Log-2464 Adopted 6-28-93

National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: July 7, 1994
In reply refer to: A-94-125 through -128

Honorable David R. Hinson
Administrator
Federal Aviation Administration
Washington, D.C. 20591

On April 14, 1993, at 1524 Pacific daylight time, a US Navy A-6E airplane on a training flight and a Grumman G-164A Ag-Cat on an aerial application mission collided in visual meteorological conditions (VMC) near Steptoe, Washington, at an elevation of approximately 200 feet above ground level (agl). The A-6E was operating in military training route (MTR) VR1354[1] and was tracking approximately 033° magnetic at a ground speed of about 468 knots. The pilot of the Ag-Cat had departed the Colfax Airport, which is located 1 mile outside the southeast boundary of VR1354, and was en route to a field located 1 mile outside the northwest boundary of the MTR to dispense a load of fertilizer. The Ag-Cat was tracking approximately 334° magnetic at an estimated ground speed of 96 knots. As a result of the accident, two persons received serious injuries, one person received minor injuries, and both aircraft were destroyed. The Safety Board determined that the probable cause of the accident was "the inherent limitations of the see-and-avoid concept of separation of aircraft operating under visual flight rules [VFR] that precluded the crew of the A-6E and the pilot of the Ag-Cat from recognizing a collision hazard and taking actions to avoid a midair collision."[2]

On July 7, 1992, a U.S. Air Force F-16 airplane operating in an MTR near Okeechobee, Florida, nearly collided with a Maule MX-7-180 airplane. The Maule was upset by the F-16's wake turbulence. Although the civilian pilot regained control of his airplane, he sustained serious injuries and his airplane incurred substantial damage from the wake turbulence. The Safety Board determined that the cause of the accident was the improper planning by the pilot of

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[1]Indicates a visual flight rules military training route with no segment above 1,500 feet agl.

[2]For more detailed information, read Field Accident Brief 0474 (attached).

the Maule who was flying under VFR and had crossed through the entry point of the MTR.[3]

On April 20, 1986, a U. S. Air Force A-7E airplane collided with a civilian glider in an MTR during VMC over Hot Springs Mountain near Warner Springs, California. Both aircraft were operating under VFR. The A-7E was attempting a rapid pull up, and the glider was attempting a nose-down, 30° right turn. The collision occurred as the A-7E was executing a southbound turn within VR1257 and the glider, also within VR1257, was attempting to gain lift on the west side of a nearby mountain. There were no injuries as a result of the collision. The pilot of the A-7E had advised the appropriate flight service station (FSS) that the route was active; however, the glider pilot had not inquired about the activity status of the route. The Safety Board determined that the probable cause of the accident was the improper preflight planning and preparation by the pilot of the glider.[4]

Although these three accidents are the only such mishaps involving MTRs found in the Safety Board's accident records since 1986, a check of the FAA's Near Mid-Air Collision (NMAC) records for the same period indicates that there have been 51 incidents involving military aircraft operating within MTRs and civilian aircraft that were traversing those routes. These reports indicate that in 45 cases a collision was avoided when the military flightcrews observed the general aviation aircraft and maneuvered to avoid them. Additionally, since 1986, 46 pilot reports to the National Aeronautics and Space Administration (NASA) Aviation Safety Reporting System (ASRS) have pertained to MTR incidents. Of those reports, seven involved encounters within VFR MTRs. Based on this information, the Safety Board is concerned that civilian pilots are not adequately informed about the location of MTRs, about the times when the MTRs may be in use by high speed traffic, and about the limitations of the "see and avoid" concept to assure separation between military and civil aircraft traversing these routes.

According to the Airman's Information Manual (AIM), the MTR program is a joint venture by the FAA and the Department of Defense. That is, MTRs are jointly developed for use by the military for the purpose of conducting low altitude, high speed (above 250 knots) training. There are both instrument flight rules (IFR) and VFR MTRs. The routes above 1,500 agl are developed to be flown, to the maximum extent possible, under IFR. The routes at

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[3]For more detailed information, read Field Accident Brief 3020 (attached).

[4]For more detailed information, read Field Accident Brief 1079 (attached).

1,500 feet agl and below are generally developed to be flown under VFR. Operations in IFR military training routes (IR) are conducted in accordance with IFR, regardless of weather conditions. Operations in VFR military training routes (VR) are conducted in accordance with VFR, except that the flight visibility must be 5 miles or more, and flights shall not be conducted below a ceiling of less than 3,000 feet agl.

The AIM indicates that information about MTRs is available from several aeronautical charts. It also instructs pilots to contact FSSs within 100 nmi of a particular MTR to obtain current information pertaining to route usage in their vicinity. Information available includes times of scheduled activity, altitudes in use on each route segment, and actual route width. Charts listed in the AIM as sources of MTR information include the IFR Low Altitude En Route Chart, the VFR Planning Chart, and the Area Planning (AP/1B) Chart and Booklet (DOD Flight Information Publication-FLIP).

A review of these sources has raised questions regarding their availability and adequacy for apprising the general aviation community about MTR operations. Specifically, many general aviation pilots who fly only under VFR conditions would not otherwise need to obtain and use the IFR Low Altitude En Route Chart. Similarly, the DOD-produced FLIP Chart and Booklet are designed primarily for military users and are available from a DOD source. The issuance of the VFR Planning Chart reportedly was discontinued in January 1993, due to funding constraints; therefore, it is no longer available to pilots as a source of current MTR information. Finally, U.S. Sectional Charts, which contain some information about MTRs, are not currently listed in the AIM as such a source. The omission of a reference to Sectional Charts in the AIM may have been intentional, since the charts are updated only at 6-month intervals and MTR routes are subject to change every 56 days. Nevertheless, in light of the previously mentioned limitations on the availability of MTR information, reference in the AIM to the widely used Sectional Chart for MTR information appears warranted. Furthermore, in light of the above discussion, and of the recognized limitations of the "see-and-avoid" concept for assuring separation under the low altitude, high speed conditions of MTR operations, the Safety Board believes that the FAA should reexamine the adequacy and availability of MTR information to the pilot community and initiate action to improve the dissemination of information about these routes and to foster pilot inquiries about times these routes are in use by the military.

After the first MTR collision cited above, the Ag-Cat pilot stated that he did not know about the MTR, did not contact the FSS for information regarding the MTR, and had never heard of anyone else calling for such information. However, even if the pilot had

called the nearest FSS at Walla Walla, Washington, he would have been given inaccurate information regarding the time that the route was active. According to the Walla Walla FSS specialist, the pilot would have been advised that the route was active 24 hours a day. However, the military agency responsible for activating the training route notified the FSS by teletype that the route would be active the day of the accident for two 20-minute periods. According to the FLIP, there were "Special Operating Procedures" in effect regarding VR1354. One of these procedures required that the military flightcrew contact the nearest FSS when the flight was entering the route. The FLIP then lists the four closest FSS's within a 100-mile radius. In this accident, the flightcrew of the A-6E had advised the Seattle FSS that the flight was entering VR1354. However, the Seattle FSS specialist did not advise the other FSS's that the MTR had become active and would be active later than originally scheduled. Therefore, although the Walla Walla FSS also services the VR1354 area, the new information was not disseminated to that station, and ultimately, if contacted, that specialist would not have been able to issue correct information to any pilots. Thus, although specific procedures are prescribed in Flight Services Manual 7110.10 for dissemination of information regarding MTR status, they were not followed in this case. The Safety Board believes that flight service specialists should be reminded of the importance of information received from military pilots that activates an MTR and the need for its prompt dissemination to other FSS and air traffic control (ATC) facilities so that accurate information may be available to civilian pilots in a timely fashion.

Accident investigation experience and NMAC reports indicate that many general aviation pilots may not be aware of the location and usage of MTRs, nor the extent to which the "see and avoid" concept for collision avoidance may be degraded during VFR flight in areas containing such operations. Also, general aviation pilots may not be aware of the need for correspondingly greater pilot precautions and vigilance when operating in MTRs.

Title 14 Code of Federal Regulations (CFR) 91.117, "Aircraft Speed," states that, "unless otherwise authorized by the Administrator (or by ATC in case of operations in Class A or Class B airspace), no person may operate an aircraft below 10,000 feet msl at an indicated airspeed of more than 250 knots (288 mph)." Military flights operating in MTRs are authorized to exceed this speed limit. In fact, they frequently fly as low as 200 feet agl and at speeds in the 420-480 knot range. Additionally, they typically are painted in colors that blend with the terrain. Notwithstanding the virtually universal use of anti-collision lights by military aircraft, these conditions make these aircraft very difficult for other pilots to see in time to maneuver and avoid a collision.

The FAA has provided excellent information for the purpose of alerting pilots to the hazards of midair collisions or near-midair collisions in Advisory Circular (AC) 90-48C, "Pilots' Role in Collision Avoidance," issued March 18, 1983. Appendix 1 of the AC indicates that for a situation in which two aircraft are on a collision course, a time of 12.5 seconds is required from initial target acquisition to the completion of a successful avoidance maneuver. By applying information from Appendix 1 to the geometry and dynamics of the previously cited A-6E/Ag-Cat collision, it was determined that the Ag-Cat airplane would have become visible to the A-6E flightcrew approximately 8.5 seconds before impact. And, had the Ag-Cat pilot been looking over his left shoulder, at the horizon, he could have first seen the A-6E approximately 3.5 seconds before impact. This example illustrates the severe limitations of the "see and avoid" concept to ensure traffic separation under the conditions of conflict that may exist in MTR operations. It also points out the seriousness of the midair collision threat that arises from flight in active MTRs and the importance of ensuring pilot awareness of the need to avoid flight into active MTRs if possible. In light of this information, the Safety Board believes that the FAA should initiate a safety education program to increase pilot awareness of MTRs, the potential hazards associated with operating in them, and the special precautions and vigilance needed to avoid midair conflicts.

Therefore, the Safety Board recommends that the Federal Aviation Administration:

> Revise the Airman's Information Manual, Chapter 3, Section 5, paragraph 3-41, "Military Training Routes," by deleting reference to the visual flight rules (VFR) Planning Chart and adding a reference to the VFR Sectional Chart as a source of information about military training routes. (Class II, Priority Action) (A-94-125).
>
> Issue a General Notice to all flight service specialists directing them to adhere to the provisions of Flight Service Manual 7110.10 regarding notification of all nearby flight service stations responsible for visual military training routes when the routes become active if the time does not correlate with that reserved by the military. (Class II, Priority Action) (A-94-126).
>
> Reexamine the current sources and means for disseminating information to the pilot community regarding military training routes and initiate appropriate action to improve the dissemination of such information and to foster pilot inquiries about times the routes will be in use by the military. (Class II, Priority Action) (A-94-127).

Develop and implement a safety awareness program for all general aviation pilots to warn them of the serious limitations of the "see and avoid" concept for collision avoidance within military training routes. (Class II, Priority Action) (A-94-128).

Also as a result of its investigation, the Safety Board issued Safety Recommendations A-94-129 and -130 to the Department of Defense.

Acting Chairman HALL and Members LAUBER, HAMMERSCHMIDT, and VOGT concurred in these recommendations.

By: Jim Hall
Acting Chairman

National Transp[illegible]ion Safety Board
Washingto[illegible], D.C. 20594

Brief of Accident

File No. - 0474 4/14/93 STEPTOE,WA A/C Reg. No. USN Time (Lcl) - 1524 PDT

----Basic Information----
Type Operating Certificate-NONE (GENERAL AVIATION)
Type of Operation -MILITARY
Flight Conducted Under -MILITARY
Accident Occurred During -MANEUVERING

Aircraft Damage
DESTROYED
Fire
IN FLIGHT

	Injuries			
	Fatal	Serious	Minor	None
Crew	0	1	1	0
Pass	0	0	0	0
Other	0	1	0	0

----Aircraft Information----
Make/Model - GRUMMAN A6E
Landing Gear - TRICYCLE-RETRACTABLE
Max Gross Wt - 60400
No. of Seats - 2

Eng Make/Model - P & W J52P-8B
Number Engines - 2
Engine Type - TURBOJET
Rated Power - 8700 LBS THRUST

ELT Installed/Activated - NO -N/A
Stall Warning System - NO

----Environment/Operations Information----
Weather Data
Wx Briefing - MILITARY
Method - UNK/NR
Completeness - UNK/NR
Basic Weather - VMC
Wind Dir/Speed- CALM
Visibility - 20.0 SM
Lowest Sky/Clouds - 2500 FT
Lowest Ceiling - 2500 FT BROKEN
Obstructions to Vision- NONE
Precipitation - NONE
Condition of Light - DAYLIGHT

Itinerary
Last Departure Point
NAS WHIDBEY IS,WA
Destination
LOCAL

ATC/Airspace
Type of Flight Plan - IFR
Type of Clearance - CRUISE
Type Apch/Lndg - NONE

Airport Proximity
OFF AIRPORT/STRIP

Airport Data
Runway Ident - N/A
Runway Lth/Wid - N/A
Runway Surface - N/A
Runway Status - N/A

----Personnel Information----
Pilot-In-Command
Certificate(s)/Rating(s)
COMMERCIAL,MILITARY
ME LAND

Age - 31
Biennial Flight Review
Current - YES
Months Since - 5
Aircraft Type - A6

Medical Certificate - VALID MEDICAL-NO WAIVERS/LIMIT
Flight Time (Hours)
Total - 2814
Make/Model- 201
Instrument- UNK/NR
Multi-Eng - UNK/NR
Last 24 Hrs - 1
Last 30 Days- 26
Last 90 Days- 93
Rotorcraft - UNK/NR

Instrument Rating(s) - AIRPLANE

----Narrative----
THE A6E WAS TRACKING 033 DEG LEVEL AT 200 FT AGL AT 468 KTS VFR IN PUBLISHED ROUTE VR-1354. THE AGCAT WAS TRACKING 334 DEG LEVEL AT 200 FT AGL AT 96 KTS VFR ACROSS THE ROUTE TO HIS DESTINATION SPRAY FIELD. THE TWO AIRCRAFT CONVERGED ON A 59 DEG COLLISION ANGLE WITH A CLOSURE SPEED OF 429 KTS. THE A6E NOTIFIED FSS THAT HE WAS ENTERING THE ROUTE LATE AND PROJECTED EXITING 8 MINUTES AFTER THE PUBLISHED CLOSURE OF THE ROUTE. THE AGCAT PILOT REPORTED HE WAS UNAWARE OF ANY INFORMATION/PUBLICATIONS REGARDING THE OPERATION OF MILITARY AIRCRAFT IN THE AREA. THE LOCAL FSS WAS IN THE HABIT OF REPORTING THE ROUTE "HOT" 24 HRS A DAY RATHER THAN THE PRECISE SCHEDULE. THE CONVERGENCE ANGLE OF THE A6E WAS 111 DEG (8 O'CLOCK POSITION & BEHIND THE AGCAT'S LEFT WING). THE CONVERGENCE ANGLE OF THE AGCAT WAS 10 DEG. AT THE PROJECTED CLOSURE SPEED THE AGCAT WOULD HAVE SUBTENDED AN ANGLE OF 0.2 DEG 8.6 SECS BEFORE IMPACT; THE A6E 19.2 SECS.

File No. - 0474 4/14/93 STEPTOE,WA A/C Reg. No. USN Time (Lcl) - 1524 PDT

Occurrence #1 MIDAIR COLLISION
Phase of Operation MANEUVERING

Finding(s)
1. VISUAL SEPARATION - NOT POSSIBLE - PILOT IN COMMAND
2. VISUAL SEPARATION - NOT POSSIBLE - PILOT OF OTHER AIRCRAFT

----Probable Cause----

The National Transportation Safety Board determines that the Probable Cause(s) of this accident was:
THE INHERENT LIMITATIONS OF THE SEE-AND-AVOID CONCEPT OF SEPARATION OF AIRCRAFT OPERATING UNDER VISUAL FLIGHT RULES THAT PRECLUDED THE CREW OF THE A6E AND THE PILOT OF THE AGCAT FROM RECOGNIZING A COLLISION HAZARD AND TAKING ACTIONS TO AVOID A MIDAIR COLLISION.

National Transpor n Safety Board
Washington, D.C. 20594

Brief of Accident

File No. - 3020 7/07/92 OKEECHOBEE,FL A/C Reg. No. N148DP Time (Lcl) - 0939 EDT

----Basic Information----
Type Operating Certificate-NONE (GENERAL AVIATION)
Type of Operation -PERSONAL
Flight Conducted Under -14 CFR 91
Accident Occurred During -CRUISE

Aircraft Damage
SUBSTANTIAL
Fire
NONE

	Injuries	Fatal	Serious	Minor	None
	Crew	0	0	1	0
	Pass	0	0	0	0

----Aircraft Information----
Make/Model - MAULE MX-7-180
Landing Gear - TAILWHEEL-ALL FIXED
Max Gross Wt - 2500
No. of Seats - 4

Eng Make/Model - LYCOMING O-360
Number Engines - 1
Engine Type - RECIPROCATING-CARBURETOR
Rated Power - 180 HP

ELT Installed/Activated - YES/NO
Stall Warning System - YES

----Environment/Operations Information----
Weather Data
Wx Briefing - FSS
Method - TELEPHONE
Completeness - PARTIAL,LMTD BY PILOT
Basic Weather - VMC
Wind Dir/Speed- 250/004 KTS
Visibility - 5.0 SM
Lowest Sky/Clouds - CLEAR
Lowest Ceiling - NONE
Obstructions to Vision- HAZE
Precipitation - NONE
Condition of Light - DAYLIGHT

Itinerary
Last Departure Point
TAMPA,FL
Destination
STUART,FL

ATC/Airspace
Type of Flight Plan - VFR
Type of Clearance - NONE
Type Apch/Lndg - NONE

Airport Proximity
OFF AIRPORT/STRIP

Airport Data
Runway Ident - N/A
Runway Lth/Wid - N/A
Runway Surface - N/A
Runway Status - N/A

----Personnel Information----
Pilot-In-Command
Certificate(s)/Rating(s)
PRIVATE
SE LAND

Age - 59
Biennial Flight Review
Current - YES
Months Since - 17
Aircraft Type - ML7

Medical Certificate - EXPIRED
Flight Time (Hours)
Total - 6000
Make/Model- 1857
Instrument- UNK/NR
Multi-Eng - UNK/NR
Last 24 Hrs - 2
Last 30 Days- 15
Last 90 Days- 37
Rotorcraft - UNK/NR

Instrument Rating(s) - NONE

----Narrative----
THE PILOT OF N148DP FILED A VFR FLIGHT PLAN, BUT DID NOT OBTAIN NOTAM INFORMATION FOR HIS ROUTE OF FLIGHT. EN ROUTE HE REPORTED TO THE AIR FORCE AVON PARK OPERATIONS THAT HE INTENDED TO PASS TO THE SOUTH OF THE RESTRICTED AREA AT AVON PARK. WHILE IN CRUISE FLIGHT AT 1,400 FEET OVER INSTRUMENT ROUTE 34 (IR 34). N148DP ENCOUNTERED A FLIGHT OF FOUR F16 AIRCRAFT FLYING AT 1,500 FEET AT 500 KNOTS. THE F16 AIRCRAFT WERE IN WIDE FORMATION AND NONE OF THE AIRCRAFT HAD RADAR CONTACT WITH N148DP. THE LEAD AIRCRAFT PERFORMED A 6 "G" PULL UP TO AVOID COLLISION WITH N148DP. N148DP ENCOUNTERED WAKE TURBULENCE FROM THE F16 AND SUSTAINED SUBSTANTIAL DAMAGE TO THE STRUCTURE. THE PILOT OF N148DP CONTINUED TO THE DESTINATION AND LANDED UNEVENTFULLY. THE F16 FLIGHT CONTINUED THE MISSION AND RETURNED TO BASE UNEVENTFULLY. THE IR 34 ROUTE WAS ON A NOTICE TO AIRMAN (NOTAM) AS BEING ACTIVE AT THE TIME OF THE OCCURRENCE.

File No. - 3020 7/07/92 OKEECHOBEE,FL A/C Reg. No. N148DP Time (Lcl) - 0939 EDT

Occurrence #1 NEAR COLLISION BETWEEN AIRCRAFT
Phase of Operation CRUISE

Finding(s)
1. PREFLIGHT PLANNING/PREPARATION - INADEQUATE - PILOT IN COMMAND
2. NOTAMS - NOT ATTAINED - PILOT IN COMMAND

Occurrence #2 VORTEX TURBULENCE ENCOUNTERED
Phase of Operation CRUISE

----Probable Cause----

The National Transportation Safety Board determines that the Probable Cause(s) of this accident was:
THE FAILURE OF THE PILOT-IN-COMMAND OF N148DP TO OBTAIN NOTAM INFORMATION CONCERNING MILITARY ROUTES ALONG HIS ROUTE OF FLIGHT, RESULTING IN HIS ENCOUNTER WITH A FLIGHT OF F16 AIRCRAFT WHO WERE OPERATING ON A MILITARY ROUTE.

National Transpor. n Safety Board
Washington, D.C. 20594

Brief of Accident

File No. - 1079 4/20/86 WARNER SPRINGS,CA A/C Reg. No. USN Time (Lcl) - 1443 PST

----Basic Information----
Type Operating Certificate-NONE (GENERAL AVIATION)

Type of Operation -MILITARY
Flight Conducted Under -14 CFR 91
Accident Occurred During -MANEUVERING

Aircraft Damage
SUBSTANTIAL
Fire
NONE

	Injuries			
	Fatal	Serious	Minor	None
Crew	0	0	0	1
Pass	0	0	0	0
Other	0	0	0	1

----Aircraft Information----
Make/Model - LTV AEROSPACE INDUSTRIES A7E
Landing Gear - TRICYCLE-FIXED
Max Gross Wt - 34000
No. of Seats - 1

Eng Make/Model - ALLISON TF-41A-402D
Number Engines - 1
Engine Type - TURBOFAN
Rated Power - 15000 LBS THRUST

ELT Installed/Activated - NO -N/A
Stall Warning System - YES

----Environment/Operations Information----
Weather Data
Wx Briefing - MILITARY
Method - IN PERSON
Completeness - WEATHER NOT PERTINENT
Basic Weather - VMC
Wind Dir/Speed- 310/009 KTS
Visibility - 25.0 SM
Lowest Sky/Clouds - CLEAR
Lowest Ceiling - NONE
Obstructions to Vision- NONE
Precipitation - NONE
Condition of Light - DAYLIGHT

Itinerary
Last Departure Point
SAN DIEGO,CA
Destination
LEMORE,CA

ATC/Airspace
Type of Flight Plan - VFR/IFR
Type of Clearance - VFR
Type Apch/Lndg - STRAIGHT-IN

Airport Proximity
OFF AIRPORT/STRIP

Airport Data
MIRAMAR NAVAL AIR STATION
Runway Ident - 24
Runway Lth/Wid - 12000/ 200
Runway Surface - CONCRETE
Runway Status - DRY

----Personnel Information----
Pilot-In-Command
Certificate(s)/Rating(s)
COMMERCIAL
SE LAND,ME LAND

Age - 26
Biennial Flight Review
Current - YES
Months Since - 7
Aircraft Type - A7

Medical Certificate - NO MEDICAL

Flight Time (Hours)

Total	- 1171	Last 24 Hrs	- 6
Make/Model	- 859	Last 30 Days	- 40
Instrument	- 377	Last 90 Days	- 107
Multi-Eng	- 100		

Instrument Rating(s) - AIRPLANE

----Narrative----
A ROLLADEN-SCHNEIDER LS-4 GLIDER AND AN LTV A7E JET COLLIDED OVER HOT SPRINGS MTN. NEAR WARNER SPRINGS, CA. THE A7E WAS ATTEMPTING A RAPID PULL UP AND THE GLIDER WAS ATTEMPTING A NOSE DOWN, 30 DEG RIGHT TURN WHEN THEY COLLIDED. BOTH AIRCRAFT WERE OPERATING UNDER VISUAL FLT RULES AND LANDED WITHOUT FURTHER INCIDENT. NEITHER PILOT WAS INJURED. THE GLIDER LEFT WING OUTBD 3 FT SECTION WAS SEVERED. THE A7E NOSE COWLING WAS SUBSTANTIALLY DAMAGED AND THE ENGINE INGESTED EXTENSIVE FIBERGLASS MATERIAL. THE COLLISION OCCURRED AS THE A7E WAS EXECUTING A SOUTHBOUND TURN ON VR 1257 AND WAS WITHIN THE ROUTE WIDTH (4 NM): THE GLIDER WAS ATTEMPTING TO GAIN LIFT ON THE WEST SIDE OF HOT SPRINGS MTN AND WAS WITHIN VR 1257 ROUTE STRUCTURE. THE A7E PLT HAD INFORMED THE NECESSARY FLT SERV STATIONS THAT THE ROUTE WAS ACTIVE; THE GLIDER PLT HAD NOT CONTACTED THE FLT SERV STATIONS TO DETERMINE IF THE ROUTE WAS ACTIVE.

File No. - 1079 4/20/86 WARNER SPRINGS,CA A/C Reg. No. USN Time (Lcl) - 1443 PST

Occurrence #1 MIDAIR COLLISION
Phase of Operation MANEUVERING

Finding(s)
1. TERRAIN CONDITION - MOUNTAINOUS/HILLY
2. PREFLIGHT PLANNING/PREPARATION - IMPROPER - PILOT OF OTHER AIRCRAFT
3. IN-FLIGHT PLANNING/DECISION - IMPROPER - PILOT OF OTHER AIRCRAFT
4. CHECKLIST - POOR - PILOT OF OTHER AIRCRAFT

----Probable Cause----

The National Transportation Safety Board determines that the Probable Cause(s) of this accident is/are finding(s) 2,3,4

Factor(s) relating to this accident is/are finding(s) 1