National Transportation Safety Board **FACTUAL REPORT** **AVIATION**	NTSB ID: LAX98FA106	Aircraft Registration Number: N257NW
	Occurrence Date: 03/05/98	Most Critical Injury: FATAL
	Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone	
NOVATO	CA	94947	1905	PST	
Accident Location: Off Airport	Distance From Landing Facility: UNK/NA		Direction From Airport: UNK/NA		

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
Piper	PA-31-350	Airplane

Sightseeing Flight: No **Air Medical Transport Flight:** No

Narrative

Brief narrative statement of facts, conditions, and circumstances pertinent to the accident/incident:

HISTORY OF FLIGHT

On March 5, 1998, about 1905 hours Pacific standard time, Airpac Flight 263, a Piper PA-31-350, N275NW, collided with trees and terrain near Novato, California. The aircraft was destroyed and the airline transport rated pilot, the sole occupant, received fatal injuries. The aircraft was being operated by Airpac Airlines, Inc., as a positioning flight under 14 CFR Part 91 when the accident occurred. The aircraft departed Santa Rosa, California, at 1848. Marginal visual meteorological conditions prevailed at the departure airport and no flight plan was filed.

The airplane was part of a flight of two company aircraft that departed the Sonoma County airport en route to the Oakland Metropolitan International airport. Airpac Flight 1961 was in the lead and Airpac Flight 263 was in trail, about 1 minute behind. The pilot of Flight 1961 stated that they were both navigating by a combination of dead reckoning and pilotage. They both had VOR navigation aids on their routes of flight that could be used to verify their positions and monitor progress.

During the flight, the pilot of Flight 1961 radioed the pilot of Flight 263 and asked about her progress. She reported that she was "still back here." Later, while he was about 20 miles north of the Oakland airport, he began to encounter instrument meteorological conditions. He called to advise the accident pilot, but this time he was not successful in establishing radio contact. Flight 1961 landed at the Oakland airport at 1920.

When Flight 263 did not arrive, the flight was reported overdue and a missing aircraft report was issued. At 0148 on March 6, a U.S. Coast Guard search and rescue helicopter, homing on an ELT signal, located the wreckage near the northern crest of a hill. The accident site was approximately 1,500-feet mean sea level (msl), about 40 miles north of San Francisco.

The pilot of Flight 1961 reported that the accident site was about 5 miles west of the route that Airpac pilots routinely flew between Santa Rosa and Oakland. While the westerly route is a more direct course to Oakland, it does, however, cross higher terrain. The pilot of Flight 1961 also reported that during the flight he found it necessary to descend between 1,200 and 1,500 feet msl in order to maintain VFR conditions.

PILOT INFORMATION

The chief pilot reported that the pilot had flown between Santa Rosa and Oakland 2 to 3 times a week for

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Narrative (Continued)

the past 2 years. A review of her training records showed a Part 135 check dated September 19, 1997, and revealed that she had successfully passed a flight check in the aircraft and route flown as single pilot IFR. No training deficiencies or weaknesses were recorded in her file.

On the evening of the accident, she was scheduled to give a speech as her final examination in an evening college course. She had informed the instructor that she might be late, and had been told that he could not hold the class past its scheduled dismissal time to accommodate her late arrival.

AIRCRAFT INFORMATION

Both altimeters on the accident aircraft were set to 29.69 inHg. The current altimeter setting at 1850 at the departure airport was 29.78 inHg. Since each .01 equals 10 feet, an error of this magnitude and direction would cause the altimeter to indicate that the aircraft was 90 feet higher than it would be with the current setting.

The aircraft records reflected a current pitot-static system check.

The aircraft had last been refueled on the day of the accident. The fuel log shows that it was filled with 92.8 gallons of 100LL aviation fuel by truck No. 2 at the Hayward Jet Center, Hayward Air Terminal, Hayward, California. The operator estimated that 70 gallons were onboard at the time of the accident.

METEOROLOGICAL CONDITIONS

The 2100 surface analysis chart showed a low pressure approaching the coast from the west. The 1904 Weather Surveillance Radar showed returns of 5 to 25 dBZ or video integrator processor (VIP) level 1 thunderstorm (weakest of 5 levels). At the time of the accident, Napa (APA) the nearest reporting station, reported a 1,300-foot broken ceiling with 5- to 6-mile visibility in light rain and mist.

Sun and moon illumination tables for the time and location of the accident reported nautical twilight with 58 percent moon illumination at an altitude of 69.3 degrees above the horizon.

AIDS TO NAVAGATION

The navigation radios, NAV 1 and 2, were set to 116.80 and 116.60. Oakland visual omni range tactical air navigation (VORTAC) is 116.80; however, 116.60 does not correlate to any very high frequency (VHF) navigational aid in the area. The omni bearing selector (OBS) settings were destroyed on both NAV radios.

The automatic direction finder (ADF) was set to 341 which is the frequency for the RORAY nondirectional beacon (NDB) locator middle marker (LMM). RORAY is associated with the OAK instrument lading system (ILS) 27R approach.

These NAVAIDS were reported to have been in service at the time of the accident. The aircraft maintenance records indicated that all navigation radios were serviceable.

COMMUNICATIONS

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Narrative (Continued)

The only radio communication reported from the accident pilot was in response to a request for an en route progress check from the pilot of Flight 1961.

The communication radios, COM 1 and 2, were set to the Sonoma County airport tower frequency and the company frequency, respectively.

The pilot had last used the Sonoma County tower frequency on her departure and the company frequency while en route. The aircraft maintenance records indicated that both communication radios were serviceable.

WRECKAGE AND IMPACT INFORMATION

The accident site was located in an area of fully-grown oak trees. The geographic location was 38 degrees 9.19 minutes east latitude and 122 degrees 35.48 minutes west longitude, about the 1,500-foot level of Mount Burdell. The wreckage distribution was along a bearing of 144 degrees and extended about 300 feet from the initial point of impact to the main wreckage. A survey of the debris field revealed that all of the major flight control components were present at the accident site.

The trees on the northwest end of the accident site exhibited a series of broken limbs of up to 10 inches in diameter. The width of the initial swath through the trees was consistent with the tip-to-tip wingspan of the aircraft.

A section of the left wing was found to the left side of the swath near the initial impact point. The aileron was attached and the counterweight was in place. The wing had separated outboard of the fuel tank near the outboard flap hinge.

On the right side of the swath a section of the right wing was found, also near the initial impact point. The section was 3 feet in length measured inboard from the wingtip. A few feet beyond another section of the right wing with the right fuel tank and outboard engine nacelle were found.

The empennage was located about 50 feet beyond the initial impact point. Found nearby was one blade from the left propeller, two propeller hub springs, a "do not push" placard, and a section of burned wing tank with the fuel sender float still attached. Although the tank was sooted, the metal structure did not exhibit any evidence of heat distress.

The majority of the right horizontal stabilizer remained attached to empennage with the elevator and trim tab in place. The major portion vertical and rudder also remained attached and exhibited leading edge crushing. The upper section of the vertical and rudder had separated. A portion of the left horizontal and elevator remained attached to the empennage. The left horizontal had separated about 2 feet outboard of the tip. At the point of separation the spar was bent aft.

The next 5 feet of the left wing contained the left main landing gear assembly in the "up" position. Wing walk material partially covered the upper skin.

The cabin and fuselage section came to rest inverted about 75 feet forward of the tail section. It exhibited extensive crushing and fragmentation. Numerous fragments could be seen along the debris path extending forward from the tail section. Evidence of a ground fire was found that had consumed portions of the

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Narrative (Continued)

remaining structure.

The throttle, mixture, and propeller levers were found in the aft position. The electronic trim indicators were both at bottom of their scales. The fuel control panel was still attached to the cabin. The left selector was found in the "inboard" tank position, the right fuel lever was found between the "off" and "inboard" tank detents, and the cross-feed valve was found in the "off" position. Both cross-feed lockout levers were examined. The first lever was bent while the second was secure.

The electrical circuit panel had been destroyed by fire. The master switch was found in the "on" position.

A fuel gage cluster had separated from the aircraft and was in the debris path between the fuselage and the empennage. The left and right fuel gauges read about 0.5 to 0.75 full. The ammeter was reading about plus 5 amps.

The inboard section of the right wing with the engine nacelle still attached and right main landing gear partially extended was found leaning against a tree. The nacelle exhibited evidence of ground fire.

The left front seat was separated from the aircraft. The seat exhibited downward crushing and the seat back was bent aft. The seat belt was attached to the seat frame although the webbing was distorted and torn. The shoulder harness was separated about 6 inches from the buckle. The webbing was torn, stretched, and distorted at the point of separation.

The right seat was also separated from the aircraft. The shoulder harness did not appear stretched or distorted.

The left engine was separated from the airframe and was found on the left side of the primary debris path. The accessories, baffles, propeller, and induction system had separated from the case, although portions of the exhaust system were still attached. There was no evidence of catastrophic mechanical malfunction/separation. The No. 2 cylinder rocker box casting was damaged and the two valves were protruding from their respective ports without support.

An attempt to hand-rotate the crankshaft was unsuccessful. The rocker covers from the No. 1, 3, 5, 4, and 6 cylinders were removed to examine the rocker assemblies. The cavities were free of foreign debris and showed indications of lubrication.

The turbocharger impellers and spark plug electrodes were undamaged.

The propeller governor was separated from the engine and exhibited fractures at the point it separated from its mounting pad. Control system continuity could not be determined. The gasket and screen were destroyed.

The single drive magneto was separated from the engine and exhibited fractures in the area of its mounting lobes. The engine timing could not be determined and the magneto could not be tested. The drive was saftied and secure.

The fuel injection servo remained attached to its mounting pad on the plenum casting. The plenum, itself,

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Narrative (Continued)

exhibited multiple fractures. Control continuity could not be determined. The throttle and mixture control cables were severed but the rodends were still attached to the servo arms.

The injector nozzles were present at each cylinder but exhibited evidence of impact damage.

The engine-driven fuel pump remained attached to its mounting pad that itself had separated from the accessory section.

The exhaust system showed evidence of crushing and bending. The pipes remained attached at each cylinder and the clamps were snuggly attached. The exhaust bypass valve was undamaged. The differential controller was destroyed. The exhaust system gas path coloration was unremarkable.

The left 3-bladed constant speed propeller was found along the left side of the debris path with 1 blade detached. The separated blade was found in the vicinity of the initial impact point. The propeller was separated from the engine and the propeller hub was fractured. A portion of the hub remained attached to the crankshaft flange. All three blades were equipped with de-icing boots.

The right engine was separated from the airframe and was also found on the left side of the primary debris path. The accessories, baffles, propeller, and the complete induction system had separated from the case. The engine case still had portions of the exhaust system attached. The case was separated near the front exposing the crankshaft, camshaft, and connecting rods for the forward cylinders. The camshaft was separated aft of the No. 2 cylinder exhaust lobe. The No. 1 cylinder exhibited impact damage and was partially displaced. The No. 6 cylinder exhibited impact damage in the area of the rocker box casting. There was no evidence catastrophic mechanical malfunction.

An attempt to hand-rotate the crankshaft was unsuccessful. The rocker covers from the No. 1, 3, 5, 2, and 4 were removed to examine the rocker assemblies. The cavities were free of foreign debris and showed indications of lubrication.

The turbocharger impellers and spark plug electrodes were undamaged.

The propeller governor was separated from the engine and exhibited fractures at the point it separated from its mounting pad. Control system continuity could not be determined. The gasket and screen were destroyed.

The single drive magneto was separated from the engine and was destroyed. The engine timing could not be determined and the magneto could not be tested. The drive was saftied and secure.

The fuel injection servo was separated from the engine and had been destroyed. The data plate was missing and was not recovered. Control continuity could not be determined. The throttle and mixture control cables were severed and the control arms were detached.

The injector nozzles were present at each cylinder but exhibited evidence of impact damage. The engine driven fuel pump was not recovered.

The exhaust system showed evidence of crushing and bending. The pipes remained attached at each

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Narrative (Continued)

cylinder but were distorted. The clamps were secure at each location. The exhaust bypass valve was undamaged. The differential controller was destroyed. The exhaust system gas path coloration was unremarkable.

The right 3-bladed constant speed propeller was found near the main fuselage with all 3 blades attached to the hub. The propeller was separated from the engine and the propeller hub was fractured. A portion of the hub remained attached to the crankshaft flange. All three blades were equipped with de-icing boots.

The three blades exhibited various combinations of S-bending, torsional twisting, midspan bending and curling with leading and trailing edge damage. Of the three blades, two were turned in the hub while one was found at low pitch.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was conducted on March 6, 1998, by the Marin County Coroner's Office, with specimens retained for toxicological examination. The toxicological tests were negative for alcohol and all screened drug substances.

FIRE

Evidence of ground fire was found most notably in the area of the right wing and fuselage.

TESTS AND RESEARCH

Utilizing radar data provided Federal Aviation Administration Quality Assurance office a radar plot was generated depicting profile altitude and distance information. Radar data showed the aircraft as it departed Santa Rosa and climbed to about 2,000 feet msl. It maintained 2,000 feet plus or minus 100 feet until beginning a descent. The last three returns showed the aircraft in a descent from to 2,000 feet until radar contact was lost about 1,500 feet msl. During the last three returns, the aircraft traveled about 1.94 nautical miles. Radar returns are sequenced once every 12 seconds.

ADDITIONAL INFORMATION

The aircraft wreckage was released to Peter Gordon of the Thomas Howell Group, a representative of the registered owner on April 21, 1998.

National Transportation Safety Board **FACTUAL REPORT AVIATION**	NTSB ID: LAX98FA106 Occurrence Date: 03/05/98 Occurrence Type: Accident	

Landing Facility/Approach Information

Airport Name	Airport ID	Airport Elevation	Runway Used	Runway Length	Runway Width
UNK/NA	U/NA	U/NA Ft. MSL	UNK/NA	UNK/NA	UNK/NA

Runway Surface Type: UNK/NA

Runway Surface Condition :	UNK/NA			
Type Instrument Approach :	UNK/NA			
VFR Approach/Landing :	UNK/NA			

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
Piper	PA-31-350	31-7952014

Airworthiness Certificate :	Normal			
Landing Gear Type :	Tricycle-Retractable			

Homebuilt Aircraft? No	Number of Seats: 2	Certified Max Gross Wt.	Number of Engines
Stall Warning System Installed? Yes		7045 LBS	2

Engine Type	Engine Manufacturer	Model/Series	Rated Power
Recip-Fuel Injected	Lycoming	TIO-540-J2BD	350 HP

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
AAIP	02/12/98	3 Hours	6881 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?	ELT Operated?	ELT Aided in Locating Accident Site?
Yes	Yes	Yes

Owner/Operator Information

Registered Aircraft Owner	Street Address		
AIRPAC AIRLINES, INC.	7277 PERIMETER ROAD SOUTH		
	City	State	Zip Code
	SEATTLE	WA	98108

Operator of Aircraft	Street Address		
Same As Reg'd Aircraft Owner	Same as Registered Aircraft Owner		
	City	State	Zip Code

Operator Does Business As:

Operator Designator Code: APCA

- Type of Certificate(s) Held:

Air Carrier Operating Certificate :	On-Demand Taxi		

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: 14 CFR 91

Type of Flight Operation Conducted: Positioning

National Transportation Safety Board **FACTUAL REPORT** **AVIATION**	NTSB ID: LAX98FA106 Occurrence Date: 03/05/98 Occurrence Type: Accident	

First Pilot Information

Name	City	State	Date of Birth	Age
ISABELLE ARSONNEAU	ALAMEDA	CA	04/09/64	33

Sex: F	Seat Occupied: Left	Principal Profession: Pilot-Civilian	Certificate Number: 2473046

Certificate(s) :	Commercial	ATP			
Airplane Rating(s) :	SE Land	ME Land			
Rotorcraft/Glider/LTA :	None				
Instrument Rating(s) :	Airplane				
Instructor Rating(s) :	SE Airplane	ME Airplane	Instrument		

Type Rating Endorsement for Accident/Incident Aircraft? UNK/NA	Current Biennial Flight Review? Yes		
Months Since Last BFR: 7	BFR Aircraft Make: PIPER	BFR Aircraft Model: PA-31	Medical Certificate: Class 1 Date of Last Medical Exam: 08/05/97
Medical Certificate Status: Valid Medical-No Waivers/Limitations			
Source of Pilot Flight Time Information :	FAA	Pilot Rpt	

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	4300									
Pilot In Command (PIC)										
Instructor										
Last 90 Days	63	19		63						
Last 30 Days	23	10		23						
Last 24 Hours	1	1		1						

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Autopsy Performed? Yes	Toxicology Performed? Yes
Person at Controls of Aircraft at Time of Accident/Incident: First Pilot			Second Pilot? No

Flight Plan/Itinerary

Type of Flight Plan Filed: None				
Departure Point SANTA ROSA	State CA	Airport Identifier STS	Departure Time 1850	Time Zone PST
Destination OAKLAND	State CA	Airport Identifier OAK		

Type of Clearance :	None		
Type of Airspace :	Class G		

Weather Information

Source of Briefing :	UNK/NA			
Method of Briefing :	UNK/NA			

National Transportation Safety Board **FACTUAL REPORT** **AVIATION**	NTSB ID: LAX98FA106 Occurrence Date: 03/05/98 Occurrence Type: Accident	

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
STS	1950	PST	125 Ft. MSL	24 NM	317 Deg. Mag.

Sky/Lowest Cloud Condition: Ft. AGL		Condition of Light: Dusk
Lowest Ceiling: Broken 3000 Ft. AGL	Visibility: 5 SM	Altimeter: 29.79 "Hg
Temperature: 42 F	Dew Point: 41 F	Wind Direction: 330
Density Altitude: UNK/NA Ft.		
Wind Speed: 5	Gusts: None	Weather Conditions at Accident Site: Instrument Conditions
Visibility (RVR): Ft.	Visibility (RVV) SM	Intensity of Precipitation:
Restrictions to Visibility :	None	
Type of Precipitation :	None	

Accident Information

Aircraft Damage: Destroyed	Aircraft Fire: On Ground	Aircraft Explosion: None

Classification: US Registered on US Soil, Territories or Possessions, or Intl Waters

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot	1				1
Second Pilot					
Dual Student					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers					
TOTAL ABOARD	1				1
Other Aircraft					
Other Ground					
GRAND TOTAL	1				1

National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: LAX98FA106 Occurrence Date: 03/05/98 Occurrence Type: Accident	

Administrative Information

Investigator-In-Charge (IIC)

ROBERT R. CRISPIN

Additional Persons Participating in This Accident/Incident Investigation:

RICHARD M. BROWN
WP-OAK-FSDO
OAKLAND CA 94621

MARK W. PLATT
TEXTRON LYCOMING
VAN NUYS CA 91406

CHARLES R. LITTLE
PIPER AIRCRAFT
CHINO HILLS CA 91709

National Transportation Safety Board
Supporting Documentation File Contents

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National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB Accident/Incident Number: LAX98FA106

Supplement A
— Wreckage Documentation, Single and Twin Reciprocating Engine and Unpowered Aircraft

1 Engine #1 Serial No.	2 Engine #2 Serial No.	3 Supercharger Installed	4 Turbocharger Installed	5. Propeller Manufacturer	6 Propeller Model/Series
RL-9570-61A	RL-1400-68A	1 ☐ Yes 2 ☒ No	1 ☒ Yes 2 ☐ No	Hartzell	HCE3YR-2ATF
A Other ____	A Other ____	A Other ____	A Other ____	A Other ____	A Other ____

7 Propeller Type (Multiple Entry)

1 ☐ Wood
2 ☒ Metal
3 ☐ Composite
4 ☐ Constant speed controllable pitch
5 ☐ Ground adjustable/variable pitch
6 ☐ Reversible
7 ☐ Full automatic Feathering
8 ☒ Full manual feathering
A Other ____

8 Aircraft STOL Modification Installed

1 ☐ Yes
2 ☒ No
A Other ____

Landing Gear Positions (If fixed gear, go to block 12)	9 Nose/Tail	10 Left Main	11 Right Main	For Rotorcraft or Balloon accidents, go to block 20
	1 ☒ Up 2 ☐ Down 3. ☐ Intermediate A Other ____	1 ☒ Up 2 ☐ Down 3. ☐ Intermediate A Other ____	1 ☒ Up 2 ☐ Down 3. ☐ Intermediate A Other ____	

Control Surface Positions	12 Left Trailing Edge Flap	13 Right Trailing Edge Flap	14 Speed Brake	15 Spoiler
	1 ☒ Up A Extended ____ deg. B Other ____	1 ☒ Up A Extended ____ deg. B Other ____	1 ☒ Not Installed 2 ☐ Stowed 3 ☐ Deployed A Other ____	1 ☒ Not Installed 2 ☐ Stowed 3 ☐ Deployed 4 ☐ Deployed Asymmetrically A Other ____

Trim Tab Positions (Multiple Entry)	16 Left Aileron	17 Right Aileron	18 Rudder	19 Elevator/Stabilator/ Ruddervator
	1 ☐ Not Installed 2 ☐ Neutral 3 ☐ Up 4 ☐ Down A ____degrees B Other Destroyed	1 ☐ Not Installed 2 ☐ Neutral 3 ☐ Up 4 ☐ Down A ____degrees B Other Destroyed	1 ☐ Not Installed 2 ☒ Neutral 3 ☐ Up 4 ☐ Down A .5degrees B Other ____	1 ☐ Not Installed 2 ☒ Neutral 3 ☐ Up 4 ☐ Down A 0 degrees B Other ____

Cargo Restraint Systems	20 Cargo Restraint Installed (Multiple entry)	21 Cargo Restraint Used (Multiple entry)	22 Cargo Restraint Failed (Multiple entry)
	1 ☐ None (Go to block 26) 2 ☒ Cargo net 3 ☐ Straps/tie down A Other ____	1 ☒ None (Go to block 26) 2 ☐ Cargo net 3 ☐ Straps/tie down A Other ____	1 ☒ None (Go to block 26) 2 ☐ Cargo net 3 ☐ Straps/tie down A Other ____

Computed Weight and Balance Information—

Complete when weight and/or center of gravity limitations are exceeded on accident flight. (Otherwise go to block 32)

Takeoff

26 Weight	27 Center of Gravity	28 CG Range (Multiple entry)
____ Lbs.	A ____ % MAC or B ____ inches	1 ☐ At takeoff weight 2 ☐ At max gross weight A ____ % MAC to ____ % MAC or B ____ inches to ____ inches

Accident

29 Weight	30 Center of Gravity	31 CG Range (Multiple entry)	32 Fuel On Board At Accident
____ Lbs.	A ____ % MAC or B ____ inches	1 ☐ At takeoff weight A ____ % MAC to ____ % MAC or 2 ☐ At max gross weight B ____ inches to ____ inches	1 ☒ Estimated 2 ☐ Verified A Total Gallons 70 B Other ____

National Transportation Safety Board
FACTUAL REPORT
AVIATION

NTSB Accident/Incident Number: LAX98FA106

Supplement A — Wreckage Documentation, Single and Twin Reciprocating Engine and Unpowered Aircraft (Continued)

Fuel Tanks	Fuel on Board at Accident			D Tank Construction				F Spillsafe Fittings			H Fuel Leakage/Rupture				
	A Gallons Estimated	B Gallons Verified	C Other	1 Wet Wing	2 Bladder	3 Metal	E Other	1 Yes	2 No	G Other	1 None	2 Line	3 Fitting	4 Tank	I Other
33 Left Wing	30			☐	☒	☐		☐	☒		☐	☒	☒	☒	
34 Right Wing	30			☐	☒	☐		☐	☒		☐	☒	☒	☒	
35 Left Tip	5			☐	☒	☐		☐	☒		☐	☒	☒	☒	
36 Right Tip	5			☐	☒	☐		☐	☒		☐	☒	☒	☒	
37 Fuselage				☐	☐	☐		☐	☐		☐	☐	☐	☐	
38 *(Specify)*				☐	☐	☐		☐	☐		☐	☐	☐	☐	

41 Fuel Found in #1 Engine (Multiple entry)

1 ☐ None
2 ☐ Lines
3 ☐ Gascolator/strainer
4 ☐ Carburetor/Fuel Injector
5 ☐ Engine driven pump
6 ☒ Auxiliary fuel pump
7 ☐ Filter(s)
8 ☒ Selector Valve
9 ☐ Fuel manifold/spider
10 ☐ Accumulator Tank
A Other ____

41 Fuel Found in #2 Engine (Multiple entry)

1 ☐ None
2 ☐ Lines
3 ☐ Gascolator/strainer
4 ☐ Carburetor/Fuel Injector
5 ☐ Engine driven pump
6 ☒ Auxiliary fuel pump
7 ☐ Filter(s)
8 ☒ Selector Valve
9 ☐ Fuel manifold/spider
10 ☐ Accumulator Tank
A Other ____

43 Flight Controls, Evidence of Operational Failure or Malfunction (Multiple entry)

1 ☒ None
2 ☐ Pitch Control
3 ☐ Roll Control
4 ☐ Yaw Control
A Other ____

44 Airframe/Structure, Evidence of In-Flight Separation/Failure ((Multiple entry)

1 ☒ None
2 ☐ Helicopter (Complete Supp. G)
3 ☐ General disintegration
4 ☐ Left wing
5 ☐ Right wing
6 ☐ Left stab/elevator
7 ☐ Right stab/elevator
8 ☐ Vertical fin/rudder
9 ☐ Canard
10 ☐ Powerplant
11 ☐ Cabin/cargo door
A Other ____

45 Propeller, Evidence of In-Fight Separation/Failure

1 ☐ Yes
2 ☒ No
A Other ____

46 Powerplant, Evidence of In-Flight Malfunction

1 ☐ Yes
2 ☒ No
A Other ____

47 Fuel, Evidence of Improper Grade or Contamination (Multiple Entry)

1 ☒ None
2 ☐ Improper grade
3 ☐ Contamination
A Other ____

48 Oil, Evidence of Improper Grade or Contamination (Multiple entry)

1 ☒ None
2 ☐ Improper grade
3 ☐ Contamination
A Other ____

Emergency Locator Transmitter (ELT) Information

51 ELT Manufacturer

Narco

A Other ____

52 ELT Model

ELT 10

A Other ____

55 Preimpact ELT Location(s) (Multiple entry)

1 ☐ Cockpit
2 ☐ Cabin
3 ☒ Tailcone
4 ☐ Empennage
5 ☐ Raft
6 ☐ Survival Kit
A Other ____

53 ELT Battery Type

1 ☒ Alkaline
2 ☐ Cadmium
3 ☐ Nicad
4 ☐ Nickel
5 ☐ Lithium
A Other ____

54 ELT Battery Expiration Date (Nos for M,D,Y)

July 31, 1999

A Other ____

56 ELT — Reason for Noneffectiveness/Failure (Multiple entry)

1 ☒ Operated effectively
2 ☐ Insufficient G's
3 ☐ Improper installation
4 ☐ Battery dead
5 ☐ Battery corroded
6 ☐ Battery installation incorrect
7 ☐ Incorrect battery
8 ☐ Fire damage
9 ☐ Impact damage
10 ☐ Antenna broken/disconnected
11 ☐ Water submersion
12 ☐ Unit not armed
13 ☐ Shielded by wreckage
14 ☐ Shielded by terrain
15 ☐ Internal failure
16 ☐ Test satisfactorily after accident
17 ☐ Signal direction altered by terrain
18 ☐ Packing device still installed
19 ☐ Remote switch off
A Other ____

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Supplement B — Cockpit Documentation, Single and Twin Reciprocating Engine and Unpowered Aircraft

1 Cockpit Secured, Readings Not Pertinent 1 ☐ Yes (Go to block 3)

2 Cockpit/Instrument Panel Destroyed 1 ☒ Yes (Go to block 3)

Cockpit Instrument Indications — Enter direct in appropriate category

Flight Instruments

Item	Reading/Setting
Altimeter	29.69"
Standby Altimeter	29.69", 2,440 Feet
Airspeed	140 Kts
Hsi	135 Degrees
Rmi	350 Degrees

Engine/System Instruments

Item	Reading/Setting
Left Tachometer	1,100 Rpm
Right Tachometer	400 Rpm
Left Main Fuel Gauge	1/2
Right Main Fuel Gauge	1/2

Comm/Nav Equipment

Item	Frequency/Remark
Com #1	118.50
Nav #1	116.80
Com #2	128.90
Nav #2	116.60
Adf	341

Miscellaneous

Item	Remark
Clock	3:30

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Supplement B — Cockpit Documentation, Single and Twin Reciprocating Engine and Unpowered Aircraft (Continued)

3 Navigational Equipment/Displays Installed (Multiple entry)
- 1 ☒ OMNI Head(s)
- 2 ☒ Glide slope
- 3 ☒ HSI
- 4 ☐ Flight Director
- 5 ☐ RMI
- 6 ☒ RNAV
- 7 ☐ LORAN/Omega/INS
- 8 ☒ DME
- 9 ☒ ADF
- 10 ☒ Marker beacons
- A Other ____

4 Autopilot
- 1 ☐ Not Installed
- 2 ☐ Engaged
- 3 ☐ Not Engaged
- A Other Destroyed

5 Digital Electronic/ Nav/Com Displays
- 1 ☐ Not Installed
- 2 ☒ Installed
- A Other ____

6 Primary Altimeter Type
- 1 ☐ Counter-pointer
- 2 ☐ Drum-pointer
- 3 ☒ 3-pointer
- 4 ☐ 2-pointer
- A Other ____

7 Standby Altimeter Installed
- 1 ☒ Yes
- 2 ☐ No
- A Other ____

8 Radar Altimeter Installed
- 1 ☒ Yes
- 2 ☐ No
- A Other ____

9 Transponder
- 1 ☐ Not Installed
- 2 ☐ Installed - not used
- 3 ☐ Installed - used
- 4 ☒ Installed - used - Altitude encoding
- A Other ____

10 Attitude Indicator Installed
- 1 ☒ Yes
- 2 ☐ No
- A Other ____

11 Attitude Indicator Power Source (Multiple entry)
- 1 ☒ Pressure/vacuum system
- 2 ☐ Pressure/vacuum system - with backup power source
- 3 ☐ Electrical
- 4 ☐ Standby indicator with alternate power source
- A Other ____

12 Type of Stall Warning Indicator
- 1 ☐ None
- 2 ☐ Visual/light
- 3 ☐ Visual/gauge
- 4 ☒ Aural
- 5 ☐ Stick shaker
- A Other ____

13 Weather Radar/Detection Equipment
- 1 ☒ Not Installed
- 2 ☐ Installed – on
- 3 ☐ Installed – off
- 4 ☐ Installed, on/off unknown
- A Other ____

14 Type Weather Radar/Detection Equipment (Multiple entry)
1 ☐ Storm Scope 2 ☐ Black and white radar 3 ☐ Color radar A Other N/A

Electrical/System Switches

18 ☒ **Switches Destroyed/Inaccessible** (Go to block 56)
19 ☐ **Switch Positions Not Pertinent** (Go to block 56)

Switch/Item	1 Not Installed	2 On	3 Off	A Other	Pertinent Setting/Remark
20 Electrical Master	☐	☒	☐		
21 Battery	☐	☐	☐	Destroyed	
22 #1 Gen/Alternator	☐	☐	☐	Destroyed	
23 #2 Gen/Alternator	☐	☐	☐	Destroyed	
24 Inverter	☒	☐	☐		
25 Avionics Master	☐	☒	☐		
26 Pitot Heat	☐	☐	☐	Destroyed	
27 Ice Detection	☐	☐	☐	Destroyed	
28 Propeller Deice/Anti-ice	☐	☐	☐	Destroyed	
29 Windshield Deice	☒	☐	☐		
30 Windshield Anti-Ice	☐	☐	☐	Destroyed	
31 Airframe Deice	☐	☐	☐	Destroyed	
32 Cabin Air/Fan	☐	☐	☐	Destroyed	
33 Cabin Heater	☐	☐	☐	Destroyed	
34 Air Conditioning	☒	☐	☐		
36 Cabin Pressure Altitude	☒	☐	☐		
36 Cabin Pressure Temperature	☒	☐	☐		
37 Crew Oxygen	☒	☐	☐		
38 Cabin/Passenger Oxygen	☒	☐	☐		
39 Taxi Lights	☐	☐	☐	Destroyed	
40 Landing Lights	☐	☐	☐	Destroyed	
41 Rotating Beacon	☐	☐	☐	Destroyed	

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Supplement B — Cockpit Documentation, Single and Twin Reciprocating Engine and Unpowered Aircraft (Continued)

Electrical/System Switches (continued)

Switch/Item	1 Not Installed	2 On	3 Off	A Other	Pertinent Setting/Remark
42 Strobes	☐	☐	☐	Destroyed	
43 Navigation Lights	☐	☐	☐	Destroyed	
44 Instrument Panel Lights	☐	☐	☐	Destroyed	
45 Cockpit/Storm Lights	☐	☐	☐	Destroyed	
46 Cabin Lights	☐	☐	☐	Destroyed	
47 ELT Remote	☐	☐	☐	Destroyed	

Engine Controls-No. 1 Engine

48 ☐ Engine Control Positions Not Pertinent (Go to block 57)

49 Throttle Position
1 ☐ Not Installed
2 ☐ Full Forward
3 ☐ Midrange
4 ☒ Idle
A Other ____

50 Propeller
1 ☐ Not Installed
2 ☐ Full Increase (Low Pitch)
3 ☐ Midrange
4 ☒ Full Decrease
5 ☐ Feather
A Other ____

51 Mixture
1 ☐ Not Installed
2 ☐ Full Rich
3 ☐ Midrange
4 ☒ Idle Cutoff
A Other ____

52 Carburetor Heat
1 ☒ Not Installed
2 ☐ Full On
3 ☐ Partial
4 ☐ Off
A Other ____

53 Alternate Air
1 ☐ Not Installed
2 ☐ Open
3 ☐ Closed
4 ☐ Midrange
A Other Destroyed

54 Cowl Flaps
1 ☐ Not Installed
2 ☐ Open
3 ☐ Closed
4 ☐ Midrange
A Other Destroyed

55 Magneto Switch Position
1 ☐ Not Installed
2 ☐ Both
3 ☐ Left
4 ☐ Right
5 ☐ Off
6 ☐ Start
A Other Destroyed

56 Throttle Friction
1 ☐ Not Installed
2 ☐ Tight
3 ☐ Loose
A Other Destroyed

Engine Controls-No. 2 Engine

57 ☐ Engine Control Positions Not Pertinent (Go to block 57)

58 Throttle Position
1 ☐ Not Installed
2 ☐ Full Forward
3 ☐ Midrange
4 ☒ Idle
A Other ____

59 Propeller
1 ☐ Not Installed
2 ☐ Full Increase (Low Pitch)
3 ☐ Midrange
4 ☒ Full Decrease
5 ☐ Feather
A Other ____

60 Mixture
1 ☐ Not Installed
2 ☐ Full Rich
3 ☐ Midrange
4 ☒ Idle Cutoff
A Other ____

61 Carburetor Heat
1 ☒ Not Installed
2 ☐ Full On
3 ☐ Partial
4 ☐ Off
A Other ____

62 Alternate Air
1 ☐ Not Installed
2 ☐ Open
3 ☐ Closed
4 ☐ Midrange
A Other Destroyed

63 Cowl Flaps
1 ☐ Not Installed
2 ☐ Open
3 ☐ Closed
4 ☐ Midrange
A Other Destroyed

64 Magneto Switch Position
1 ☐ Not Installed
2 ☐ Both
3 ☐ Left
4 ☐ Right
5 ☐ Off
6 ☐ Start
A Other Destroyed

65 Throttle Friction
1 ☐ Not Installed
2 ☐ Tight
3 ☐ Loose
A Other Destroyed

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Supplement B — Cockpit Documentation, Single and Twin Reciprocating Engine and Unpowered Aircraft (Continued)

Landing Gear Controls/Indicators, Flight Controls/Indicators, and Fuel Selectors/Pumps

66 Landing Gear Control
1 ☐ Not Installed
2 ☐ Up
3 ☐ Down
4 ☐ Off
A Other Destroyed

67 Landing Gear Indicator
1 ☐ Not Installed
2 ☐ Up
3 ☐ Down
4 ☐ Transit/unsafe
A Other Destroyed

68 Trailing Edge Flap System
1 ☐ Not Installed
2 ☐ Manual
3 ☒ Electric
4 ☐ Hydraulic
A Other ____

69 Trailing Edge Flap Control
1 ☐ Not Installed
2 ☐ Up
A Down ____ degrees
B Other Destroyed

70 Trailing Edge Flap Indicator
1 ☐ Not Installed
2 ☐ Up
A Down ____ degrees
B Other Destroyed

71 Speed Brake Control
1 ☒ Not Installed
2 ☐ Stowed
3 ☐ Deployed
A Other ____

72 Spoiler Control
1 ☒ Not Installed
2 ☐ Stowed
3 ☐ Deployed
A Other ____

73 Dual Controls
1 ☐ Not Installed
2 ☒ Installed
A Other ____

74 Throwover Control/Yoke Position
1 ☒ Not Installed
2 ☐ Left
3 ☐ Right
4 ☐ Intermediate
A Other ____

75 Elev/Stab Trim Control (Multiple Entry)
1 ☐ Not Installed
2 ☒ Manual
3 ☒ Electric
A Other ____

76 Elev/Stab Trim Indicator
1 ☐ Not Installed
2 ☐ Up
3 ☐ Down
4 ☐ Neutral
A Other Destroyed

77 Aileron Trim Control
1 ☐ Not Installed
2 ☒ Manual
3 ☐ Electric
A Other ____

78 Aileron Trim Indicator
1 ☐ Not Installed
2 ☐ Left
3 ☐ Right
4 ☐ Neutral
A Other Destroyed

79 Rudder Trim Indicator
1 ☐ Not Installed
2 ☐ Left
3 ☐ Right
4 ☐ Neutral
A Other Destroyed

80 Fuel Selector Position(s) (Multiple entry)
1 ☒ Left main
2 ☐ Right main
3 ☐ Both
4 ☐ Left auxiliary
5 ☐ Right auxiliary
6 ☐ Center
7 ☐ Forward
8 ☐ Aft
9 ☐ External tank
10 ☒ Between tanks
11 ☐ X-feed left to right
12 ☐ X feed right to left
13 ☐ On-engine #1
14 ☐ Off-engine #1
15 ☐ On-engine #2
16 ☐ Off-engine #2
A Other ____

81 Fuel Boost Pump, Engine #1
1 ☐ Not Installed
2 ☐ On
3 ☐ High
4 ☐ Low
5 ☐ Off
A Other Destroyed

81 Fuel Boost Pump, Engine #2
1 ☐ Not Installed
2 ☐ On
3 ☐ High
4 ☐ Low
5 ☐ Off
A Other Destroyed

82 Fuel Transfer Pump
1 ☒ Not Installed
2 ☐ Off
A On (____ tank to ____ tank)
Other ____

83 Primer, Engine #1
1 ☒ Not Installed
2 ☐ Locked
3 ☐ Unlocked
A Other ____

84 Primer, Engine #2
1 ☒ Not Installed
2 ☐ Locked
3 ☐ Unlocked
A Other ____

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Supplement K — Occupant, Survival and Injury Information

1 Seat No.
A L/F
B If Seat Unknown Enter Persons Name
C Other ____

2 Position
1 ☒ Pilot in command
2 ☐ Second Pilot
3 ☐ Other Crewmember
4 ☐ Passenger
A Other ____

For non-survivable accident, go to block 36

3 Age
A ____ Yrs
B Under 24 mos. enter months
C Other ____

4 Height
____ Inches
A Other ____

5 Weight
____ Lbs
A Other ____

6 Injury Index
1 ☐ None
2 ☐ Minor
3 ☐ Serious
4 ☐ Fatal

7 Condition Prior to Accident
1 ☐ Smoker
2 ☐ Language difficulty
3 ☐ Pre-existing disease
4 ☐ Prosthesis
A Other ____

8 Physically Handicapped (Multiple entry)
1 ☐ No
2 ☐ Blind
3 ☐ Mobility impaired
4 ☐ Deaf
A Other ____

9 Seat Belt Adjustment
1 ☐ Not Fastened
2 ☐ Loose
3 ☐ Snug
4 ☐ Tight
5 ☐ Fastened-Tightness Unknown
6 ☐ Not Seated
7 ☐ Seat not equipped
A Other ____

9 Shoulder Harness Adjustment
1 ☐ Not Fastened
2 ☐ Loose
3 ☐ Snug
4 ☐ Tight
5 ☐ Fastened-Tightness Unknown
6 ☐ Seat not equipped
A Other ____

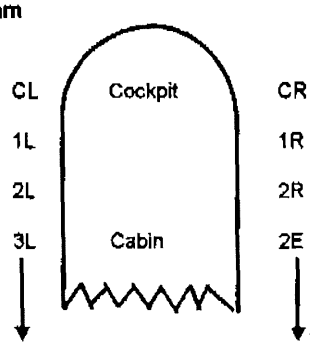
11 Knew Impact/Accident Coming
1 ☐ Yes
2 ☐ No
A Other ____

12 Braced for Impact
1 ☐ Yes
2 ☐ No
A Other ____

13 Direction of Movement at Impact
1 ☐ Forward
2 ☐ Rearward
3 ☐ Upward
4 ☐ Downwards
5 ☐ Left
6 ☐ Right
A Other ____

14 Exit Used
1 ☐ Did not escape
2 ☐ Split fuselage
A Exit number (use diagram)
B Other ____

Exit Diagram



Use Following codes for overhead hatches
Cockpit 99
Cabin 88
Tailcone 77

15 Escape Hampered by (Multiple entry)
1 ☐ Not Hampered
2 ☐ Smoke
3 ☐ Heat
4 ☐ Injuries
5 ☐ Trapped
6 ☐ Darkness
7 ☐ Debris
8 ☐ Disorientation
9 ☐ Difficulty Using Exit
A Specify
B Other ____

16 Briefed on Emergency Procedures (Multiple entry)
1 ☐ No
2 ☐ Before takeoff
3 ☐ Before impact/accident
A Other ____

17 Evacuation Aided by (Multiple entry)
1 ☐ Passenger
2 ☐ Crew
3 ☐ Bystander
4 ☐ CFR personnel
5 ☐ Unaided
A Other ____

18 Injured During Evacuation
1 ☐ Yes
2 ☐ No
A Other ____

Complete this section if oxygen was used.

21 Type of Equipment
1 ☐ Supplemental
2 ☐ Portable
A Other ____

22 Difficulty In Use
1 ☐ Yes
2 ☐ No
A Other ____

23 Type of Oxygen System
1 ☐ Solid state
2 ☐ Gaseous
A Specify
B Other ____

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Supplement K — Occupant, Survival and Injury Information (continued)

Complete this section for accidents involving fire — 24 ☐ No fire involved (Go to block 29)

25 Fire First Sighted (Location)
1 ☐ Inside aircraft
2 ☐ Outside aircraft
3 ☐ Both
A Other ____

26 Smoke Mask/Goggles Used (Multiple entry)
1 ☐ No
2 ☐ Yes
3 ☐ Both
4 ☐ Difficulty in use
A Other ____

27 Material of Clothes Worn (Multiple entry)
1 ☐ Synthetic
2 ☐ Nonsynthetic
3 ☐ Fire resistant
4 ☐ Mix-synthetic and nonsynthetic
A Other ____

28 Exposure to Heat/Fire (Multiple entry)
1 ☐ Head/face
2 ☐ Arm(s)
3 ☐ Hand(s)
4 ☐ Leg(s)
5 ☐ Torso
6 ☐ Feet
A Other ____

Complete this section for accidents involving ditching/water impact — 29 ☐ No water impact (Go to block 36)

Flotation Devices	A Available			C Used			E Familiar With Use			G Problems In Use			I Malfunctioned With Use			K Equipment Damage		
	1 Yes	2 No	B Other	1 Yes	2 No	D Other	1 Yes	2 No	F Other	1 Yes	2 No	H Other	1 Yes	2 No	J Other	1 Yes	2 No	L Oth
30 Liferaft	☐	☐		☐	☐		☐	☐		☐	☐		☐	☐		☐	☐	
31 Vest-Inflatable	☐	☐		☐	☐		☐	☐		☐	☐		☐	☐		☐	☐	
32 Vest-Non-Inflatable	☐	☐		☐	☐		☐	☐		☐	☐		☐	☐		☐	☐	
33 Cushion	☐	☐		☐	☐		☐	☐		☐	☐		☐	☐		☐	☐	

34 Time in Water
A ____ Hrs
B ____ Mins

36 Rescued by
1 ☐ Boat
2 ☐ Airplane
3 ☐ Helicopter
5 ☐ None
A Other ____

Occupant Injuries — Complete applicable parts for survivors and nonsurvivors.

Items 36 thru 39 apply **ONLY** to flight crewmembers.

36 Medication Prescribed
1 ☒ No
A Yes (Specify: ____)
B Other ____

37 Medication Being Taken
1 ☒ No
A Yes (Specify: ____)
B Other ____

38 Medication/Drugs Found
1 ☒ No
A Yes (Specify: ____)
B Other ____

39 Pre-existing Disease Found at Autopsy
1 ☐ No Autopsy performed
2 ☒ None reported
A Yes Specify ____
B Other ____

Results of Toxicological Analyses — Complete as applicable for survivors and nonsurvivors.

40 Toxicology (Multiple entry)
1 ☐ Not ordered
2 ☐ Not ordered — performed
3 ☒ Ordered — performed
4 ☐ Ordered — not performed
5 ☐ Embalmed
6 ☐ Specimen not available/unsuitable for analysis
A Other ____

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Supplement K — Occupant, Survival and Injury Information (continued)

Results of Toxicological Analyses — (Complete as applicable for survivors and nonsurvivors.) (continued)

Substances	A Test Results 1 Positive	2 Negative	3 Other	C Level of Substances Found
41 Ethanol (Alcohol)	☐	☒		Mg
42 CO (Carbon Monoxide)	☐	☐	N/A	% Saturati
43 hb (Hemoglobin)	☐	☐	N/A	gm
44 HCN (Hydrogen Cyanide)	☐	☐	N/A	Microgram/
45 Acidic and Neutral Drugs	☐	☒		
46 Basic Drugs	☐	☒		
47 Marijuana	☐	☒		
48 (Specify)	☐	☐		

List any additional toxicological substances discovered below

A Substance Code	B Level of Substances Found	A Substance Code	B Level of Substances Found
49		56	
50		57	
51		58	
52		59	
53		60	
54		(Specify) 61	
55		(Specify) 62	

Toxicological Substances/Codes

Acetamenophen	001	Cocaine	018	Imipramine	035
Acetaldehyde	002	Codeine	019	Isopropanol	036
Acetone	003	Desipramine	020	Ketimine	037
Amoxapine	004	Diazepam	021	Lidocaine	038
Amitriptyline	005	Dihydrocodeinone	022	Loxapine	047
Amobarbital	006	Diphenhydramine	023	Meloqualone	039
Amphetamine	007	Diphenylhydantoin	024	Meperidine	040
Benzoylecgonine	008	Doxepin	025	Mephentermine	041
Brompheniramine	009	Desalkylflurazepam	026	Meprobamate	042
Butalbital	010	Demoxepan	027	Methonal	043
Butabarbital	011	Ethchlorvynol	028	Methadone	044
Caffene	012	Flunitrazepam	029	Methamphetamine	045
Cannabinoids	013	Flurazepam	030	Methaqualone	046
Chlorazepate	014	Fluphenazine	031	Methylenedioxyam	048
Chlordiazepoxide	015	Glutethimide	032	Phetamine	049
Chlorphentermine	016	Haloperidol	033	Methylphenidate	050
Clonazepam	017	Hexobarbital	034	Methyprylon	051
Menthol	052				
Morphine	053				
Medazepan	054				
Nicotine	055				
Nortriptyline	056				
Oxazepam	057				
Pentazocine	058				
Phenobarbital	059				
Procaine	060				
Propoxyphene	061				
Secobarbital	062				
Thiolidazine	063				
Temazepam	064				
Nordiazepam	065				
Pentobarbital	066				
Phencyclidine	067				
Phendimetrazine	068				
Prazepam	069				

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Supplement K — Occupant, Survival and Injury Information (continued)

63 ☒ For multiple extreme traumatic injuries, check box, and go to next applicable supplement.

Occupant Injury Coding Chart (Complete for survivors and non survivors as applicable.)

	A Body Region	B Aspect	C Lesion	D System/Organ	E A.I.S. Severity	F 6 Injury Source	G 7 Source of Da
64							
65							
66							
67							
68							
69							
70							
71							
72							
73							

Body Region – A

01 Head (Skull, scalp, ears)
02 Face (Forehead, nose, eyes, mouth)
03 Neck (Cervical spine, C1-C7)
04 Shoulder (Clavicle, scapula, joint)
05 Upper limb (Whole arm)
06 Arm (Upper)
07 Elbow
08 Forearm
09 Wrist
10 Hand—Fingers
11 Chest (Anterior and posterior ribs)
12 Abdomen (Diaphragm and below)
13 Back (Thoracic spine T1-T12)
14 Back (Lumbar L1-L5)
15 Pelvis—hip
16 Lower limb (Whole leg)
17 Thigh (Femur)
18 Knee
19 Leg (Below knee)
20 Ankle
21 Foot—toes
22 Whole body
88 Injured, unknown region
99 Other

Aspect Of Injury

01 Right
02 Left
88 Injured aspect unknown
99 Other

Lesion – C

01 Laceration
02 Contusion
03 Abrasion
04 Fracture
05 Concussion
06 Avulsion
07 Rupture
08 Sprain
09 Dislocation
10 Crush
11 Amputation
12 Burn
13 Fracture and dislocation
14 Severence (Transection)
15 Strain
16 Detachment (Separation)
17 Perforation (Puncture)
88 Injured unknown lesion
99 Other

System/Organ – D

01 Skeletal
02 Vertebrae
03 Joints
04 Digestive
05 Liver
06 Nervous System
07 Brain
08 Spinal cord
09 Ears
10 Arteries veins
11 Heart
12 Spleen
13 Urogenital
14 Kidneys
15 Respiratory
16 Eye
17 Pulmonary/lungs
18 Airway
19 Muscles
20 Integumentary
21 Thyroid or other endocrine gland)
88 Injured, unknown system or organ

Abbreviated Injury Scale – E

00 Not injured
01 Minor Injury
02 Moderate injury
03 Serious injury (Not life-threatening)
04 Severe injury (Life-threatening survival probable)
05 Critical injury (Survival uncertain)
06 Maximum (untreatable)
07 Injured (Unknown severity)
88 Unknown if injured

Source of Data — G

Official
01 Autopsy records with or without hospital/medical records
02 Hospital/medical records
03 Emergency room records
04 Private or treating physicians

Unofficial
05 Lay coroner
06 E.M.S. personnel
07 Interviewee
08 Police
09 Other source

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Supplement K — Occupant, Survival and Injury Information (continued)

Injury Source List – F

01 Windshield
02 Windshield frame
03 Window
04 Window frame
05 Instrument panel
06 Side Console
07 Center console
08 Control stick/cyclic stick
09 Collective
10 Control yoke/column
11 Throttle quadrant/levers
12 Rudder pedals
13 Ceiling
14 Sidewall
15 Floor
16 Fuselage framing/structure
17 Table
18 Seat
19 Seatback tray
20 Restraints—seatbelt/tiedown
21 Restraints—shoulder harness
22 Unsecured item(s) in cockpit
23 Unsecured item(s) in cabin
24 Other occupants
25 Ground/runway
26 Unsecured seat(s)
27 Outside object(s) entering aircraft
28 Galley item(s)
29 Food/beverage item(s)
30 Other interior objects
31 Other exterior objects
32 Evacuation slide/slide raft
33 Escape rope/tape
34 Escape inertia device
35 Ejected from aircraft
36 Propeller/rotor blades
37 Exterior aircraft surface
38 Engine
39 Wheel/tires
40 Ground vehicle
41 Toxic/noxious/irritant fumes
42 Fire/radiant heat
43 Flying glass
44 Door/hatches
45 Acceleration forces
46 Exposure
47 Glare Shield
48 Eyeglasses
88 Unknown
99 Other

74 Death Due To Fire/Smoke

1 ☐ Yes
2 ☒ No
A Other ____

75 Death Due To Drowning

1 ☐ Yes
2 ☒ No
A Other ____

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB Accident/Incident Number: LAX98FA106

Supplement N—Fire/Explosion

1 Fire Started
1 ☐ In-flight 3 ■ During impact sequence 5 ☐ Greater than 1 minute after aircraft came to rest
2 ☐ During ground operation 4 ☐ After aircraft came to rest A Other

Location of Initial Fire or Explosion (Specify)	A 1 Fire	B 1 Explosion	C In-Flight 1 Yes	C In-Flight 2 No	C In-Flight D Other	E On Ground 1 Yes	E On Ground 2 No	E On Ground F Other	G After Impact 1 Yes	G After Impact 2 No	G After Impact H Other
2 FUSELAGE	X			X		X			X		
3 RIGHT WING	X			X		X			X		
4											

5 Fire/Explosion Ignition Source(s) *(Multiple entry)*
1 ☐ Engine
2 ☐ APU
3 ☐ Hot surface
4 ☐ Explosive
5 ☐ Aircraft system
6 ☐ Cargo
7 ■ Short circuit
8 ☐ Static electricity
9 ☐ Lightning
10 ■ Sparks *(Friction, skidding, etc.)*
11 ☐ Ground vehicle
12 ☐ Ground structure
13 ☐ Aircraft occupant
A Other

6 Fluid Spilled
1 ■ Yes
2 ☐ No *(Go to block 8)*
A Other

7 Type of Fluid Spilled *(Multiple entry)*
1 ■ Fuel
2 ☐ Oil
3 ☐ Hydraulic
A Other

8 Other Fuels Present *(Multiple entry)*
1 ☐ Natural gas
2 ☐ Heating oil
3 ☐ Gasoline
4 ☐ Kerosene
5 ☐ Explosives
6 ■ None
A Other

9 Fire Propagation Direction *(Multiple entry)*
1 ☐ Forward 5 ☐ Left to right
2 ☐ Rearward 6 ☐ Right to left
3 ■ Upward A Other
4 ☐ Downward

10 Percent of Occupiable Space in Fire Area at Time of Evacuation
___ Percent
A Other N/A

11 Ground Structure Burned *(Multiple entry)*
1 ☐ Single family house 4 ☐ Farm building 7 ☐ Other aircraft
2 ☐ Multifamily house 5 ☐ Trees 8 ■ None
3 ☐ Commercial building 6 ☐ Vehicle A Other

12 Fire Sensing and Extinguishing Systems Installed/Available
1 ☐ Yes
2 ■ No *(Omit blocks 13-34)*
3 ☐ Not pertinent to accident *(Omit blocks 13-34)*
A Other

Sensors / Extinguishers	Sensors: A Available 1 Yes	A Available 2 No	A Available B Other	C Type of Sensor 1 Heat	C Type of Sensor 2 Smoke	C Type of Sensor 3 Optic	C Type of Sensor D Other	Extinguishers: E Available 1 Yes	E Available 2 No	E Available F Other	G Number 1 Number	G Number H Other	I Type of Extinguisher 1 Manual	I Type of Extinguisher 2 Automatic	I Type of Extinguisher J Other
13 Engine #1															
14 Engine #2															
15 Engine #3															
16 Engine #4															
17 APU															

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB Accident/Incident Number

LAX98FA106

Supplement N—Fire/Explosion (continued)

Sensors Extinguishers	Sensors							Extinguishers							
	A Available			C Type of Sensor				E Available			G Number		I Type of Extinguisher		
	1 Yes	2 No	B Other	1 Heat	2 Smoke	3 Optic	D Other	1 Yes	2 No	F Other	1 Number	H Other	1 Manual	2 Automatic	J Other
20 Galley															
21 Lavatory															
22 Heater															
23 Battery															
24 Electrical System															
25 *Specify* _____															
26 *Specify* _____															
27 *Specify* _____															

Sensor Operation	Engine #1 1	Engine #2 2	Engine #3 3	Engine #4 4	APU 5	Cabin 6	Cargo 7	Galley 8	Lavatory 9	Heater 10	Battery 11	Electrical Sys. 12	Other A
28 Activated													
29 Did Not Activate													

Extinguisher Operation	Engine #1 A	Engine #2 B	Engine #3 C	Engine #4 D	APU E	Cabin F	Cargo G	Galley H	Lavatory I	Heater J	Battery K	Electrical Sys L	Other M
Number Activated — 30 Man													
31 Auto													
# Did Not Activate — 32 Man													
33 Auto													

34 **Extinguisher Systems/Agents Used** *(Multiple entry)*

1 ☐ Fixed equipment
2 ☐ Portable equipment
3 ☐ CO_2 (Carbon Dioxide)
4 ☐ CB (Chlorobroyethane)
5 ☐ Halon 1211
6 ☐ ME (Methylbromide)
7 ☐ Halon 1301
A Other

RECEIVED

FORM APPROVED FOR USE THROUGH 11/30/90 BY OMB NO. 3147-0

MAR 16 1998

SWS-LAX

NATIONAL TRANSPORTATION SAFETY BOARD
PILOT/OPERATOR AIRCRAFT ACCIDENT REPORT
This form To Be Used For Reporting Civil Aircraft Accidents Involving Commercial and General Aviation Aircraft

Location

Nearest City/Place, State, Zip Code	Date of Accident	Local Time (24 HOUR CLOCK)	Zone	Elevation At Accident Site
MT Burdell Novato, Ca.	3-5-98	1400 1430	PST	____ Feet MSL ____ Feet MSL

If The Accident Occurred On Approach, Takeoff Or Within 3 Miles Of An Airport, Complete The Following Information

Proximity To Airport

1. ☐ On Airport
2. ☐ Within ¼ Mile
3. ☐ Within ½ Mile
4. ☐ Within ¾ Mile
5. ☐ Within 1 Mile
6. ☐ Within 2 Miles
7. ☐ Within 3 Miles
8. ☐ Beyond 8 Miles

Airport Name	Airport Ident	Runway Land Surface and Conditions
		1. Direction: 3. Width: 2. Length: 4. Surface: Condition:

Phase of Operations

1. ☐ Standing
2. ☐ Taxi
3. ☐ Takeoff
4. ☐ Climb
5. ☐ Cruise
6. ☐ Descent
7. ☐ Approach
8. ☐ Landing
9. ☐ Hover/Maneuver
10. ☐ Altitude of In-Flight Occurrence ____ Feet MSL

Aircraft Information

Registration Mark	Aircraft Manufacturer	Aircraft Type/Model	Serial Number	Cert Max Gross W
N257NW	Piper	PA-31 Chieftain	31-7952014	7645

Type of Aircraft

1. ☒ Airplane
2. ☐ Helicopter
3. ☐ Glider
4. ☐ Balloon
5. ☐ Blimp/Dirigible
6. ☐ Ultralight
7. ☐ Gyroplane
8. Specify ____

Type of Airworthiness Certificate

1. ☒ Normal
2. ☐ Utility
3. ☐ Acrobatic
4. ☐ Transport
5. ☐ Restricted
6. ☐ Limited
7. ☐ Experimental
8. Specify ____

Amateur Built

1. ☐ Yes
2. ☒ No

Landing Gear

1. ☐ Tricycle – Fixed
2. ☒ Tricycle – Retractable
3. ☐ Tailwheel--Fixed
4. ☐ Tailwheel—Retractable
5. ☐ Tailwheel—Retractable Mains
6. ☐ Amphibian
7. ☐ Skid
8. ☐ Ski/Wheel
9. Specify ____

No. of Seats Flight/Cabin

Crew 2
Pax 6

Stall Warning System Installed	IFR Equipped	Engine Type
1. ☒ Yes 2. ☐ No	1. ☒ Yes 2. ☐ No	1. ☐ Reciprocating—Carburetor 2. ☒ Reciprocating—Fuel Injected 3. ☐ Turbo Prop 4. ☐ Turbo Jet 5. ☐ Turbo Fan 6. ☐ Turbo Shaft

Engine Manufacturer	Engine Model/Series	Engine Rated Power	Type of Fire Extinguishing System Used
Lycoming	TIO-540-J2BD	1. 350 Horsepower 2. ____ Lbs. Thrust	1. ☒ None 2. Specify ____

Engine(s)	Date of Mfg.	Mfg. Serial No.	Total Time	Time Since Inspection	Time Since Overhaul
Engine No. 1	10-12-94	RL-4570-61A	540.4 Hours	3.0 Hours	540.4 Hour
Engine No. 2	10-17-94	RL-1400-60A	419.2 Hours	3.0 Hours	419.2 Hour
Engine No. 3			Hours	Hours	Hour
Engine No. 4			Hours	Hours	Hour

Type of Maintenance Program

1. ☐ Annual
2. ☐ Manufacturer's Inspection Program
3. ☒ Other Approved Inspection Program (AAIP)
4. ☐ Continuous Airworthiness
5. Specify ____

Type of Last Inspection

1. ☐ Annual
2. ☐ 100-Hour
3. ☒ AAIP
4. ☐ Continuous Airworthiness

Date Last Inspection Performed 2-12-98 (M/D/Y)

Time Since Last Inspection 3.0 Hours

Airframe Total Time 6281.3 Hours

Emergency Locator Transmitter (ELT)	ELT Manufacturer	Model/Series	Serial Number	Battery Date (M/D/Y)
	Unknown	Unknown	Unknown	10-31-9

Switch	Operated	Aided In Accident Location
1. ☐ On 2. ☐ Off 3. ☒ Armed	1. ☐ Yes 2. ☐ No	1. ☐ Yes 2. ☐ No

Registered Aircraft Owner	Address
Airpac Airlines Inc	7277 Perimeter Rd So Seattle WA 98108

Operator of Aircraft	Address
1. ☒ Same As Registered Owner 2. Name ____ 3. DBA:	1. ☒ Same As Registered Owner 2. ____

Owner/Operator Information (cont.)

Operator (Certificate Number)	Operator Designator (4 Letter Designator)
APCA20Ec	APCA

Purpose of Flight and Type of Operation

Regulation Flight Conducted Under
1. ☒ FAR 91 (only) 4. ☐ FAR 121 7. ☐ FAR 133
2. ☐ FAR 91D 5. ☐ FAR 125 8. ☐ FAR 135
3. ☐ FAR 103 6. ☐ FAR 129 9. ☐ FAR 137

Purpose of Flight
1. ☐ Personal 6. ☐ Aerial Observation
2. ☐ Business 7. ☐ Other Work Use
3. ☐ Instructional 8. ☐ Public Use
4. ☐ Executive/Corporate 9 ☐ Ferry
5. ☐ Aerial Application 10 ☒ Positioning

Operator Authority
FAR 121
1. ☐ Domestic
2. ☐ Flag
3. ☐ Supplemental

FAR 135
4. ☒ On Demand
5. ☐ Commuter

FAR 133
6. ☐ Rotorcraft External Load

FAR 125
7. ☐ Large Aircraft

FAR 129
8. ☐ Foreign

FAR 121, 125, 127, 129, 136 Revenue Operations
1. ☐ Scheduled
2. ☐ Non Scheduled
3. ☐ Domestic
4. ☐ International
5. ☐ Passenger
6. ☒ Cargo
7. Specify _____

Pilot Information

Pilot Name	Pilot Certificate No.	Address	Nationality
Isabelle Arsonneau	2473046	3131 Fernside ave Alameda, Ca 94501	French

Certificate(s)
1. ☐ Student 3. ☐ Commercial 5. ☐ Flight Instructor 7. ☐ Military 9. ☐ None
2. ☐ Private 4. ☒ Airline Transport 6. ☐ Flight Engineer 8. ☐ Foreign 10. Specify _____

Rating(s)
1. ☐ None 6. ☐ Helicopter
2. ☒ Single Engine Land 7. ☐ Glider
3. ☐ Single Engine Sea 8. ☐ Free Balloon
4. ☒ Multiengine Land 9. ☐ Airship
5. ☐ Multiengine Sea 10. ☐ Gyroplane

Instrument Rating(s)
1. ☐ None
2. ☒ Airplane
3. ☐ Helicopter

Instructor Ratings
1. ☐ None 6. ☐ Instrument Airplane
2. ☐ Airplane S.E. 7. ☐ Instrument Helicopter
3. ☐ Airplane M.E. 8. ☐ Ground Instructor
4. ☐ Helicopter 9. Specify _____
5. ☐ Glider

Type Ratings/Student Endorsements	Date of Biennial Flight Review or Equivalent (M/D/Y)	BFR Aircraft
unKnown	8-5-97	1. Make Piper 2. Model PA-31

Medical Certificate	Date of Last Medical (M/D/Y)	Limitations	Date of Birth (M/D/Y)
1. ☐ None 3. ☐ Class 2 2. ☒ Class 1 4. ☐ Class 3	8-5-97	None **Waivers** None	4-9-64

Degree of Injury
1. ☐ None
2. ☐ Minor
3. ☐ Serious
4. ☒ Fatal

Seat Occupied
1. ☒ Left 4. ☒ Front
2. ☐ Right 5. ☐ Rear
3. ☐ Center

Person at Controls at Time of Accident
1. ☒ Pilot In Command 3. ☐ Both Pilots 5. ☐ No One
2. ☐ Second Pilot 4. ☐ Non-Pilot

Seat Belt Available
1. ☒ Yes
2. ☐ No

Seat Belt Used
1. ☒ Yes
2. ☐ No

Shoulder Harness Available
1. ☒ Yes
2. ☐ No

Shoulder Harness Used
1. ☒ Yes
2. ☐ No

Source of Pilot Flight Time Information
1. ☐ Pilot Logbook 4. ☒ Company
2. ☐ Operator's Estimate 5. Specify _____
3. ☐ FAA Records

Flight Time	All A/C	This Make & Model	Airplane Single Engine	Airplane Multiengine	Night	Instrument Actual Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time									
Pilot in Command (PIC)									
Instructor									
This Make/Model									
Last 90 Days	63.2	19.5		63.2					
Last 30 Days	22.5	10.4		22.5					
Last 24 Hours	1.0	1.0		1.0					

Second Pilot Information

Second Pilot Responsibilities at the Time of Accident
1. ☐ Co-Pilot 2. ☐ Dual Student 3. ☐ Safety Pilot 4. ☐ Check Pilot 5. ☐ None (Pilot-Rated Passenger)

Pilot Name	Pilot Certificate No.	Address	Nationality

Certificate(s)
1. ☐ Student 3. ☐ Commercial 5. ☐ Flight Instructor 7. ☐ Military 9. ☐ None
2. ☐ Private 4. ☐ Airline Transport 6. ☐ Flight Engineer 8. ☐ Foreign 10. Specify _____

Owner/Operator Information (cont.)

Rating(s)
1. ☐ None
2. ☐ Single Engine Land
3. ☐ Single Engine Sea
4. ☐ Multiengine Land
5. ☐ Multiengine Sea
6. ☐ Helicopter
7. ☐ Glider
8. ☐ Free Balloon
9. ☐ Airship
10. ☐ Gyroplane

Instrument Rating(s)
1. ☐ None
2. ☐ Airplane
3. ☐ Helicopter

Instructor Ratings
1. ☐ None
2. ☐ Airplane S.E.
3. ☐ Airplane M.E.
4. ☐ Helicopter
5. ☐ Glider
6. ☐ Instrument Airplane
7. ☐ Instrument Helicopter
8. ☐ Ground Instructor
9. Specify _____

Type Ratings/Student Endorsements

Date of Biennial Flight Review or Equivalent (M/D/Y)

BFR Aircraft
1. Make _____
2. Model _____

Medical Certificate
1. ☐ None
2. ☐ Class 1
3. ☐ Class 2
4. ☐ Class 3

Date of Last Medical (M/D/Y)

Limitations

Waivers

Date of Birth (M/D/Y)

Degree of Injury
1. ☐ None
2. ☐ Minor
3. ☐ Serious
4. ☐ Fatal

Seat Occupied
1. ☐ Left
2. ☐ Right
3. ☐ Center
4. ☐ Front
5. ☐ Front

Seat Belt Available
1. ☐ Yes
2. ☐ No

Seat Belt Used
1. ☐ Yes
2. ☐ No

Shoulder Harness Available
1. ☐ Yes
2. ☐ No

Shoulder Harness Used
1. ☐ Yes
2. ☐ No

Source of Pilot Flight Time Information
1. ☐ Pilot Logbook
2. ☐ Operator's Estimate
3. ☐ FAA Records
4. ☐ Company
5. Specify _____

Flight Time	All A/C	This Make & Model	Airplane Single Engine	Airplane Multiengine	Night	Instrument Actual Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time									
Pilot In Command (PIC)									
Instructor									
This Make/Model									
Last 90 Days									
Last 30 Days									
Last 24 Hours									

Name	Seat	Address (City & State	Crew	Passenger Non-Revenue	Passenger Revenue	Non-Occupant	FAA	Degree of Injury Fatal	Serious	Minor	None
1.			☐	☐	☐	☐	☐	☐	☐	☐	☐
2.			☐	☐	☐	☐	☐	☐	☐	☐	☐
3.			☐	☐	☐	☐	☐	☐	☐	☐	☐
4.			☐	☐	☐	☐	☐	☐	☐	☐	☐
5.			☐	☐	☐	☐	☐	☐	☐	☐	☐
6.			☐	☐	☐	☐	☐	☐	☐	☐	☐

Flight Itinerary Information

Last Departure Point
1. Airport ID SNS
2. City/Place Santa Rosa
3. State CA.

Time of Departure
1. Time 1850
2. Time Zone PST

Destination
1. Airport ID OAK
2. City/Place OAKland
3. State CA.

Flight Plan Filed
1. ☐ None
2. ☐ VFR
3. ☐ IFR
4. ☐ VFR/IFR
5. ☒ Company (VFR)
6. ☐ Military (VFR)

If Weather Was Involved, State If Weather Briefing Was Obtained Or If Weather Reports Were Checked And How It Was Accomplished

unKnown

Fuel On Board At Last Takeoff
_____ Gallons
or
732 Pounds

Fuel Type
1. ☐ 80/88
2. ☒ 100 Low Lead
3. ☐ 100/130
4. ☐ 115/145
5. ☐ Jet A
6. ☐ Automotive
7. Specify _____

Other Services, If Any, Prior To Departure

Weather Information At The Accident Site

Source Of Weather Information (Pilot/Operator, Weather Observation)

unKnown

Light Condition
1. ☐ Dawn
2. ☐ Daylight
3. ☐ Dusk
4. ☒ Dark Night
4. ☐ Bright Night

Visibility
_____ Miles

Temp (°F)

Weather Information At The Accident Site

Dew Point	Altimeter Setting	Sky/Lowest Cloud Condition
(°F)	inHg	1. ☐ Clear 2. ☐ Scattered _____ Feet AGL 3. ☐ Broken _____ Feet AGL 4. ☐ Overcast _____ Feet AGL 5. ☐ Partial Obscuration 6. ☐ Obscurred

Wind Information	Restriction To Visibility	Type Precipitation	Intensity of Precipitation
1. Direction _____ 2. Velocity _____ KTS 3. Gusts _____ KTS			

Turbulence (Multiple entry)

1. ☐ None 2. ☐ Light 3. ☐ Moderate 4. ☐ Severe 5. ☐ Extreme 6. Clear Air 7. ☐ In Clouds

Damage To Aircraft And Other Property

Degree of Aircraft Damage

1. ☐ None 2. ☐ Minor 3. ☐ Substantial 4. ☒ Destroyed

Fire

1. ☐ Yes 3. ☐ In-Flight
2. ☐ No 4. ☐ On Ground

Description of Damage to Aircraft and Other Property

Mechanical Malfunction Failure

1. ☐ No
2. ☐ Yes List The Name Of The Part, Manufacturer, Part No., Serial No. And Describe The Damage

Total Time

On Part	At Overhaul
_____ Hours	_____ Hours

Collision Accident

If Collision Accident Occurred, Complete The Information For Other Aircraft

Registration Mark	Aircraft Manufacturer	Aircraft Type/Model	Degree of Aircraft Damage
			1. ☐ Destroyed 3. ☐ Minor 2. ☐ Substantial 4. ☐ None

Registered Aircraft Owner	Address

Pilot Name	Address	Pilot Certificate No.

Evacuation of Aircraft

Assistance Received

1. ☐ Outside Person(s) 3. ☐ Slide 5. ☐ Ladder
2. ☐ Auxiliary Lighting 4. ☐ Rope 6. ☐ Specify _____

Method of Exit (State Approximate Number of Persons Using Each of the Following)

1. Main Door _____ 2. Auxiliary Door _____ 3. Emergency Exit _____

Recommendation (How Could This Accident Have Been Prevented

Operator/Owner Safety Recommendation (Optional Entry)

Additional Flight Crew Members

For Each Additional Flight Crew Members, Exclusive of Cabin Attendants, Complete the Following Information:

Name	FAA Certificate No.	Address	Title

Certificate(s)

1. ☐ Student 3. ☐ Commercial 5. ☐ Flight Instructor 7. ☐ Military 9. ☐ None
2. ☐ Private 4. ☐ Airline Transport 6. ☐ Flight Engineer 8. ☐ Foreign 10. Specify ____

Ratings/Endorsements	Total Flight Time	Flight Time This Accident

Name	FAA Certificate No.	Address	Title

Certificate(s)

1. ☐ Student 3. ☐ Commercial 5. ☐ Flight Instructor 7. ☐ Military 9. ☐ None
2. ☐ Private 4. ☐ Airline Transport 6. ☐ Flight Engineer 8. ☐ Foreign 10. Specify ____

Ratings/Endorsements	Total Flight Time	Flight Time This Accident

Name	FAA Certificate No.	Address	Title

Certificate(s)

1. ☐ Student 3. ☐ Commercial 5. ☐ Flight Instructor 7. ☐ Military 9. ☐ None
2. ☐ Private 4. ☐ Airline Transport 6. ☐ Flight Engineer 8. ☐ Foreign 10. Specify ____

Ratings/Endorsements	Total Flight Time	Flight Time This Accident

Narrative History Of Flight

Describe what occurred in chronological order, the circumstances leading to the accident and the nature of the accident. Describe the terrain and include a sketch of wreckage distribution if pertinent. Attach extra sheets if more space is needed. State Point of departure, time of departure, intended destination and services obtained.

airplane took off from Santa Rosa, CA. about 1850. VFR to Oakland International Airport, never arrived at destination.

I Hereby Certify That The Above Information Is Complete And Accurate To The Best Of My Knowledge

Date of This Report	Signature of Pilot/Operator
3-27-98	[signature], Pres

Signature of Person Filing Report Other Than Pilot/Operator

1. Signature ____________________
2. Type or Print Name ____________________
3. Title ____________________

For NTSB Use Only

NTSB Accident No.	Review By NTSB Office Located At	Name of Investigator	Date Report Received
LAX--98-F-A106	1515 W. 190th Street, Suite 555 Gardena, California 90248-4319	Robert R. Crispin, EdD	3/30/98

National Transportation Safety Board
Office of Aviation Safety
Washington, D.C. 20594-2000

September 14, 1998

METEOROLOGY FACTUAL REPORT
LAX98FA106

A. ACCIDENT

Location: Novato, California
Date: March 5, 1998
Time: 1905 Pacific standard time (0305Z)
Aircraft: Piper PA-31-350, Registration: N257NW

B. METEOROLOGICAL SPECIALIST

Donald E. Eick
Meteorologist
National Transportation Safety Board
Operational Factors Division, AS-30
Washington, DC

C. SUMMARY

On March 5, 1998, at about 1905 Pacific Standard Time (PST), Airpac flight 263, a Piper PA-31-350, N275NW, collided with trees and terrain near Novato, California. The aircraft was destroyed and the pilot, the sole occupant, received fatal injuries. The airplane was operated by Airpac Airlines, Inc. as a positioning flight under 14 CFR Part 91 when the accident occurred. The airplane departed Santa Rosa, California, at 1850 PST. Visual meteorological conditions prevailed at the departure airport and no flight plan was filed.

The airplane was part of a flight of two company airplanes that departed the Sonoma County airport en route to the Oakland Metropolitan International airport. Airpac flight 1961 was in the lead and Airpac flight 263 was in trail about 5 minutes behind. The pilot of flight 1961 stated that although they were both navigating by a combination of dead reckoning and pilotage, they also had VOR navigation aids available to verify their position while en route.

During the flight, the pilot of flight 1961 radioed the pilot of flight 263 to ask about her progress. She reported that she was "still back here." At about 20 miles north of the Oakland airport, flight 1961 began to encounter instrument meteorological conditions and again attempted to contact the pilot; however, this attempt was not successful in establishing contact. Flight 1961 landed at the Oakland airport at 1920 PST.

When flight 263 did not arrive, it was reported as overdue and a missing aircraft report was issued. At 0148 PST on March 6, a U.S. Coast Guard search and rescue helicopter located the wreckage near the northern crest of a hill. The approximate location of the accident site was about 40 miles north of San Francisco at an elevation of 1,500 feet.

The pilot of flight 1961 reported that the accident site was about 10 miles west of the route that Airpac pilots routinely flew between Santa Rosa and Oakland. The westerly route is a more direct course to Oakland; however, it crosses higher terrain. He said that during the flight he had to descend to 1,200 to 1,500 feet above mean asea level (MSL) to remain in VFR conditions.

According to Airpac, the accident pilot had reportedly flown this route two to three times a week for the past 2 years.

D. DETAILS OF INVESTIGATION

All data and products in this report were obtained from the National Weather Service (NWS) headquarters and the National Climatic Data Center (NCDC) to reconstruct the weather conditions. All times are reported in Universal Time Coordinated (UTC) based upon the 24 hour clock. Pacific Standard Time (PST) is + 8 hours to UTC and UTC=Z. Directions are referenced to true north and distances are in nautical miles. Heights are above mean sea level (MSL) unless otherwise noted. Visibility is reported in statute miles and fractions of statute miles.

1.0 Synoptic Situation

The NWS Surface Analysis Chart for 0300Z on March 6, 1998 (attachment 1), provided the main synoptic situation on the evening of the accident. The chart depicted a low pressure system with a central pressure of 999 millibars (mb)

over the California and Nevada border near Las Vegas. Extending southward from the low pressure center was a cold front that stretched across southern Nevada, southeastern California, into Baja California and the Pacific Ocean. To the east of the low, a warm front stretched across Nevada and southern Utah to the four corners of Utah, Colorado, New Mexico and Arizona. To the north and northwest of the low pressure center, two troughs of low pressure were also indicated. The troughs were depicted with one across Nevada and the other along the Nevada-California border.

A second low pressure system with a central pressure of 1004 mb was also depicted approaching the California coastline near the accident location. A trough of low pressure extended southwestward from the low across the eastern Pacific Ocean to 26.5 degrees north latitude and 135 degrees west longitude.

Except for extreme northern California, the station models depicted on the 0300Z Surface Analysis Chart indicated overcast skies across the state. Over central and northern California several stations reported continuous light to moderate rain or fog and mist. Over the northern Sierra Mountains of California and across Nevada, several stations also reported continuous light to heavy snow with temperatures in the mid twenties (degrees Fahrenheit).

The NWS computer-generated Weather Depiction Chart (attachment 2) for 0100Z on March 6, 1998, depicted a large area of Marginal Visual Flight Rules (MVFR) conditions over northern California and Nevada, with an embedded area of Instrument Flight Rules (IFR) over the northern Sierra Mountains of California and over western Nevada. An enlarged western region Weather Depiction Chart is included (attachment 3). The 0100Z Weather Depiction Charts indicate that stations over the route from Santa Rosa to Oakland were all reporting MVFR conditions due to low ceilings and restricted visibility in rain and fog.

2.0 Weather Observations

The surrounding area was documented by meteorological aerodrome reports or METARs for conditions likely encountered en route and in the vicinity of the accident site. All cloud heights reported in this section are above ground level (AGL).

2.0.1 Santa Rosa, Sonoma County Airport, California (KSTS)

Sonoma County Airport, the departure station, is located approximately 28 miles northwest of the accident site at an elevation of 125 feet MSL. Santa Rosa reported the following conditions at departure:

KSTS at 0145Z, wind 320 degrees at 6 knots, visibility 4 miles in light rain and mist, ceiling broken at 2,900 feet, overcast at 4,400 feet, temperature 7 degrees

Celsius (C), dew point temperature 5 degrees C, altimeter 29.77 inches of mercury (Hg).

KSTS at 0250Z, wind 320 degrees at 6 knots, visibility 5 miles in light rain an mist, ceiling broken at 1,000 feet, overcast at 3,000 feet, temperature 7 degrees C, dew point 5 degrees C, altimeter 29.78 inches Hg.

2.0.2 Napa, California (KAPC)

Napa was the closest weather reporting station to the accident location, located approximately 15 miles east northeast at an elevation of 33 feet MSL. The following conditions were reported about the time of the accident:

KAPC at 0245Z, wind 340 degrees at 12 knots, visibility 6 miles in light rain, ceiling overcast at 1,300 feet, altimeter 29.75 inches Hg.

KAPC at 0345Z, wind 010 degrees at 10 knots, visibility 5 miles in light rain, ceiling broken at 2,100 feet, overcast at 3,100 feet, altimeter 29.76 inches of Hg. Remarks last observation of the day.

2.0.3 Concord Buchanan Airport (KCCR)

Concord Buchanan Airport is located approximately 25 miles east southeast of the accident site at an elevation of 23 feet MSL, reported the following:

KCCR at 0245Z, winds variable at 5 knots, visibility 1 1/2 miles in light rain and mist, ceiling broken at 400 feet, overcast at 2,000 feet, temperature 8 degrees C, dew point 7 degrees C, altimeter 29.73 inches of Hg.

KCCR at 0345Z, winds 010 degrees at 10 knots, visibility 1 1/2 miles in light rain and mist, ceiling broken at 400 feet, overcast at 1,000 feet, temperature 8 degrees C, dew point 7 degrees C, altimeter 29.24 inches Hg.

2.0.4 Oakland International Airport (KOAK)

Oakland international Airport, the planned destination of the flight, is located approximately 27 miles southeast of the accident site at an elevation of 6 feet MSL. The following conditions were recorded:

KOAK at 0247Z, winds 140 degrees at 18 knots, visibility 10 miles, scattered clouds at 800 feet, ceiling overcast at 2,000 feet, temperature 11 degrees C, dew point 6 degrees C, altimeter 29.73 inches of Hg.

KOAK at 0345Z, winds 150 degrees at 14 knots, visibility 10 miles, scattered clouds at 800 feet, ceiling overcast at 2,000 feet, temperature 11 degrees C, dew point 7 degrees C, altimeter 29.74 inches of Hg.

2.0.5 San Francisco International Airport (KSFO)

San Francisco International Airport is located approximately 31 miles south southeast of the accident site at an elevation of 11 feet MSL, and reported the following conditions:

KSFO at 0256Z, winds 110 degrees at 7 knots, visibility 10 miles, a few clouds at 2,300 feet, ceiling broken at 2,900 feet, overcast at 5,000 feet, temperature 9 degrees C, dew point 8 degrees C, altimeter 29.71 inches of Hg. Remarks: rain began at 0220Z and ended at 0230Z, sea level pressure 1005.9 mb.

Special KSFO at 0325Z, winds 340 degrees at 8 knots, visibility 10 miles in light rain, a few clouds at 900 feet, ceiling broken at 2,000 feet, overcast at 3,400 feet, temperature 9 degrees C, dew point 8 degrees C, altimeter 29.72 inches of Hg. Remarks: rain began at 0306Z, precipitation total 0.04 inches since last observation.

Special KSFO at 0345Z, winds 330 degrees at 14 knots, visibility 5 miles in light rain and mist, ceiling broken at 900 feet, broken at 1,700 feet, overcast at 2,300 feet, temperature 9 degrees C, dew point 8 degrees C, altimeter 29.72 inches of Hg. Remarks: ASOS, rain began at 0306Z, ceiling 500 variable 1,300 feet, precipitation since last hours observation 0.05 inches.

2.0.6 Sacramento Executive Airport (KSAC)

Sacramento Executive Airport approximately 55 miles east northeast of the accident site at an elevation of 21 feet MSL, reported the following conditions:

KSAC at 0247Z, winds calm, visibility 3 miles in light rain and mist, ceiling overcast at 1,100 feet, temperature 7 degrees C, dew point 6 degrees C, altimeter 29.75 inches of Hg.

KSAC at 0352Z, winds 360 degrees at 10 knots, visibility 3 miles in light rain and mist, ceiling broken at 1,000 feet, overcast at 1,600 feet, temperature 7 degrees C, dew point 6 degrees C, altimeter 29.75 inches of Hg.

2.0.7 Sacramento International Airport (KSMF)

Sacramento International Airport located approximately 58 miles east northeast of the accident site, and 12 miles north of KSAC at an elevation of 25 feet MSL, reported the following conditions:

KSMF at 0252Z, wind 350 degrees at 6 knots, visibility 3 miles in light rain and mist, a few clouds at 500 feet, ceiling broken at 900 feet, overcast at 2,000 feet, temperature and dew point 6 degrees C, altimeter 29.76 inches of Hg.

Special for KSMF at 0324Z, winds 350 degrees at 8 knots, visibility 2 ½ miles in moderate rain and mist, a few clouds at 300 feet, ceiling broken at 1,100 feet, overcast at 1,800 feet, temperature 7 degrees C, dew point 6 degrees C, altimeter 29.76 inches of Hg.

3.0 Upper Air Data

The upper air sounding from Oakland, California, station number 72493 was examined to provide the temperature and wind structure near the accident site. The balloon launch occurred at 2303Z on March 5, 1998, and provided the following information:

Height MSL (FT)	Temp. (C)	Dew point(C)	RH %	Wind direction & Speed (KT)
20	9.0	6.8	86.0	120 degrees at 12
220	8.0	5.8	86.0	123 degrees at 14
690	6.2	4.9	90.7	130 degrees at 17
1,600	4.3	3.3	93.3	144 degrees at 17
2,310	2.7	2.1	95.3	164 degrees at 16
3,040	1.8	1.2	95.4	187 degrees at 18
4,550	0.1	- 0.5	95.5	218 degrees at 22
4,870	0.0	- 0.6	95.4	222 degrees at 23
6,130	- 1.8	- 2.4	95.0	232 degrees at 22
7,810	- 4.5	- 5.3	94.7	235 degrees at 24
8,460	- 5.5	- 6.3	94.5	232 degrees at 25
9,580	- 8.5	-11.9	76.5	235 degrees at 27
11,460	-11.4	-12.5	91.7	236 degrees at 21
13,460	-15.6	-17.2	87.7	237 degrees at 16

4.0 Weather Radar Information

The closest Weather Surveillance Radar 1988, Doppler (WSR-88D) was located at Santa Clara, California (KMUX), approximately 72 miles southeast of the accident site. The Level III archive Composite Reflectivity product was obtained from the NWS for the accident investigation. The 0304Z Composite Reflectivity image at an elevation angle of 0.5 degrees (attachment 4) indicated several areas of precipitation across California. The band of greatest radar returns was located south of the Oakland/San Francisco area and was oriented in an east northeast to west southwest direction (ENE-WSW band). The reflectivity levels are 25 decibels (dBZ) or above in this ENE-WSW band with a maximum of 56 dBZ noted off the coast. Several separate areas of return are noted off the coast and south of the ENE-WSW band ranging from

20 to 40 dBZ. In the immediate area of the accident site (northwest of the OAKLAND label) radar returns of 5 to 25 dBZ or VIP level 1 is indicated. A larger more defined area to the north over the Santa Rosa area, extended eastward and then southeast across the Sacramento Valley to the Sierra Mountains.

The Composite Reflectivity image at 0310Z (attachment 5) continues to indicate several small areas of 5 to 25 dBZ returns in the vicinity of the accident site and south over the San Francisco Bay area. However, at the 72 mile range, the 0.5 degrees radar elevation would put the center of the WSR-88D's beam at approximately 10,900 feet, with the base of the beam at 7,200 feet and the top at 14,500 feet.

5.0 Pilot Reports

Within a 75-mile radius of the accident location, pilot report bulletins (UA/UUA) below 18,000 feet from 0000Z to 0600Z were documented for flight conditions reported by other aircraft. The reports within the area and time constraints are listed below in plain language and in chronological order:

Sacramento (SAC) pilot report, 50 miles north of Linden VORTAC (LIN) at 0016Z, altitude 8,500 feet, type aircraft Cessna 414 multiengine airplane, air temperature minus 1 degree C with light rime ice.

Stockton (SCK) pilot report, 6 miles southwest of Linden VORTAC (LIN) at 0019Z, altitude 6,000 feet, type aircraft Beechcraft Bonanza BE35, air temperature + 5 degrees C with light rime ice.

Sacramento (SAC) urgent pilot report, over SAC at 0030Z from a Cessna 414 multiengine airplane, sky cover in Instrument Meteorological Conditions (IMC), moderate to severe rime ice between 7,000 and 11,000 feet, remarks during climb out of SAC southbound, unable to maintain altitude descended to 6,000 feet.

Sacramento (SAC) pilot report, from 10 miles north to 10 miles west of Hangtown VOR at 0103Z, altitude 7,000 feet, type aircraft Trinidad TB21, light rime ice from 10,500 to 7,000 feet.

Sacramento (SAC) pilot report, route from Reno to Sacramento at 0115Z, altitude 6,000 feet, type aircraft not reported, light rime ice between 10,000 and 8,000 feet during descent into SAC.

Sacramento (SAC) pilot report, location 15 miles northeast of Auburn (AUN) at 0120Z, at 8,000 feet, type aircraft Douglas DC-10 jet, light rime icing between 12,000 and 8,000 feet.

Sacramento (SAC) pilot report, location 15 miles northeast of SAC at 0128Z, altitude 8,000 feet, type aircraft McDonald Douglas MD-80 jet, icing light rime 15,000 feet and moderate at 12,000 feet, remarks freezing rain and sleet from 8,000 to 7,000 feet.

San Francisco (SFO) pilot report, 20 miles northwest of Point Reyes VORTAC (PYE) at 0205Z, altitude 15,000 to 9,000 feet, Type aircraft Boeing B-737 jet, light rime icing.

Stockton (SCK) pilot report, from 15 miles east of Livermore (LVK) at 0300Z, altitude 6,000 feet, type aircraft Cessna C-172, air temperature minus 1 degree C with a trace of rime ice.

Santa Rosa (STS) pilot report, over Point Reyes VORTAC (PYE) at 0400Z, report from multiple jet aircraft, light to moderate icing between 9,000 to 11,000 feet.

Marysville/Yuba airport (MYV) at 0407Z, altitude 17,000 feet, type aircraft Boeing B737, moderate rime ice between 17,000 to 8,000 feet.

Oakland (OAK) urgent pilot report, over Oakland at 0430Z, type aircraft British Aerospace HS-125 executive jet, remarks low level wind shear plus/minus 10 knots between 750 and 300 feet landing on runway 27 at Oakland.

San Francisco (SFO) urgent pilot report, 25 miles southeast of Woodside VORTAC at 0547Z, altitude 12,000 feet, type aircraft McDonald Douglas MD80 jet, moderate to severe rime ice between 10,000 to 12,000 feet.

San Jose (SJC) urgent pilot report, over SJC at 0539Z, altitude 300 feet, type aircraft Boeing B737 jet, low level wind shear +10 knots at 300 feet during descent to final approach to runway 12R.

6.0 Satellite Data

Geostationary Operational Environmental Satellite 9 (GOES-9) data was obtained from the NCDC and displayed on the National Transportation Safety Board's Man Computer Interactive Data Access System (McIDAS) workstation. The infrared band 4 GOES-9 satellite imagery at 0245Z, 0300Z, 0330Z and 0400Z on March 6, 1998, were examined. Attachment 6 is the 0300Z infrared GOES 9 satellite image with a resolution of 4 kilometers with the accident site located at the red square. The image was centered over the accident site and magnified (4X) on attachment 7. The radiative temperatures obtained from the imagery at 0300Z provided a temperature of 260 degrees Kelvin (K) or -13.16 degrees C at the accident site, with a minimum of 258.7 degrees K, maximum of 268.0 degrees K, and a mean of 261.9 degrees K. By utilizing

the upper air data, the cloud tops can be estimated based on the radiative temperatures obtained.

The following table provides the observed satellite derived temperatures at 0300Z on March 6, 1998 and approximate cloud heights based upon the Oakland sounding.

Location	Degrees K	Degrees C	Cloud tops feet
Accident site	260.0	-13.16	12,000
Minimum	258.7	-14.46	12,800
Maximum	268.0	- 5.16	8,000
Mean	261.9	-11.26	11,500

The area of precipitation noted in the radar sector above was examined to determine its satellite characteristics. An enhancement curve used in identifying thunderstorms was applied to the 0300Z infrared image at 4X magnification (attachment 8). The area in the immediate location of the accident did not show any enhancement, nor did the area of radar returns south of the San Francisco/Oakland area. The area north of Santa Rosa and northeast of the accident site was the location of coldest temperatures and highest cloud tops.

7.0 Area Forecast

Information contained in the area forecast issued at 2045Z on March 5, 1998, from the Aviation Weather Center (AWC) located in Kansas City, Missouri and valid from 2045Z to 0900Z on March 6, 1998, indicated the following:

The header began with a flag to see the AIRMET Sierra series for IFR conditions and mountain obscuration that was current at issuance.

The synopsis section followed the flag and discussed the current features influencing the weather over the western states. The features were an upper level low centered over northwestern Oregon moving southeastward to central Oregon by 0000Z, with dry northerly wind flow behind the low over Washington, Oregon and northern California. West to southwesterly wind flow over central and southern California was to become northwesterly by 1200Z. At the surface, a trough of low pressure located over western Oregon to northern California would move quickly eastward into Idaho and Nevada by 0600Z with isolated showers of rain and snow. A coastal low pressure system would be moving ashore over Central California by 2300Z, and then move eastward to eastern Nevada by 0600Z. The system would be over central Utah by 1200Z. A trailing cold front would extend southwestward from the low across northern Arizona and southern California. With couds and precipitation

spreading eastward ahead of the system. Dry northwesterly wind flow would then fill behind both systems.

The forecast for central California and the coastal section indicated that after 2045Z, the visibility would be unrestricted, greater than 6 miles, with scattered to broken clouds at 2,000 feet with a second broken layer at 6,000 feet. Cloud tops would extend to 20,000 feet with occasional light rain. From 0200Z, visibility would be unrestricted, greater than 6 miles, with scattered clouds at 3,000 feet and broken clouds at 8,000 feet with cloud tops to 15,000 feet with isolated light rain showers. From 0400Z, visibility would be unrestricted, greater than 6 miles, with scattered clouds at 3,000 feet and at 8,000 feet. The outlook from 0900Z to 1500Z, called for visual flight rules (VFR).

The Area Forecast was updated on March 6, 1998, at 0345Z. The forecast for central California changed to unrestricted visibility, a few clouds at 1,500 feet, broken to scattered clouds at 3,000 to 4,000 feet and broken clouds at 6,000 feet with tops to 10,000 feet. Scattered rain showers were forecasted through the period. At 0800Z, the forecast called for scattered clouds at 4,000 feet and 6,000 feet. The outlook called for VFR conditions to prevail.

8.0 In-Flight Weather Advisories

There were three separate in-flight weather advisories that were current for the area before and up to the time of the accident. The advisories included AIRMET SIERRA for mountain obscuration, AIRMET ZULU for icing conditions and AIRMET TANGO for moderate turbulence.

AIRMET SIERRA 3 was issued for IFR conditions and mountain obscuration at 2045Z and was valid until 0300Z on March 6, 1998. The advisory covered portions of California, Nevada and Utah. The position of the advisory was from Medford, Oregon (MFR) to 80 miles northeast of Salt Lake City, UT (SLC) to Dove Creek, CO (DVC) to 80 miles south of Wilson Creek, NV (ILC) to 40 miles east of San Diego, CA (SAN) to San Diego to 40 miles west of Santa Barbara, CA (SBA) to Fortuna, CA (FOT) and back to Medford. The advisory was issued for mountains occasionally obscured in clouds and precipitation. Conditions over northern and central California were spreading eastward over the remaining area by 0200Z to 0600Z and were expected to continue through 0900Z. The AIRMET was updated at 0245Z on March 6, 1998, and was valid until 0900Z. The area was extended to cover portions of Oregon, California, Idaho, Wyoming, Nevada, Utah, Colorado and Arizona. The area was defined from Eugene, OR (EUG) to Rock Springs, WY (RKS) to Hayden, CO (CHE) to Gunnison, CO (GUC) to Needles, CA (EED) to 40 miles east of San Diego, CA (SAN) to 25 miles southwest of Ukiah, CA (UKI) to Fortuna, CA (FOT) and back to Eugene, OR (EUG). The advisory called for occasional mountains obscured in clouds and precipitation with conditions continuing beyond 0900Z through 1500Z.

AIRMET ZULU 3 was issued at 2045Z and was valid until 0300Z on March 6, 1998. The advisory was issued for icing conditions over California, Nevada and the coastal waters of California. The advisory was issued for occasional moderate rime to mixed icing in clouds and in precipitation between the freezing level and 18,000 feet. The freezing level altitudes were provided and over the central California area was estimated at 6,000 feet. The advisory was updated at 0245Z on March 6, 1998, and was valid until 0900Z. The updated advisory extended the area that was affected to include portions of California, Nevada, Utah, Colorado, Arizona and coastal waters. Occasional moderate rime and mixed icing in clouds and in precipitation between the freezing level and 18,000 feet. The advisory stated that the freezing level had lowered over central California to 4,500 to 7,000 feet.

AIRMET TANGO 3 was issued at 2045Z and included California, Nevada, Utah and Arizona. The coordinates of the advisory extended south of a line from San Francisco to Reno, and excluded the accident site but included the destination airport Oakland. The advisory was issued for occasional moderate turbulence below 15,000 feet, with conditions expected to develop over California from 2100Z to 0000Z and spread over the remainder of the area between 0200Z to 0600Z on March 6, 1998. The turbulent conditions were expected to continue through 0900Z. AIRMET TANGO was updated at 0245Z on March 6, 1998, and was valid until 0900Z.

Attachment 9 depicts the in-flight weather advisories that were issued at 2045Z on March 5, 1998. These advisories were current until 0300Z on March 6, 1998. Attachment 10 depicts the AIRMETs that were issued at 0245Z on March 6, 1998, and valid until 0600Z.

There were no SIGMETs or Convective SIGMETs issued for the period from 2200Z on March 5, 1998, through 0500Z on March 6, 1998.

9.0 Terminal Aerodrome Forecast (TAF)

The following terminal forecasts were issued for the departure and destination airports:

9.0.1 Santa Rosa Airport (KSTS)

The TAF for KSTS was issued March 5, 1998, at 2330Z and was valid for a 24-hour period beginning at 0000Z on March 6, 1998. At 0000Z, the winds were forecasted to be from 140 degrees at 8 knots, visibility better than 6 miles in light rain showers. The forecast included a few clouds at 1,500 feet, ceiling broken at 3,000 feet, and broken at 5,000 feet. The forecast also included temporarily conditions between 0000Z and 0200Z of 5 miles visibility in mist and a ceiling broken at 2,500 feet. From 0200Z, the winds were forecasted to be variable at 6 knots with visibility

better than 6 miles. The forecast included a few clouds at 1,000 feet, scattered clouds at 3,000 feet, and ceiling broken at 6,000 feet. The forecast included a temporary condition between 0200Z and 0600Z of light rain showers.

9.0.2 Oakland International Airport (KOAK)

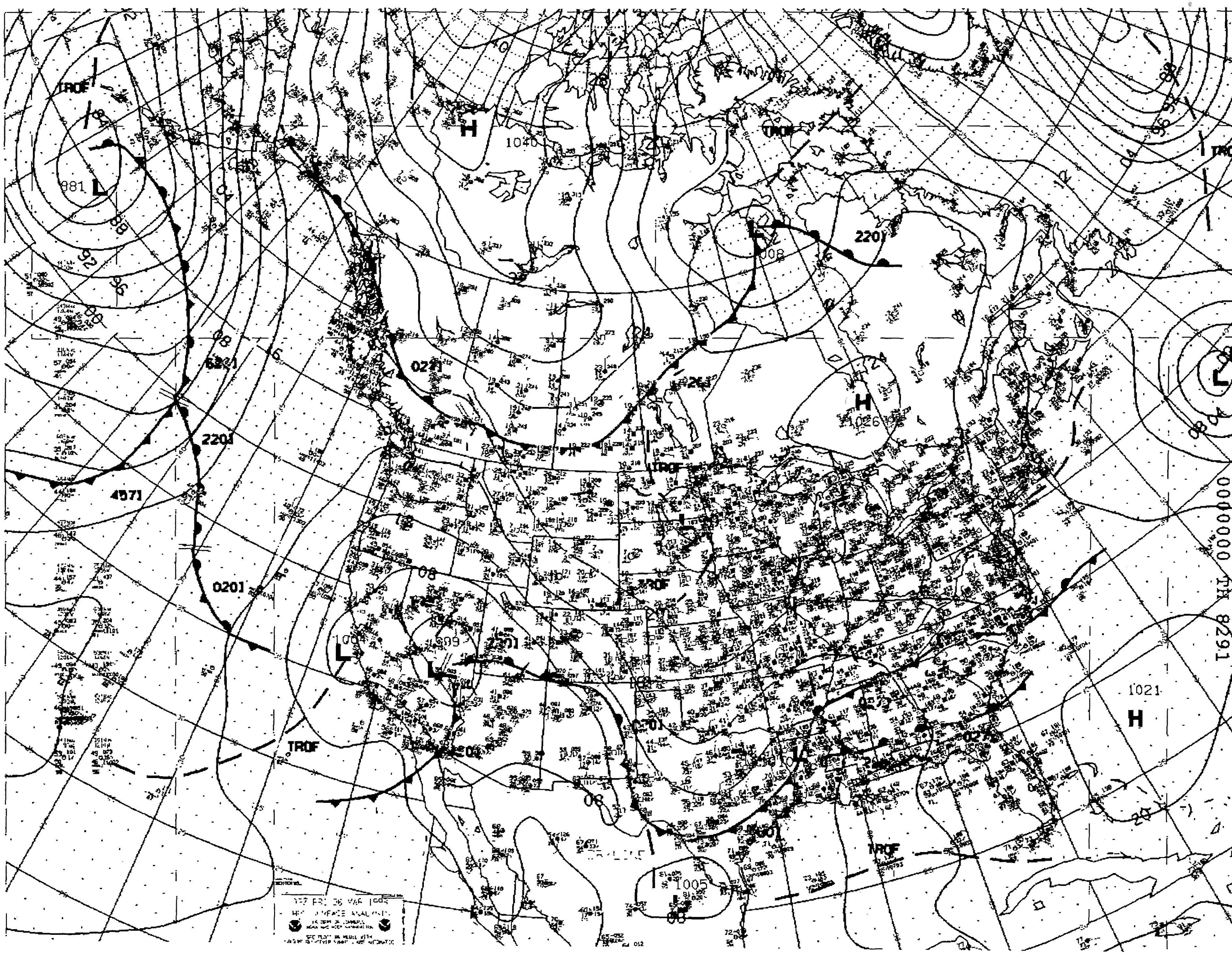
The TAF for KOAK was issued on March 5, 1998 at 2330Z and was valid for a 24-hour period beginning at 0000Z on March 6, 1998. At 000Z, the winds were forecasted to be from 120 degrees at 12 knots with visibility better than 6 miles in light rain showers. Sky conditions included scattered clouds at 1,000 feet, ceiling broken at 2,000 feet, and broken at 4,000 feet. The forecast included temporary conditions between 0000Z and 0300Z of visibility 5 miles in mist, scattered clouds at 2,000 feet, ceiling broken at 3,500 feet. From 0400Z, the winds were forecasted from 280 degrees at 10 knots and visibility better than 6 miles. Sky conditions included a ceiling broken at 4,000 feet and broken at 6,000 feet. The forecast included a temporary conditions of light rain showers and scattered clouds at 4,000 feet between 0400Z and 0600Z.

There were no forecast amendments issued from 0000Z through 0400Z on March 6, 1998, for either Santa Rosa or Oakland.

10.0 Astronomical Data

Accident location: Novato, CA at N38° 06.61' W122° 33.43'
Sunset: 1808 PST (0208Z)
End of civil twilight: 1834 PST (0234Z)
Altitude of the sun: 12 degrees below the horizon
True bearing of the sun: 272 degrees
Altitude of the moon: 69.3 degrees above the horizon
Percent illumination of moon: 58 % above the clouds
Phase of the moon: First quarter occurred March 5, 1998 at 12:41 PST

Donald E. Eick
NTSB Meteorologist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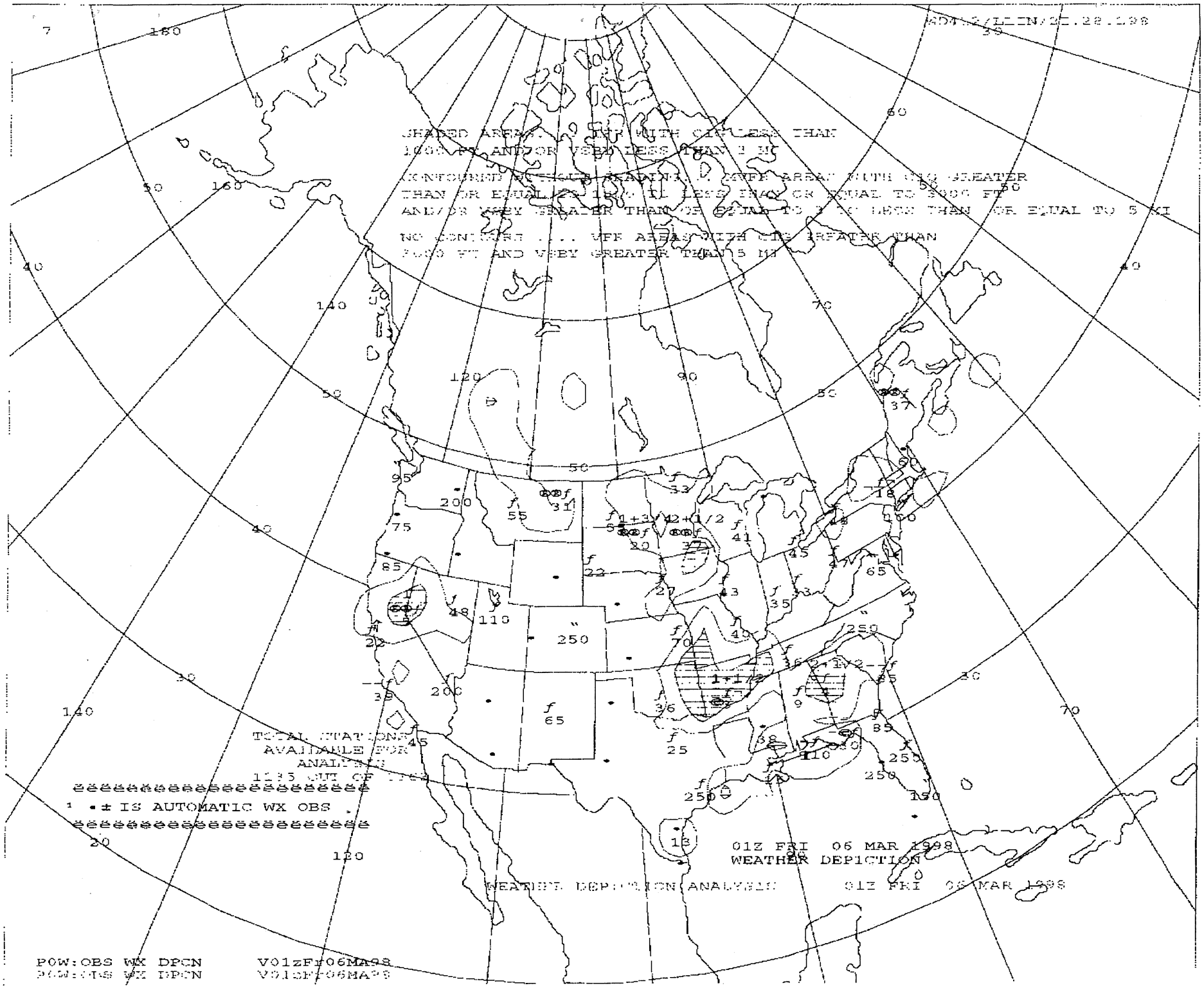
SHADED AREAS ... VFR WITH CIG LESS THAN
1000 FT AND/OR VSBY LESS THAN 3 MI
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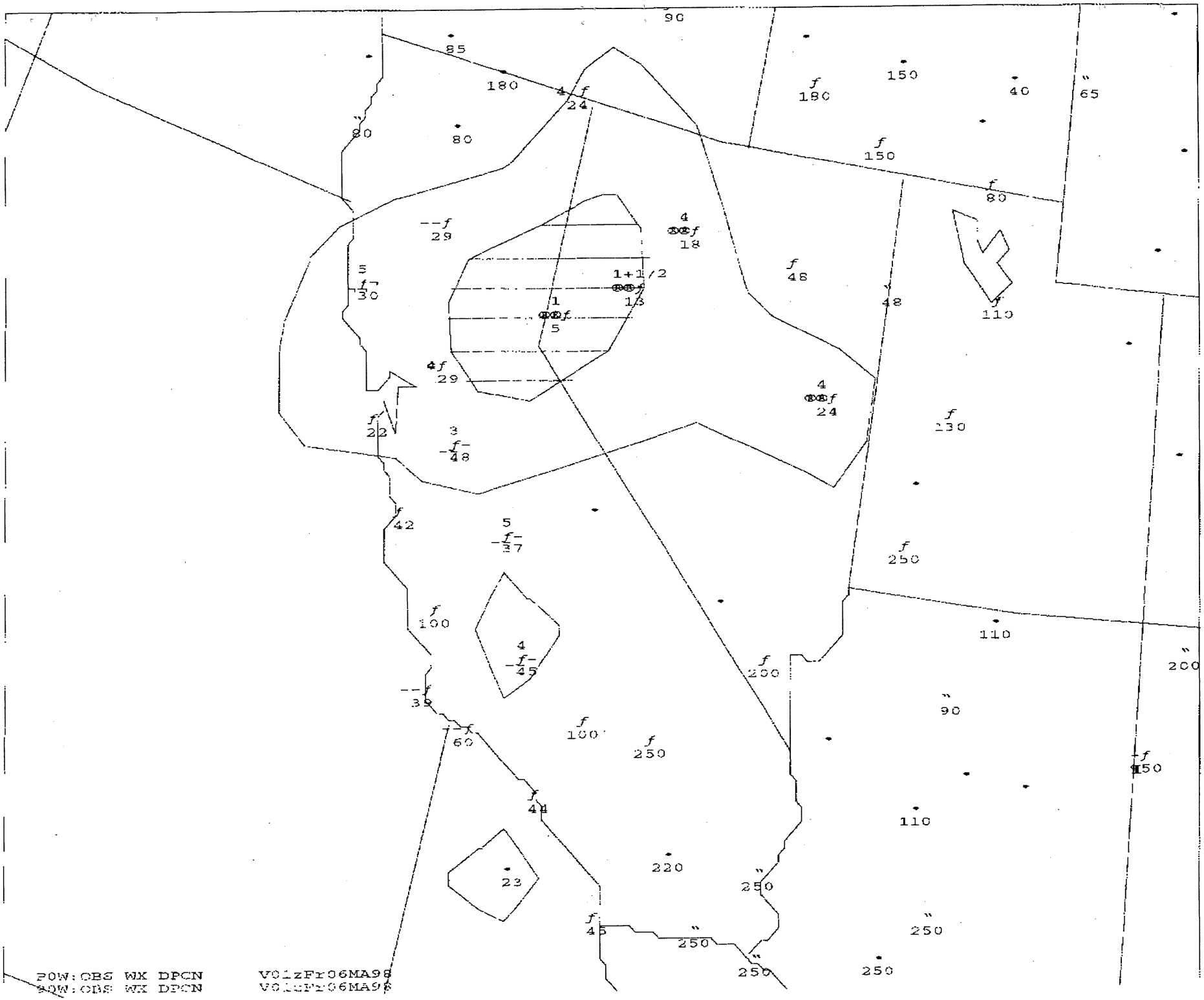
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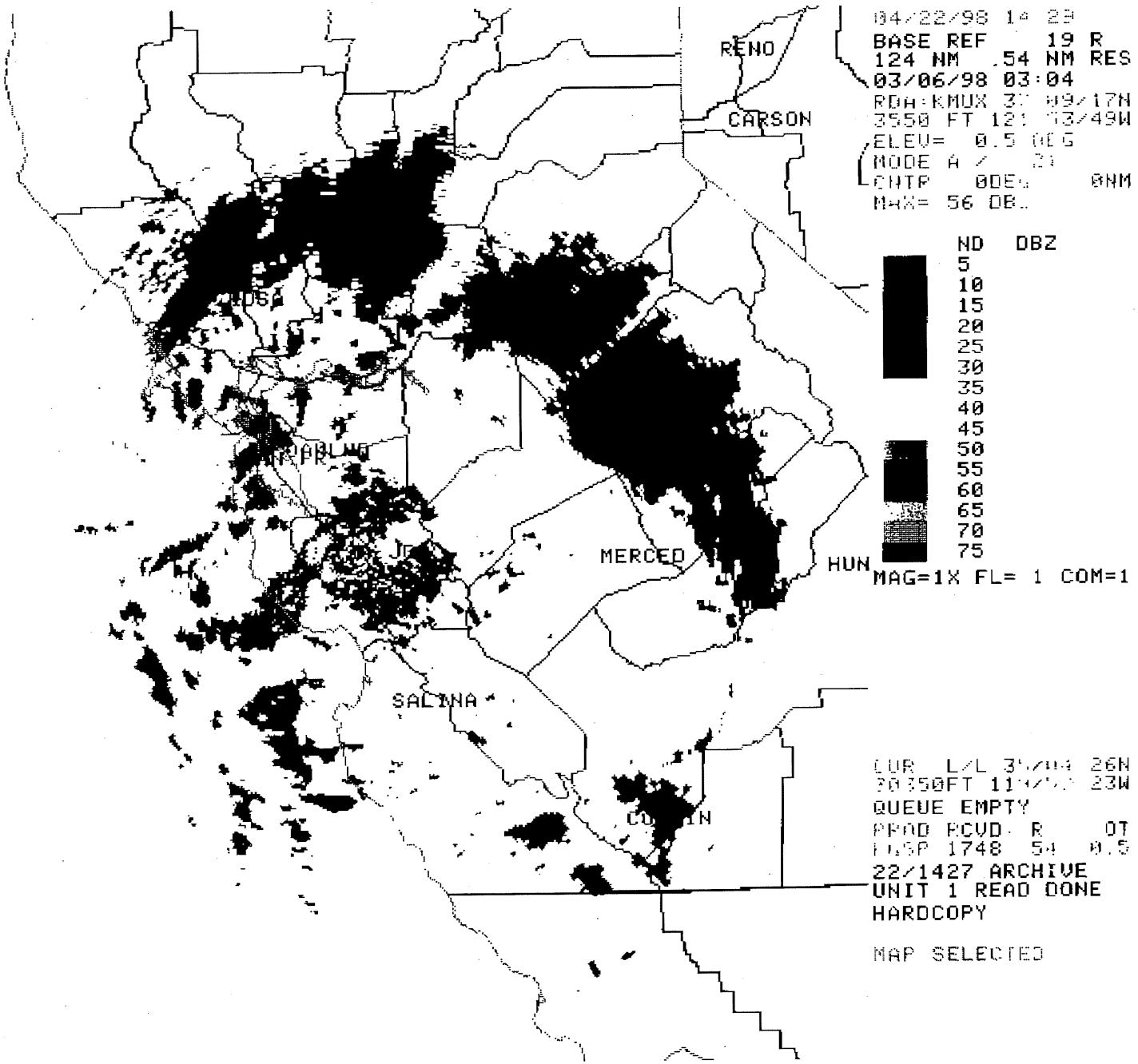
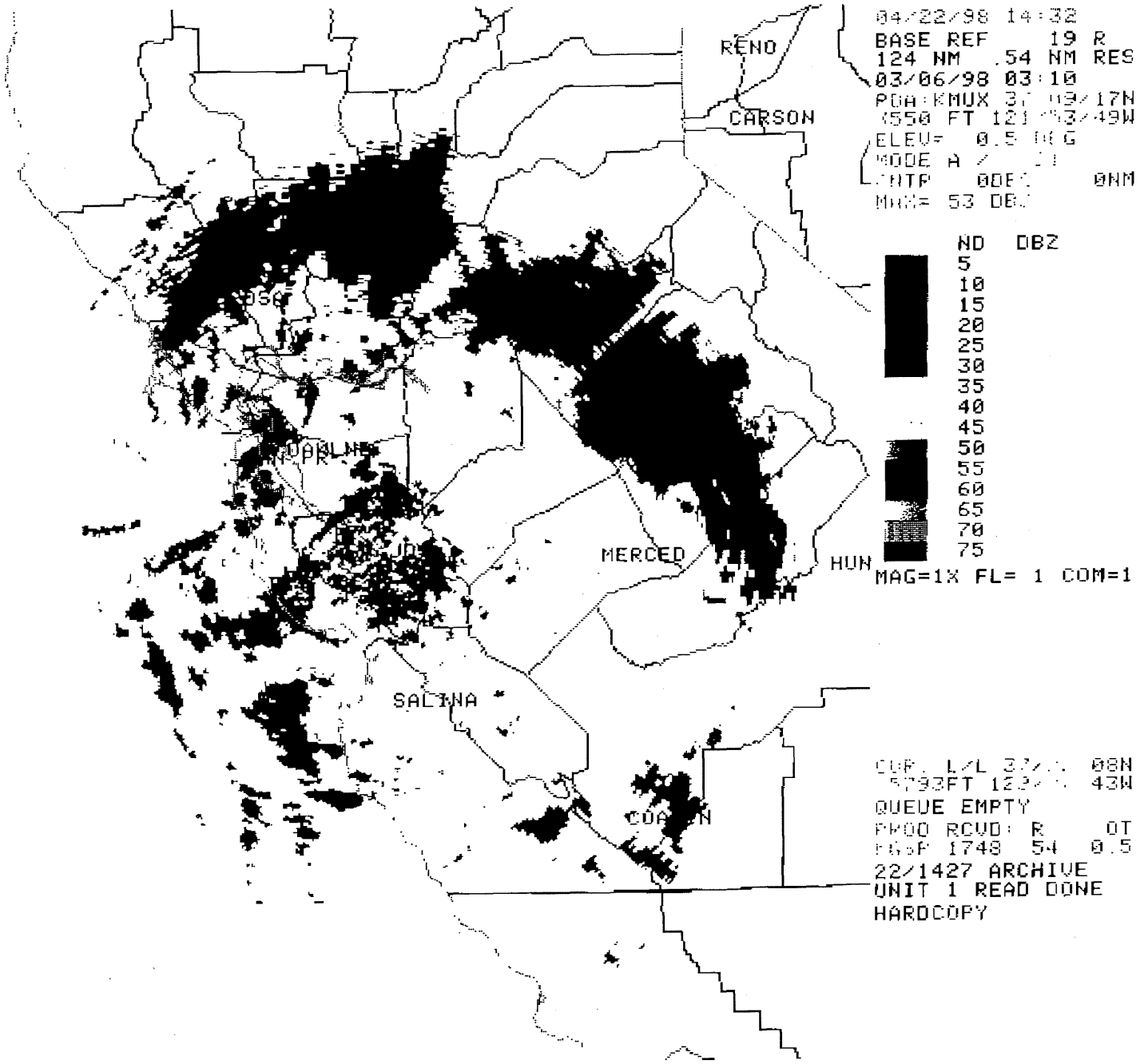
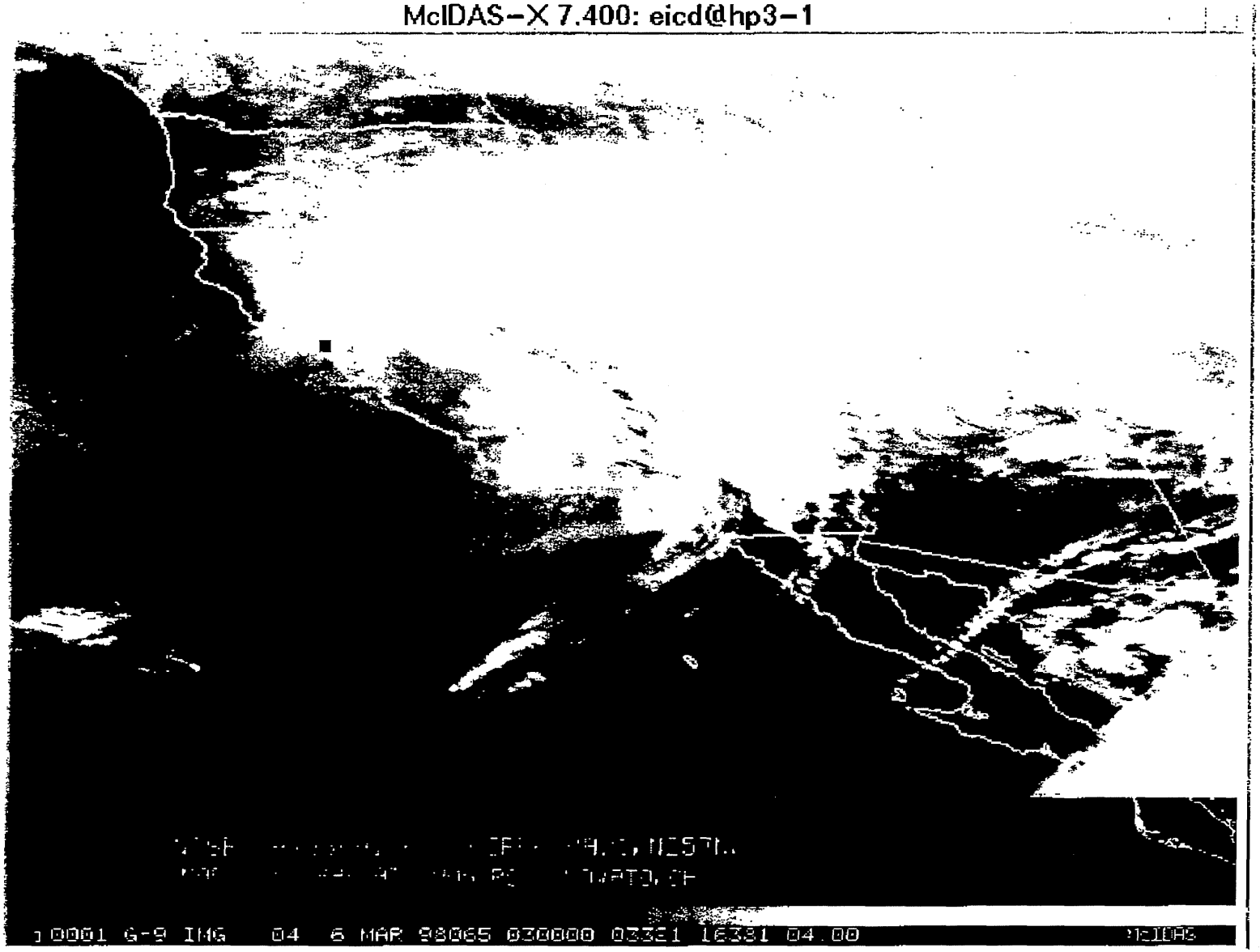


ATTACHMENT 4 - WSR-88D AT 0304Z FROM KMUX



ATTACHMENT 5 - KMUX AT 6210Z



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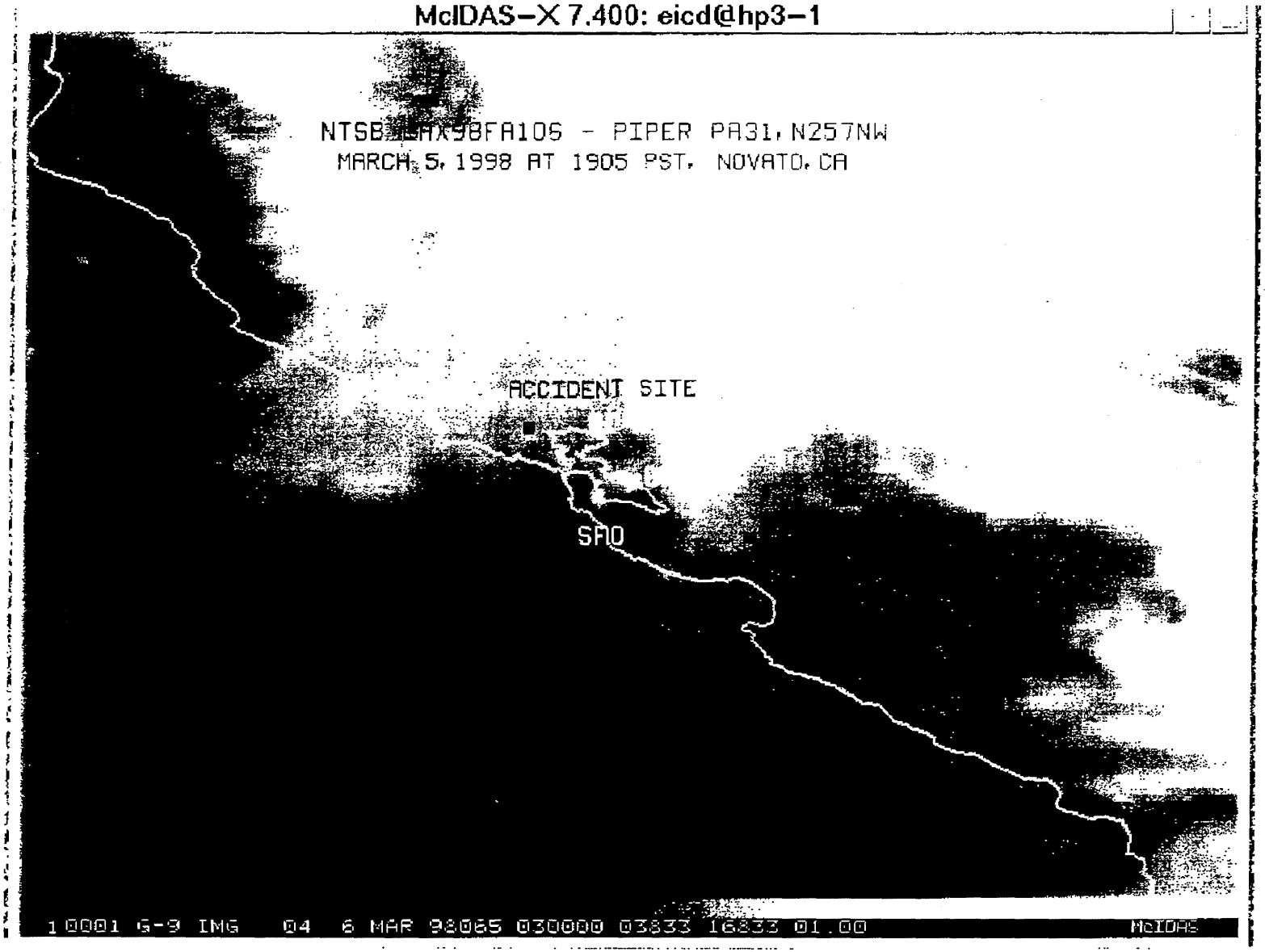

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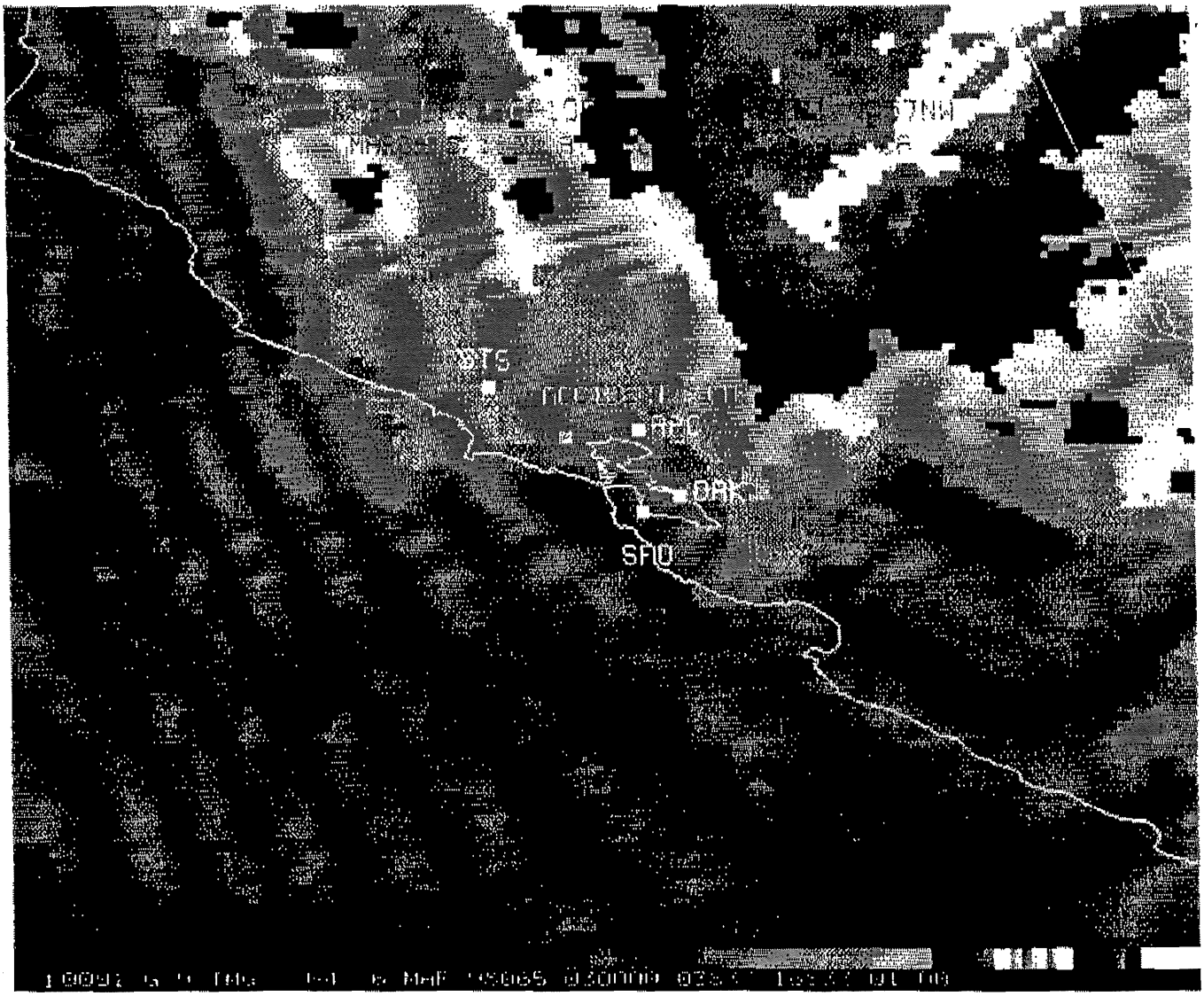
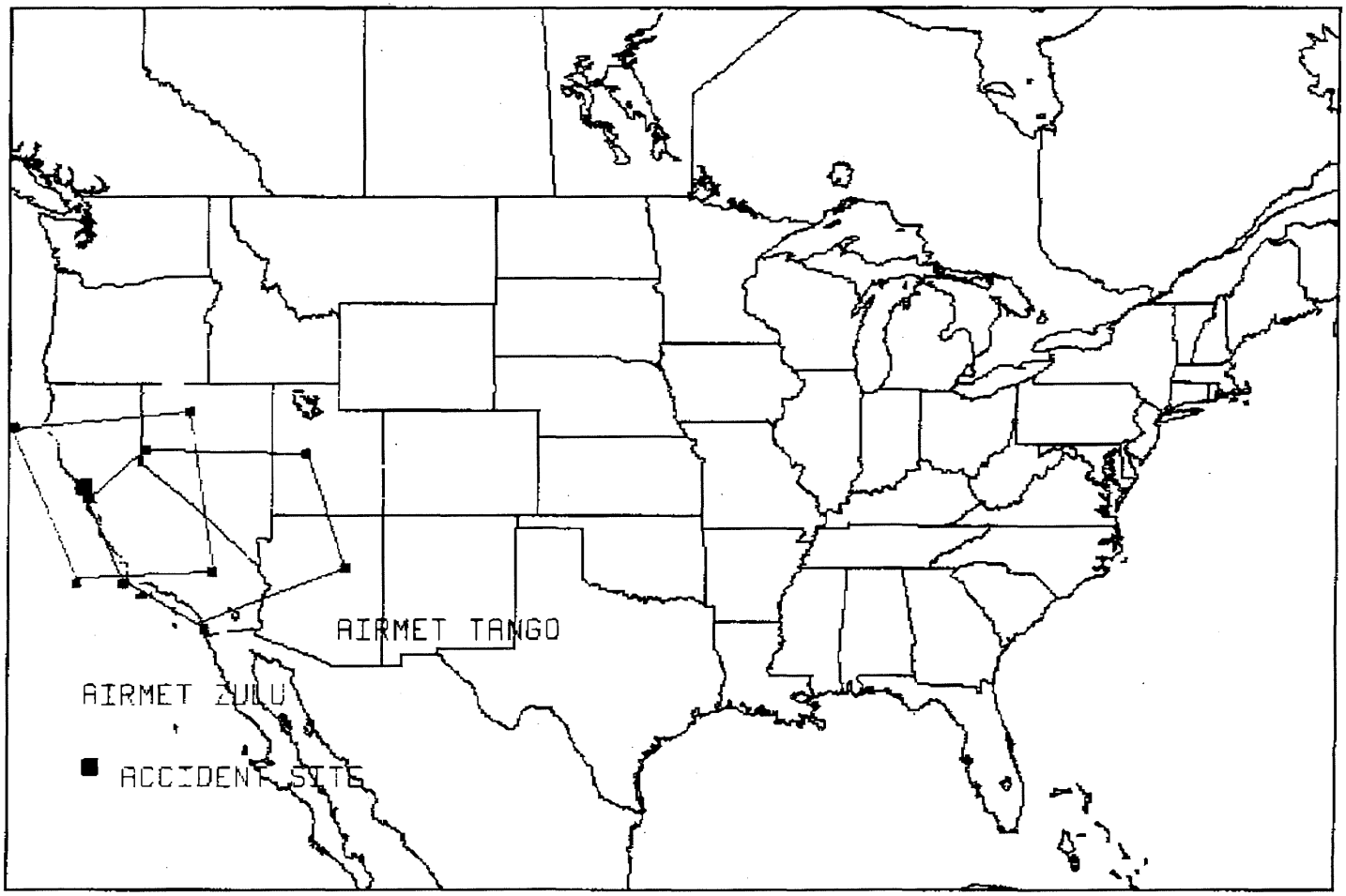
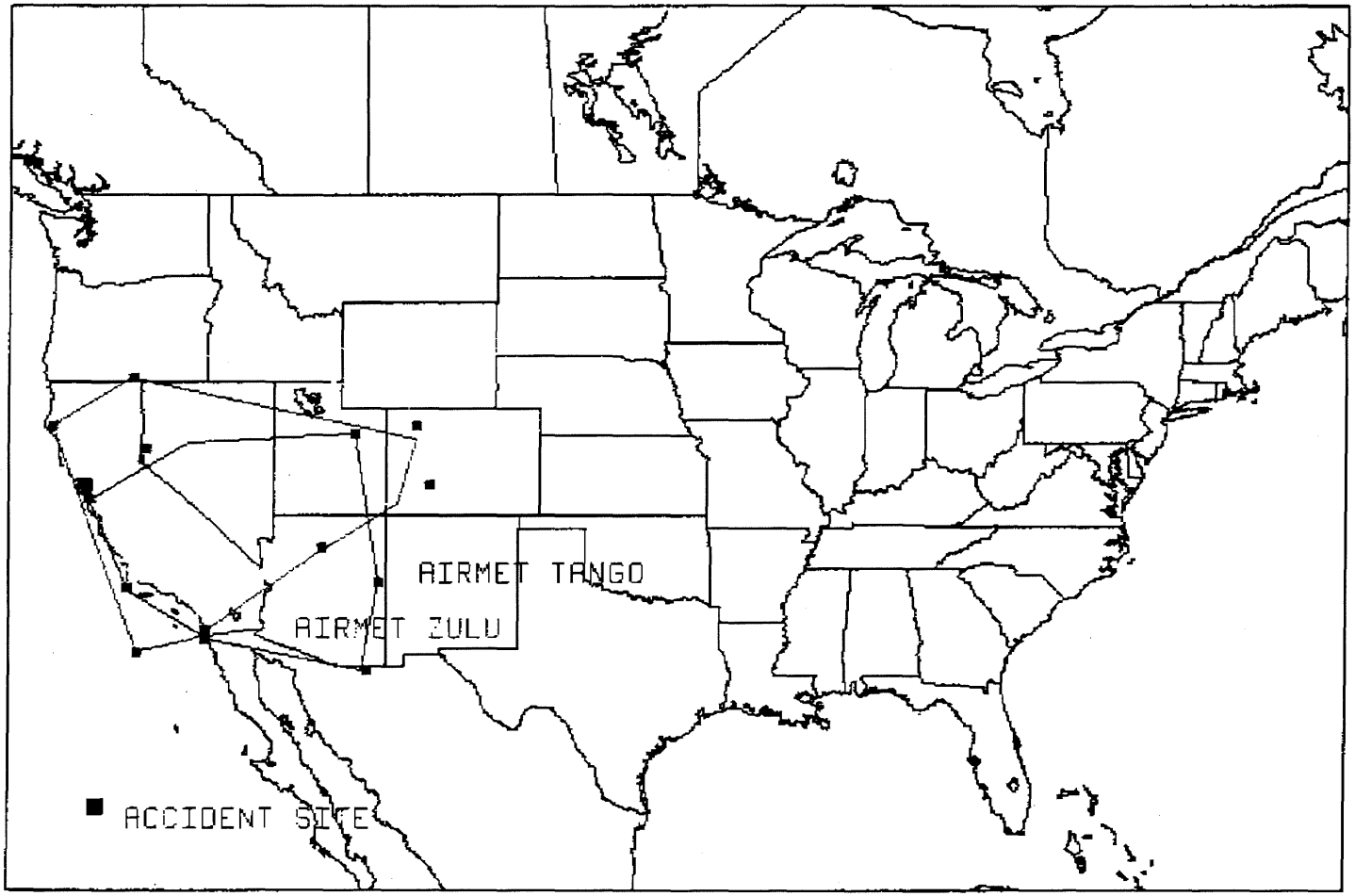


ATTACHMENT 8

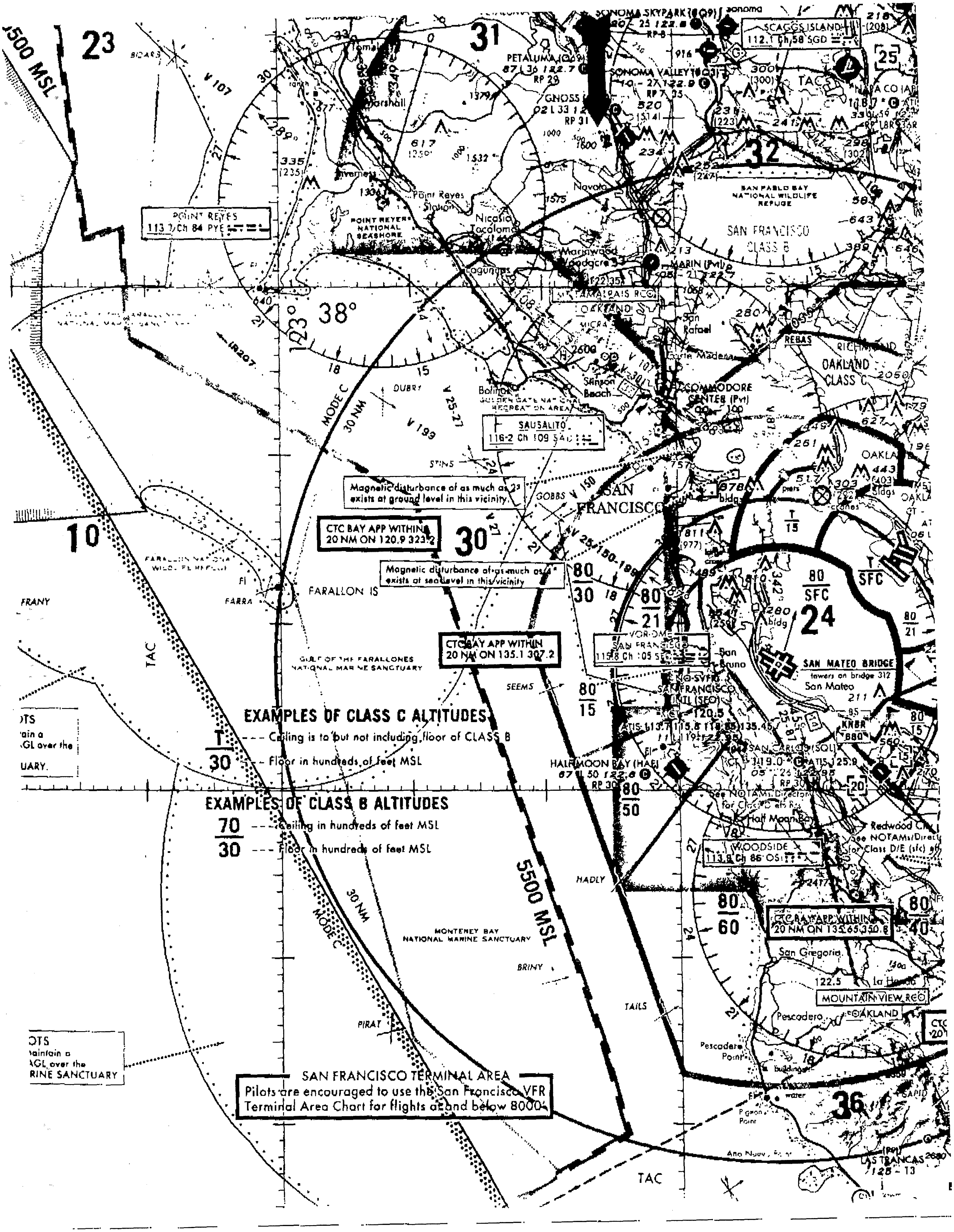


IN FLIGHT WEATHER ADVISORIES ISSUED AT 2045Z 5 MAR98
ATTACHMENT 9



IN FLIGHT WEATHER ADVISORIES ISSUED AT 0245Z 6MAR98

ATTACHMENT 10



SONOMA SKYPARK
SCAGGS ISLAND
112.1 Ch 58 SGD
PETALUMA
SONOMA VALLEY
GNOSS
NAPA CO
Marshall
Inverness
Point Reyes Station
POINT REYES NATIONAL SEASHORE
POINT REYES
113.7 Ch 84 PYE
Novato
Nicasio
SAN PABLO BAY NATIONAL WILDLIFE REFUGE
SAN FRANCISCO CLASS B
MARIN (Pvt)
MT TAMALPAIS RCO
OAKLAND
San Rafael
Corte Madera
REBAS
RICHMOND
OAKLAND CLASS C
COMMODORE CENTER (Pvt)
Bolinas
Stinson Beach
GOLDEN GATE NATIONAL RECREATION AREA
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MODE C
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V 199
V 25-27
STINS
Magnetic disturbance of as much as 2° exists at ground level in this vicinity.
GOBBS
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CTC BAY APP WITHIN 20 NM ON 120.9 323.2
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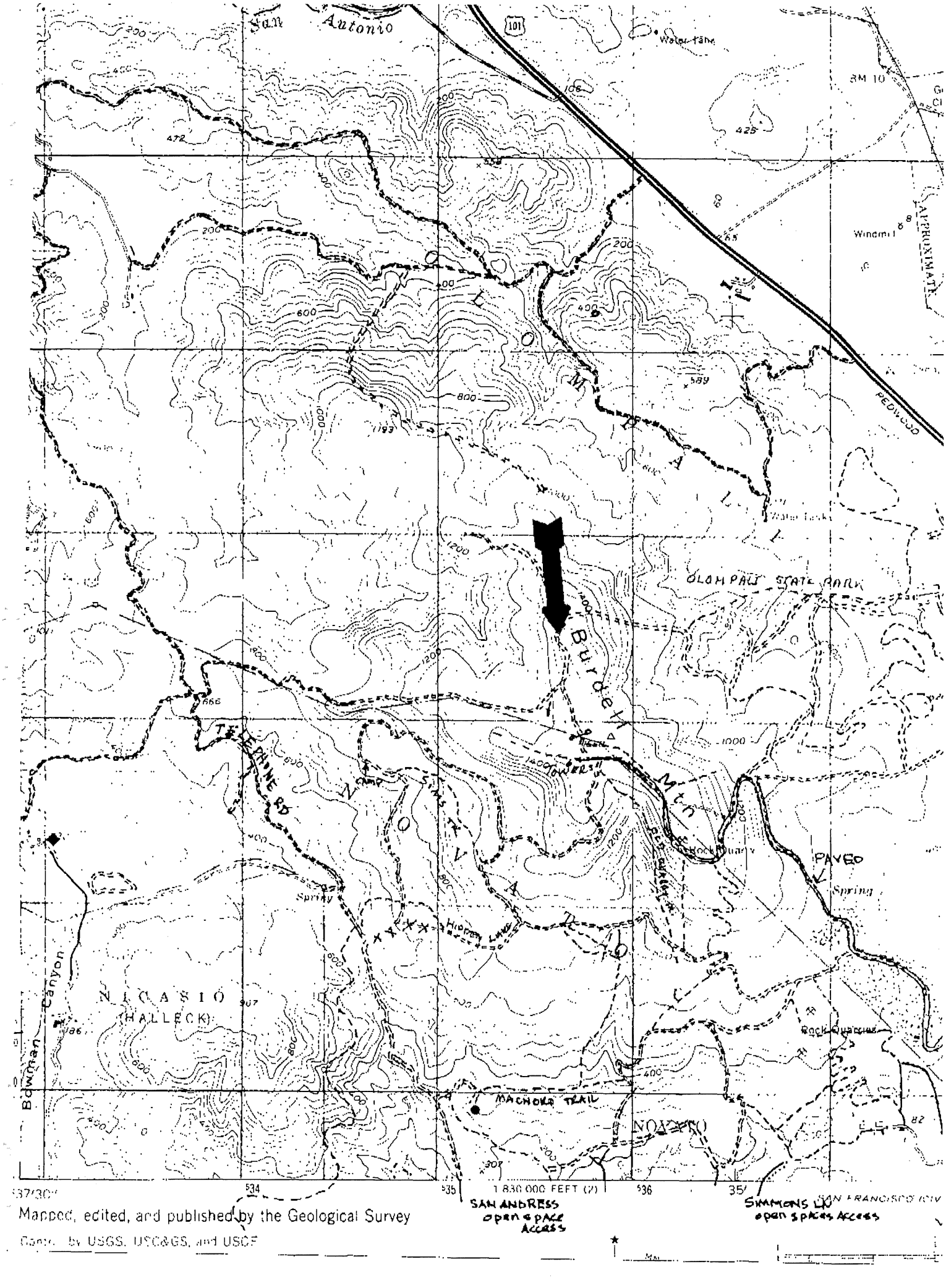
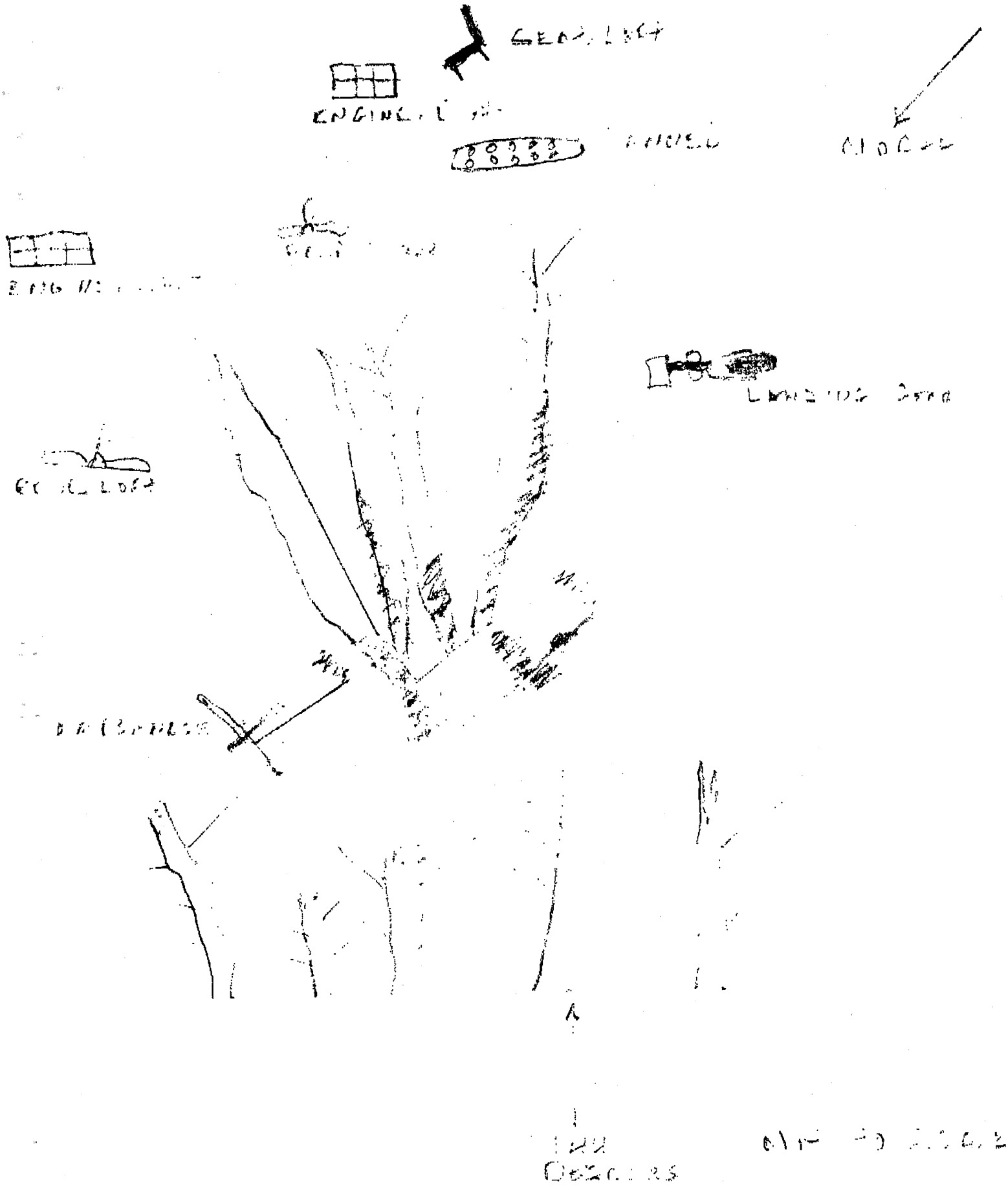
FARALLON IS
FARALLON NATIONAL WILDLIFE REFUGE
GULF OF THE FARALLONES NATIONAL MARINE SANCTUARY
CTC BAY APP WITHIN 20 NM ON 135.1 307.2
VOR-DME SAN FRANCISCO
115.8 Ch 105 SFO
San Bruno
SAN MATEO BRIDGE
towers on bridge 312
San Mateo
SAN FRANCISCO INTL (SFO)
SEEMS
EXAMPLES OF CLASS C ALTITUDES
T/30
--- Ceiling is to but not including floor of CLASS B
--- Floor in hundreds of feet MSL
HALF MOON BAY (HAF)
SAN CARLOS (SQL)
Half Moon Bay
Redwood City
EXAMPLES OF CLASS B ALTITUDES
70/30
--- Ceiling in hundreds of feet MSL
--- Floor in hundreds of feet MSL
WOODSIDE
113.9 Ch 86 OSI
HADLY
5500 MSL
CTC BAY APP WITHIN 20 NM ON 135.65 350.8
San Gregorio
MONTEREY BAY NATIONAL MARINE SANCTUARY
BRINY
La Honda
MOUNTAIN VIEW RCO
OAKLAND
TAILS
Pescadero
PIRAT
Pescadero Point
SAN FRANCISCO TERMINAL AREA
Pilots are encouraged to use the San Francisco VFR Terminal Area Chart for flights at and below 8000'
Pigeon Point
Ano Nuevo Point
LAS TRANCAS
TAC
23
31
32
25
38°
123°
10
30
24
36
20



Mapped, edited, and published by the Geological Survey

Control by USGS, USC&GS, and USCE



U.S. Department of Transportation — Federal Aviation Administration

FAA ACCIDENT / INCIDENT REPORT

1 [X] ACCIDENT [ ] INCIDENT

2 DATE: 03 (MO) 05 (DA) 98 (YR)

4 FAA OFFICE: WP27 (REGION)

5 NTSB ID: LAX98LA109

6 FLIGHT NUMBER AIR CARRIER ONLY: 263

7 LOCATION-CITY/STATE/ZIP: Novato, CA

8 OPERATOR NAME (AIR CARRIER ONLY): Airpac Airlines Inc. — FOUR LETTER IDENTIFIER: APCA

9 AIRPORT (IF APPLICABLE): — 3- OR 4- LETTER ID:

10 TIME LOCAL: 1905 — 24- HOUR CLOCK

11A LATITUDE: N/A ALASKA

11B LONGITUDE: N/A ALASKA

12 AIRCRAFT DAMAGE

	NONE
	MINOR
	SUBSTANTIAL
X	DEMOLISHED

13 COLLISION - BETWEEN TWO AIRCRAFT

[ ] YES [ ] AIR
[X] NO [X] GROUND

REGISTRATION NUMBER SECOND AIRCRAFT:

AIRCRAFT

REGISTRATION: N257NW

MAKE/MODEL: PA31-350

SERIAL NO.: 31-7952014

YEAR OF MANUFACTURE: 1978

TOTAL AIRFRAME HRS. (WHOLE HOURS): 6879

AIRFRAME CYCLES (AIR CARRIER ONLY):

15 FAR PART NUMBER

	X	135 ON DEMAN
	103	135 COMMUTI
	105	137
	121	141
	125	PUBLIC USE
	129	FOREIGN
	133	MILITARY
	/////	OTHER

16 TYPE OF AIRCRAFT

X	AIRPLANE
	HELICOPTER
	GLIDER
	BALLOON
	DIRIGIBLE
	GYROPLANE
	HOMEBUILT / AMATEUR
	ULTRALIGHT

17 POWER PLANT MAKE/MODEL/SERIES (IF APPLICABLE)

18 PROPELLER MAKE/MODEL/SERIES (IF APPLICABLE)

19 BIOHAZARD AREA [X] YES [ ] NO

20 INJURY SUMMARY [ ] UNKNOWN

	FLT. CREW	CABIN CREW	PASSENGERS	OTHER	TOTA
NONE					
MINOR					
SERIOUS					
FATAL	1				
TOTAL	1				

FACTORS - IDENTIFY PRIMARY FACTOR AS A. IDENTIFY SECONDARY FACTORS AS X.

CHECKING OF FACTORS IS THE OPINION OF THE INVESTIGATOR/INSPECTOR BASED ON THE INVESTIGATION

21A TECHNICAL FACTORS

X	NOT APPLICABLE		FIRE AFTER LANDING
	GEAR UP LANDING		SYSTEM FAILURE
	FIRE OR EXPLOSION		COMPONENT FAILURE
	FUEL CONTAMINATION		LOST POWER
	BLADE/ROTOR FAILURE		FOD
	DESIGN OF AIRCRAFT		AUTO/IMPROPER FUEL
	METAL FATIGUE		CORROSION
	IMPROPER MAINTENANCE		INFLIGHT FIRE
	IMPROPER INSTALLATION		SMOKE/FUMES
	AD NON-COMPLIANCE		INFLIGHT BREAKUP
	DECOMPRESSION		IMPROPER PART
	21F. ATA CODE		OTHER

21B OPERATIONAL FACTORS

	NOT APPLICABLE		SABOTAGE
X	PILOT INDUCED		PILOT INCAPACITATED
	GROUND CREW		PILOT INCP. ALCOHOL
	OTHER THAN PILOT		DOWNWIND TAKEOFF
	FUEL DEPLETION		CARBURETOR ICE
	OVER GROSS WEIGHT	X	HIT KNOWN OBJECT
	CG OUT OF LIMITS		EMERGENCY LANDING
	STRUCK ANIMAL		HARD LANDING
	BIRD STRIKE		OVERSHOT RUNWAY
	PAX DISTURBANCE		UNDERSHOT RUNWAY
	STOLEN AIRCRAFT		LOSS OF CONTROL
	HIJACK		STALL/SPIN
			MISMANAGED GEAR
			MISMANAGED CONTROLS
			ABORTED TAKEOFF
			ICE/FROST
			WAKE TURBULENCE
		X	OTHER TERRAIN

21C. PART NAME | 21D. MANUFACTURER | 21E PART NUMBER

22. TYPE OF OPERATIONS

	PERSONAL
	COMMERCIAL
	CARGO
	INSTRUCTION
	CORPORATE
X	FERRY
	AERIAL APPLICATION
	AMBULANCE
	FIREFIGHTING
	BANNER TOW
	AIR SHOW
	SIGHTSEEING
	SKYDIVING
	MAINTENANCE TEST
	EXPERIMENTAL/HOMEBUI
	FLOATS INSTALLED
	OTHER

23. WX. BRIEFING SOURCE

X	NOT APPLICABLE/NOT AVAILABLE
	NATIONAL WEATHER SERVICE
	FLIGHT SERVICE STATION
	PATWAS
	VOICE RESP. SYSTEM
	COMPANY
	COMMERCIAL WX. SERVICE
	TV/RADIO WEATHER
	MILITARY
	COMPUTER BRIEFING

24. PRECIPITATION

X	NOT APPLICABLE/NOT AVAILABLE
	RAIN
	HAIL
	SLEET
	SNOW
	FREEZING DRIZZLE
	FREEZING RAIN
	THUNDERSTORM
	DRIZZLE
	OTHER

25. WEATHER FACTORS

	NONE / NOT APPLICABLE		ICE ON RUNWAY
	HAZE		WET RUNWAY
	DUST		TURBULENCE
	SMOKE		DENSITY ALTITUDE
	FOG		LIGHTNING STRIKE
	BLOWING DUST		BLOWING SNOW
	BLOWING SMOKE		WHITE OUT
	ICING CONDITIONS		WIND SHEAR
	GUSTY WINDS	X	OTHER LOWERING CEILING

26. PHASE OF FLIGHT

	GROUND	X	CRUISE		MANEUVER
	TAXI		DESCENT		HOVER
	TAKEOFF		APPROACH		OTHER
	CLIMB		LANDING		/////////

27. ACTUAL WEATHER [ ] IMC [X] VMC [ ] NOT AVAILA

28. RUNWAY CONDITIONS [X] NOT APPLICABLE

	DRY		SNOW
	WET		SLUSH
	ICE		STANDING WATER

DID PILOT ATTEND SAFETY SEMINAR OR CLINIC WITHIN PAST 3 YEARS ?	YES ☐	NO ☐
DID PILOT PARTICIPATE IN WINGS PROGRAM WITHIN PAST 3 YEARS ?	YES ☐	NO ☐
DID PILOT ATTEND ANY OTHER RECURRENT TRAINING WITHIN THE PAST 3 YEARS ?	YES ☐	NO ☐

10 (AIR CARRIER ONLY)

EVACUATION INITIATED		EVACUATIO INJURIES	
YES ☐	NO ☐	YES ☐	

31. PILOT INFORMATION ☐ NOT APPLICABLE

PILOT INFORMATION	PIC	CERTIFICATE TYPE		SECOND PILOT
NAME	ARSONNEAU, ISABELLE		RECREATIONAL	
DATE OF BIRTH	04 (MO) 09 (DA) 64 (YR)		STUDENT	MO DA YR
DATE HIRED (AIR CARRIER ONLY)	09 (MO) 07 (DA) 93 (YR)		PRIVATE	MO DA YR
DOMICILE ZIP CODE	94501		COMMERCIAL	
HOURS MAKE AND MODEL			FLIGHT INST.	
HOURS LAST 90 DAYS	89		ATP	
TOTAL HOURS	4389	X	NON-PILOT	
CERTIFICATE NO.	2473046 CFI, ATP			
SOCIAL SECURITY NO.	603 56 6593			
REGULATORY CHECK RIDE	MO DA YR			MO DA YR

32. CORRECTIVE ACTION(S) PLANNED OR INITIATED ☒ NONE ☐ 44709 RIDE ☐ EIR ☐ SDR ☐ COUNSELING ☐ M or D ☐ OTHER

NARRATIVE (ATTACH ADDITIONAL SHEETS AS NECESSARY)

(ONLY STATE THE FACTS THAT ARE CAUSAL TO THE ACCIDENT/INCIDENT)

Airpac flight 263 departed STS at approximately 1850 LCL and climbed to 2000 ft. MSL on a heading of 143 True. At approximately 1857 LCL the aircraft started a descent with the aircraft impacting rising terrain on the Northwest side of Burdell Mt. at about the 1400 ft level at Lat 38 09'02"; Long 122 35' 07" . The aircraft impacted trees and was destroyed . The pilot sustained fatal injuries. The pilot of a second company aircraft flying one minute ahead and to the East of the accident aircraft indicated that weather in the crash site vicinity necessitated him to descend to 1200 ' to maintain V .

CONDUCT OF INVESTIGATION ACCIDENT ONLY

34. NTSB PARTICIPATION ON SCENE ☒ LIMITED ☐ | 35. FAA PARTICIPATION ON SCENE ☒ NOT ON SCENE ☐ SCENE NOT ACCESSIBLE ☐

FAA INITIAL NOTIFICATION	FSDO NOTIFICATION	FAA IIC ARRIVAL ON SCENE
36. DATE AND LOCAL TIME 03 (MO) 05 (DA) 98 (YR)	37. DATE AND LOCAL TIME 03 (MO) 06 (DA) 98 (YR)	38. DATE AND LOCAL TIME 03 (MO) 06 (DA) 98 (YR)
2302 24 - HOUR CLOCK	0830 24 - HOUR CLOCK	1130 24-HR CLOCK
FAA HRS. USED FOR TOTAL	10 TOTAL HRS USED AT ACCIDENT SCENE	4 TOTAL TRAVEL HRS. TO & FROM

39. FAA NINE RESPONSIBILITIES

IDENTIFICATION OF RESPONSIBILITIES IS THE INVESTIGATORS OPINION BASED ON HIS/HER INVESTIGATION

1. ☐ YES ☒ NO FAA FACILITIES	4. ☒ YES ☐ NO AIRMAN/AIR AGENCY COMPETENCE	7. ☐ YES ☒ NO SECURITY
2. ☐ YES ☒ NO NON FAA FACILITIES	5. ☐ YES ☒ NO FAR CHANGE NEEDED	8. ☐ YES ☒ NO AIRMAN MEDICAL QUALIFICATION
3. ☐ YES ☒ NO AIRWORTHINESS	6. ☐ YES ☒ NO AIRPORT CERTIFICATION	9. ☒ YES ☐ NO FAR VIOALATIONS

40. BRIEF EXPLANATION OF ISSUES INVOLVED

FAR VIOLATED: 91.119(C)

41. FAA IIC NAME: RICHARD M. BROWN	DATE: 03/06/1998	REGION: WP	DISTRICT OFFICE: 27

FAA FORM 8020-23 (12/87) SUPERSEDES FAA FORMS 8020-5 AND 8020-16

MEMORANDUM

Date: **March 6, 1998**

To: **Lt. R. Russell**

From: **Stephen Lawrence**
Captain, Air Patrol

Subject: **Search For Downed Aircraft On Mount Burdell**

We were provided with Lat./Long. Coordinates of 38 degrees, 09 minutes, 2 seconds and 122 degrees, 35 minutes, 7 seconds as the coordinates established by the crew of the United States Coast Guard helicopter, which was on scene in the early morning hours. This location was found to be off Mount Burdell and was not further pursued.

Martin Sprick and I flew a total of 1.6 hours over the Mount Burdell area.

Given that we did not descend below approximately two thousand feet (2,000') in the vicinity of the point at which the aircraft impacted the terrain, Mount Burdell being one thousand five hundred eighty feet (1,580') MSL (mean sea level), my observations can best be described as impressions or estimations.

The scene of the crash was located on the northerly portion of Mount Burdell at a point where the mountain has risen from north to south to a somewhat level area. As this somewhat level area continues in a southerly direction, the terrain begins to rise again to another area which is also somewhat level and which constitutes the highest point on Mount Burdell.

The aircraft appears to have impacted in either level flight or perhaps while descending, with the terrain in the impact area rising slightly to the south. Given our altitude, I am unable to positively state what heading the aircraft was flying at the time of impact. It is however my impression that the aircraft was travelling on an approximate heading of 340 degrees magnetic. In any event, it is evident that the aircraft was travelling in a southerly

direction and impacted the trees first, either while descending or while the terrain was rising, and disintegrated in a straight line to the south. From my observations it is reasonable to say that the aircraft burned after the initial impact.

I would have to estimate that had the aircraft been perhaps as little as one hundred feet (100') higher, it would have cleared the highest point of Mount Burdell.

The Federal Aviation Administration office in Oakland reports that the only official weather observation for the area occurred at 1950 Hours on March 5th and was made by the Sonoma County Airport at Santa Rosa as follows:

Winds 330 degrees at 5 knots
Visibility 5 statute miles
Moderate rain/mist
Ceiling 3,000 feet broken and 8,000 overcast
Temperature 6 degrees Celsius
Dewpoint 5
Altimeter 29.79 inches of mercury

I am informed by a pilot, that the weather in the Marin County area during the night of March 5th/6th was rain with a low ceiling. What specifically the weather was in the vicinity of Mount Burdell at the time of the crash may never be known.

STATEMENT OF PARTY REPRESENTATIVES TO NTSB INVESTIGATION

Aircraft Identification

Registration Number N257NW
Make and Model PIPER PA-31-350
Location NOVATO, CA
Date 3-98

The undersigned hereby acknowledge that they are participating in the above-referenced aircraft accident or incident investigation (including any component tests and teardowns or simulator testing) on behalf of the party indicated adjacent to their name, for the purpose of providing technical assistance to the National Transportation Safety Board.

The undersigned further acknowledge that they have read the attached copy of 49 C.F.R. Part 831 and have familiarized themselves with 49 C.F.R. § 831.11, which governs participation in NTSB investigations and agree to abide by the provisions of that regulation.

It is understood that a party representative to an investigation may not occupy a legal position or be a person who also represents claimants or insurers. The placement of a signature hereon constitutes a representation that participation in this investigation is not on behalf of either claimants or insurers and that, while any information obtained may ultimately be used in litigation, participation is not for the purposes of preparing for litigation.

By placing their signatures hereon, all participants agree that they will neither assert, nor permit to be asserted on their behalf, any privilege in litigation, with respect to information or documents obtained during the course of and as a result of participation in the NTSB investigation as described above. It is understood, however, that this form is not intended to prevent the undersigned from participating in litigation arising out of the accident referred to above or to require disclosure of the undersigned's communications with counsel.

SIGNATURE	NAME (Print)	PARTY	DATE
Charles R. Little	CHARLES R. LITTLE	PIPER AIRCRAFT	03/06/98
Mark W Platt	MARK W. PLATT	LYCOMING	03/06/98

(Continued on reverse side)

NATIONAL TRANSPORTATION SAFETY BOARD
RELEASE OF AIRCRAFT WRECKAGE

ACCIDENT IDENTIFICATION NUMBER: LAX-98-F-A106

PART I—RELEASE OF AIRCRAFT WRECKAGE

REGISTERED OWNER (name and address)	REGISTRATION NUMBER—N257NW
Airpac Airlines, Inc. 7277 Perimeter Road South Seattle, WA 98108	MAKE: Piper

MODEL	DATE OF ACCIDENT	LOCATION
PA-31-350	3/5/98	Novato, CA

The National Transportation Safety Board has ☒ has not ☐ completed its investigation of the aircraft wreckage described above. All wreckage except that listed on the reverse side is hereby released to the registered owner, or owner's representative, for appropriate disposition. (If no parts are retained, insert NONE.)

NONE

SIGNATURE OF NTSB REPRESENTATIVE	TITLE	DATE
[signature]	Air Safety Investigator	4/21/98

(This section may be signed by a person, not the owner or owner's representative, who has knowledge of the disposition of the aircraft wreckage and its parts. Such signature does not place a responsibility for disposition of the wreckage upon that person.)

I HEREBY ACKNOWLEDGE:

☐ Receipt of the above described aircraft wreckage.

☐ Removal of the parts, if any, listed on the reverse side of this form.

SIGNATURE	TITLE	DATE
[signature]	adjuster	APR 27 1998

REMARKS:

[illegible] APR 27 [illegible]

NTSB FORM 6120.15 (Rev. 5/79)

U.S. Department of Transportation
Federal Aviation Administration

Mike Monroney Aeronautical Center

P.O. Box 25082
Oklahoma City, Oklahoma 73125

April 20, 1998

National Transportation Safety Board
1515 W. 190th St., Suite 555
Gardena, CA 90248

CASE#: 9800052001 NAME: ARSONNEAU, ISABELLE Putrefied: No
DATE OF INCIDENT : 030698 DATE RECEIVED: 031198
LOCATION OF ACCIDENT: NOVATO, CA
SPECIMENS RECEIVED : Vitreous fluid, Bile, Liver, Lung, Muscle

---

FORENSIC TOXICOLOGY FATAL ACCIDENT REPORT

CARBON MONOXIDE:
Carbon monoxide analysis was not performed due to a lack of suitable specimen.

CYANIDE:
Cyanide analysis was not performed due to a lack of suitable specimen.

VOLATILES: The volatile concentrations were determined by headspace gas chromatography at a cutoff of 10 mg/dl. All positive ethanols were confirmed by Radiative Energy Attenuation.
--> NO Ethanol detected in Vitreous fluid

DRUGS: Immunoassay and chromatography are used to screen for abused drugs such as amphetamine(0.010), opiates(0.010), marihuana(0.001), cocaine(0.020), phencylidine(0.002), benzodiazepines(0.030), barbiturates(0.060), and other drugs such as antidepressants(0.100), antihistamines(0.020), meprobamate(0.100), methaqualone(0.100), and nicotine(0.050). The values in () are the threshold values in ug/ml used to report positive results. Values below this concentration are normally reported as not detected.
GC/Mass Spec, or GC/FTIR, is used to confirm most positive results.
--> NO Drugs detected in Muscle

Dennis V. Canfield APR 2 3 1998
Dennis V. Canfield, Ph.D.
Manager Toxicology and Accident
Research Laboratory

Airpac Airlines, Inc.

Pilot Assignment

Name Isabelle Arsonneau

Date Employed 9-17-93

Date of Assignment	Aircraft	Date
	BA31-350	9-27-93
		3-25-94
		3-20-95
		3-12-96
	Change Base month	(10-23-96)

Current Duties

Captain MEL Day Night IFR/VFR Cargo Only W/prior [illegible] Calif Routes

Form 102

Airpac Airlines, Inc.

Certificate of Completion

Company Recurrent

Flight Crew Member/Recurrent Training/Pilot-in-command
(Except Specific Aircraft)

This is to certify that ISABELLE ARSENEAU has completed all segments,modules, and elements of the Flight Crew Member/Recurrent Training/Pilot-in-command, as required by the Company Training Program, and the Federal Aviation Regulations, and is proficient and knowledgeable in subjects pertinent to operation Certificate No. APCA208C issued by the Federal Aviation Administration.

Hours of training completed: 5.0

Date of completion: 10/20/97

Instructor's Signature: _____

I acknowledge having received the Specific Aircraft Flight training for Pilot-in-Command duties as set forth in the Company Training Program as certified above

Signature of PIC trainee: _____

Form: 160

GROUND TRAINING LOG

AIRPAC
AIRLINES

Name: Isabelle Hesse

Type of Training

( ) Initial (X)Recurrent ( ) Differences ( ) Transition ( ) Other

Date	A/C #	Type	Operations	Time	Instruct
10/20/97			FAR's, OPS. SPECS, OPS MANUAL. METEOROLOGY COLD WEATHER OPS., HAZ-MAT, EMERGENCY PROC	5.0	G. SMI
Form 141			Rev 10-16-92		

Airpac Airlines, Inc.

Certificate of Completion

Aircraft **GROUND** Training and Emergency Drills/Pilot-in-Command

Type Aircraft PA 31-350

This is to certify that J. ARSONNEAU has completed all segments, modules, and elements of the

- ☐ Initial New Hire
- ☐ Transition
- X Recurrent

ground training program for the aircraft specified, and contained in the Company Training Program, and is proficient and knowledgeable in subjects pertinent to operation Certificate No. APCA208C issued by the Federal Aviation Administration.

Hours of training completed: 2.0

Date of completion: 10/23/96

Instructor's Signature: Adam. Smith

And has completed the emergency drills, indicated below, using the proper equipment and procedures.

	Date:	Instructors Signature:
Emergency Evacuation	10/23/96	G Smith
Use of Fire Extinguisher	10/23/96	G Smith
Smoke Control	10/23/96	G Smith
Use of Crew & Passenger Oxygen*		
Use of Flotation Equipment*		
Ditching*		

*If applicable

I acknowledge having received the Specific Aircraft Ground training for Pilot-in-Command duties as set forth in the Company Training Program as certified above.

Signature of PIC trainee:

Form: 140 Revised 10-29-93

AIRMAN COMPETENCY/PROFICIENCY CHECK
FAR 135

	OAK	DATE OF CHECK 9-19-97

NAME OF AIRMAN *(last, first, middle initial)*: Besonneau Isabelle

TYPE OF CHECK: FAR 135.293 ☒ FAR 135.297 ☒ FAR 135.299 ☒

PILOT CERTIFICATION INFORMATION: Grade: ATP — Number: 2473046

MEDICAL INFORMATION: Date of Exam. 8-5-97 — Date of Birth 4-9-64 — Class First

EMPLOYED BY: Airpac Airlines — **BASED AT** *(City, State)*: OAK CA

TYPE AIRPLANE *(Make/Model)*: MD31-350

Simulator/Training Device *(Make/Model)*:

NAME OF CHECK AIRMAN: Glenn Smith — **SIG. OF CHECK AIRMAN**: [signature]

FLIGHT TIME: 1.7 — N27594

FLIGHT MANEUVERS GRADE *(S—Satisfactory U—Unsatisfactory)*

PILOT	Air-craft	Simu-lator	Trng. Dev.
PREFLIGHT			
1. Equipment Examination *(Oral or written)*	S		
2. Preflight Inspection	S		
3. Taxiing	—		
4. Powerplant Checks	—		
TAKEOFFS			
5. Normal	S		
6. Instrument	S		
7. Crosswind	—		
8. With Simulated Powerplant Failure	S		
9. Rejected Takeoff OAK	—		
INFLIGHT MANEUVERS			
10. Steep Turns	—		
11. Approaches to Stalls	S		
12. Specific Flight Characteristics	S		
13. Powerplant Failure	S		
LANDINGS			
14. Normal	S		
15. From an ILS	S		
16. Crosswind	✓		
17. With Simulated Powerplant(s) Failure		—	—
18. Rejected Landing	S		
19. From Circling Approach	S		
EMERGENCIES			
20. Normal and Abnormal Procedures	S		
21. Emergency Procedures	S		
INSTRUMENT PROCEDURES			
22. Area Departure			
23. Holding Mt Diablo	S		
24. Area Arrival	S		
25. ILS Approaches	S		
26. Other Instrument Approaches	—		
Approaches: NDB/ADF	—		
VOR	S		
ILS OAK	S		
Other *(Specify)* LOC	S		
27. Circling Approaches 27S	S		
28. Missed Approaches	S		
29. Comm./Nav. Procedures	S		
30. Use of Auto. Pilot	/		

HELICOPTER	Air-craft	Simu-lator	Trng. Dev.
1. Ground and/or Air Taxi			
2. Hovering Manuevers			
3. Normal & Crosswind T.O. & Landings			
4. High Altitude Takeoffs & Landings			
5. Sim. Engine Failure			
6. Confined Areas, Slopes, & Pinnacles			
7. Rapid Deceleration *(Quick Stops)*			
8. Autorotations *(Single Engine)*			
9. Hovering Autorotations *(Single Engine)*			
10. Tail Rotor Failures *(Oral)*			
11. Settling With Power *(Oral or Flight)*			
SEAPLANE OPERATIONS			
1. Taxiing, Sailing, Docking			
2. Step Taxi & Turns			
3. Glassy/Rough Water T.O./Landings			
4. Normal Takeoff & Landings			
5. Crosswind T.O. & Landings			
OTHER			
6. Ski Plane Ops. *(when applicable)*			
GENERAL			
7. Judgment			
8. Crew Coordination			

AIRMAN COMPETENCY INFORMATION:

Demonstrated Current Knowledge FAR 135.293(a)
Make/Model Expires MD31-350 (12 months) (10/98)

Demonstrated Competency FAR 135.293(b)
Make/Model Expires MD31 350 (12 months) (10/98)

Satisfactorily Demonstrated Line Checks
FAR 135.299 Expires (12 months) (10/98)

Satisfactorily Demonstrated IFR Proficiency
FAR 135.297 Expires (6 months) (4-98)

Use of Autopilot (is) (is not) Authorized.
Expires → N/A ~~(12 months) ( )~~

REMARKS: Done in Train Grade

RESULT OF CHECK: ☒ Approved ☐ Disapproved

CHECK AIRMAN'S PERFORMANCE *(FAA Only)*: ☐ Satisfactory ☐ Unsatisfactory

REGION	DISTRICT OFFICE	FAA INSPECTOR's SIGNATURE

FAA Form 8410-3 (6-81)

*U.S.GPO:1994-568-012/00132

Airpac Airlines, Inc.

Certificate of Completion

Company Basic Emergency Training

(Except Specific Aircraft)

This is to certify that _____ has completed all segments, modules, and elements of the

☐ Initial New Hire
☒ Recurrent

Emergency Training as required by the Company Training Program, and the Federal Aviation Regulations, and is proficient and knowledgeable in subjects pertinent to operation Certificate No. APCA208C issued by the Federal Aviation Administration.

Hours of training completed: 1.0

Date of completion: 10-20-97

Instructor's Signature: _____

I acknowledge having received the Specific Aircraft Flight training for Pilot-in-Command duties as set forth in the Company Training Program as certified above.

Signature of PIC trainee: _____

Form: 135 Revised 10-29-93

Avgas Truck #2

Initials	A/C #	METER BEFORE	METER AFTER	Gallons Sold	Price	Invoice #	Amount	Cash	Check #	Annex	On Account
SM	Sump	24397.1	24397.6	.5							
CJ	203KA	24397.6	24418.9	21.3	[redacted]	4556086 (1)	44.52		4450		Leahy
ER	257MM	24418.9	24511.7	92.8		4556090 (2)	216.22	X			C/C
ER	35336	24511.7	24526.8	15.1		5206143 (3)	31.56				Brent
ER	203KA	24526.8	24544.1	17.3		5206773 (4)	36.16				Leahy
ER	9120L	24544.1	24559.5	15.4		5206784 (5)	32.19				Leahy
ER	7352J	24559.5	24583.4	23.9		5206795 (6)	49.95				Brents
			MK								
							410.60				

X

SUN & MOON INFORMATION

Location : NAVATO, CALIFORNIA
Ref. No. : LAX98FA106

Time/Date : 1905 PST, MARCH 5, 1998

Latitude : 38,09 N Longitude : 122,35 W

UTC Differential : 8 Hours

Magnetic Variation : 16 East

All data computed for an altitude of 1500 Feet MSL

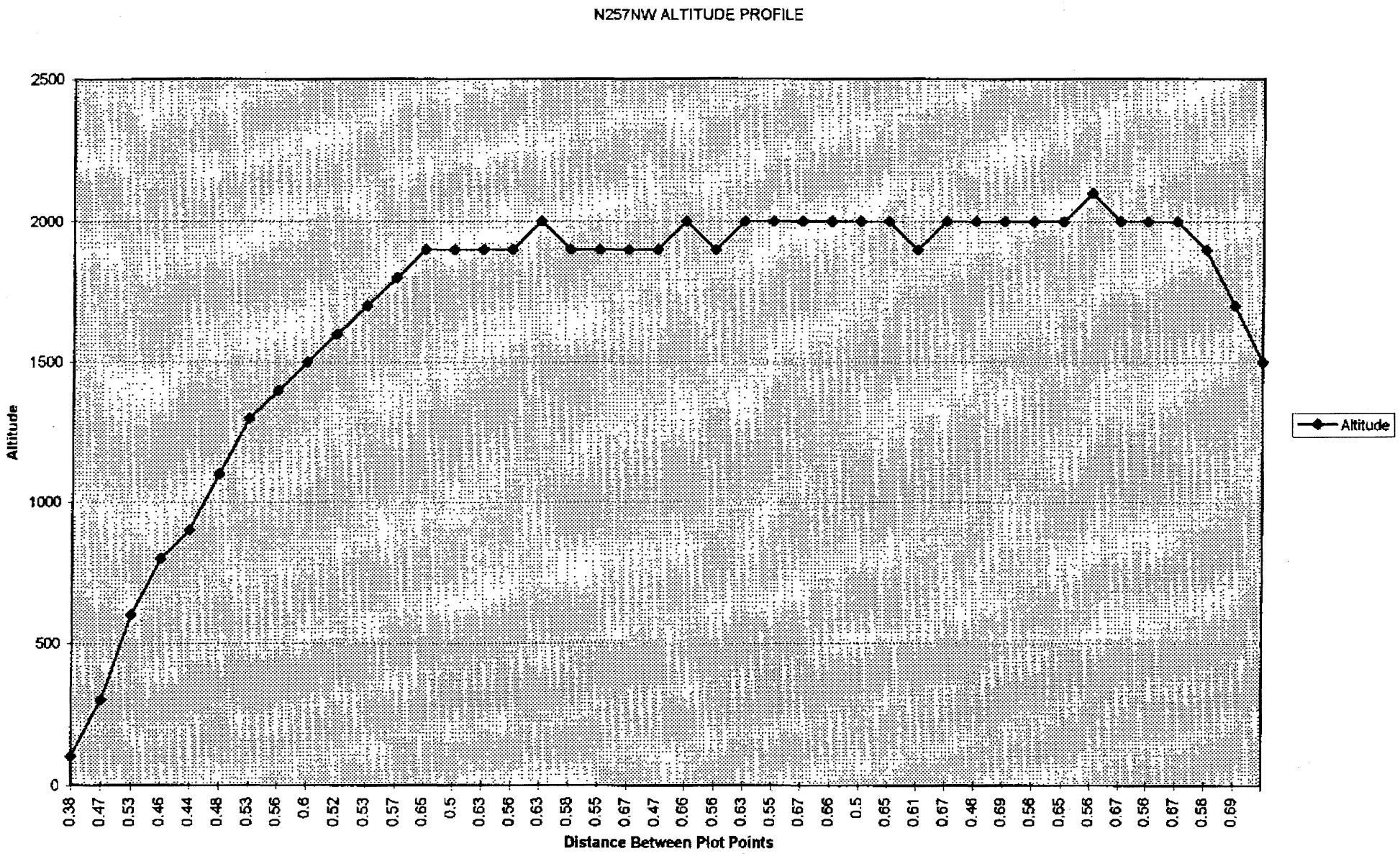
0634	SUNRISE	1811
	SUNSET	
0607	CIVIL TWILIGHT	1837
0537	NAUTICAL TWILIGHT	1908
0506	ASTRONOMICAL TWILIGHT	1938

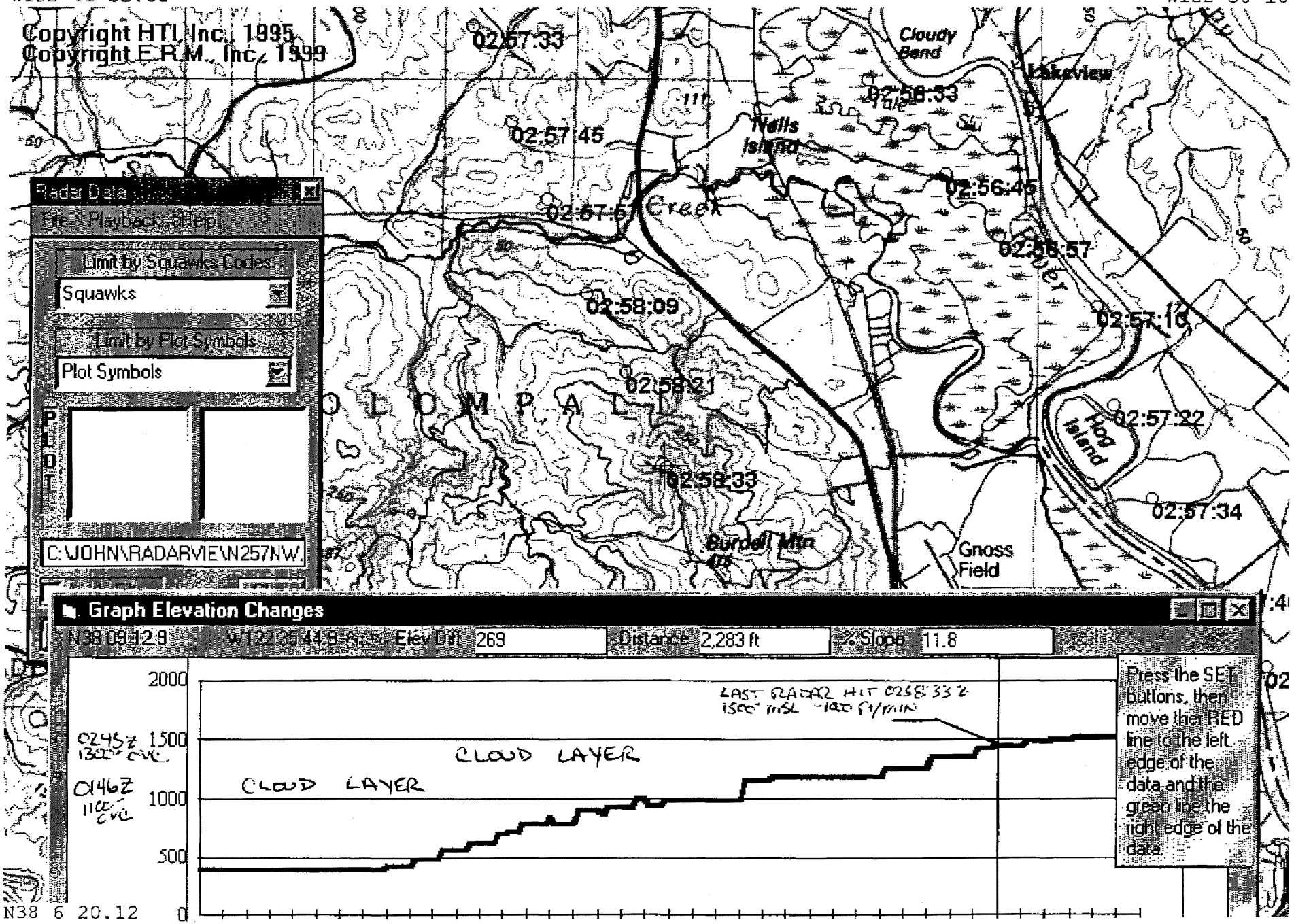
Altitude of Sun	-11.5
Magnetic Bearing to Sun	256.1
Altitude of Moon	-.1
Magnetic Bearing to Moon	277.1
Percent Illumination of Moon	57 %

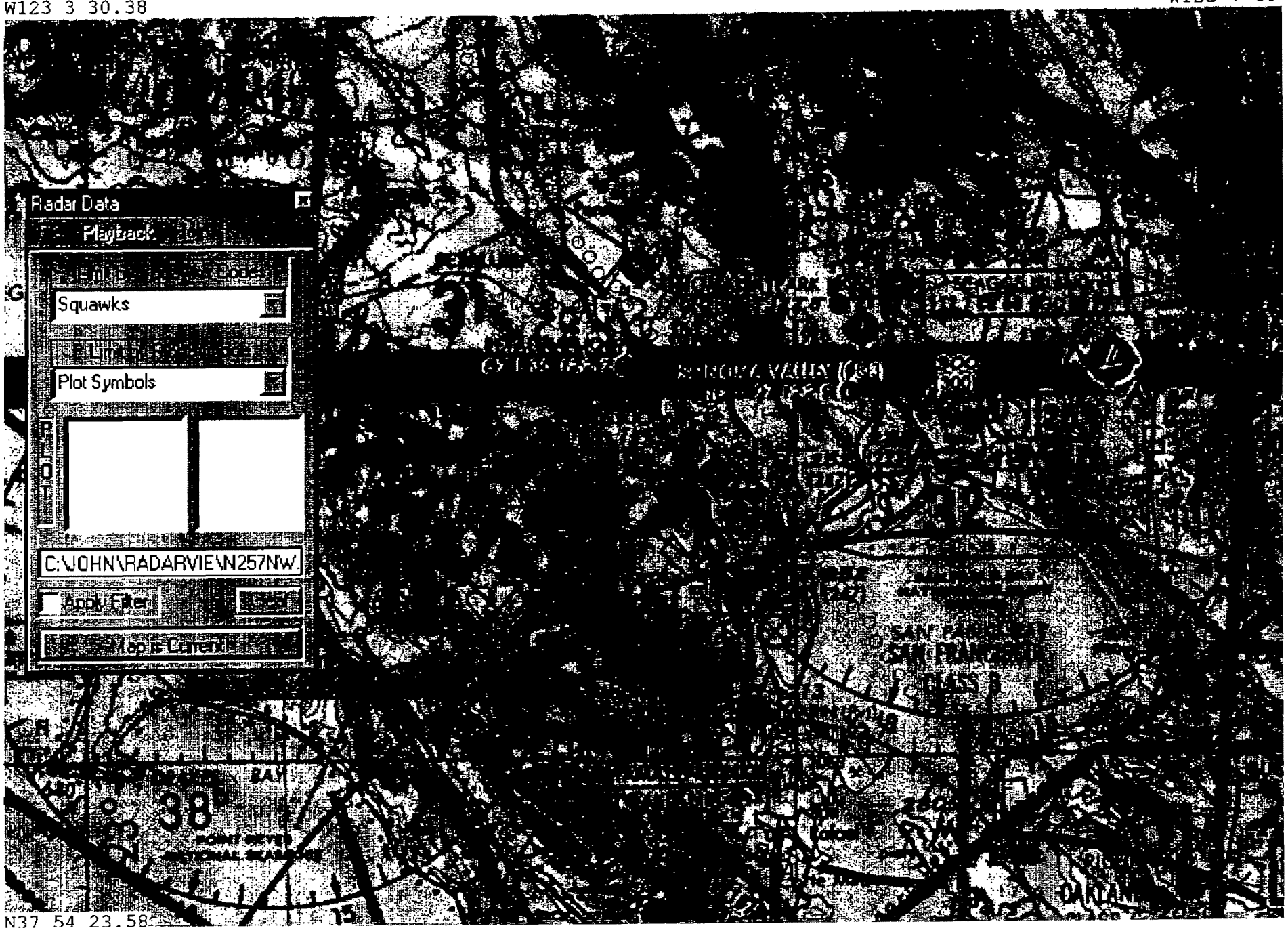
No Compensation For Non-Level Horizons

Standard Corrections for Atmospheric Refraction and Parallax

Time	Latitude	Longitude	Altitude	knots	V.ft/min	bearing	Nmiles	
0250:20	N38 30 14	W122 48 25	100	115	1000	162.2	0.38	
0250:32	N38 29 52	W122 48 16	300	141	1500	148.1	0.47	
0250:44	N38 29 28	W122 47 57	600	158	1000	131.7	0.53	
0250:56	N38 29 07	W122 47 27	800	137	500	147.0	0.46	
0251:08	N38 28 44	W122 47 08	900	131	1000	143.2	0.44	
0251:20	N38 28 23	W122 46 48	1100	143	1000	146.8	0.48	
0251:32	N38 27 59	W122 46 28	1300	159	500	151.9	0.53	
0251:44	N38 27 31	W122 46 09	1400	168	500	135.5	0.56	
0251:56	N38 27 07	W122 45 39	1500	180	500	140.8	0.60	
0252:08	N38 26 39	W122 45 10	1600	155	500	165.3	0.52	
0252:20	N38 26 09	W122 45 00	1700	159	500	167.1	0.53	
0252:32	N38 25 38	W122 44 51	1800	171	500	151.2	0.57	
0252:44	N38 25 08	W122 44 30	1900	194	0	168.3	0.65	
0252:56	N38 24 30	W122 44 20	1900	150	0	180.0	0.50	
0253:08	N38 24 00	W122 44 20	1900	189	0	168.0	0.63	
0253:20	N38 23 23	W122 44 10	1900	167	500	150.3	0.56	
0253:32	N38 22 54	W122 43 49	2000	188	-500	169.2	0.63	
0253:44	N38 22 17	W122 43 40	1900	174	0	153.1	0.58	
0253:56	N38 21 46	W122 43 20	1900	165	0	151.5	0.55	
0254:08	N38 21 17	W122 43 00	1900	201	0	156.9	0.67	
0254:20	N38 20 40	W122 42 40	1900	141	500	148.1	0.47	
0254:32	N38 20 16	W122 42 21	2000	184	-461	158.0	0.66	
0254:45	N38 19 39	W122 42 02	1900	167	500	150.3	0.56	
0254:57	N38 19 10	W122 41 41	2000	188	0	169.2	0.63	
0255:09	N38 18 33	W122 41 32	2000	165	0	134.2	0.55	
0255:21	N38 18 10	W122 41 02	2000	201	0	156.9	0.67	
0255:33	N38 17 33	W122 40 42	2000	199	0	158.0	0.66	
0255:45	N38 16 56	W122 40 23	2000	150	0	180.0	0.50	
0255:57	N38 16 26	W122 40 23	2000	195	-500	142.7	0.65	
0256:09	N38 15 55	W122 39 53	1900	182	500	142.7	0.61	
0256:21	N38 15 26	W122 39 25	2000	201	0	156.9	0.67	
0256:33	N38 14 49	W122 39 05	2000	137	0	146.9	0.46	
0256:45	N38 14 26	W122 38 46	2000	206	0	157.5	0.69	
0256:57	N38 13 48	W122 38 26	2000	169	0	152.3	0.56	
0257:09	N38 13 18	W122 38 06	2000	195	500	157.4	0.65	
0257:21	N38 12 42	W122 37 47	2100	169	-500	152.3	0.56	
0257:33	N38 12 12	W122 37 27	2000	201	0	156.9	0.67	
0257:45	N38 11 35	W122 37 07	2000	168	0	153.4	0.56	
0257:57	N38 11 05	W122 36 48	2000	201	-500	156.9	0.67	
0258:09	N38 10 28	W122 36 28	1900	174	-1000	153.0	0.58	
0258:21	N38 09 57	W122 36 08	1700	206	-1000	157.4	0.69	
0258:33	N38 09 19	W122 35 48	1500					


N257NW ALTITUDE PROFILE
2500
2000
1500
1000
500
0
Altitude
0.38 0.47 0.53 0.46 0.44 0.48 0.53 0.56 0.6 0.52 0.53 0.57 0.65 0.5 0.63 0.56 0.63 0.58 0.55 0.67 0.47 0.66 0.56 0.63 0.55 0.67 0.66 0.5 0.65 0.61 0.67 0.48 0.69 0.56 0.65 0.56 0.67 0.56 0.67 0.58 0.69
Distance Between Plot Points
Altitude


N38 12 19.04
W122 41 22.31
W122 30 16
Copyright HTI, Inc. 1995
Copyright E.R.M., Inc. 1999
02:57:33
02:57:45
02:57:57
02:58:09
02:58:21
02:58:33
02:58:33
02:56:45
02:56:57
02:57:10
02:57:22
02:57:34
Cloudy Bend
Lakeview
Wells Island
Creek
Flod Island
Burdell Mtn
Gnoss Field
Radar Data
File Playback Help
Limit by Squawks Codes
Squawks
Limit by Plot Symbols
Plot Symbols
PLOT
C:\JOHN\RADARVIE\N257NW.
Graph Elevation Changes
N38 09 12.9
W122 35 44.9
Elev Diff 269
Distance 2,283 ft
% Slope 11.8
2000
1500
1000
500
0
LAST RADAR HIT 0258:33 Z
1500' MSL -180 Ft/min
0245Z 1300' CVC
CLOUD LAYER
CLOUD LAYER
0146Z 1100' CVC
Press the SET buttons, then move the RED line to the left edge of the data and the green line the right edge of the data.
N38 6 20.12


N38 24 18.17
W123 3 30.38
W122 7 59
Radar Data
Playback
Squawks
Plot Symbols
C:\JOHN\RADARVIE\N257NW
Apply Filter
Map is Current
N37 54 23.58

Single-Track NTAP Database

Time	Latitude	Longitude	Alt.	knots	ft/min	bearing	NMiles
0250:20.00	N38-30-14"	W122-48-25"	100	115	1000	162	0.38
0250:32.00	N38-29-52"	W122-48-16"	300	141	1500	148	0.47
0250:44.00	N38-29-28"	W122-47-57"	600	158	1000	132	0.53
0250:56.00	N38-29-07"	W122-47-27"	800	137	500	147	0.46
0251:08.00	N38-28-44"	W122-47-08"	900	131	1000	143	0.44
0251:20.00	N38-28-23"	W122-46-48"	1100	143	1000	147	0.48
0251:32.00	N38-27-59"	W122-46-28"	1300	159	500	152	0.53
0251:44.00	N38-27-31"	W122-46-09"	1400	168	500	135	0.56
0251:56.00	N38-27-07"	W122-45-39"	1500	180	500	141	0.60
0252:08.00	N38-26-39"	W122-45-10"	1600	155	500	165	0.52
0252:20.00	N38-26-09"	W122-45-00"	1700	159	500	167	0.53
0252:32.00	N38-25-38"	W122-44-51"	1800	171	500	151	0.57
0252:44.00	N38-25-08"	W122-44-30"	1900	194	0	168	0.65
0252:56.00	N38-24-30"	W122-44-20"	1900	150	0	180	0.50
0253:08.00	N38-24-00"	W122-44-20"	1900	189	0	168	0.63
0253:20.00	N38-23-23"	W122-44-10"	1900	167	500	150	0.56
0253:32.00	N38-22-54"	W122-43-49"	2000	188	-500	169	0.63
0253:44.00	N38-22-17"	W122-43-40"	1900	174	0	153	0.58
0253:56.00	N38-21-46"	W122-43-20"	1900	165	0	151	0.55
0254:08.00	N38-21-17"	W122-43-00"	1900	201	0	157	0.67
0254:20.00	N38-20-40"	W122-42-40"	1900	141	500	148	0.47
0254:32.00	N38-20-16"	W122-42-21"	2000	184	-461	158	0.66
0254:45.00	N38-19-39"	W122-42-02"	1900	167	500	150	0.56
0254:57.00	N38-19-10"	W122-41-41"	2000	188	0	169	0.63
0255:09.00	N38-18-33"	W122-41-32"	2000	165	0	134	0.55
0255:21.00	N38-18-10"	W122-41-02"	2000	201	0	157	0.67
0255:33.00	N38-17-33"	W122-40-42"	2000	199	0	158	0.66
0255:45.00	N38-16-56"	W122-40-23"	2000	150	0	180	0.50
0255:57.00	N38-16-26"	W122-40-23"	2000	195	-500	143	0.65
0256:09.00	N38-15-55"	W122-39-53"	1900	182	500	143	0.61
0256:21.00	N38-15-26"	W122-39-25"	2000	201	0	157	0.67
0256:33.00	N38-14-49"	W122-39-05"	2000	137	0	147	0.46
0256:45.00	N38-14-26"	W122-38-46"	2000	206	0	157	0.69
0256:57.00	N38-13-48"	W122-38-26"	2000	169	0	152	0.56
0257:09.00	N38-13-18"	W122-38-06"	2000	195	500	157	0.65
0257:21.00	N38-12-42"	W122-37-47"	2100	169	-500	152	0.56
0257:33.00	N38-12-12"	W122-37-27"	2000	201	0	157	0.67
0257:45.00	N38-11-35"	W122-37-07"	2000	168	0	153	0.56
0257:57.00	N38-11-05"	W122-36-48"	2000	201	-500	157	0.67
0258:09.00	N38-10-28"	W122-36-28"	1900	174	-1000	153	0.58
0258:21.00	N38-09-57"	W122-36-08"	1700	206	-1000	157	0.69
0258:33.00	N38-09-19"	W122-35-48"	1500				

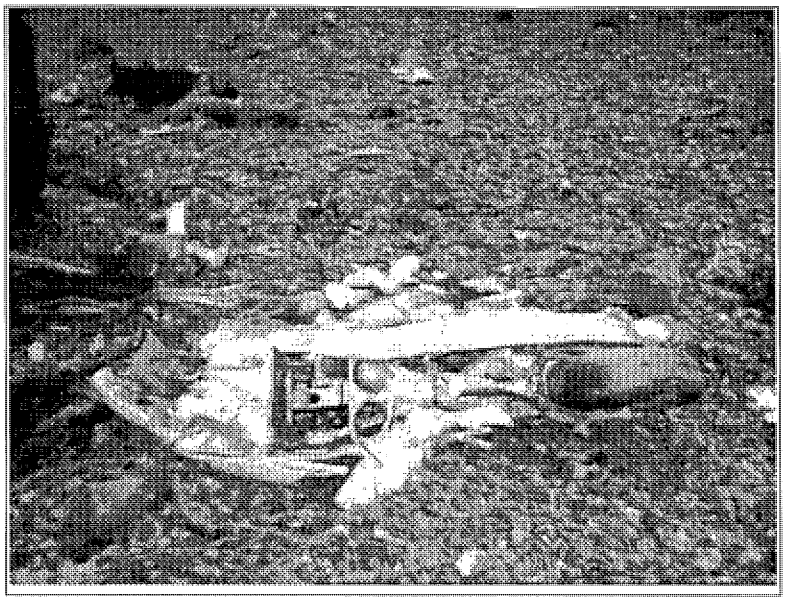


Photo 01: View of Nose Gear with Nose Gear Door (NTSB)

Photo 02: View of Fuselage (NTSB)

Photo 03: Initial Impact Point Looking in the Direction of Approach (NTSB)

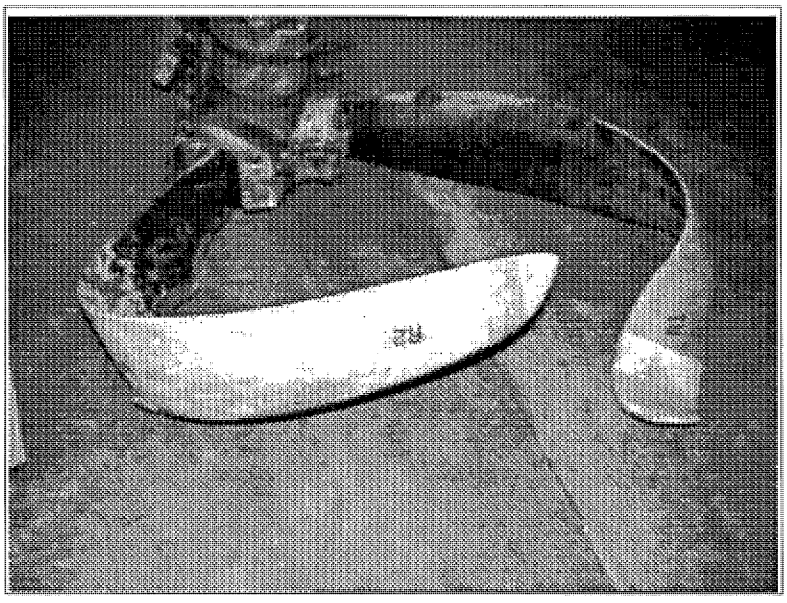


Photo 04: View of Right Propeller (NTSB)

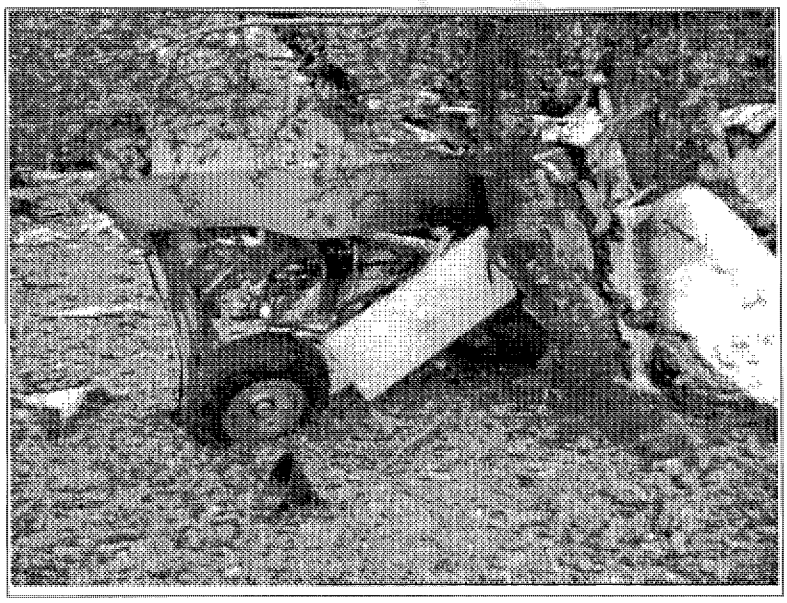


Photo 05: View of Right Wing and Main Landing Gear (NTSB)

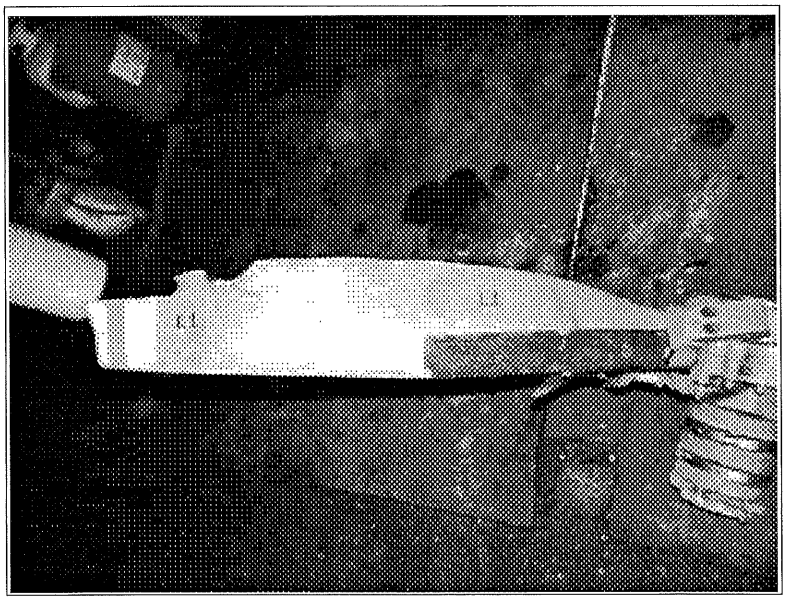


Photo 06: View of Left Propelle (NTSB)