



**NTSB** National Transportation Safety Board

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*Office of Aviation Safety*

# **Controlled Flight Into Terrain Learjet 35A**

San Diego, California

October 24, 2004

# Accident Flight



- Fourth leg of the flight
- Departed around 1500 October 23<sup>rd</sup>
- Albuquerque, El Paso, Manzanillo, and San Diego



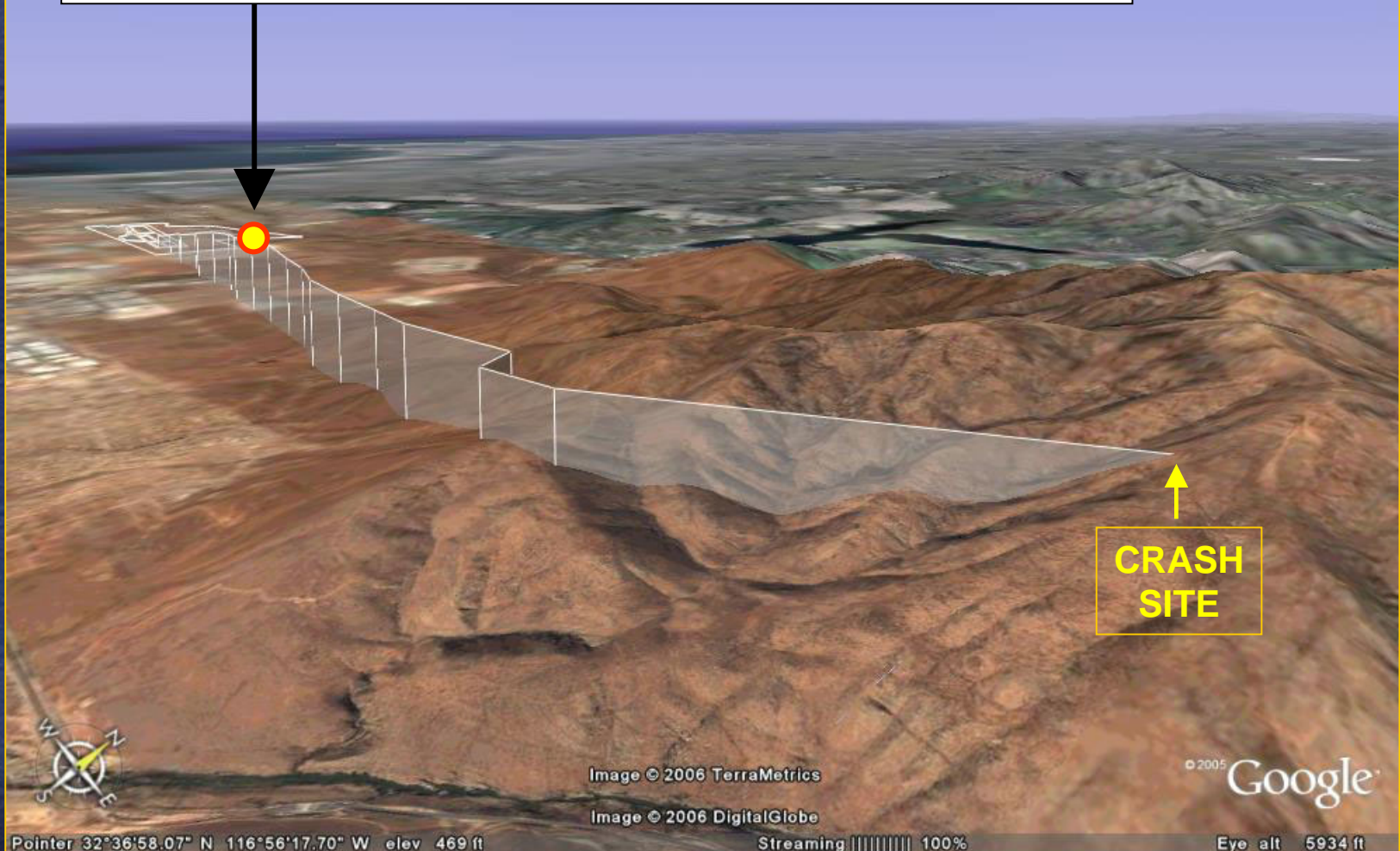
# Prior to Departure

- Captain called FSS to file IFR flight plan
- Copilot could not obtain clearance on various radio frequencies
- Crew elected to depart VFR to east
- Clouds overcast at 2,100 feet above ground

00:24:12

1,800 ft.

[N30DK] off Brown field ... squawking VFR  
with the IFR please to Albuquerque



↑  
**CRASH  
SITE**

Image © 2006 TerraMetrics

Image © 2006 DigitalGlobe

© 2005 Google

Pointer 32°36'58.07" N 116°56'17.70" W elev 469 ft

Streaming ||||| 100%

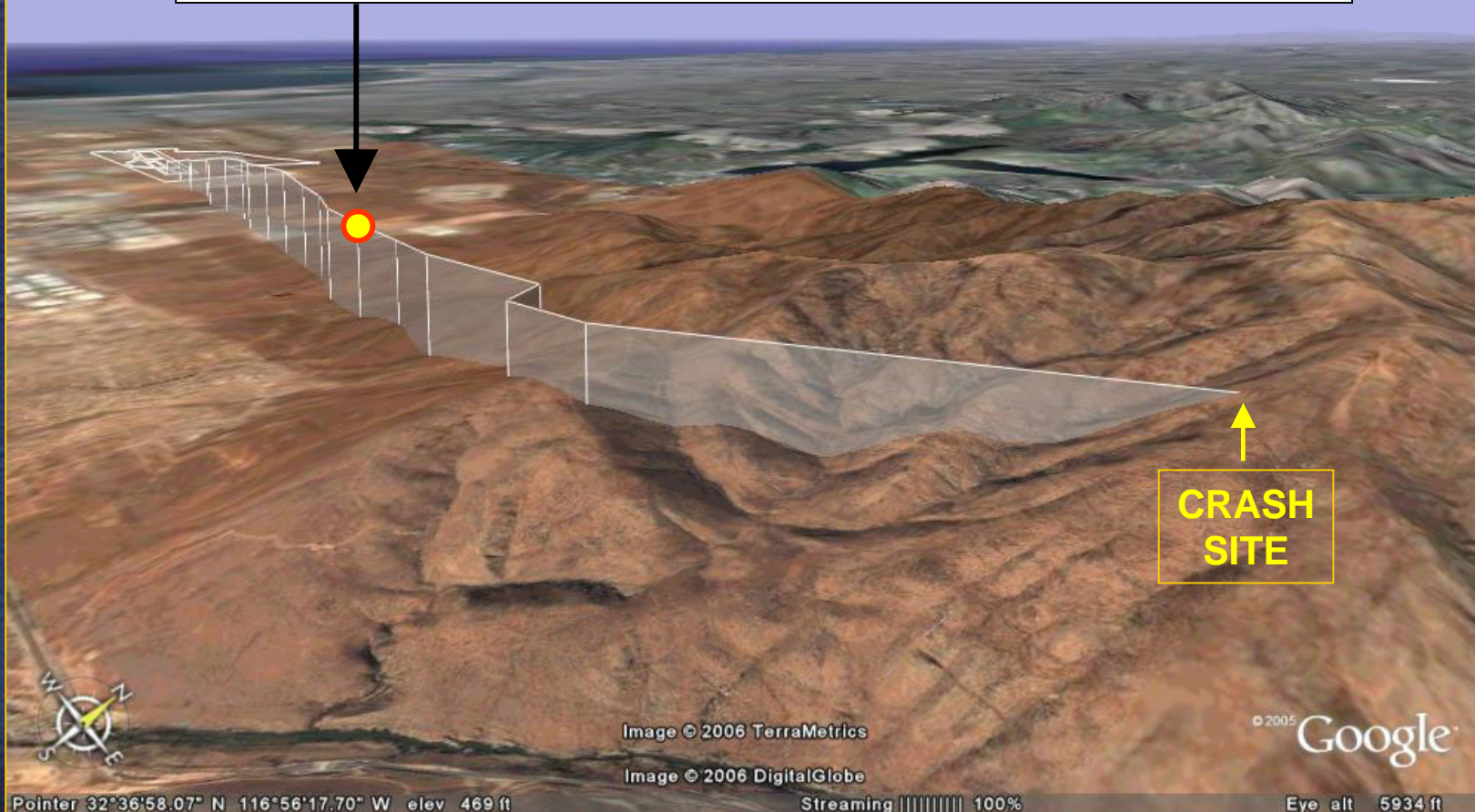
Eye alt 5934 ft



00:24:55

2,300 ft.

[ATC] Lifeguard 30DK radar contact...  
fly heading 020, maintain VFR ...  
above 5000 I'll have an IFR clearance for ya



↑  
**CRASH  
SITE**

Image © 2006 TerraMetrics

Image © 2006 DigitalGlobe

© 2005 Google

Pointer 32°36'58.07" N 116°56'17.70" W elev 469 ft

Streaming ||||| 100%

Eye alt 5934 ft

00:24:59

2,300 ft.

MSAW alert

00:25:03 (last mode C return)

2,400 ft.

MSAW alert

↑  
CRASH  
SITE



Image © 2006 TerraMetrics

Image © 2006 DigitalGlobe

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Pointer 32°36'58.07" N 116°56'17.70" W elev 469 ft

Streaming ||||| 100%

Eye alt 5934 ft



00:25:09 (primary return)  
2,400 ft. (assumed)  
[N30DK] ...020 heading  
Lifeguard 30DK roger



↑  
**CRASH  
SITE**



Image © 2006 TerraMetrics

Image © 2006 DigitalGlobe

© 2005 Google

Pointer 32°36'58.07" N 116°56'17.70" W elev 469 ft

Streaming ||||| 100%

Eye alt 5934 ft

00:25:18 (last primary return)  
2,400 ft. (assumed)

CRASH  
SITE  
ELEV. 2256 ft.



Image © 2006 TerraMetrics

Image © 2006 DigitalGlobe

© 2005 Google

Pointer 32°36'58.07" N 116°56'17.70" W elev 469 ft

Streaming ||||| 100%

Eye alt 5934 ft











# Crew Duty/Flight Times

- Captain: 17.5 hours awake
- Copilot: 16 hours awake
- 3 hours past normal bedtime
- NTSB study revealed performance degradation after 11 hours awake

## RIALTO, CA

## RIALTO MUNI-MIRO FIELD

TAKE-OFF MINIMUMS: **Rwys 17, 35**, NA.  
DEPARTURE PROCEDURE: **Rwy 6**, climbing right turn. **Rwy 24**, climbing left turn. **All aircraft** climb via PDZ R-012 to PDZ VORTAC. Aircraft departing PDZ R-091 CWR-140 and R-231 CWR-280 climb on course. All others continue climb in PDZ holding pattern (NE, right turns, 210° inbound) to cross PDZ VORTAC at or above: R-281 CWR-090, 6700, R-141 CWR-230, 4000.

## RIVERSIDE, CA

## RIVERSIDE MUNI

TAKE-OFF MINIMUMS: **Rwy 9**, CAT A, B 1200-2 or std. with a min. climb of 210' per NM to 2300. CAT C, D 2100-2 or std. with a min. climb of 240' per NM to 3500. **Rwy 16**, NA. **Rwy 27**, CAT C, D 2400-2 or std. with a min. climb of 230' per NM to 3800. **Rwy 34**, CAT A, B 700-2 or std. with a min. climb of 400' per NM to 1600. CAT C, D 1600-2 or std. with a min. climb of 400' per NM to 2600.  
DEPARTURE PROCEDURE: **Rwy 9**, climbing right turn. **Rwy 34**, climbing left turn. **Rwy 27**, climb heading 280° to 2000, then climbing left turn. **All aircraft** climb direct PDZ VORTAC. Aircraft departing PDZ R-091 CWR-140 and R-231 CWR-280 climb on course. All others continue climb in PDZ holding pattern (NE, right turns, 210° inbound) to cross PDZ VORTAC at or above: R-281 CWR-090, 6700, R-141 CWR-230, 4000, or Airway MEA.

## SAN BERNARDINO, CA

## SAN BERNARDINO INTL

TAKE-OFF MINIMUMS: **Rwy 6**, CAT A, B 2100-2 or std. with a min. climb of 340' per NM to 3700. CAT C, D 3100-2 or std. with a min. climb of 480' per NM to 4600.  
DEPARTURE PROCEDURE: **Rwy 6**, climbing right turn. **Rwy 24**, climbing left turn. **All aircraft** climb direct PDZ VORTAC. Aircraft departing PDZ R-091 CWR-140 and R-231 CWR-280 climb on course. All others continue climb in PDZ holding pattern (Hold NE, right turns, 210° inbound) to cross PDZ VORTAC at or above: R-281 CWR-090, 7700, R-141 CWR-230, 4900.

## SAN CLEMENTE ISLAND NALF

## (FREDERICK SHERMAN FLD) (NUC)

## SAN CLEMENTE ISLAND, CA

Diverse departures not authorized between 090° to 160° clockwise bearing from ARP.

## SAN DIEGO, CA

## BROWN FIELD MUNI

TAKE-OFF MINIMUMS: **Rwys 8L, 8R**, CAT A, B 1900-2 or std. with a min. climb of 480' per NM to 2600. CAT C, D 3100-3 or std. with a min. climb of 520' per NM to 3900.  
DEPARTURE PROCEDURE: **Rwys 8L, 8R**, climbing left turn. **Rwys 26L, 26R**, climbing right turn. **All aircraft** climb heading 280° to intercept MZB R-160 northwestbound to MZB VORTAC.

## SAN DIEGO, CA (CON'T)

## MONTGOMERY FIELD

TAKE-OFF MINIMUMS: **Rwy 5**, 1500-2 or std. with a min. climb of 290' per NM to 1700.  
DEPARTURE PROCEDURE: **Rwys 5, 10L/R**, climbing right turn. **Rwys 28L/R**, climbing left turn. **All aircraft** climb direct to MZB VORTAC. Aircraft departing MZB R-090 CWR-360 climb on course. All others climb in MZB holding pattern (W, right turns, 075° inbound) to cross MZB VORTAC at or above 1800.

## SAN DIEGO INTL

TAKE-OFF MINIMUMS: **Rwy 9**, CAT A, B 400-1 or 300-1 with a min. climb of 610' per NM to 600. CAT C, D 300-1 with a min. climb of 610' per NM to 2300. **Rwy 27**, 300-1½ or std. with a min. climb of 317' per NM to 400.  
DEPARTURE PROCEDURE: **Rwy 9**, climb runway heading to 600, then climbing left turn direct MZB VORTAC. **Rwy 27**, climb runway heading to 900, then climbing right turn direct MZB VORTAC. Aircraft departing MZB VORTAC R-180 CWR-360 climb on course. All others climb in MZB VORTAC holding pattern (W, right turns, 075° inbound) to cross MZB VORTAC at or above 1475.

NOTE: **Rwy 9**

142' left of centerline from departure end of runway, 62' AGL/82' runway, 969 trees 1377' centerline, 8' departure end of runway, 63' trees 3118' centerline, 1' departure end of runway, 116' MSL.

## SAN DIEGO

## GILLESPIE FLD

TAKE-OFF MINIMUMS: **Rwy 27L**, 2000-2 or std. with a min. climb of 370' per NM to 2600. CAT C, D 3100-3 or std. with a min. climb of 520' per NM to 3900.  
DEPARTURE PROCEDURE: **Rwy 27L**, climbing right turn. **All aircraft** climb heading 280° to intercept MZB R-160 northwestbound to MZB VORTAC.

# Takeoff Minimums and Departure Procedures

## SAN DIEGO, CA BROWN FIELD MUNI

TAKE-OFF MINIMUMS: **Rwys 8L, 8R**, CAT A, B 1900-2 or std. with a min. climb of 460' per NM to 2600. CAT C, D 3100-3 or std. with a min. climb of 520' per NM to 3900.

DEPARTURE PROCEDURE: **Rwys 8L, 8R**, climbing left turn. **Rwys 26L, 26R**, climbing right turn. **All aircraft** climb heading 280° to intercept MZB R-160 northwestbound to MZB VORTAC.



## SAN DIEGO, CA

## BROWN FIELD MUNI

TAKE-OFF MINIMUMS: **Rwys 8L, 8R**, CAT A, B 1900-2 or std. with a min. climb of 480' per NM to 2600. CAT C, D 3100-3 or std. with a min. climb of 520' per NM to 3900.  
DEPARTURE PROCEDURE: **Rwys 8L, 8R**, climbing left turn. **Rwys 26L, 26R**, climbing right turn. **All aircraft** climb heading 280° to intercept MZB R-160 northwestbound to MZB VORTAC.



SAN DIEGO, CALIFORNIA

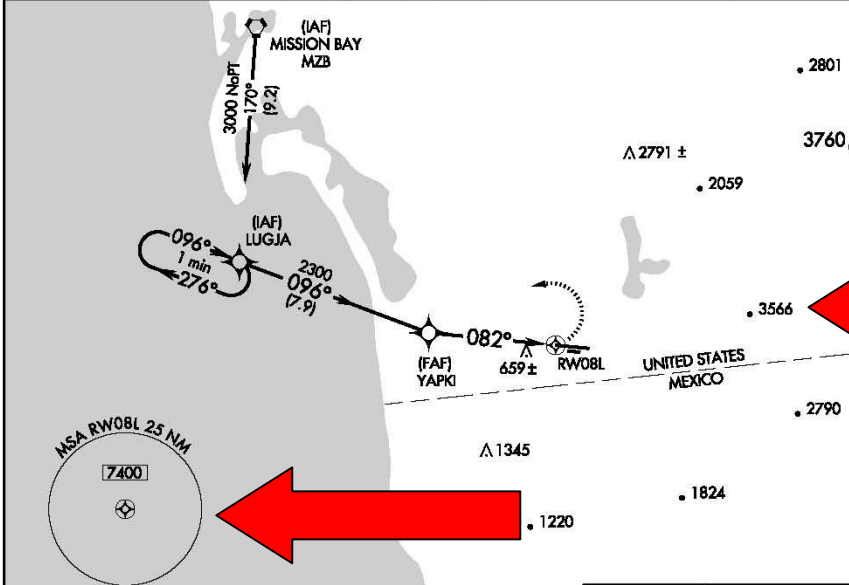
AI-5814 (FAA)

APP CRS  
082°  
Rwy ldg  
7999  
TDZE  
524  
Apt Elev  
524

GPS RWY 8L  
SAN DIEGO/BROWN FIELD MUNI (SDM)

When local altimeter setting not received, use San Diego Intl altimeter setting.  
Circling not authorized south of Rwy 8R-26L  
MISSED APPROACH: Climbing left turn to 3000 direct LUGJA WP and hold.

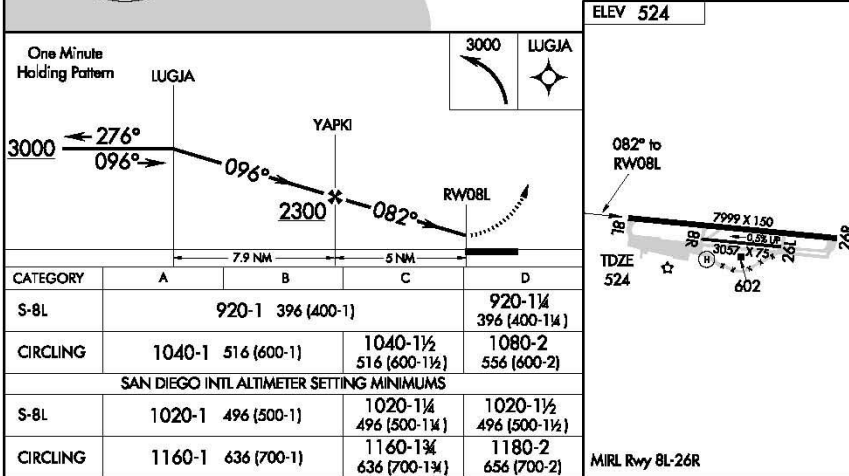
ATIS 132.35	SOCAL APP CON 124.35 381.5	BROWN TOWER* 126.5 (CTAF) 288.1 128.25 (8R/26L)	GND CON 124.4	CLNC DEL 124.4	UNICOM 122.85
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SW-3,17 MAR 2005

SW-3,17 MAR 2005

# Instrument Approach Procedures



SAN DIEGO, CALIFORNIA  
Orig 05020

32°34'N-116°59'W

SAN DIEGO/BROWN FIELD MUNI (SDM)  
GPS RWY 8L



# Controller Information

- Aware of terrain east of Brown Field
- Aware of cloud ceiling
- Did not distinguish between day or night VFR operations
- Stated he was on landline with Tijuana approach during MSAW alerts



# Air Traffic Control Procedures

- VFR aircraft unable to climb to minimum IFR altitude
  - Ask if able to maintain terrain clearance
  - Do not assign (or imply) specific course guidance below minimum altitudes
- Issue safety alert if aircraft is in unsafe proximity to terrain

# Safety Improvements - ATI Jet

- ATI Jet maintains operational control of Part 135 and Part 91 legs
- No VFR departures at night without company approval
- Moving map approach plates



# Safety Improvements - FAA

- All aircraft equipped with TAWS
- Brown tower frequency switching to approach control at night
- Airport/Facility Directory includes terrain information

SAN DIEGO, CALIFORNIA

AI-5814 (FAA)

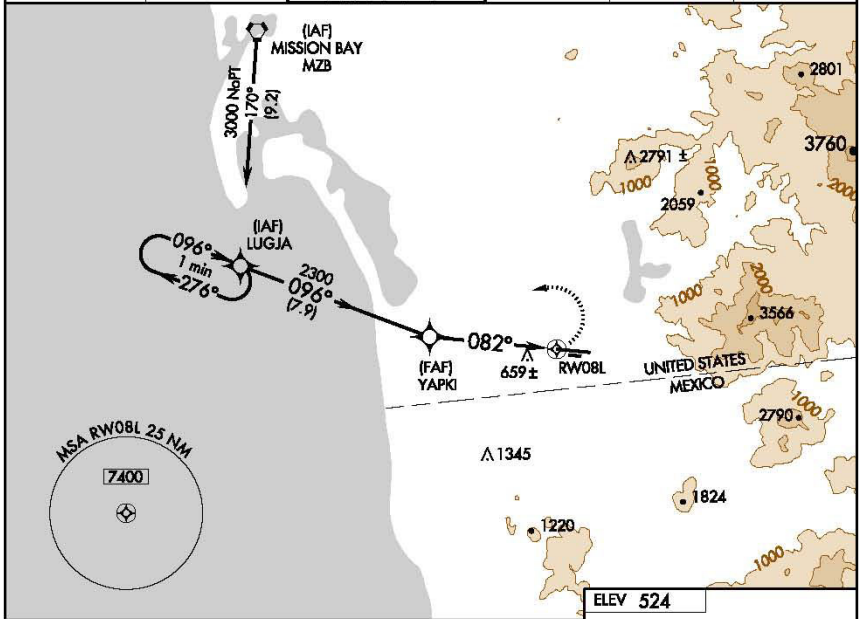
APP CRS 082°  
 Rwy ldg 7972  
 TDZE 524  
 Apt Elev 524

**GPS RWY 8L**

SAN DIEGO/ BROWN FIELD MUNI (SDM)

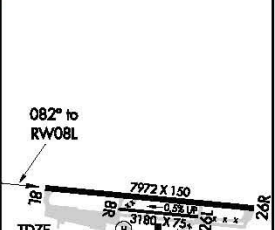
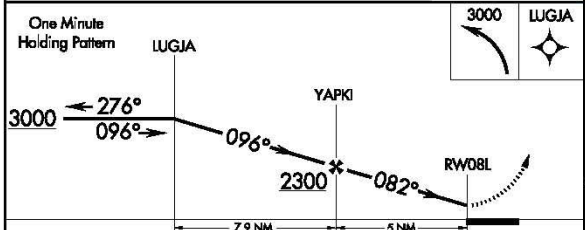
When local altimeter setting not received, use San Diego Intl altimeter setting.  
 MISSED APPROACH: Climbing left turn to 3000 direct LUGJA WP and hold.

ATIS 132.35	SOCAL APP CON 124.35 381.5	BROWN TOWER* 126.5 (CTAF) 288.1 128.25 (BR/26L)	GND CON 124.4	CINC DEL 124.4	UNICOM 122.85
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SW-3, 22 DEC 2005 to 19 JAN 2006

SW-3, 22 DEC 2005 to 19 JAN 2006



CATEGORY	A	B	C	D
S-8L	920-1 396 (400-1)		920-1¼ 396 (400-1¼)	
CIRCLING	1040-1	516 (600-1)	1040-1½ 516 (600-1½)	1080-2 556 (600-2)
SAN DIEGO INTL ALTIMETER SETTING MINIMUMS				
S-8L	1020-1	496 (500-1)	1020-1¼ 496 (500-1¼)	1020-1½ 496 (500-1½)
CIRCLING	1160-1	636 (700-1)	1160-1¾ 636 (700-1¾)	1180-2 656 (700-2)

SAN DIEGO, CALIFORNIA  
 Orig 05244

32°34'N-116°59'W

SAN DIEGO/ BROWN FIELD MUNI (SDM)  
**GPS RWY 8L**



# Parties to the Investigation

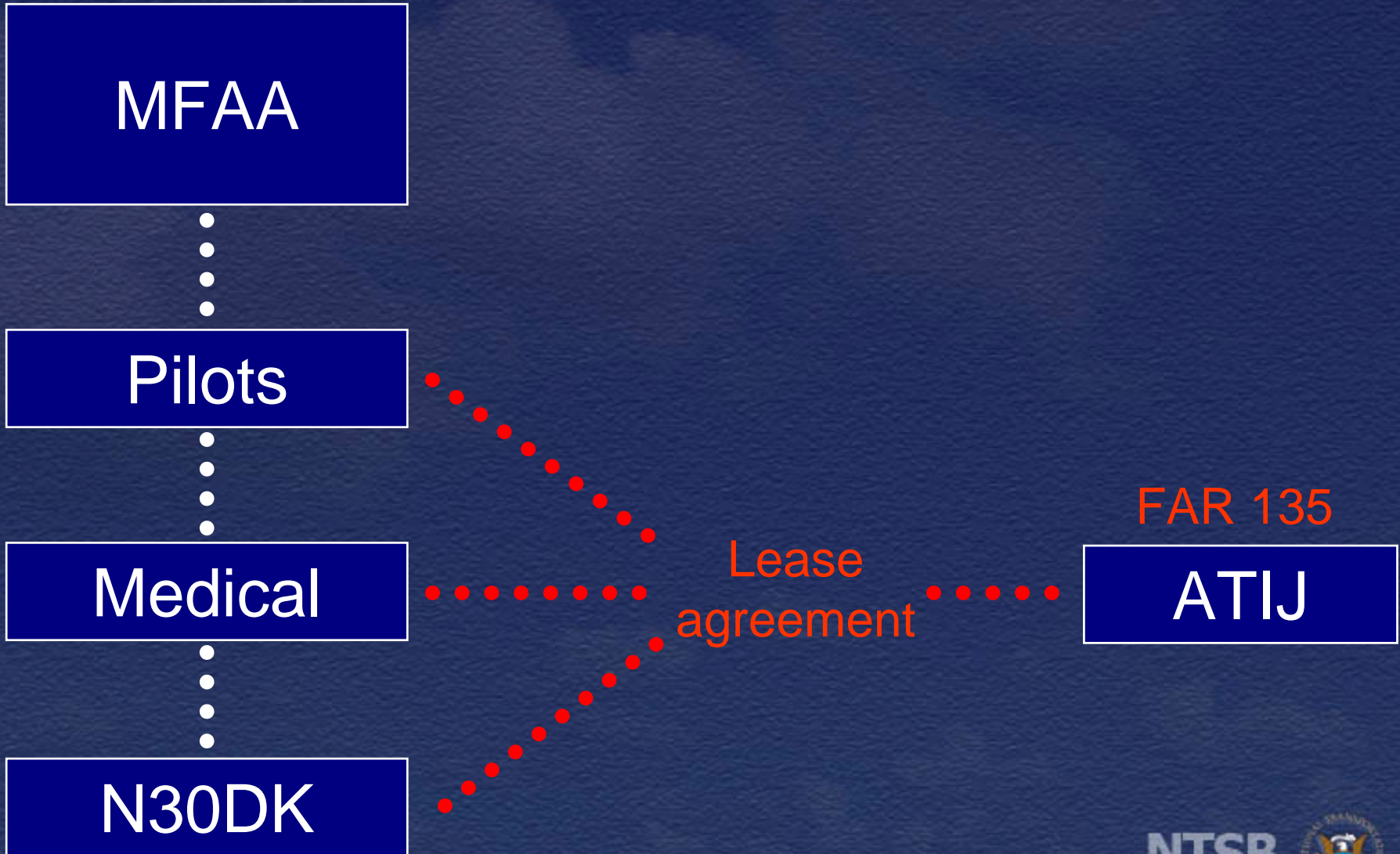
- Federal Aviation Administration
- Med Flight Air Ambulance
- Learjet (Bombardier)
- Honeywell



**NTSB**



# Organizational Chart





**NTSB**