BUREAU OF SAFETY REPORT

BOSR 5-4-3

U.S. AIR CARRIER ACCIDENTS

STATISTICAL REVIEW and RESUME OF ACCIDENTS

Calendar Year 1962

CIVIL AERONAUTICS BOARD
WASHINGTON, D.C. 20428

071

FOREWORD

The purpose of this report is to present the record of aircraft accidents, incident to flight, which occurred in U. S. Air Carrier operations during the calendar years 1958-1962. It includes a statistical recapitulation of all accidents, and a brief description of each accident along with the probable cause as determined by the Civil Aeronautics Board. ( )

Certain revisions and corrections have been incorporated in data dealing with years prior to 1962 due to the receipt of additional information or changes in classification.

Public reports containing greater detail have been issued by the Board on a number of the major accidents included in this report and are available upon request. In all cases, factual data obtained in the investigation may be released to inquirers at their expense when the reproduction of records is involved.

In the computation of accident rates and passenger fatality rates, dynamite accidents are excluded. Midair collisions nonfatal to Air Carrier occupants are excluded in computation of fatal accident rates.

Dynamite Accidents

Date	Passenger Fatalities
11/1/55.....	39
7/25/57.....	1
1/6/60.....	29
5/22/62.....	37

The accident record of U. S. General Aviation, small fixed-wing aircraft, large fixed-wing aircraft, and rotorcraft, is contained in a separate publication entitled, General Aviation Accidents, A Statistical Review.

TABLE OF CONTENTS

073

GLOSSARY

Aircraft Accident: An aircraft accident is an accident which occurs during the starting or warming up of an engine or engines, or operation of an aircraft, which results in serious or fatal injury to one or more persons or in substantial damage to any aircraft, or which involves a collision of two or more aircraft. Whenever serious or fatal injury results from contact with a rotating propeller which is installed on an aircraft, it shall be considered an aircraft accident.

Aircraft Accident Incident to Flight: An aircraft accident incident to flight is an aircraft accident which occurs between the time an engine or engines are started for the purpose of commencing flight until the aircraft comes to rest with all engines stopped for complete or partial deplaning or unloading. It excludes death or injuries to persons on board which results from illness, altercations, and other incidents not directly attributable to flight operations.

Air Carrier: As used in this report, those operators who have been issued a Certificate of Public Convenience and Necessity by the Civil Aeronautics Board.

Aircraft Miles: The miles (computed in airport-to-airport distances) for each interairport flight actually completed, whether or nor performed in accordance with the scheduled pattern. For this purpose, operation to a flag stop is a flight completed even though a landing is not actually made. In cases where interairport distances are inapplicable, aircraft miles flown are determined by multiplying the normal cruising speed of the aircraft by the airborne hours.

All-Cargo Carriers: Certificated Route Carriers primarily engaged in the transportation of freight and express. The nonscheduled passenger operations of these carriers are included in this category. Does not include the all cargo operations of the passenger/cargo carriers.

All-Cargo Service: Transport service established primarily for the transportation of freight, express, and/or mail.

Certificate Of Public Convenience and Necessity: A certificate issued to an Air Carrier by the Civil Aeronautics Board, authorizing the carrier to engage in air transportation.

Certificated Route Carriers: One of a class of air carriers holding certificates of Public Convenience and Necessity, issued by the Civil Aeronautics Board, authorizing the performance of scheduled air transportation over specified routes and a limited amount of nonscheduled operations. This general carrier grouping includes the all-purpose carriers (i.e., the so-called passenger/cargo carriers) and the all-cargo carriers, and comprises all of the airlines certificated by the Board, except supplemental air carriers. Certificated Route Air Carriers are often referred to as "Scheduled Airlines" although they also perform nonscheduled service.

Domestic Operations: In general, operations wholly within the territory of the United States. Includes domestic operations of the certificated trunk carriers and the local service, Helicopter, Intra-Alaska, Intra-Hawaii and Domestic All-Cargo carriers.

Domestic Trunk Carriers: Those Domestic "grandfather" carriers designated as "Trunk Carriers" in 1945-46, when "feeder" carriers (now called local service carriers) were granted certificates by the Civil Aeronautics Board to perform local feeder air service. International and Territorial operations of the Trunk Carriers are shown under "International and Territorial Operations" and are not included under "Domestic Operations."

Helicopter Carriers: Domestic Certificated Route Air Carriers employing helicopter aircraft for their primary operations.

International and Territorial Operations: In general, operations outside the territory of the United States, including operations between United States points separated by foreign territory or major expanses of international waters.

Intra-Alaska Operations: Statehood for Alaska since 1959 requires the inclusion of its Intra-State air carrier operations with the Domestic Carriers. Operations between Alaska and other States of the United States are included under International and Territorial, since such operations are over foreign territory or International waters.

Intra-Hawaii Operations: Intra-Hawaii air carrier operations, are included under Domestic operations. Operations between Hawaii and other States of the United States are carried under International and Territorial Operations.

Local Service Carriers: Certificated Domestic Route Air Carriers operating over routes of lesser density between the smaller traffic centers and between those centers and principal centers.

Nonscheduled Service: Revenue flights that are not operated in regular scheduled service such as charter flights and all nonrevenue flights incident to such flights.

Passenger Mile: One passenger transported one mile. Passenger miles are computed by the summation of the products of the aircraft miles flown on each interairport flight multiplied by the number of passengers carried on that flight.

Revenue Passenger: A person receiving air transportation from an air carrier for which remuneration is received by the air carrier. Air carrier employees and others receiving air transportation against whom token service charges are levied are considered nonrevenue passengers.

Revenue Plane Miles: The total plane miles flown in revenue service.

Supplemental Air Carriers: One of a class of air carriers holding temporary Certificates of Public Convenience and Necessity, issued by the Civil Aeronautics Board, authorizing them to perform passenger and cargo charter services supplementing the scheduled service of the certificated route air carriers.

Causal Factors: In determining the cause of an accident all contributing factors are considered. The factors are classified according to appropriate categories. For statistical purposes, where two or more causal factors exist in an accident, each is recorded and no attempt is made to establish a primary cause. Therefore, the figure shown in the tables dealing with causal factors will exceed the total number of accidents.

Section I

STATISTICAL REVIEW

U. S. AIR CARRIER SAFETY RECORD - 1962

The 1962 safety record of the U. S. Air Carriers is presented in this report in relation to the various classifications and groupings of air carriers, and to the different types of operations in which they engage. There are two main categories of air carriers; the Certificated Route Carriers and the Supplemental Carriers. Data is furnished in relation to each category and to the different groupings of carriers within each category. Additional breakdowns are made in respect to the different types of service performed by these carriers.

HIGHLIGHTS - U. S. AIR CARRIER SAFETY RECORD - ALL OPERATIONS

In the overall operation of the U. S. Air Carriers during 1962 there were 70 aircraft accidents incident to flight, 10 of which were fatal accidents resulting in 330 fatalities. Following is a comparison of salient points with the previous year's record.

	1961	1962
TOTAL ACCIDENTS.....	84	70
Fatal Accidents.....	11	10
Involving serious injury only.	10	11
Involving minor or no injury..	63	49
NUMBER AIRCRAFT DESTROYED.....	14	14
Substantial damage.....	63	46
FATALITIES - TOTAL.....	311	330
Passengers.....	275	279
Crew Members.....	35	48
Other Persons.....	1	3
MILES FLOWN - (Billion).....	1.10	1.17
HOURS FLOWN - (Millions).....	4.19	4.11
ACCIDENT RATES		
Per 1 million aircraft miles	0.076	0.059
Per 100 thousand aircraft hours.....	2.003	1.678

CERTIFICATED ROUTE CARRIERS

ALL OPERATIONS OF CERTIFICATED ROUTE CARRIERS

In 1962 the Certificated Route Carriers had 63 accidents in their total revenue and nonrevenue operations. Nine of these were fatal accidents resulting in 327 fatalities. The distribution of accidents by type of operations was as follows:

Operation	Number Accidents Total	Number Accidents Fatal	Fatalities
Scheduled Passenger Service.....	43	5	183
Scheduled Cargo Service.....	4	1	8
Nonscheduled Revenue Operations..	9	3	136
Nonrevenue Operations			
Training.....	4	0	0
Other.....	3	0	0
Total All Operations.....	63	9	327

Miles - Hours Flown	
Miles Flown.....	1,117,103,908
Hours Flown.....	3,878,925

Accident Rates	Total Accidents	Fatal Accidents
Per 1 million aircraft miles...	0.055	0.007
Per 100 thousand aircraft hours	1.598	0.206

SCHEDULED PASSENGER SERVICE

Revenue passengers carried.....	62.55 million
Passenger-miles (revenue and nonrevenue).....	45.85 billion
Aircraft miles flown.....	961.80 million
Passenger fatality rate per 100 million passenger miles flown.	0.26

Accident Rate Per 1 Million Aircraft Miles

Total Accidents.....	0.044
Fatal Accidents.....	0.004
Miles Flown Per Accident.....	22.90 million
Miles Flown Per Fatal Accident.	240.45 million

SUPPLEMENTAL AIR CARRIERS

ALL OPERATIONS OF SUPPLEMENTAL CARRIERS

In 1962 the Supplemental Air Carriers had 7 accidents 1 of which was fatal, resulting in 3 fatalities. These accidents occurred in the following types of operation.

Operation	Number Accidents Total	Number Accidents Fatal	Total Fatalities
Civil Operations:			
Passenger.....	1	0	0
Cargo.....	1	0	0
Military Operations:			
Passenger.....	0	0	0
Cargo.....	3	0	0
Training.....	1	0	0
Ferry.....	0	0	0
Test.....	1	1	3
Total - All Operations...	7	1	3

Miles - Hours Flown

Aircraft Miles Flown.....	53,270,187
Hours Flown.....	232,779

Accident Rates	Total Accidents	Fatal Accidents
Per 1 million aircraft miles	0.131	0.019
Per 100 thousand acft. hours	3.007	0.430

The Supplemental Carriers had 1 fatal accident in their nonrevenue operations, resulting in 3 fatalities.

Other pertinent statistics relating to passenger operations:

Type Operation	Passengers Carried	Passenger-Miles Flown (000) 1/	Passg. Fatality Rate Per 100 Million Passg.Miles
Civil.....	NA	816,384	0
Military..	NA	1,053,313	0
Total.....	871,613	1,869,697	0

1/ Revenue

080

ACCIDENT RATES
U. S. AIR CARRIERS
ALL OPERATIONS

1962

CLASS OF CARRIER	Number of Accidents: Total	Injury Index: Fatal	Injury Index: Serious	Injury Index: Minor/None	Aircraft Damage: Destroyed	Aircraft Damage: Substantial	Aircraft Miles Flown	Aircraft Hours Flown	Accident Rates: Per 1 Million Miles: Total Accidents	Per 1 Million Miles: Fatal Accidents	Per 100,000 Hours: Total Accidents	Per 100,000 Hours: Fatal Accidents
CERTIFICATED ROUTE AIR CARRIERS												
1. Domestic Carriers												
Trunk	26	4	3	19	5	19	730,601,161	2,325,125	0.034	0.004	1.075	0.129
Local Service	10	1	2	7	2	6	117,490,604	705,182	0.085	0.008	1.418	0.142
Helicopter	0	0	0	0	0	0	1,664,153	20,141	0	0	0	0
All-Cargo Carriers	10	4	0	6	4	6	45,244,848	176,761	0.221	0.088	5.657	2.263
Other	1	0	0	1	0	1	490,098	3,605	2.040	0.000	27.739	0.000
Subtotal	47	9	5	33	11	32	895,490,864	3,230,814	0.051	0.009	1.423	0.248
Intra-Alaska Carriers	6	0	1	5	1	5	10,356,675	76,469	0.579	0.000	7.846	0.000
Intra-Hawaii Carriers	0	0	0	0	0	0	5,871,025	32,118	0	0	0	0
TOTAL DOMESTIC CARRIERS	53	9	6	38	12	37	911,718,564	3,339,401	0.057	0.009	1.557	0.239
2. International/Terr. Carriers												
Passenger/Cargo Carriers	8	0	4	4	1	3	191,229,450	489,682	0.042	0.000	1.634	0.000
All-Cargo Carriers	2	0	0	2	0	2	14,155,894	49,842	0.141	0.000	4.013	0.000
TOTAL INTERNAT./TERR. CARRIERS	10	0	4	6	1	5	205,385,344	539,524	0.049	0.000	1.853	0.000
TOTAL-CERTIFICATED ROUTE AIR CARRIERS	63	9	10	44	13	42	1,117,103,908	3,878,925	0.055	0.007	1.598	0.206
SUPPLEMENTAL AIR CARRIERS												
1. Domestic												
Civil Operations	3	1	1	1	1	1	NA	NA	NA	NA	NA	NA
Military Contract	2	0	0	2	0	1	NA	NA	NA	NA	NA	NA
Subtotal	5	1	1	3	1	2	26,998,453	129,726	0.185	0.037	3.854	0.771
2. International												
Civil Operations	1	0	0	1	0	1	NA	NA	NA	0.000	NA	0.000
Military Contract	1	0	0	1	0	1	NA	NA	NA	0.000	NA	0.000
Subtotal	2	0	0	2	0	2	26,271,734	103,073	0.076	0.000	1.940	0.000
TOTAL-SUPPLEMENTAL AIR CARRIERS	7	1	1	5	1	4	53,270,187	232,799	0.131	0.019	3.007	0.430
TOTAL - ALL OPERATIONS	70	10	11	49	14	46	1,170,374,095	4,111,724	0.059	0.008	1.678	0.219

NA - Not Available.

ACCIDENT RATES
CERTIFICATED ROUTE AIR CARRIERS
ALL REVENUE OPERATIONS
1962

CLASS OF CARRIER	Number of Accidents				Aircraft Miles Flown	Aircraft Hours Flown	Number of Departures	Accident Rates					
		Injury Index						Total Accidents			Fatal Accidents		
	Total	Fatal	Serious	Minor/None				1 Million Miles	100,000 Hours	100,000 Departures	1 Million Miles	100,000 Hours	100,000 Departures
SCHEDULED SERVICE													
1. Domestic Carriers													
Trunk	24*	4*	3	17	699,900,310	2,229,779	1,991,680	0.032	1.031	1.155	0.004	0.134	0.151
Local Service	10	1	2	7	112,985,885	680,862	1,199,432	0.088	1.468	0.833	0.008	0.146	0.083
Helicopter Carriers	0	0	0	0	1,517,933	18,559	96,768	0.000	0.000	0.000	0.000	0.000	0.000
All-Cargo Carriers	1	1	0	0	5,610,574	21,968	7,664	0.178	4.552	13.048	0.178	4.552	13.048
Other	0	0	0	0	282,911	2,101	7,685	0.000	0.000	0.000	0.000	0.000	0.000
Subtotal	35*	6*	5	24	820,297,613	2,953,269	3,303,229	0.041	1.151	1.029	0.006	0.169	0.151
Intra-Alaska	3	0	1	2	7,544,763	55,007	102,511	0.397	5.453	2.926	0.000	0.000	0.000
Intra-Hawaii	0	0	0	0	5,461,068	29,779	47,742	0.000	0.000	0.000	0.000	0.000	0.000
Total Domestic	38*	6*	6	26	833,303,444	3,038,055	3,453,482	0.044	1.217	1.071	0.006	0.164	0.144
2. Internat./Terr. Carriers													
Passenger/Cargo Carriers	8	0	4	4	171,500,111	435,423	201,209	0.047	1.841	3.976	0.000	0.000	0.000
All-Cargo Carriers	1	0	0	1	4,880,175	17,696	5,554	0.205	5.650	18.005	0.000	0.000	0.000
Total International/ Territorial Carriers.	9	0	4	5	176,380,286	453,119	206,763	0.051	1.986	4.352	0.000	0.000	0.000
TOTAL SCHEDULED SERVICE	47*	6*	10	31	1,009,683,730	3,491,174	3,660,245	0.045	1.317	1.257	0.005	0.143	0.137
NONSCHEDULED REVENUE SERVICE													
1. Domestic Carriers													
Trunk	0	0	0	0	4,460,688	16,754	6,967	0.000	0.000	0.000	0.000	0.000	0.000
Local Service	0	0	0	0	1,049,815	6,033	3,877	0.000	0.000	0.000	0.000	0.000	0.000
Helicopter	0	0	0	0	50,486	719	3,173	0.000	0.000	0.000	0.000	0.000	0.000
All-Cargo Carriers	5	3	0	2	35,722,010	140,860	64,044	0.139	3.549	7.807	0.083	2.129	4.684
Other	0	0	0	0	197,062	1,428	3,361	0.000	0.000	0.000	0.000	0.000	0.000
Subtotal	5	3	0	2	41,480,061	165,794	81,422	0.120	3.015	6.140	0.072	1.809	3.684
Intra-Alaska Carriers	2	0	0	2	2,206,546	16,814	25,330	0.906	11.894	7.895	0.000	0.000	0.000
Intra-Hawaii Carriers	0	0	0	0	5,976	40	60	0.000	0.000	0.000	0.000	0.000	0.000
Total Domestic	7	3	0	4	43,692,583	182,648	106,812	0.160	3.83	6.55	0.068	1.64	2.81
2. Internat./Terr. Carriers													
Passenger/Cargo Carriers	1	0	0	1	12,526,844	34,730	8,057	0.079	2.879	12.411	0.000	0.000	0.000
All-Cargo Carriers	1	0	0	1	8,040,394	27,835	4,823	0.124	3.592	20.733	0.000	0.000	0.000
Total International/ Territorial Carriers.	2	0	0	2	20,567,238	62,565	12,880	0.097	3.19	15.52	0.000	0.000	0.000
TOTAL NONSCHEDULED SERVICE	9	3	0	6	64,259,821	245,213	119,692	0.140	3.670	7.519	0.046	1.223	2.506
GRAND TOTAL	56*	9*	10	37	1,073,943,551	3,736,387	3,779,937	0.051	1.472	1.455	0.007	0.214	0.212

* One dynamite accident.

ACCIDENTS, INJURIES, AIRCRAFT DAMAGE
BY TYPE OF OPERATION
1962

ITEMS	CERTIFICATED ROUTE CARRIERS					SUPPLEMENTAL CARRIERS				GRAND TOTAL
	Scheduled Passenger Service	All Scheduled Services	Nonsched. Revenue Operations	Nonrevenue Operations	All Operations	Public Passenger/ Cargo Operations	Military Contract Operations	Nonrevenue Operations	All Operations	
Accidents - Injury Index										
Fatal.....	5	6	3	0	9	0	0	1	1	10
Serious.....	10	10	0	0	10	1	0	0	1	11
Minor/None.....	28	31	6	7	44	1	4	0	5	49
Total.....	43	47	9	7	63	2	4	1	7	70
Aircraft Damage										
Destroyed.....	7	8	4	1	13	0	0	1	1	14
Substantial.....	28	31	5	6	42	1	3	0	4	46
Minor/None.....	8	8	0	0	8	1	1	0	2	10
Total.....	43	47	9	7	63	2	4	1	7	70
Fatalities										
Captain.....	4	5	1	0	6	0	0	1	1	7
Copilot.....	4	5	2	0	7	0	0	1	1	8
Flight Engineer...	3	4	3	0	7	0	0	0	0	7
Cabin Attendants..	11	11	7	0	18	0	0	0	0	18
Other Crew.....	3	3	4	0	7	0	0	1	1	8
Passengers.....	158	160	119	0	279	0	0	0	0	279
Non-occupants.....	0	3	0	0	3	0	0	0	0	3
Total.....	183	191	136	0	327	0	0	3	3	330
Serious Injuries										
Captain.....	1	1	0	0	1	0	0	0	0	1
Copilot.....	0	0	0	0	0	0	0	0	0	0
Flight Engineer...	0	0	0	0	0	0	0	0	0	0
Cabin Attendants..	7	7	0	0	7	0	0	0	0	7
Other Crew.....	0	0	0	0	0	0	0	0	0	0
Passengers.....	25	25	0	0	25	3	0	0	3	28
Non-occupants.....	1	1	0	0	1	0	0	0	0	1
Total.....	34	34	0	0	34	3	0	0	3	37

RECORD OF INDIVIDUAL TRUNK CARRIERS
SCHEDULED PASSENGER SERVICE

1962

Operators	Accidents Total	Accidents Fatal	Fatalities Passg.	Fatalities Crew	Fatalities Others	Revenue Passengers Carried	Passenger-Miles 1/ (000)	Revenue Plane Miles	Departures
Trunk									
American Airlines.....	3	1	87	8	0	7,997,901	6,711,685	117,465,660	258,946
Braniff Airways.....	0	0	0	0	0	2,345,261	1,170,821	29,648,746	121,107
Continental Air Lines...	2	1	37	8	0	1,391,959	993,698	24,651,051	82,401
Delta Air Lines.....	0	0	0	0	0	4,227,819	2,848,185	56,097,836	187,438
Eastern Air Lines.....	7	1	21	4	0	6,852,515	3,712,542	87,521,224	339,546
National Airlines.....	0	0	0	0	0	2,043,459	1,567,146	29,711,678	86,718
Northeast Airlines.....	1	0	0	0	0	1,551,059	761,555	19,259,575	74,504
Northwest Airlines.....	1	0	0	0	0	2,042,551	1,492,732	31,629,895	89,437
Trans World Airlines....	0	0	0	0	0	4,826,717	4,705,329	87,176,818	158,005
United Air Lines.....	9	1	13	4	0	11,442,951	8,228,460	170,495,258	477,394
Western Air Lines.....	0	0	0	0	0	2,036,863	1,216,901	23,469,221	76,362
Total.....	23	4	158	24	0	46,759,055	33,409,054	677,126,962	1,951,858

1/ Both revenue and nonrevenue

RECORD OF INDIVIDUAL LOCAL SERVICE (INCLUDING HELICOPTER CARRIERS)

SCHEDULED PASSENGER SERVICE

1962

Operators	Accidents		Fatalities			Revenue Passengers Carried	Passenger-Miles 1/ (000)	Revenue Plane Miles	Departures
	Total	Fatal	Passg.	Crew	Others				
Local Service									
Allegheny Airlines.....	1	1	0	1	0	960,030	209,006	10,609,122	96,052
Bonanza Airlines.....	0	0	0	0	0	425,475	114,595	5,443,441	39,501
Central Airlines.....	0	0	0	0	0	331,961	73,282	7,228,081	84,103
Frontier Airlines.....	1	0	0	0	0	374,525	110,381	10,179,334	94,824
Lake Central Airlines....	0	0	0	0	0	431,646	70,187	6,167,290	83,795
Mohawk Airlines.....	0	0	0	0	0	1,006,331	212,593	10,133,666	91,931
North Central Airlines...	1	0	0	0	0	1,038,187	199,484	15,062,136	180,564
Ozark Airlines.....	2	0	0	0	0	672,136	127,377	9,583,132	107,286
Pacific Airlines.....	1	0	0	0	0	493,301	116,925	5,470,054	[illegible],719
Piedmont Aviation.....	3	0	0	0	0	663,561	157,114	9,201,121	107,263
Southern Airways.....	0	0	0	0	0	499,020	96,819	9,007,544	104,381
Trans-Texas Airways.....	0	0	0	0	0	384,918	93,631	8,025,601	80,753
West Coast Airlines.....	0	0	0	0	0	369,473	100,487	6,868,270	73,260
Subtotal.....	9	1	0	1	0	7,650,564	1,681,881	112,978,792	1,199,432
Helicopter Service									
Chicago Helicopter Airways	0	0	0	0	0	92,976	1,847	468,948	30,814
Los Angeles Airways.....	0	0	0	0	0	77,433	2,974	527,511	25,236
New York Airways.....	0	0	0	0	0	188,267	3,843	437,083	33,835
Subtotal.....	0	0	0	0	0	358,676	8,664	1,433,542	89,885

1/ Both Revenue and Nonrevenue.

RECORD OF INDIVIDUAL INTRA-ALASKA AND INTRA-HAWAII
AIR CARRIERS IN SCHEDULED PASSENGER SERVICE

1962

Operators	Accidents		Fatalities			Revenue Passengers Carried	Passenger-Miles 1/ (000)	Revenue Plane Miles	Departures
	Total	Fatal	Passg.	Crew	Others				
Intra-Alaska									
Alaska Coastal Airlines a/..	0	0	0	0	0	9,515	1,047	192,043	3,241
Alaska Coastal - Ellis a/..	0	0	0	0	0	103,000	8,203	1,390,134	29,364
Cordova Airlines.....	0	0	0	0	0	23,945	3,478	594,576	7,778
Ellis Airlines a/.....	0	0	0	0	0	10,464	609	128,907	3,223
Kodiak Airways.....	0	0	0	0	0	8,068	478	189,050	6,460
Northern Consolidated Airlines	0	0	0	0	0	27,836	8,565	1,606,609	19,380
Reeve Aleutian Airways.....	0	0	0	0	0	13,492	13,939	924,797	4,291
Western Alaska.....	0	0	0	0	0	6,872	323	249,804	7,017
Wein Alaska Airlines.....	2	0	0	0	0	35,769	14,183	2,268,843	21,757
Total.....	2	0	0	0	0	238,961	50,825	7,544,763	102,511
Intra-Hawaii									
Aloha Airlines.....	0	0	0	0	0	385,362	59,019	2,206,300	19,287
Hawaiian Airlines.....	0	0	0	0	0	491,219	75,222	2,601,064	23,105
Total.....	0	0	0	0	0	876,581	134,241	4,807,364	42,392
Other									
Avalon.....	1	0	0	0	0	66,111	2,464	282,911	7,685

1/ Both revenue and nonrevenue.

a/ Alaska Coastal and Ellis merged April 1, 1962. Data for the two carriers are for one quarter. Data for Alaska Coastal-Ellis are for the remaining nine months.

RECORD OF U. S. INTERNATIONAL/TERRITORIAL CARRIERS
SCHEDULED PASSENGER SERVICE

1962

Operators	Accidents		Fatalities			Revenue Passengers Carried	Passenger Miles 1/ (000)	Revenue Plane Miles	Departures
	Total	Fatal	Passg.	Crew	Others				
Alaska Airlines.....	1	0	0	0	0	75,357	67,167	1,749,305	4,145
American Airlines.....	0	0	0	0	0	115,159	135,294	1,923,196	2,189
Braniff Airways.....	0	0	0	0	0	102,083	148,739	3,226,072	3,463
Caribbean Atlantic Airlines.	0	0	0	0	0	549,139	41,664	1,906,145	27,390
Delta Air Lines.....	0	0	0	0	0	22,757	41,255	1,019,565	832
Eastern Air Lines.....	0	0	0	0	0	413,993	629,028	9,494,622	6,700
Mackey Air Transport.....	0	0	0	0	0	104,234	17,705	702,162	8,562
National Air Lines.....	0	0	0	0	0	NA	NA	NA	NA
Northwest Airlines.....	0	0	0	0	0	215,473	489,783	9,392,609	7,430
Pacific Northern Airlines...	0	0	0	0	0	140,208	135,286	4,259,077	10,962
PAWA (All Divisions).....	6	0	0	0	0	3,918,882	6,436,831	91,503,608	94,516
Pan American Grace Airways..	1	0	0	0	0	134,627	247,009	3,746,756	4,565
South Pacific Air Lines.....	0	0	0	0	0	2,336	7,122	253,525	107
Trans Caribbean Airways....	0	0	0	0	0	144,434	230,991	2,079,178	1,483
Trans World Airlines.....	0	0	0	0	0	365,013	1,265,842	17,547,181	11,704
United Air Lines.....	0	0	0	0	0	214,118	545,610	7,168,008	2,876
Western Air Lines.....	0	0	0	0	0	80,638	126,888	1,656,280	1,085
Total.....	8	0	0	0	0	6,598,451	10,566,214	157,627,289	188,009

1/ Both revenue and nonrevenue

NA - Not Available

RECORD OF INDIVIDUAL SUPPLEMENTAL AIR CARRIERS
PASSENGER OPERATIONS (CIVIL AND MILITARY)

1962

Operators	CIVILIAN SERVICES						MILITARY-CONTRACT OPERATIONS						Aggregate 2/ Number of Passengers Carried	Total 3/ Hours Flown
	Accidents		Revenue Passenger-Miles (000)	Revenue 1/ Plane-Miles	Fatalities		Accidents		Revenue Passenger-Miles (000)	Revenue 1/ Plane-Miles	Fatalities			
	Total	Fatal			Passg.	Crew	Total	Fatal			Passg.	Crew		
AAXICO Airlines, Inc.	0	0	NA	NA	0	0	0	0	4,920	1,628,130	0	0	NA	6,253
Airline Transport Carriers, i/b/a California Hawaiian	0	0	32,431	361,994	0	0	0	0	NA	NA	0	0	19,476	1,479
American Flyers	0	0	13,251	371,042	0	0	0	0	28,413	616,296	0	0	39,645	4,595
Argonaut Airways	0	0	NA	117,618	0	0	0	0	NA	NA	0	0		629
Associated Air Transport, Inc.	0	0	17,321	253,544	0	0	0	0	NA	NA	0	0	8,660	1,038
Blatz Airlines	1	0	10,772	404,987	0	0	0	0	2,923	102,905	0	0	80,606	4,088
Capitol Airways	0	0	153,430	2,386,419	0	0	0	0	105,291	8,828,387	0	0	69,790	57,404
Johnson Flying Service	0	0	703	112,277	0	0	0	0	NA	NA	0	0	2,087	821
Modern Air Transport	0	0	2,158	32,318	0	0	0	0	16,221	293,429	0	0	17,776	1,926
Overseas National Airways	0	0	68,738	1,167,507	0	0	0	0	180,542	2,077,404	0	0	96,386	13,239
President Airlines	0	0	435	5,562	0	0	0	0	NA	NA	0	0	340	26
Purdue Aeronautics Corp.	0	0	3,517	236,319	0	0	0	0	654	2,338	0	0	7,066	2,608
Quaker City Airways	0	0	172,284	1,976,825	0	0	0	0	28,052	502,689	0	0	120,910	10,540
Roberts, Vance d/b/a/ Vance Int. Airways	0	0	293	17,977	0	0	0	0	NA	NA	0	0	980	137
Saturn Airways	0	0	17,992	234,315	0	0	0	0	15,574	296,045	0	0	21,402	2,562
Southern Air Transport	0	0	445	842,446	0	0	0	0	97,217	2,442,910	0	0	87,417	15,172
Standard Airways	0	0	62,820	729,044	0	0	0	0	18,845	316,061	0	0	44,477	4,887
Trans-International	0	0	254	2,670	0	0	0	0	191,244	3,657,302	0	0	48,567	13,314
United States Overseas	0	0	144,826	1,917,171	0	0	0	0	19,221	297,052	0	0	81,639	9,573
World Airways	0	0	26,301	769,368	0	0	0	0	337,824	10,485,814	0	0	64,630	44,164
World Wide	0	0	14,242	204,938	0	0	0	0	NA	NA	0	0	11,259	903
Zantop	0	0	NA	1,973,857	0	0	0	0	NA	4,933,012	0	0	NA	33,716
Total	1	0	742,213	14,118,198	0	0	0	0	1,046,941	36,479,774	0	0	823,383	226,074

1/ Includes miles flown in cargo operations.
2/ Breakdown between civil and military-contract services not available.
3/ Total hours flown in all operations.

NA - Not available.

ACCIDENTS BY CATEGORY OF AIRCRAFT

CERTIFICATED ROUTE AIR CARRIERS

- 1962 -

Following is a resume of the accident involvement of the different categories of aircraft. Accident rates per 100,000 hours of revenue flight operations are also presented. These figures are shown for purposes of general information. As the accident figures are related to all types of accidents they do not provide any significant basis for a comparative analysis between types of aircraft.

Aircraft Category	Revenue Hours Flown	Accidents		Accident Rates Per 100,000 Hrs.	
		Total	Fatal	Total	Fatal
Helicopters.....	19,278	0	0	0	0
Single Engine Aircraft.....	20,110	1	0	4.97	0
Piston Engine Aircraft 1/..	2,071,156	33	6	1.59	0.29
Turboprop Aircraft 1/.....	577,392	7	1	1.21	0.17
Turbojet Aircraft 1/.....	1,047,233	15	2	1.33	0.09
Total.....	3,735,169	56	9	1.47	0.21

1/ Two or more engines.

089

ACCIDENT TYPE - PHASE OF OPERATION

Accidents are classified for statistical purposes according to certain established types. These accident types describe the general circumstances of the occurrence but they do not necessarily indicate the cause or the conditions that contributed to the cause. The phase of operation relates to the particular segment of the flight or operation during which the circumstances of the accident occur.

The table on page 14 shows the types of all the accidents during 1962 in relation to the operational phase in which they occurred.

Frequency - Accident Types - 1962

TYPE	NUMBER	PERCENT
Ground-waterloop-swerve	2	3
Wheels-up landing	6	9
Gear collapsed	10	14
Gear retracted	4	6
Hard landing	2	3
Nose/over/down	1	1
Overshoot	3	4
Undershoot	10	14
Collided with aircraft (Both on ground)	1	1
Collided with ground/water		
Controlled	2	3
Uncontrolled	2	3
Collided with objects (Miscellaneous)	6	9
Bird strike	2	3
Stall, spin, spiral	1	1
Fire or explosion in flight	1	1
Engine failure or malfunction	4	6
Propeller failure	3	4
Turbulence in flight	5	7
Evasive maneuver	2	3
Missing aircraft	1	1
Airframe failure in flight	2	3
Total	70	100

Frequency - Accidents by Phase of Operation - 1962

PHASE OF OPERATION	NUMBER	PERCENT
Ground (Static)	2	3
Taxi	5	7
Takeoff	6	9
Enroute	17	24
Landing	39	56
Unknown	1	1
Total	70	100

Note: Constituent percentages may not add to total because of rounding.

090

TYPE OF ACCIDENT VS. PHASE OF OPERATION
TOTAL OPERATIONS
1962

OPERATIONAL PHASE	STATIC			TAXI		TAKEOFF			IN-FLIGHT						LANDING							UNK
TYPE OF ACCIDENT	STARTING ENGINE (S)	IDLING ENGINE (S)	ENGINE RUNUP	TO TAKEOFF	FROM LANDING	GROUND ROLL-RUN	INITIAL CLIMB	ABORTED	CLIMB TO CRUISE	NORMAL CRUISE	DESCENDING	HOLDING	IN TRAFFIC PATTERN -CIRCLING	FINAL APPROACH (VFR)	INITIAL APPROACH (IFR)	FINAL APPROACH (IFR)	LEVEL OFF/ TOUCHDOWN	ROLLOUT	GO-AROUND (ABORTED) VFR	MISSED APPROACH (IFR)	UNKNOWN	TOTAL
GROUND-WATERLOOP-SWERVE																		2				2
DRAGGED WINGTIP, POD OR FLOAT																						0
WHEELS-UP LANDING																5			1			6
GEAR COLLAPSED							1									4		5				10
GEAR RETRACTED		1				1												2				4
HARD LANDING																1			1			2
NOSE/OVER/DOWN																		1				1
ROLL OVER																						0
OVERSHOOT														2				1				3
UNDERSHOOT														9		1						10
COLLISION WITH AIRCRAFT																						0
Both in flight																						0
One airborne																						1
Both on ground					1																	
COLLISION WITH GROUND/WATER																				1		2
Controlled							1															2
Uncontrolled									1						1							
COLLISION WITH OBJECTS																						0
Wires/Poles																						0
Trees																						0
Residences																						0
Other Buildings																						0
Fence, fenceposts																						0
Electronic towers																						0
Runway or approach lights																						0
Airport Hazard																						0
Animals																						0
Ditches																						0
Snowbank																						2
Parked Aircraft				2																		4
Other	1			2														1				
BIRD STRIKE										2												2
Collision with birds							1															1
STALL, SPIN, SPIRAL																						1
FIRE OR EXPLOSION										1												0
In flight																						
On ground																						2
AIRFRAME FAILURE											2											0
In flight																						0
On ground																						4
ENGINE TEARAWAY						1				2	1											3
ENGINE FAILURE OR MALFUNCTION						1				1						1						0
PROPELLER FAILURE																						0
PROPELLER/ROTOR ACCIDENT TO PERSON																						5
JET INTAKE/EXHAUST ACC. TO PERSON										2	3											0
TURBULENCE IN FLIGHT																						0
HAIL DAMAGE TO AIRCRAFT																						2
LIGHTNING STRIKE									1		1										1	1
EVASIVE MANEUVER																						0
MISSING AIRCRAFT																						
UNDETERMINED																						
TOTAL	1	1	0	4	1	3	2	1	2	8	7	0	0	11	0	1	12	12	2	1	1	70

CAUSAL FACTORS

There were 70 accidents in the overall operations of the air carriers in 1962. The figures shown below indicate the frequency of occurrence of each of the different causal categories in the 70 accidents.

Broad Categories of Causal Factors	Total Accidents	Accidents in Which No Other Causal Factor was Involved
Pilot Personnel	39	11
Other Personnel	20	2
Weather	11	2
Powerplant	7	5
Landing Gear	10	7
Airframe	3	0
Rotor Installation	0	0
Airport Facilities/Terrain	10	1
Miscellaneous	9	3
Undetermined	1	1

DETAILED LISTING OF INDIVIDUAL CAUSAL FACTORS

All of the separate, individual causal factors found to exist in Air Carrier accidents are listed as follows:

PILOT:

Attempted operation with known deficiencies in equipment	1
Became lost/disorientated on VFR flight	0
Continued flight into area of severe turbulence	3
Failed to extend landing gear	2
Inadvertent retraction of gear on ground	2
Failed to observe other aircraft	3
Failed to observe objects or obstructions	3
Failed to maintain adequate flying speed	1
Misjudged distance, speed, altitude or clearance	8
Failed to use or incorrectly used miscellaneous equipment	0
Failed to follow approved procedures, directives, instructions, etc.	7
Improper operation powerplant and powerplant controls (includes propeller controls)	1
Improper operation brakes and/or flight controls on ground	3
Improper operation flight controls in air	0
Premature lift-off	0
Improper level-off	1
Improper IFR operation	2
Improper in-flight decisions or planning	2

092

PILOT: (Cont'd)

Inadequate or incorrect compensation for wind conditions	1
Inadequate or improper preflight preparation and/or planning	1
Inadequate supervision of flight (Pilot)	5
Selected unsuitable terrain	0
Exercised poor judgment	2
Forgetfulness	1
Taxied - parked without proper assistance	1

COPILOT:

Failed to observe objects or obstructions	0
Misjudged distance, speed, altitude or clearance	3
Failed to use or incorrectly used miscellaneous equipment	1
Inadequate or improper preflight preparation and/or planning	0
Improper operation of brakes - flight controls on ground	2
Lack of familiarity with aircraft involved	1

OTHER PERSONNEL:

Maintenance, Servicing, Inspection	10
Operational Supervisory Personnel	5
Flight Engineer	2
Dispatching	1
Miscellaneous	9

POWERPLANT:

Engine structure	3
Exhaust system	1
Compressor assembly	1
Accessory drive assembly	0
Fuel system	0
Thrust reverser	0
Lubricating system	1
Propeller & accessories	3

AIRFRAME:

Fuselage	1
Flight control surfaces	2

LANDING GEAR:

Normal retraction/extension assembly	2
Main gear	2
Nose gear	4
Emergency extension system	1
Landing gear warning and indicating components	1

SYSTEMS:

Hydraulic	1
Flight controls	1
Fire warning detection	1

033

INSTRUMENTS/EQUIPMENT & ACCESSORIES:

Flight & navigation instruments	1
Miscellaneous equipment/accessories	1

WEATHER:

Low ceiling	4
Rain	3
Fog	1
Snow	1
Unfavorable wind conditions; takeoff and landing (includes crosswind conditions)	2
Turbulence in flight, clear air	3
Turbulence in flight, in clouds, including thunderstorm, etc.	3
Downdrafts, updrafts - (includes mountain wave)	1
Obstructions to vision (smoke, haze, sand, dust)	1

AIRPORTS/AIRWAYS FACILITIES:

Ice/slush on runway	3
Approach lighting	0
Hidden hazard	1
Wet runway	3
Snow on runway	1
Ice/slush on ramp/taxiway	1
Poorly maintained runway surface	1

MISCELLANEOUS:

Whiteout	1
Bird collision	2
Evasive maneuver to avoid collision	2
Sunglare	1
Oil contamination	1
Other	3
Undetermined	1

ACCIDENTS, ACCIDENT RATES AND FATALITIES
U. S. CERTIFICATED ROUTE AND SUPPLEMENTAL CARRIERS
ALL OPERATIONS

1953 - 1962

Year	Number Accidents		Aircraft Miles Flown	Accident Rate Per 1 Million Miles Flown		Fatalities			
	Total	Fatal		Total Accidents	Fatal Accidents	Passg.	Crew	Others	Total
1953.....	90	18	734,894,000	.122	.024	255	54	3	312
1954.....	93	8	758,654,000	.122	.010	25	13	2	40
1955.....	93	17	862,787,000	.106	.018	224	42	5	271
1956.....	103	9	993,055,000	.103	.009	156	18	0	174
1957.....	112	13	1,089,727,000	.101	.011	73	20	5	98
1958.....	91	14	1,084,652,000	.083	.012	128	29	3	160
1959.....	101	18	1,155,520,000	.087	.015	271	61	8	340
1960.....	90	17	1,130,069,000	.078	.011	429	57	13	499
1961.....	84	11	1,104,042,000	.076	.009	275	35	1	311
1962.....	70	10	1,170,374,000	.059	.008	279	48	3	330

ACCIDENTS, ACCIDENT RATES AND FATALITIES
CERTIFICATED ROUTE AIR CARRIERS
ALL OPERATIONS

1953 - 1962

Year	Number Accidents		Aircraft Miles Flown	Accident Rate 1 Million Miles Flown		Fatalities			
	Total	Fatal		Total Accidents	Fatal Accidents	Passg.	Crew	Others	Total
1953.....	69	11	685,957,000	.100	.016	113	27	3	143
1954.....	80	7	719,550,000	.111	.009	16	12	2	30
1955.....	80	14	819,581,000	.096	.015	197	37	4	238
1956.....	94	9	948,183,000	.099	.009	156	18	0	174
1957.....	104	12	1,054,241,000	.097	.010	73	18	5	96
1958.....	85	13	1,045,439,000	.081	.012	128	27	3	158
1959.....	93	17	1,112,703,000	.083	.015	270	59	8	337
1960.....	82	13	1,077,745,000	.075	.009	336	46	11	393
1961.....	78	8	1,056,059,000	.073	.007	124	24	1	149
1962.....	63	9	1,117,104,000	.055	.007	279	45	3	327

ACCIDENTS, ACCIDENT RATES
CERTIFICATED ROUTE AIR CARRIERS
ALL SCHEDULED SERVICE

1953 - 1962

Year	Number Accidents		Miles Flown	Hours Flown	Number of Departures	Accident Rates					
						Per 1 Million Miles		Per 100,000 Hours		Per 100,000 Departures	
	Total	Fatal				Total Accidents	Fatal Accidents	Total Accidents	Fatal Accidents	Total Accidents	Fatal Accidents
1953.....	61	7	657,093,300	3,271,900	3,070,412	.092	.010	1.864	.213	1.986	.227
1954.....	67	6	689,782,700	3,294,100	3,093,672	.097	.008	2.033	.182	2.165	.193
1955.....	64	11	779,921,000	3,672,500	3,276,386	.080	.012	1.715	.272	1.922	.305
1956.....	70	7	869,315,000	4,031,000	3,502,790	.080	.008	1.736	.173	1.998	.199
1957.....	73	7	976,168,000	4,443,500	3,768,861	.073	.006	1.620	.135	1.910	.159
1958.....	67	8	972,988,000	4,338,900	3,633,348	.068	.008	1.544	.184	1.846	.220
1959.....	78	14	1,030,252,000	4,503,000	3,912,178	.075	.013	1.732	.310	1.993	.357
1960.....	72	12	997,923,699	4,088,650	3,856,477	.071	.009	1.736	.220	1.841	.233
1961.....	66	6	969,656,382	3,654,503	3,750,364	.068	.006	1.805	.016	1.759	.159
1962.....	47	6	1,009,683,730	3,491,174	3,660,245	.045	.005	1.317	.143	1.257	.137

ACCIDENTS, FATALITIES, FATALITY RATES
U. S. CERTIFICATED ROUTE AIR CARRIERS
SCHEDULED DOMESTIC AND INTERNATIONAL/TERRITORIAL PASSENGER SERVICE

1953 - 1962

Year	Number Accidents		Fatalities			Passengers Carried	Passenger-Miles Flown	Passenger Fatality Rate Per 100 Million Passenger-Miles
	Total	Fatal	Passg.	Crew	Total			
1953.....	50	6	88	15	103	31,645,567	19,003,087,000	0.46
1954.....	58	5	17	7	24	35,447,523	21,388,518,000	0.07
1955.....	56	9	197	28	225	41,707,543	25,270,012,000	0.62
1956.....	61	6	152	15	167	46,004,528	28,608,285,000	0.53
1957.....	58	6	70	13	83	49,423,170	32,395,675,000	0.21
1958.....	62	8	125	16	141	49,165,720	32,671,848,000	0.38
1959.....	67	10	268	42	310	56,002,094	37,765,609,000	0.70
1960.....	67	12	336	42	378	57,886,566	40,484,908,000	0.75
1961.....	58	5	124	11	135	58,411,977	41,701,560,000	0.29
1962.....	43	5	158	25	183	62,548,399	45,853,343,000	0.26

ACCIDENTS, FATALITIES, FATALITY RATES
U. S. CERTIFICATED ROUTE AIR CARRIERS
SCHEDULED DOMESTIC PASSENGER SERVICE

1953 - 1962

Year	Number Accidents		Fatalities			Passengers Carried	Passenger-Miles Flown	Passenger Fatality Rate Per 100 Million Passenger-Miles
	Total	Fatal	Passg.	Crew	Total			
1953	32	4	86	15	101	28,722,743	15,337,760,000	0.56
1954	44	4	16	7	23	32,343,867	17,389,817,000	0.09
1955	41	8	195	26	221	38,027,120	20,550,940,000	0.75
1956	47	4	143	13	156	41,738,569	23,155,153,000	0.61
1957	44	4	32	2	34	44,972,334	26,252,338,000	0.11
1958	42	4	114	15	129	44,580,984	26,266,401,000	0.43
1959	61	9	209	33	242	51,002,218	30,435,495,000	0.68
1960	62	10	326	37	363	52,391,708	31,851,753,000	0.93
1961	56	5	124	11	135	52,712,556	32,547,998,000	0.38
1962	35	5	158	25	183	55,949,948	35,287,129,000	0.34

ACCIDENTS, FATALITIES, FATALITY RATES
U. S. CERTIFICATED ROUTE AIR CARRIERS
SCHEDULED INTERNATIONAL/TERRITORIAL PASSENGER SERVICE

1953 - 1962

Year	Number Accidents		Fatalities			Passengers Carried	Passenger-Miles Flown	Passenger Fatality Rate Per 100 Million Passenger-Miles
	Total	Fatal	Passg.	Crew	Total			
1953.....	5	2	2	0	2	2,702,678	3,565,420,000	0.05
1954.....	4	0	0	0	0	2,878,800	3,904,459,000	0
1955.....	5	1	2	2	4	3,416,652	4,601,273,000	0.04
1956.....	1	0	0	0	0	3,950,671	5,307,543,000	0
1957.....	7	1	36	8	44	4,147,937	5,981,841,000	0.60
1958.....	12	2	10	0	10	4,272,340	6,230,732,000	0.16
1959.....	6	1	59	9	68	4,999,876	7,330,114,000	0.80
1960.....	5	2	10	5	15	5,494,858	8,633,155,000	0.11
1961.....	2	0	0	0	0	5,699,421	9,153,562,000	0
1962.....	8	0	0	0	0	6,598,451	10,566,214,000	0

ACCIDENTS, ACCIDENT RATES AND FATALITIES
SUPPLEMENTAL AIR CARRIERS
ALL OPERATIONS

1953 - 1962

Year	Number of Accidents		Aircraft Miles Flown	Accident Rate Per 1 Million Miles Flown		Fatalities			
	Total	Fatal		Total Accidents	Fatal Accidents	Passg.	Crew	Other	Total
1953.....	21	7	48,937,000	.429	.143	142	27	0	169
1954.....	13	1	39,104,000	.332	.025	9	1	0	10
1955.....	13	3	43,206,000	.301	.069	27	5	1	33
1956.....	9	0	44,822,000	.201	.0	0	0	0	0
1957.....	8	1	35,486,000	.225	.028	0	2	0	2
1958.....	6	1	39,213,000	.153	.025	.0	2	0	2
1959.....	8	1	42,817,000	.186	.023	1	2	0	3
1960.....	8	4	52,324,000	.152	.057	93	11	2	106
1961.....	6	3	47,983,000	.125	.062	151	11	0	162
1962.....	7	1	53,270,000	.131	.019	0	3	0	3

ACCIDENTS, FATALITIES, FATALITY RATES
U. S. SUPPLEMENTAL AIR CARRIERS
PASSENGER OPERATIONS (CIVIL AND MILITARY)

1953 - 1962

Year	Accidents		Fatalities			Revenue Passengers Carried	Revenue Passenger-Miles Flown	Passenger Fatality Rate Per 100 Million Passenger-Miles
	Total	Fatal	Passg.	Crew	Total			
1953.....	13	5	141	20	161	724,014	1,256,911,000	11.21
1954.....	4	1	9	1	10	695,152	1,243,030,000	0.72
1955.....	5	2	27	3	30	788,783	1,395,682,000	1.93
1956.....	0	0	0	0	0	663,603	1,003,261,000	0
1957.....	2	0	0	0	0	535,248	767,287,000	0
1958.....	2	0	0	0	0	676,072	1,152,988,000	0
1959.....	5	1	1	2	3	895,518	1,629,556,000	0.06
1960.....	3	2	93	9	102	1,057,933	2,207,595,000	4.21
1961.....	2	2	151	9	160	978,171	1,543,027,000	9.7
1962.....	1	0	0	0	0	823,383	1,789,154,000	0

Section II

RÉSUMÉ OF ACCIDENTS

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passenger F	Passenger S	Passenger M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
1/1/62	2130 EST	Charlotte, N. C.	Piedmont	F-27	Substantial	On Ground	36	0	0	33	0	0	3			

(SCHED. PASSG. SERV. - DOM.) The accident occurred as the aircraft was being started prior to taxi and departure from Charlotte. The right engine had been started and the external power unit had been disconnected when the crew heard a solenoid actuating sound and all three components of the landing gear collapsed. The aircraft was stationary on the ramp. Examination revealed the landing gear control was in the down position. Design of the system precludes movement of the selector to the up position or for the gear to retract with the aircraft at rest unless an electrical malfunction energizes the "A" solenoid of the gear selector valve. Such malfunction was found when it was determined that electrical flow had occurred at the base of the ground service connector plug between the contact pins for solenoid "A" and "B". Residue of a foreign matter, which acted as a conductor, was found at the base of the plug and the electrical flow path was clearly evident under magnification. The foreign substance was not identified.

PROBABLE CAUSE: Collapse of the landing gear caused by an electrical short in the landing gear selector valve connector plug.

1/13/62	1843 PST	Fillmore, Calif.	United	DC-6	None	None	52	0	0	47	0	1	4			

(SCHED. PASSG. SERV. - DOM.) While descending through 11,000 feet prior to landing, a single jolt of turbulence occurred resulting in a minor injury to one passenger and serious injury to the stewardess. Investigation revealed that in anticipation of turbulence, the "fasten seat belt" sign had been on for about 30 minutes before the accident. The passenger, who was seated and asleep, was injured when the jolt threw her head against an adjacent seat. The stewardess was apparently thrown to the floor. Neither had her seat belt fastened.

PROBABLE CAUSE: In-flight turbulence.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passenger F	Passenger S	Passenger M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
1/14/62	1821 CST	Birmingham, Ala.	Eastern	L-188	Substantial	None	30	0	0	25	0	0	5			

(SCHED. PASSG. SERV. - DOM.) During two scheduled stops before the accident, the landing gear warning horn could not be silenced using the override. It was therefore silenced when desirable by pulling the circuit breaker. At Birmingham, during a prolonged descent and approach at reduced power, because of turbulence, the same procedure was used. Thereafter the landing gear was forgotten and a wheels-up landing occurred.

PROBABLE CAUSE: (1) Pilots failed to extend the landing gear prior to landing.
(2) Inadequate use of the before-landing-checklist.

1/16/62	1551 EST	Limestone, Me.	Riddle	C-46	Substantial	None	2	0	0	0	0	0	2			

(TEST) During the course of a test flight following a No. 2 engine change, the Captain flew the aircraft at an altitude of 5,500 feet close to Loring AFB while he checked the feathering action of the No. 2 propeller. The propeller feathered normally and after about 2 minutes, he told the copilot to unfeather it. As the copilot took this intended action, the r.p.m. of the No. 1 engine dropped off and the No. 2 propeller remained stopped. The Captain tried unsuccessfully to regain power from the left engine. During this period a right descending turn to runway 10 at the Air Base was made. The Captain attempted to extend the gear but was unsuccessful and it collapsed from a partially extended position after touchdown on the runway. Investigation disclosed that both propellers were feathered at touchdown. It disclosed that even after 24 hours in a warm hangar, the battery charge was insufficient to run the propeller feathering motors. When this was corrected by recharging the batteries, the feathering system operated normally. All other systems operated normally. From the above evidence it was concluded the the copilot, intending to unfeather the No. 2 propeller, feathered the No. 1. Thereafter with both generators off the line and because of the depleted batteries there was insufficient electrical power for unfeathering either propeller.

PROBABLE CAUSE: (1) Inadvertent feathering of the No. 1 propeller during intended feathering of the No. 2 propeller by the copilot.
(2) Inadequate battery condition caused by inadequate maintenance and inspection.

1/20/62	0026 PST	Big Tree, Calif.	Blatz	DC-3	Minor	None	22	0	3	16	0	0	3			

(PASSG. SERV. - DOM.) About 0026, over an area of the Sierra Mountains near Big Trees, California intersection (on Victor 108), the flight was in instrument weather conditions at 14,000 feet. At this time severe turbulence was encountered, causing injuries to several passengers. One passenger had struck the arm rest of her seat with force that failed the two main supports that attach the arm rest on the aisle side of the seat. (Cont'd.)

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
Big Tree, Calif. (Cont'd)																

It was the statement of the crew members that the turbulence encountered was forecast and expected. Because of this, about 10 minutes before the occurrence, the "fasten seat belt" sign was turned on and the stewardess was instructed to check the passenger for compliance. This, the stewardess said, was done. Of the passengers who gave statements, nearly all said the "fasten seat belt" sign came on and the stewardess made her check well before the turbulence was encountered. Investigation revealed that all safety belts in the aircraft were unbroken and the buckles were capable of proper security.

PROBABLE CAUSE: (1) In-flight turbulence.
(2) Failure of the affected passengers to properly fasten seat belts.

1/20/62	1840 CST	Chicago, Ill.	United	DC-7	Substantial	None	26	0	0	21	0	0	5			
			American	CV-240	Substantial	None	35	0	0	32	0	0	3			

(SCHED. PASSG. SERV. - DOM.) After a night landing at Chicago, Illinois O'Hare Field, the pilot of N-94253, a Douglas DC-7, received ground control clearance to taxi to the unloading ramp. As the DC-7 reached a position near the outer taxi circle, the pilot observed N-6326C, a Convair 240, that was holding at the intersection in accordance with ground control instructions. The pilot of the DC-7 applied brakes but, finding that braking action was extremely poor he initiated thrust reversal, while at the same time he attempted a turn to the right. Contact between the aircraft was by the left outboard wing section of the DC-7 striking the tail cone of the Convair. Investigation disclosed that, although the icy, snow-covered taxiways had been sanded and treated, braking action was still reported to be fair to poor. The pilot of N-6326C indicated, however, that his stop at the intersection had been made without difficulty.

PROBABLE CAUSE: (1) Failure of the pilot of N-94253 to exercise adequate caution while taxiing under adverse conditions.
(2) Poor braking action on icy runway.

1/26/62	0941 EST	Detroit, Mich.	American	DC-7	Substantial	None	3	0	0	0	0	0	3			

(SCHED. CARGO SERV. - DOM.) As propeller reversing was completed during the landing roll, a severe nosewheel vibration occurred. The aircraft veered to the right and the nose gear collapsed. Investigation revealed the right side bulkhead fitting assembly of the upper nose gear retracting link axis tube failed. The tube dropped from its journal allowing the nose gear to collapse. Examination of the failure revealed no evidence of fatigue.

PROBABLE CAUSE: Failure for an undetermined reason of the right nose gear bulkhead fitting of the nose gear retracting link axis tube.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
1/26/62	1548 EST	Fort Lauderdale, Fla.	Northwest	B-720-B	Substantial	None	9	0	0	2	0	0	7			

(SCHED. PASSG. SERV. - DOM.) During a day landing at the Broward County International Airport, Fort Lauderdale, Florida after a flight from Miami, Florida, the aircraft touched down short of the runway. Impact separated the right main landing gear from the aircraft, and the plane slid to a stop on the underside of the No. 3 jet pod. Investigation revealed that the touchdown occurred 84 feet short of the end of the runway and 384 feet short of the runway threshold, which, not counting overrun areas, has an effective length of 6,242 feet. More specifically the right main wheels struck the upslope of a gradual 2-foot rise to runway level, located on the oil stabilized blast area covering 154 feet of area short of the end of the runway, where the 300 feet of overrun begins. Investigation showed the blast area, the overrun area of the runway, and the runway threshold were clearly and properly marked. Examination of the landing gear showed that impact had failed the landing gear trunnion fuse bolt.

PROBABLE CAUSE: Pilot misjudged distance and undershot during landing.

2/1/62	2353 PST	Portland, Ore.	United	B-720	Substantial	None	49	0	0	42	0	0	7			

(SCHED. PASSG. SERV. - DOM.) During the takeoff roll, the No. 1 engine failed. Pieces of the engine, hurled at high velocity, penetrated the wing surface left flap and the left side of the fuselage. The takeoff was aborted and the flight returned to the terminal without further incident. Investigation revealed the initial failure was a fatigue failure of three compressor blades of the third stage of the low pressure compressor. In each failed blade, the fatigue failure originated at the trailing edge corner of the dovetail on the convex side of the blade and progressed forward about 1/3 of the length of the dovetail before final separation occurred. The broken blades then jammed and failed the low pressure compressor assembly.

PROBABLE CAUSE: Engine failure caused by fatigue failure of three third stage compressor blades.

2/3/62	1100 EST	New York, N. Y.	United	DC-8	Substantial	None	125	0	0	117	0	0	8			

(SCHED. PASSG. SERV. - DOM.) During the landing roll on the slush and snow-covered runway, the First Officer, with the Captain assisting him, was unable to stop the aircraft before it slid off the end of the runway. Investigation revealed the accident occurred following an instrument approach at which time braking action for the runway was reported fair to poor. Investigation showed the landing was made with a 10 knot tailwind component, the limit for the aircraft involved based on a dry runway condition. Touchdown occurred with excessive speed and thereafter the pilots felt foot thumper action of the anti-skid system, indicationg the wheels were sliding. It was further learned that the ejectors of the reverse system were not extended until after touchdown and that the flaps were retracted immediately after touchdown. Examination of the brake and systems pertinent to stopping the plane revealed no malfunction or failure.

PROBABLE CAUSE: (1) Judgment of the Captain in initiating landing under the existing runway and surface wind conditions.
(2) Excessive speed at touchdown and improper minimum distance stopping technique.
(3) Unfavorable braking runway conditions.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
2/3/62	0955 CST	Chicago, Ill.	Eastern	DC-7	Substantial	None	60	0	0	55	0	0	5			

(SCHED. PASSG. SERV. - DOM.) During the turn off the runway following the landing roll, the aircraft contacted an ice-covered area and slid off the concrete surface, collapsing the nose gear. Investigation revealed no malfunction or failure of the aircraft. The pilot had been advised before landing that the turn off area was slipping.

PROBABLE CAUSE: (1) Pilot failed to use adequate caution during taxi turnoff after landing.
(2) Unfavorable runway conditions.

2/15/62	1515 AST	Nyac, Alaska	Northern	Cessna Consolidated 180-A	Substantial	None	2	0	0	1	0	0	1			

(COMPANY BUSINESS) During landing, the aircraft touched down short of the runway. The right ski struck a hummock under the snow and the ski was torn off at its fuselage attachment. Investigation revealed that a "whiteout" condition existed at the time of landing. It further revealed that the flight was made to ferry parts to repair another company plane which had been damaged from a short landing under the same condition. The pilot of the plane initially damaged did not report the adverse condition for the benefit of the pilot of N-7858A.

PROBABLE CAUSE: (1) Pilot misjudged distance and undershot during landing.
(2) Whiteout condition.
(3) Failure of the pilot of the aircraft initially damaged to report a hazardous condition.

2/25/62	2020 CST	Waterloo, Ia.	Ozark	F-27	Substantial	None	21	0	0	18	0	0	3			

(SCHED. PASSG. SERV. - DOM.) During the landing roll of a night landing, the aircraft gradually veered off the right side of the runway. The plane then paralleled the runway about 30 feet off the right side. It crossed another runway hitting snowbanks on each side and stopped, with airframe deformation damage, about 1,900 feet beyond the initial touchdown. Investigation revealed the entire runway surface was covered by compacted snow and ice. In addition, newly fallen snow covered the right one-half of the runway. At the runway centerline the new snow was between 1 and 2 inches deep becoming increasingly deep toward the right edge where it was between 18 and 24 inches deep. The snow condition occurred during a heavy snowfall which began about 1½ hours before the accident and was still in process when the accident occurred.

PROBABLE CAUSE: (1) Loss of directional control during the landing roll caused by deep and drifted snow on one side of the runway.
(2) Inadequate runway inspection.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passenger F	Passenger S	Passenger M/N	Crew F	Crew S	Crew M/N	Other F	Other S	Other M/N
2/27/62	2254 PST	Burbank, Calif.	Flying Tiger	Canadair CL-44	Substantial	None	10	0	0	6	0	0	4			

(FERRY) Near the end of a flight from Cold Bay, Alaska to Burbank, California, descent was made using flight idle from 21,000 ft. to 11,000. When the power levers were advanced to level off, an explosion occurred in the No. 1 engine and the engine burst into flame. Both fire extinguisher shots failed to put out the fire; however, after about two minutes, it died down and went out. Seven minutes later the plane was landed safely at Burbank. Examination of the engine confirmed that an internal explosion had occurred in the form of the failure of the high pressure turbine. This failure was determined to have been the result of an oil starvation failure of the high pressure turbine bearing leading to fracture of the turbine shaft and overspeed of the turbine. Because of extensive internal damage to the high pressure turbine area of the engine, conclusive factual evidence was lacking to determine the cause of the lack of lubrication. Previous engine history and subsequent testing indicate that sludge accumulation in the oil delivery system was the most probable cause for the oil starvation. Corrective action with regards to the oil delivery system has been taken and additional measures are under study.

PROBABLE CAUSE: Failure of the high pressure turbine bearing caused by oil starvation.

3/1/62	1009 EST	Jamaica Bay, New York, N. Y.	American	B-707/123B	Destroyed	After Impact	95	87	0	0	8	0	0			

At 1007 est. N-7506A was airborne after what appeared to be a normal takeoff from runway 31L at New York International Airport, Jamaica, N. Y. The initial climb also appeared normal and, while still over the runway, the aircraft was observed to enter a gentle turn to the left after reaching a height of about 100 ft. The aircraft climbed on a heading of 290 degrees following this turn and then a second left climbing turn was initiated. As this turn progressed the angle of bank increased until the aircraft rolled through 90 degrees of bank at an altitude of about 1600 feet m.s.l. It then entered an inverted, nose-low attitude and plunged to earth in a nearly vertical dive crashing about three miles southwest of the airport control tower.

PROBABLE CAUSE: The Board determines that the probable cause of this accident was a rudder control system malfunction producing yaw, sideslips, and roll leading to a loss of control from which recovery action was not effective.

3/5/62	1731 AST	Moses Pt. Alaska	Wein	Beech D-18	Destroyed	After Impact	3	0	1	1	0	0	1			

(SCHED. PASSG. SERV. - DOM.) When the flight reached the vicinity of Moses Pt. following a VFR flight from Unalakleet, the pilot was furnished the current altimeter setting and weather. The reported weather was: Ceiling 800 feet, partial obscuration: visibility 1½ miles, light snow and fog. Because of the weather, clearance to enter the control zone was issued and the pilot initiated a VFR approach, utilizing the low frequency radio as an assist. The pilot, who flew the plane without a copilot on this flight, stated that he passed over the radio facility and tracked outbound 065 degrees magnetic. After two minutes, he initiated an 80-260 reversal and descended to an altimeter indicated altitude of 460 feet. The airport elevation is sea level. On a heading of 245 degrees magnetic, the aircraft struck the ground. Fire followed impact. The pilot stated that he was able to see the ground during the approach maneuvering but his judgment of height was seriously impaired by whiteout conditions. He further said he may have descended below 460 feet during the reversal turn but the altimeter was indicating adequate terrain. (Continued on next page)

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N

Nr. Moses Point, Alaska (Cont'd)

clearance at impact. A passenger, who was looking in the cockpit, said the altimeter read 250 feet not more than 5 seconds before impact. The elevation of the crash site, 2½ miles east of the airport, was sea level. The passenger was a private pilot with 16 years of "off and on" flying. Examination of the aircraft wreckage showed the cockpit area was burned out. All instruments, including the suspect altimeter, were melted and burned beyond recognition. Because of this, the reason for the altimeter error could not be determined. For the same reason, the static source system could not be examined. The pilot, immediately after the accident, checked the altimeter setting furnished him in flight and found no discrepancy between the ground setting and the one he used, 29.54. Investigation disclosed that there had been no complaints filed relative to the altimeter operation. The pilot said it appeared to function normally. Several months later, he stated there was an excessive altimeter lag during the flight which preceded the crash.

PROBABLE CAUSE: (1) Altimeter error for an undetermined reason resulting in descent below obstructing terrain during a visual landing approach.
(2) Judgment of the pilot in continuing a visual approach in weather conditions and white out which prevent the visual requirements necessary to the type approach being made.

3/ 7/62	2214 EST	Buffalo, N. Y.	American	DC-6	Substantial	None	56	0	0	51	0	0	5			

(SCHED. PASSG. SERV. - DOM.) During the landing roll the crew heard a loud noise, and the aircraft settled on the right side to the extent that the No. 4 propeller hit a ground object. Investigation revealed a failure of the right main landing gear oleo strut had occurred. A portion of the strut cylinder wall, 5 inches wide and 2 feet long, had split out and fallen from the plane. Examination of the failure showed it was a fatigue-type failure.

PROBABLE CAUSE: Fatigue failure of the right main landing gear oleo strut during landing.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
3/15/62	0114 BST	Adak, Alaska	Flying Tiger	L-1049H	Destroyed	After Impact	7	0	0	0	1	0	6			

(MILITARY CONTRACT CARGO - INT.) During a precision radar approach to land on runway 23 at Adak, Alaska, N-6911C touched down 328 feet short of the threshold lights and 4 feet below the elevation of the runway. Investigation disclosed that all aircraft engines and systems were functioning properly at the time of the accident. The weather conditions were above the approved minima for the operation involved, and the crew had been adequately briefed. It was determined that the copilot was making the approach while flying from the left seat. The Captain in command was seated in the right pilot's seat and was monitoring the approach. During the approach the flight received seven advisiories that it was below the glide path followed by an advisory to execute a missed approach. To this, the Captain in command had replied that the field was in sight. The distance of the flight from touchdown at that time was 1 3/4 miles. The altitude was estimated as 400 feet by the Captain. The approach had then been continued under visual flight conditions, and the Captain then remarked to the copilot, "You are too low," As the copilot added power, the Captain pulled back on the yoke. Almost concurrently the right landing gear struck rocks short of the runway and the aircraft crashed and burned.

PROBABLE CAUSE: The Board determines that the probable cause of this accident was the pilot's misjudgement of distance and altitude during the final approach for landing.

3/15/62	Unknown	Between Guam and Philippine Is.	Flying Tiger	L-1049	Destroyed	Unk.	107	96	0	0	11	0	0			

(MILITARY CONTRACT PASSG. - INT.) While en route from Agana Naval Air Station, Guam to Clark Air Force Base, Philippine Islands N-6921C disappeared west of Latitude 13° 14' North and Longitude 140° 00' East at some time after the aircraft was reported at this position at 1422 GMT. At 1530 GMT the crew members of a surface vessel witnessed what appeared to have been a midair explosion. The position and time of this observance coincides very nearly with the time and position given by the pilot for his next position report. A widespread and intensive search failed to reveal any evidence that could be definitely associated with N-6921C.

PROBABLE CAUSE: The Board is unable to determine the probable cause of this accident from the evidence now available.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passenger F	Passenger S	Passenger M/N	Crew F	Crew S	Crew M/N	Other F	Other S	Other M/N
4/7/62	1310 CST	Mexico City, Mexico	Pan American World Airways	DC-8	Substantial	None	107	0	0	98	0	0	9			

(SCHED. PASSG. SERV. - INT.) The investigation of this accident is under the jurisdiction of the Mexican Government. Their report of findings on this accident has not been received at this time by the Civil Aeronautics Board.

4/7/62	1644 AST	Shungnak, Alaska	Wein	Cessna 180	Substantial	None	1	0	0	0	0	0	1			

(SCHED. CARGO SERV. - DOM.) Just after touchdown for landing on a frozen river covered by about one foot of new snow, the right ski failed. The nose and right wing dug into the surface causing the aircraft to nose over. Investigation showed the right ski had dug under the new snow to the extent that it hit an ice ridge. Impact bent the right ski leg inward and rearward, stripping the nut from the attach bolt allowing the ski to turn sideways and collapse.

PROBABLE CAUSE: Overload failure of the right ski caused by impact with a hidden hazard on the landing area.

4/14/62	0254 WST	Wake Island Pacific Ocean	Slick	CL-44	Substantial	None	6	0	0	4	0	0	2			

(ALL CARGO SERV. - INT. MILITARY CONTRACT) During the approach to land on runway 9 at Wake Island, Pacific Ocean at night, following a flight from Honolulu, Hawaii, the right horizontal stabilizer of N-602SA struck a 28 foot high antenna pole that is located 1,462.7 feet from the threshold lights on the runway. Thereafter the crew accomplished a normal touchdown on the runway. Investigation disclosed that the right horizontal stabilizer was damaged extensively by the impact. There were no reported mechanical malfunctions of the aircraft that would contribute to this accident.

PROBABLE CAUSE: Pilot misjudged distance and undershot during landing.

4/17/62	1102 PST	Lompoc, Calif.	Pacific	Martin 404	Substantial	None	41	0	0	38	0	0	3			

(SCHED. PASSG. SERV. - DOM.) When the pilots took action to extend the landing gear for landing at Santa Maria, California, the left main gear failed to extend. Every effort was therefore expended in an effort to correct the condition before the plane was landed wheels up on a foamed runway at Vandenberg Air Force Base. Examination of the left landing gear assembly revealed an AN24-18 bolt had come out of the jury strut lock link assembly of the gear. With the bolt out, both the normal and manual gear release systems were rendered ineffective in releasing the gear from the uplock. The AN24-18 bolt was found in the lower landing gear door assembly. A nut for the bolt or a cotter key or pieces of a cotter key were not found. Investigation revealed evidence indicating a possibility that the rolling action of the bolt produced wear action of the castle nut on the cotter pin which wore it through, allowing the nut to back off and the bolt to back out of the assembly. It also recognized the possibility that the nut had not been safetied or had not been properly safetied, allowing the nut to back off.

PROBABLE CAUSE: Detachment of the left landing gear jury strut lock assembly bolt.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
4/18/62	1622 CST	Dallas, Tex.	Purdue	DC-3	Destroyed	After Impact	3	0	0	0	3	0	0			

(TEST) The Vice President and General Manager of the airline and the Superintendent of Maintenance of the airline went to the repair facility to inspect the aircraft following overhaul, installation of new engines, and modification of the aircraft. Following the inspection, the Superintendent of Maintenance decided to test-fly the aircraft personally. This was decided although the Superintendent was not type-rated on the plane and his DC-3 experience was very limited. Also, at the time, a flight crew of the airline was en route to Dallas for the purpose of flight-testing the plane. The Vice President and General Manager approved the flight when he learned that a technician, occupying the copilot's seat, was a rated private pilot. During the takeoff, the aircraft became airborne in an excessively nose-high attitude, a condition which attracted numerous qualified witnesses to the flight. After the plane became airborne, there was an audible reduction of power. The aircraft continued a very slow airspeed in the nose-high position with the landing gear extended. About 300 feet above the surface, the aircraft stalled and pitched down. It turned approximately 150 degrees to the left and struck the ground in a steep, nosedown attitude. Fire followed impact, consuming a major portion of the aircraft. Careful examination of the wreckage disclosed no evidence that malfunction or failure of the aircraft, its engines, or systems caused or contributed to the cause of the accident.

PROBABLE CAUSE: (1) Pilot failed to maintain flying speed during an improperly executed takeoff and takeoff climb.
(2) Judgment of the pilot in initiating the flight and the Vice President and General Manager for approving the flight under existing circumstances.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
4/27/62	1522 LST	Manila, Philippines	Pan American World Airways	B-707-321	Substantial	After Impact	53	0	0	43	0	0	10			

(SCHED. PASSG. SERV. - INT.) During landing at Manila, Philippine Islands, following a normal routine flight from Singapore, Malay, the aircraft touched down short of the runway. The main landing gear then collapsed under impact overload when it contacted the lip of the end of the runway, and the aircraft slid to a stop on the runway. The Captain stated that the First Officer, who was flying the aircraft from the right seat, had established a normal landing approach to touch down near the threshold of the runway. He further stated that he was satisfied with the landing approach and believed the aircraft would float a little and touch down well down the runway.

PROBABLE CAUSE: (1) Pilot misjudged distance and undershot during landing.
(2) Inadequate supervision by the Captain.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
4/27/62	0738 EST	New York, N. Y.	Northeast	Viscount	Substantial	None	27	0	0	23	0	0	4			

(SCHED. PASSG. SERV. - DOM.) Shortly after the aircraft was airborne for takeoff from runway 04 of the LaGuardia Airport, the pilots experienced a fire warning of the No. 3 engine. Fire procedures were executed and an immediate landing was initiated on the runway of takeoff. About 4,500 feet down the runway, the plane went off the right side of the runway striking taxiway light installations failing the nose gear. Investigation revealed the first discernible marks from the landing aircraft were tire skid marks. These began about 2,100 feet past the runway threshold and were nearly continuous for the next 2,300 feet. All four main wheel tires were blown out under braking. The Captain had intentionally steered the aircraft off the runway to avoid the possibility of hitting the dike beyond the runway. The No. 3 propeller was feathered and the other three were in ground fine. The ground find system was capable of normal operation. The No. 3 fire warning had been a false fire warning. It was signalled by a warning system on the Nos. 3 and 4 powerplants undergoing service test. This was installed in addition to the normal system which had not been activated. It was considered possible that carbon sparks from the engine overboard drain had activated the infrared system; however, this not could not be established with certainty and could not be duplicated in extensive testing including operation of the engine. Information from the flight recorder was not available because the instrument had apparently been turned off just before takeoff.

PROBABLE CAUSE: (1) Pilot misjudged speed and distance resulting in an overshoot during landing.
(2) A false fire warning caused by malfunction of a fire detection system undergoing service test.

5/9/62	1654 CST	Ackerly, Tex.	Slick	DC-4	Substantial	None	2	0	0	0	0	0	2			

(MILITARY CONTRACT CARGO - DOM.) At 6,500 feet, m.s.l., about 1 hour after takeoff, at which time the aircraft was loaded to its maximum allowable gross weight, failure of the No. 1 engine occurred. The pilots established course to Webb AFB, about 75 miles southeast and dumped fuel from the Nos. 1 and 4 fuel tanks. Shortly thereafter, at 5,500 feet, m.s.l. and an airspeed of 130 knots, engine temperature for the No. 3 engine reached critical limits and the engine was shut down. Fuel was dumped from the Nos. 2 and 3 fuel tanks. En route to Webb in turbulent air conditions, the temperatures of the operating engines under METO power approached critical limits. In compromising between temperature, altitude, and airspeed, the aircraft descended to 3,500 feet, m.s.l. About 23 miles from Webb while being vectored around a thunderstrom, severe downdrafts compounded the turbulence air condition and resulted in descent to an extremely low level where the avoidance of a transmission line necessitated a wheels-up landing on open terrain, elevation 2,880 feet, m.s.l. Examination of the No. 1 engine showed it had failed at the front crankshaft crankpin. The cylinders and valves of the No. 3 engine revealed heavy lead deposits and 2 cylinders were cracked in the area of the spark plug bushing. There was internal oil leakage in the oil pump. Brief tests of the Nos. 2 and 4 engines revealed normal operation. A review of the weather conditions showed an outside temperature of 93 degrees Fahrenheit. Over the route, turbulence of moderate intensity would have existed. In the vicinity of the accident, outflow (Cont'd)

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Other F	Other S	Other M/N

Ackerly, Texas (Cont'd)

on the backside of the thunderstorm would have been expected to cause the downdrafts which were encountered. These conditions, together with the existing high engine temperatures, would seriously impair the marginal capability of the aircraft for continued flight as indicated by two-engine performance data for the aircraft.

PROBABLE CAUSE: Failure of the Nos. 1 and 3 engines under adverse weight and weather conditions resulting in the aircraft being unable to maintain flight.

5/22/62	2121 CST	Unionville, Mo.	Continental	B-707	Destroyed	Unk.	45	37	0	0	8	0	0		

(SCHED. PASSG. SERV. - DOM.) While N-70775 was being flown at an altitude of 39,000 feet on Jet Route 26V between O'Hare Airport Chicago, Ill. and Kansas City, Missouri an explosion occurred in the right rear lavatory resulting in separation of the tail section from the fuselage. Thereafter, the aircraft descended out of control and crashed 6 miles north northwest of Unionville, Mo.

PROBABLE CAUSE: The Board determines the probable cause of this accident was the disintegrating force of a dynamite explosion which occurred in the right rear lavatory, resulting in destruction of the aircraft.

5/24/62	1733 EST	Panama City, Florida	Riddle	C-46	Substantial	None	2	0	0	0	0	0	2		

(MILITARY CONTRACT CARGO - DOM.) At touchdown for landing made by the First Officer in a 7 knot crosswind, the aircraft bounced three times. The bounces were porpoising-type and, after the third, the aircraft veered. At this time a go-around was initiated. The aircraft became airborne in a nose-high attitude. The plane settled to the ground left-wing first in a crabbed attitude. Impact broke off the left main wheel assembly and caused airframe damage. Investigation showed the aft center of gravity limitations of the aircraft was 29.7 percent MAC. Computations, using the actual cargo weights and loading locations, showed that at takeoff from Robbins AFB the center of gravity was 35.5 MAC or 5.8 percent in excess of the aft limitation. Loading information supplied to the crew would have resulted in a center of gravity of 27.4 percent MAC.

PROBABLE CAUSE: Loss of control during landing caused by improper loading.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
5/28/62	2230 EST	New York, N. Y.	Eastern	L-1049	Substantial	None	40	0	0	35	0	0	5			

(SCHED. PASSG. SERV. - DOM.) When the landing gear was actuated to the down position for landing, an unsafe condition was indicated for the nose gear. After efforts to correct the condition were unsuccessful, a visual inspection through the forward baggage compartment floor access revealed the nose gear was hanging free. It further revealed the clevis on the piston end of the nose gear retract cylinder was separated from the nose gear. Complete emergency cabin procedures were taken and the aircraft was landed on a foamed runway. The nose gear collapsed during the landing roll. Investigation revealed the bolt, which normally attaches the nose gear actuating cylinder piston rod to the nose gear drag strut, was broken. A small portion of the head end of the bolt remained in the upper half of the clevis. While there was no positive evidence of fatigue found in the available half of the fracture, it was believed that fatigue progression had caused the failure.

PROBABLE CAUSE: Failure of the bolt attaching the nose gear to the nose gear retract cylinder.

6/5/62	0642 EST	San Juan, Puerto Rico	Riddle	C-46R	Substantial	None	2	0	0	0	0	0	2			

(SCHED. CARGO SERV. - INT.) Flight 301/5 departed Ramey Air Force Base, Puerto Rico, at 0430 e.s.t. for the last segment of a scheduled cargo flight from Miami, Florida to San Juan, Puerto Rico. As the landing gear was in the retraction cycle after takeoff, the crew heard a loud noise and shortly thereafter it was confirmed that the left landing gear had not retracted. The flight proceeded to San Juan where several unsuccessful attempts were made to obtain an indication of a safe landing gear condition for landing. It was ascertained by tower fly-bys that the left landing gear was hanging suspended in an abnormal position. The Captain then elected to land with the gear extended, and after touchdown the left landing gear collapsed. Investigation disclosed that the outboard left landing gear side brace, P/N 20-310-1028, had failed in the machined area along the upper weld at the attachment point of the upper forging to the side brace tube. Inspection of the failed tube and Rockwell hardness tests revealed evidence of fatigue and disclosed that the part had been improperly machined, resulting in substandard strength qualities of the part relative to the acceptable manufacturer's specifications. It could not be determined if the improper machining occurred during original manufacture or during a retubing process of the part.

PROBABLE CAUSE: Fatigue failure of the left landing gear side brace caused by improper machining of the component.

Date	Type of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Other F	Other S	Other M/N
6/8/62	1105 EST	Miami, Fla.	Eastern	DC-7	Substantial	None	4	0	0	0	0	0	4			

(TRAINING) As the aircraft was making a right-pivoting-type taxi turn from its parked position, the No. 1 propeller struck a ground power starting unit which had been used to start the engines. The power unit operator stated that after the engines were started he removed the downlock pins and chocks and disconnected the power unit. He then signalled "clear to taxi", mounted the power unit, and began moving it away. After about 20 feet of movement, the self-contained driving engine of the unit stalled and the vehicle stopped. A few seconds later, the operator saw the aircraft moving toward the vehicle and ran. The ground signalman stated that ha had not signalled the crew to taxi; however, the Captain thought he did. He said he saw the stalled power unit, signalled the captain to hold position, and started for a tractor to push the stalled vehicle. Thereafter, he saw the plane moving toward a collision and ran, signalling for the flight to stop. This action, from behind the left wingtip, was not seen by the Captain but was seen by several ground persons. One said the power unit was an estimated 30 feet ahead of the aircraft when the plane started to move. Another said the aircraft was 20 feet from the power unit as the signalman was trying to stop the plane. The Captain stated the copilot responded "clear right" before the aircraft started to roll. Investigation revealed that the position of the ground power unit was 42 feet forward of the nose of the aircraft at its parked position. It also revealed that from the start of taxi to impact, the aircraft turned right 30 degrees.

PROBABLE CAUSE: (1) Inadequate and premature signalling of ground personnel before and during taxi departure from the terminal gate.
(2) Inadequate vigilance and caution of the pilots.

6/14/62	2043 EST	Marco, Fla.	Pan American World Airways	DC-8	None	None	47	0	1	37	0	0	9			

(SCHED. PASSG. SERV. - INT.) Approaching the Marco intersection at 27,000 feet, during a flight to Miami, Florida from Guatemala City, Guatemala and a stop at Merida, Mexico, the flight encountered severe turbulence of short duration. The "fasten seat belt" sign was not on and several passengers were thrown from their seats. One serious injury was reported. Investigation revealed that at the time of the accident the flight was proceeding through an area between a few widely scattered cumulus clouds, some with tops exceeding the flight level. The Area Forecast called for the thunderstorms and for moderate to severe turbulence in thunderstorms.

PROBABLE CAUSE: (1) Failure of the crew to anticipate turbulence and turn on the "fasten seat belt" sign.
(2) In-flight turbulence.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Other F	Other S	Other M/N
6/15/62	1227 EST	San Juan, Puerto Rico	Pan American World Airways	B-707/121	None	None	89	0	0	82	0	1	6			

(SCHED. PASSG. SERV. - INT.) During the IFR climbout while westbound on the "Yankee" route from San Juan, Puerto Rico to Miami, Florida, the flight topped all clouds and was in VFR flight conditions after passing flight level 23,000. As it continued to climb in visual conditions to the assigned altitude of 28,000 feet on a compass heading fo 304 degrees, the Captain saw that two military aircraft, a KC-135 in-flight refueling a B-47, on a collision course of 132 degrees, and about the same altitude. At the time of the sighting, the airliner was climbing through 27,700 feet at an indicated airspeed of 270 knots. The Captain immediately disconnected the automatic pilot, reduced power, and executed an abrupt pushover. A maximum of 300 feet of altitude was dissipated when the sound of jet engines of the military aircraft was heard as the airliner passed below the military planes. The passenger seat belt sign was on at the time; however, one stewardess, who was standing, was injured when thrown to the top of the cabin and then to the floor. It was reported that, at the time of this occurrence, the military aircraft were operating at 27,500 feet under "VFR on top" flight rules.

PROBABLE CAUSE: Failure of the pilots of both aircraft to observe the other aircraft in time to avoid the necessity of an extreme collision evasive maneuver.

7/2/62	2008 EST	Wilmington, Del.	Capitol	Argosy AW-650	Substantial	None	6	0	0	0	0	0	6			

(TRAINING) Prior to the third landing of a crew training flight, an unsafe for landing gear indication occurred. A visual inspection revealed the right main landing gear drag strut was broken. Following touchdown for the resultant emergency landing, the gear collapsed and the plane veered off the runway. Examination of the landing gear assembly showed the lower attach fitting of the right main landing gear drag strut had failed. Close examination of the failure showed it originated from a small fatigue zone in the upper rear corner radius of the fitting.

PROBABLE CAUSE: Fatigue failure of the right landing gear lower drag strut fitting.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
7/5/62	1735 AST	Clear AFB, Alaska	Alaska	Beech. C-18S	Substantial	None	6	0	0	5	0	0	1			

(SCHED. PASSG. SERV. - DOM.) To discharge and load his passengers and cargo, the pilot parked at the most suitable area available which was between 50 and 60 feet behind another parked plane. About one hour later, when the flight was ready to continue, the pilot made a walkaround inspection, boarded the plane, and started its engines. At this point the ramp agent left the area of the plane, and the pilot commenced to taxi. He taxied straight into the rear of the parked plane described above which was still in its original position. The pilot stated he was preoccupied with other duties, and although he was aware of the parked plane, he simply forgot it for the moment. (Parked Aircraft: Beechcraft B-35; N-2111D; (S).

PROBABLE CAUSE: Pilot failed to see and avoid the parked aircraft during initial taxi.

7/6/62	1247 PST	Vandenburg, AFB, Calif.	Zantop Air Transport	C-46	Minor	None	2	0	0	0	0	0	2			

(MILITARY CONTRACT CARGO - DOM.) During taxi for takeoff the right engine and propeller of N-619Z struck the vertical and horizontal stabilizer of a parked, unattended aircraft, Piper PA-23, N-4587P. Investigation disclosed that the pilot of N-619Z initiated taxi prior to receiving a signal from the ground crewman. Just prior to the collision, a radio operator tried unsuccessfully to stop N-619Z by saying, "Logan 619Z hold your position' *** Hold your position." (Parked Aircraft: Piper PA-23; N-4587P; (S).)

PROBABLE CAUSE: Pilot failed to see and avoid a parked aircraft while taxiing for takeoff.

7/7/62	1010 AST	Kotzebue, Alaska	Wien	Beech C-18S	Substantial	None	2	0	0	0	0	0	2			

(NONSCHEDULED CARGO SERV.- DOM.) According to the pilot complete preflight and pre-takeoff checks were performed and takeoff was initiated by the assigned pilot trainee who occupied the left seat. The pilot in command occupied the right seat supervising the flight. After about 300 feet, estimated by the trainee, and 600 feet, estimated by the pilot in command, of the takeoff roll, the plane veered very slightly. Immediately thereafter, the main landing gear collapsed. The plane settled onto the fuselage and slid to a stop. Investigation revealed the gear had collapsed as a result of the normal electrically actuated retract cycle. There was no malfunction or failure of the actuation system. The pilot stated that the landing gear switch was not touched by either during the takeoff. It was therefore concluded that the switch must have been placed in the up position before the flight by an unknown person and had remained in the up position during taxi, pre-takeoff check, and the takeoff roll. Until the aircraft was light, the gear antiretraction system kept the gear from retracting.

PROBABLE CAUSE: Inadvertent retraction of the landing gear during takeoff caused by inadequate preflight inspection and pre-takeoff check.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
7/8/62	0705 CST	Amarillo, Tex.	Continental	Viscount 812	Destroyed	After Impact	16	0	0	13	0	0	3			

(SCHED. PASSG. SERV. - DOM.) After a normal takeoff run, and lift off, from runway 21 at Amarillo Municipal Airport, Texas the pilots attention was momentarily distracted by rainwater which was falling on his shirt sleeve from the window channel. The distraction occurred as the landing gear was being retracted and inadvertent action by the pilot caused the Nos. 2 and 3 propellers to strike the runway. The No. 4 propeller and engine were damaged by metal pieces projected from the damaged No. 3 propeller causing increasingly severe vibrations. As a right wing heaviness developed, a sudden and excessive rise of exhaust gas temperatures on Nos. 2 and 3 engines was noted and the pilot effected an emergency wheels-up landing on a harvested wheat field. Touchdown was about 6,930 feet beyond the end of runway 21 and 21 degrees to the right of the extended centerline of runway 21.

PROBABLE CAUSE: The Board determines that the probable cause of this accident was the Captain's diverson of his attention during takeoff which allowed the aircraft to settle to the runway striking the Nos. 2 and 3 propellers.

7/11/62	1407 EST	Pit-a-Pitre French W. I.	Southern Air Transport	C-46	Substantial	None	2	0	0	0	0	0	2			

(NON-SCHED. CARGO SERV. - INT.) The investigation of this accident is under the jurisdiction of the French Government. Their findings on this accident has not been received at this time by the Civil Aeronautics Board.

7/17/62	0930 PST	Catalina Island, Avalon Calif.		Grumman G-21A	Substantial	None	7	0	0	6	0	0	1			

(SCHED. PASSG. SERV. - DOM.) About three seconds after power was applied for takeoff, the pilot experienced a severe engine vibration. He immediately discontinued the takeoff and stopped the engines. Investigation revealed that the No. 3 blade of the propeller of the left engine and the engine ring cowling had separated from the engine. Vibration had failed or damaged the engine mounting structure. Examination of the failed propeller blade revealed it had failed in fatigue. The fatigue area started in the blade retention flange radius at the trailing edge of the blade and progressed through an area of the blade shank. Investigation further revealed evidence that the failed blade had rotated within the blade retention clamp. Examination of the retention clamps showed there was no clearance at the parting line of the clamp of the failed blade and one other blade of the left propeller. Clearance of the third clamp was minimum. Clearance of the clamps for the right propeller were minimum plus. From the above evidence, together with a deteriorated condition of the propeller bearings, investigators were lead to conclude the failed blade had rotated in the retention clamp, and as a result vibration occurred over an extended period and caused the fatigue failure. Propeller records showed that at the time of the accident both propellers had opeated 2,158 hours, 683 since overhaul. As a result of the accident, the overhaul period of 1,500 hours was reduced to 500 hours. In addition, mandatory measures were issued to prevent recurrence of this type blade failure.

PROBABLE CAUSE: Fatigue failure of the No. 3 propeller blade resulting from vibration caused by rotation of the blade within the retention clamp.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
7/23/62	1600 EST	Rome, N. Y.	Capitol	Armstrong-Whitworth	Substantial	None	3	0	0	0	0	0	3			

(MILITARY CONTRACT CARGO - DOM.) When the pilot attempted to extend the landing gear after a normal initial flap extension for landing at Griffiss AFB, Rome, N. Y., a loss of normal hydraulic system pressure occurred and the gear would not extend. When all efforts to correct the condition failed and fuel became low, the aircraft was landed wheels up on a foamed section of runway. Investigation revealed that a normal hydraulic system failure had occurred and was caused by a failure of the hydraulic hose from the No. 3 engine-driven pump. It further revealed that the pitot valve solenoid on the emergency landing gear system selector valve was malfunctioning. Disassembly of the valve revealed metal chips and other foreign particles in the valve passages. When no other condition was found which could adversely effect the valve, it was concluded it was the foreign object condition that caused the emergency system failure.

PROBABLE CAUSE: A wheels-up landing caused by the failure of the normal and malfunction of the emergency landing gear extension systems.

7/26/62	1136 Z	Amsterdam, Holland	Pan American World Airways	B-707	Minor	None	88	0	10	69	0	2	7

The investigation of this accident is under the jurisdiction of the Netherlands Government. Their report of findings on this accident has not been received at this time by the Civil Aeronautics Board.

8/6/62	1010 EST	Rocky Mount, N. C.	Piedmont	M-404	Substantial	None	24	0	0	20	0	0	4

(SCHED. PASSG. SERV. - DOM.) In the latter portion of a visual landing approach to runway 21, 3,785 feet long, the pilot noted the aircraft height was unsuitably low, particularily as the plane was approach a highway with vehicular traffic which crossed below the approach zone. To correct the lowness the pilot applied noseup control and added power. Before his action was effective, the aircraft settled at a high vertical rate and touched down with damaging force 71 feet short of the runway threshold. The plane bounced onto the runway from this point and rolled to a stop.

PROBABLE CAUSE: Pilot misjudged speed and distance during the landing approach, resulting in an undershoot and hard landing.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
8/6/62	1731 EST	Knoxville, Tenn.	American	L-188	Substantial	None	72	0	0	67	0	0	5			

(SCHED. PASSG. SERV. - DOM.) During landing on runway 4L in high winds associated with a thunderstorm at McGee-Tyson Airport, Knoxville, Tennessee, the aircraft veered off the right side of the runway. It then struck the raised edge of a taxiway that was under construction. Impact against the taxiway caused the right landing gear to separate from the wing structure. Subsequent contact between the ground and the right wing assembly caused that wing to separate from the fuselage near the attachment point. Investigation revealed that, at the time of the accident, surface wind at touchdown was variable from north to northwest at 35 knots with peak gusts to 40 knots. In addition, there was moderate turbulence and heavy rain, all of which were associated with a thunderstorm over the airport. Investigation revealed the Captain had been advised of the weather conditions prior to and during the approach. Examination of the aircraft systems and the engines revealed that they were capable of normal operation prior to impact.

PROBABLE CAUSE: The Board determines that the probable cause of this accident was the loss of directional control as a result of the improper technique employed in a crosswind landing in adverse weather conditions.

8/10/62	0900 PST	Clark AFB, P. I.	Trans International	L-1049	Substantial	None	6	0	0	4	0	0	2			

(CARGO SERV. - INT. MILITARY CONTRACT) The investigation of this accident is under the jurisdiction of the Phillipine Government. Their findings on this accident has not been received at this time by the Civil Aeronautics Board.

8/11/62	1305 AST	Liz "A" Alaska	Wien	Beech AT-11	Substantial	None	3	0	0	2	0	0	1			

(NONSCHEDULED PASSG. SERV. - DOM.) During a routine landing at DEW Line Site, LIZ "A" the aircraft was landed with the wheels retracted. The pilot stated that he had observed a "Green Light" indication after actuating the gear down switch, and also he had heard the gear extend and felt the shift in the center of gravity attending gear extension. He further stated that his first knowledge that the gear was not down and locked occurred at touchdown when the propellers struck the runway just as the gear warning horn sounded. Investigation failed to reveal any malfunction or failure to the landing gear or the related warning systems. The aircraft was raised, and the gear was extended and retracted through several cycles using both the electrical and manual systems. Thereafter, the aircraft was returned to service without alteration or repair to the landing gear being necessary.

PROBABLE CAUSE: Pilot failed to extend the landing gear for landing.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
8/17/62	2056 EST	Miami, Fla.	Riddle	C-46R	Substantial	None	4	0	0	0	0	0	4			

(TRAINING) During that portion of training flight which was for the purpose of a copilot proficiency check, the candidate-pilot occupied the left pilot's seat and the instructor-check-pilot occupied the right seat. Near the completion of the check flight, which the instructor described as unsatisfactory, the copilot was given a single-engine landing. He was allowed to make a complete circuit of the airport to be completely ready for the approach and landing. The instructor said the approach was some what erratic, a little fast, and the plane touched down before the level off was complete. As a result, the aircraft skipped and bounced to an extent the instructor took control and stopped the bounces. He then turned control back to the copilot, and the latter allowed the plane to drift gradually toward the left side of the runway. When the deviation was called to his attention, the copilot took abrupt and excessive corrective action. At this point both pilots took actions, the nature of which were uncertain, and the plane nosed up on the nose section and engine nacelles. The plane then slid gradually off the left side of the runway, turned left and stopped. Both pilots and the FAA Air Carrier Inspector on the flight indicated that heavy braking was applied in the latter corrective attempts which caused the plane to nose up. The check-pilot was quite certain he had not used braking in this manner.

PROBABLE CAUSE: (1) Loss of directional control and misuse of braking during the landing roll of a bounced landing.
(2) Inadequate supervision by the check-pilot.

8/22/62	0748 EST	Wilmington, N. C.	Piedmont	M-404	Destroyed	None	3	0	0	0	0	0	3			

(TRAINING) During a crew-training flight, the trainee pilot was given a simulated right engine-out landing. Normal procedures were followed and the approach was uneventful until the trainee made the final power reduction and commenced the level off. At that time, the left wing dropped abruptly between 15 to 25 degrees, and the aircraft veered approximately 30 to 40 degrees left of the runway heading. Full corrective flight controls were applied with negligible corrective effectiveness, and the aircraft struck the runway on the left wing and left gear. It then groundlooped out of control off the left side of the runway, resulting in unrepairable damage. Both pilots stated positively that a malfunction of the left propeller had made the aircraft uncontrollable. During the investigation it was disclosed that the blades of the left engine propeller were well within the reversing regime at the time of impact. A complete teardown inspection of this unit was therefore performed and the appropriate components were functionally tested. During testing of the left engine propeller low pitch stop lever assembly, and initial application of pressure in excess of 400 p.s.i. was required to move the low pitch stop wedge and several applications of a 300-p.s.i. pressure failed to actuate the servo valve. The valve operates normally at 245/250 p.s.i. Disassembly of the servo valve and related parts failed to reveal the source of the irregularity which caused the malfunction; however, a moderate accumulation of sludge was noted in the propeller dome assembly during teardown. Upon reassembly, the servo valve unit functioned normally. As a result of these

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Other F	Other S	Other M/N

Wilmington, N. C. (Cont'd)

tests it was concluded that the servo valve had malfunctioned due to the introduction of foreign materials into the servo valve control system.

PROBABLE CAUSE: Unwanted propeller reversal during a critical phase of landing caused by malfunction of the propeller low pitch stop lever assembly, resulting from foreign matter in the servo valve control.

8/30/62	0925 CST	New Orleans, La.	Eastern	B-720	Substantial	None	43	0	0	35	0	0	8			

(SCHED. PASSG. SERV. - DOM) As the aircraft touched down for a landing on runway 10 at Moisant International Airport, New Orleans, Louisiana, a loud thud was heard by the crew and passengers. Immediately thereafter, the crew observed that the right main landing gear and gear door warning lights came on momentarily. Coincident with this, the gear warning horn "beeped" and a vibration was felt. The crew of a taxiing aircraft then informed the pilot that the right main gear rear outboard tire was shedding rubber and the landing gear appeared to be tilted inward. The pilot then elected to extend the landing roll sufficiently to decelerate the aircraft and thus avoid using brakes or thrust reversal. At the end of the roll the aircraft was turned onto a taxiway, and as it was being taxied to the ramp, the right main landing gear collapsed. Investigation revealed that the aircraft had initially touched down just short of the runway. Thereafter, the main landing gear struck the 9-inch high concrete "lip" of the runway. The right gear sustained impact damage, which caused it to separate from the aircraft during the subsequent taxi turn.

PROBABLE CAUSE: Pilot misjudged distance and undershot during landing.

9/11/62	1544 EST	Cleveland, Ohio	United	Caravelle	Substantial	None	64	0	0	59	0	0	5			

(SCHED. PASSG. SERV. - DOM.) During the landing roll following a normal landing both nosewheels separated, and the plane slid to a stop on the nose gear strut. Investigation revealed a failure of the right nosewheel bearing had occurred. Heat generated during the failure lessened the existing bearing tolerances, generating even greater heat until the bearing seized, and the heat softened axle twisted off. Examination revealed that a lack of bearing lubrication or improper torqueing of the right bearing retaining nut most probably caused the bearing failure. The results of intense heat prevented determination of the existing torque condition of the nut and the heat had burned out the lubricant to the extent the amount of lubricant, if any, in the bearing before failure could not be ascertained.

PROBABLE CAUSE: Failure of the right nosewheel bearing assembly caused by inadequate maintenance and inspection.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
9/19/62	1520 EST	Daytona Beach, Fla.	Eastern	DC-7B	Substantial	None	16	0	0	11	0	0	5			

(SCHED PASSG. SERV. - DOM.) After a routine landing touchdown on the wet runway following an ILS approach in instrument weather conditions, the Captain initiated propeller reversing. The copilot then reported "Four Browns" to indicate that the reverse cycle indicating lights were lighted and the Captain immediately applied reverse power. As he did so, and deceleration began, the aircraft yawed to the left. As the yaw to the left continued, the Captain returned the throttles to a forward thrust condition and applied right brake the right nosewheel steering, while at the same time he applied forward thrust power to the No. 1 engine in an effort to correct the yaw. As he did so, the nosewheel of the aircraft chattered momentarily and then collapsed rearward and toward the right side of the nose section. Investigation failed to disclose any evidence of mechanical failure or malfunction of the aircraft, the engines, the brakes, the nosewheel steering mechanism, or of the propeller indicating lights. A review of the aircraft logbooks and checksheets disclosed reports that the No. 4 propeller was "very slow going into reverse." One report estimated that the time required by the No. 4 propeller to complete the reversing cycle was twice that required by the other propellers.

PROBABLE CAUSE: (1) Improper recovery technique from asymmetrical reverse thrust during the landing roll.
(2) Asymmetrical thrust for an undetermined reason under wet runway conditions.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
9/21/62	2122 EST	Miami, Fla.	Eastern	B-720	Substantial	None	20	0	0	13	0	0	7			

(SCHED. PASSG. SERV. - DOM.) While eastbound on the ILS localizer course for runway 9L, Miami International Airport, Florida, the pilot received clearance for an ILS approach and was advised that rain showers moving into the vicinity might make a circling approach to land on runway 27R more desirable. During the next 9 or 10 minutes, while the Captain was executing the landing approach, the rainstorms moved onto the airport. As they did so the wind changed from a reported east at 6 knots to a reported southwest at 30 to 40 knots, and the intensity of the rain fall increased an appreciable amount. The Captain was continuously advised of these changes, and as a result elected to land on runway 27R with a circling approach. The approach was standard for the existing conditions and execution was normal until heavy rain fall was encountered near the touchdown point. This caused a rapid increase in the sink rate of the aircraft, resulting in an extremely hard touchdown. This was followed by a nose-high bounce, a second touchdown on all wheels, and another bounce. The subsequent touchdown was made nosewheel-first and with force that caused the nose gear to fail upward and rearward. The aircraft then slid to a stop off the right side of the runway. Examination of the aircraft revealed no evidence of malfunction or failures that were not caused by the accident. A review of the Miami terminal weather forecast valid for this period stated in part, ".....chance brief ceilings 800 feet visibility 2 miles in rain showers or thunderstorms with winds south to southeast 15 knots, gusting to 35 knots."

PROBABLE CAUSE: Pilot misjudged level off and made improper recovery from the resultant bounced landing.
Unfavorable wind condition.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
9/23/62	2020 EST	Albany, N. Y.	United	B-720	None	None	107	0	1	99	0	1	6			

(SCHED. PASSG. SERV. - DOM.) Over the vicinity of Albany, New York, en route to Boston, Massachusetts from Chicago, the pilot encountered clear air turbulence. As a result of the turbulence, several occupants of the cabin were jostled into cabin structure and injured, two seriously. Investigation revealed that, shortly before the occurrence, the flight crew were advised that an early descent from 25,000 feet was proposed to get the flight below an area of turbulence in the Albany area. Thereafter the flight was cleared to descend to 22,000 feet. According to the crew, it was at this time the turbulence was encountered, which was also just after the Captain had turned on the "fasten seat belt" sign and announced the reason for his action. Persons in the cabin said the turbulence occurred so quickly after the warning there was inadequate time to comply with the instructions. Investigation showed that company weather information furnished the crew before the flight clearly anticipated the turbulence in the area and at the levels it was encountered. The turbulence was also the subject of a SIGMET being issued by appropriate ground facilities in the Albany area. In additions, the Captain of the flight had traversed the route on an earlier flight and had encountered the condition.

PROBABLE CAUSE: Failure of the Captain to take timely turbulence flight precautionary measures in an area of reported turbulence.

9/23/62	2200 GMT	North Atlantic Ocean	Flying Tiger	L-1049H	Destroyed	Fire In-flight	76	23	0	45	5	0	3			

(MILITARY CONTRACT PASSG. - INT.) While operating as a Military Air Transport Service passenger contract flight from McGuire Air Force Base, New Jersey to Frankfort, Germany N-6923C was ditched at sea approximately 560 nautical miles west of Shannon Ireland. Approximately three hours flying time east of Gander, Newfoundland a fire developed in the No. 3 engine. This engine was shut down and the propeller was feathered. A few minutes later the propeller of the No. 1 engine oversped when the flight engineer inadvertently closed the firewall shutoff valve to the No. 1 engine. The No. 1 engine was then shut down and the No. 1 propeller was feathered. The pilot then altered course for Shannon, Ireland however, after about one hour of two engine operation the No. 2 engine developed serious mechanical trouble and the aircraft was subsequently ditched in the open sea.

PROBABLE CAUSE: The Board determines that the probable cause of this accident was the failure of of two of the aircraft's four engines, and improper action of the flight engineer which disabled a third engine, thereby necessitating a ditching at sea.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
10/1/62	1427 AST	Pow "B" Dew Line Site, Alaska	Wien	Beech C-18S	Substantial	None	5	0	0	4	0	0	1			

(SCHED. PASSG. SERV. - DOM.) During a scheduled flight from Point Barrow, Alaska to several Dew Line Sites, the pilot encountered adverse weather conditions which prevented the landings at the first two sites. Upon arrival at the third site, the pilot learned that the weather was, "600 foot ceiling; 7 miles visibility; wind WNW 5 m.p.h." After one unsuccessful approach and a completed missed approach, the pilot made a second approach. Touchdown for landing occurred five feet short of the runway threshold and one foot below runway level on the sharp 15-degree incline of the runway fill. Impact failed the left wheel fork attachments and that wheel separated from the aircraft. Thereafter, the aircraft bounced and again contacted the surface in a 3-point landing attitude about three feet beyond the approach threshold. The aircraft nosed up and slid to a stop on the runway. Investigation disclosed no failure or mechanical malfunction of the aircraft prior to touchdown. It was revealed, however, that the nuts were missing from the forward bolts in the wheel axle retaining caps and there was no evidence of stripped threads on the forward cap bolts.

PROBABLE CAUSE: (1) Pilot misjudged distance and undershot during the landing.
(2) Inadequate maintenance and inspection.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
10/3/62	1027 EST	Baltimore, Md.	Piedmont	M-404	Minor	None	13	0	0	10	0	0	3	0	1	0

(SCHED. PASSG. SERV. - DOM.) After the right engine of the aircraft was started, the signalman signified "pressure up" and the Captain in the cockpit acknowledged. The left engine was then started, after which the electrical cord of the ground power unit (GPU) was disconnected from the aircraft and stowed on the GPU by a second ramp agent. The signalman then boarded the GPU and drove it about three feet toward the left side of the aircraft, where it was stopped while the ramp agent removed the chock from the nosewheel of the aircraft and stowed it aboard the GPU. The signalman then drove the GPU an additional 5 or 6 feet and stopped it to disconnect the electrical generator drive unit. As he did so, the aircraft was taxied forward, and the left engine propeller struck the GPU and inflicted serious injuries to the signalman. The Captain stated that he had received a signal to diconnect the GPU after the start of the right engine. He further stated that, following the start of the left engine, he had received the all clear signal, and open hand salute, from the signalman who was later injured. The signalman, the chief ramp agent, and the station manager, all stated that no such signals were given. While the prescribed hand signals used are somewhat standard the company had no published instructions for the dispatching procedures to be used with this particular model aircraft.

PROBABLE CAUSE: (1) Pilot failed to assure that the taxiway was clear before commencing to taxi.
(2) The lack of company instructions for the proper dispatching procedures to be used with the type aircraft involved.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
10/14/62	0027 PST	Sacramento, Calif.	United	DC-7	Substantial	None	38	0	0	33	0	0	5			

(SCHED. PASSG. SERV. - DOM.) During the initial descent for a night landing at Sacramento, California, the crew of N-6311C detected a high frequency vibration through the rudder pedals. The automatic pilot was disengaged, and, as the Captain assumed manual control, the left rudder kicked backward. A loud noise was heard and the aircraft shuddered violently as it turned upward and outward. The rudder pedals became free and totally ineffective, necessitating the use of maximum continuous power on the right engines to restore level flight. Thereafter, the crew skillfully used differential power in conjunction with the elevator and aileron controls and were able to maneuver the aircraft to a safe landing at Mather AFB, Sacramento. Investigation disclosed that the entire rudder and the vertical fin from Station 90 outward to the tip had separated from the aircraft. Inspection of the failed components disclosed no evidence of damage from natural elements, collision, fatigue, or corrosion; however, there were indications of varying magnitudes of flutter forces in the vertical fin with evidence of violent forces at and above the break line at Station 90. The latter had caused initial failure at the rear spar below the Station 135 A-frame. An intensive examination of the failed portions revealed that the vibrations most likely origninated at the Station 135 rudder hinge bearing. The outer bearing race and the ball type bearings of this unit were missing. Inspection of the remaining portions of the failed unit showed that the inner bearing race was galled statically at ball diameter intervals. Brinelled areas existed along the race shoulders where the bearings had been forced out of the assembly. The inner bearing race was coated with thick grease of a consistancy resembling modeling clay. The inner surface of the eyebolt attachment fitting was scored and coated the dry grease which had no remaining lubricating capability. The clevis attachment fitting was galled and scored where it fitted to the eyebolt attachment. Consideration that an accumulation of water in the rudder trim tab could possibly have generated the initial vibration was discounted because the design and construction of this unit would not retain sufficient quantities of water to render this feasible.

PROBABLE CAUSE: High frequency fatigue failure of the vertical stabilizer, resulting from flutter induced through failure of the Station 135 rudder attachment and bearing assembly caused by inadequate lubrication and inspection.

10/19/62	2050 EST	Windsor Locks, Conn.	Allegheny	CV-440	Minor	None	52	0	0	48	1	0	3			

(SCHED. PASSG. SERV. - DOM.) During the climb to cruising altitude, 5,500 feet, m.s.l., following departure from Philadelphia, Pennsylvania at 1855 e.s.t., the hostess informed the Captain of a high-pitched sound emanating from the rear service door. Subsequently, the hostess and the first officer inspected the door for irregularities. The visual inspection and warning lights disclosed no failures and wet cloths were placed about the door seal to abate the noise. The flight was continued in good weather conditions past numerous suitable airports and with cabin pressurization operating. During the letdown to land at Bradley Field, Windsor Locks, Connecticut, the rear service door became disengaged at the lower latch points, causing an

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N

Windsor Locks, Conn. (Cont'd)

explosive decompression. The force of this action and the ensuing outward rush of air caused a hostess, who was standing in the vicinity, to be ejected through the door and out of the aircraft. Investigation disclosed that, prior to ramp departure at Philadelphia, ground crew personnel had assisted the closing of the rear door by slamming it shut from the outside. Test performed subsequent to the accident revealed that such action resulted in the rear lower door hook not properly engaging. Duplication of the flight conditions experienced by N-8415H after departure from Philadelphia resulted in the door locking handle becoming unlocked and the two lower latch locks becoming disengaged, allowing the door to extend outward at the bottom. It was noted that, commencing in 1954, several Service Bulletins recommending modifications to this door assembly had been issued by the manufacturer. These bulletins were available to the airline; however, at the time of this, the third inadvertent in-flight opening of the rear service door of N-8415H, the bulletins had just been partially complied with. A review of the emergency instructions for company flight personnel regarding in-flight loss of pressurization or leaks showing a lack of completeness and detail. They did, however, prescribe depressurization for continued flight and complete avoidance of cabin exit areas following the discovery of door or latch pressurization leaks.

PROBABLE CAUSE: The Board determines that the probable cause of this accident was an undetected insecure latching of the rear service door, resulting in an in-flight explosive decompression which ejected a hostess from the aircraft.

10/22/62	1052 AST	Sitka Sound, Alaska	Northwest	DC-7C	Destroyed	None	102	0	0	95	0	0	7			

(MILITARY CONTRACT PASSG. - INT.) En route from McChord Air Force Base, Washington to Elmendorf Air Force Base, Alaska, while operating as Military Air Transport Charter Flight No. 293, the crew of N-285 experienced a loss of power on the No. 2 engine which followed by an uncontrollable overspeeding of the No. 2 propeller. Remedial measures failed to correct the overspeed condition, and, because of resulting complications, the pilot ditched the aircraft in Sitka Sound, Alaska. All 102 persons on board were evacuated into liferafts and subsequently rescued.

PROBABLE CAUSE: The Board determines the probable cause of the accident was an uncontrollable overspeeding propeller due to failure in the blower section of the No. 2 engine.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passenger F	Passenger S	Passenger M/N	Crew F	Crew S	Crew M/N	Other F	Other S	Other M/N
10/24/62	2210 CST	Pierre, S. D.	North Central	CV-340	Substantial	None	47	0	0	44	0	0	3			

(SCHED. PASSG. SERV. - DOM.) About 35 miles northeast of Pierre, South Dakota, the aircraft sustained multiple bird strikes, two of which caused penetration of the right wing structure of the aircraft. The occurrence was at night while the flight was cruising at an indicated altitude of 4,500 feet, m.s.l., in VFR conditions. Although the right wing sustained appreciable damage externally and internally in the areas of penetrations, no adverse flight characteristics resulted, and the pilot continued the flight to destination without further incident. Inspection revealed that the aircraft had encountered a flock of wild geese, at least four of which had struck the aircraft. The two which penetrated the wing weighed about 14 pounds each. One penetrated into a fuel cell of the right wing, another to a depth of 18 inches in the right wingtip cap.

PROBABLE CAUSE: In-flight bird strike during cruising flight at night.

10/29/62	1508 Local	LaPaz, Bolivia	PANAGRA	DC-7B	Substantial	None	42	0	0	36	0	0	6			

(SCHED. PASSG. SERV. - INT.) The investigation of this accident is under the jurisdiction of the Bolivian Government. Their report of findings on this accident has not been received at this time by the Civil Aeronautics Board.

11/9/62	0820 EST	Kingston, Jamaica	Pan American World Airways	B-707	None	None	21	0	0	13	0	1	7			

(SCHED. PASSG. SERV. - INT.) The investigation of this accident is under the jurisdiction of the British Colony of Jamaica. Their report of findings on this accident has not been received at this time by the Civil Aeronautics Board.

11/23/62	1224 EST	Ellicott City, Md.	United	Viscount	Destroyed	After Impact	17	13	0	0	4	0	0			

(SCHED. PASSG. SERV. - DOM.) En route from Newark, N. J. to Washington, D. C. at an assigned altitude of 6,000 ft. the aircraft penetrated a flock of whistling swans, at least two of which, were struck by the aircraft. One swan, which was struck penetrated the leading edge of the left horizontal stabilizer and egressed from the rear surface causing damage to the elevator as it did so. This so weakened the structure that failure occurred which rendered the aircraft uncontrollable. Thereafter, N-7430 descended and struck the ground in a nose-low inverted attitude.

PROBABLE CAUSE. The Board determines that the probable cause of this accident was a loss of control following separation of the left horizontal stabilizer which had been weakened by a collision with a whistling swan.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Other F	Other S	Other M/N
11/30/62	2145 EST	New York, N. Y.	Eastern	DC-7	Destroyed	After Impact	51	21	12	12	4	2	0			

(SCHED. PASSG. SERV. - DOM.) During an instrument approach to land on runway 4R at New York International Airport the pilot of N-815D encountered a fog condition near the threshold of the runway. A go-around was initiated, however, the aircraft continued to descend, struck the ground in a slightly nose-high attitude and was virtually destroyed by impact and subsequent fire.

PROBABLE CAUSE: The Board determines the probable cause of this accident was the technique employed by the crew during abandonment of the approach under fog conditions not adequately reported.

12/4/62	1140 EST	Macon, Ga.	Riddle	C-46A	Substantial	None	2	0	0	0	0	0	2			

(TRAINING) During a local training flight the crew of N-5131B experienced a loss of aileron control boost. Inspection of the cockpit instruments and gauges revealed that the hydraulic system had lost all pressure and the main hydraulic system reservoir was empty. The control boosts were disconnected and the fluid supply in the main reservoir was replenished from the reserve tank. Thereafter, the Company approved emergency procedures were used to extend the landing gear by use of the hydraulic system hand pump. A hydraulic system pressure of about 300 p.s.i. was obtained by this method and the gear down-and-locked indicator lights came on. A visual check from the cockpit further indicated a down-and-locked condition, and the aircraft was then landed in a flaps-up configuration. After touchdown and during the landing roll, the left landing gear collapsed and the aircraft swerved off the runway. Investigation disclosed that the landing gear emergency up-latch release handle was not fully depressed, permitting the associated hydraulic dump valves on each gear retract cylinder to open. The two main gear cylinder dump valves then return fluid to the main system reservoir but the tailwheel vents the fluid overboard. With the landing gear lever in the up position, this condition would result in the hydraulic fluid in the main reservoir being vented overboard through the tailwheel hydraulic dump valve and a resultant loss of hydraulic system pressure. Inspection of the left landing gear warning systems revealed that the microswitches for the landing gear position indicator light and the landing gear warning horn were frozen in the "on", or safe gear position and were uneffected by the retraction or extension action of the landing gear.

PROBABLE CAUSE: Loss of normal system hydraulic fluid caused by improper positioning of the emergency up-lock release handle. Malfunction of the left landing gear position light and gear warning horn microswitches caused by inadequate maintenance and inspection.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
12/10/62	1848 PST	Los Angeles, Calif.	United	DC-6	Substantial	None	9	0	0	4	0	0	5			

(SCHED. PASSG. SERV. - DOM.) During the landing roll as the captain completed prop reversing and called for the propellers to be unreversed, the landing gear warning horn sounded and the nose gear retracted. Investigation revealed that the flight engineer had actuated the landing gear handle to the up position, for flap retraction, instead of the flap handle.

PROBABLE CAUSE: Inadvertent landing gear retraction during the landing roll caused by misuse of controls by the flight engineer.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
12/14/62	2212 PST	Hollywood, Calif.	Flying Tiger	L-1049H	Destroyed	After Impact	5	2	0	0	3	0	0	3	0	0

(SCHED. CARGO SERV. - DOM.) At 2212 p.s.t., N-6913C crashed in a fog-shrouded residential industrial area $1\frac{1}{4}$ miles west of the Lockheed Air Terminal, Burbank, California. The crash occurred during an ILS approach in adverse weather conditions and 20 seconds after the crew acknowledged their radar-observed position as two miles from the approach end of runway 07. Investigation revealed no evidence of any failure or malfunction of the aircraft, its components, or systems prior to impact. There was no evidence of failure or malfunction in any of the airport instrument approach facilities. Post-mortem examination revealed that the Captain had coronary artery disease sufficient in severity to have caused partial or complete incapacitation or even death, particularly during a sequence of stressful or anxious moments. A review of Company training records indicated that the first officer had not adequately demonstrated his proficiency in the execution of an ILS approach during training flights while under normal simulated instrument flight conditions.

PROBABLE CAUSE: The Board has determined that the probable cause of this accident was the incapacitation of the pilot-in-command, at a critical point in the approach, resulting in a loss of control of the aircraft from which the copilot was unable to recover.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
12/21/62	2030 CST	Grand Island, Nebraska	Frontier	CV-340	Destroyed	After Impact	42	0	0	39	0	1	2			

(SCHED. PASSG. SERV. - DOM.) At 2030 CST, N-73130 touched down approximately 4061 feet short of the threshold of runway 17, Grand Island Municipal Airport Grand Island, Nebraska. Impact forces and subsequent fire caused a high degree of aircraft destruction. At the time of the occurrence the crew of N-73130 was making an instrument approach to land because of fog conditions which restricted surface visibility.

PROBABLE CAUSE: The Board determines the probable cause of this accident was failure of the crew to monitor altitude properly during a landing approach.

Date	Time of Accident	Location	Airline	Aircraft	Aircraft Damage	Fire	Total Aboard	Division of Injury: Passengers F	Passengers S	Passengers M/N	Crew F	Crew S	Crew M/N	Others F	Others S	Others M/N
12/22/62	1552 CST	Clinton, Iowa	Ozark	DC-3	Substantial	None	26	0	0	23	0	0	3			

(SCHED. PASSG. SERV. - DOM.) The pilot of this flight conducted an instrument approach for a landing at the Clinton, Iowa Municipal Airport, and during the landing roll on runway 14 the aircraft overran the end of the runway and slid into a ditch, causing substantial damage. The pilot had received the wind information with the winds reported as 195 to 210 degrees at 13 to 18 knots, and was also advised that a light twin-engine aircraft had landed on runway 14 shortly before and reported that the braking action was fair to poor. The flight crew stated that observation of the windsock, while on the downwind leg, indicated a south easterly wind and the approach and touchdown were normal; however, when the pilot attempted to slow the aircraft on the landing roll, he found the braking action was "nil." Runway 14 is concrete surfaced, 3,700 feet in length, with a level turf overrun of 200 feet on the southeast and terminated by a ditch running into a north-south direction. The temperature at the time of the accident was reported as 33 degrees F., and examination of the aircraft tracks the following morning, when the temperature had dropped below the freezing level, disclosed frozen slush from one-half to three-fourths inches in depth. The track of this aircraft disclosed that the initial touchdown was made approximately 800 feet from the approach end of the runway and solid contact was established at a point 900 feet farther down the runway.

PROBABLE CAUSE: Pilot misjudged speed and distance and overshot during landing on terrain which was unsuitable under the existing conditions.