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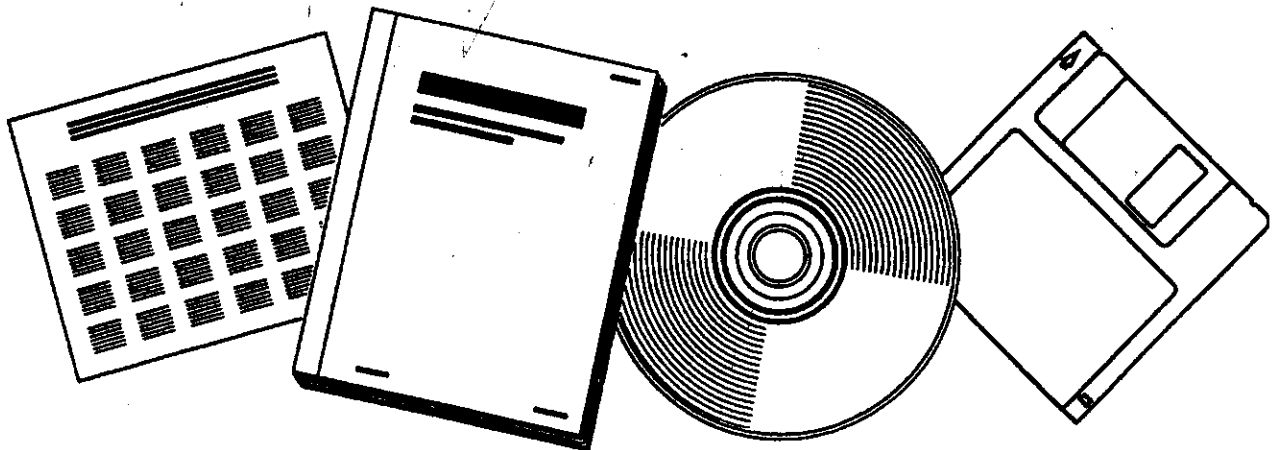
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**AIRCRAFT ACCIDENT REPORT, LEXINGTON AIR
TAXI, INC. BEECH C-45H, N3727G NEAR BLUE
GRASS FIELD LEXINGTON, KENTUCKY, APRIL 3,
1967**

**NATIONAL TRANSPORTATION SAFETY BOARD,
WASHINGTON, D. C**

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National Technical Information Service**

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File 2-0001

AIRCRAFT ACCIDENT REPORT

Adopted: March 13, 1968

LEXINGTON AIR TAXI, INC.
BEECH C-45H, N3727G NEAR BLUE GRASS FIELD
LEXINGTON, KENTUCKY
APRIL 3, 1967

NATIONAL TRANSPORTATION SAFETY BOARD
DEPARTMENT OF TRANSPORTATION
WASHINGTON D.C. 20591

LEXINGTON AIR TAXI, INC.
BEECH C-45H, N3727G
NEAR BLUE GRASS FIELD
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NATIONAL TRANSPORTATION SAFETY BOARD
DEPARTMENT OF TRANSPORTATION
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Adopted: March 13, 1968

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BEECH C-45H, N3727G
NEAR BLUE GRASS FIELD
LEXINGTON, KENTUCKY
APRIL 3, 1967

SYNOPSIS

A Lexington Air Taxi, Inc., Beech C-45H, N3727G, operating as a passenger charter flight, crashed following takeoff from Runway 33 at Blue Grass Field, Lexington, Kentucky, at approximately 1631 e.s.t., April 3, 1967.

The aircraft was observed after takeoff climbing slowly on runway heading in a nose-high attitude. At an altitude of between 200 and 300 feet the aircraft settled slightly, entered a left rotational spin, and crashed in an open field approximately 4,000 feet from the departure end of Runway 33. Witnesses reported seeing black smoke emanating from the underside of the aircraft just prior to impact.

All nine persons on board, the pilot and eight passengers, received fatal injuries. The aircraft was destroyed by impact and subsequent fire.

The investigation disclosed evidence of an inflight fire of undetermined origin in the area of the left engine nacelle. It was also

revealed that the aircraft had been loaded improperly so that its weight and center of gravity were beyond approved limits at departure.

The Board determines that the probable cause of this accident was the loss of control because of a power interruption to the left engine at a time when controllability was marginal due to an extreme tail-heavy condition caused by improper loading.

1. INVESTIGATION

1.1 History of Flight

A Lexington Air Taxi, Inc., (Lex Air), Beech C-45H, N3727G, operating as a charter flight under Federal Aviation Regulation (FAR) Part 135, crashed following takeoff from Runway 33 at Blue Grass Field, Lexington, Kentucky, at approximately 1631 e.s.t. ^{1/} on April 3, 1967. All nine occupants of the aircraft, the pilot and eight passengers, received fatal injuries. The aircraft was destroyed by impact and subsequent fire.

N3727G was chartered from Lex Air by Piedmont Airlines, Inc., (PIA) on April 3, 1967, to transport eight passengers from Blue Grass Field to Standiford Field, Louisville, Kentucky. All of these passengers were ticketed on PIA Flight 473 from Lexington to Louisville, Kentucky, which was delayed at Roanoke, Virginia, because of mechanical difficulties. Charter arrangements with Lex Air were made by the local PIA agent to enable the passengers to make connecting flights at Louisville.

Mr. Robert M. Yonk was the pilot assigned by Lex Air for the flight. He received a weather briefing from the Weather Bureau (WB) at Blue Grass Field covering the period of the flight from Lexington to Louisville and return. The weather was reported as: 2,000 feet scattered, estimated 10,000 broken, higher broken, and was forecast to remain VFR throughout the intended flight period. No flight plan was filed or required.

The aircraft was taxied from the Lex Air facilities on Blue Grass Field to the Piedmont Terminal area where passenger and baggage loading

^{1/} All times herein are eastern standard based on the 24-hour clock.

was conducted. Eight passengers and the baggage for this flight were manifested at the Piedmont ticket counter; however, no actual scale weight of the passengers or baggage was taken. ^{2/} One of the Piedmont ticket agents assisted the pilot in loading the baggage aboard the aircraft. He stated that five bags and one briefcase were placed in the nose baggage compartment by the pilot. Although two other pieces of baggage had been checked-in for this flight no evidence could be obtained as to how or where they were loaded in the aircraft.

At approximately 1628 the pilot requested taxi instructions and was advised by the tower that the wind was 330 degrees at 10-15 knots, altimeter setting 30.30, and that either Runway 33 or 04 could be used for takeoff. The pilot advised that he would use Runway 33 for departure.

At 1630:57 the tower cleared N3727G for takeoff on Runway 33. Pilot Yonk's acknowledgement of this clearance was the last known radio transmission from the flight.

According to the evidence the aircraft lifted off approximately 1,550 feet down the runway in a nose-high attitude, leveled off momentarily, the landing gear was retracted, and it then resumed the nose-high attitude. The rate of climb appeared to be slower than normal and at an altitude of 200 to 300 feet the aircraft settled, the left wing went down, and it went into an abrupt spin to the left, making approximately one and one-half

^{2/} In accordance with Piedmont passenger check-in procedures an average weight of 170 pounds per passenger and 24 pounds per bag is utilized for weight and balance computations. The average passenger weight of 170 pounds includes 5 pounds for carry-on baggage, i.e., briefcases, attache cases, etc. This procedure was also authorized by Lex Air for weight and balance computations when actual scale weights were not available.

turns before impact with the ground. Black smoke was observed coming from underneath the fuselage of the aircraft prior to impact but no fire was seen. The point of impact was 3,900 feet from the departure end of Runway 33, 850 feet left of the extended runway centerline. The accident occurred during daylight hours.

1.2 Injuries to Persons

<u>Injuries</u>	<u>Crew</u>	<u>Passengers</u>	<u>Others</u>
Fatal	1	8	0
Nonfatal	0	0	0
None	0	0	0

1.3 Damage to Aircraft

The aircraft sustained major damage at impact. The fuselage and inboard wing sections were destroyed by ground fire.

1.4 Other Damage

Passenger baggage located in the nose baggage compartment and passenger cabin was damaged by fire. Although much of the baggage was burned and charred it remained identifiable as to its general location.

1.5 Crew Information

The pilot was properly certificated and qualified for this flight.
(For detailed information see Appendix A)

1.6 Aircraft Information

N3727G, a Beech C-45H, was initially purchased by Fort Wayne Air Service, on October 1, 1959, as a U. S. Air Force surplus aircraft at which time its

U. S. registration No. (N3727G) was assigned. It was modified from military to civilian configuration by Fort Wayne Air Service and was purchased by Bituminous Material Company, Inc., on September 9, 1961. N3727G was purchased by Lexington Air Taxi, Inc., on March 14, 1966. At the time of the accident the aircraft had accumulated a total of approximately 3,322 flying hours.

N3727G was equipped with two Pratt and Whitney R985-14B engines fitted with Hamilton Standard full feathering propellers. The left engine, serial No. 11812 had a total engine time of 1892 hours with 929 hours time since overhaul. The right engine, serial No. 208097, had a total engine time of 3292 hours with 558 hours since overhaul. Inspection of the company maintenance records for N3727G disclosed that the aircraft and powerplants had been maintained in accordance with FAA requirements.

An airplane flight manual is required by FAR 91.31^{3/} to be aboard each aircraft over 6,000 pounds. Such manuals contain information which has an important bearing on safe operation, including weight and balance data.

According to the Chief Pilot of Lex Air, there was an airplane flight manual

3/ FAR 91.31(b)(3) Civil aircraft operating limitations and marking requirements

(b) No person may operate a U. S. registered civil aircraft unless there is available in the aircraft a current FAA approved Aircraft Flight Manual for that aircraft, placards, listings, instrument markings, or any combination thereof, containing each operating limitation prescribed for that aircraft by the Administrator, including the following:

(3) Aircraft weight, center of gravity, and weight distribution, including the composition of the useful load in those combinations and ranges intended to insure that the weight and center of gravity position will remain within approved limits (e.g., combinations and ranges of crew, oil, fuel, and baggage).

aboard N3727G at the time of the accident, which included the required weight and balance data; however, this manual was not found in the burned wreckage.

In order for the Board to determine the weight and center of gravity (c.g.) of N3727G at the time of the accident, it was necessary to review all available records and construct a weight and balance history for the aircraft. It was found that in the course of the original modification of N3727G by the Fort Wayne Air Service in March 1960, four seats (two facing two) and a three-place divan were installed in the aircraft (see Attachment No. 1). The installation of the divan in the rear right side of the aircraft required the removal of the aft bulkhead (No. 9) which formed the rear of the cabin-interior, and the placing of the divan just aft of the rear right-side seat extending back to bulkhead No. 10 which now formed the rear of the cabin-interior.

An entry in the aircraft logbook referring to this modification and signed by the Chief Inspector of the Fort Wayne Air Service, was as follows:

"3-9-60 Aircraft modified and converted from military to original FAA certification. Licensing Kit American Turbine Engine Company ATE B-1 STC ^{4/} SA3-358 approved 1-22-59 installed. Aircraft modified in accordance with American Turbine Engine Company Beech Aircraft Company and Aircraft Specification

^{4/} Supplemental Type Certificate - a certificate required by the FAA of anyone who alters an aeronautical product by introducing a major change in a previously approved type design and which is not so extensive as to require application for a new type certificate.

#A765 . . . Installed 4 chairs and divan and center cabin lite from American Turbine Co. . . ." ^{5/}

According to the Chief Inspector, the aircraft was weighed following completion of the modification and a sketch of the aircraft-interior was prepared showing the seating configuration and c.g. for the installation. The sketch, unsigned and undated, was identified as, "Aircraft Empty Weight including Full oil and Pilot." ^{6/} The Chief Inspector also stated that three loading schedules in graphical form were prepared to show the weight and c.g. of the aircraft under various conditions of loading. The sketch was contained in the files for N3727G maintained by Lex Air; however, the loading schedules were not located during the investigation.

The entire modification, including weight and balance data, was reviewed and approved by an FAA inspector on March 8, 1960. Because this was an original aircraft certification, a Major Repair and Alteration Form (FAA Form ACA 337) was not required or prepared. This form normally includes weight and balance computations, updating the data as required by the alteration, and is retained as a permanent FAA record.

Two subsequent minor alterations were performed on the aircraft prior to its purchase by Lex Air. FAA Form 337's were prepared for these alterations, dated April 12, 1962 and April 30, 1963. The weight and balance

^{5/} Reference is made to the installation of the four chairs and divan from the American Turbine Company, and also, the basic licensing kit STC SA3-358. A review of the records from American Turbine Company, Pasadena, California, failed to reveal any record of sales of either the licensing kit or the chairs and divan to Fort Wayne Air Service.

^{6/} The applicable regulation relating to aircraft empty weight, FAR 23.25, does not include provision for full oil and the weight of the pilot in this computation.

data listed on these forms reflected the empty-weight data derived during the initial certification and were recomputed in conformance with the alterations shown thereon. The last Form 337 issued (April 30, 1963) was forwarded to Lex Air at the time they purchased N3727G and it formed the basis for further empty-weight and c.g. data computations.

The only modification made to N3727G while it was owned by Lex Air was the removal of the nose fuel tank, and relocation of two pieces of radio equipment. This modification was accomplished on June 17, 1966. According to Lex Air, the modification was made to provide additional baggage space, since the nose tank was never used. A work record reflecting the removal of the nose tank and relocation of the radio equipment showed the aircraft empty-weight as 6,472.68 pounds with a c.g. of 107.09 inches. It was stated by the Chief Pilot that no loading schedules were computed for the aircraft while it was owned by Lex Air and that operation under maximum passenger loading had been accomplished a number of times by the pilot involved.

Although the weight of the baggage put aboard N3727G for this flight could not be positively determined because actual scale weights were not taken, the burned baggage was weighed at the scene and identified as to its location in the wreckage. The total weight of the burned baggage was 201 pounds, 92 pounds in the nose compartment and 109 pounds in the passenger cabin.

The positions of the pilot and passengers at the time of impact were identified and the combined weight of all occupants was determined to have been 1,490 pounds.

The aircraft had been serviced for the flight at the Lex Air facility with 90 gallons of 80/87 octane aviation gasoline ^{7/} for a total of 147.8 gallons.

The computed take-off gross weight for this flight was found to be 8,857 pounds with a c.g. of 120.2 inches aft of datum. Landing gear retraction moved the c.g. further aft to 121.6 inches (see Attachment No. 2). The maximum allowable take-off gross weight for this aircraft was 8,750 pounds with an aft c.g. limit of 117.7 inches.

1.7 Meteorological Information

The WB surface weather observation for Blue Grass Field taken at the time of the accident was in part: high scattered clouds, visibility 12 miles, temperature 53 F., dewpoint 36 F., wind 360 degrees 10 knots, altimeter setting 30.30 inches.

1.8 Aids to Navigation

Navigational aids were not involved in this accident.

1.9 Communications

Not applicable.

1.10 Aerodrome and Ground Facilities

Runway 33 is hard-surfaced, 3,500 feet long and 150 feet wide. The field elevation is 978 feet m.s.l.

1.11 Flight Recorders

The aircraft was not equipped with a flight data recorder or a cockpit voice recorder and neither was required.

^{7/} Test of fuel samples taken from the refueling tank showed no evidence of any contaminants.

1.12 Wreckage

The aircraft impacted in a flat attitude in a near vertical flight path on a heading of 310 degrees. It came to rest 38 feet beyond the initial impact-point on a heading of 295 degrees. The impact-area was located 3,950 feet from the end of Runway 33, and 850 feet to the left of the extended runway centerline. Ground fire consumed most of the upper fuselage extending back to the tail section as well as the wing sections to the outer panel attachments. On initial impact the left wing was impaled by a fence post between outer panel wing ribs Nos. 2 and 3, and 12 inches forward of the rear spar. The post traversed through the trailing edge of the wing and tore off the outboard four-foot section of wing flap. This portion of the flap showed fire damage with the greater portion of the fabric burned away. It was found in close proximity to the tail section which was devoid of any fire damage. Chordwise sooting was noted behind the flap screw heads on the metal lower surface. The leading edge of the flap showed no soot-shielding in the creases or areas where the metal was impact folded. Extending to the left of the fence post along the impact track was a 10-foot-long slice in the pasture sod which corresponded to the left aileron impact area. The sod, when folded up and over, revealed charred particles of fabric in the resultant trough similar in appearance and texture to the remnants of burned fabric still attached to the left aileron.

There was no evidence of any inflight aircraft structural failure or separation. Examination of the flight control systems showed no evidence of malfunction or failure prior to impact.

The elevator trim tab indicated 1.75 degrees airplane nose-down which was the full limit of nose-down travel on this installation. Normal full airplane nose-down trim is 2.00 degrees; however, the indicator potentiometer rack was wired to the trim jackscrew in such a manner that jackscrew extension was constrained to a maximum of 1.75 degrees nose-down trim. The rudder tab indicated 1.3 degrees nose-right trim, and the aileron tab indicated approximately 14 degrees left-wing-down.

Both main landing gear slider rings were found in the full forward (gear-up) position and the landing gear handle was found in the "up" or retract detent. The flaps were fully retracted as determined from jackscrew measurement.

Both the left and right fuel selector valves were disassembled and were found set at intermediate positions, with the right selector port about 50 percent open to the right main tank, and the left valve port about 90 percent open to the left main tank.

The engine fire extinguisher panel was recovered with the selector handles positioned to the "left motor", the safety wire broken, and the "T" handle actuation cable extended $1/2$ to $3/4$ inches. The engine fire extinguisher bottle showed severe external fire damage. The thermal relief safety disc was intact. The valve actuator handle was free to turn and the valve, as found, was open to approximately one-half the valve-travel. The weight of the fire extinguisher bottle, as recovered, was 10 pounds 8 ounces. The bottle valve was stamped "Full 18 pounds 9 ounces - Empty 11 pounds 9 ounces."

Both engines remained attached to the aircraft and sustained severe fire damage in the ground fire subsequent to impact. Disassembly and examination of each engine revealed no evidence of any failure or malfunction of any of the engine components prior to impact. Hydraulic, fuel, and oil lines located in the area of both engines were severely burned and broken and no appraisal of pre-impact condition could be made. Heat damage to the left fuel pump precluded bench testing of this unit. The diaphragm in the fuel setting area was almost totally consumed which made determination of its pre-impact condition impossible.

Inspection of the left propeller showed the No. 1 blade bent severely rearward with the No. 2 blade bent rearward about ten degrees. The right propeller showed similar damage with the No. 1 blade bent rearward approximately 80 degrees. The No. 2 blade had a small scallop bend in the leading edge near the tip. Shim plate markings indicated that the blade angles of each propeller at impact was 12 degrees.

1.13 Fire

The upper fuselage, from the cockpit aft to the tail section, and the inboard wing sections were destroyed by ground fire.

1.14 Survival Aspects

This was a nonsurvivable accident.

2. ANALYSIS AND CONCLUSIONS

2.1 Analysis

The investigation disclosed that an inflight fire of undetermined proportions occurred in the area of the left wing flap and aileron aft of the left engine nacelle. Examination of the fire extinguishing system to that engine indicated that it had been activated at some time prior to impact. Evidence of the fire was further confirmed by witnesses located nearest to the crash site who reported seeing black smoke coming from the underside of the aircraft. However, the evidence remaining in the powerplants after the extensive ground fire yielded no source of the inflight fire, nor any conclusive indication that either engine had not been capable of producing its rated power prior to impact.

The evidence of the fire is indicative of the type that might occur from fuel leaking back over the wing trailing edge followed by flash ignition. There are several possibilities as to the source of the fire, one being failure of the pressure relief diaphragm in the fuel pump of the left engine. With this diaphragm ruptured, fuel under pressure would have been sprayed out of the 5/64-inch vent hole in the air side of the diaphragm compartment. The fuel mixture could then have been ignited by the exhaust system heat and a fire created in the rear accessory area of the engine. However, this can be considered only as a postulation because the diaphragm was virtually consumed by ground fire and as a result there was no diaphragm failure in evidence.

Another possible fire source would have been failure of a fuel line; however, the effects of ground fire obliterated any such evidence to support this possibility.

The propellers provided evidence that the engines were developing little or no power at impact. The impact blade angle of each propeller was found to have been approximately 12 degrees, which is the angle of the low pitch stops. This blade angle by itself could also be appropriate for high power when matched with the very low airspeed existent just before impact. However, the evidence refuting high power was that only one blade of each propeller was appreciably damaged by impact, and the badly damaged blade in each case was bent rearward. Substantial power would not have been dissipated, under these impact conditions, within one-half propeller revolution. Also, substantial power at impact, in conjunction with the flat impact angle, should have resulted in a forward bend in each contacted blade and not rearward as found.

It was determined through the investigation that at the time of take-off for this flight, the aircraft's gross weight was 8,857 pounds with a c.g. of 121.6 inches aft of datum. This condition was 107 pounds in excess of the approved maximum gross weight limitation of 8,750 pounds and 3.9 inches (gear retracted) aft of the approved c.g. limitation of 117.7 inches.

When the c.g. of an aircraft lies sufficiently forward of the neutral stability point, ^{8/} the airplane possesses a positive static

^{8/} That c.g. position at which the slope of the curve of pitching moment coefficient versus angle of attack is equal to zero.

longitudinal stability. ^{9/} As the c.g. is moved rearward, aft of the approved limits, and beyond the neutral stability point, the aircraft will become unstable. If the c.g. is moved sufficiently rearward of the neutral stability point elevator effectiveness will be reduced to the point where there may not be sufficient elevator control to reverse an unwanted pitching-moment. The use of elevator trim tabs to relieve an unwanted pitching-moment in conjunction with a severe aft c.g. condition will further lessen the effectiveness of elevator control.

The effects of the aft c.g. condition in this case were shown throughout the takeoff and climb phase of this flight. The fact that the aircraft was airborne after only 1,300-1,500 feet of roll, compared to the minimum required distance of approximately 2,200 feet, indicates that a premature lift-off occurred. This situation can most logically be explained by the inability of the pilot to lower the nose of the aircraft sufficiently during the takeoff roll, with lift-off occurring before the recommended speed was attained. Moreover, the premature takeoff was coupled with a nose-high flight attitude and a slow "mushing" climb to an altitude of only 200-300 feet over a distance of more than one mile.

The full available nose-down elevator trim position, as found, further attests to the tail-heavy condition of the aircraft at the time of the

^{9/} Positive static longitudinal stability occurs at any c.g. position at which the slope of the curve of pitching-moment coefficient versus angle of attack is negative. Negative static longitudinal stability occurs at the c.g. position at which the slope of the curve of the pitching-moment coefficient versus angle of attack is positive.

accident, and indicates an attempt by the pilot to lower the nose by use of trim in addition to the use of the elevator.

All factors considered, it is believed that even though the aircraft was operating in a precarious operational envelope at this time, most likely at or below the minimum control speed, flight could have been maintained if continuous rated power was available to both engines. However, at this point the aircraft was observed to fall off on the left wing and complete more than one full spin revolution to the left prior to impact with the ground.

Examination of the aircraft's flight characteristics indicates that a complete revolution could not be expected from a normal stall spin occurring at the maximum altitude attained by N3727G (200-300 feet). However, an engine power interruption at this point, in addition to causing an immediate loss of aircraft control, would most likely have induced a rapid flat spin of this type.

In view of the foregoing, and in conjunction with the evidence of inflight fire in the left engine area, it is believed that a power interruption to this engine occurred either through the pilot's intentional reduction of engine power in conjunction with his attempt to fight the fire, or through a power loss directly associated with, and attributable to the conditions creating the engine fire.

Additionally, because of the indications of low power on both engines at impact, as evidenced by propeller blade damage and blade angle settings,

it is concluded that power to the right engine was also reduced by the pilot prior to impact in an attempt to regain aircraft control. However, the confines of airspeed and altitude at this point were insufficient to effect recovery.

The Board's investigation revealed no evidence to indicate that the pilot of N3727G computed a weight and balance for this flight. Had a proper computation been made and utilized by the pilot, it would have been immediately apparent that the aircraft, as loaded, was not within authorized weight and c.g. limitations and, therefore, unacceptable for this flight.

The actual weight and balance program in effect for the operation of N3727G could not be verified because, according to the operator, all available data were on board the aircraft and were destroyed in the fire following the crash.

However, computations of the weight and balance show that operation of this aircraft within proper weight and c.g. limits is not possible with the main fuel tanks full and eight average-weight passengers on board. In fact, operations with eight passengers even under minimum fuel conditions would require approximately 175 pounds of ballast in the nose compartment to bring the c.g. within the authorized aft limitation.

In view of the facts that the rear bulkhead (No. 9) of the passenger cabin had been removed during the conversion, and that a three-place passenger divan had been installed extending beyond this area, it would be expected that during the original certification process (March 1960) the effects of the modification on the c.g. and loading conditions would be

closely examined. The aft c.g. conditions, as described above, should then have become apparent to the FAA inspector and it would have been adviseable not only to require weight and c.g. data reflecting various contingencies of passenger and baggage loading but also to have installed placards in those aircraft compartments where critical weight limitations existed. The evidence shows that this was not done.

Moreover, it should have become apparent during the 12-month period this aircraft was utilized in air taxi service that it could not be flown properly under maximum passenger loading conditions. A simple weight and balance review by the operator, especially when the nose fuel tank was removed, would have pointed out the foregoing.

Although the applicable regulations ^{10/} state that it is the pilot's responsibility for the safe operation of the aircraft, the Board believes that this responsibility also extends to the operator of an aircraft used in passenger services to insure that a proper weight and balance program is maintained and that its operating procedures complement safety of flight in all respects.

Provisions aimed at these areas are presently being considered by the FAA in its procedures to amend Part 135 of the FAR's. The Board concurs with this action.

It was also noted that normal FAA surveillance of Air Taxi operators does not require the inspection of every aircraft utilized in passenger operations conducted under FAR Part 135. In this case, N3727G was obtained

^{10/} FAR 91.3(a)
FAR 91.31(b)(3)

by Lex Air subsequent to the initial Air Taxi certification inspection, and consequently was not inspected by the FAA, nor was it required to be, during its period of ownership by Lex Air. The aircraft's weight and balance documentation, passenger loading contingencies, and operating practices and procedures, therefore did not come under FAA scrutiny within the framework of established FAA Air Taxi surveillance.

2.2 Conclusions

(a) Findings

1. N3727G was registered properly and was maintained in accordance with FAA regulations.
2. The pilot was currently certificated and qualified for the flight.
3. During the modification of N3727G, prior to the original certification in March 1960, the aft bulkhead (No. 9) was removed and a three-seat divan installed which extended beyond this area and increased the aircraft passenger capacity to eight persons.
4. A minimum of approximately 175 pounds of ballast was required in the nose baggage compartment for proper aircraft operation under conditions of maximum passenger load (average weight 170 pounds) under even minimum fuel conditions.
5. No placards were installed in any aircraft compartment pertaining to weight limitation or ballast requirements.

6. Aircraft loading schedules aboard the aircraft were not recovered from the wreckage. No other loading schedules for N3727G were located during the investigation.
7. Improper loading resulted in the aircraft being overweight and out of approved c.g. limits at departure.
8. There was no evidence to indicate that the pilot computed the aircraft's weight and balance for this flight.
9. Because of the aft c.g. conditions, there was insufficient elevator effectiveness to prevent an excessive nose-high flight attitude resulting in minimum aircraft performance capability.
10. An inflight fire of undetermined origin occurred in the area of the left engine nacelle during climb-out.
11. Power to the left engine was interrupted by either the pilot's intentional reduction of power in an attempt to control the fire or, loss of engine power associated with the fire.
12. The asymmetrical engine power in conjunction with the aft c.g. condition caused an immediate loss of control of the aircraft and induced a flat rotational spin to the left from which recovery was not possible.
13. There was no evidence of any inflight structural failure or separation prior to impact.
14. N3727G was not inspected by the FAA while it was owned by Lex Air and operated as a charter aircraft under FAR Part 135.

(b) Probable Cause

The Board determines that the probable cause of this accident was the loss of control because of a power interruption to the left engine at a time when controllability was marginal due to an extreme tail-heavy condition caused by improper loading.

3. RECOMMENDATIONS

Problems outlined in this report concerning aircraft loading and weight and balance documentation, preflight planning, dispatching, and operational practices and procedures, although discussed in terms of this accident, lend weight to the need for the upgrading of FAR Part 135 now being considered under Advanced Notice of Proposed Rule Making 67-9. Provisions of the proposed rule making would increase the scope of the present regulations pertaining to air taxi operations to include those operational areas which were found deficient in the investigation of this accident. The Board is in favor of the enlargement of this regulation and recommends its expedited implementation.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD:

/s/ JOSEPH J. O'CONNELL, Jr.
Chairman

/s/ OSCAR M. LAUREL
Member

/s/ JOHN H. REED
Member

/s/ LOUIS M. THAYER
Member

/s/ FRANCIS H. McADAMS
Member

APPENDIX A

Crew Information

Pilot Robert M. Yonk, age 49, was employed by Lex Air in October 1966. He held airline transport certificate No. 36827 with single/multiengine land and instrument ratings. His FAA first-class medical certificate was issued on August 29, 1966, with no waivers or limitations. According to FAA records and previous employment applications, Mr. Yonk had a total of 15,740 flight hours at the time of his employment with Lex Air. From October 1966 to the date of the accident he had flown a total of 404 hours as a pilot with Lex Air. In the 90-day period preceding the accident Pilot Yonk had accumulated a total of 194 pilot-hours of which 21.3 hours were in C-45H aircraft. In the 30-day period preceding the accident he had flown 1.0 hours in the C-45H.

On the day of the accident Pilot Yonk flew a company trip from Lexington to Murray, Kentucky, and return in a Piper PA-30 aircraft. He departed Lexington at approximately 0600 and returned at approximately 1515 that afternoon. Total flight time recorded was 3.2 hours.

Records maintained by Lex Air showed that Pilot Yonk passed company check flights satisfactorily in the PA 28-140, PA 28-180, and PA 32-260 type aircraft on October 2, 1966. He satisfactorily completed a company check flight in the C-45H on December 1, 1966.

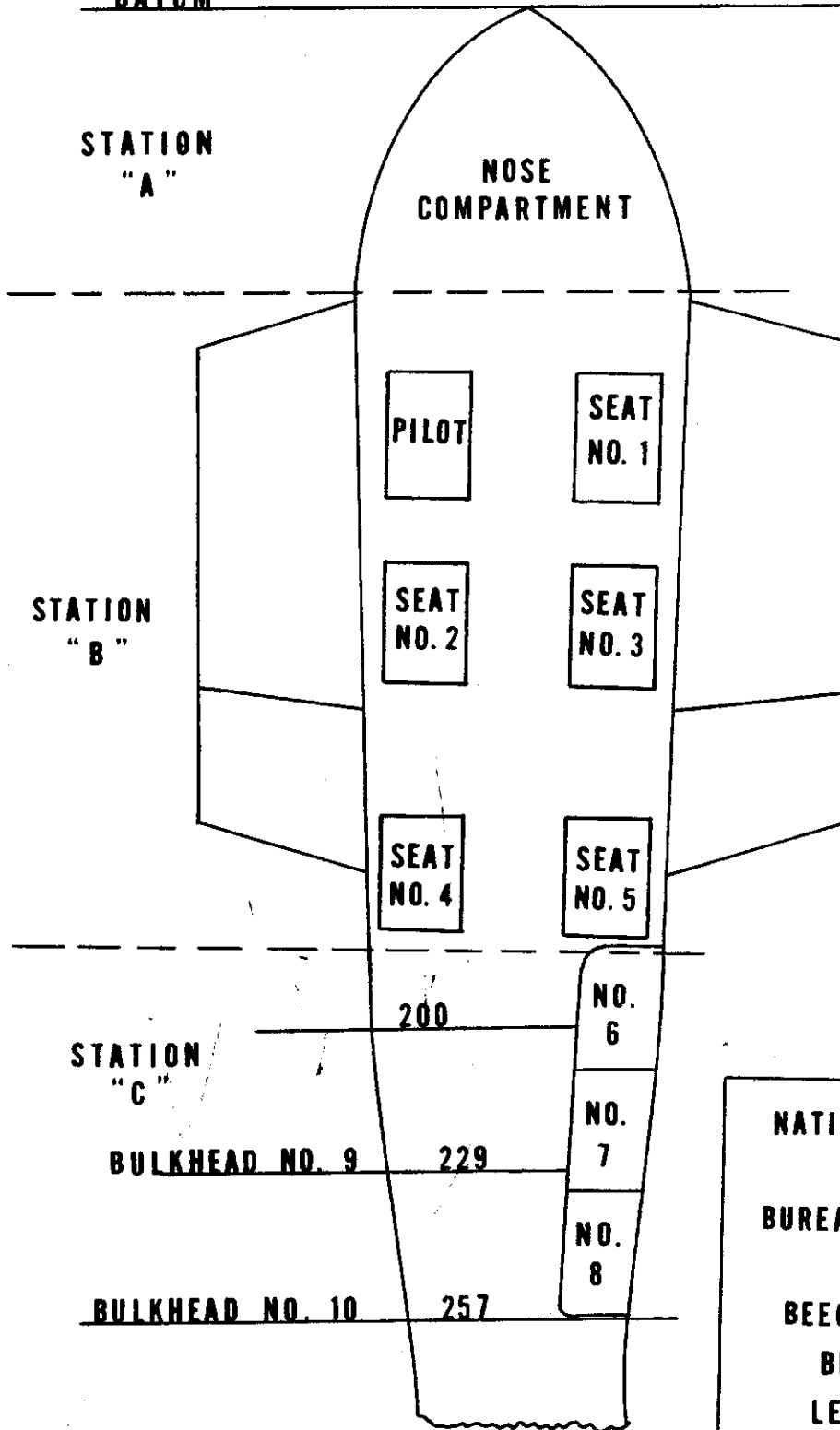
He was limited to VFR flight operations during the hours of daylight as pilot-in-command for company flights conducted under FAR Part 135.

On January 31, 1967, pilot Yonk received an unsatisfactory grading on an instrument check flight given by the Chief Pilot of Lex Air. The reasons noted under the remarks section of the check form were:

"Needs additional practice on single engine procedures and control instruments only."

DATUM

ATTACHMENT NO. 1



NATIONAL TRANSPORTATION
SAFETY BOARD
BUREAU OF AVIATION SAFETY
INTERIOR SKETCH
BEECH C-45H, N 3727G,
BLUE GRASS FIELD,
LEXINGTON, KENTUCKY
APRIL 3, 1967
NO SCALE GFJ

BEECH AIRCRAFT CORP.
WICHITA, KANSAS

BY K.E. Sayre
CK
DATE 5-4-67

ATTACHMENT
NO. 2
REPORT
PAGE 1
TEMP.
PERM.

Model C-45H (Serial AF-214) N3727G Condition (3)

	WT	H-arm	H-mom
Empty weight & CG (per FAA Form 337) (30 Apr. 1963)	6518	107.4	700270
Remove: Full oil (16 gal)	-120	93	-11160
Pilot	-170	87	-14790
Nose Fuel Tank	-45	38	-1710
more Radio Equipment (Sta. 26 to Sta. 42)	(24)	(16)	+384
	6183	108.8	672994
add: Engine oil (12 gal)	90	93	8370
Fuel: main (147.8 gal)	887	126	111762
Seat A (Pilot)	157	87	13659
Seat B (Copilot)	165	87	14355
Seat C	170	120	20400
Seat D	155	120	18600
Seat E	184	183.5	33764
Seat F	160	183.5	29360
Seat G	156	209	32604
Seat H	175	228	39900
Seat I	168	247	41496
Baggage (Nose Comp)	98	28	2744
Baggage (Cabin Sta. 193)	36	193	6948
" " " 243)	73	243	17739
Take-off weight & CG	8857	120.2	106469.5
		(29.7910 MAC)	
Gear Retraction			+12000
	8857	121.6	107669.5
		(31.2910 MAC)	

SA-398
EXHIBIT
NO. 2N