UNITED STATES
FEDERAL AVIATION AGENCY

AIR VEHICLE PERFORMANCE CHARACTERISTICS

Volume III

PRE-CLIMB

FOR.

BUREAU OF RESEARCH & DEVELOPMENT
U S FEDERAL AVIATION AGENCY
Washington 25, D C

BY

APPLIED SCIENCE DIVISION
FAIRCHILD ENGINE & AIRPLANE CORP
Alexandria, Virginia

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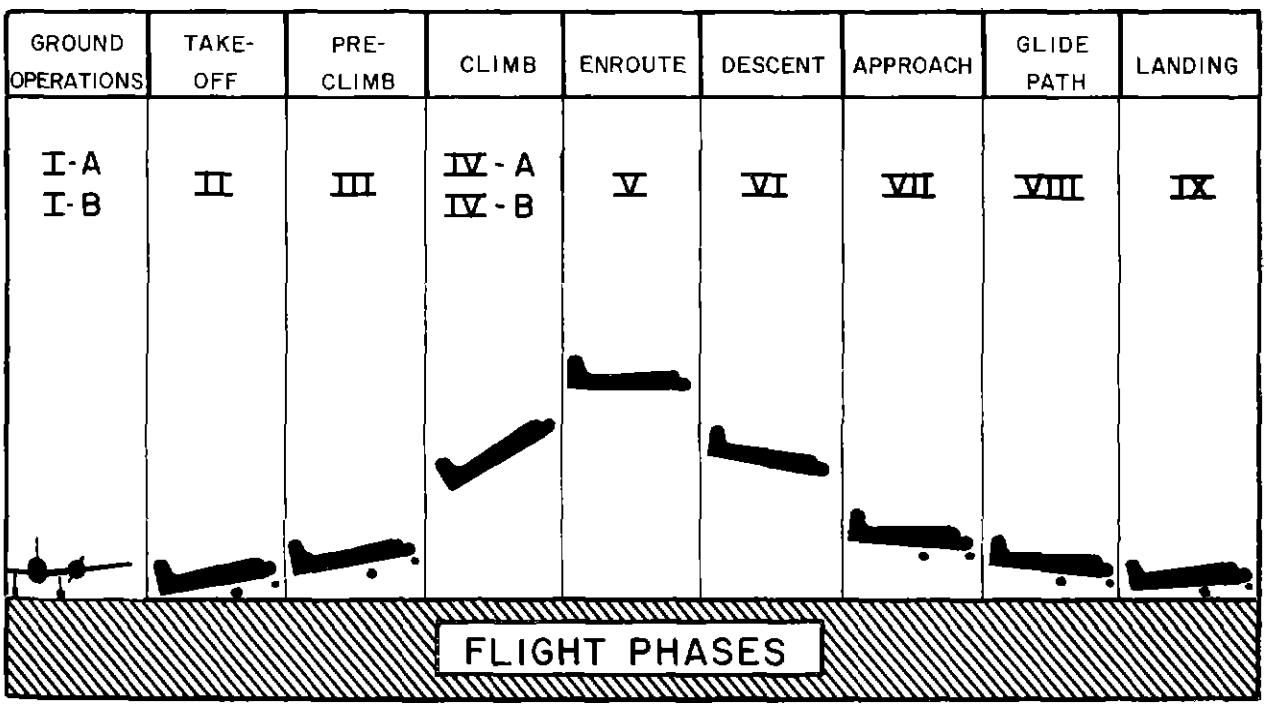
AIR VEHICLE PERFORMANCE CHARACTERISTICS

This is a fourteen volume study,
containing the following

Volume I-A	Ground Operations
Volume I-B	Ground Operations
Volume II	Take-Off
Volume III	Pre-Climb
Volume IV-A	Climb
Volume IV-B	Climb
Volume V	Enroute
Volume VI	Descent
Volume VII	Approach
Volume VIII	Glide Path
Volume IX	Landing
* Volume X-A	Classified Military Aircraft (S)
* Volume X-B	Classified Military Aircraft (S)
* Volume XI	Future Aircraft (S)

* Volumes I-A through IX contain flight phase data on current aircraft, except those classified by the military. The latter are in Volumes X-A and X-B, and future aircraft in Volume XI. These three volumes have a security classification of secret.



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AIR VEHICLE PERFORMANCE CHARACTERISTICS

MASTER INDEX

The following is a complete listing of the 122 aircraft reported and their location by volume

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MASTER INDEX - (Cont'd)

AIR VEHICLE PERFORMANCE CHARACTERISTICS

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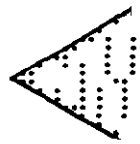

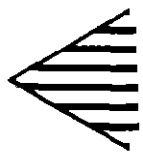

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AIR VEHICLE PERFORMANCE CHARACTERISTICS

Volumes I-A through IX

SECTION 1

MILITARY AIRCRAFT

containing data on

Beechcraft T-34A
Bell H-13H (47G-2)
Bell H-40
Boeing B-47B/B-47E
Boeing KC-97G
Boeing KC-135A
Cessna L-19 A/E (OE-1)
Cessna TL-19D
Cessna T-37A
Convair C-131A
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Convair T-29C
Curtiss C-46R
Douglas C-124C
Douglas C-133A
Douglas RB/WB-66B
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Grumman SA-16A-GR (UF-1)
Hayes-Boeing KB-50J/KB-50K
Hiller H-23D
Lockheed C-121 C/G
Lockheed C-130A
Lockheed T2V-1
Lockheed T-33A-1
Martin B-57B
North American F-86L
North American TB-25M
North American T-28A
North American T-28B
North American T2J-1
Northrop F-89H
Republic F-84F Series
Sikorsky H-19D
Sikorsky H-34A (S-58) (HSS-1)
Sikorsky H-37A
Vertol H-21C (44-B)

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NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated 33 knots above V2 speed Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration. If flaps are utilized, flap retraction is initiated at approximately 200 feet altitude.

Speed (knots IAS)

	100% Flaps
Minimum (flap retraction)	67
Maximum (flap retraction)	109

Distance (from lift off point to end of pre-climb)

Minimum 0 8 nautical mile
Maximum 1.5 nautical miles
Operationally desirable 1.5 nautical miles (see Figure 1)

Time (from lift off point to end of pre-climb)

Minimum 0 5 minute
Maximum 1 0 minute
Operationally desirable 1.0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 500 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

13 2 pounds (estimated)

Maneuver

First turn after take-off at 200 feet altitude.

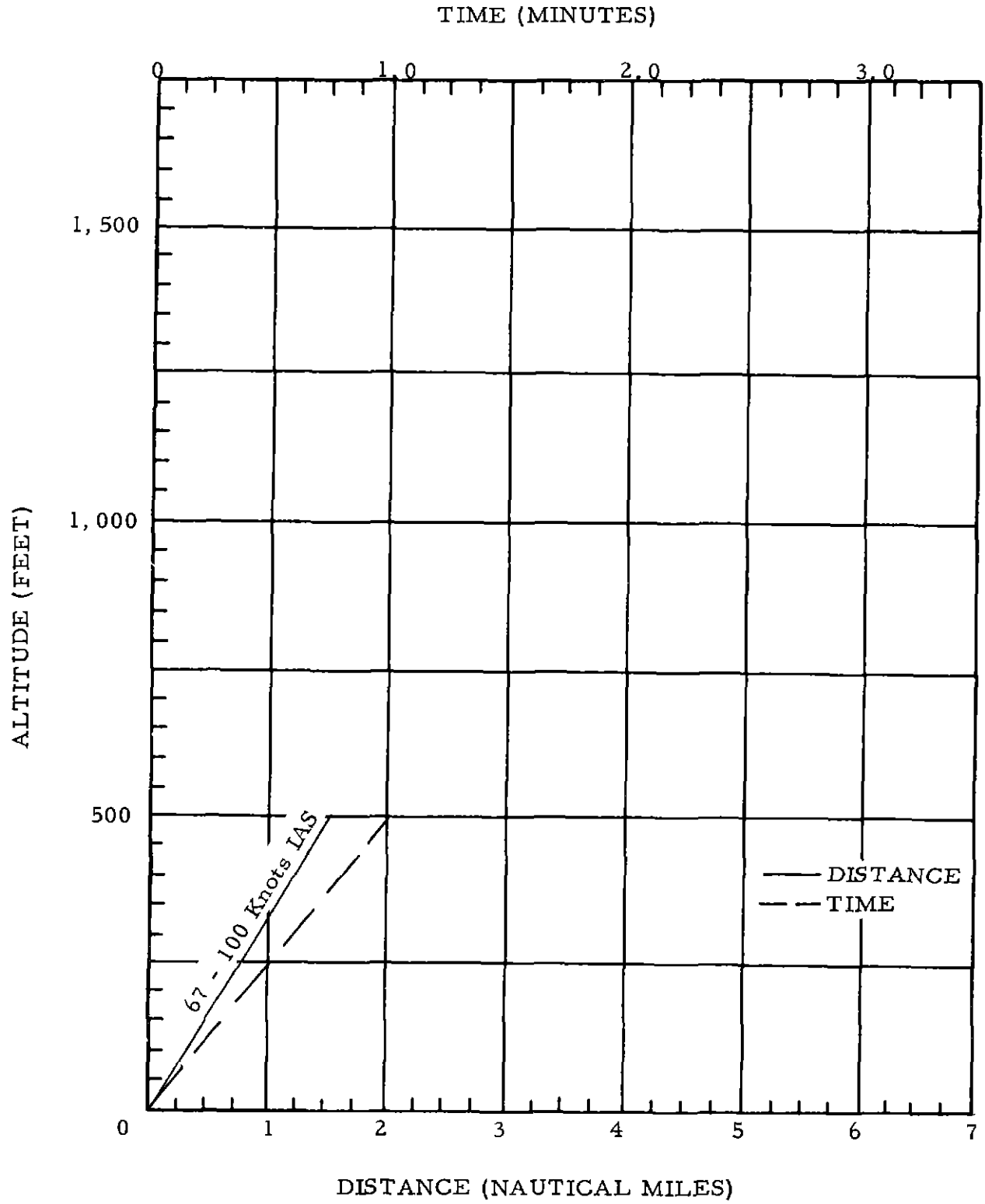

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the helicopter is accelerated to 25 knots above V2 speed A pre-climb attitude is continued until a minimum of 50 feet altitude is attained. From this altitude, while maintaining a constant airspeed of 40 knots IAS a 500 fpm rate of climb is established Upon reaching 100 feet altitude, the helicopter will normally be in climb configuration

Distance (from lift-off point to end of pre-climb)

Minimum 0 1 nautical mile
Maximum 0 2 nautical mile
Operationally desirable 0 1 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0. 2 minute
Maximum 0 5 minute
Operationally desirable 0 3 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 50 feet
Maximum 150 feet
Operationally desirable 100 feet

Fuel Consumed (from start engine through pre-climb)

10 pounds (estimated)

Maneuver

First turn after take-off is at 50 feet altitude or after clearing highest obstacle.

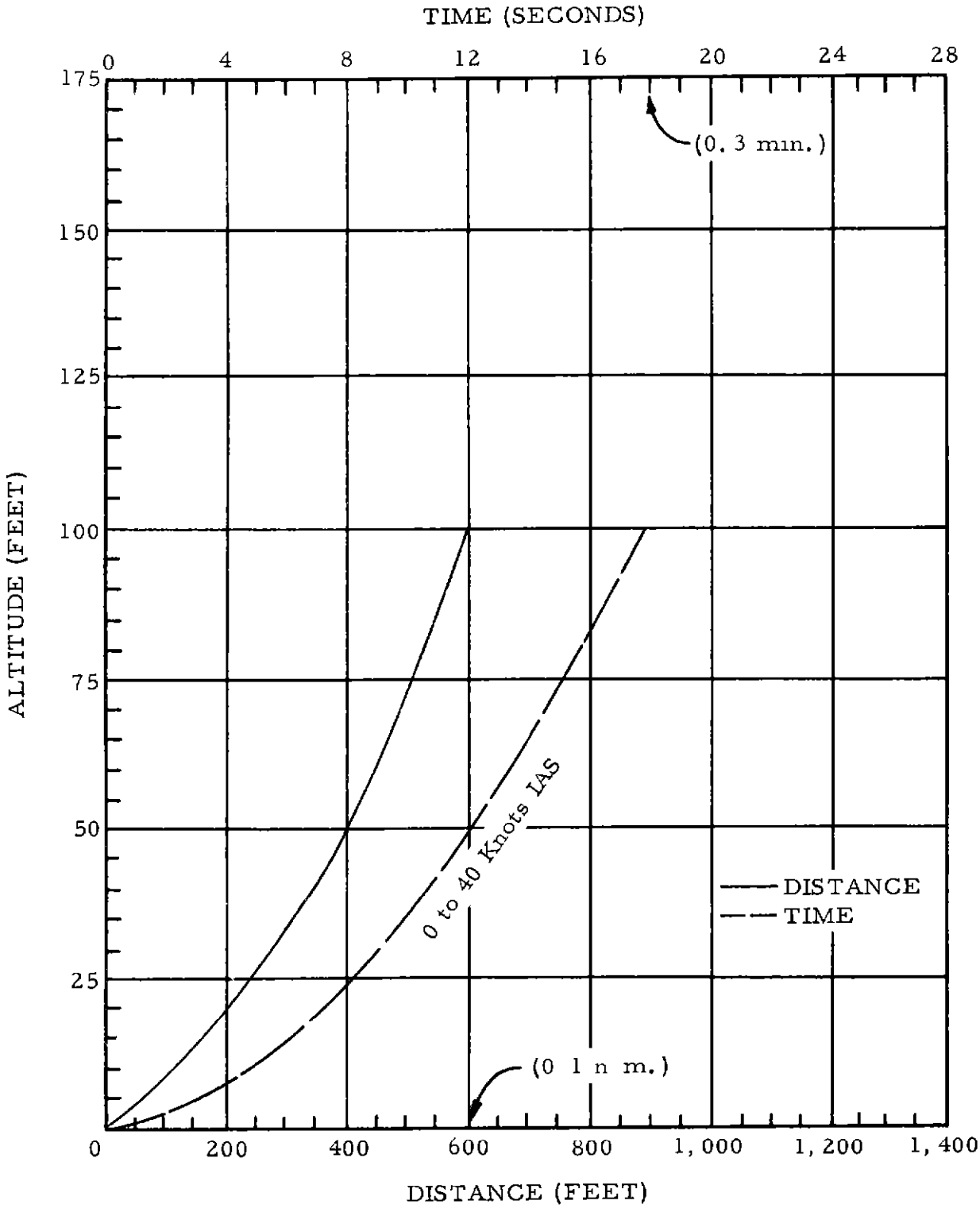

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the helicopter is accelerated to 20 knots above V2 speed A pre-climb attitude is continued until a minimum of 50 feet altitude is attained From this altitude, while maintaining a 1,000 fpm rate of climb, acceleration is continued to 60 knots IAS Upon reaching 100 feet altitude, the helicopter will normally be in climb attitude

Distance (from lift-off point to end of pre-climb)

Minimum 0 1 nautical mile
Maximum 0 3 nautical mile
Operationally desirable 0 2 nautical mile (see Figure 1)

Time (from lift-off to end of pre-climb)

Minimum 0 2 minute
Maximum 0 5 minute
Operationally desirable. 0 3 minute (see Figure 1)

Altitude

Minimum 50 feet
Maximum 150 feet
Operationally desirable. 100 feet

Fuel Consumed (from start engine through pre-climb)

20 pounds (estimated)

Maneuver

First turn after take-off at 50 feet altitude or after clearing highest obstacle

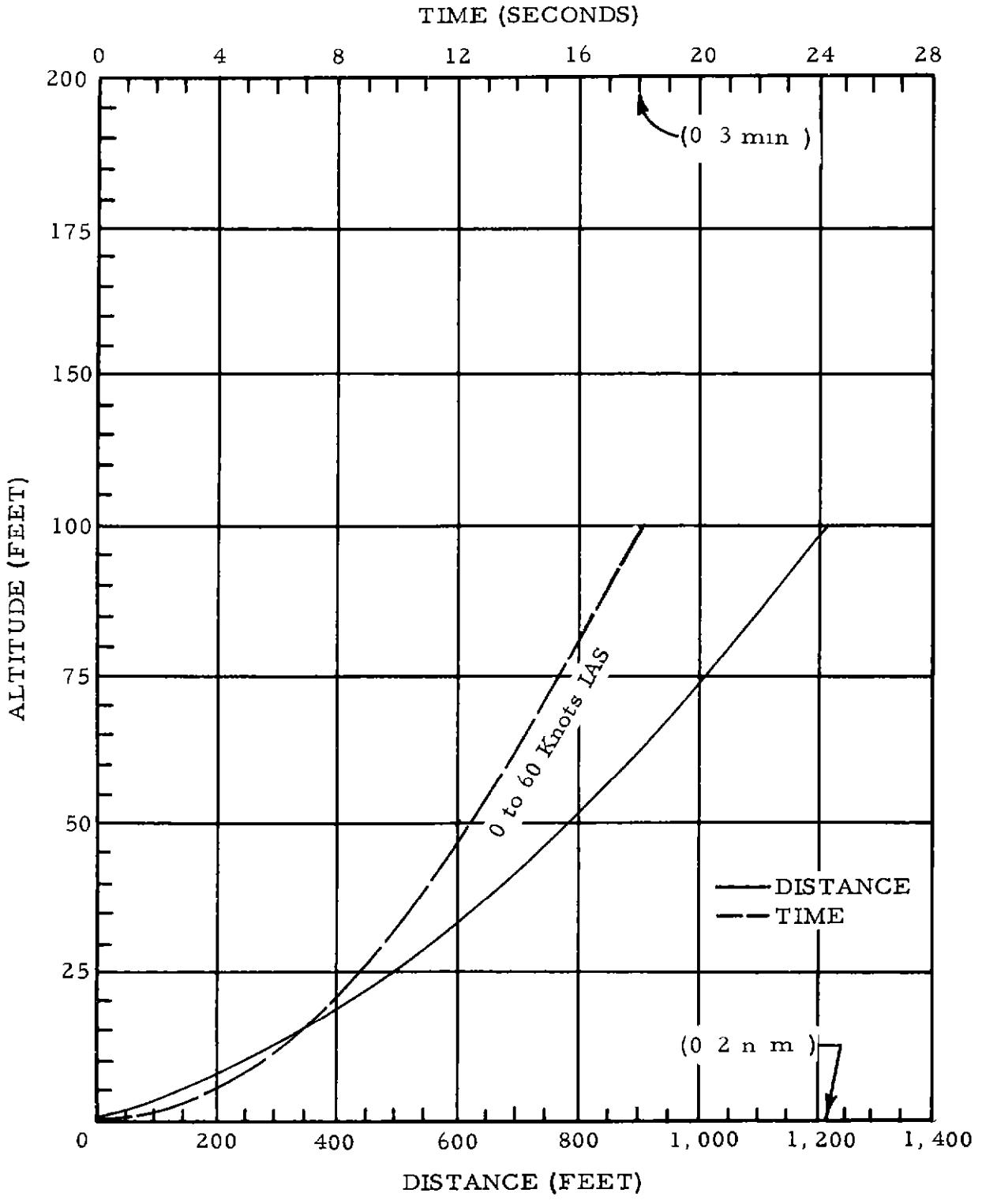

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 20 knots above V2 speed. A pre-climb attitude is continued with a full flaps configuration until a minimum of 300 feet altitude is attained. At this altitude flap retraction is initiated while maintaining a minimum rate of climb of 300 fpm and a definite increase in airspeed. Upon reaching 1,000 feet altitude and 310 knots IAS the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	100% Flaps	50% Flaps	22-1/2% Flaps
Minimum (flap retraction)	195	205	220
Maximum (flap retraction)	195	230	236

Distance (from lift-off point to end of pre-climb)

Minimum 9 nautical miles
Maximum 10 nautical miles
Operationally desirable: 10 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 2 minutes
Maximum 3 minutes
Operationally desirable: 3 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1,000 feet
Operationally desirable. 1,000 feet

Fuel Consumed (from start engines through pre-climb)

5,000 pounds estimated

Maneuver

First turn after take-off at 500 feet.

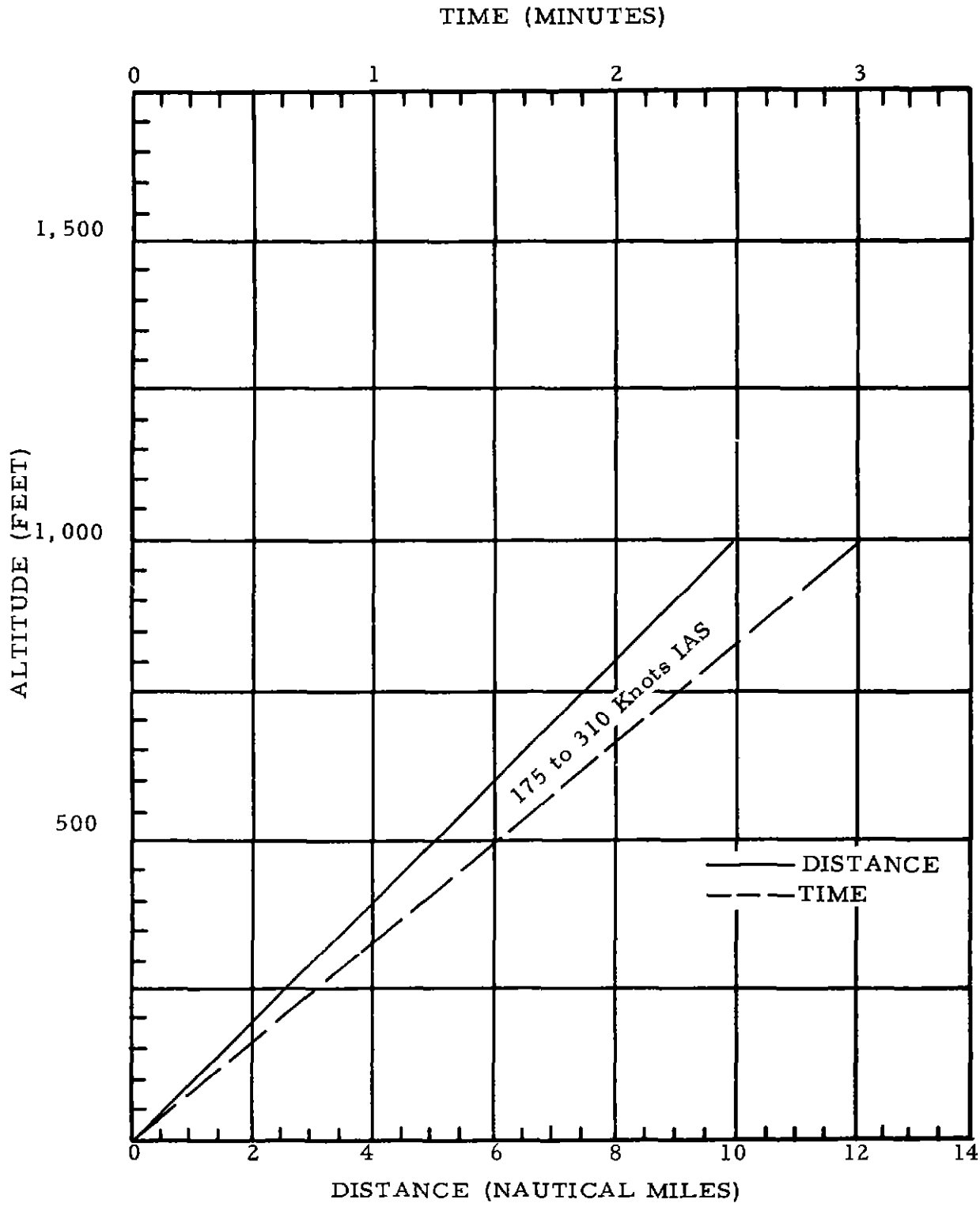

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 15 knots above V2 speed A pre-climb attitude is continued with flaps extended 33 degrees until a minimum of 200 feet altitude is attained At this altitude, flap retraction is initiated while maintaining a shallow rate of climb and a positive increase in airspeed to 170 knots IAS Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	45° Flaps	22° Flaps
Minimum (flap retraction)	125	125
Maximum (flap retraction)	142	165

Distance (from lift-off point to end of pre-climb)

Minimum 8 0 nautical miles
Maximum 12 3 nautical miles
Operationally desirable 8 0 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 3 0 minutes
Maximum 5 0 minutes
Operationally desirable 3 0 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1,000 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

650 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

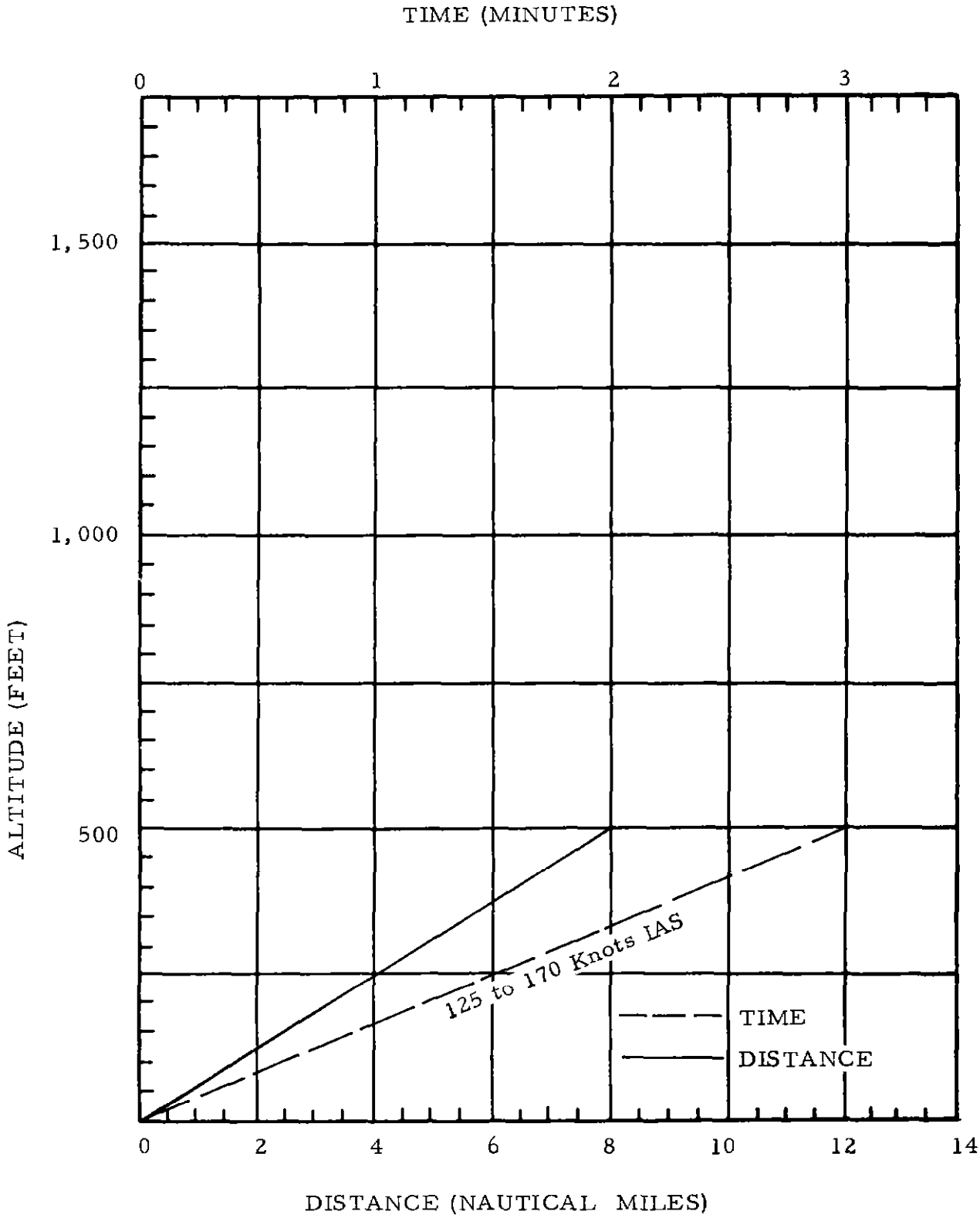

FIGURE 1 - PRE-CLIMB - TIME AND DISTANCE DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 10 knots above V2 speed A pre-climb attitude is continued with flaps extended 30 degrees until a minimum of 500 feet altitude is attained At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 1, 200 fpm and a positive increase in airspeed Upon reaching 1, 500 feet altitude and 280 knots IAS, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	30° Flaps
Minimum (flap retraction)	162
Maximum (flap retraction)	210

Distance (from lift-off point to end of pre-climb)

Minimum 7 0 nautical miles
Maximum 10 0 nautical miles
Operationally desirable. 10 0 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 2 0 minutes
Maximum 3 0 minutes
Operationally desirable 3 0 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 1, 000 feet
Maximum· 1, 500 feet
Operationally desirable 1, 500 feet

Fuel Consumed (from start engines through pre-climb)

4, 000 pounds (estimated)

Maneuver

First turn after take-off at 1, 000 feet altitude

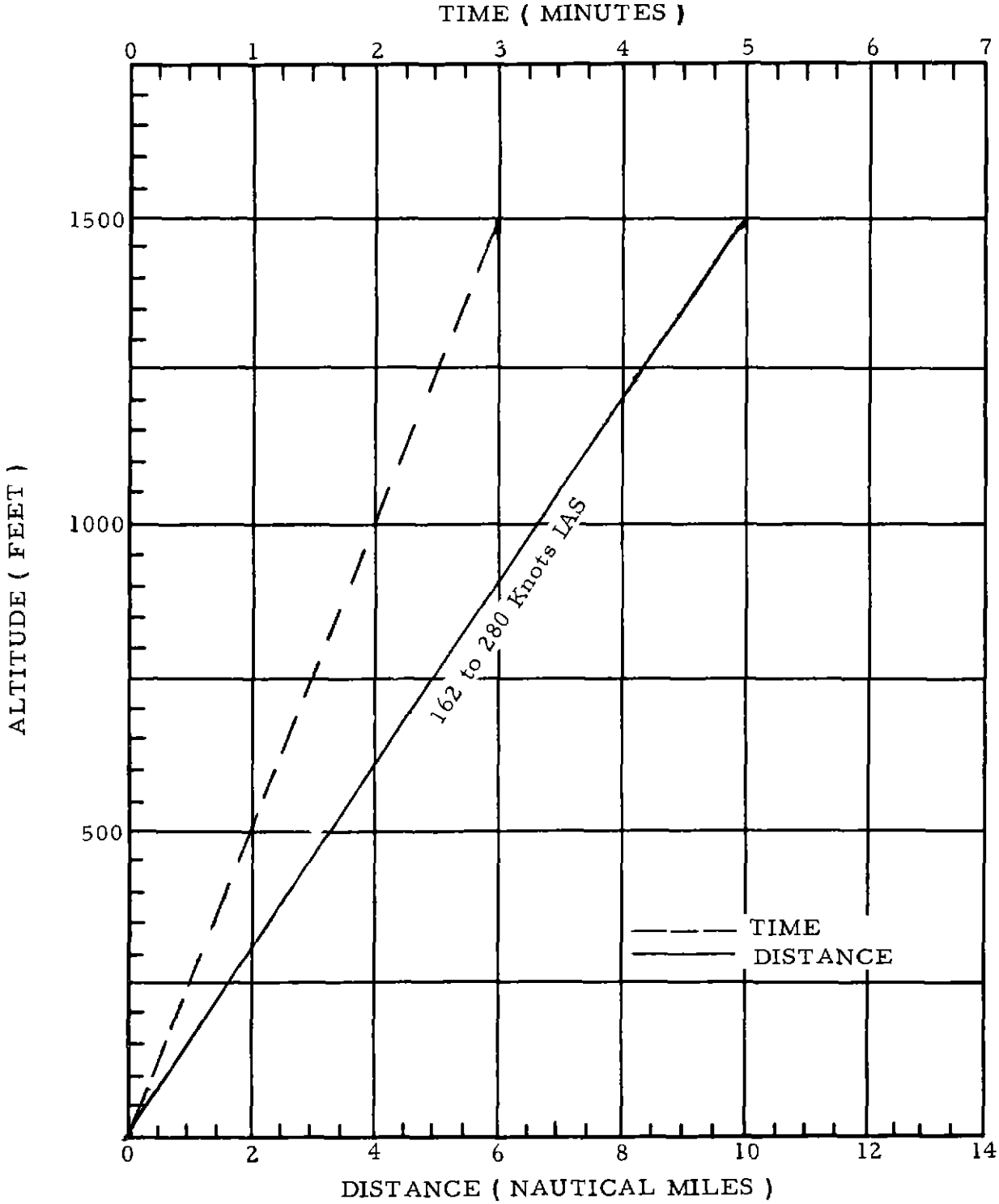

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the aircraft is accelerated to 12 knots above V2 speed A pre-climb attitude is continued until a minimum of 100 feet altitude is attained At this altitude flap retraction is initiated and airspeed is increased to 55 knots IAS while maintaining a positive rate of climb Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	All Flap Settings
Minimum (flap retraction)	49
Maximum (flap retraction)	87

Distance (from lift-off point to end of pre-climb)

Minimum 0 4 nautical mile
Maximum 0. 8 nautical mile
Operationally desirable 0 6 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0. 5 minute
Maximum 1. 0 minute
Operationally desirable 0 8 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 500 feet
Operationally desirable. 500 feet

Fuel Consumed (from start of engines through pre-climb)

10 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude

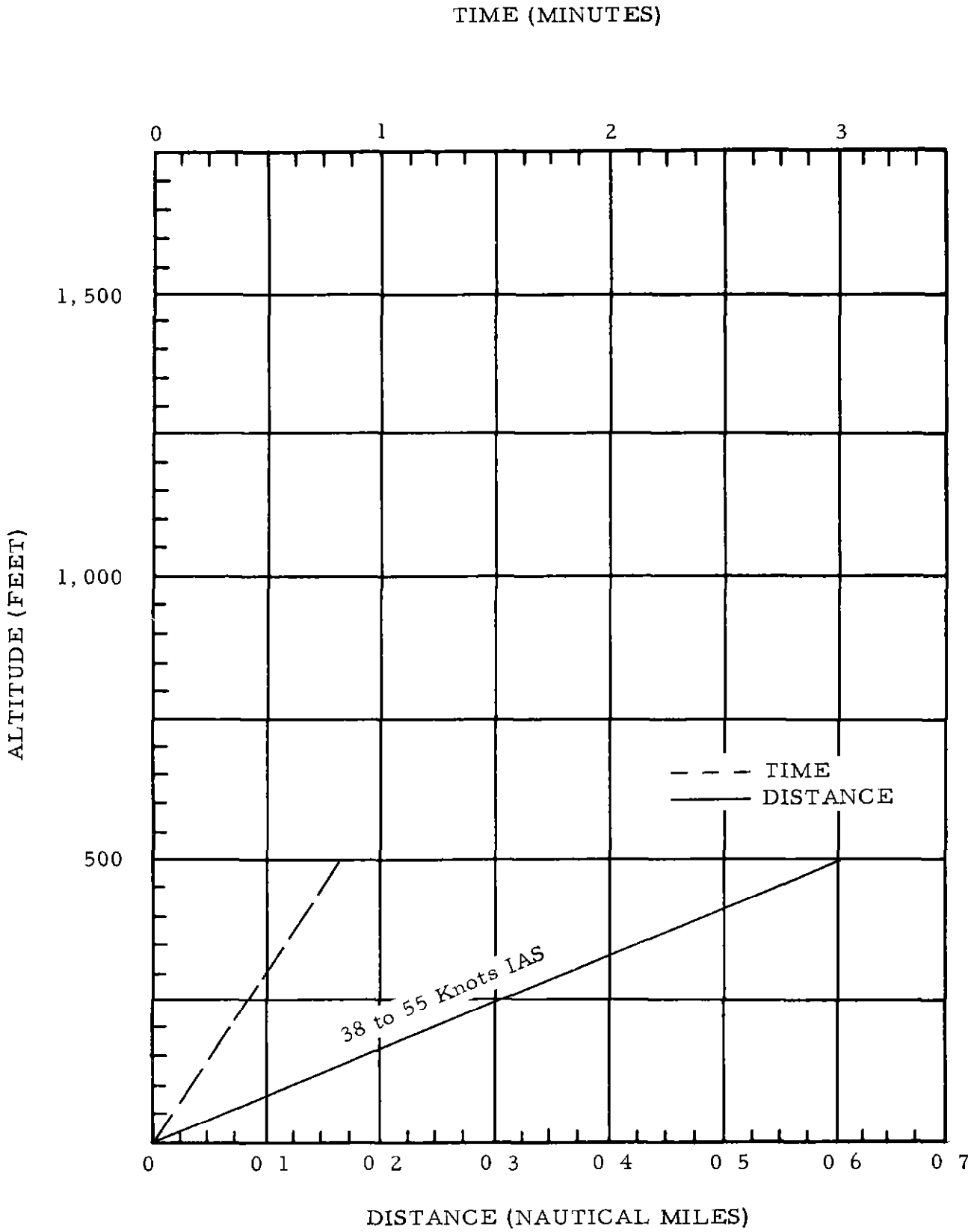

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the aircraft is accelerated to 6 knots above V2 speed A pre-climb attitude is continued until a minimum of 300 feet altitude is attained At this altitude airspeed is increased to 72 knots IAS while maintaining a positive rate of climb. Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean) If flaps are utilized for take-off, flap retraction is initiated at approximately 300 feet altitude

Speed (knots IAS)

	All Flap Settings
Minimum (flap retraction)	60
Maximum (flap retraction)	87

Distance (from lift-off point to end of pre-climb)

Minimum 0 6 nautical mile
Maximum 1 0 nautical mile
Operationally desirable 0 8 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 6 minute
Maximum 1 0 minute
Operationally desirable 0 8 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 500 feet
Operationally desirable. 500 feet

Fuel Consumed (from start engines through pre-climb)

10 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude

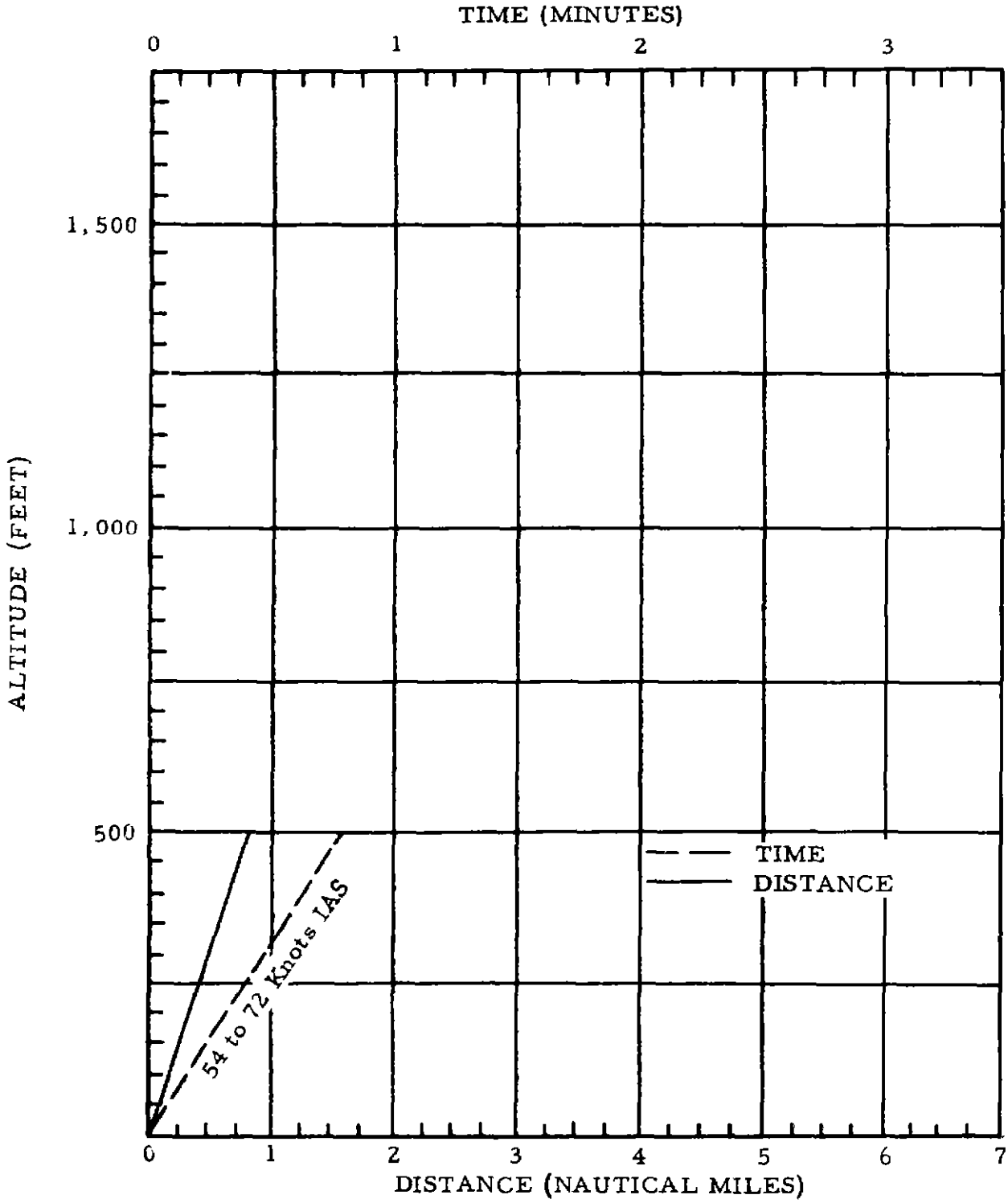

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted Flaps remain extended 20 degrees until a minimum airspeed of 22 knots above V2 speed is attained Flaps are then retracted and the aircraft is accelerated to 190 knots IAS. Upon reaching 1,000 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	20°Flaps
Minimum (flap retraction)	110
Maximum (flap retraction)	135

Distance (from lift-off point to end of pre-climb)

Minimum 1 2 nautical miles
Maximum 3 5 nautical miles
Operationally desirable 2 3 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0. 5 minute
Maximum 1 5 minutes
Operationally desirable 1. 0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1, 500 feet
Operationally desirable 1, 000 feet

Fuel Consumed (from start engines through pre-climb)

134 pounds (estimated)

Maneuver

First turn after take-off at 200 feet altitude

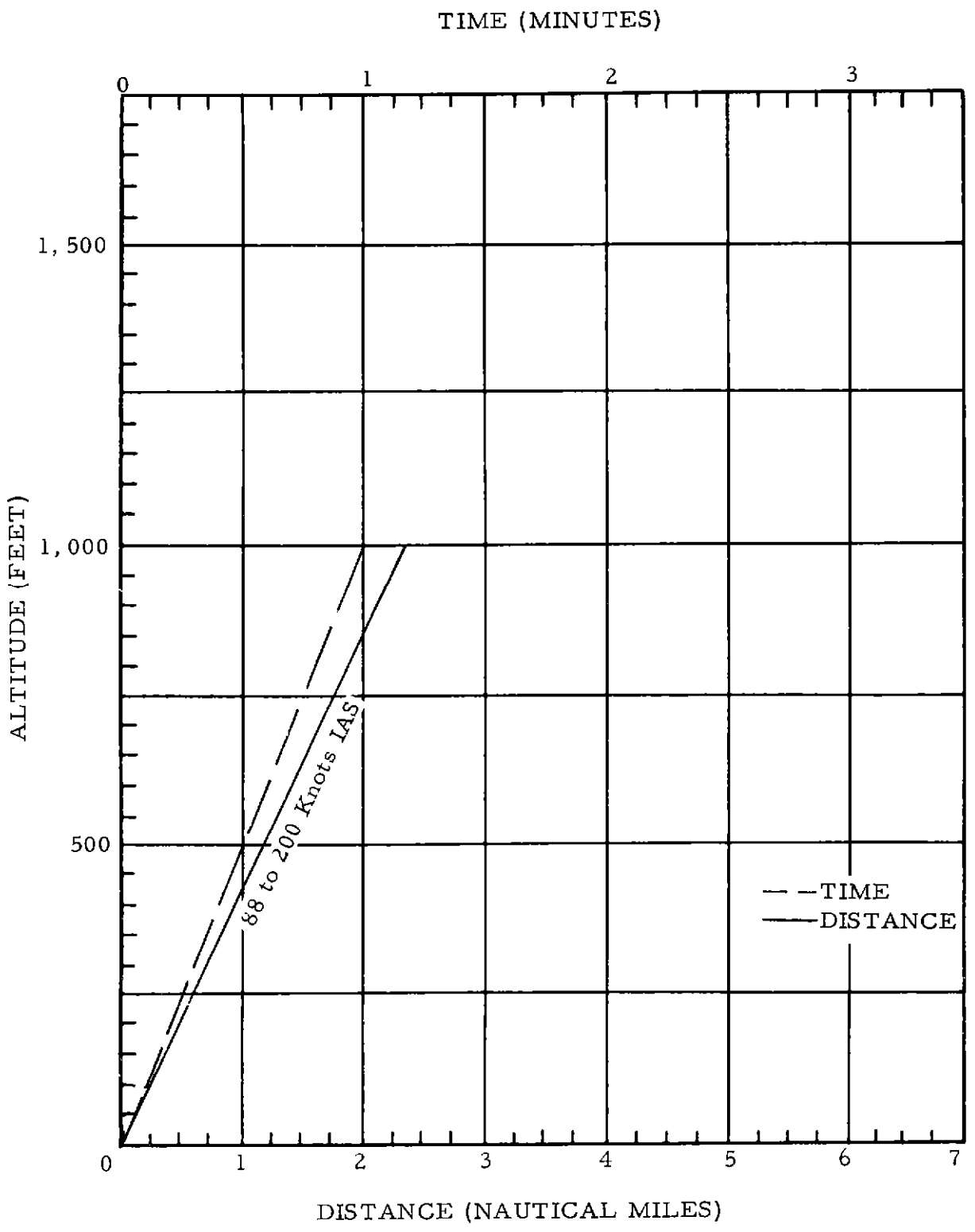

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 14 knots above V2 speed. A pre-climb attitude is continued with a 12 degrees flaps configuration until a minimum of 300 feet altitude is attained. At this altitude, flap retraction is initiated while airspeed is increased to 145 knots IAS Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	50° Flaps
Minimum (flap retraction)	125
Maximum (flap retraction)	175

Distance (from lift-off point to end of pre-climb)

Minimum 1 0 nautical mile
Maximum: 2 1 nautical miles
Operationally desirable 2 1 nautical miles (see F gure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0. 5 minute
Maximum. 1. 0 minute
Operationally desirable 1. 0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum· 500 feet
Maximum. 1, 200 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

300 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude.

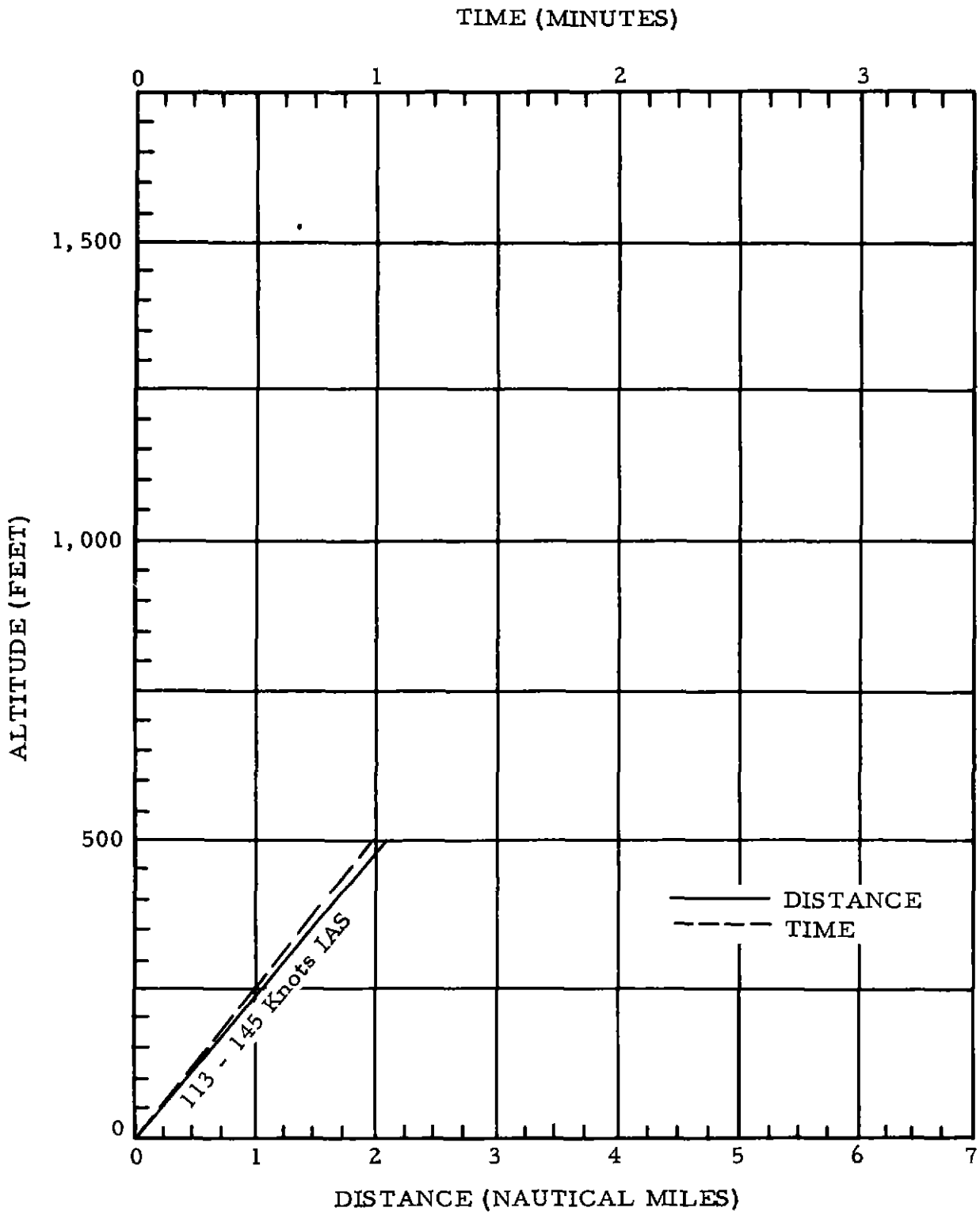

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 28 knots above V2 speed At this airspeed, flap retraction is initiated Airspeed is then increased to 145 knots IAS Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	11° Flaps
Minimum (flap retraction)	125
Maximum (flap retraction)	174

Distance (from lift-off point to end of pre-climb)

Minimum 0 9 nautical mile
Maximum 3 0 nautical miles
Operationally desirable 1 5 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.4 minute
Maximum 1 4 minutes
Operationally desirable 0 7 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 1,000 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

240 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

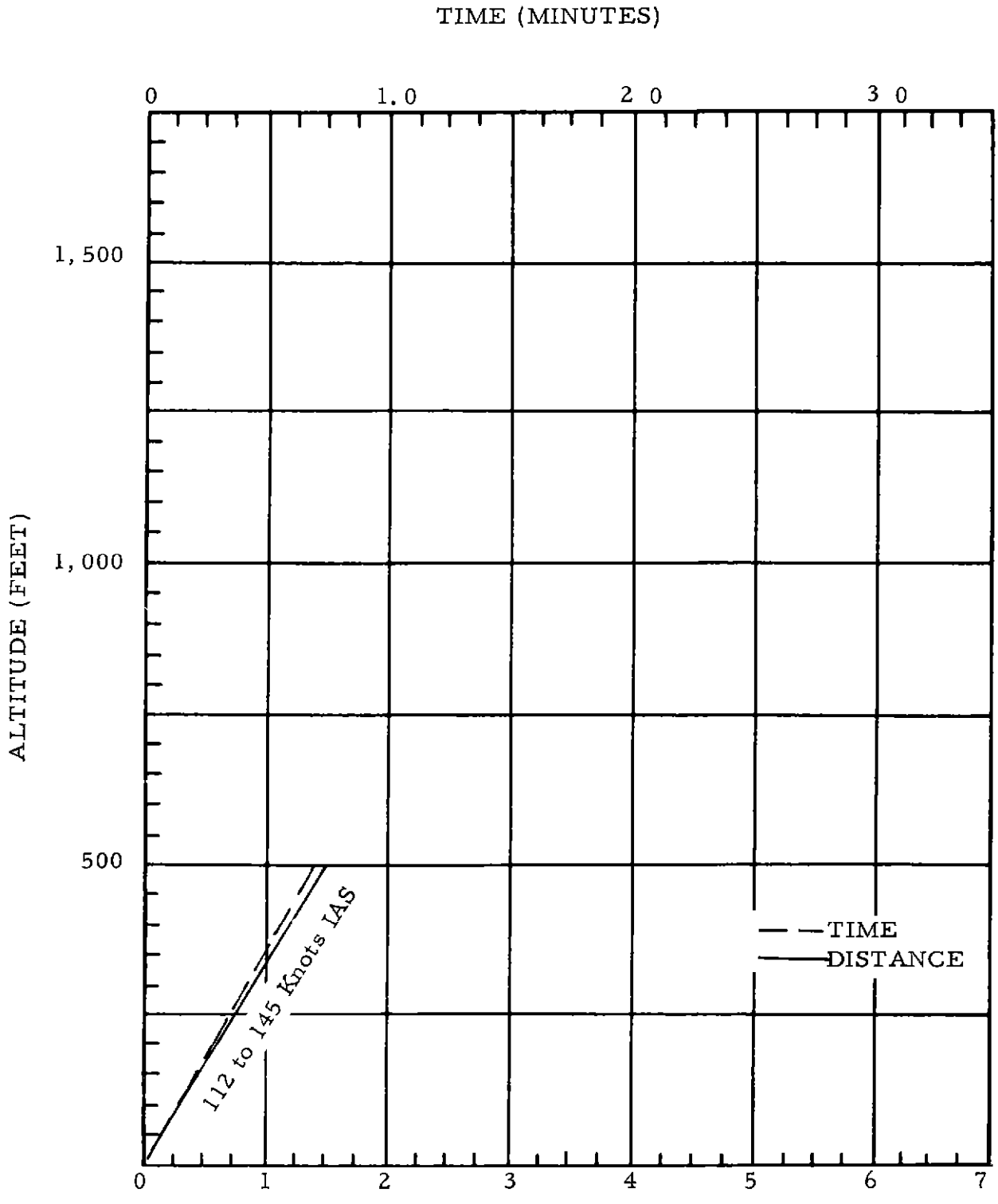

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 10 knots above V2 speed. A pre-climb attitude is continued in this configuration until a minimum of 300 feet altitude is attained At this altitude, flap retraction is initiated. Upon reaching 400 feet altitude and an airspeed of 140 knots IAS, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	12° Flaps
Minimum (flap retraction)	125
Maximum (flap retraction)	200

Distance (from lift-off point to end of pre-climb)

Minimum 1 0 nautical mile
Maximum 2 0 nautical miles
Operationally desirable 1 5 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0. 5 minute
Maximum 0 9 minute
Operationally desirable 0. 7 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 500 feet
Operationally desirable 400 feet

Fuel Consumed (from start engines through pre-climb)

497 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude

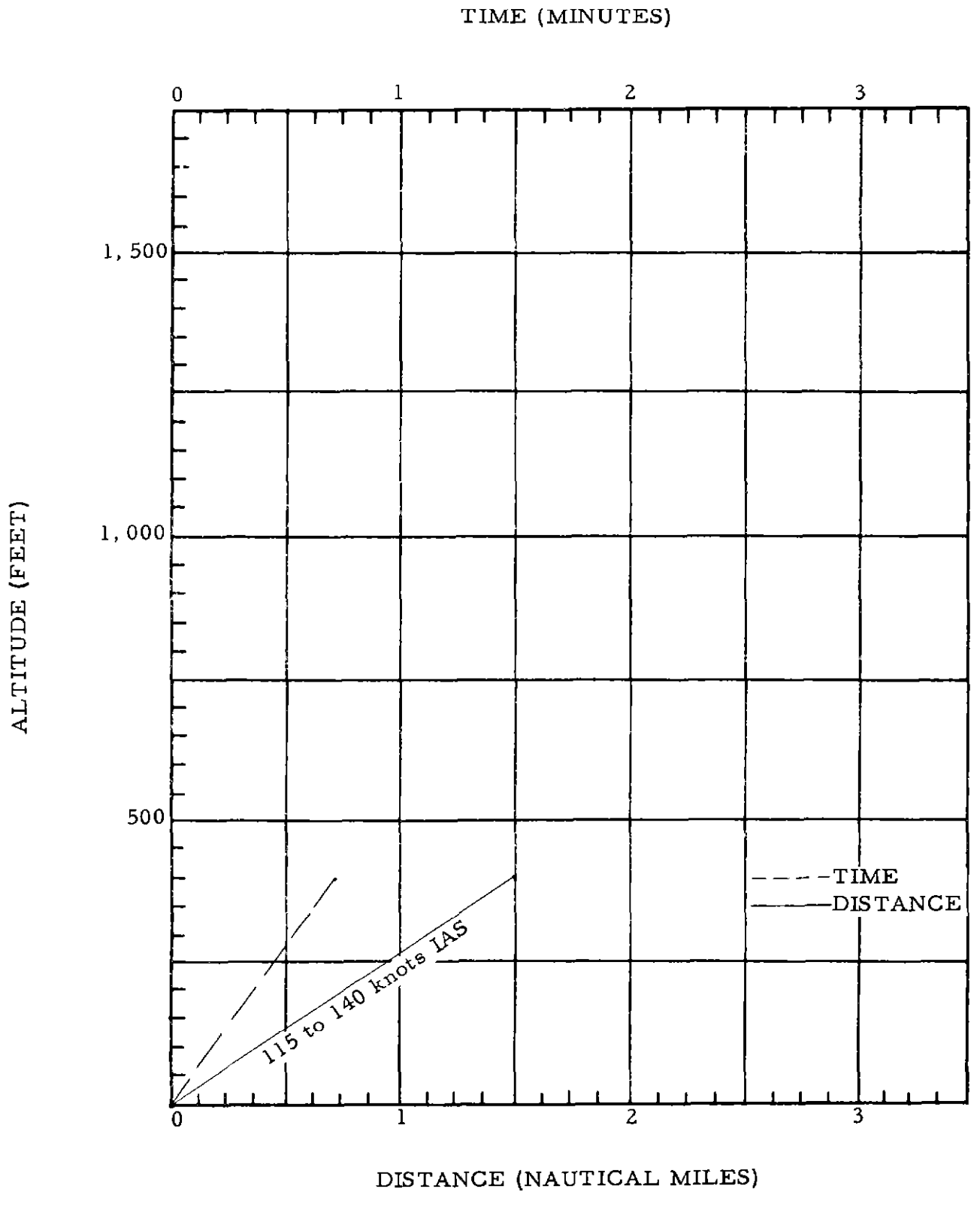

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 10 knots above V2 speed A pre-climb attitude is continued at a minimum rate of climb of 500 fpm with a positive increase in airspeed to 122 knots IAS. At 300 feet altitude, the aircraft will normally be in climb configuration(clean). If flaps are utilized, flap retraction is initiated at approximately 200 feet altitude.

Speed (knots IAS)

	At All Flap Settings
Minimum (flap retraction)	95
Maximum (flap retraction)	114

Distance (from lift-off point to end of pre-climb)

Minimum 1.4 nautical miles
Maximum 3 6 nautical miles
Operationally desirable· 1 8 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum. 0 8 minute
Maximum 2 0 minutes
Operationally desirable 1 0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum· 300 feet
Maximum 1,000 feet
Operationally desirable 300 feet

Fuel Consumed (from start engines through pre-climb)

162 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude

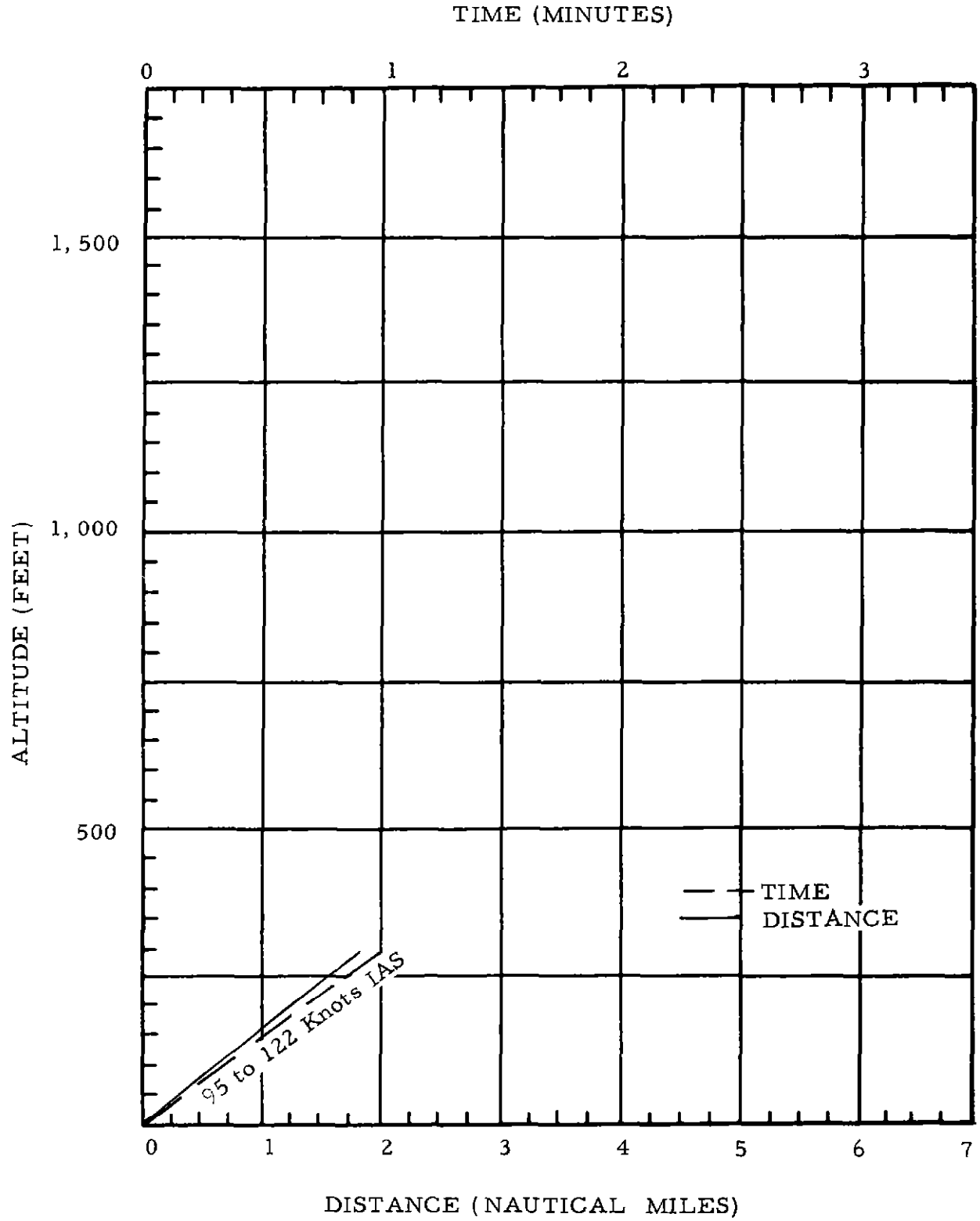

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 20 knots above V2 speed A pre-climb attitude is continued with flaps extended 20 degrees until a minimum of 400 feet altitude is attained At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 500 fpm and a definite increase in airspeed to 148 knots IAS. Upon reaching 1,000 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	20° Flaps
Minimum (flap retraction)	107
Maximum (flap retraction)	132

Distance (from lift-off point to end of pre-climb)

Minimum 1 3 nautical miles
Maximum 4 3 nautical miles
Operationally desirable 3 0 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 6 minute
Maximum 2. 0 minutes
Operationally desirable 1. 4 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 400 feet
Maximum 1, 500 feet
Operationally desirable 1, 000 feet

Fuel Consumed (from start engines through pre-climb)

1 510 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

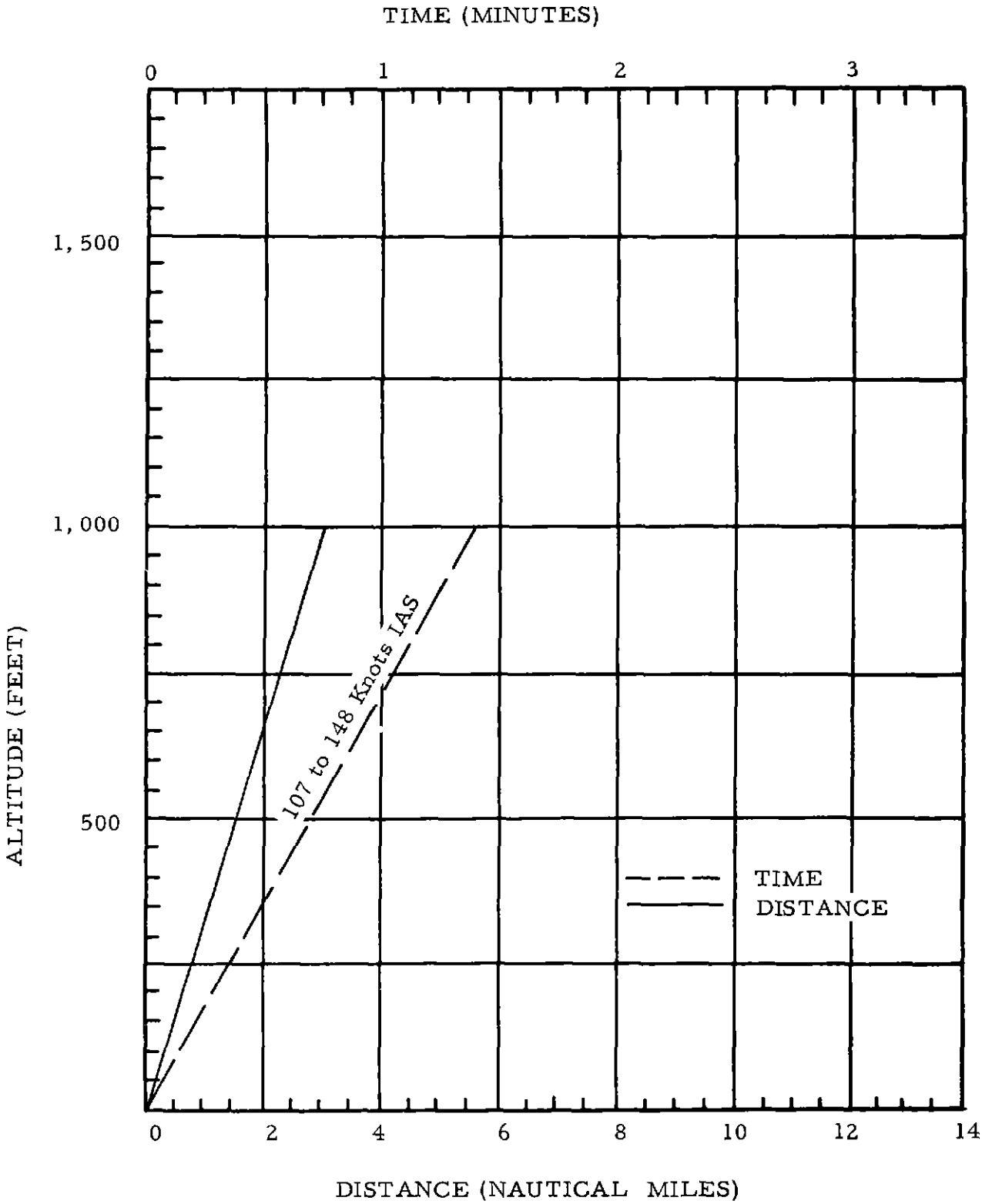

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations (estimated)

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 20 knots above V2 speed At this speed, flap retraction is initiated Upon reaching 1, 000 feet altitude, the aircraft will normally be in climb configuration (clean) and at climb airspeed (200 knots TAS)

Speed (knots IAS)

	25° Flaps
Minimum (flap retraction)	139
Maximum (flap retraction)	205

Distance (from lift-off point to end of pre-climb) (estimated)

Minimum 1 2 nautical miles
Maximum 3 0 nautical miles
Operationally desirable 2. 3 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb) (estimated)

Minimum 0 4 minute
Maximum 1 0 minute
Operationally desirable 0 8 minute (see Figure 1)

Altitude (at end of pre-climb) (estimated)

Minimum 500 feet
Maximum 1, 500 feet
Operationally desirable 1, 000 feet

Fuel Consumed (from start engines through pre-climb)

1, 300 pounds (estimated)

Maneuver

First turn after take-off at 1, 000 feet altitude (estimated)

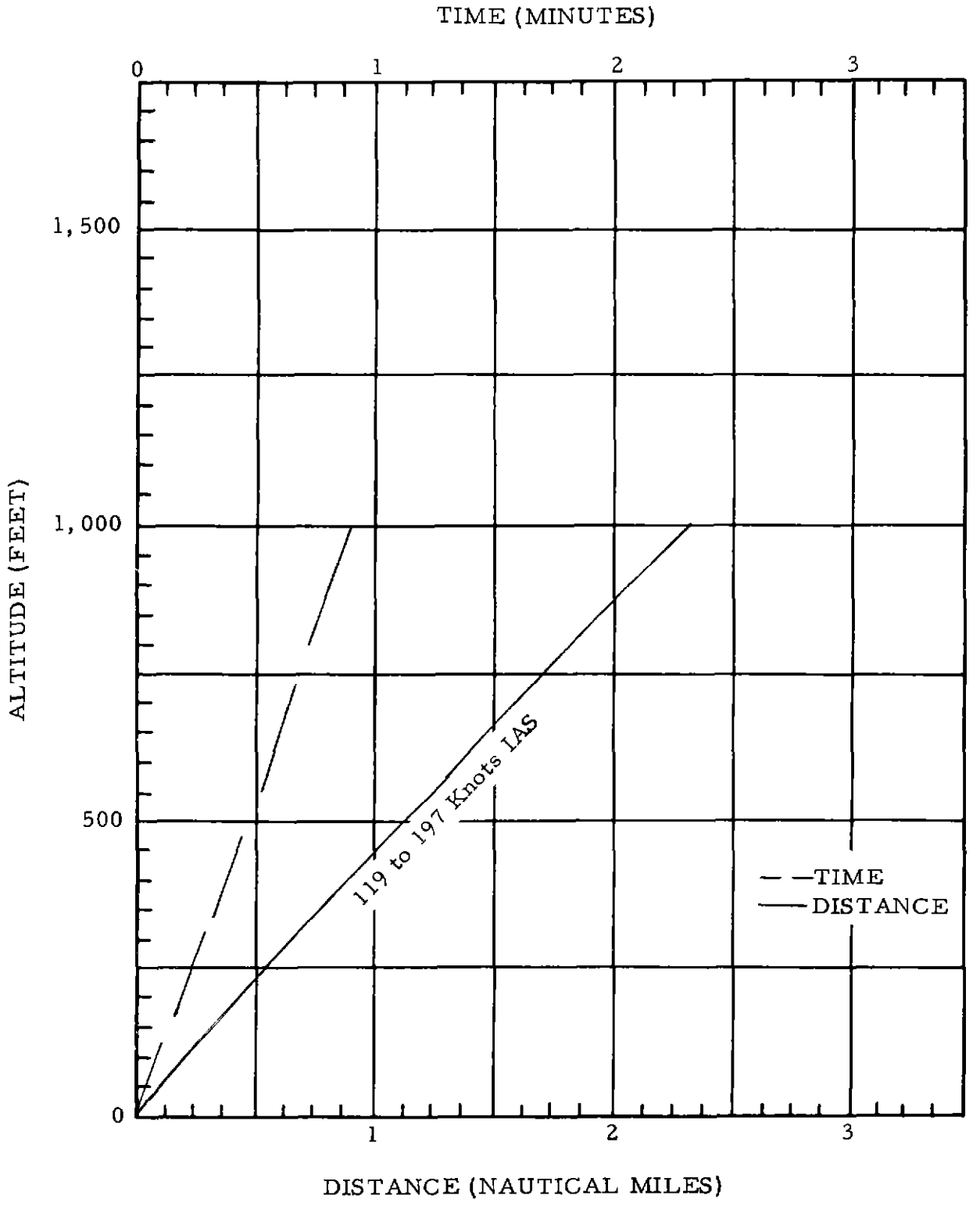

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 20 knots above V2 speed. At this airspeed, flap retraction is initiated while maintaining a normal rate of climb of 1, 150 fpm and a positive increase in airspeed Upon reaching 1, 000 feet altitude, the aircraft will normally be in climb configuration (clean) The aircraft continues in this attitude until a climb airspeed of 350 knots IAS and an altitude of 5, 000 feet is attained

Speed (knots IAS)

	60% Flaps
Minimum (flap retraction)	Not available from operator
Maximum (flap retraction)	220

Distance (from lift-off point to end of pre-climb)

Minimum 7 0 nautical miles
Maximum 17 0 nautical miles
Operationally desirable 17 0 nautical miles

Time (from lift-off point to end of pre-climb)

Minimum 2 0 minutes
Maximum 3 8 minutes
Operationally desirable 3 8 minutes

Altitude (at end of pre-climb)

Minimum 2, 400 feet
Maximum 5 000 feet
Operationally desirable 5, 000 feet

Fuel Consumed (from start engines through pre-climb)

2, 350 pounds (estimated)

Maneuver

First turn after take-off Not available from operator.

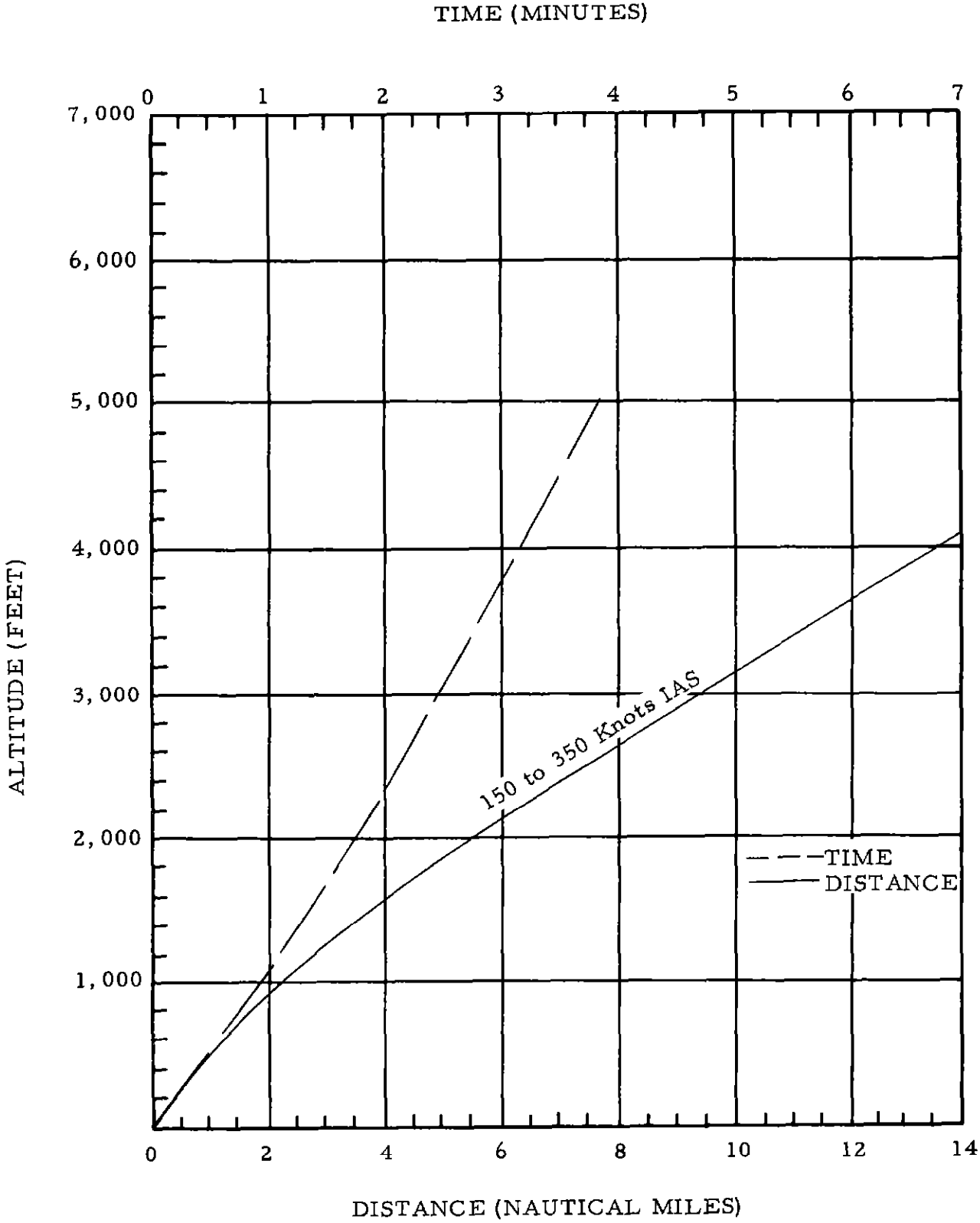

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 24 knots above V2 speed If flaps are utilized, a preclimb attitude is continued until a minimum of 200 feet altitude is attained. At this altitude, flap retraction is initiated while maintaining a shallow rate of climb, and an increase in airspeed. Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	100% Flaps
Minimum (flap retraction)	90
Maximum (flap retraction)	140

Distance (from lift off point to end of pre-climb)

Minimum 0.5 nautical mile
Maximum. 1.0 nautical mile
Operationally desirable 1.0 nautical mile

Time (from lift off point to end of pre-climb)

Minimum 0.3 minute
Maximum 0.5 minute
Operationally desirable 0.5 minute

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 500 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

557 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude.

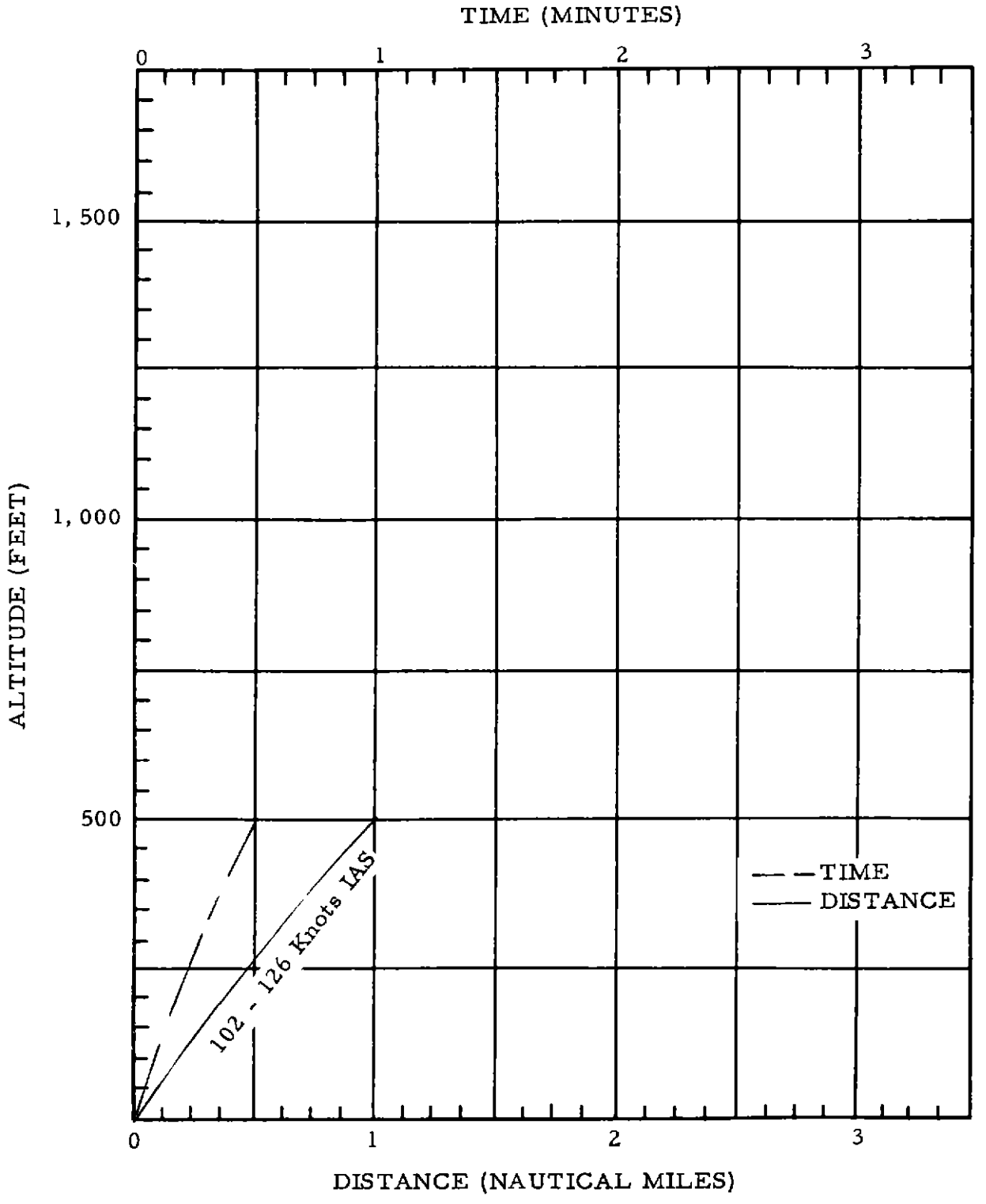

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 22 knots above V2 speed. While maintaining an airspeed of 122 knots IAS, a minimum rate of climb of 500 fpm is established. Upon reaching 200 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	20° Flaps
Minimum (flap retraction)	89
Maximum (flap retraction)	132

Distance (from lift-off point to end of pre-climb)

Minimum 0 6 nautical mile
Maximum 1 1 nautical miles
Operationally desirable 0.6 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 3 minute
Maximum 0 6 minute
Operationally desirable 0.3 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 200 feet
Maximum 500 feet
Operationally desirable 200 feet

Fuel Consumed (from start engines through pre-climb)

566 pounds (estimated)

Maneuver

First turn after take-off at 200 feet altitude

Alternate Pre-Climb Procedure

Maximum Performance (flaps extended 20 degrees)

As soon as definitely airborne, the gear is retracted. After attaining a minimum of 50 feet of altitude or clearance over the highest obstacle, and establishing safe single engine speed, flap rectraction is initiated. The aircraft is then accelerated to a climb airspeed of 122 knots IAS and a minimum rate of climb of 500 fpm is established Upon reaching 300 feet altitude, the aircraft will normally be in climb configuration (clean).

Distance (from lift-off point to end of pre-climb)

Minimum 0.8 nautical mile
Maximum 1.3 nautical miles
Operationally desirable 0.8 nautical mile (see Figure 2)

Time (from lift-off point to end of pre-climb)

Minimum. 0.5 minute
Maximum 0.8 minute
Operationally desirable 0.5 minute (see Figure 2)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 500 feet
Operationally desirable 300 feet

Fuel Consumed (from start engines through pre-climb)

558 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude

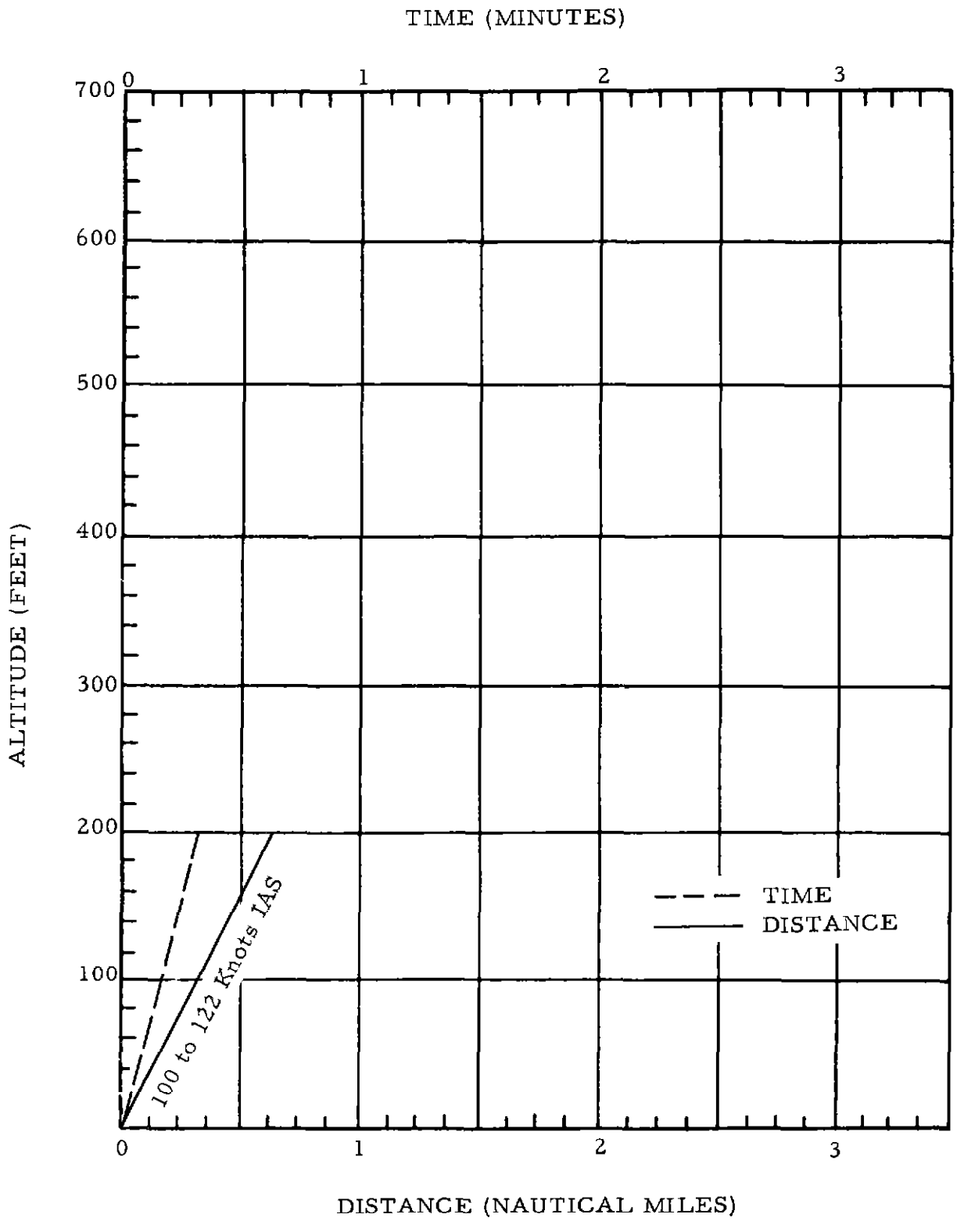

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

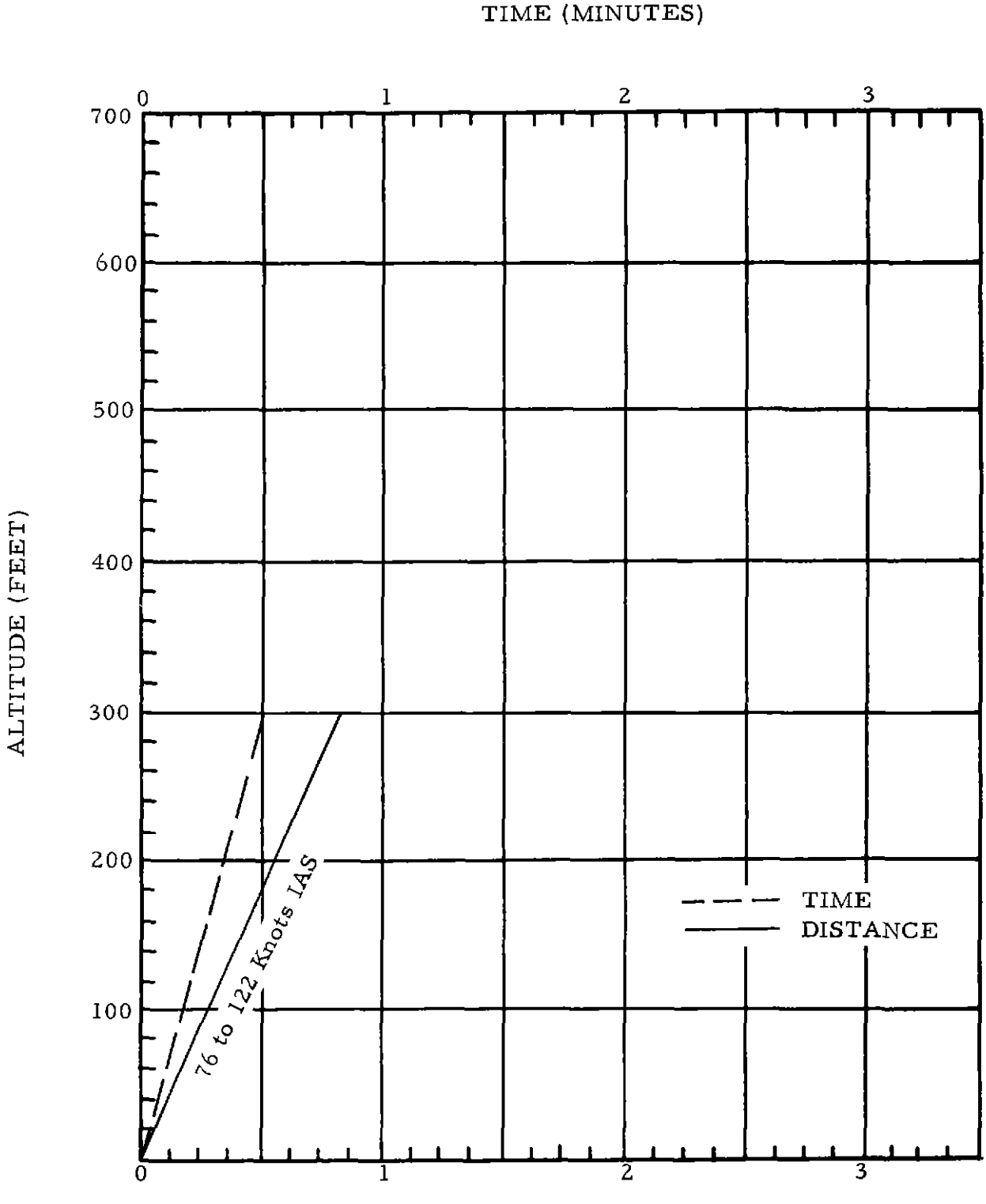

FIGURE 2 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the airship is accelerated to 4 knots above V2 speed A pre-climb attitude is continued until a minimum of 50 feet altitude is attained Upon reaching 300 feet altitude, the airship will normally be in climb configuration (clean)

Speed (knots IAS)

Minimum maneuver, 68,800 pounds 41
Minimum maneuver, 66,800 pounds 38
Minimum maneuver, 60,000 pounds 25

Distance (from lift-off point to end of pre-climb)

Minimum: 0.2 nautical mile
Maximum 0 5 nautical mile
Operationally desirable: 0 5 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 3 minute
Maximum 0 6 minute
Operationally desirable 0 6 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 50 feet
Maximum 300 feet
Operationally desirable 300 feet

Fuel Consumed (from start engines through pre-climb)

400 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

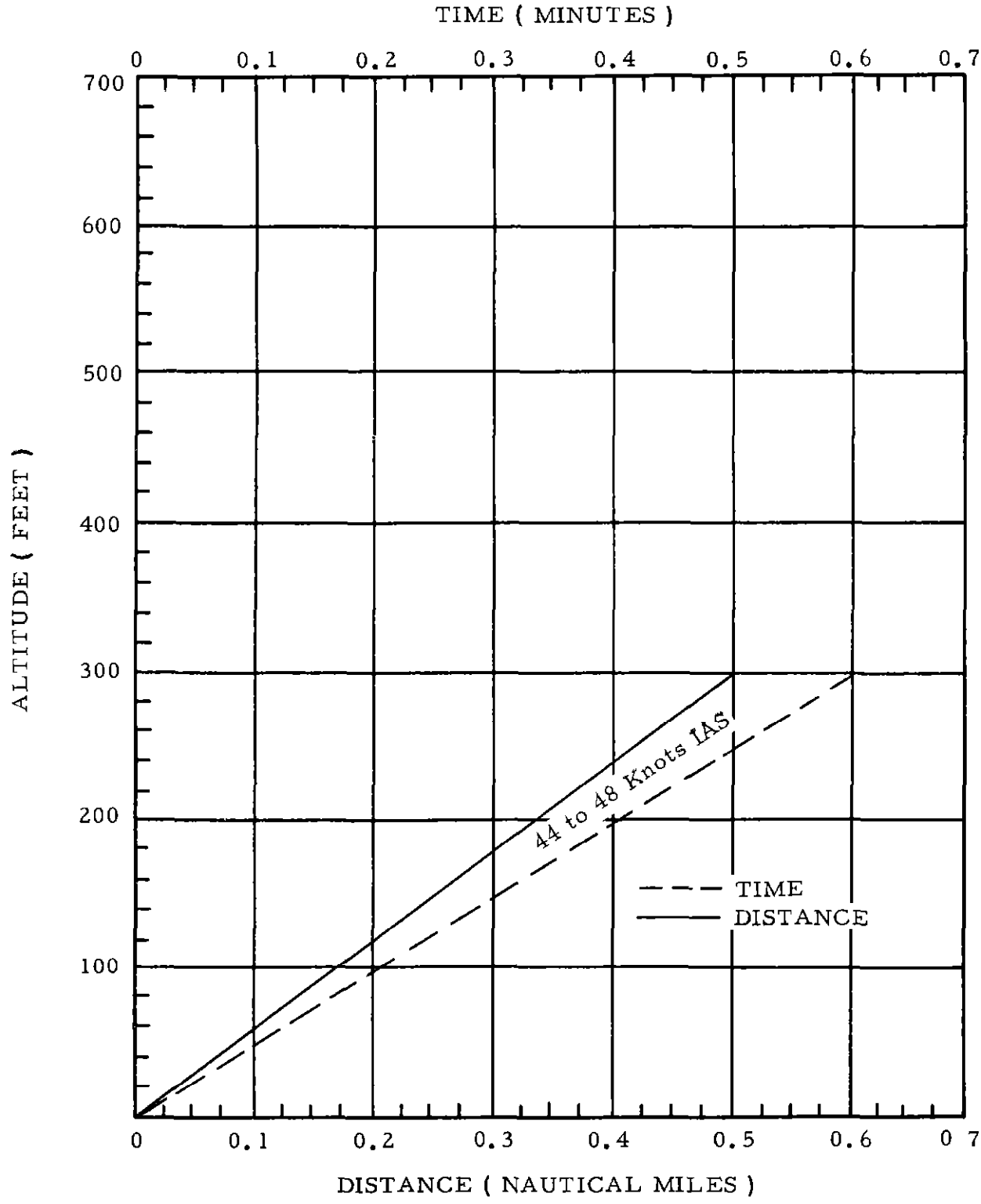

FIGURE 1 - PRE-CLIMB-DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the airship is accelerated to 5 knots above V2 speed A pre-climb attitude is continued until a minimum of 100 feet altitude is attained. Upon reaching 300 feet altitude, the airship will normally be in climb configuration (clean).

Speed (knots IAS)

Minimum maneuver, 90,000 pounds 44
Minimum maneuver, 85,000 pounds 39
Minimum maneuver, 80,000 pounds 35

Distance (from lift-off point to end of pre-climb)

Minimum 0 2 nautical mile
Maximum 0.8 nautical mile
Operationally desirable 0.5 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.2 minute
Maximum 1.0 minute
Operationally desirable. 0.6 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 100 feet
Maximum 500 feet
Operationally desirable 300 feet (see Figure 1)

Fuel Consumed (from start engines through pre-climb)

800 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude.

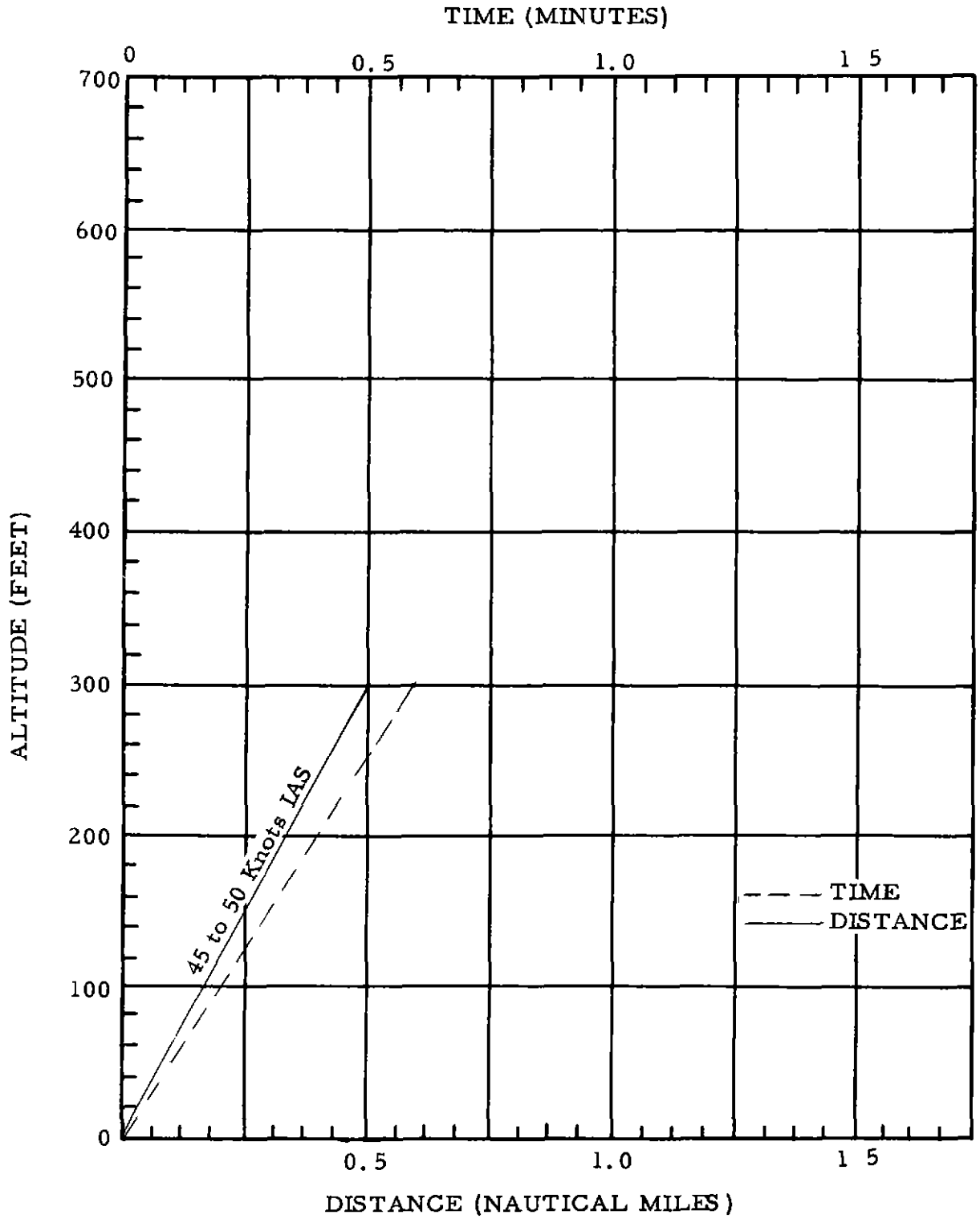

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 30 knots above V2 speed. A pre-climb attitude is continued with a 15 degree flap configuration until a minimum of 200 feet altitude is attained. At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 500 fpm and a positive increase in airspeed. Upon reaching 1,000 feet altitude, the aircraft will have normally attained a speed of 115 knots IAS and be in climb configuration (clean).

Speed (knots IAS)

	15^{o} Flaps
Minimum (flap retraction)	Not available from operator
Maximum (flap retraction)	175

Distance (from lift-off point to end of pre-climb)

Minimum 3.2 nautical miles
Maximum 4.8 nautical miles
Operationally desirable 3.2 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 2.0 minutes
Maximum 3.0 minutes
Operationally desirable 2 0 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 1,000 feet
Maximum 1,500 feet
Operationally desirable 1,000 feet

Fuel Consumed (from start engines through pre-climb)

345 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude.

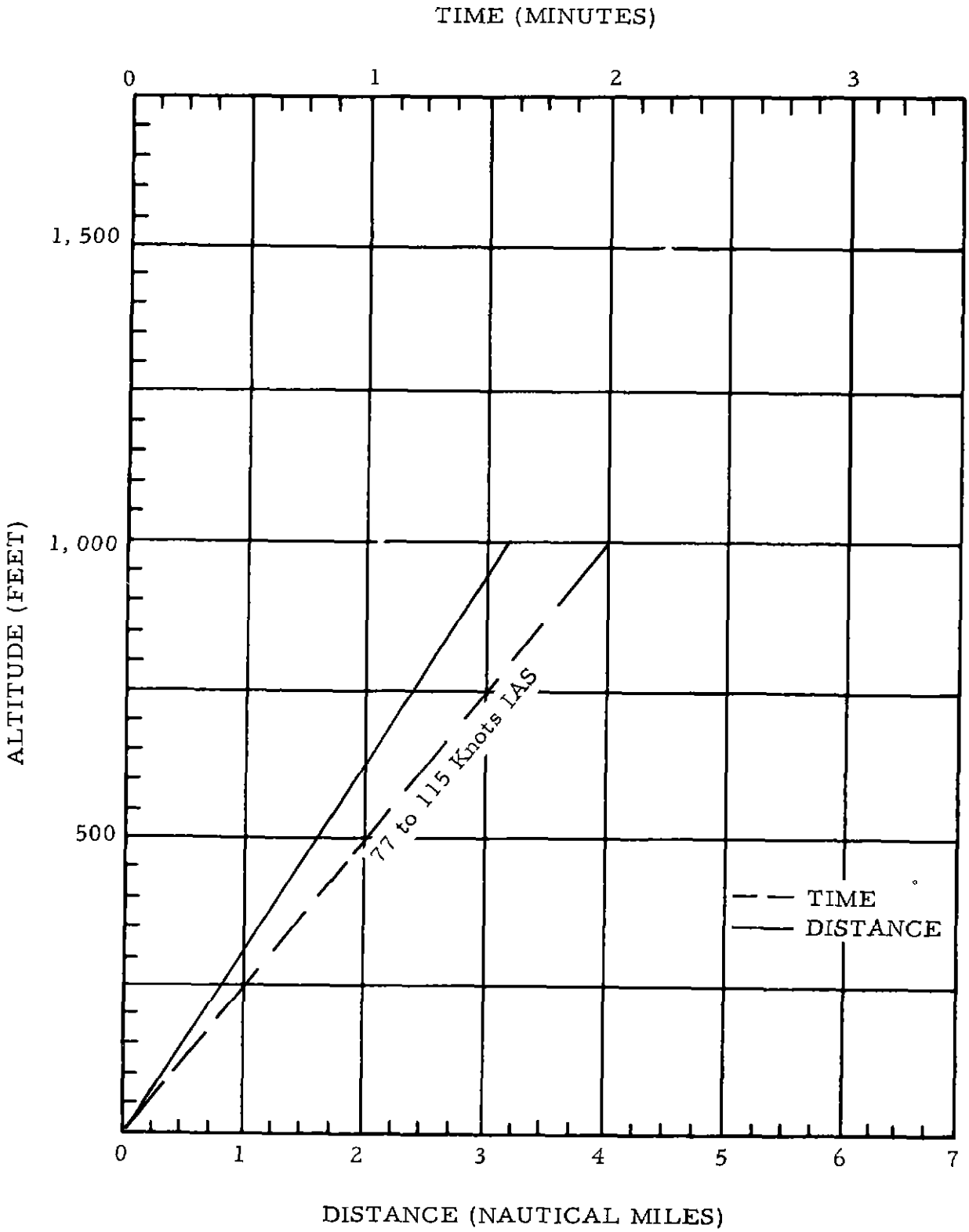

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 20 knots above V2 speed. A pre-climb attitude is continued with flaps extended 25 degrees until a minimum of 500 feet altitude is attained At this altitude, flap retraction is initiated while maintaining a shallow rate of climb and a positive increase in airspeed. Upon reaching 1,000 feet altitude, and an airspeed of 217 knots IAS, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	25° Flaps
Minimum (flap retraction)	146
Maximum (flap retraction)	190

Distance (from lift-off point to end of pre-climb)

Minimum 2.2 nautical miles
Maximum 3.0 nautical miles
Operationally desirable 2.2 nautical miles (See Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.7 minute
Maximum 1.0 minute
Operationally desirable· 0.7 minute (See Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1,500 feet
Operationally desirable 1,000 feet

Fuel Consumed (from start engines through pre-climb)

2,000 pounds (estimated)

Maneuver

First turn after take-off at 1,000 feet altitude.

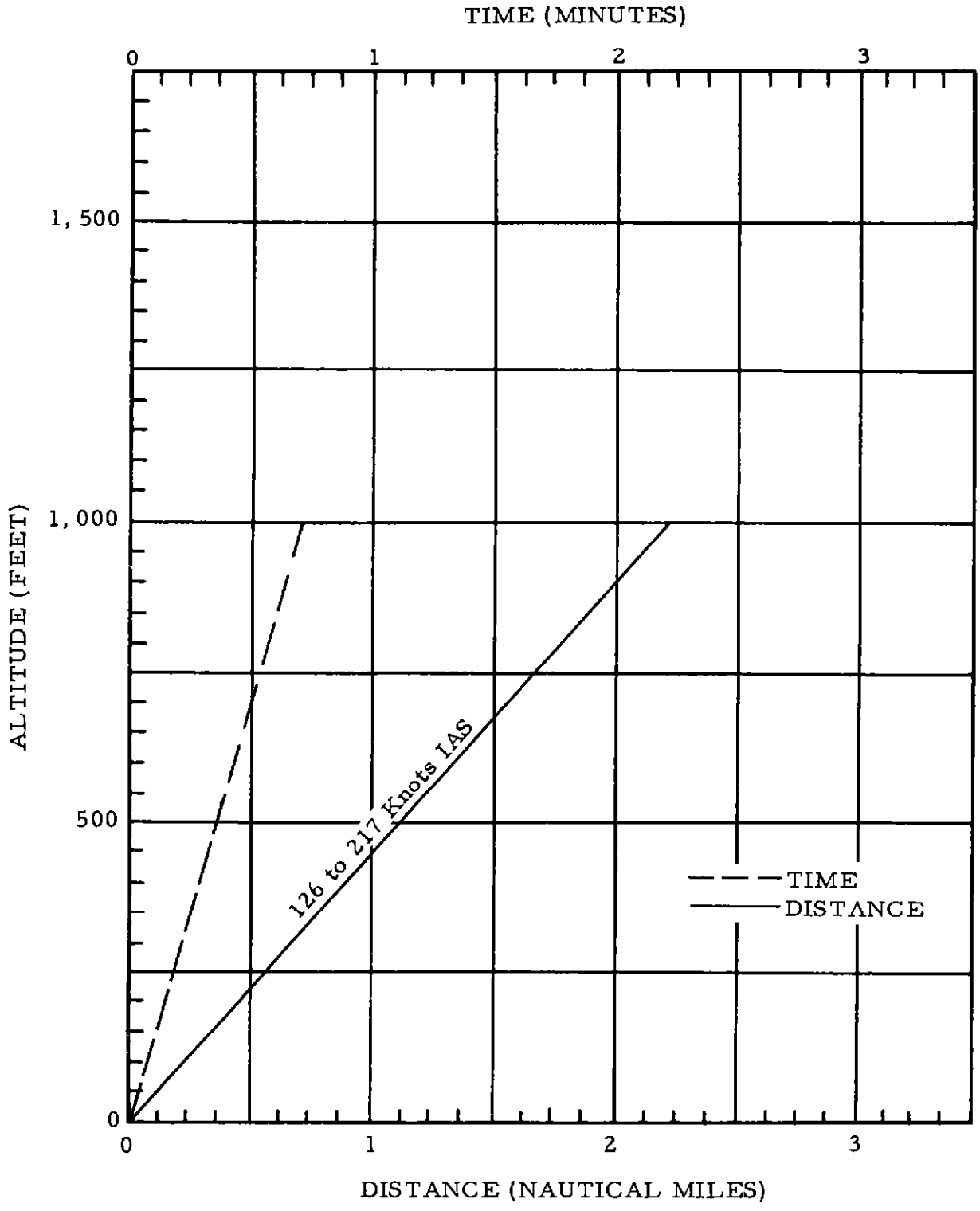

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the helicopter is accelerated to 25 knots above V2 speed A pre-climb attitude is continued until a minimum of 50 feet altitude is attained From this altitude, while maintaining a constant airspeed of 40 knots IAS, a 500 fpm rate of climb is established Upon reaching 100 feet altitude, the helicopter will normally be in climb attitude

Distance (from lift-off point to end of pre-climb)

Minimum 0 1 nautical mile
Maximum 0 2 nautical mile
Operationally desirable 0 1 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 2 minute
Maximum 0 5 minute
Operationally desirable 0 3 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 50 feet
Maximum 150 feet
Operationally desirable 100 feet

Fuel Consumed (from start engine through pre-climb)

10 pounds (estimated)

Maneuver

First turn after take-off at 50 feet altitude or after clearing highest obstacle.

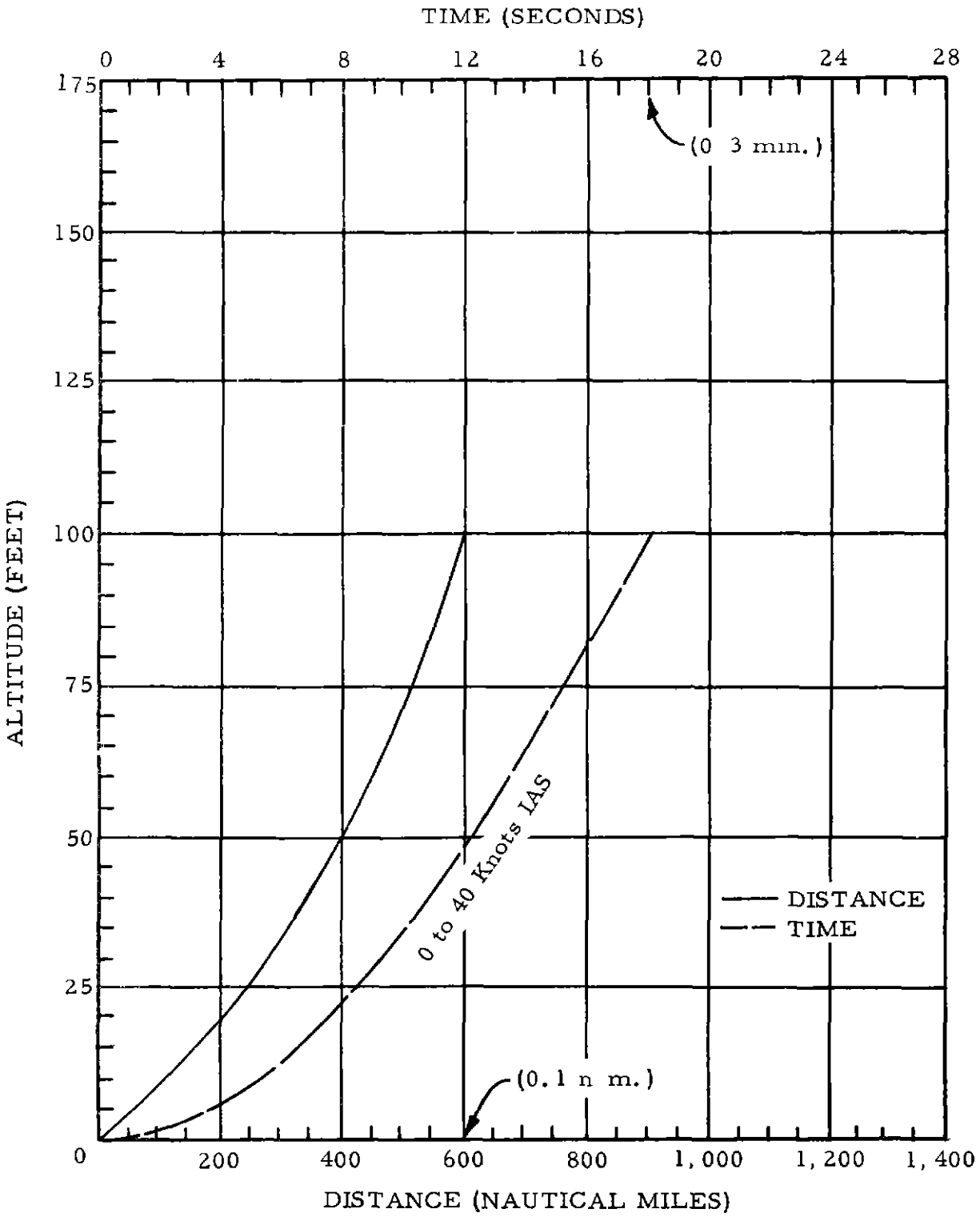

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 17 knots above V2 speed. A pre-climb attitude is continued with flaps extended 60 percent until a minimum of 500 feet altitude and an airspeed of 150 knots IAS is attained. At this altitude and airspeed flap retraction is initiated while maintaining a positive rate of climb At the completion of flap retraction, airspeed is increased to 160 knots IAS Upon reaching 1,000 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	60% Flaps
Minimum (flap retraction)	150
Maximum (flap retraction)	190

Distance (from lift-off point to end of pre-climb)

Minimum 1 0 nautical mile
Maximum 2 3 nautical miles
Operationally desirable 2. 3 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 5 minute
Maximum 1 0 minute
Operationally desirable 1 0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1,000 feet
Operationally desirable 1,000 feet

Fuel Consumed (from start engines through pre-climb)

1,280 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

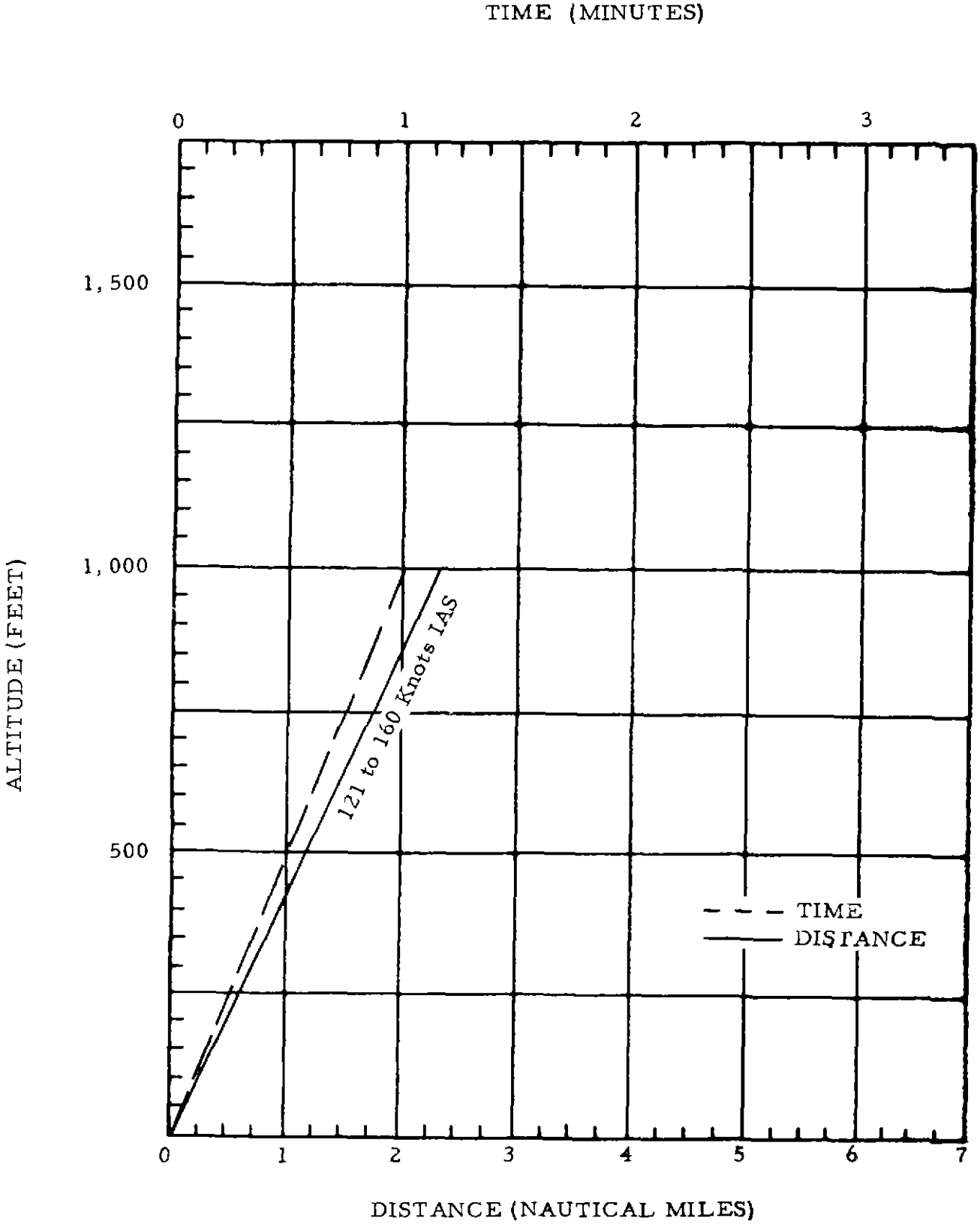

FIGURE I - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is gradually accelerated to 39 knots above V2 speed. A pre-climb attitude is continued with flaps extended 18 degrees until a minimum of 200 feet altitude is attained. At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 500 fpm and a positive increase in airspeed. Upon reaching 500 feet altitude and an airspeed of 178 knots IAS, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	18° Flaps
Minimum (flap retraction)	155
Maximum (flap retraction)	183

Distance (from lift-off point to end of pre-climb)

Minimum 1.1 nautical miles
Maximum. 2.2 nautical miles
Operationally desirable 2.2 nautical miles

Time (from lift-off point to end of pre-climb)

Minimum 0.5 minute
Maximum 1.0 minute
Operationally desirable· 1 0 minute

Altitude (at end of pre-climb)

Minimum 250 feet
Maximum· 500 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

660 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

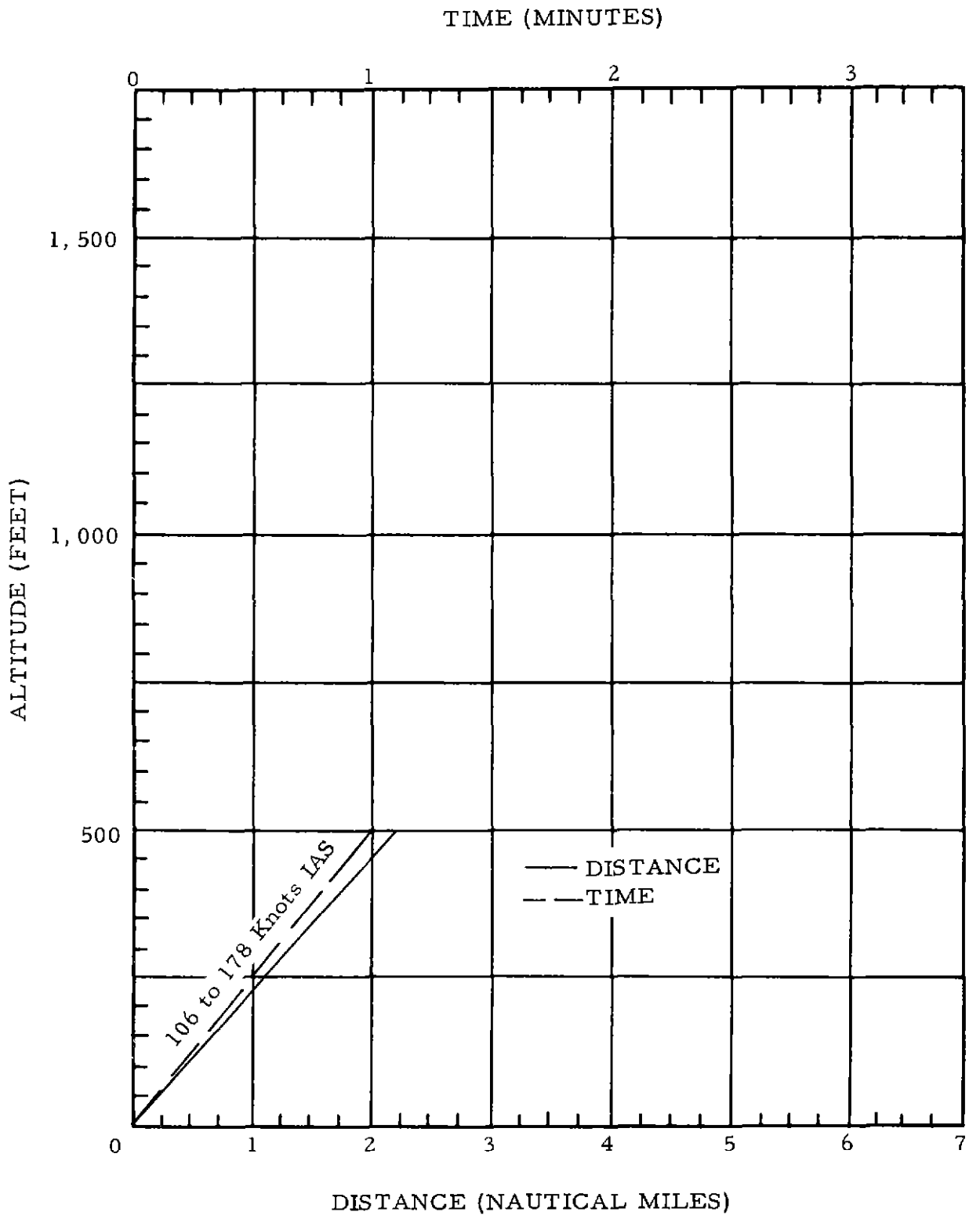

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted A pre-climb attitude is continued with flaps fully extended until a minimum of 20 knots above V2 speed is attained At this speed, flap retraction is initiated while maintaining an increase in airspeed Upon reaching 5, 000 feet attitude, the aircraft will normally be in climb configuration (clean), and a climb airspeed (300 knots IAS)

Distance (from lift off point to end of pre-climb)

Minimum 4. 0 nautical miles
Maximum 6 0 nautical miles
Operationally desirable 6 0 nautical miles (see Figure 1)

Time (from lift off point to end of pre-climb)

Minimum 1 5 minutes
Maximum 2 0 minutes
Operationally desirable 2 0 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 4, 000 feet
Maximum 5, 000 feet
Operationally desirable 5, 000 feet

Fuel Consumed (from start engines through pre-climb)

600 pounds (estimated)

Maneuver

First turn after take-off at 1, 000 feet altitude

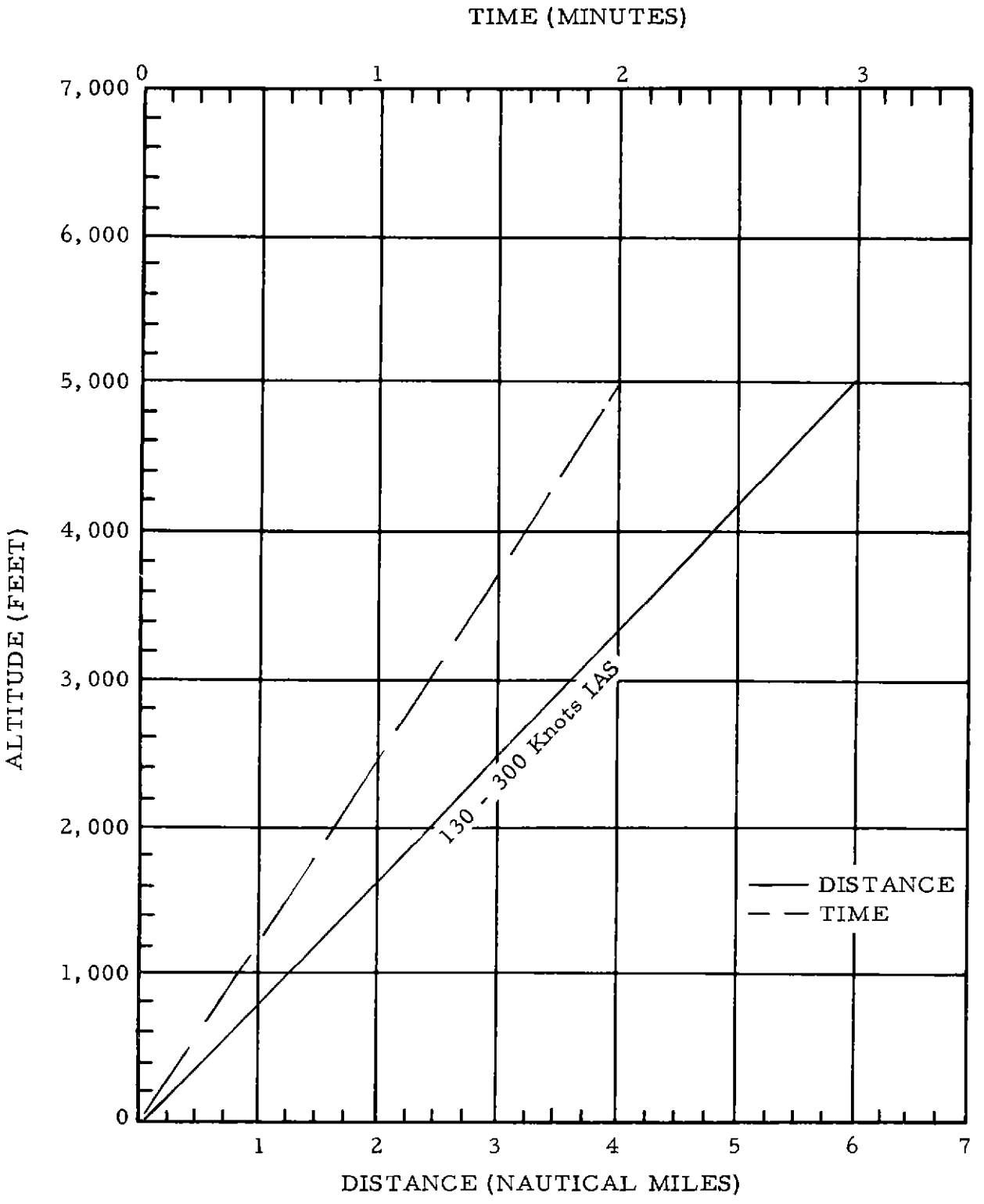

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 20 knots above V2 speed Flap retraction is initiated and the aircraft is continued in a pre-climb attitude as airspeed is gradually increased to 270 knots IAS. Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	30° Flaps
Minimum (flap retraction)	120
Maximum (flap retraction)	175

Distance (from lift-off point to end of pre-climb)

Minimum 2.6 nautical miles
Maximum 5 2 nautical miles
Operationally desirable 2 6 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 1 0 minute
Maximum 2 0 minutes
Operationally desirable 1 0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1,000 feet
Operationally desirable 500 feet

Fuel Consumed (from start engine through pre-climb)

390 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

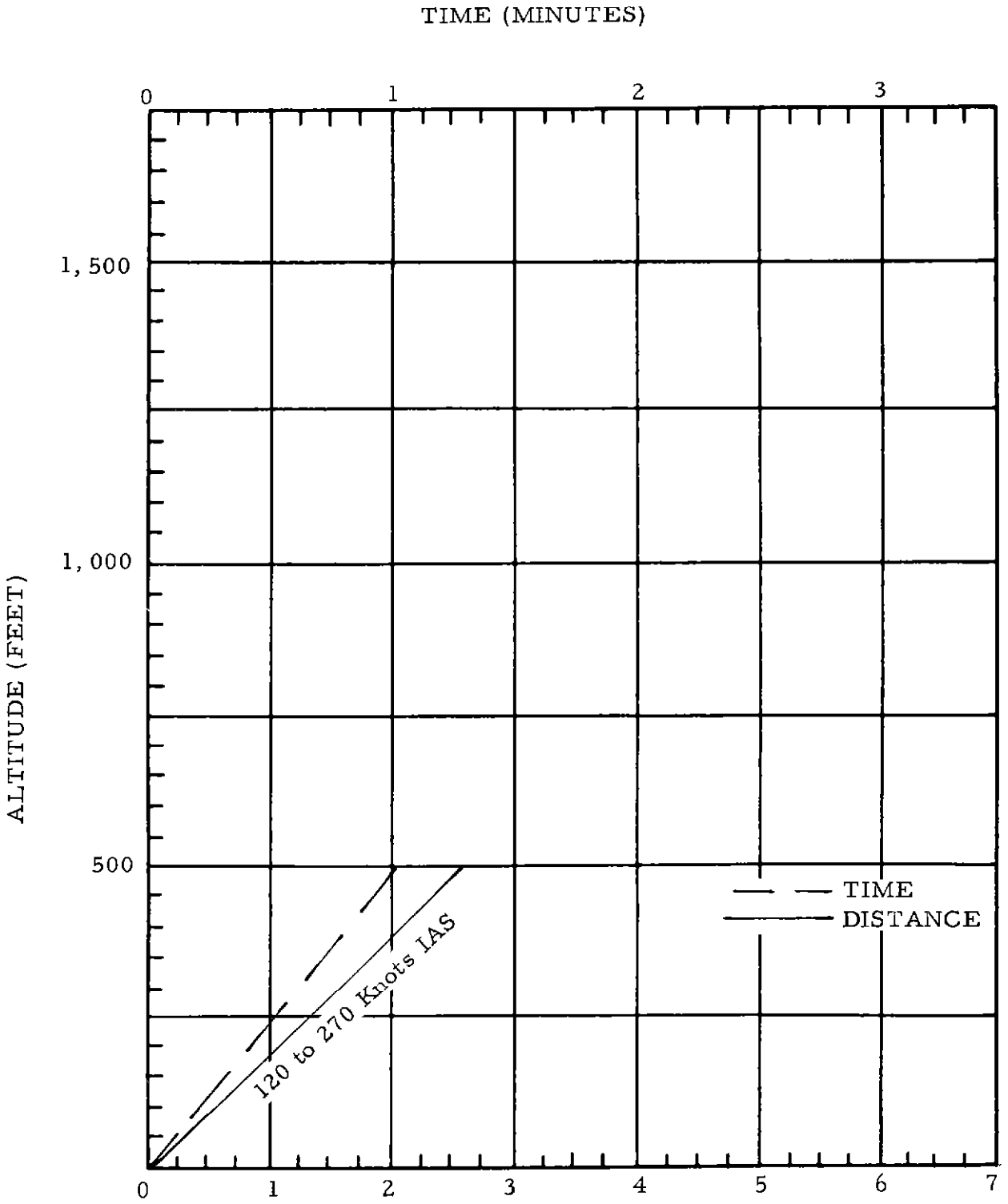

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to climb airspeed of 330 knots IAS Upon reaching 5,000 feet altitude, the aircraft will normally be in climb configuration (clean) Flaps are not utilized for take-off with this aircraft

Speed (knots IAS)

Maximum (structural limitations with gear down) 200

Distance (from lift-off point to end of pre-climb)

Minimum 4 0 nautical miles
Maximum 8 0 nautical miles
Operationally desirable. 8 0 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 1.0 minute
Maximum 2 0 minutes
Operationally desirable 2 0 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 3,000 feet
Maximum· 5,000 feet
Operationally desirable: 5,000 feet

Fuel Consumed (from start engines through pre-climb)

1,000 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

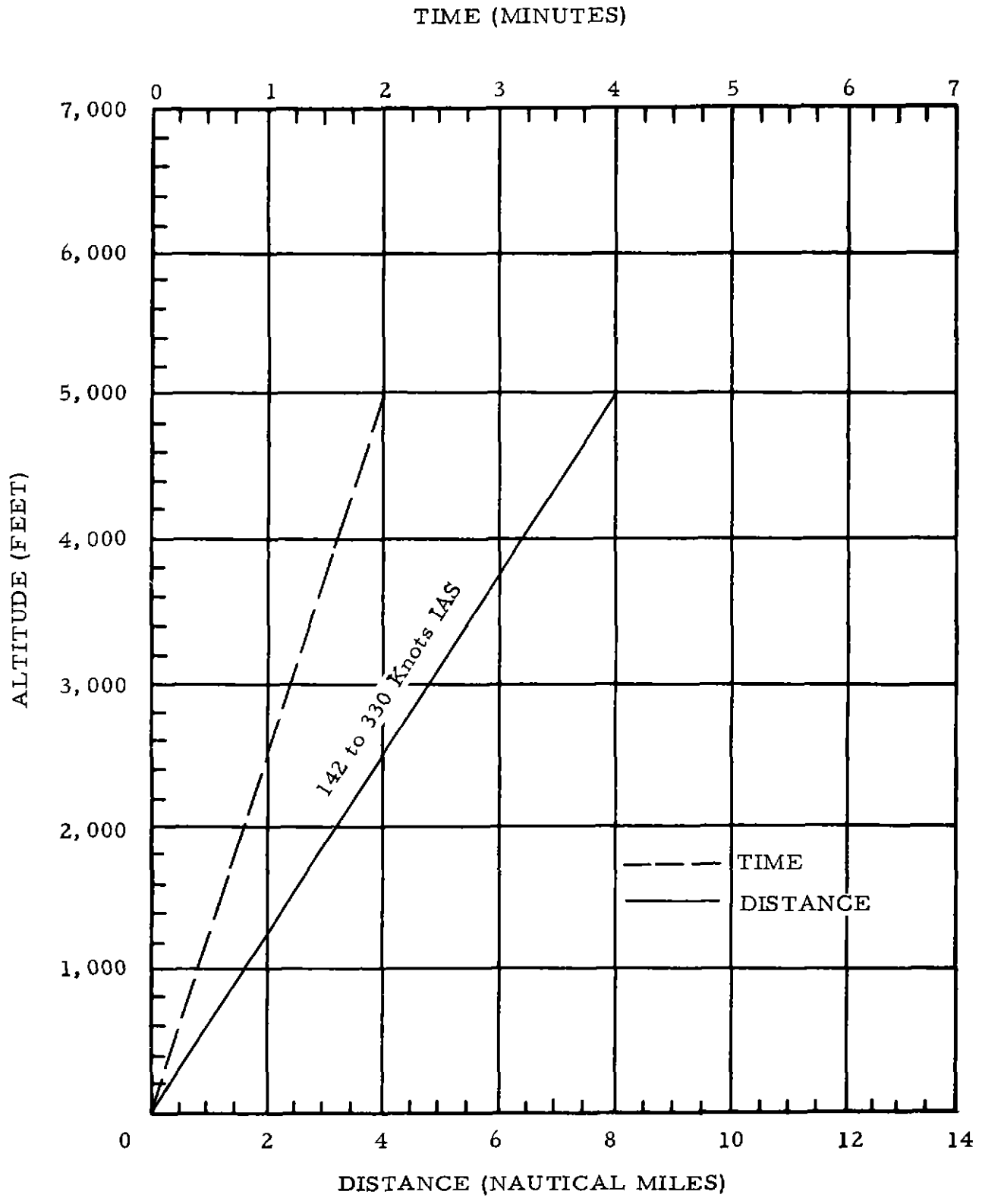

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 30 knots above V2 speed Flap retraction is initiated and the airspeed is gradually increased until an airspeed of 331 knots IAS and an altitude of 1, 500 feet is attained At this altitude and airspeed, the afterburner is discontinued and aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

Minimum (flap retraction) 155
Maximum (flap retraction) 195

Distance (from lift-off point to end of pre-climb)

Minimum 3. 4 nautical miles
Maximum 5. 0 nautical miles
Operationally desirable 5 0 nautical miles (see Figure 1)

Time (from lift-off to end of pre-climb)

Minimum 1. 5 minutes
Maximum 2. 5 minutes
Operationally desirable 2. 2 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 1, 000 feet
Maximum 1, 500 feet
Operationally desirable 1, 500 feet

Fuel Consumed (from start engines through pre-climb)

600 pounds (estimated)

Maneuver

First turn after take-off at 1, 000 feet altitude

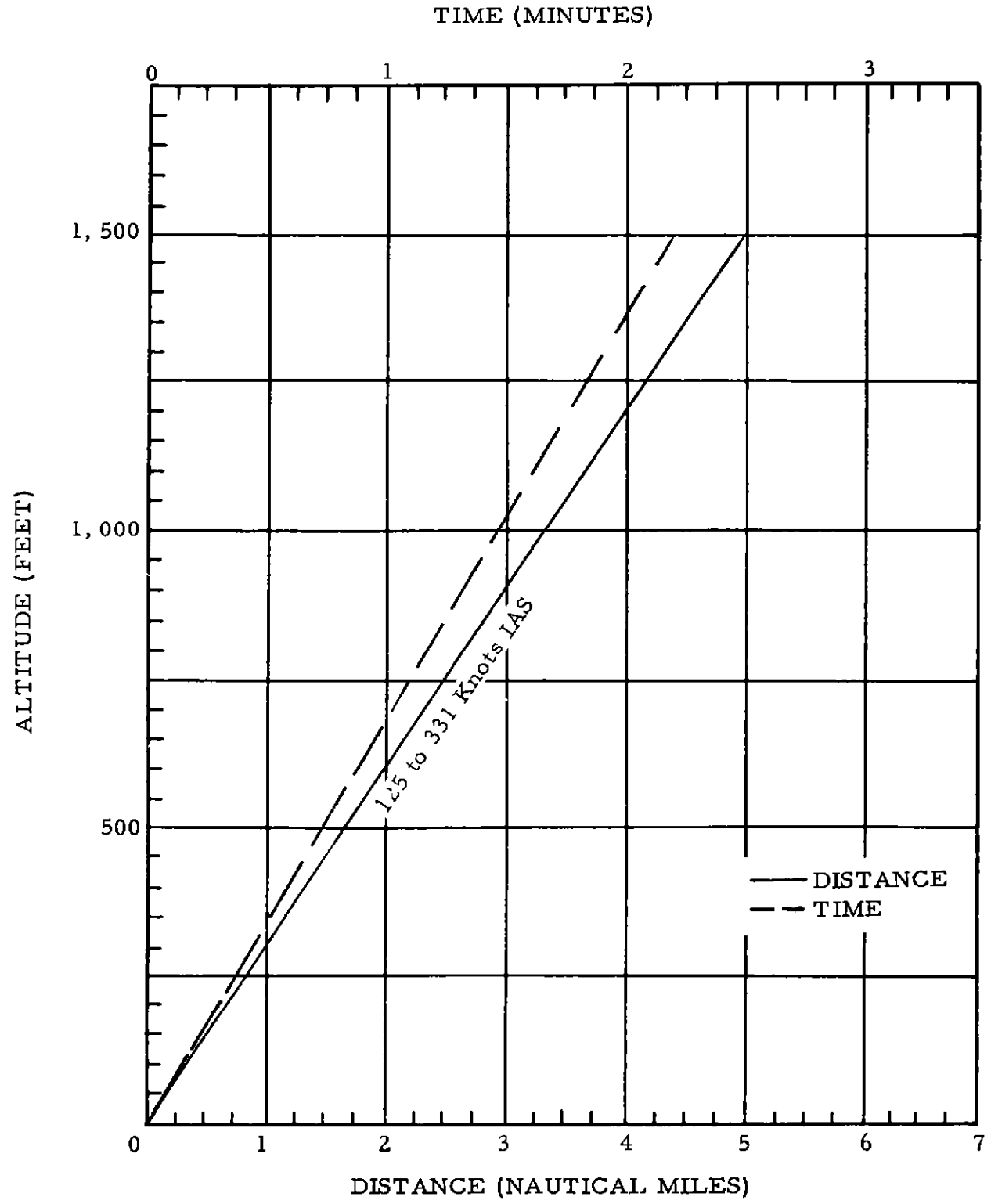

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 33 knots above V2 speed A pre-climb attitude is continued with flaps extended 11 degrees until a minimum of 300 feet altitude is attained. At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 500 fpm and a positive increase in airspeed. Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	11^{o} Flaps
Minimum (flap retraction)	112
Maximum (flap retraction)	147

Distance (from lift-off point to end of pre-climb)

Minimum 0.6 nautical mile
Maximum 1 6 nautical miles
Operationally desirable 0 6 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 3 minute
Maximum 1 0 minute
Operationally desirable 0.3 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1,000 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

300 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

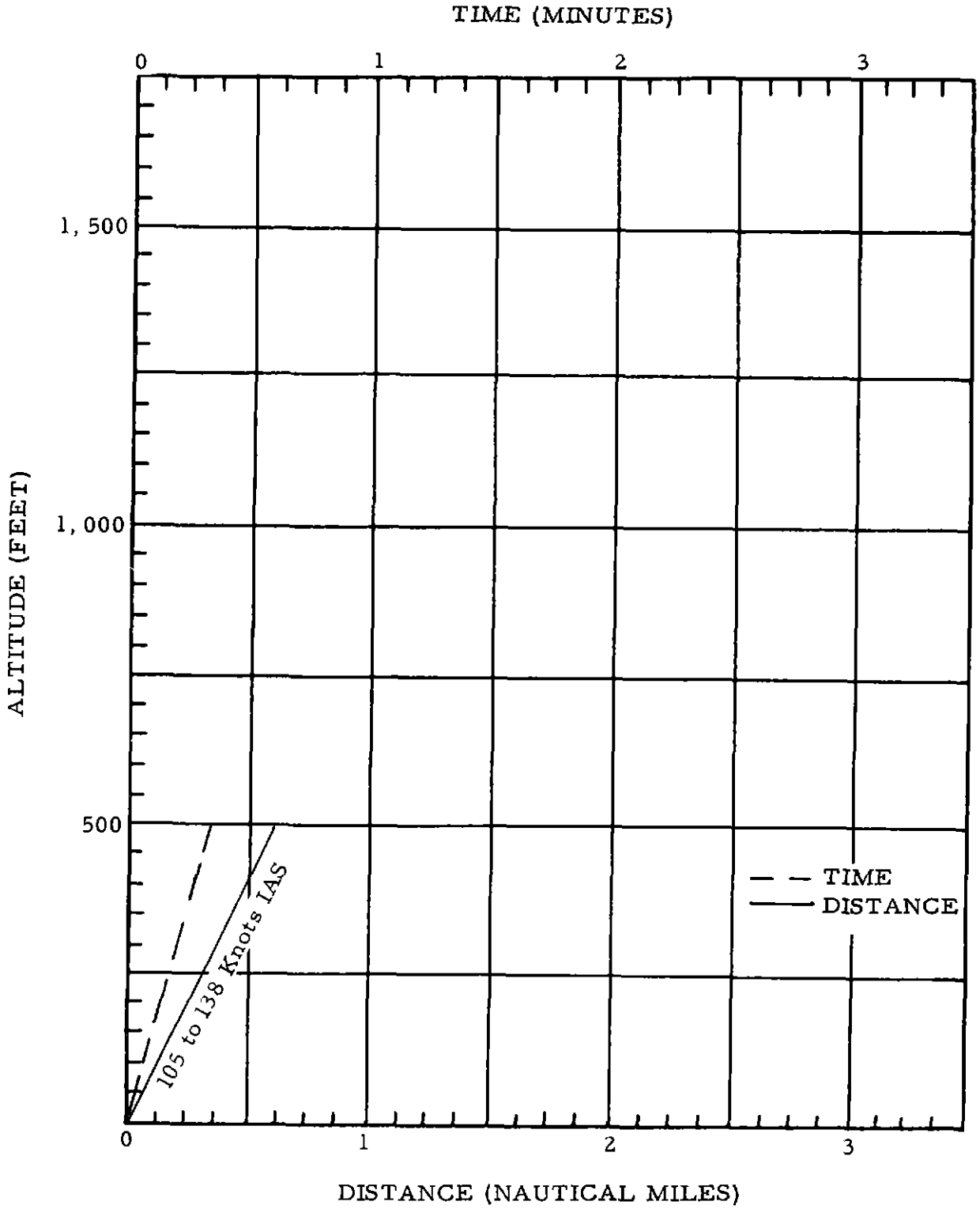

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 15 knots above V2 speed Flap retraction is initiated and acceleration is continued until a climb airspeed of 130 knots IAS is attained Upon reaching 400 feet altitude the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	9^{o} Flaps
Minimum (flap retraction)	90
Maximum (flap retraction)	140

Distance (from lift-off point to end of pre-climb)

Minimum 0 5 nautical mile
Maximum 2.0 nautical miles
Operationally desirable 1.5 nautical miles

Time (from lift-off point to end of pre-climb)

Minimum 0 3 minute
Maximum 1 2 minutes
Operationally desirable 0.9 minute

Altitude (at end of pre-climb)

Minimum 200 feet
Maximum 1,000 feet
Operationally desirable 400 feet

Fuel Consumed (from start engines through pre-climb)

50 pounds (estimated)

Maneuver

First turn after take-off at 200 feet altitude

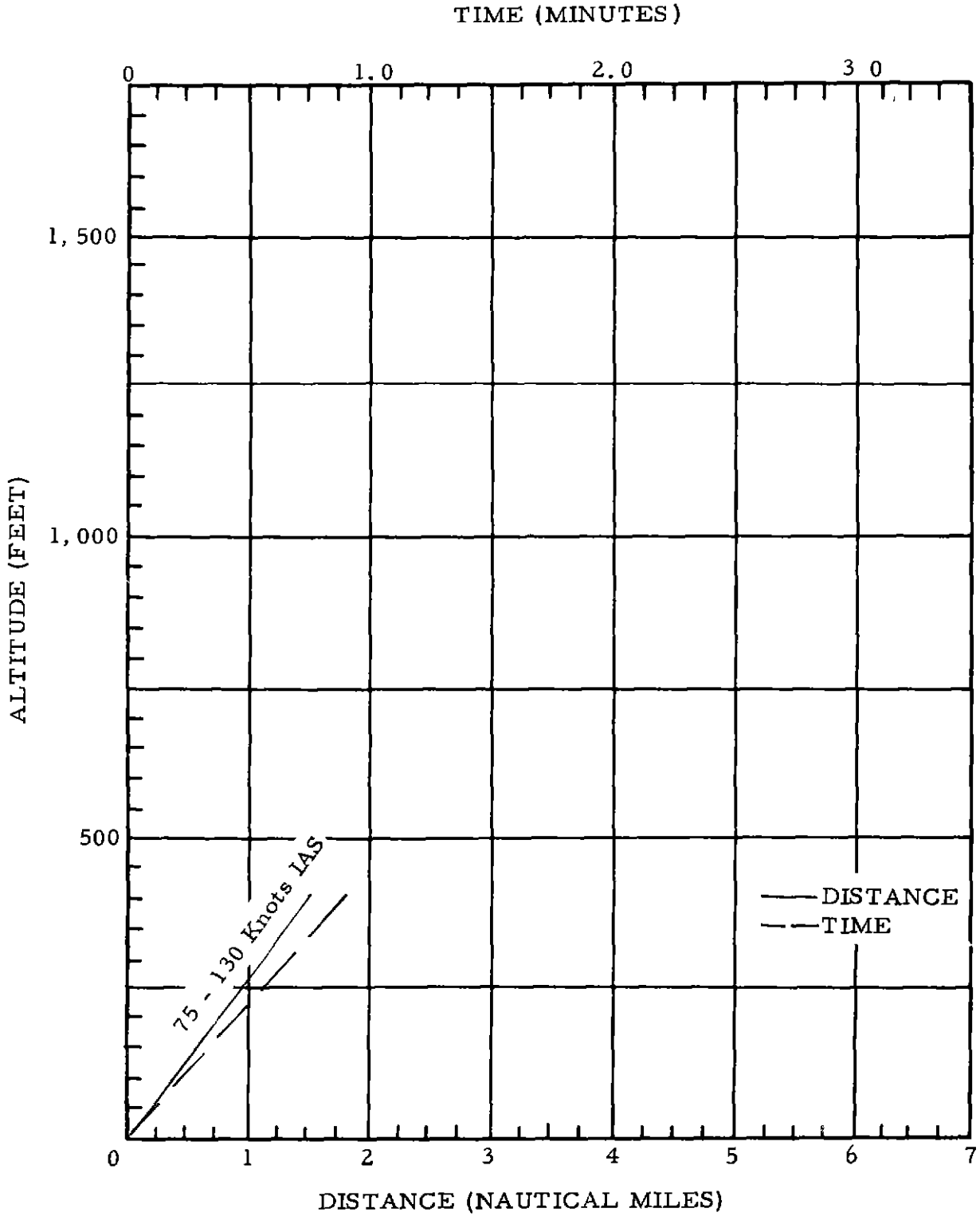

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted Slow flap retraction may be initiated immediately after gear retraction is completed Aircraft is accelerated to climb airspeed of 134 knots IAS and upon reaching 400 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	18° Flaps
Minimum (flap retraction)	Not available from manufacturer
Maximum (flap retraction)	140

Distance (from lift-off point to end of pre-climb)

Minimum	0 5 nautical mile
Maximum	2 0 nautical miles
Operationally desirable	1 5 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum	0 3 minute
Maximum	1 2 minutes
Operationally desirable	0 9 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum	200 feet
Maximum	1, 000 feet
Operationally desirable	400 feet

Fuel Consumed (from start engines through pre-climb)

75 pounds (estimated)

Maneuver

First turn after take-off at 200 feet altitude

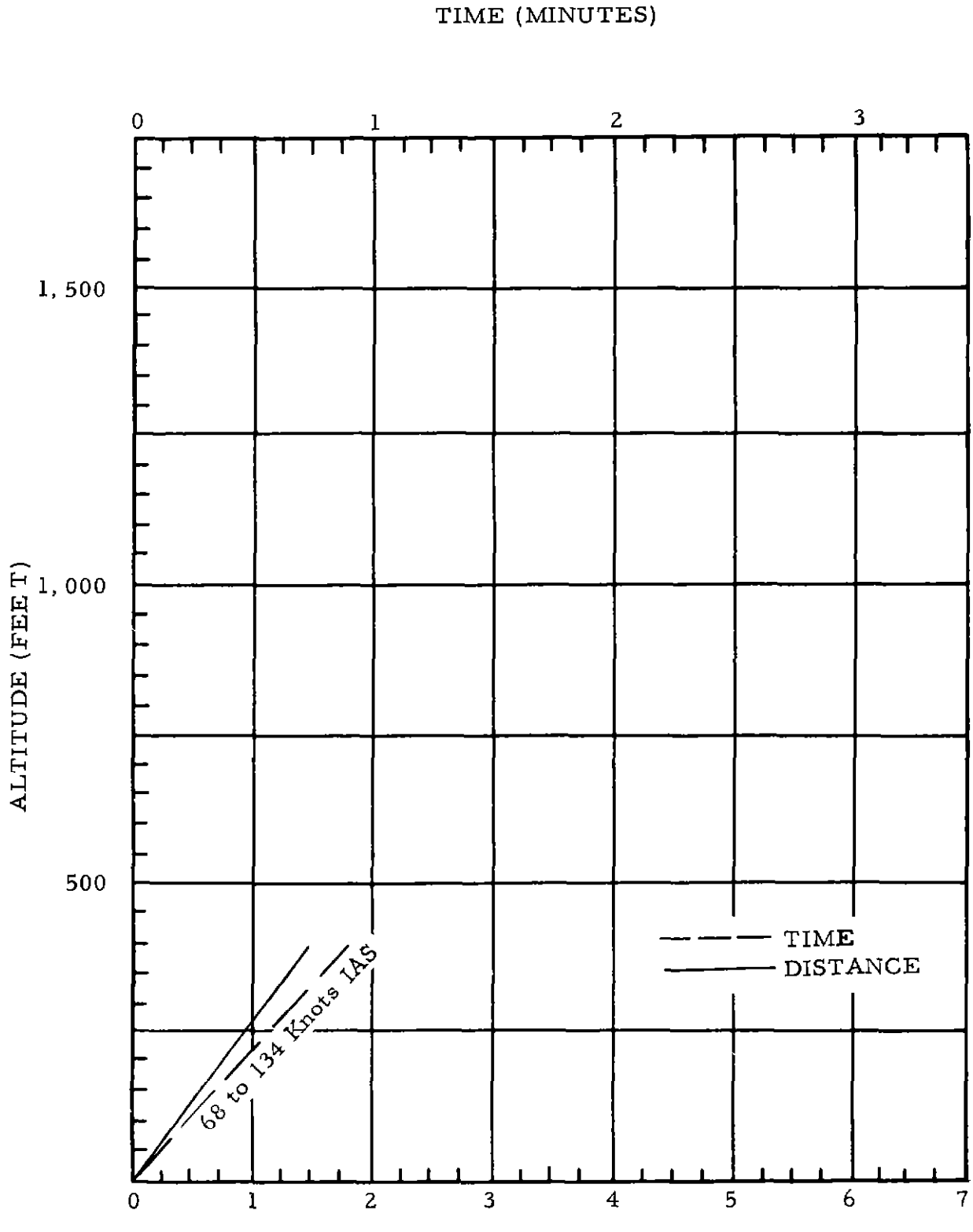

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted. If flaps have been employed, flap retraction must be completed prior to reaching 160 knots IAS. Acceleration is continued until climb speed of 250 knots IAS is attained. Upon reaching 1,000 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	100% Flaps
Minimum (flap retraction)	Not available from operator
Maximum (flap retraction)	160

Distance (from lift-off point to end of pre-climb)

Minimum 3.0 nautical miles
Maximum 5.0 nautical miles
Operationally desirable: 5.0 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 1.8 minutes
Maximum 2.5 minutes
Operationally desirable 2.5 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 1,000 feet
Operationally desirable· 1,000 feet

Fuel Consumed (from start engines through pre-climb)

350 pounds

Maneuver

First turn after take-off at 300 feet altitude.

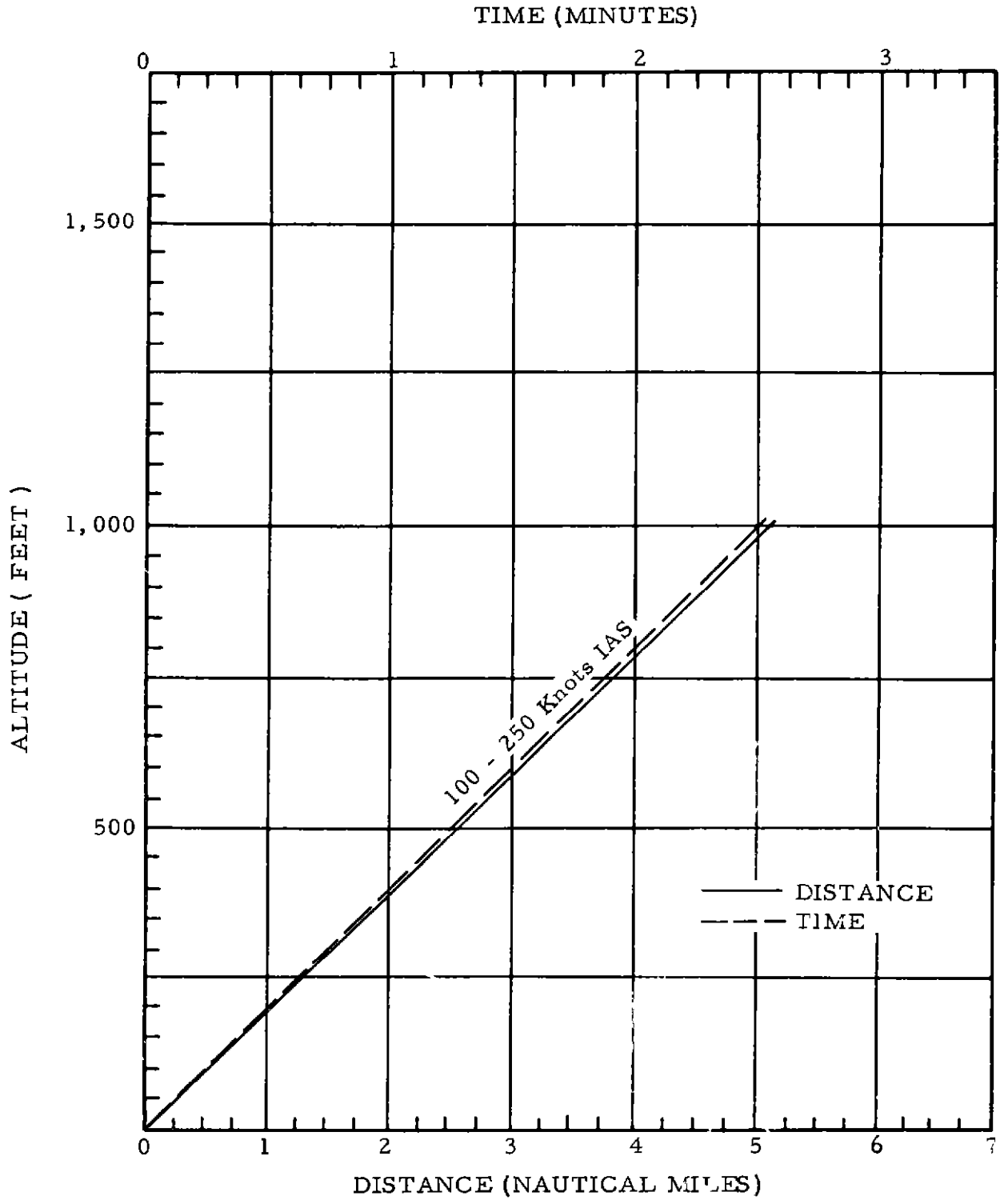

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted. A pre-climb attitude is continued with a 30 degrees flaps configuration until an airspeed of 12 knots above V2 speed is attained. At this airspeed, flap retraction is initiated while maintaining a minimum rate of climb of 1,500 fpm and an increase in airspeed to 315 knots IAS. Upon reaching 2,000 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	50° Flaps	30° Flaps
Minimum (flap retraction)	128	153
Maximum (flap retraction)	195	230

Distance (from lift-off point to end of pre-climb)

Minimum 2 7 nautical miles
Maximum 5 8 nautical miles
Operationally desirable 3 9 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.7 minute
Maximum 1.5 minutes
Operationally desirable 1 0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 1,500 feet
Maximum 3,000 feet
Operationally desirable. 2,000 feet

Fuel Consumed (from start engines through pre-climb)

900 pounds (estimated)

Maneuver

First turn after take-off at 1,500 feet altitude

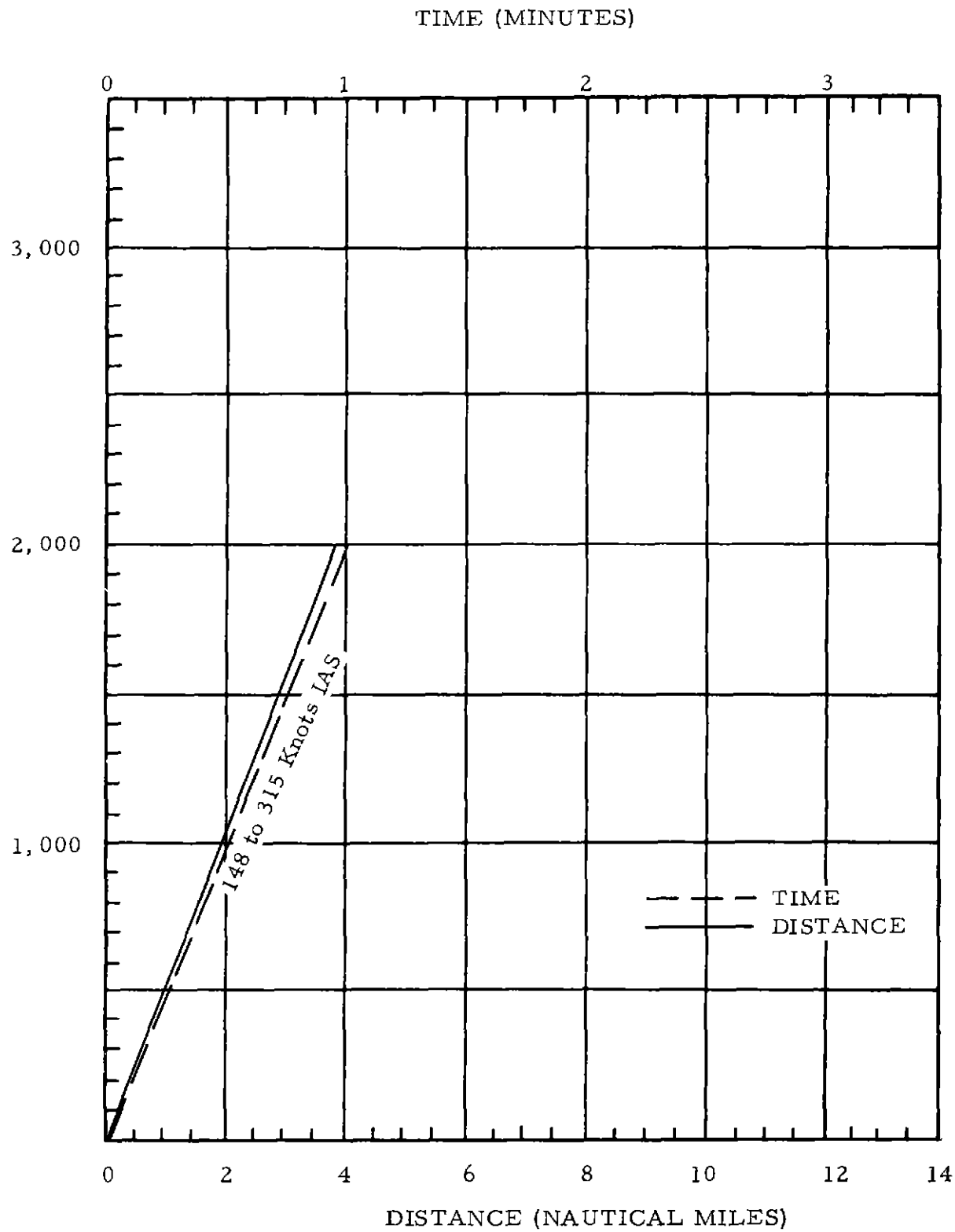

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 40 knots above V2 speed A pre-climb attitude is continued with a 20 degree flaps configuration until a minimum of 500 feet altitude is attained At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 900 fpm and a positive increase in airspeed Upon reaching 1,000 feet altitude and an airspeed of 340 knots IAS, the aircraft will normally be in climb configuration (clean).

Data presented in pre-climb apply to aircraft powered by either the J65-W-7 or the J65-B-3 engine

Speed (knots IAS)

	Gear Down
Maximum (structural limitations)	220

Distance (from lift-off point to end of pre-climb)

Minimum 4 5 nautical miles
Maximum 8 2 nautical miles
Operationally desirable 4.5 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 1 1 minutes
Maximum 2 0 minutes
Operationally desirable 1.1 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 1,000 feet
Maximum 1,500 feet
Operationally desirable 1,000 feet (see Figure 1)

Fuel Consumed (from start engines through pre-climb)

617 pounds (J65-W-7 engine) Estimated
505 pounds (J65-B-3 engine) Estimated

Maneuver

First turn after take-off at 500 feet altitude

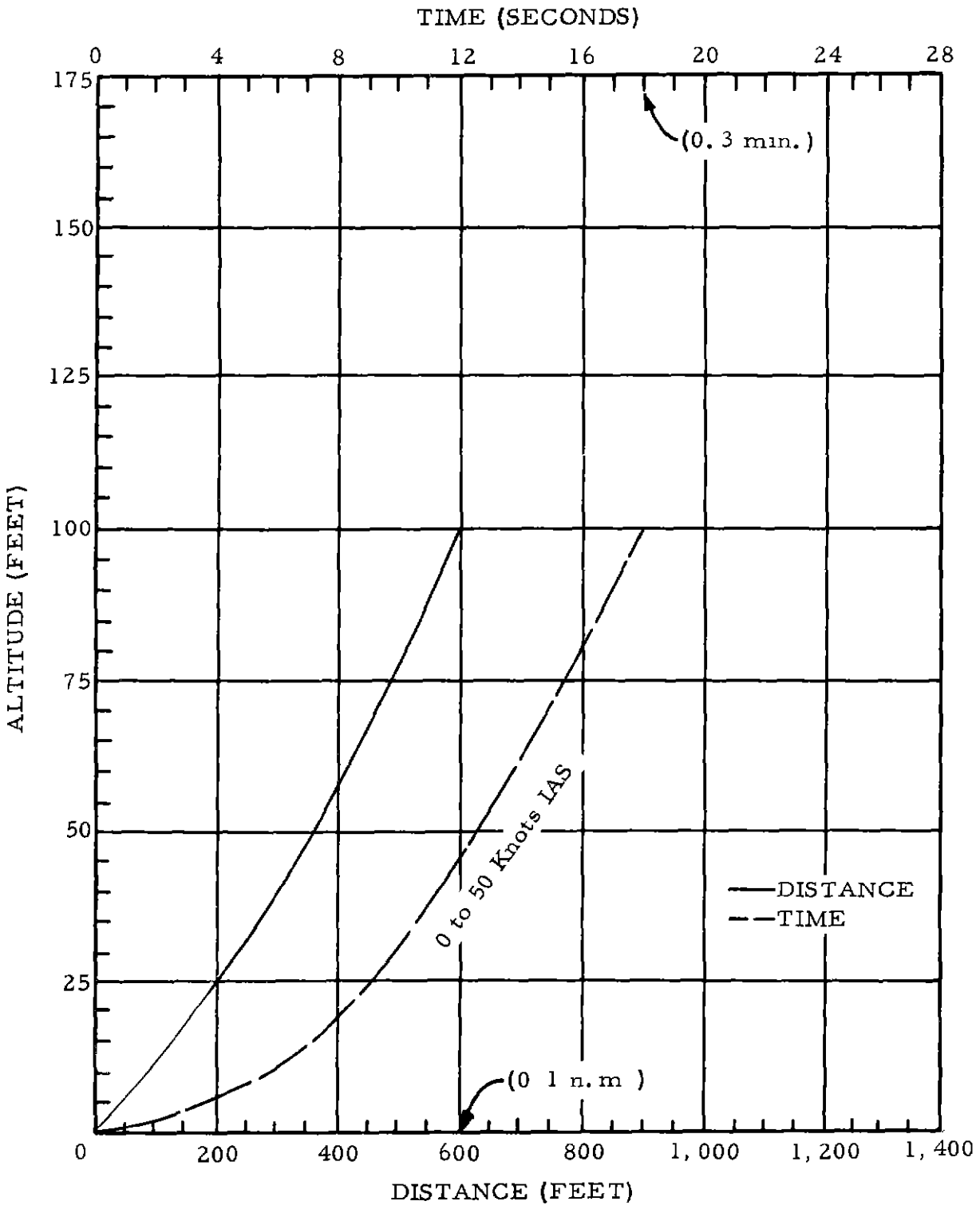

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations (normal)

As soon as definitely airborne, the helicopter is accelerated to 20 knots above V2 speed. A pre-climb attitude is continued until a minimum of 50 feet altitude is attained. From this altitude, while maintaining 50 knots IAS, a normal rate of climb of 500 fpm is established. Upon reaching 100 feet altitude, the helicopter will normally be in climb attitude

Distance (from lift-off point to end of pre-climb)

Minimum 0.1 nautical mile
Maximum 0 5 nautical mile
Operationally desirable 0 1 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum. 0.2 minute
Maximum 0.5 minute
Operationally desirable 0.3 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 50 feet
Maximum 150 feet
Operationally desirable 100 feet

Fuel Consumed (from start engine through pre-climb)

50 pounds (estimated)

Maneuver

First turn after take-off at 50 feet altitude or after clearing highest obstacle

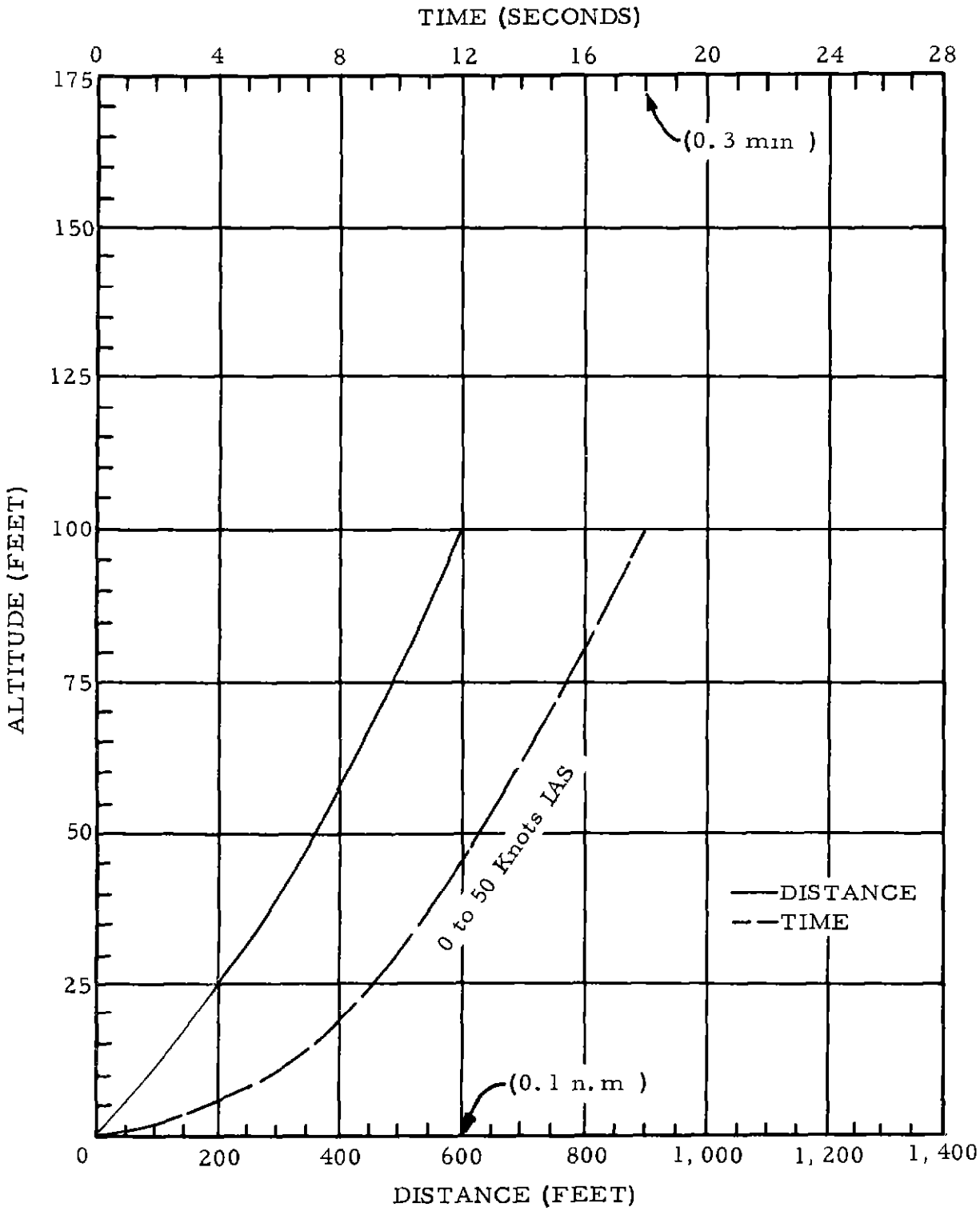

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the helicopter is accelerated to 20 knots above V2 speed. A pre-climb attitude is continued until a minimum of 50 feet altitude is attained. From this altitude, while maintaining a minimum rate of climb of 500 fpm, acceleration is continued to 60 knots IAS. Upon reaching 100 feet altitude, the helicopter will normally be in a climb attitude.

Distance (from lift-off point to end of pre-climb)

Minimum 0.1 nautical mile
Maximum: 0.5 nautical mile
Operationally desirable 0.1 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum. 0.2 minute
Maximum 1.0 minute
Operationally desirable. 0.3 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum. 50 feet
Maximum. 150 feet
Operationally desirable. 100 feet

Fuel Consumed (from start engine through pre-climb)

80 pounds (estimated)

Maneuver

First turn after take-off at 50 feet altitude or after clearing highest obstacle

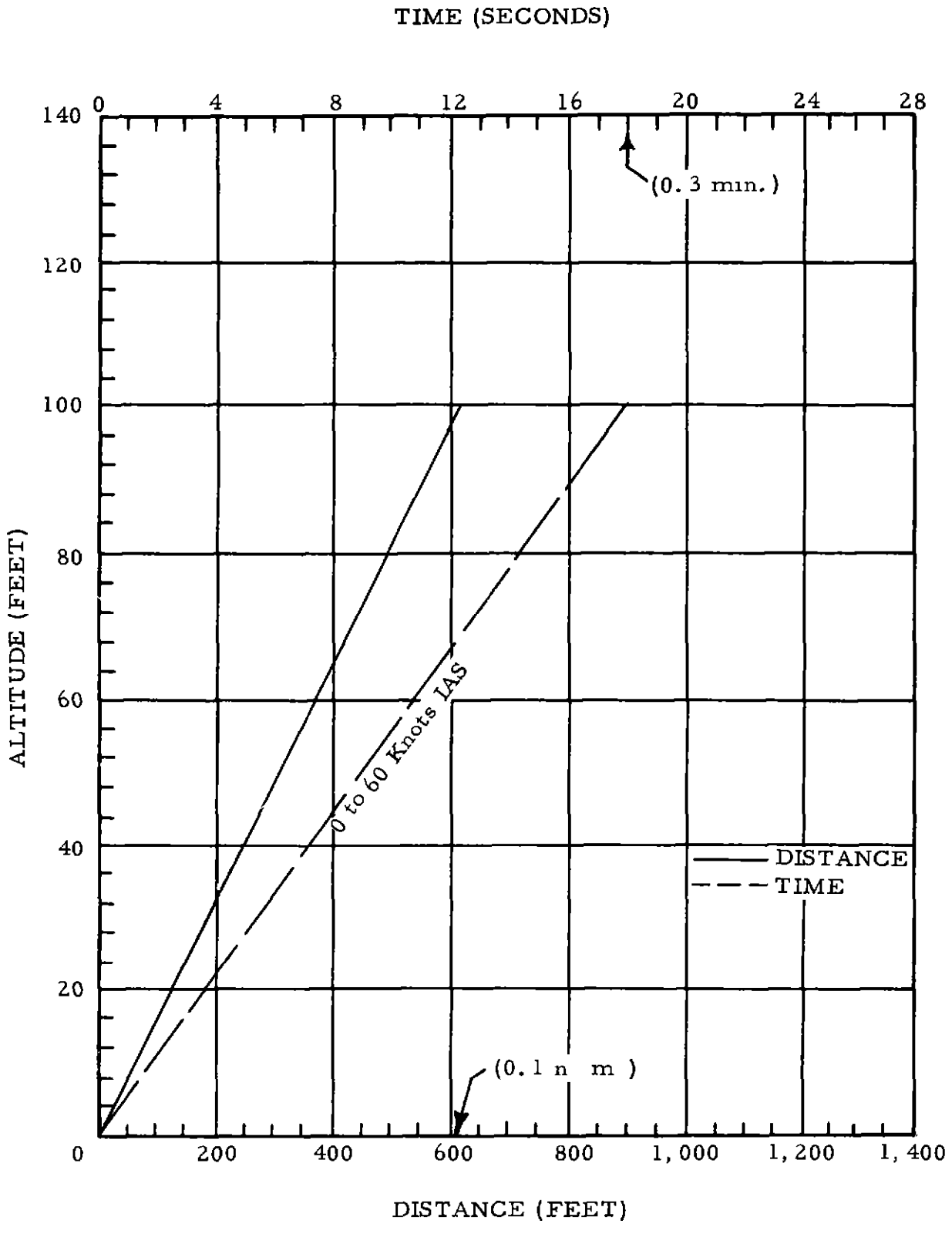

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the helicopter is accelerated to 20 knots above V2 speed A pre-climb attitude is continued until a minimum of 50 feet altitude is attained From this altitude, while maintaining a shallow rate of climb, acceleration is continued to 70 knots IAS Upon reaching 100 feet altitude, the helicopter will normally be in climb attitude

Distance (from lift-off point to end of pre-climb)

Minimum 0 1 nautical mile
Maximum 0 5 nautical mile
Operationally desirable 0.2 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 2 minute
Maximum 0 5 minute
Operationally desirable 0 3 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 50 feet
Maximum 150 feet
Operationally desirable 100 feet

Fuel Consumed (from start engines through pre-climb)

200 pounds (estimated)

Maneuver

First turn after take-off is at 50 feet altitude or after clearing highest obstacle

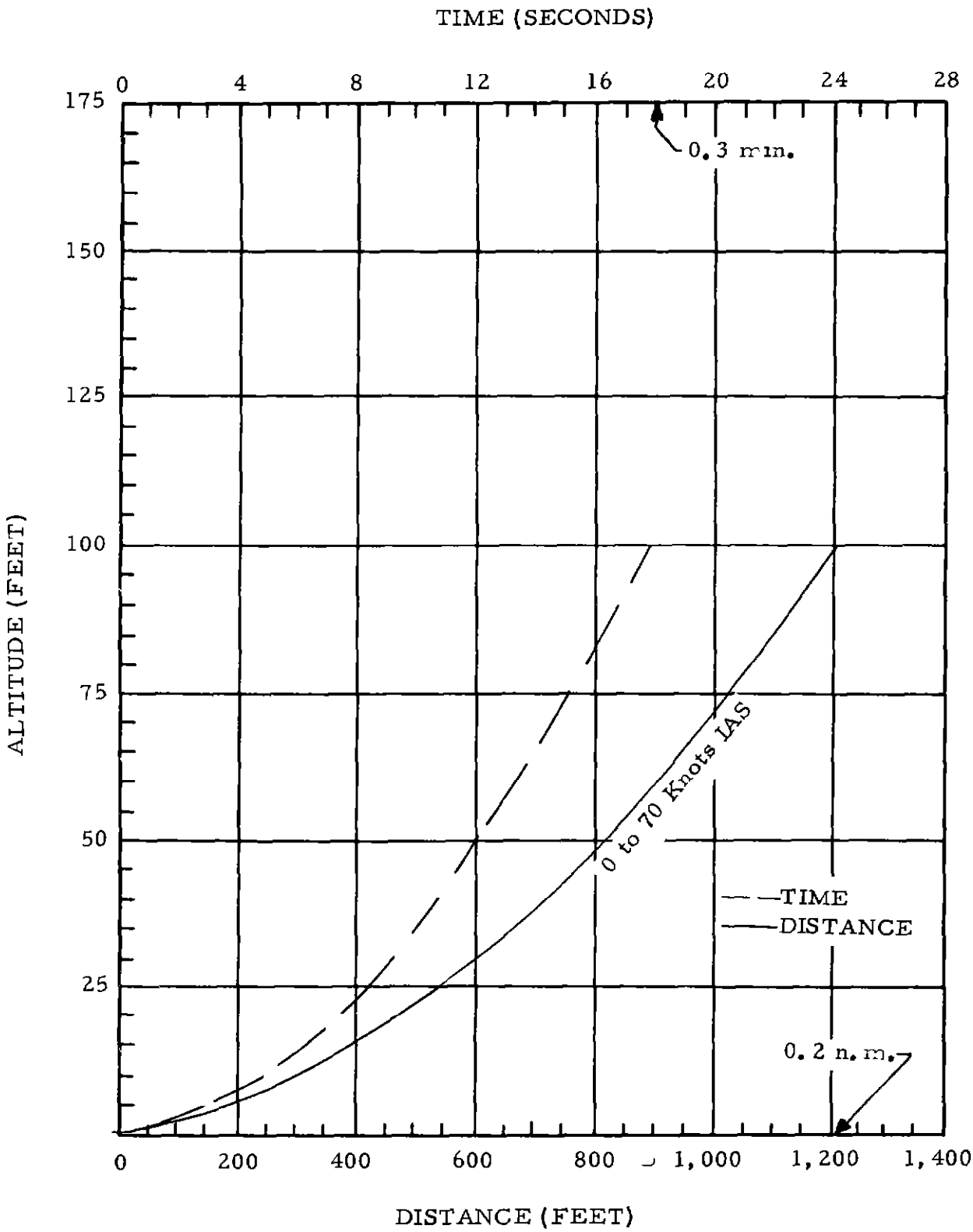

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations (normal)

As soon as definitely airborne, the helicopter is accelerated to 20 knots above V2 speed A pre-climb attitude is continued until a minimum of 50 feet altitude is attained From this altitude, while maintaining a minimum rate of climb of 500 fpm, acceleration is continued until an airspeed of 60 knots IAS is attained Upon reaching 100 feet altitude, the helicopter will normally be in climb attitude

Distance (from lift-off point to end of pre-climb)

Minimum 0. 1 nautical mile
Maximum 0 4 nautical mile
Operationally desirable. 0 2 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 2 minute
Maximum 0 5 minute
Operationally desirable 0 3 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum. 50 feet
Maximum 150 feet
Operationally desirable 100 feet

Fuel Consumed (from start engines through pre-climb)

75 pounds (estimated)

Maneuver

First turn after take-off is at 50 feet altitude or after clearing highest obstacle

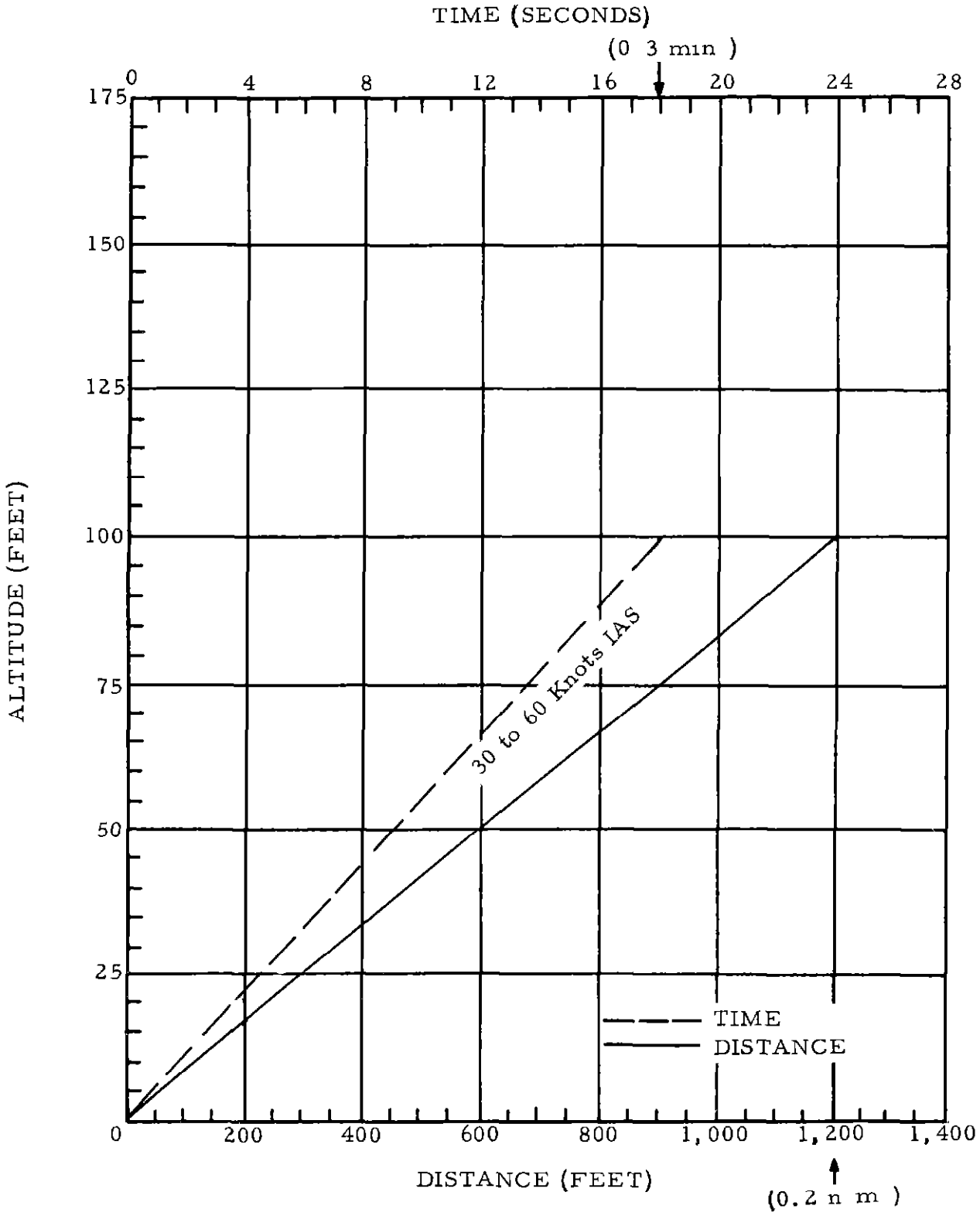

FIGURE 1 - PRE CLIMB - DISTANCE AND TIME DATA

AIR VEHICLE PERFORMANCE CHARACTERISTICS

Volumes I-A through IX

SECTION 2

COMMERCIAL AIRCRAFT

containing data on

Boeing B-377

Boeing 707-121

Convair 340/440

de Havilland Comet 4

Douglas DC-3 (C-47, R4D)

Douglas DC-4 (C-54)

Douglas DC-6

Douglas DC-6B

Douglas DC-7

Douglas DC-7B

Douglas DC-7C

Fairchild F-27B

Lockheed Electra 188

Lockheed 1049G

Lockheed 1649A

Martin 404

Vickers Viscount 745D

Vickers Viscount 812

(date of latest revision September 1, 1959)

UNITED STATES FEDERAL AVIATION AGENCY
Bureau of Research & Development Washington 25, D. C.

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 20 knots above V2 speed A pre-climb attitude is continued with a 25 degree flap configuration until a minimum of 200 feet altitude is attained At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 500 fpm and a positive increase in airspeed to 165 knots IAS Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	25° Flaps
Minimum (flap retraction)	107
Maximum (flap retraction)	159

Distance (from lift-off point to end of pre-climb)

Minimum: 2.1 nautical miles
Maximum 4 2 nautical miles
Operationally desirable: 4 2 nautical miles (see Figure I)

Time (from lift-off point to end of pre-climb)

Minimum 0 9 minute
Maximum 1 8 minute
Operationally desirable 1.8 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 1,000 feet
Maximum 2,000 feet
Operationally desirable. 2,000 feet

Fuel Consumed (from start engines through pre-climb)

650 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

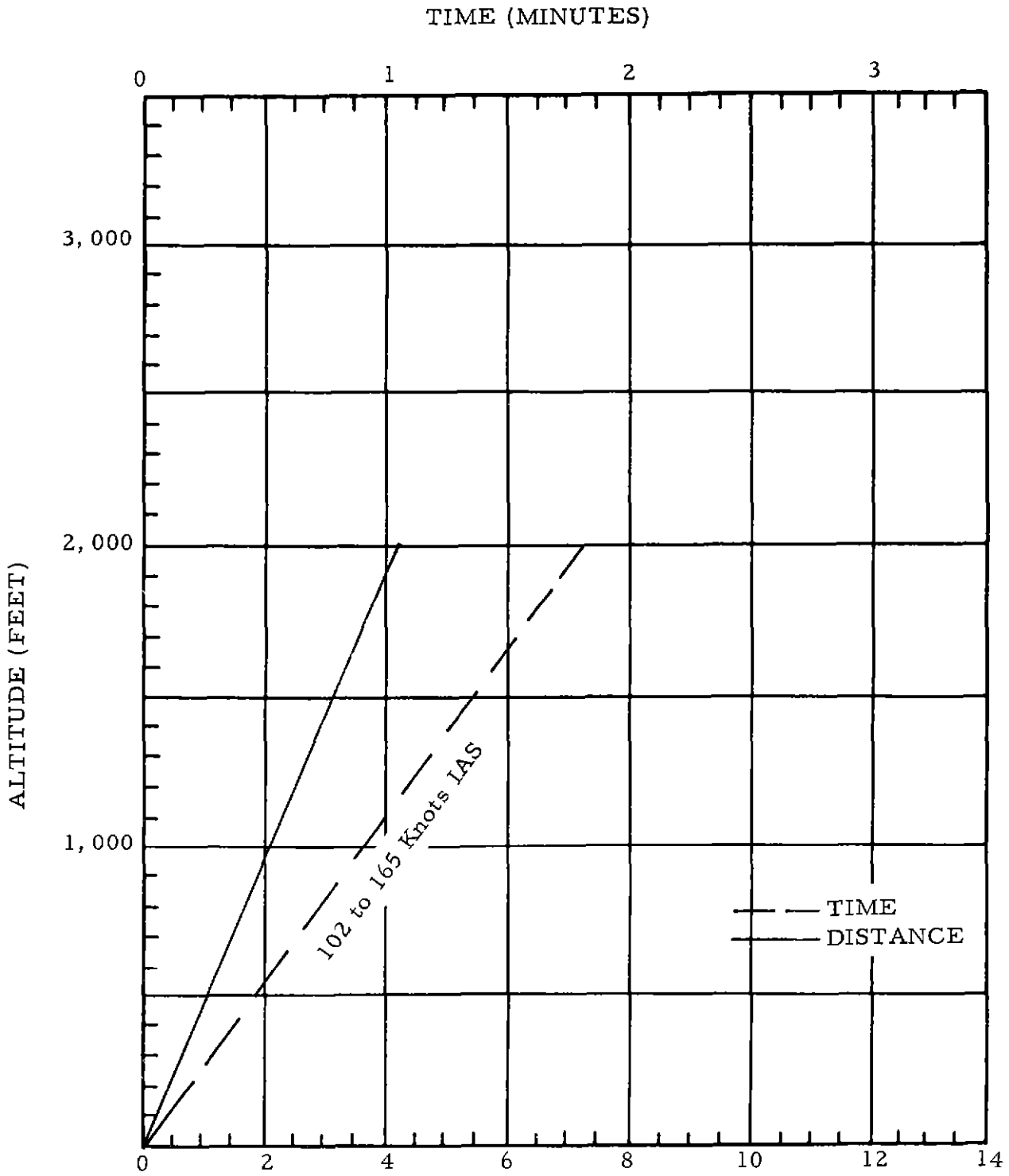

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted, the aircraft is accelerated to 10 knots above V2 speed, and flaps are retracted to 20 degrees A pre-climb attitude is continued while gradually increasing airspeed Flaps are fully retracted upon attaining an airspeed of 176 knots IAS and power is reduced to normal rated power Upon reaching an altitude of 1, 500 feet, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	30° Flaps	20° Flaps
Minimum (flap retraction)	142	142
Maximum (flap retraction)	209	219

Distance (from lift-off point to end of pre-climb)

Minimum 5 0 nautical miles
Maximum 9. 0 nautical miles
Operationally desirable 8 0 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 1 8 minutes
Maximum 3. 5 minutes
Operationally desirable 3 0 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1, 500 feet
Operationally desirable 1, 500 feet

Fuel Consumed (from start engines through pre-climb)

2, 500 pounds (estimated)

Maneuver

First turn after take-off (minimum speed of 200 knots IAS)
1, 500 to 2, 000 feet altitude

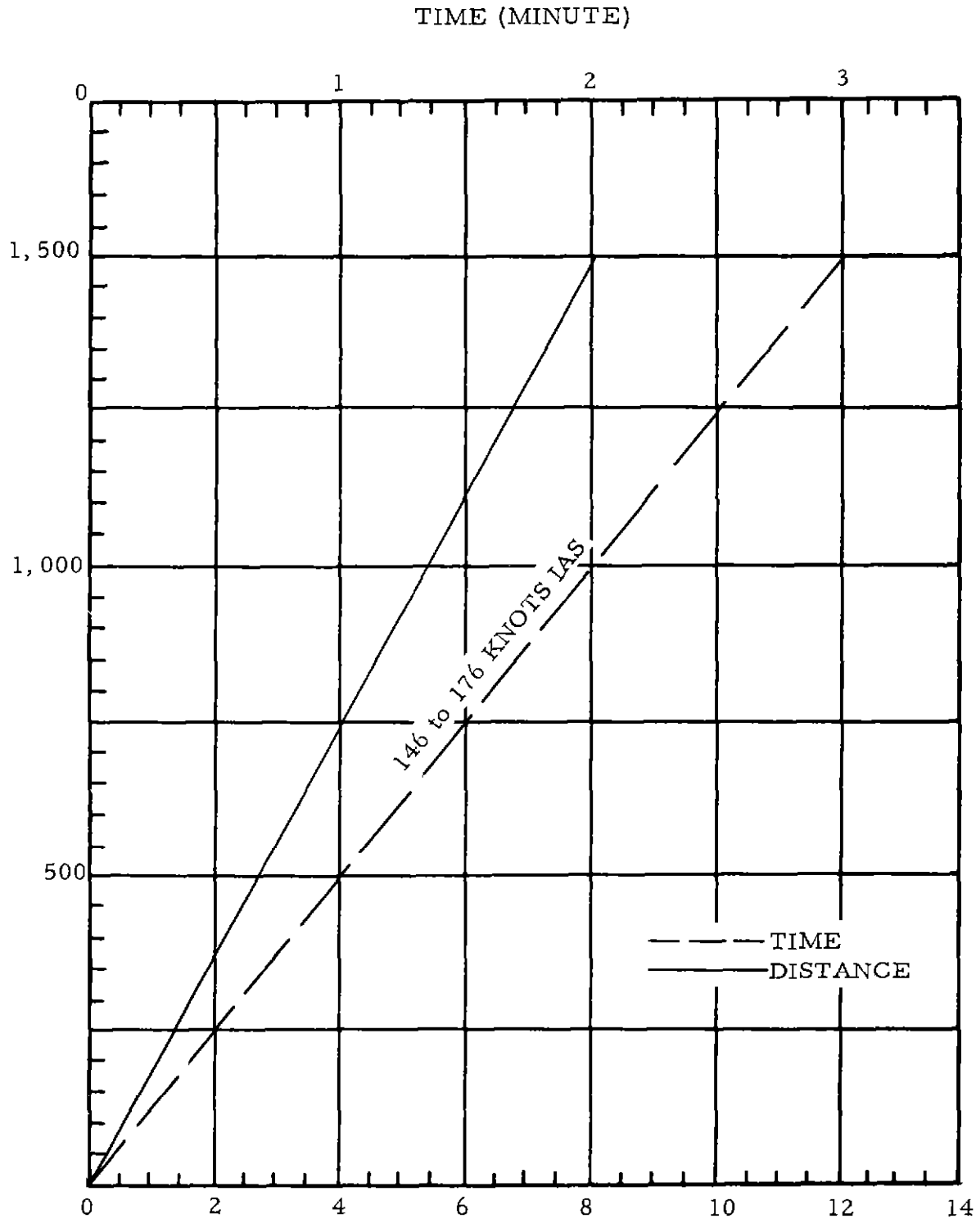

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated 17 knots above V2 speed. Flap retraction is initiated and an airspeed of 140 knots IAS is established Power is reduced to METO power as soon as flap retraction is completed. This power setting is maintained until 500 feet altitude is attained At this altitude the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	11° Flaps
Minimum (flap retraction)	126
Maximum (flap retraction)	174

Distance (from lift-off point to end of pre-climb)

Minimum 1.0 nautical mile
Maximum 2.1 nautical miles
Operationally desirable 2 1 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum. 0 5 minute
Maximum 1 0 minute
Operationally desirable. 1.0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1, 200 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

155 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

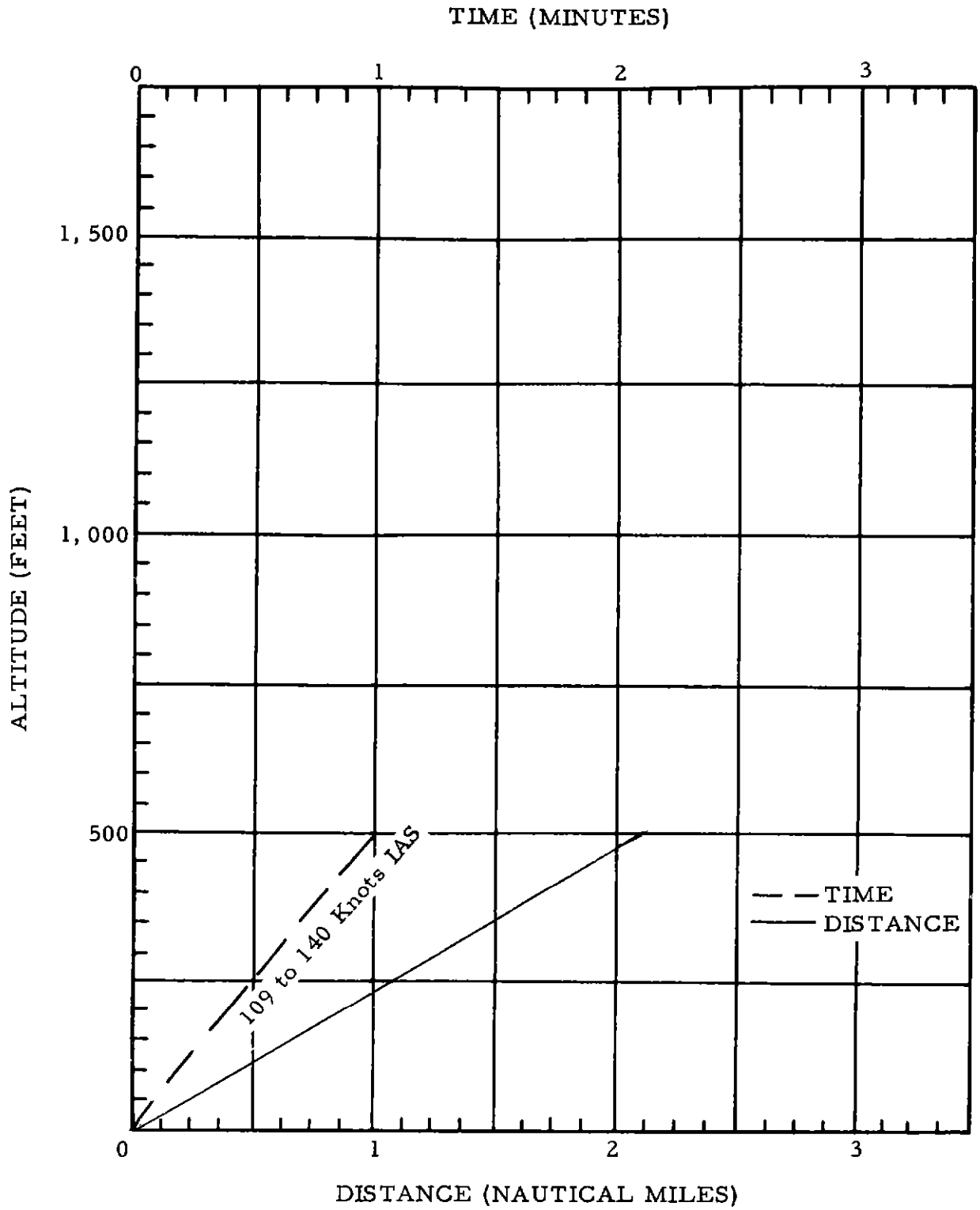

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 29 knots above V2 speed A pre-climb attitude is continued with take-off flap configuration until a minimum of 1,000 feet altitude is attained At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 500 fpm and a positive increase in airspeed to 320 knots IAS. Upon reaching 3,000 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	Full Flaps
Minimum (flap retraction)	Not available from manufacturer
Maximum (flap retraction)	" " " "

Distance (from lift-off point to end of pre-climb)

Minimum 4.0 nautical miles
Maximum 11.0 nautical miles
Operationally desirable. 7.5 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 1.0 minute
Maximum 2.9 minutes
Operationally desirable 1.8 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 1,500 feet
Maximum 5,000 feet
Operationally desirable 3,000 feet

Fuel Consumed (from start engines through pre-climb)

1,850 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude.

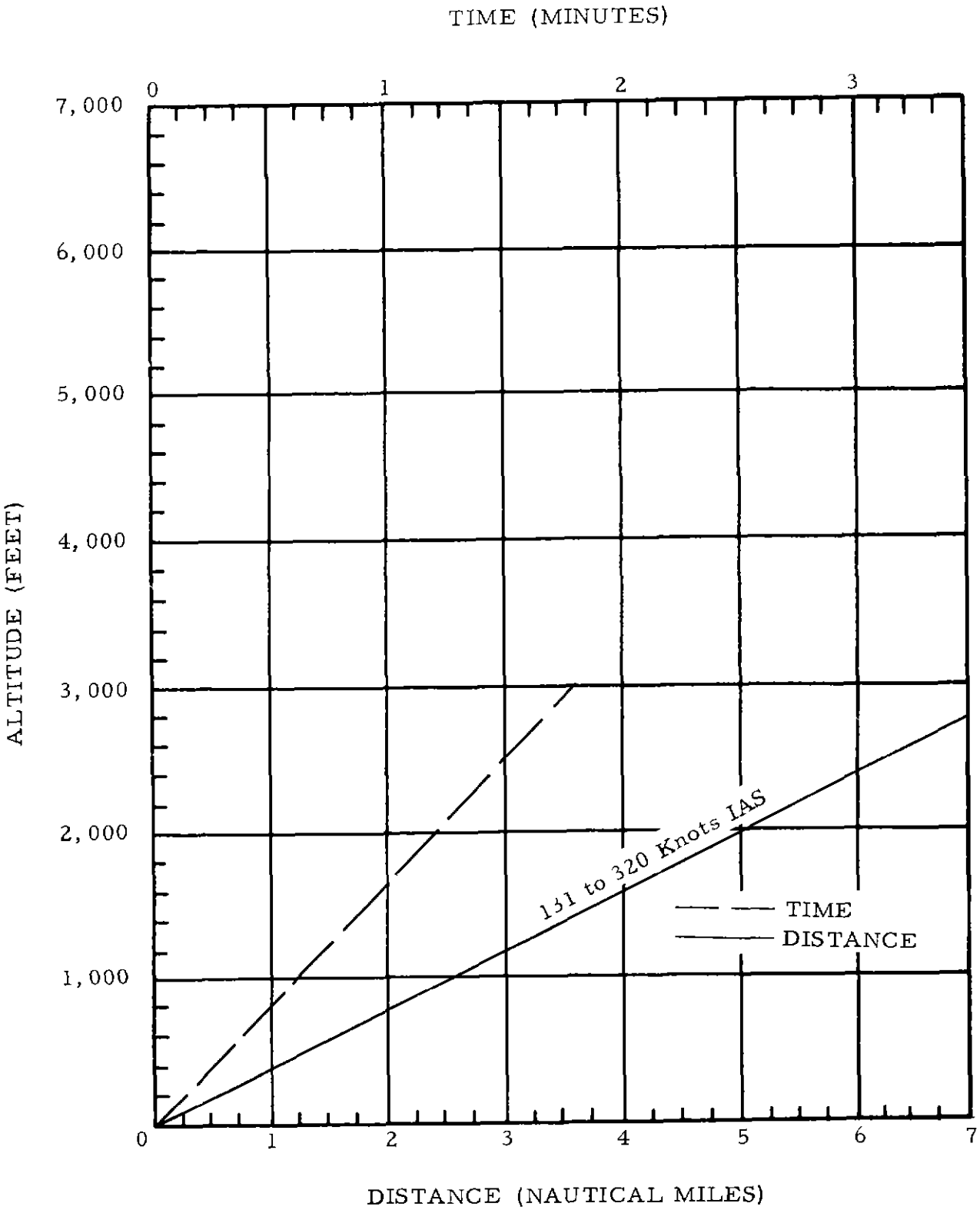

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 15 knots above V2 speed. A pre-climb attitude is continued until a minimum of 300 feet altitude is attained. At this altitude a positive rate of climb is maintained and the airspeed is increased to 105 knots IAS. Upon reaching 600 feet altitude, the aircraft will normally be in climb configuration (clean) If flaps are utilized, flap retraction is initiated at approximately 300 feet altitude.

Speed (knots IAS)

	45° Flaps
Minimum (flap retraction)	85
Maximum (flap retraction)	95

Distance (from lift-off point to end of pre-climb)

Minimum 1 1 nautical miles
Maximum 3.2 nautical miles
Operationally desirable 2 1 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.7 minute
Maximum 2.0 minutes
Operationally desirable 1 3 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 600 feet
Operationally desirable 600 feet

Fuel Consumed (from start engines through pre-climb)

120 pounds (estimated)

Maneuver

First turn after take-off at 600 feet altitude.

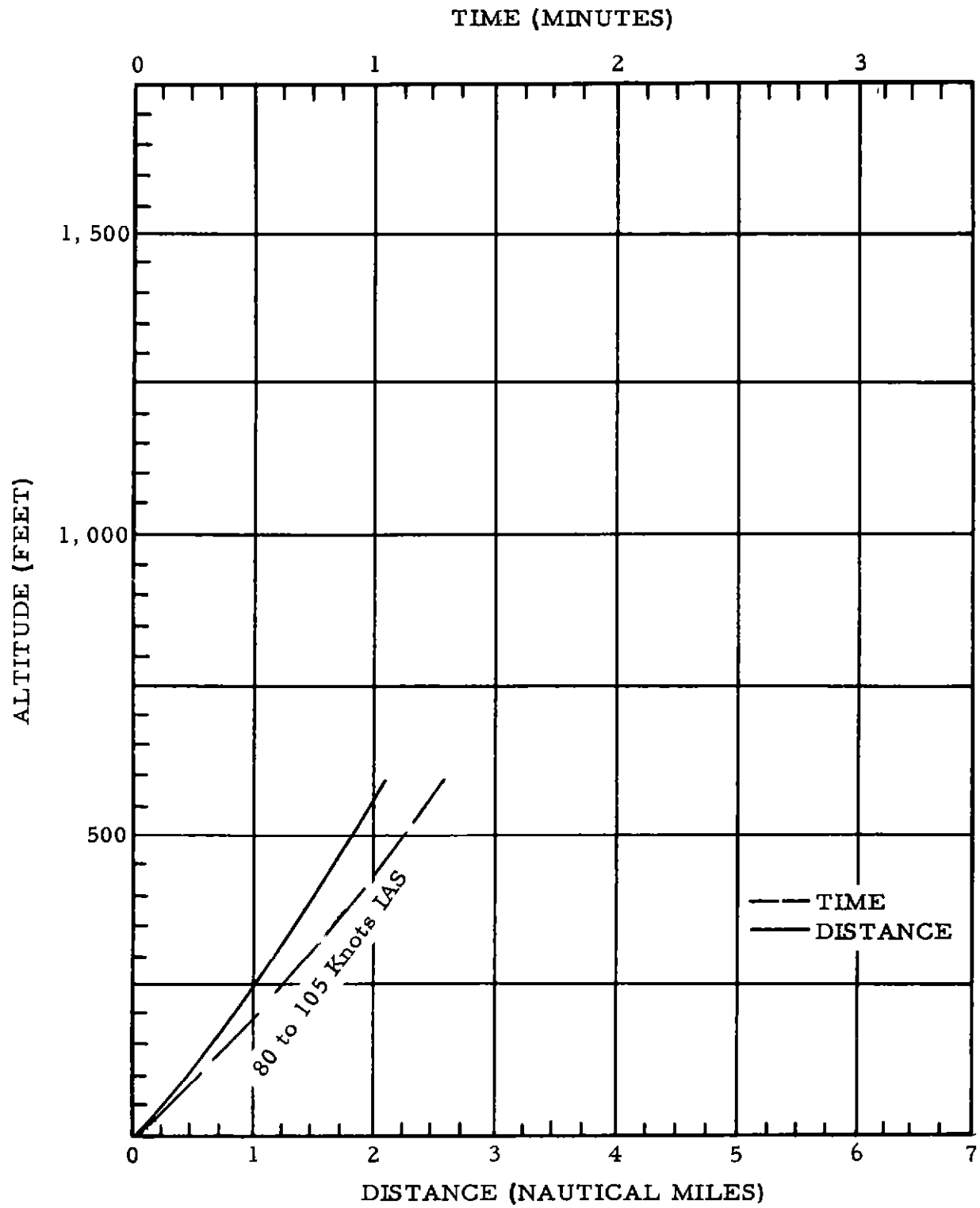

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne the gear is retracted and the aircraft is accelerated to 7 knots above V2 speed At this speed, the flaps are retracted to 8 degrees At 120 knots IAS, the flaps are fully retracted and the aircraft is accelerated to 135 knots IAS Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	15° Flaps	8° Flaps
Minimum (flap retraction)	110	120
Maximum (flap retraction)	170	170

Distance (from lift-off point to end of pre-climb)

Minimum 1 9 nautical miles
Maximum 4 0 nautical miles
Operationally desirable 1 9 nautical miles

Time (from lift-off point to end of pre-climb)

Minimum 0 9 minute
Maximum 2 0 minutes
Operationally desirable 0.9 minute

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1,200 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

235 pounds (estimated)

Maneuver

First turn after take-off at 200 feet altitude

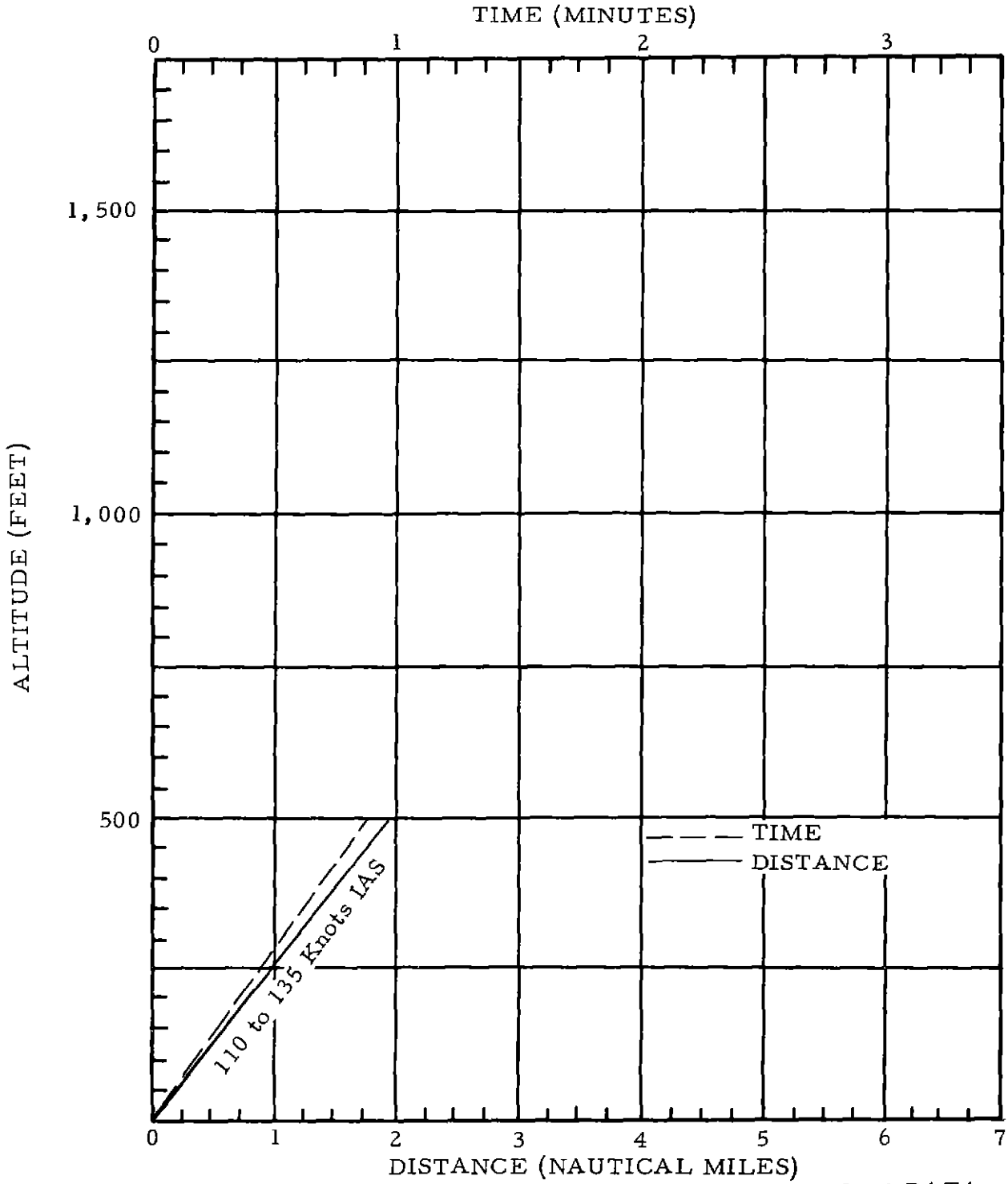

FIGURE 1 - PRE CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 22 knots above V2 speed. A pre-climb attitude is continued with a 20 degrees flaps configuration until a minimum of 100 feet altitude is attained. At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 430 fpm and a positive increase in airspeed Upon reaching 400 feet altitude, the aircraft will normally be in climb configuration (clean).

Distance (from lift-off point to end of pre-climb)

Minimum 2 1 nautical miles
Maximum 3.8 nautical miles
Operationally desirable 2.1 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 1.0 minute
Maximum 1.8 minutes
Operationally desirable 1.0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 100 feet
Maximum 1,000 feet
Operationally desirable 400 feet (see Figure 1)

Fuel Consumed (from start engines through lift-off)

330 pounds (estimated)

Maneuver

First turn after take-off at 400 feet altitude.

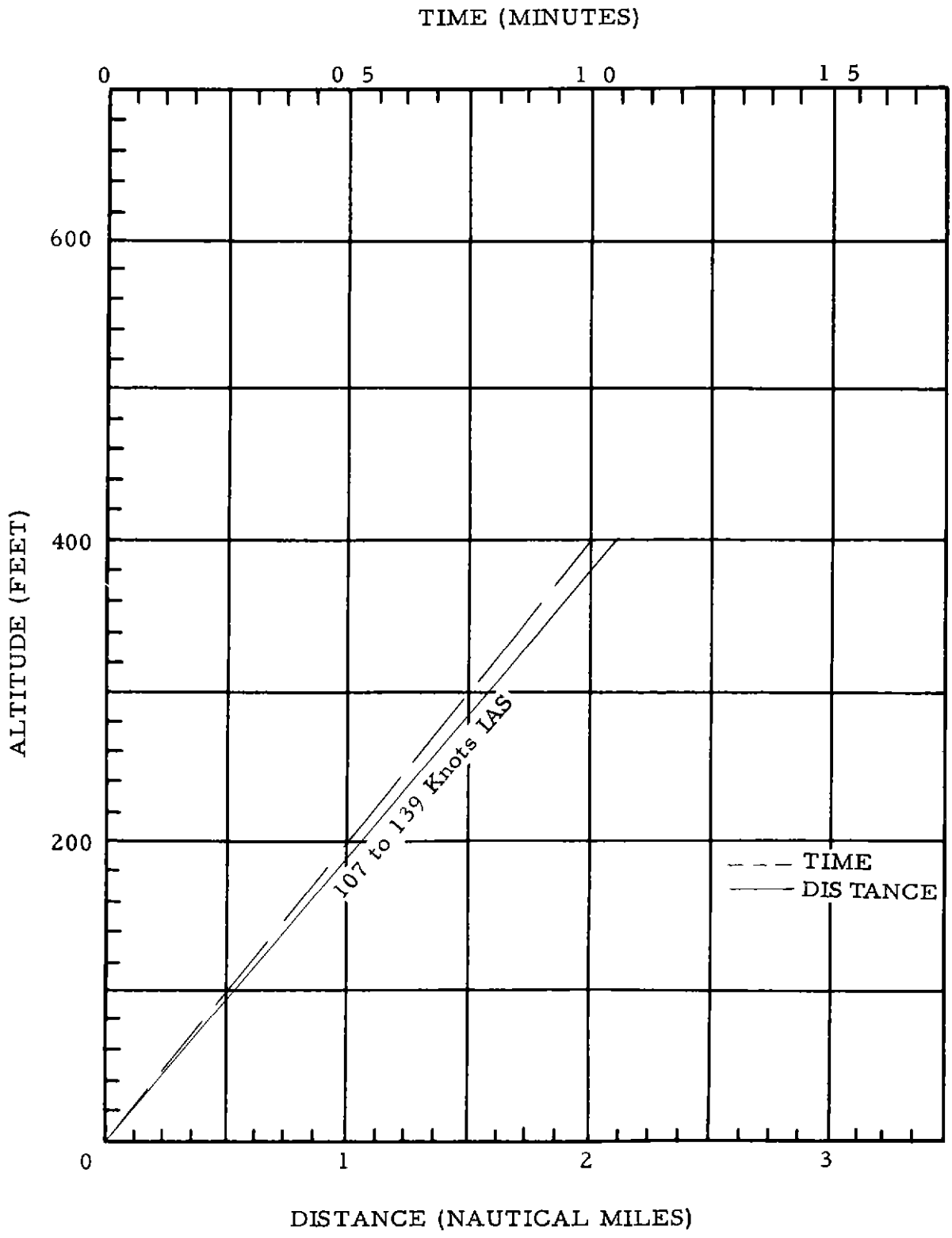

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 12 knots above V2 speed A pre-climb attitude is continued with a 20 degrees flaps configuration until a minimum of 100 feet altitude is attained At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 340 fpm and a positive increase in airspeed. Upon reaching 500 feet altitude, the aircraft will normally have attained a climb airspeed of 155 knots IAS and will be in climb configuration (clean).

Speed (knots IAS)

	0^{o} to 30^{o} Flaps	30^{o} to 50^{o} Flaps
Minimum (flap retraction)	135	133
Maximum (flap retraction)	168	147

Distance (from lift-off point to end of pre-climb)

Minimum 1 9 nautical miles
Maximum 3.7 nautical miles
Operationally desirable 1.9 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.8 minute
Maximum 1.5 minutes
Operationally desirable 0.8 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 100 feet
Maximum 1,000 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

490 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

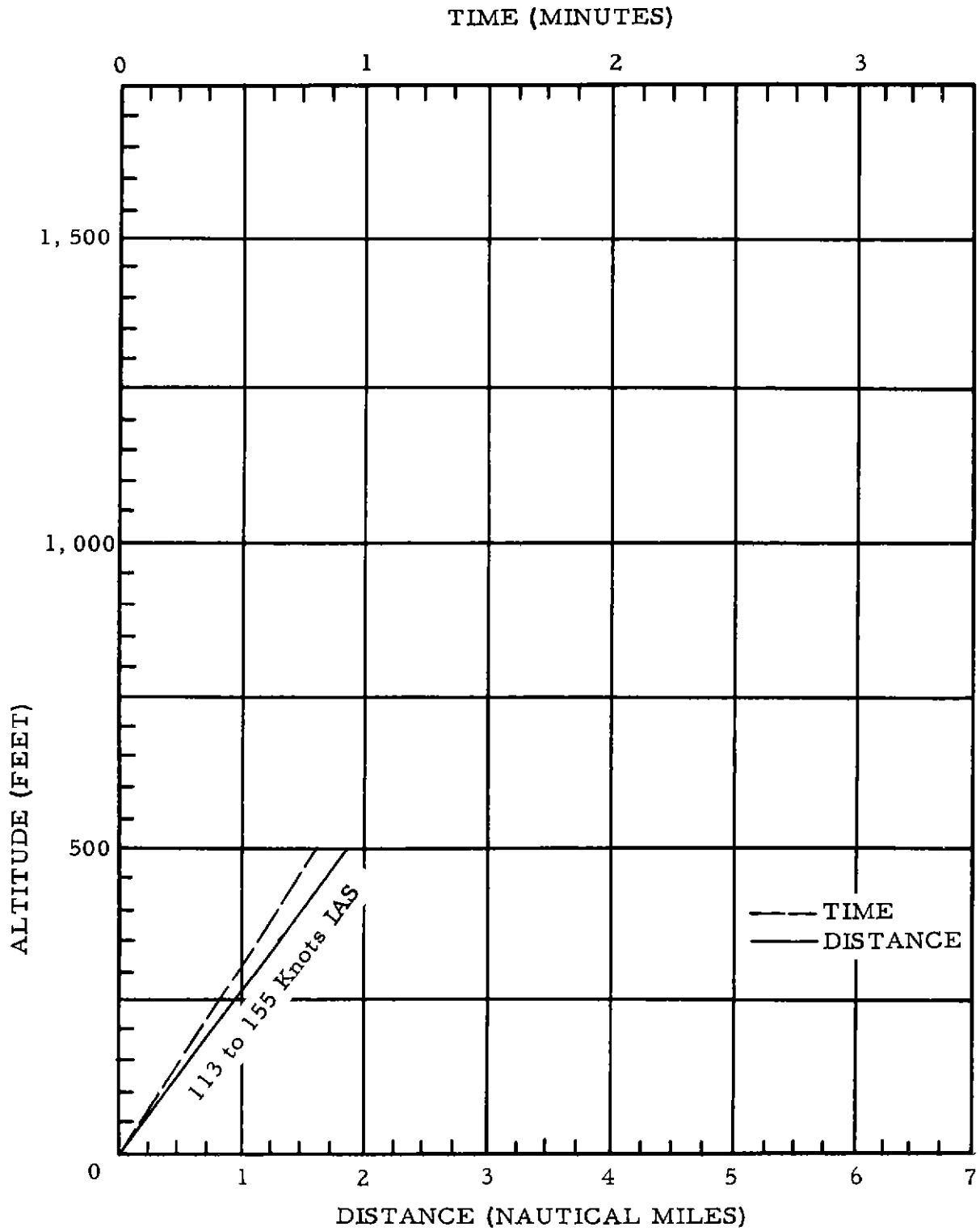

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 20 knots above V2 speed A pre-climb attitude is continued with a 20 degree flaps configuration until a minimum of 200 feet altitude is attained. At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 560 fpm and a positive increase in airspeed Upon reaching 500 feet altitude, the aircraft will normally have attained a climb speed of 175 knots IAS and will be in climb configuration (clean)

Speed (knots IAS)

	20° Flaps
Minimum (flap retraction)	145
Maximum (flap retraction)	170

Distance (from lift-off point to end of pre-climb)

Minimum 2 0 nautical miles
Maximum. 3 7 nautical miles
Operationally desirable 2 0 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 8 minute
Maximum 1. 5 minutes
Operationally desirable· 0 8 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1, 000 feet
Operationally desirable 500 feet (see Figure 1)

Fuel Consumed (from start engines through pre-climb)

650 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude.

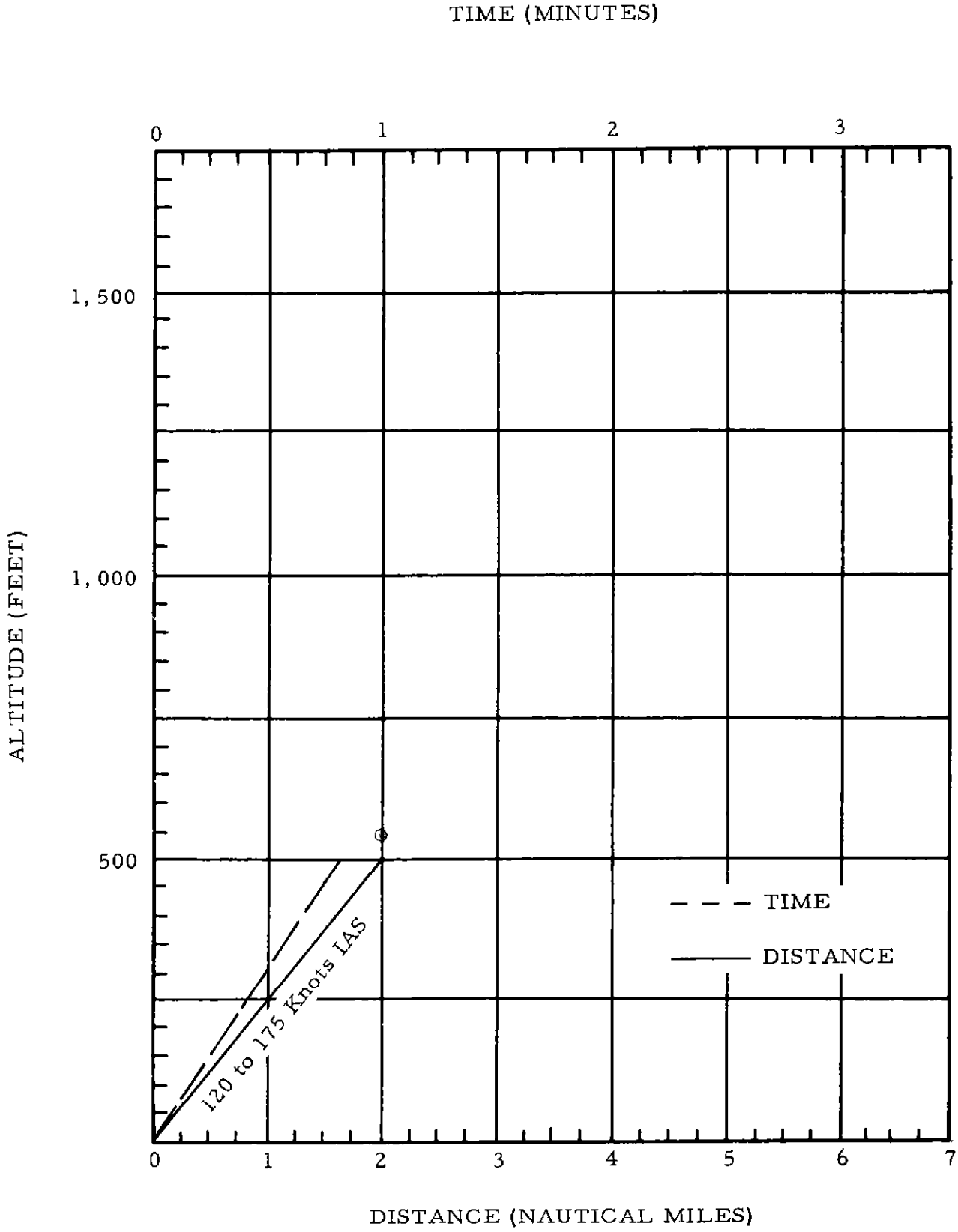

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 20 knots above V2 speed A pre-climb attitude is continued with a 20 degree flaps configuration until a minimum of 200 feet altitude is attained At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 560 fpm and a positive increase in airspeed Upon reaching 500 feet altitude, the aircraft will normally have attained a climb speed of 175 knots IAS and will be in climb configuration (clean).

Speed (knots IAS)

	20° Flaps
Minimum (flap retraction)	145
Maximum (flap retraction)	170

Distance (from lift-off point to end of pre-climb)

Minimum 2.0 nautical miles
Maximum 3 7 nautical miles
Operationally desirable 2 0 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 8 minute
Maximum 1 5 minutes
Operationally desirable 0 8 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1, 000 feet
Operationally desirable: 500 feet (see Figure 1)

Fuel Consumed (from start engines through pre-climb)

650 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude.

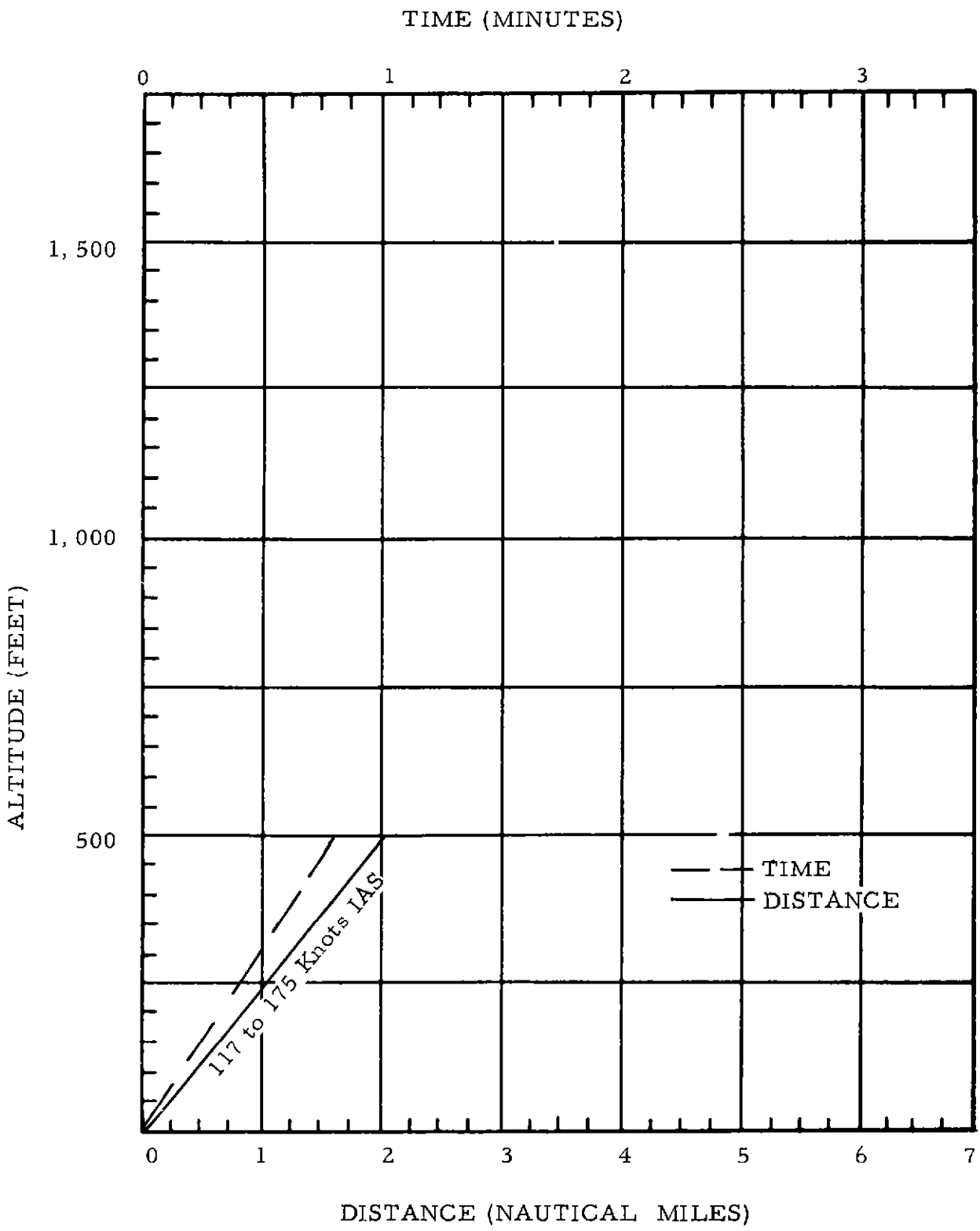

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 17 knots above V2 speed A pre-climb attitude is continued with flaps extended 20 degrees until a minimum of 100 feet altitude is attained. At this altitude, the aircraft is accelerated to 140 knots IAS, and flaps are retracted 10 degrees Airspeed is then increased to 150 knots IAS, and flaps are fully retracted Airspeed is then increased to 175 knots IAS. Upon reaching 1,000 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	20° Flaps	10° Flaps
Minimum (flap retraction)	133	136
Maximum (flap retraction)	172	189

Distance (from lift-off point to end of pre-climb)

Minimum 1.0 nautical mile
Maximum 3.0 nautical miles
Operationally desirable 3.0 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.4 minute
Maximum 1 2 minutes
Operationally desirable 1.2 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1,000 feet
Operationally desirable. 1,000 feet

Fuel Consumed (from start engines through pre-climb)

400 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

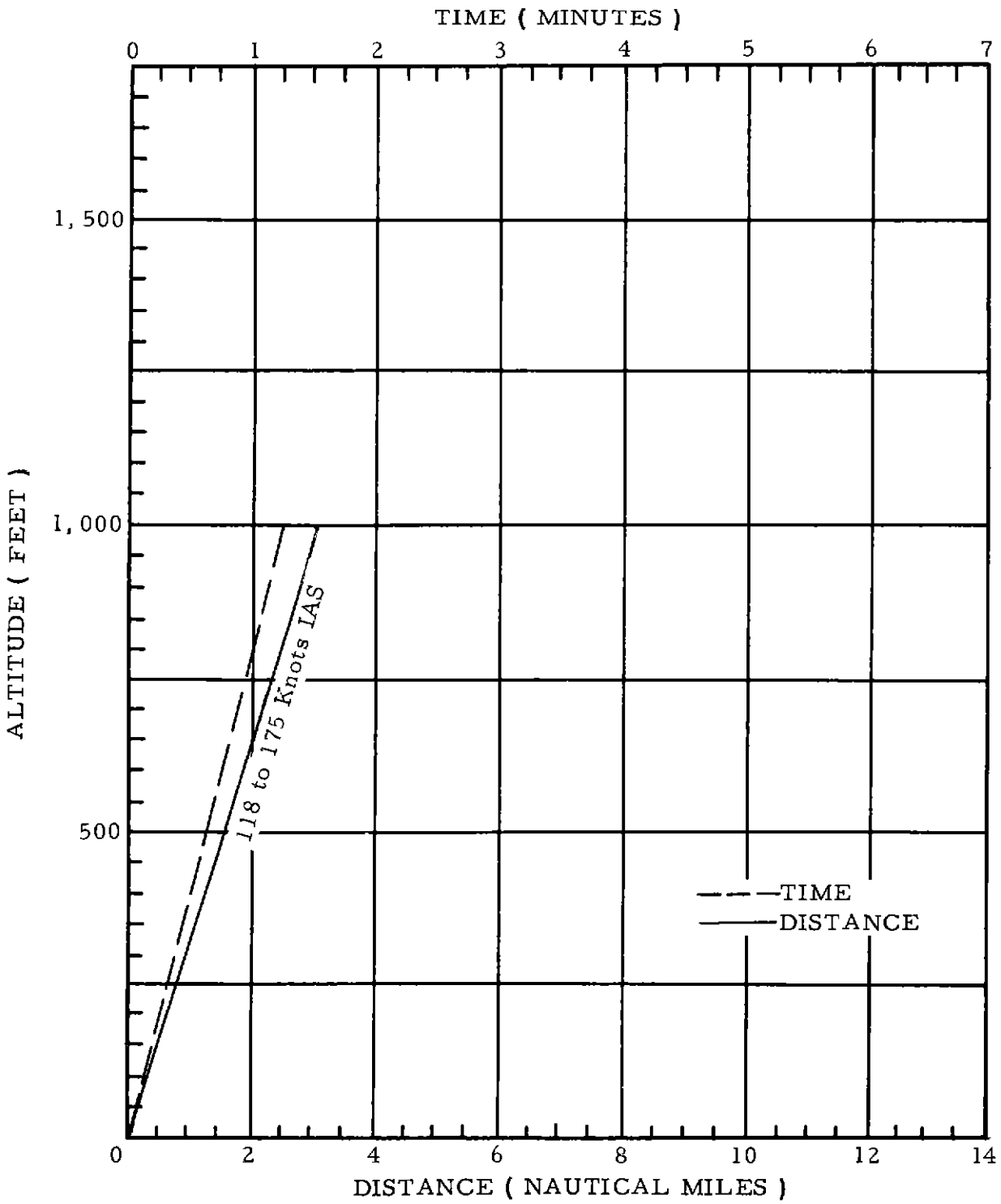

FIGURE 1 - PRE CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 30 knots above V2 speed A pre-climb attitude is continued with flaps extended 16 5 degrees until a minimum of 200 feet altitude is attained At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 500 fpm and a positive increase in airspeed to 127 knots IAS Upon reaching 1,000 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	16 5^{o} Flaps
Minimum (flap retraction)	101
Maximum (flap retraction)	140

Distance (from lift-off point to end of pre-climb)

Minimum 4 0 nautical miles
Maximum 6 0 nautical miles
Operationally desirable 5.9 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 3.0 minutes
Maximum 4 0 minutes
Operationally desirable 3 3 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 400 feet
Maximum 1,000 feet
Operationally desirable 1,000 feet

Fuel Consumed (from start engines through pre-climb)

230 pounds (estimated)

Maneuver

First turn after take-off at 400 feet altitude

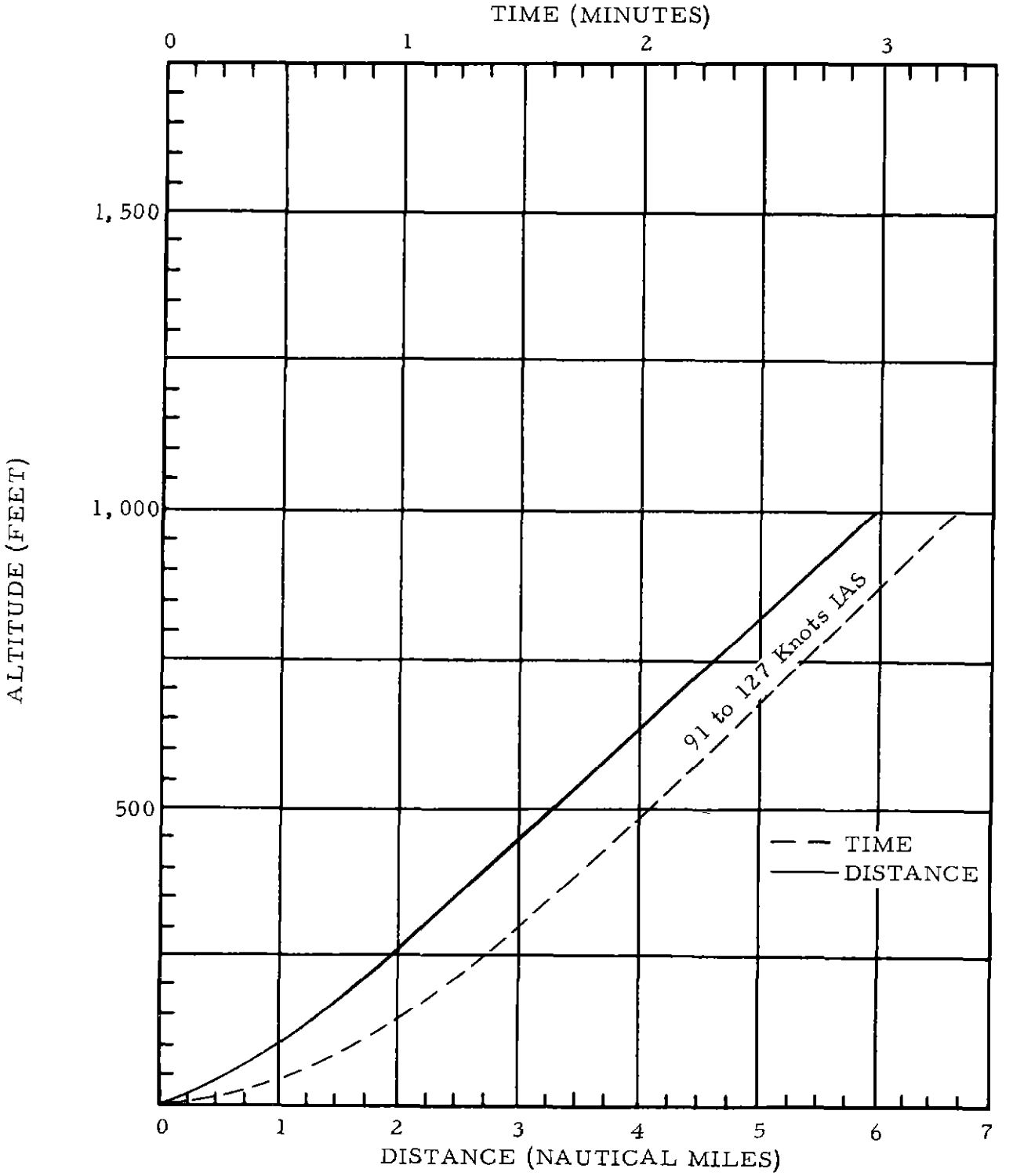

FIGURE 1 - PRE CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 20 knots above V2 speed, and flap retraction is initiated The aircraft is then accelerated to 210 knots IAS. Upon reaching 1,000 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	78% Flaps
Minimum (flap retraction)	135
Maximum (flap retraction)	190

Distance (from lift-off point to end of pre-climb)

Minimum 1 6 nautical miles
Maximum 6 5 nautical miles
Operationally desirable 3 2 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum. 0 7 minute
Maximum 2 4 minutes
Operationally desirable 1 2 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum. 2,000 feet
Operationally desirable 1,000 feet

Fuel Consumed (from start engines through pre-climb)

2,000 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

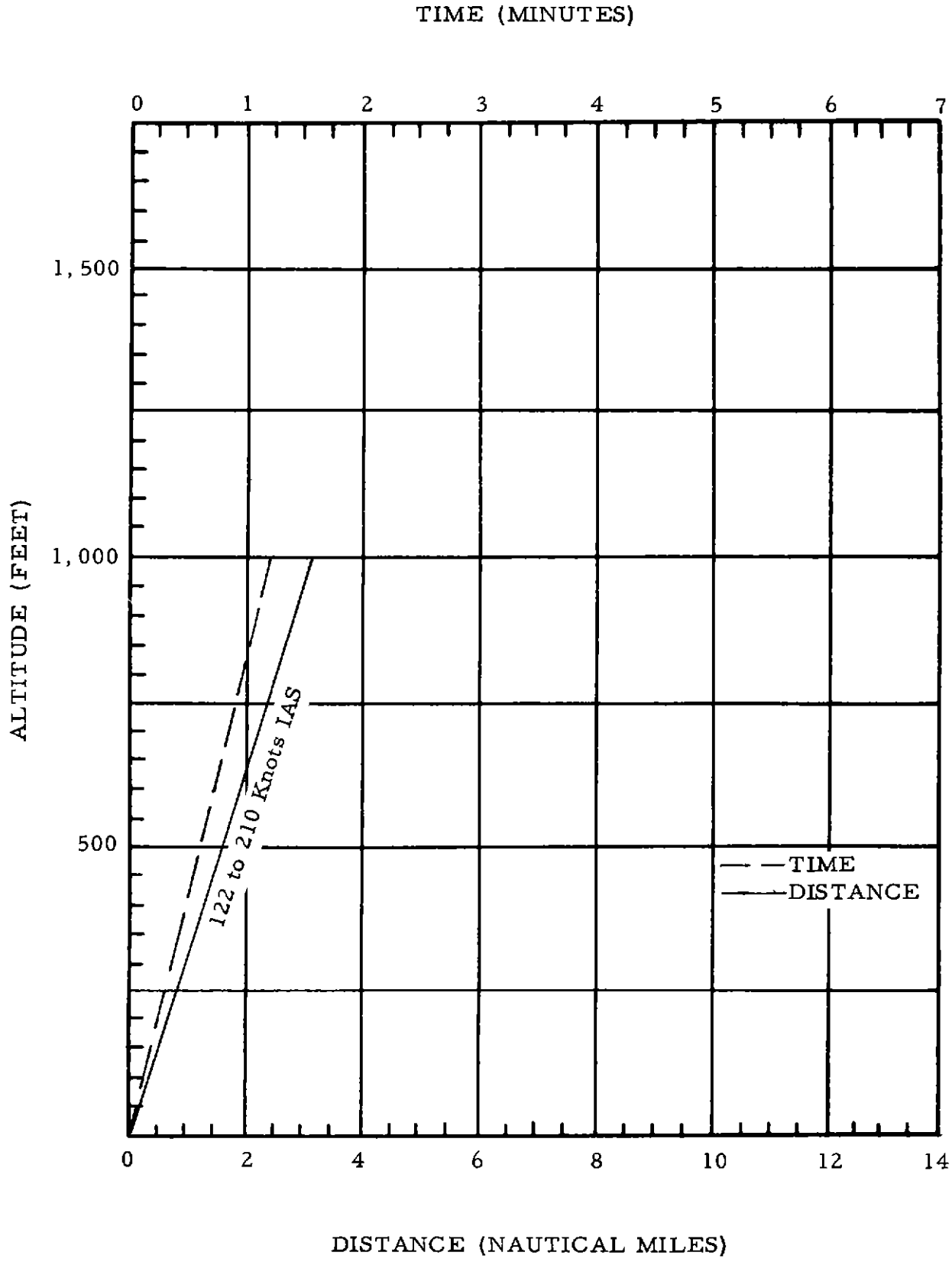

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 21 knots above V2 speed. A pre-climb attitude is continued with flaps extended 60% until a minimum of 200 feet altitude is attained At this altitude, flap retraction is initiated, while maintaining a shallow rate of climb and gradually increasing airspeed to 170 knots IAS. Upon reaching 300 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	60% Flaps
Minimum (flap retraction)	140
Maximum (flap retraction)	195

Distance (from lift-off point to end of pre-climb)

Minimum 2.0 nautical miles
Maximum 3 0 nautical miles
Operationally desirable 2.0 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.8 minute
Maximum 1.2 minutes
Operationally desirable 0.8 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 1,200 feet
Operationally desirable 300 feet

Fuel Consumed (from start of engines through pre-climb)

340 pounds (estimated)

Maneuver

First turn after take-off at 200 feet altitude

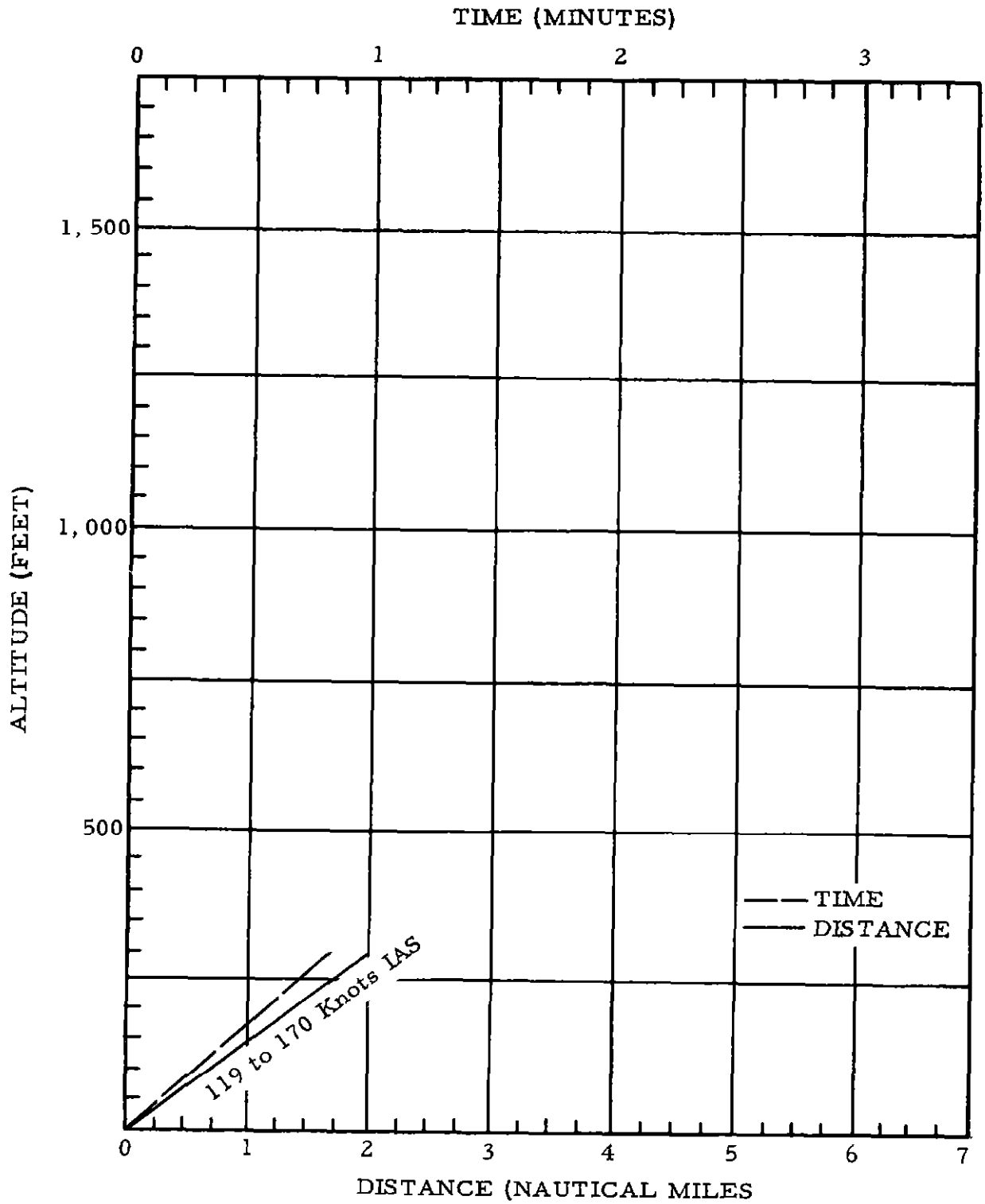

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 17 knots above V2 speed. A pre-climb attitude is continued with flaps extended 80 percent until a minimum of 200 feet altitude is attained. At this altitude, flap retraction is initiated while maintaining a shallow rate of climb and gradually increasing airspeed to 170 knots IAS. Upon reaching 300 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	80% (Flaps)
Minimum (flap retraction)	123
Maximum (flap retraction)	185

Distance (from lift-off point to end of pre-climb)

Minimum 2.0 nautical miles
Maximum 3.0 nautical miles
Operationally desirable 2.5 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 8 minute
Maximum 1 2 minutes
Operationally desirable 1 0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 200 feet
Maximum 500 feet
Operationally desirable 300 feet

Fuel Consumed (from start engines through pre-climb)

450 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

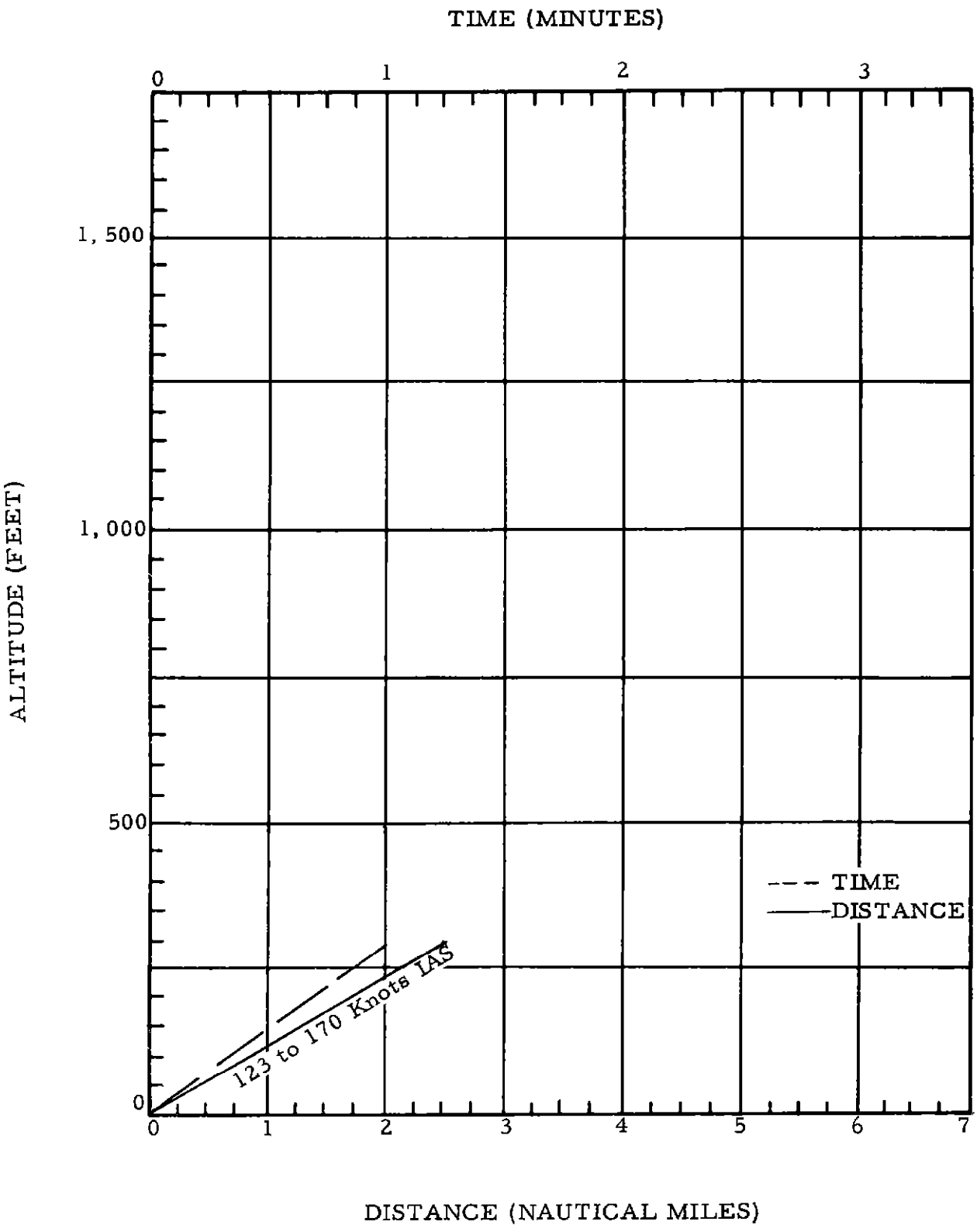

FIGURE 1 - PRE-CLIMB-DISTANCE & TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 20 knots above V2 speed A pre-climb attitude is continued with flaps extended 12 5 degrees, while increasing airspeed to 130 knots IAS Upon attaining a minimum altitude of 300 feet, flap retraction is initiated and airspeed is increased to 140 knots IAS Upon attaining 500 feet the airplane will normally be in climb configuration (clean)

Speed (knots IAS)

	12 1/2° Flaps
Minimum (flap retraction)	120
Maximum (flap retraction)	165

Distance (from lift-off point to end of pre-climb)

Minimum. 2 0 nautical miles
Maximum 4 8 nautical miles
Operationally desirable 2 0 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum· 1 0 minute
Maximum 2 4 minute
Operationally desirable. 1.0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1, 200 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

160 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

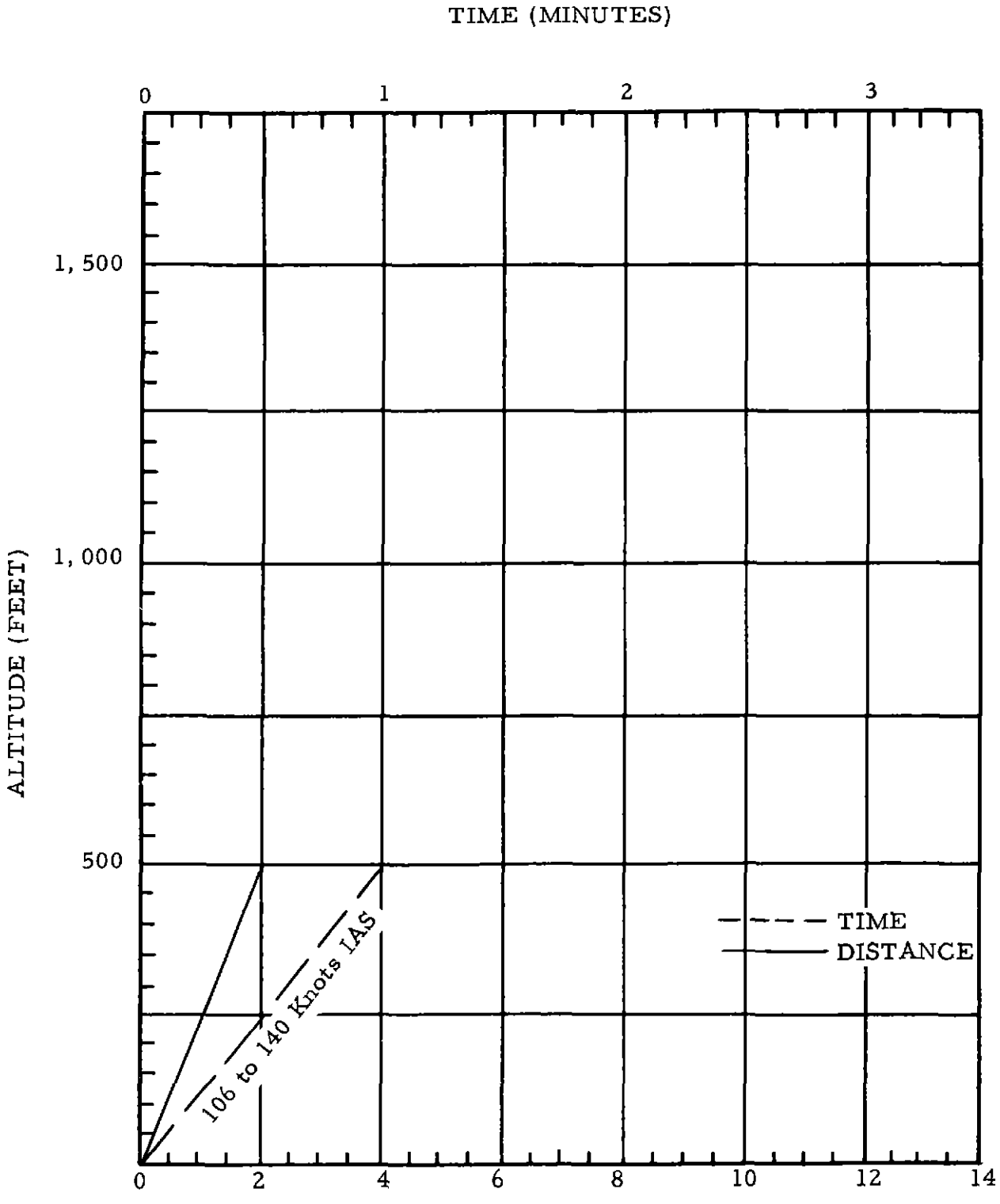

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted, the aircraft is accelerated to 20 knots above V2 speed and flap retraction is initiated. Power is reduced to climb rpm as the flaps pass the 10 degree position, and an airspeed of 160 knots IAS is established Upon reaching 700 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	20°Flaps
Minimum (flap retraction)	135
Maximum (flap retraction)	207

Distance (from lift-off to end of pre-climb)

Minimum 2.3 nautical miles
Maximum 4.6 nautical miles
Operationally desirable 3.5 nautical miles

Time (from lift-off point to end of pre-climb)

Minimum 1.0 minute
Maximum 2.0 minutes
Operationally desirable 1 5 minutes

Altitude (at end of pre-climb)

Minimum 700 feet
Maximum 1,200 feet
Operationally desirable· 700 feet

Fuel Consumed (from start engines through pre-climb)

400 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

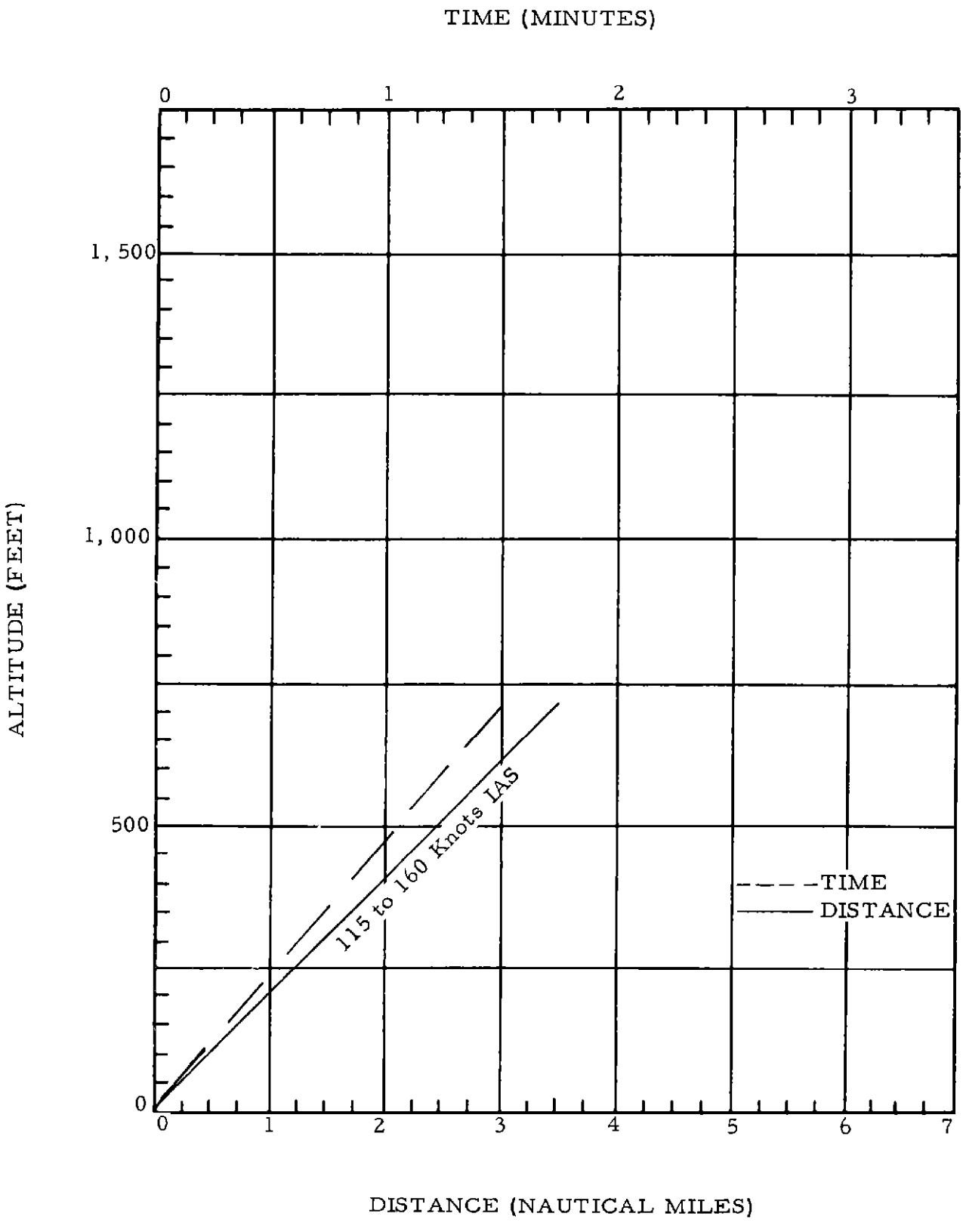

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted, the aircraft is accelerated to 20 knots above V2 speed, and flap retraction is initiated Power is reduced to climb rpm and an airspeed of 160 knots IAS is established. Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	20° Flaps
Minimum (flap retraction)	135
Maximum (flap retraction)	194

Distance (from lift-off point to end of pre-climb)

Minimum 2 0 nautical miles
Maximum 4. 0 nautical miles
Operationally desirable 3. 0 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 9 minute
Maximum 1 7 minutes
Operationally desirable 1 3 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1, 200 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

460 pounds (estimated)

Maneuver

First turn after take-off at 200 feet altitude.

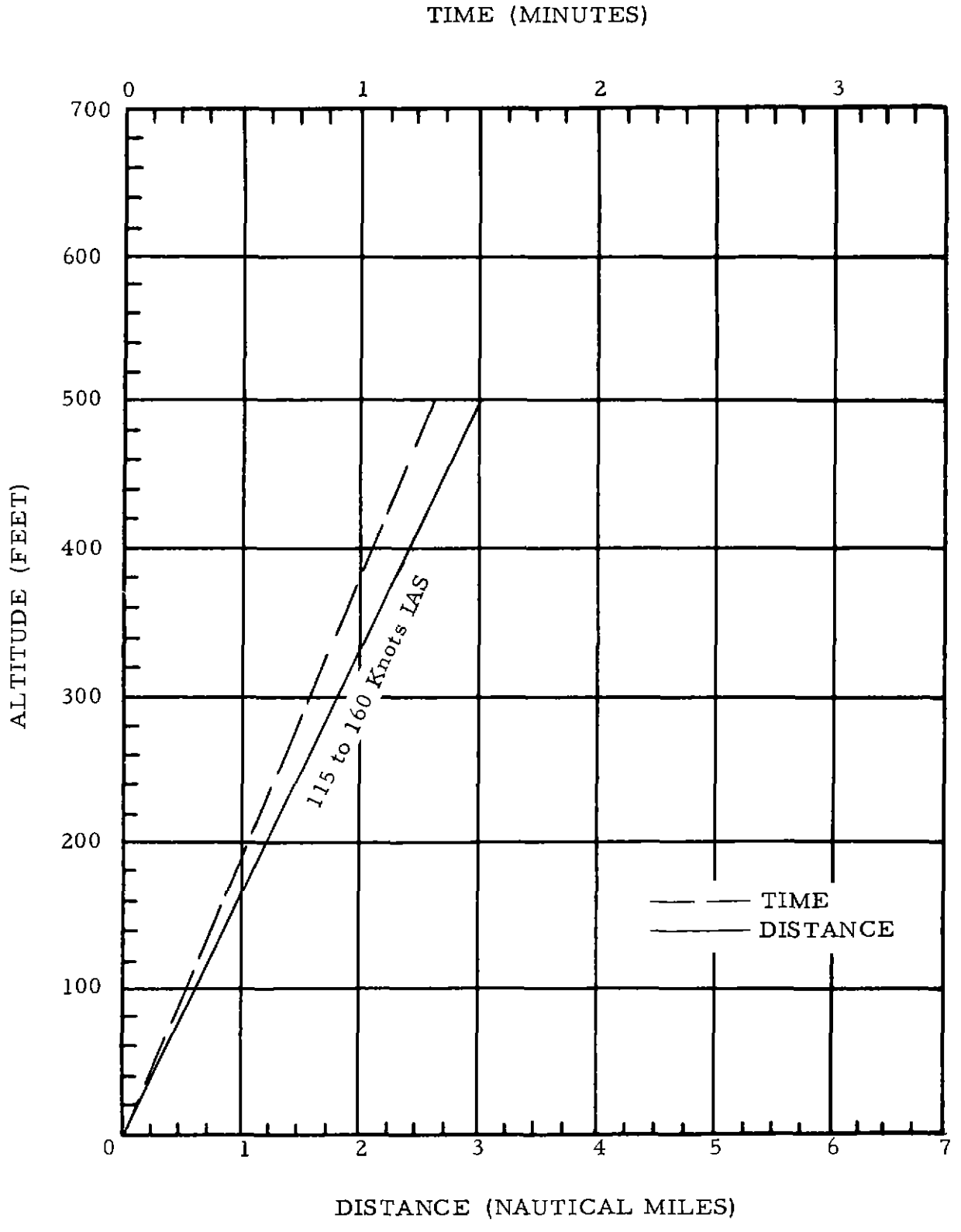

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

AIR VEHICLE PERFORMANCE CHARACTERISTICS

Volumes I-A through IX

SECTION 3

GENERAL AVIATION

containing data on

Aero Commander 500

Aero Commander 680 (L-26C)

Aero Commander 720

Beechcraft "Bonanza" K-35

Beechcraft "Twin Bonanza" (L-23D)

Beechcraft Model 95

Beechcraft Super 18

Cessna 150

Cessna 172

Cessna 175

Cessna 180 (Amphibian)

Cessna 182

Cessna 310A (L-27A)

Cessna 310C

de Havilland "Beaver" (L-20A)

de Havilland "Otter" (U-1A)

Mooney Mark 20A

Piper "Tri-Pacer" PA-22

Piper "Apache"" PA-23

Piper "Comanche" PA-24-180

(date of latest revision September 1, 1959)

UNITED STATES FEDERAL AVIATION AGENCY
Bureau of Research & Development Washington 25, D. C.

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 12 knots above V2 speed A pre-climb attitude is continued with a 10 degree flaps configuration until a minimum of 200 feet altitude is attained. At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 1,000 fpm and a positive increase in airspeed. Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	10^{o} Flaps
Minimum (flap retraction)	83
Maximum (flap retraction)	130

Distance (from lift-off point to end of pre-climb)

Minimum 0.3 nautical mile
Maximum 1.5 nautical miles
Operationally desirable 0.8 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.2 minute
Maximum 0 8 minute
Operationally desirable 0.5 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 200 feet
Maximum 500 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

16 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude.

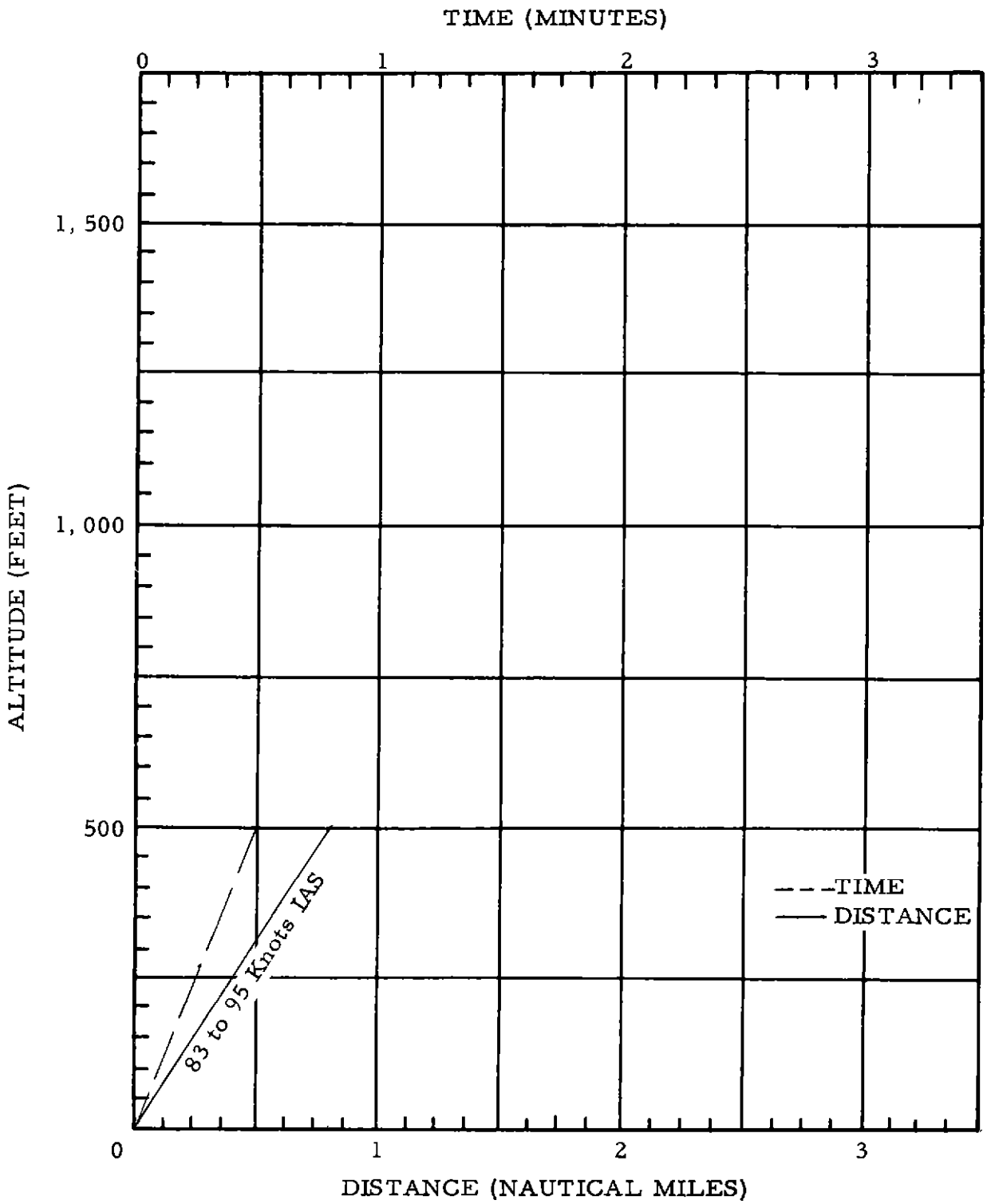

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 18 knots above V2 speed At this speed, flap retraction is initiated while maintaining a minimum rate of climb of 1,000 fpm and increasing airspeed to 113 knots IAS Upon reaching 1,000 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	10° Flaps
Minimum (flap retraction)	78
Maximum (flap retraction)	113

Distance (from lift-off point to end of pre-climb)

Minimum 0 5 nautical mile
Maximum 1 6 nautical miles
Operationally desirable 1 1 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 3 minute
Maximum 1 0 minute
Operationally desirable 0 7 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1,500 feet
Operationally desirable 1,000 feet

Fuel Consumed (from start engines through pre-climb)

54 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

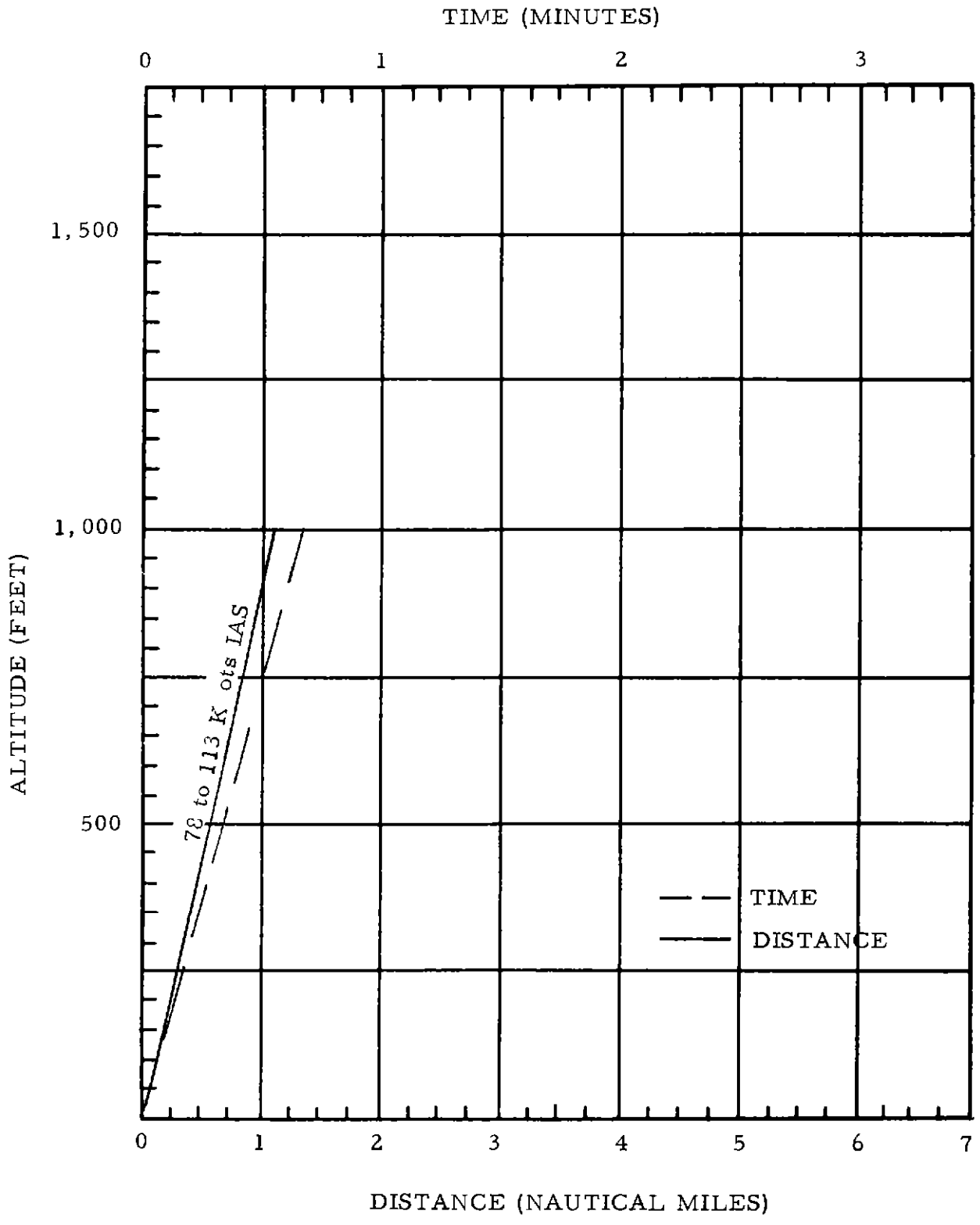

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and a pre-climb attitude is continued at V2 speed and flaps extended 10 degrees until a minimum of 300 feet altitude is attained At this altitude airspeed is gradually increased to 18 knots above V2 speed. Upon reaching 1,000 feet altitude the aircraft will normally be in climb configuration (flaps extended 10 degrees), and an airspeed of 104 knots IAS

Speed (knots IAS)

	10^{o} Flaps
Minimum (flap retraction)	86
Maximum (flap retraction)	130

Distance (from lift-off point to end of pre-climb)

Minimum 1 0 nautical mile
Maximum 1 6 nautical miles
Operationally desirable 1 6 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.6 minute
Maximum 1 0 minute
Operationally desirable. 1 0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1,000 feet
Operationally desirable 1,000 feet

Fuel Consumed (from start engines through pre-climb)

54 pounds

Maneuver

First turn after take-off at 300 feet altitude

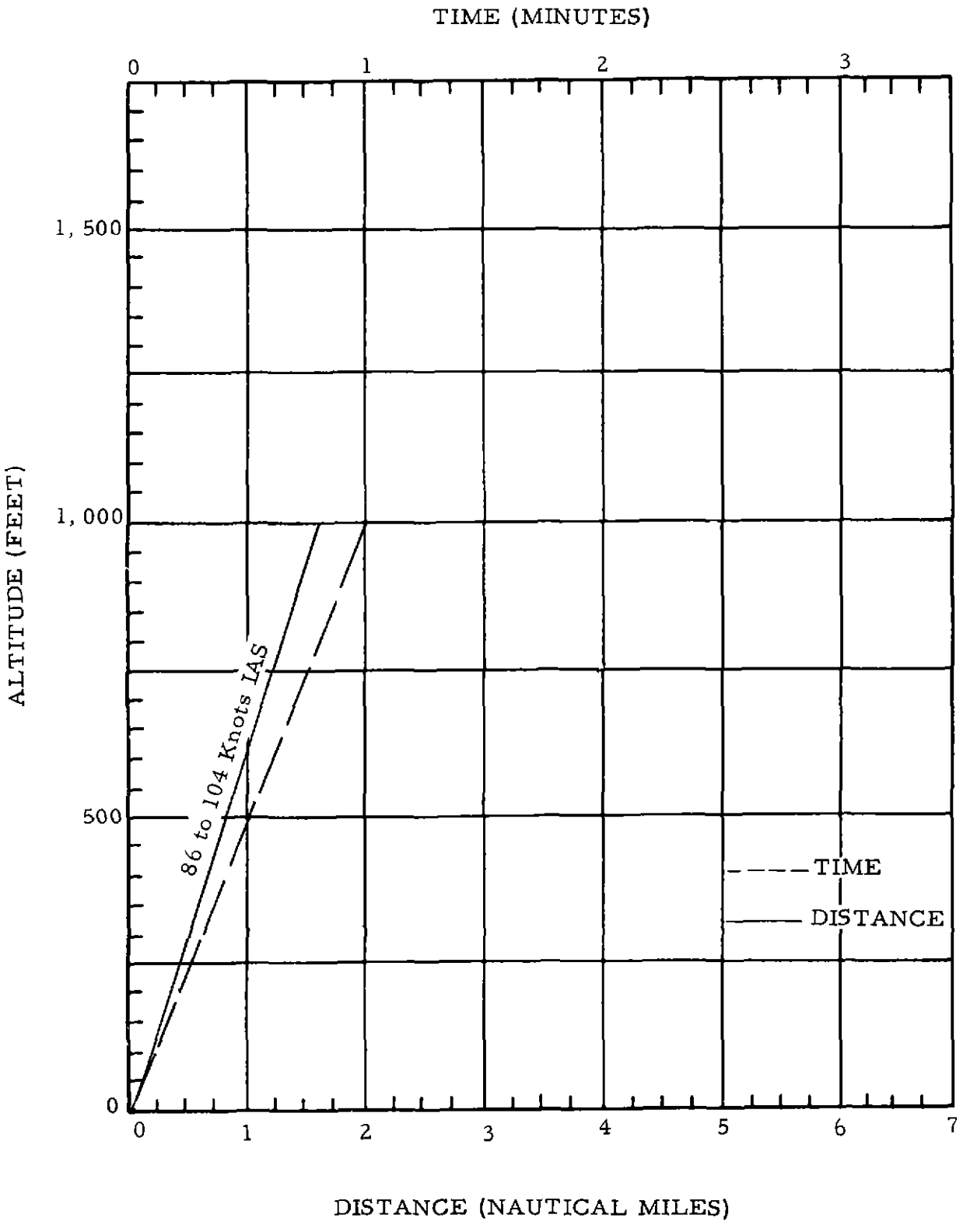

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 9 knots above V2 speed A pre-climb attitude is continued while airspeed is increased to 90 knots IAS until 500 feet altitude is attained At this altitude, the aircraft will normally be in climb configuration (clean) If flaps are utilized, flap retraction is initiated at approximately 300 feet altitude

Speed (knots IAS)

	20^{o} Flaps
Minimum (flap retraction)	56
Maximum (flap retraction)	104

Distance (from lift-off point to end of pre-climb)

Minimum 0 4 nautical mile
Maximum 0 5 nautical mile
Operationally desirable 0 5 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 3 minute
Maximum 0 4 minute
Operationally desirable 0 4 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 500 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

48 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude

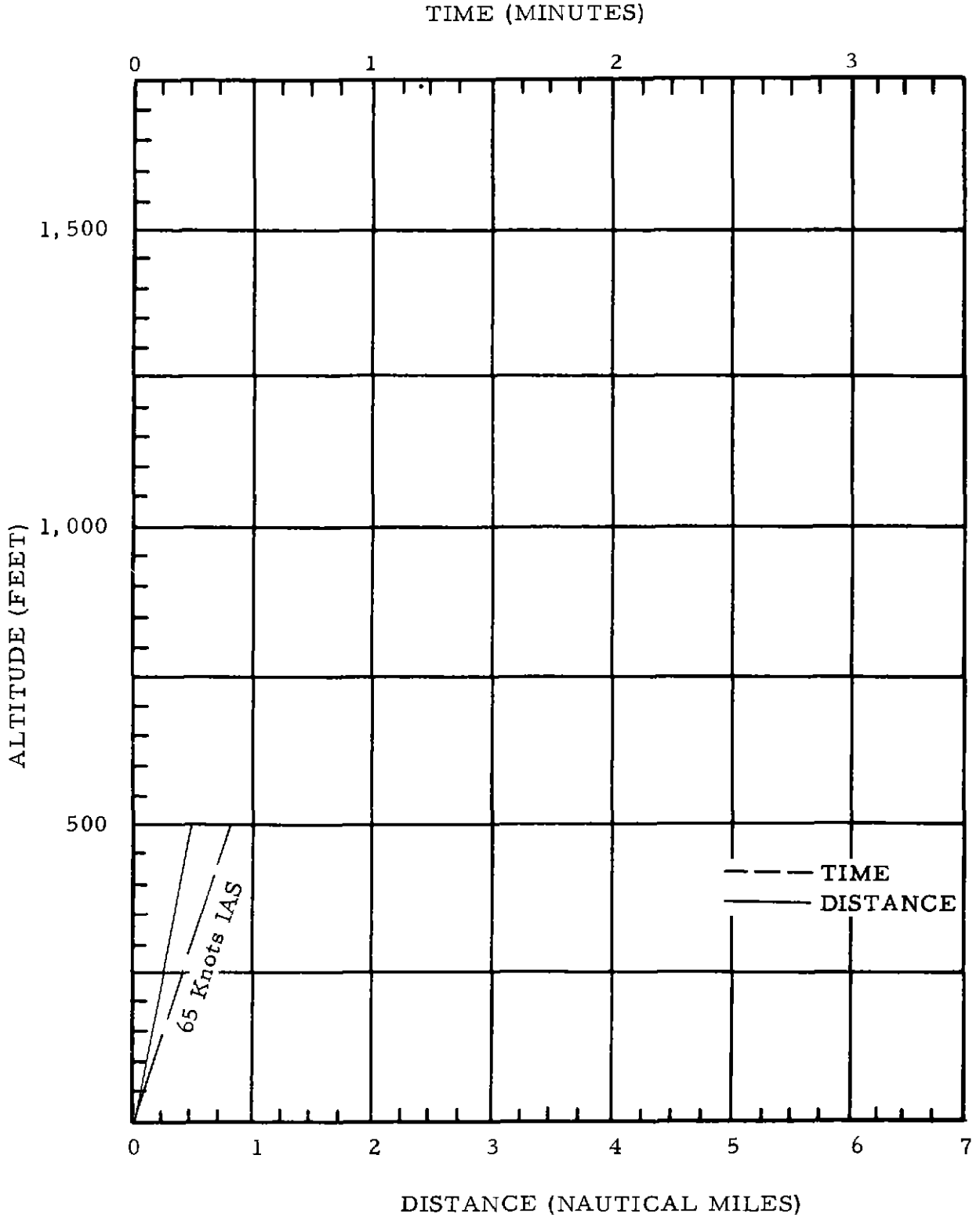

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 9 knots above V2 speed A pre-climb attitude is continued until a minimum of 100 feet altitude is attained At this altitude, while maintaining a minimum rate of climb of 500 fpm, airspeed is increased to 120 knots IAS Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	All Flap Settings
Minimum (flap retraction)	61 5
Maximum (flap retraction)	130

Distance (from lift-off point to end of pre-climb)

Minimum 0 5 nautical mile
Maximum 1 5 nautical miles
Operationally desirable 1 0 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 5 minute
Maximum 1 0 minute
Operationally desirable 0 6 minute (see Figure 1)

Altitude (at end of pre-lcimb)

Minimum 300 feet
Maximum 1, 000 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

30 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

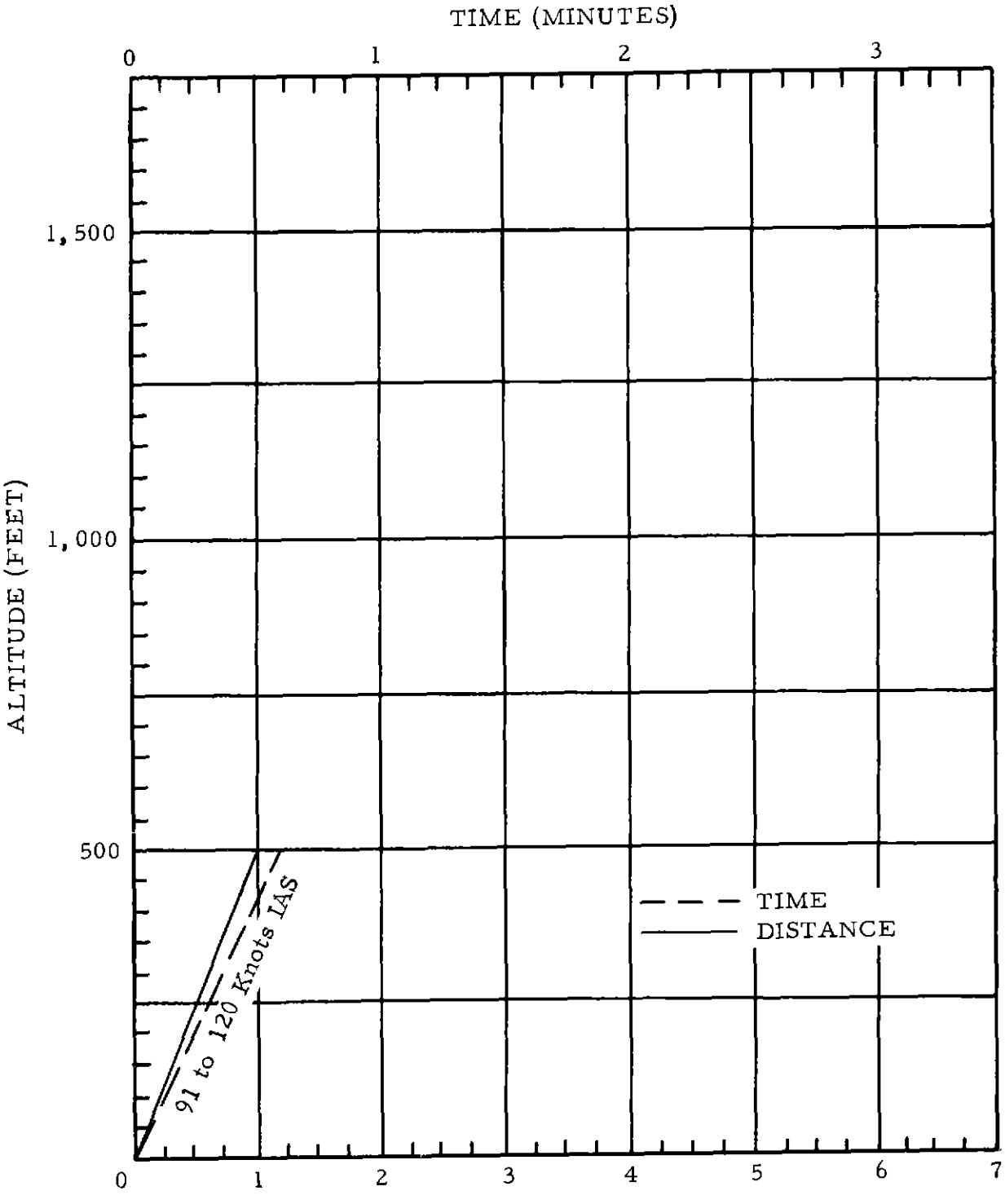

FIGURE 1 - PRE CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 16 knots above V2 speed. Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean) If flaps are utilized flap retraction is initiated at approximately 300 feet altitude

Speed (knots IAS)

	20^{o} Flaps
Minimum (flap retraction)	77
Maximum (flap retraction)	113

Distance (from lift-off point to end of pre-climb)

Minimum 0. 2 nautical mile
Maximum 0 5 nautical mile
Operationally desirable 0 5 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 2 minute
Maximum 0 3 minute
Operationally desirable 0 3 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 500 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

6 to 10 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude.

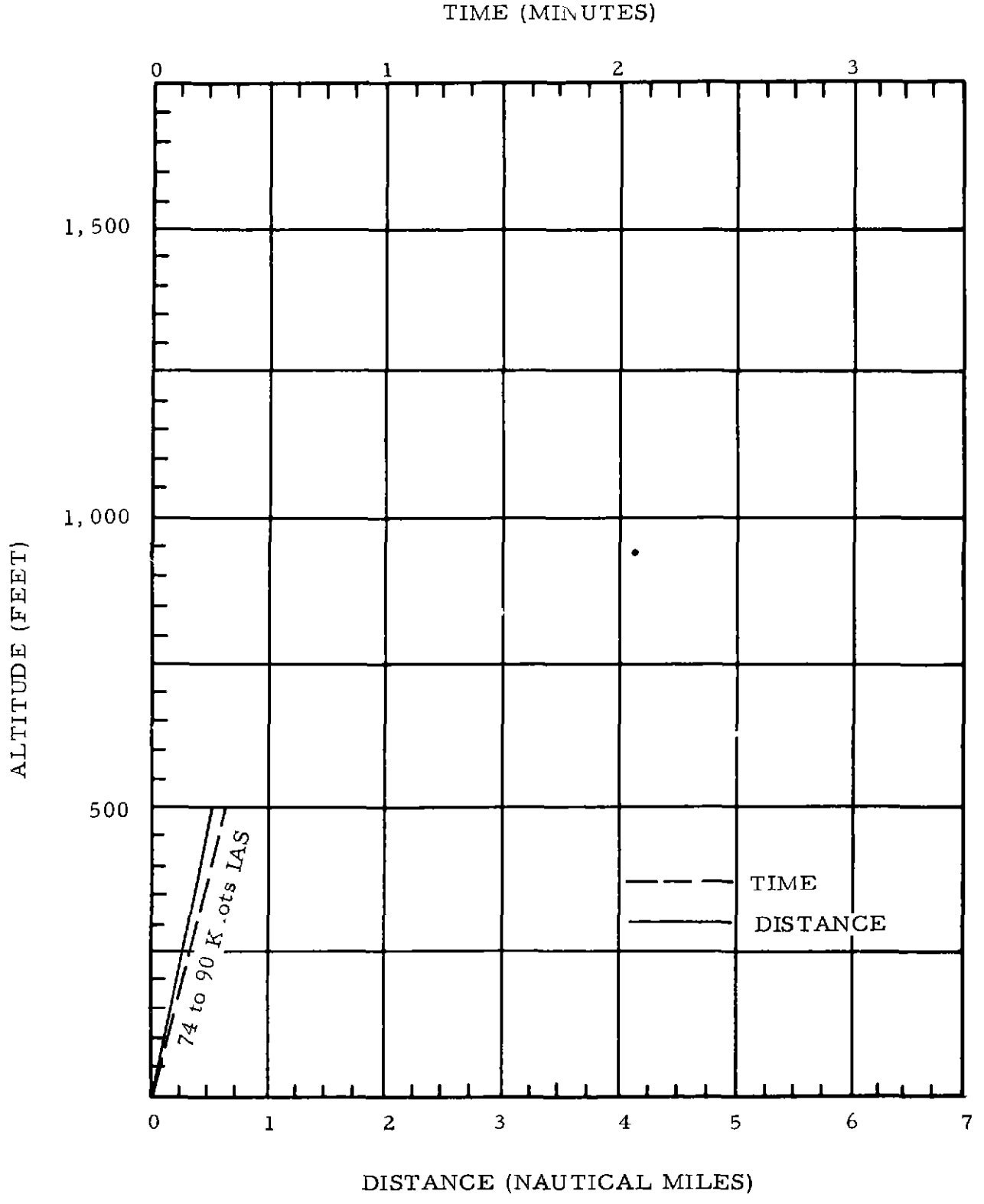

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 10 knots above V2 speed Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean) If flaps are utilized, flap retraction is initiated at approximately 200 feet altitude

Speed (knots IAS)

	All Flap Settings
Minimum (flap retraction)	87
Maximum (flap retraction)	104

Distance (from lift-off point to end of pre-climb)

Minimum 0 5 nautical mile
Maximum. 0 8 nautical mile
Operationally desirable 0 8 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum. 0 3 minute
Maximum 0. 5 minute
Operationally desirable 0 5 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum. 350 feet
Maximum 500 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

60 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude

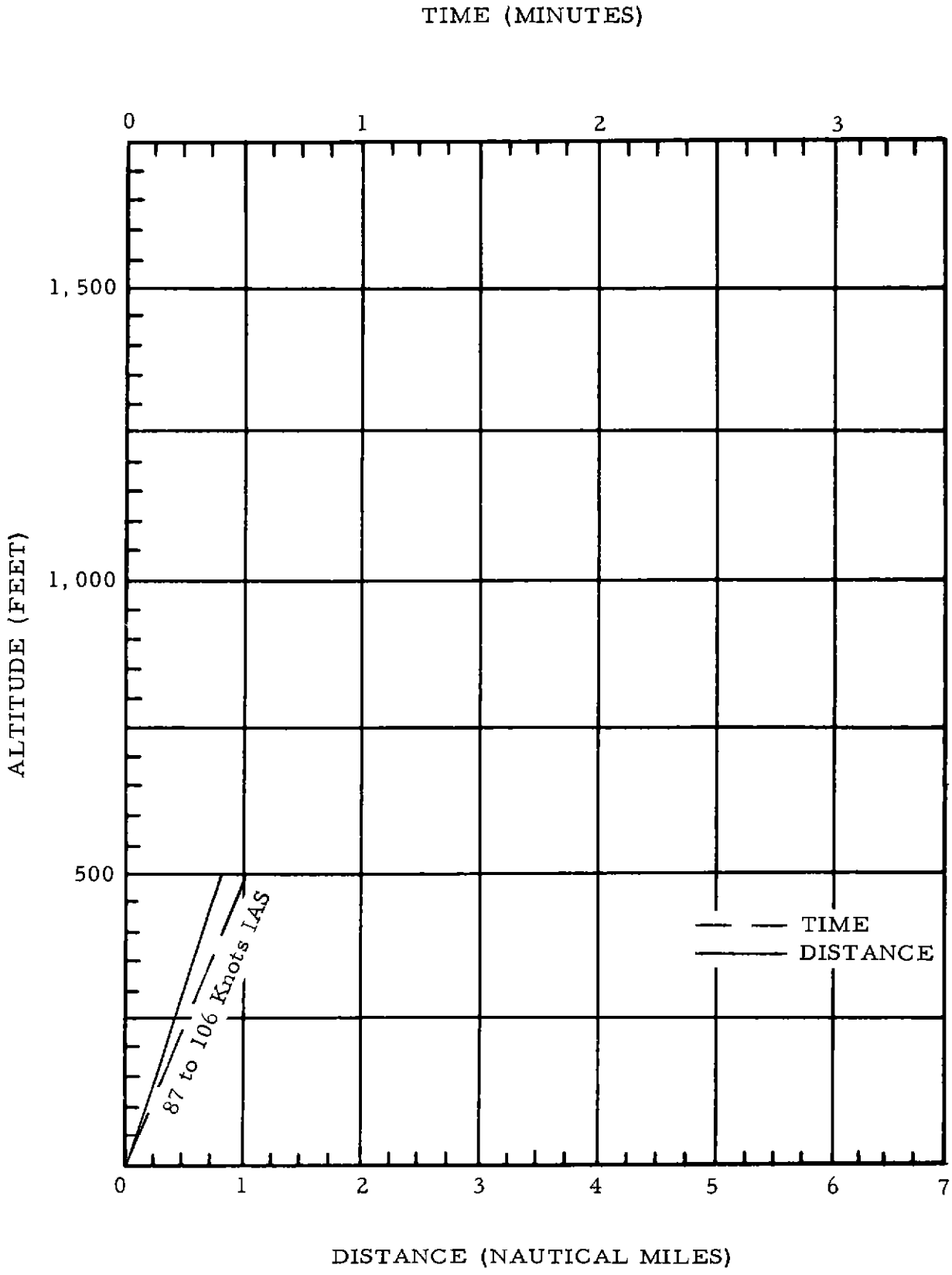

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the aircraft is accelerated to 5 knots above V2 speed A pre-climb attitude is continued until an altitude of 500 feet is attained If flaps are utilized, flap retraction is initiated at approximately 50 feet altitude

Speed (knots IAS)

	20^{o} Flaps
Minimum (flap retraction)	60
Maximum (flap retraction)	87

Distance (from lift-off point to end of pre-climb)

Minimum 0.5 nautical mile
Maximum 2 2 nautical miles
Operationally desirable 0.8 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.5 minute
Maximum 2.0 minutes
Operationally desirable 0 8 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 1,000 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

6 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

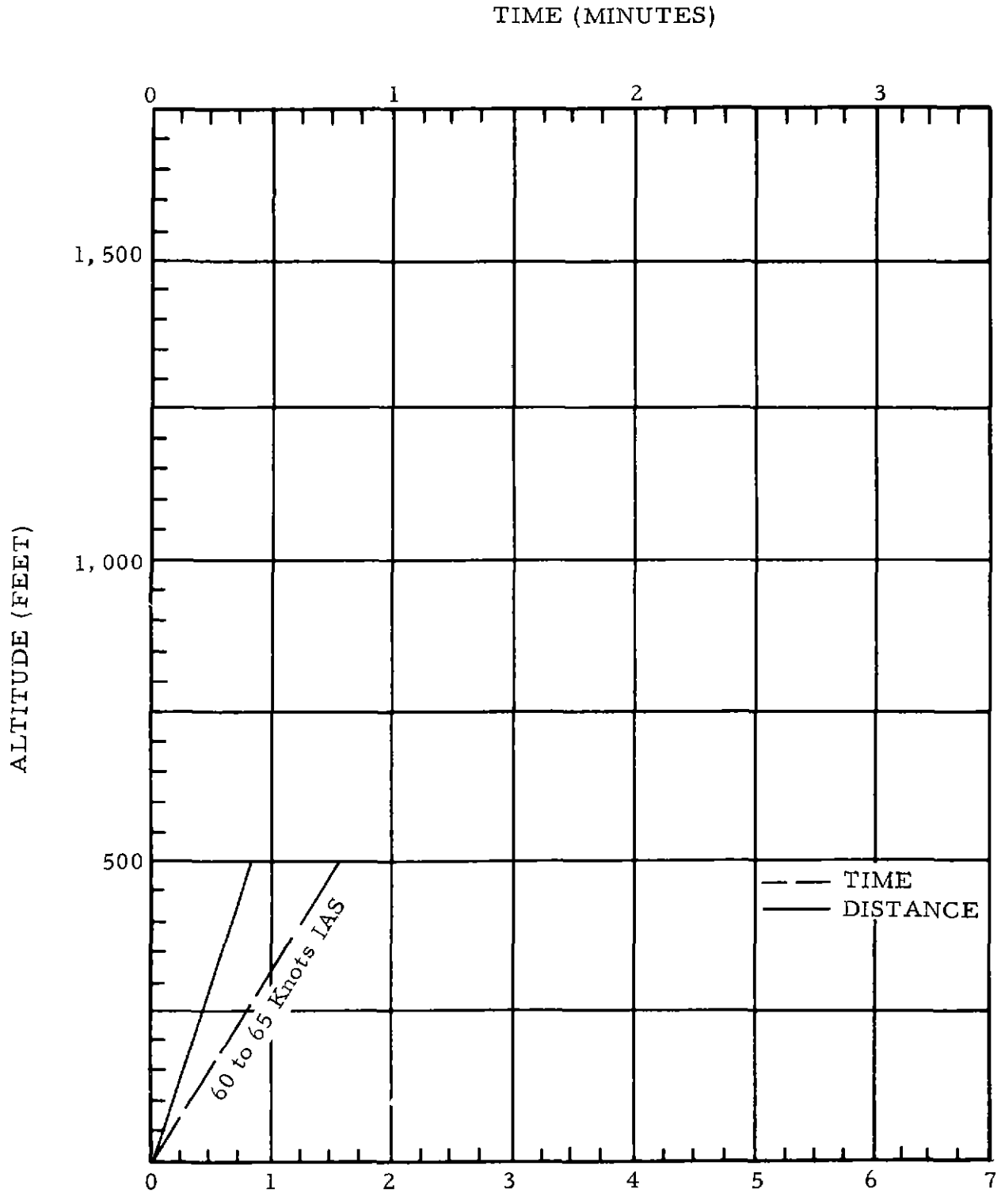

FIGURE 1 - PRE-CLIMB _ DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the aircraft is accelerated to 10 knots above V2 speed A pre-climb attitude is continued until a minimum of 100 feet altitude is attained with flaps extended 20 degrees. At this altitude, flap retraction is initiated and airspeed is increased to 73 knots IAS Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration

Speed (knots IAS)

	All Flap Settings
Minimum (flap retraction)	54
Maximum (flap retraction)	87

Distance (from lift-off point to end of pre-climb)

Minimum 1 0 nautical mile
Maximum 1 5 nautical miles
Operationally desirable 1 5 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 1. 0 minute
Maximum 1 5 minutes
Operationally desirable 1. 5 minutes (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 500 feet
Operationally desirable· 500 feet

Fuel Consumed (from start of engines through pre-climb)

7 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude.

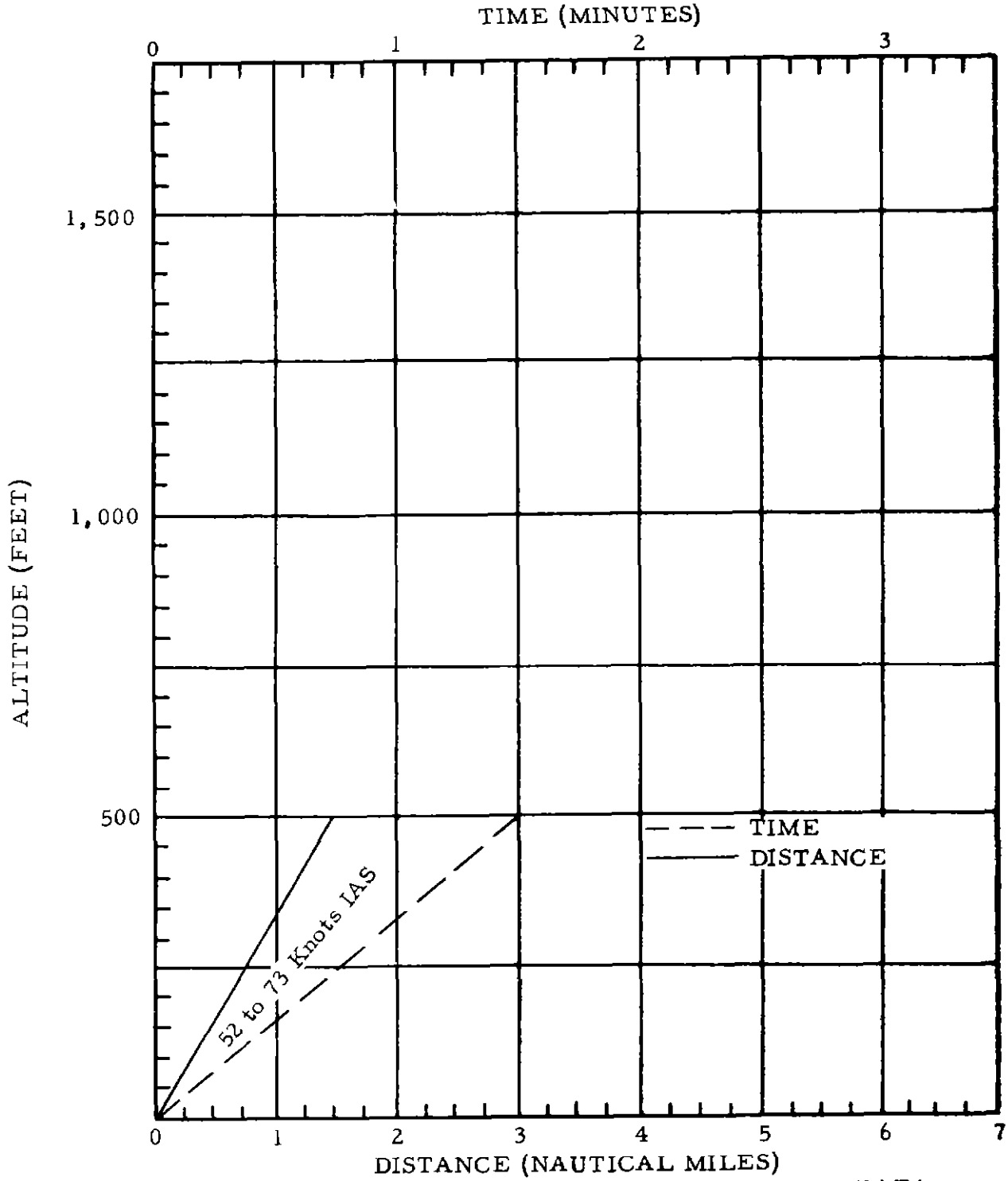

FIGURE 1 - PRE CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the aircraft is accelerated to 15 knots above V2 speed A pre-climb attitude is continued with a 20 degree flaps configuration until a minimum of 200 feet altitude is attained. At this altitude, flap retraction is initiated while maintaining a maximum rate of climb of 1,055 fpm. Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	20° Flaps
Minimum (flap retraction)	55
Maximum (flap retraction)	86

Distance (from lift-off point to end of pre-climb)

Minimum 0.3 nautical mile
Maximum 0.8 nautical mile
Operationally desirable: 0.8 nautical mile

Time (from lift-off point to end of pre-climb)

Minimum 0.3 minute
Maximum 0 7 minute
Operationally desirable 0.7 minute

Altitude (at end of pre-climb)

Minimum 200 feet
Maximum 500 feet
Operationally desirable. 500 feet

Fuel consumed (from start engines through pre-climb)

9 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude.

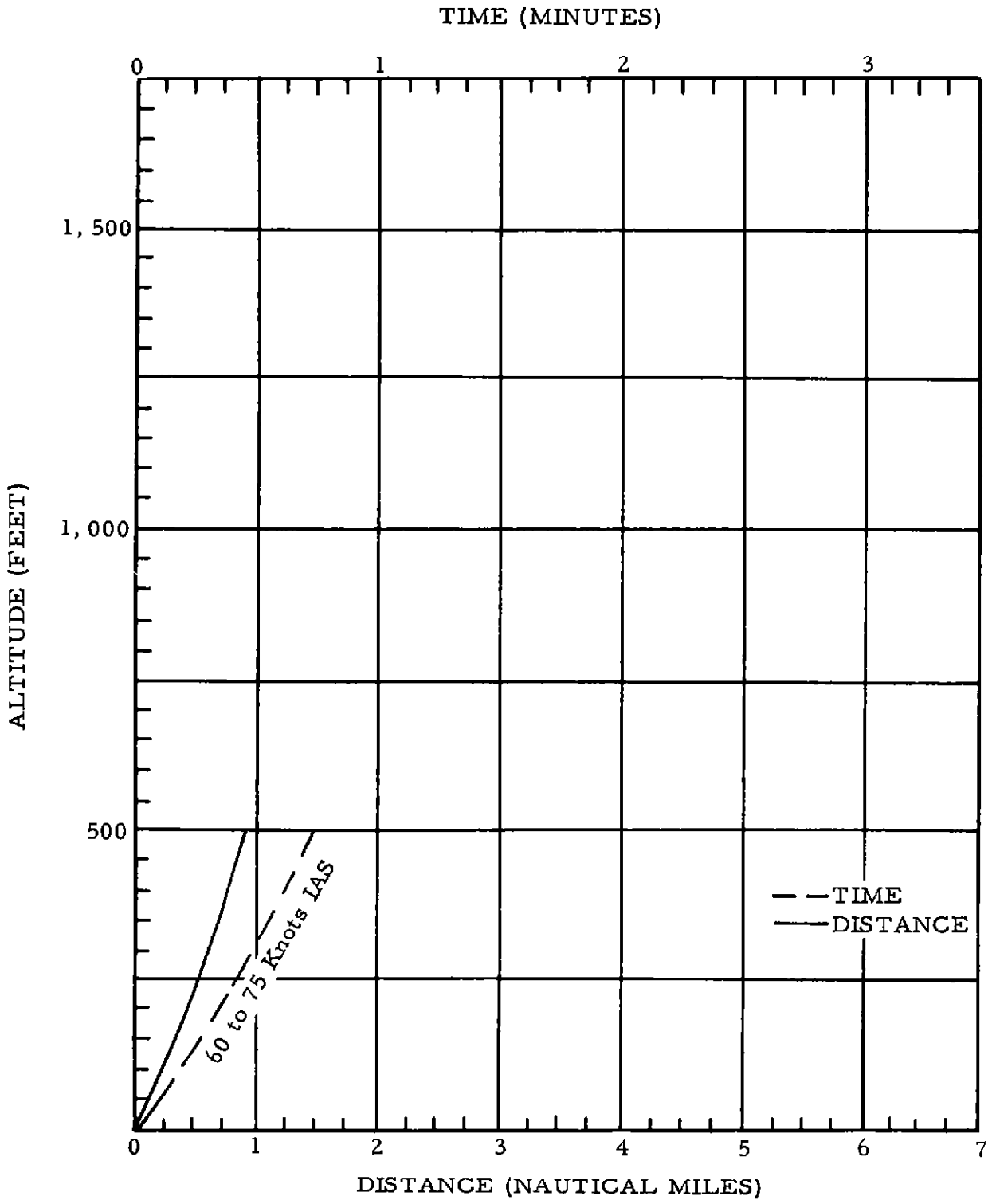

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the aircraft is accelerated to 14 knots above V2 speed A pre-climb attitude is continued until a minimum of 300 feet altitude is attained. At this altitude, flap retraction is initiated and a rate of climb of 1,030 fpm and an airspeed of 75 knots IAS is maintained. Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean).

Speeds (knots IAS)

	All Flap Settings
Minimum (flap retraction)	54
Maximum (flap retraction)	87

Distance (from lift-off point to end of pre-climb)

Minimum 0.5 nautical mile
Maximum 1.4 nautical miles
Operationally desirable: 0.7 nautical mile (see Figure 1)

Time (from lift-off point to end of pre climb)

Minimum 0.5 minute
Maximum 1.0 minute
Operationally desirable 0.6 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 500 feet
Operationally desirable 500 feet

Fuel Consumed (from start of engines through pre-climb)

9 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude.

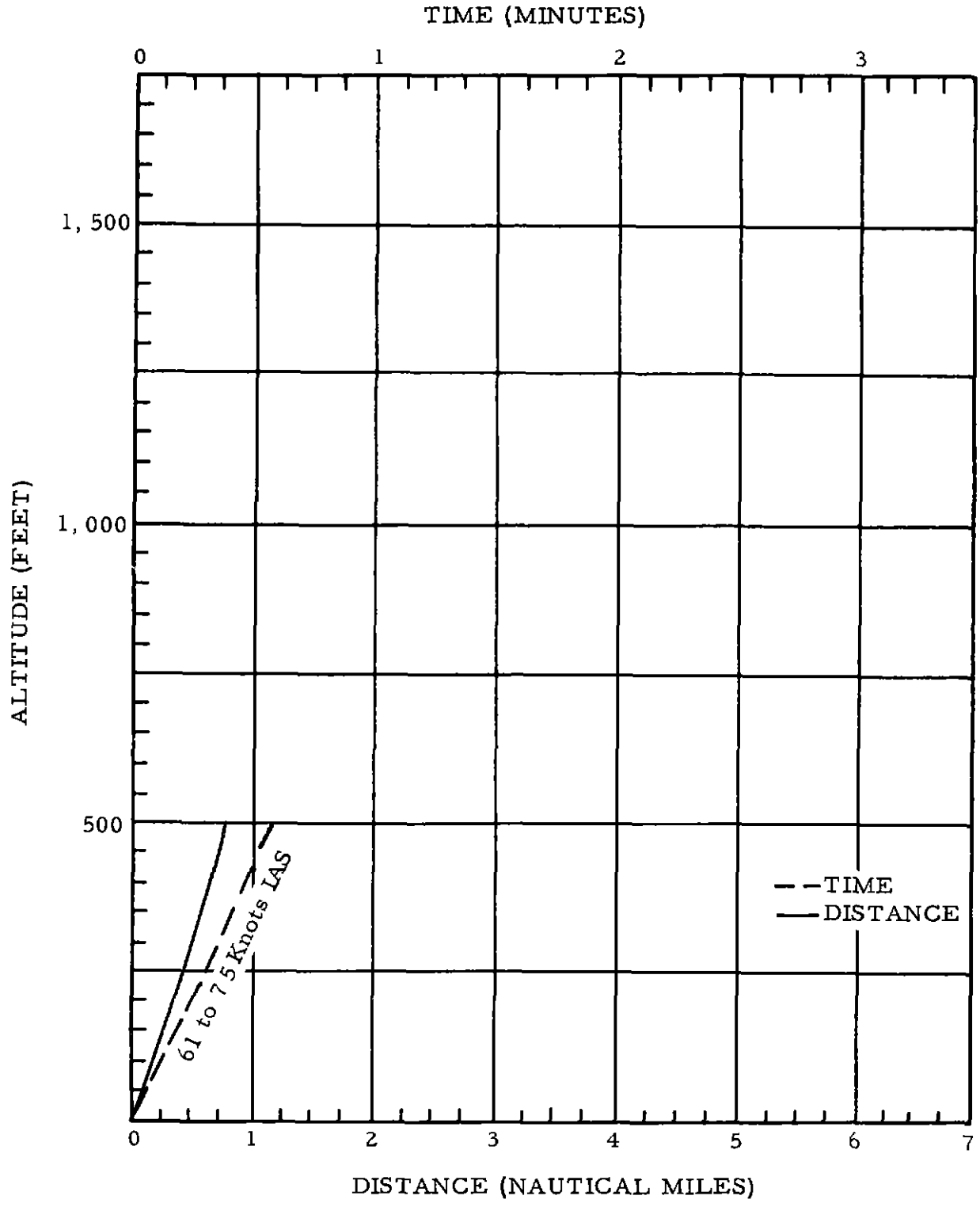

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 11 knots above V2 speed A pre-climb attitude is continued with flaps extended 15 degrees until a minimum of 300 feet altitude is attained. At this altitude flap retraction is initiated while maintaining a rate of climb of 1,500 fpm and a constant airspeed Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean).

Speed (knots IAS)

	15°Flaps
Minimum (flap retraction)	59
Maximum (flap retraction)	139

Distance (from lift-off point to end of pre-climb)

Minimum 0.5 nautical mile
Maximum 2.0 nautical miles
Operationally desirable 0.7 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.3 minute
Maximum 1.1 minutes
Operationally desirable 0.4 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 1,000 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

23 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude

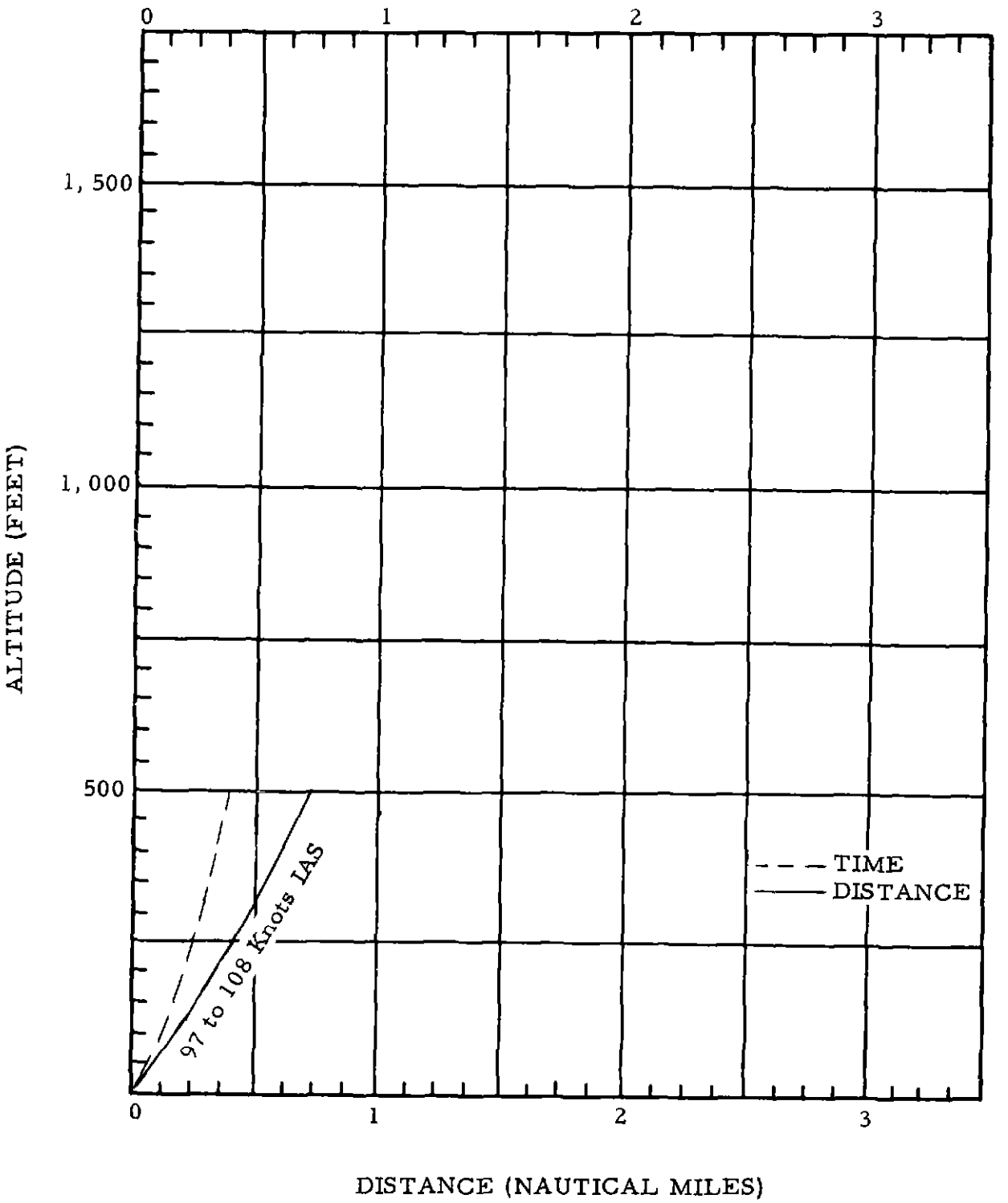

FIGURE 1- PRE-CLIMB- DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 9 knots above V2 speed A pre-climb attitude is continued with flaps extended 15 degrees until a minimum of 500 feet altitude is attained At this altitude, flap retraction is initiated while maintaining a minimum rate of climb of 1, 800 fpm and a positive increase in airspeed to 103 knots IAS Upon reaching 1, 000 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	15° Flaps
Minimum (flap retraction)	86
Maximum (flap retraction)	120

Distance (from lift-off point to end of pre-climb)

Minimum 0 8 nautical mile
Maximum 1 6 nautical miles
Operationally desirable 1 6 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 5 minute
Maximum 1 0 minute
Operationally desirable 1 0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 500 feet
Maximum 1, 000 feet
Operationally desirable 1, 000 feet

Fuel Consumed (from start engines through pre-climb)

24 pounds (estimated)

Maneuver

First turn after take-off at 500 feet altitude

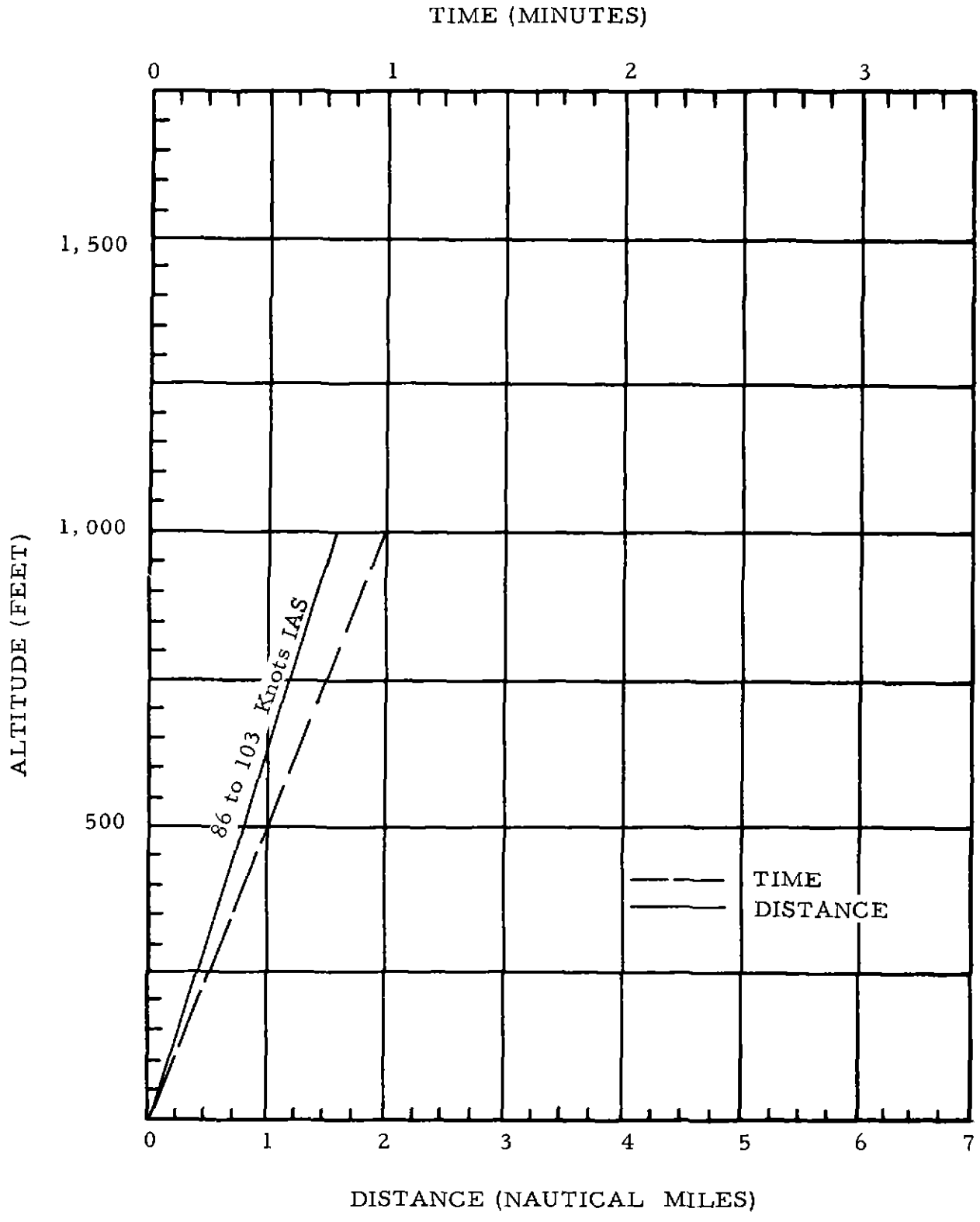

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the aircraft is accelerated to 22 knots above V2 speed A pre-climb attitude is continued with flaps extended 35 degrees until a minimum of 300 feet altitude is attained. At this altitude, the flaps are retracted to 15 degrees While maintaining a minimum rate of climb of 500 fpm, the flaps are slowly retracted as airspeed is increased to 81 knots IAS Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)

	35° Flaps
Minimum (flap retraction)	65
Maximum (flap retraction)	96

Distance (from lift-off point to end of pre-climb)

Minimum 0 6 nautical mile
Maximum 1 1 nautical miles
Operationally desirable 1.1 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 5 minute
Maximum 1 0 minute
Operationally desirable 1 0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum: 300 feet
Maximum: 500 feet
Operationally desirable. 500 feet

Fuel Consumed (from start engines through pre-climb)

42 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude

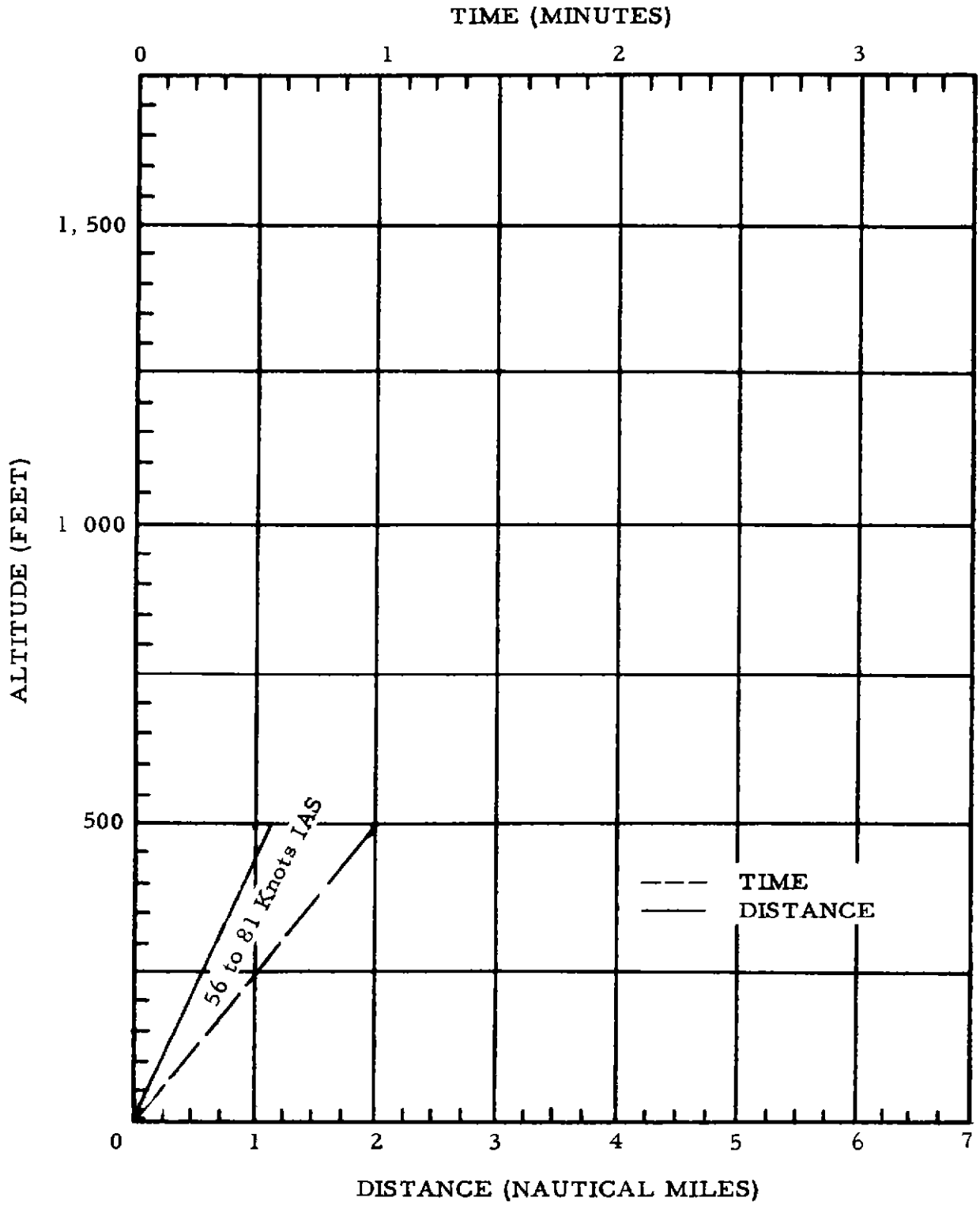

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the aircraft is accelerated to 12 knots above V2 speed, flap retraction is initiated and airspeed is increased to 80 knots IAS Upon reaching 200 feet altitude the aircraft will normally be in climb configuration (clean)

Speed (knots IAS)	30° Flaps
Minimum (flap retraction).	63
Maximum (flap retraction).	83

Distance (from lift-off point to end of pre-climb)

Minimum 0 3 nautical mile
Maximum. 1 0 nautical mile
Operationally desirable: 0 4 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 2 minute
Maximum 0 8 minute
Operationally desirable: 0 3 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 100 feet
Maximum 300 feet
Operationally desirable· 200 feet

Fuel Consumed (from start engine through pre-climb)

30 pounds (estimated)

Maneuver

First turn after take-off at 200 feet altitude

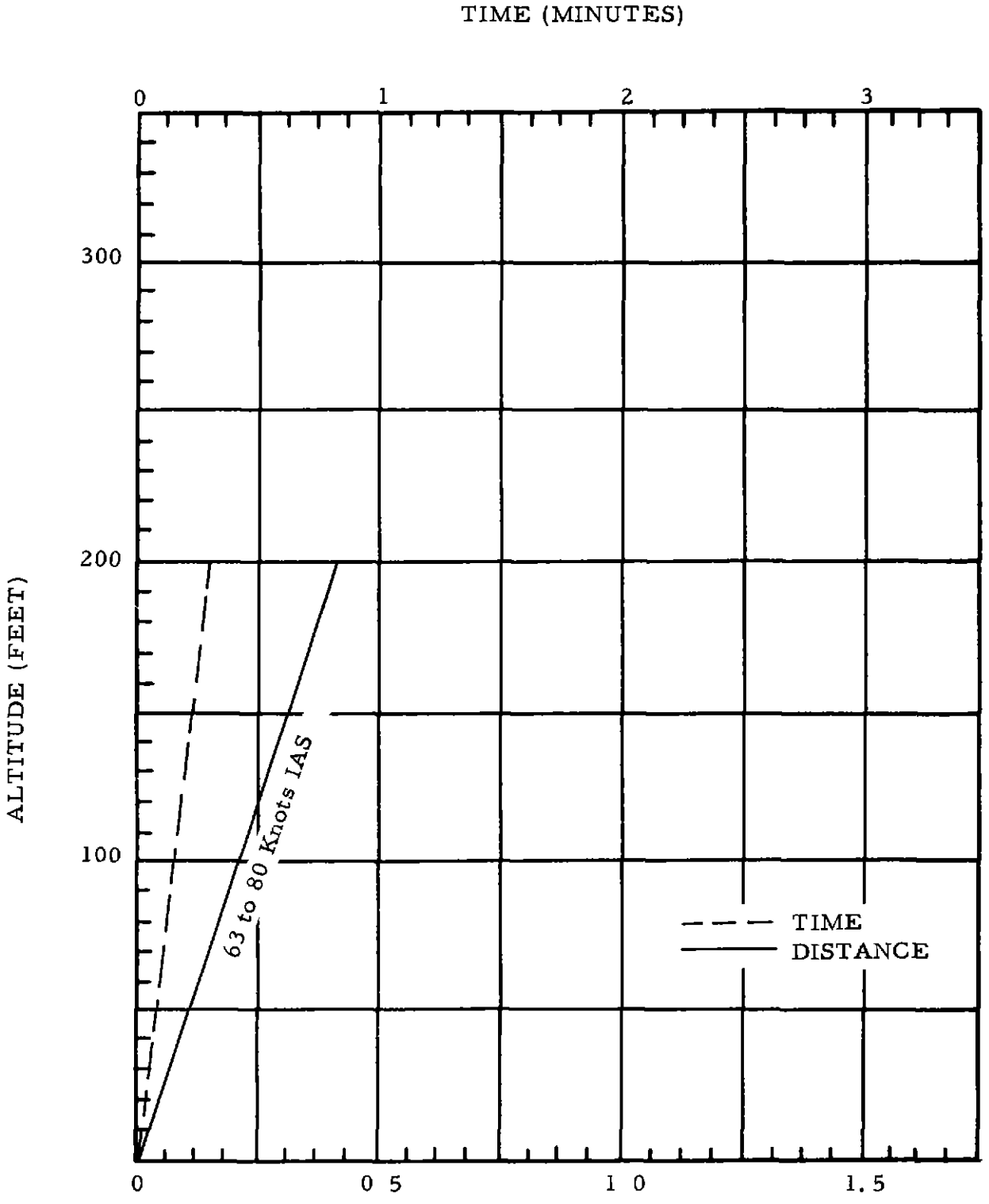

FIGURE 1 - PRE- CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 31 knots above V2 speed. A pre-climb attitude is continued until a minimum of 500 feet altitude is attained. Upon reaching 500 feet altitude the aircraft will normally be in a climb configuration (clean)

Speed (knots IAS)

	All Flap Settings
Minimum (flap retraction)	50
Maximum (flap retraction)	87

Distance (from lift-off point to end of pre-climb)

Minimum 1.0 nautical mile
Maximum 1.5 nautical miles
Operationally desirable 1.0 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0.8 minute
Maximum 1 0 minute
Operationally desirable 0.8 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum. 500 feet
Maximum 1,000 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

6 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude

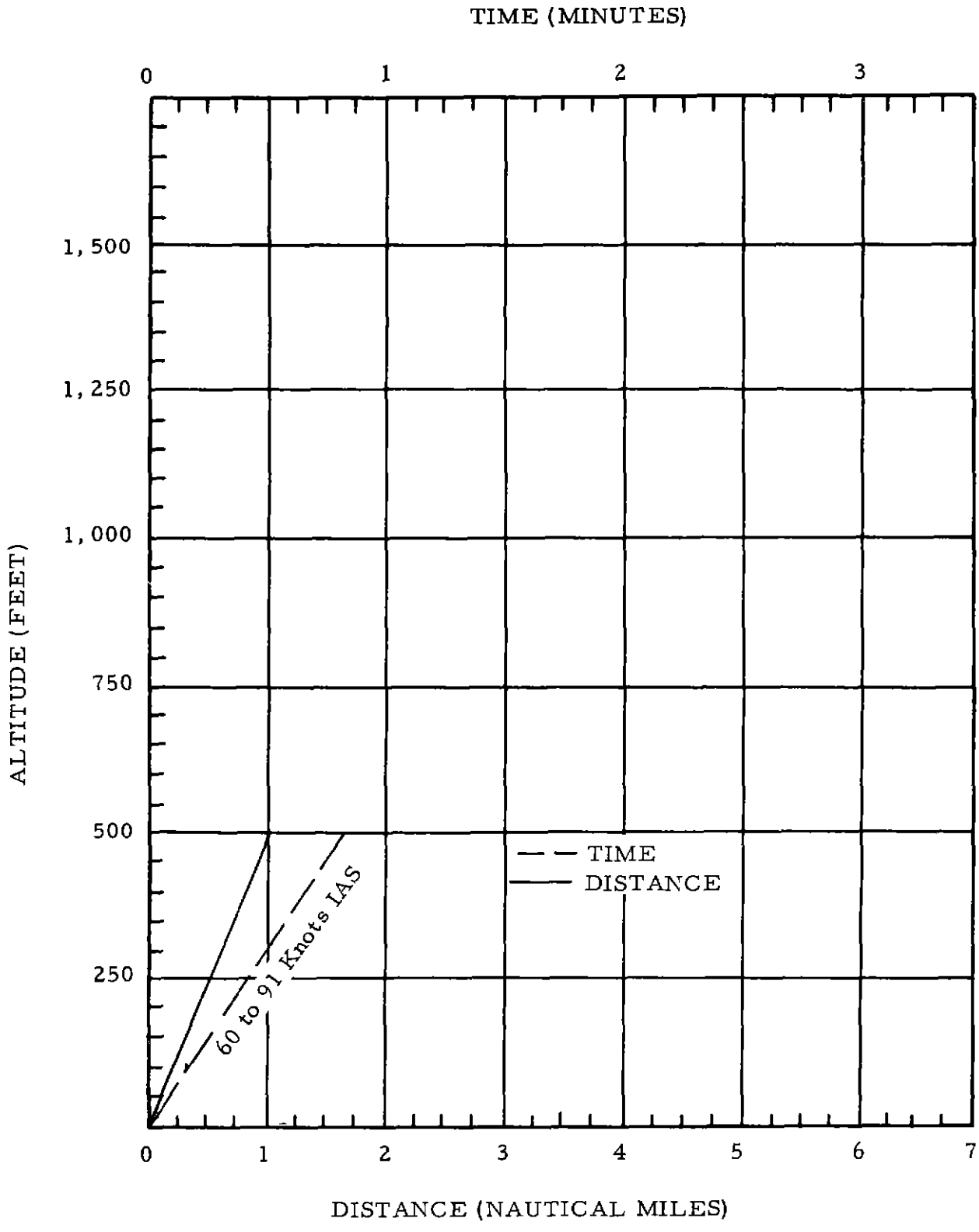

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the aircraft is accelerated to 4 knots above V2 speed A pre-climb attitude is continued until an altitude of 500 feet is attained. At this altitude the aircraft will normally be in climb configuration (clean) If flaps are used for take-off, flap retraction is initiated at approximately 100 feet altitude.

Speed (knots IAS)

	0° Flaps
Minimum (flap retraction)	70
Maximum (flap retraction)	83

Distance (from lift-off point to end of pre-climb)

Minimum· 1 2 nautical miles
Maximum. 1. 8 nautical miles
Operationally desirable 1. 2 nautical miles (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 1. 0 minute
Maximum 1. 5 minutes
Operationally desirable: 1. 0 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum: 500 feet
Maximum. 1, 000 feet
Operationally desirable. 500 feet

Fuel Consumed (from start engine through pre-climb)

6 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude

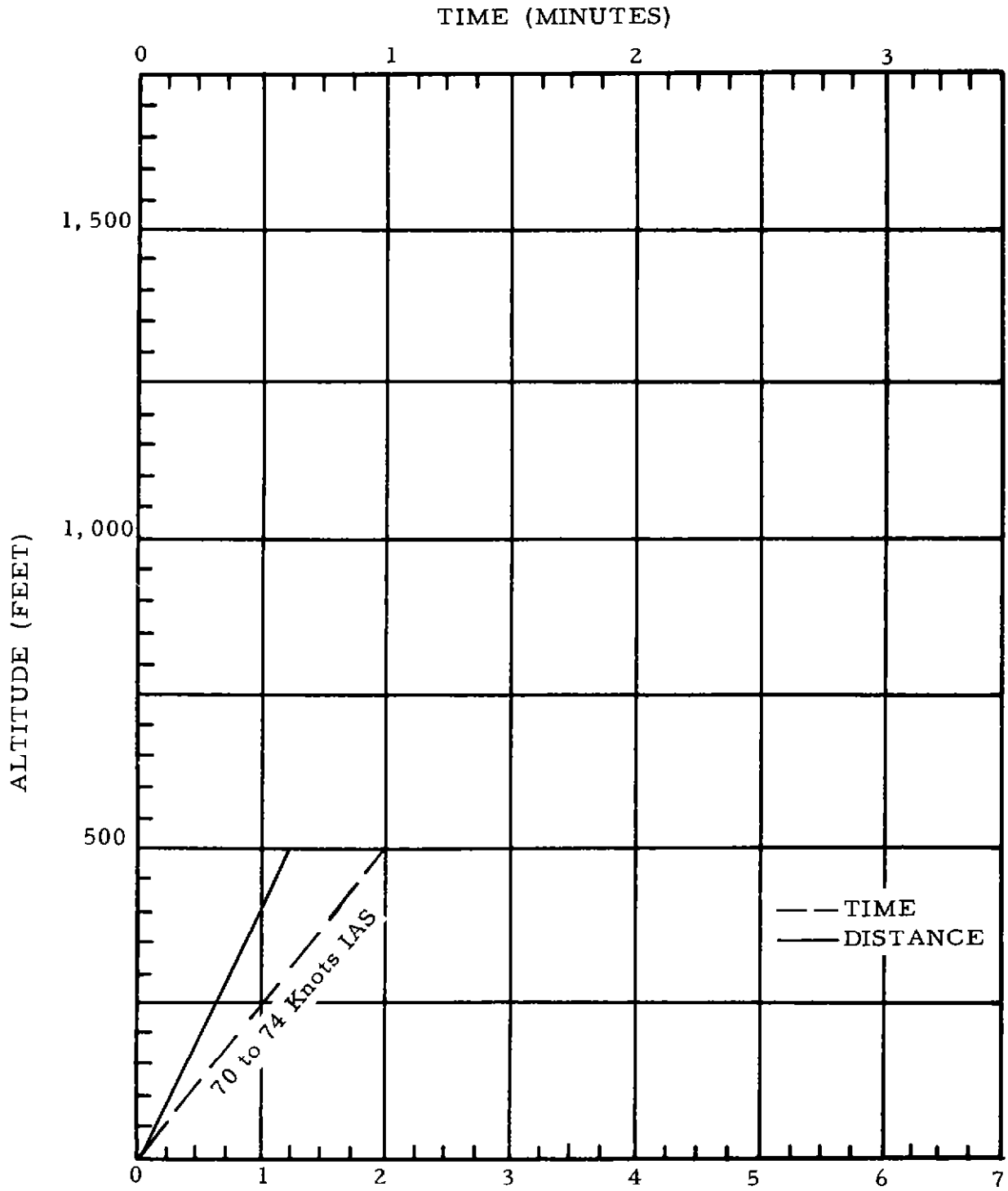

FIGURE 1 - PRE-CLIMB-DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 21 knots above V2 speed A pre-climb attitude is continued with flaps fully retracted until a minimum of 300 feet altitude is attained At this altitude, a minimum rate of climb of 1,050 fpm is established Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean) If flaps are used for take-off, flap retraction is initiated at approximately 200 feet altitude

Speed (knots IAS)

	10% Flaps
Minimum (flap retraction)	65
Maximum (flap retraction)	87

Distance (from lift-off point to end of pre-climb)

Minimum 0 6 nautical mile
Maximum 1 0 nautical mile
Operationally desirable 1 0 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 5 minute
Maximum 0 8 minute
Operationally desirable 0 8 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum: 300 feet
Maximum. 500 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

24 pounds (estimated)

Maneuver

First turn take-off at 300 feet altitude

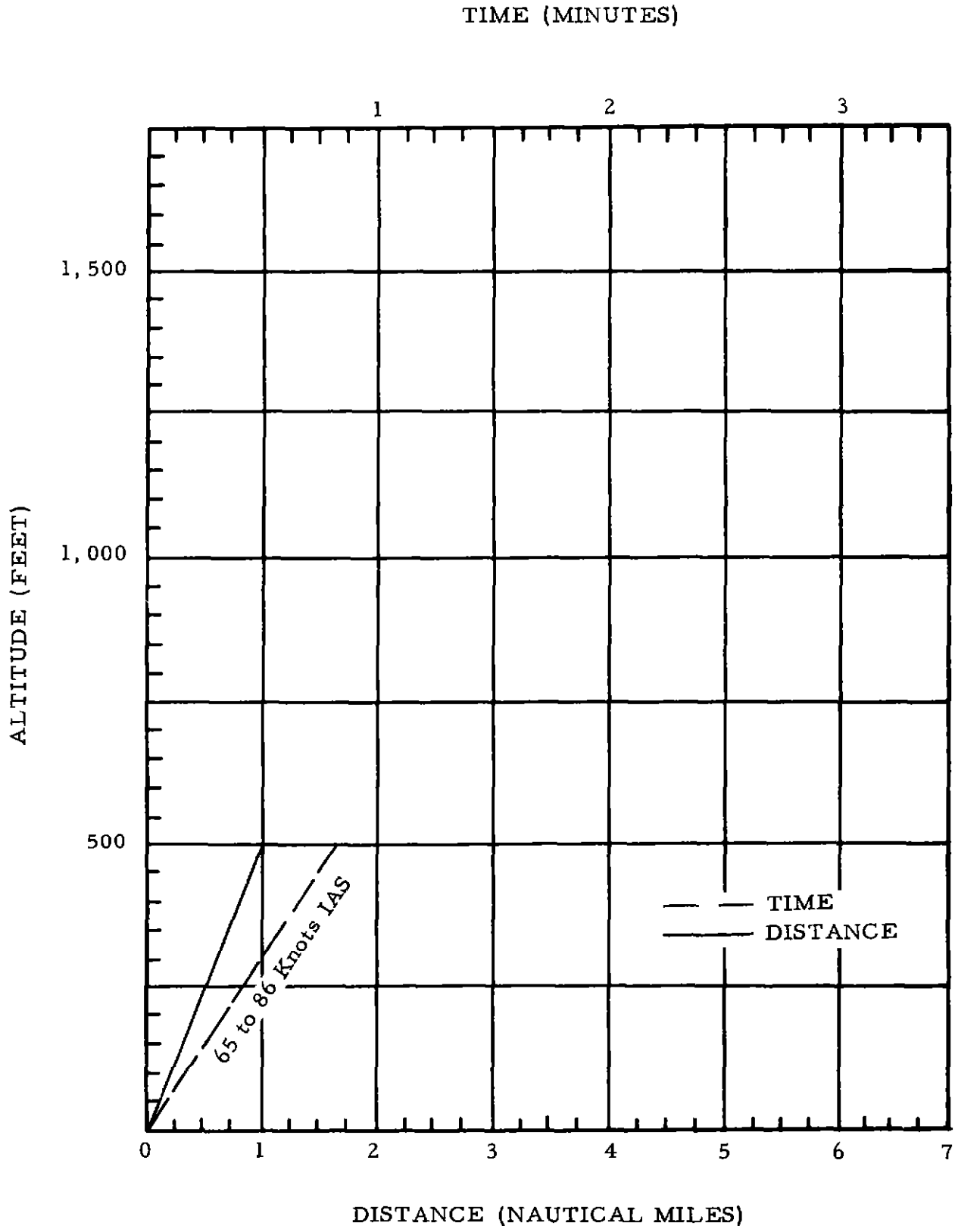

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA

NARRATIVE SUMMARY

Sequence of Operations

As soon as definitely airborne, the gear is retracted and the aircraft is accelerated to 15 knots above V2 speed. A pre-climb attitude is continued at a rate of climb of 900 fpm, while maintaining a constant airspeed Upon reaching 500 feet altitude, the aircraft will normally be in climb configuration (clean). If flaps are utilized, flap retraction is initiated at approximately 100 feet altitude

Speed (knots IAS)

	All Flap Settings
Minimum (flap retraction)	58
Maximum (flap retraction)	108

Distance (from lift-off point to end of pre-climb)

Minimum 0. 5 nautical mile
Maximum 0. 8 nautical mile
Operationally desirable 0. 8 nautical mile (see Figure 1)

Time (from lift-off point to end of pre-climb)

Minimum 0 4 minute
Maximum 0 6 minute
Operationally desirable· 0. 6 minute (see Figure 1)

Altitude (at end of pre-climb)

Minimum 300 feet
Maximum 500 feet
Operationally desirable 500 feet

Fuel Consumed (from start engines through pre-climb)

14 pounds (estimated)

Maneuver

First turn after take-off at 300 feet altitude.

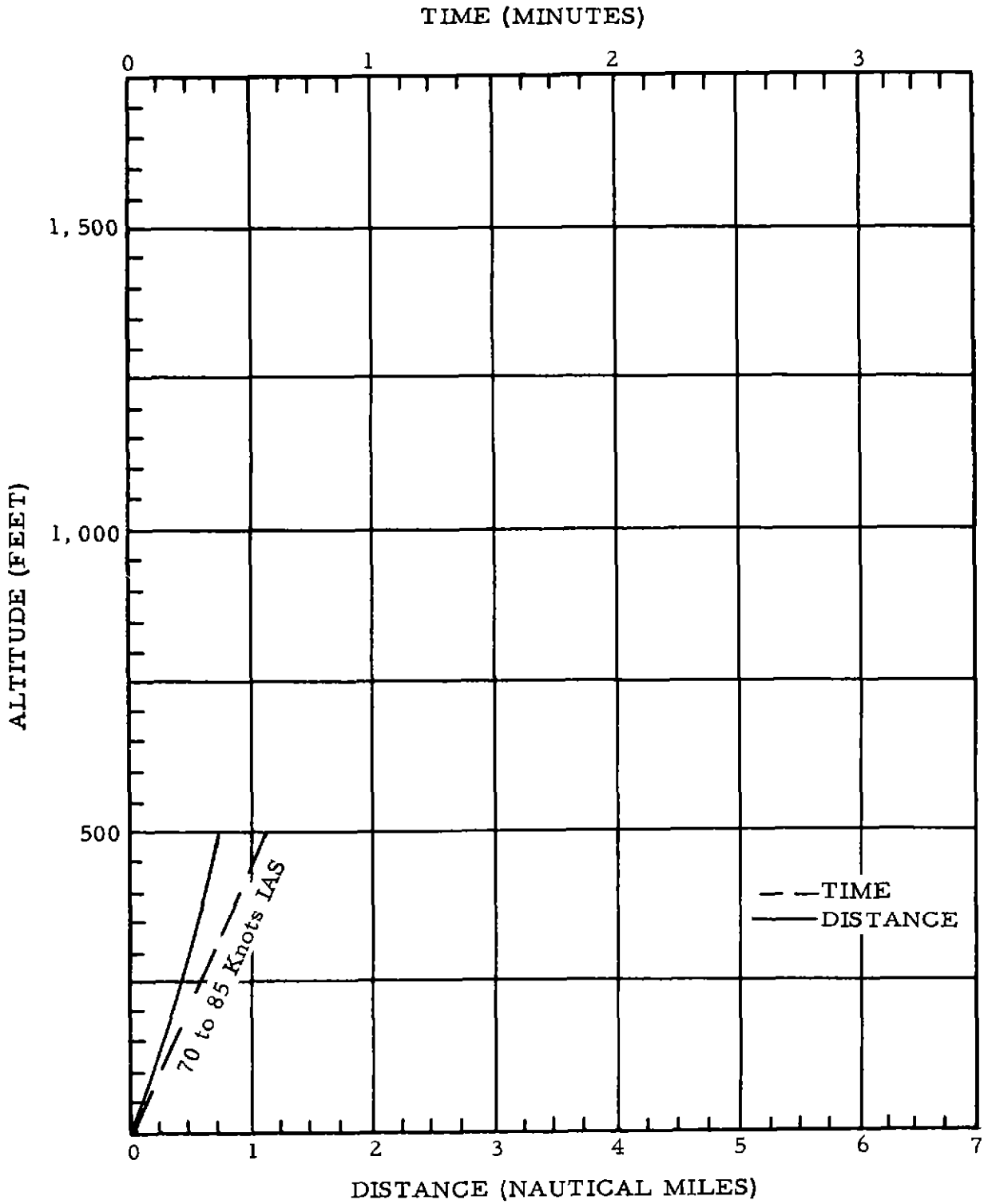

FIGURE 1 - PRE-CLIMB - DISTANCE AND TIME DATA