	110 KNOTS	120 KNOTS	30 KNOTS													
LANDING	DAY	NIGHT	00 54	00 45	00 39	00 34	00 52	00 47	00 43	00 39	00 36													



AERODROME POSITION: Lat. 34°12'N., Long. 118°21'W.

RADIO: SBML range, VHF voice, Tower, VHF tower.

LIGHTING: Rotating light; floodlights; obstruction, approach, threshold and runway lights. Quartz crystal searchlights used as approach lights on north end of runway 15-33 and west end of runway 7-25.