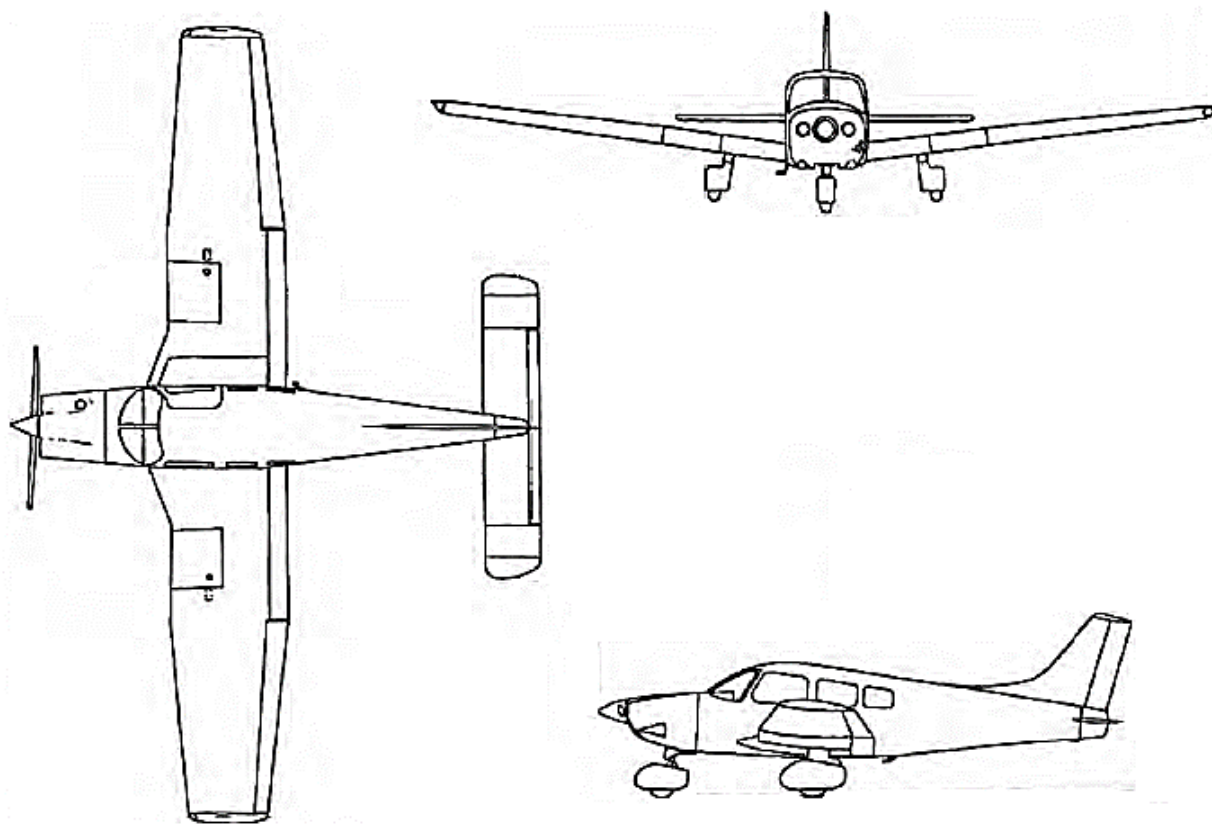




Middle Georgia State University

Flight Department

Flight Planning, Performance and W&B Packet PA28-181 Archer TX



WARNING: The data contained in this document is current as of **29MAY2021**. It is YOUR responsibility to verify performance data with the current version of the Pilots Operating Handbook for your aircraft.



PA28-181 W&B List

Tail	Empty Weight	Arm	Moment
107	1792.09 lbs	88.37"	158368.69
251	1658.2 lbs	88.24"	146313.8
252	1653.2 lbs	88.4"	146158.8
253	1653.2 lbs	89.94"	145371.8
254	1659.2 lbs	87.87"	145793.9
256	1657.2 lbs	87.75"	145417.1
257	1673.2 lbs	88.38"	147880.6
258	1672.2 lbs	88.14"	147377.4
259	1670.2 lbs	88.16"	147236.7
261	1655.2 lbs	88.05"	145748.6
262	1659.2 lbs	87.73"	145557.8
263	1653.2 lbs	87.69"	144978.3
264	1651.2 lbs	87.67"	144758.9
265	1655.2 lbs	87.8"	145276.4
266	1659.2 lbs	87.78"	145636.5
267	1656.2 lbs	88.07"	145858.3
268	1655.2 lbs	87.82"	145355.1
269	1656.2 lbs	88.16"	146015.7
271	1677.2 lbs	88.38"	148240.7
278	1688.2 lbs	89.36"	150864.0
279	1690.2 lbs	89.99"	152106.5
280	1779.2 lbs	89.52"	159272.7
290	---	---	---
291	1693.36 lbs	89.68"	151860.52
292	1695.66 lbs	89.77"	152224.42
297	1680.2 lbs	88.7"	149042.0
298	1683.2 lbs	88.97"	149764.6
718	1805.06 lbs	88.91"	160491.24



Weight and Balance Form/ Takeoff and Landing Data

	Weight (Lbs)	Arm Aft Datum (Inches)	Moment (In-Lbs)
Basic Empty Weight			
Pilot and Front Passenger		80.5	
Passengers (Rear Seats)*		118.1	
Fuel (48 Gallon Maximum)		95.0	
Baggage (200 Lbs. Maximum)*		142.8	
Ramp Weight (2558 Lbs. Normal, 2138 Lbs. Utility Maximum)			
Fuel Allowance			
For Engine Start, Taxi and Run Up	-8	95.0	-760
Takeoff Weight (2550 Lbs. Normal, 2130 Lbs. Utility Maximum)			

Totals must be within approved weight and C.G. limits. It is the responsibility of the airplane owner and the pilot to ensure that the airplane is loaded properly. The Basic Empty Weight C.G. is noted on the Weight and Balance Data Form (Figure 6-5). If the airplane has been altered, refer to the Weight and Balance Record for this information.

*Utility Category Operation - No baggage or rear passengers allowed.

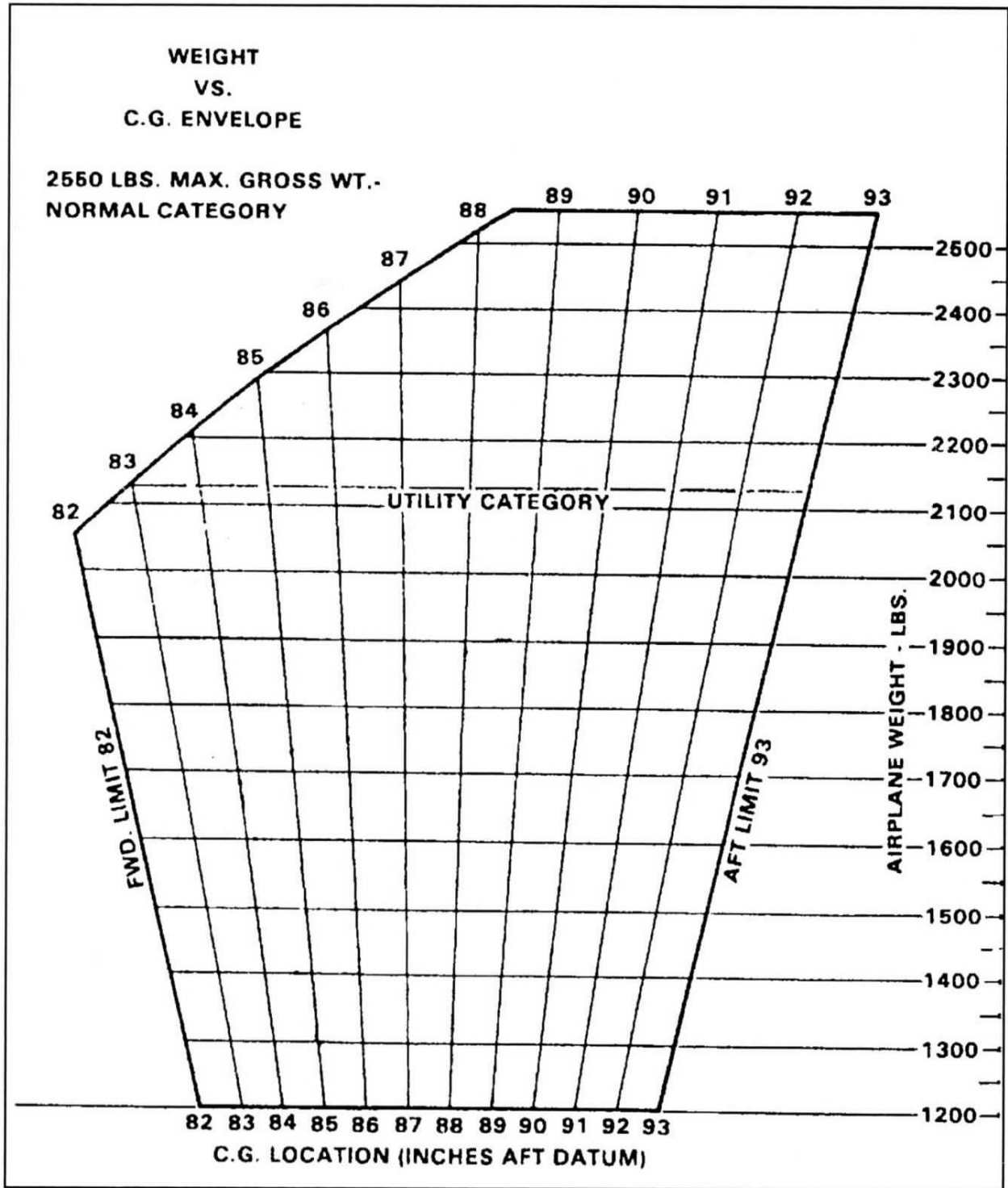
WEIGHT AND BALANCE LOADING FORM

Figure 6-11

Airport name:	Time:
Wind:	Temperature:
Altimeter:	Field elevation:
Runway(s):	Length(s):
Pressure Altitude:	
Aircraft Takeoff Weight:	
Va:	
Rotate speed:	Barrier speed:
	Vx:
Normal Takeoff Distance:	
Short-Field Takeoff Distance:	
Landing Distance:	



Weight and Balance Chart



C.G. RANGE AND WEIGHT

Figure 6-15

VFR NAVIGATION LOG

Aircraft Number	N	Notes

Check Points (Fixes)	VOR		Course (Route)	Altitude	Wind		CAS	TC	TH	MH	CH	Dist.			GS		Time Off	GPH							
	Ident	Freq.			Dir.	Vel.						Temp	TAS	-L/+R WCA	± Dev.	Leg			Rem.	Act.	Est.	ETE	ATA	Fuel	Rem.
	Rem.	Act.																							
Totals »																									

Airport & ATIS Advisories

Departure	Destination

Airport Frequencies

Departure	Destination

WEATHER LOG

	Ceiling, Visibility and Precipitation Reported		Winds Aloft	Icing and Freezing Level	Turbulence and Cloud Tops	Position of Fronts, Lows and Highs
		Forecast				
Departure						
Enroute						
Destination						
Alternate						

NOTES AND NOTAMS

FLIGHT PLAN

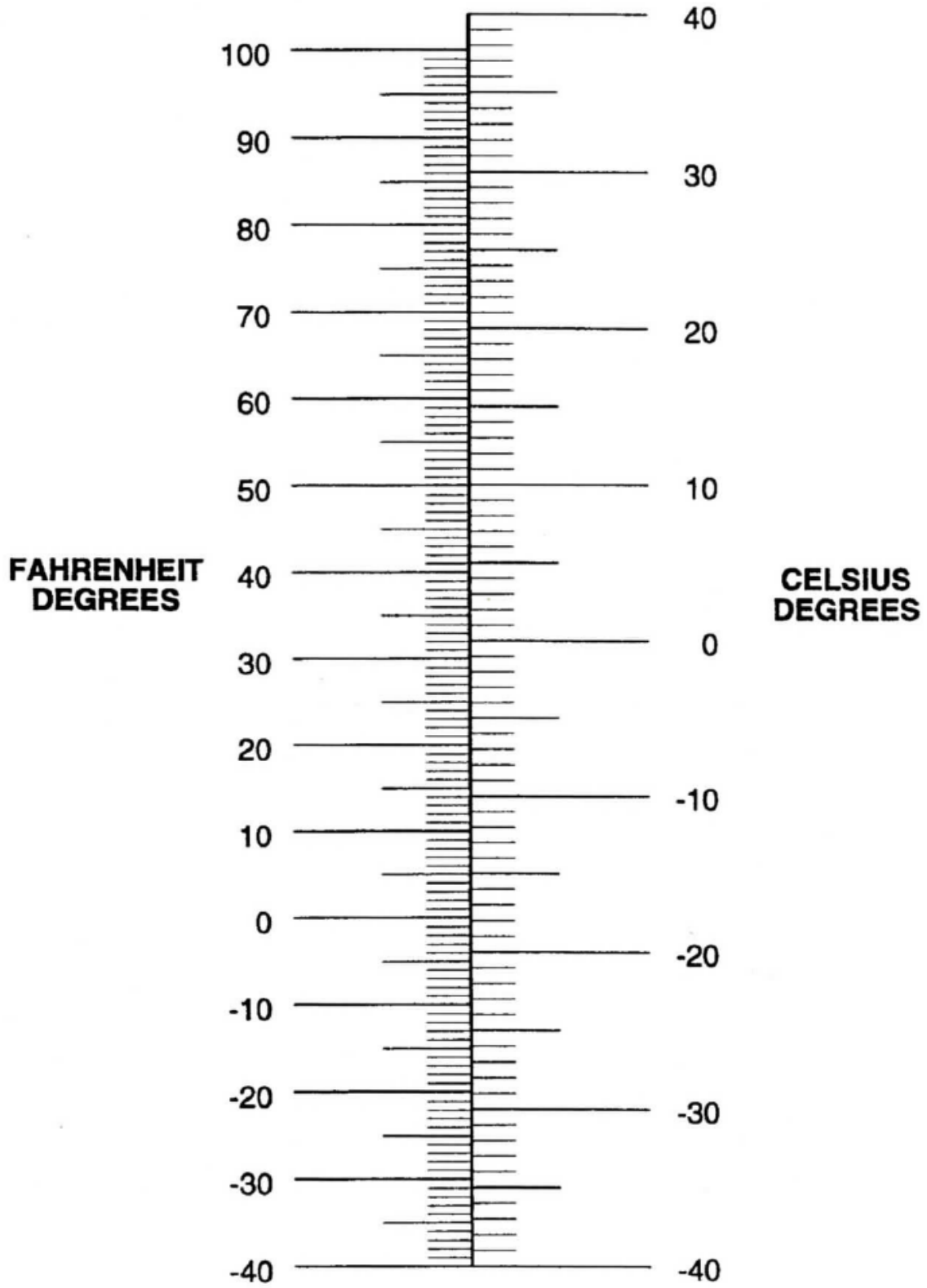
1. Type	2. Aircraft Identification	3. Aircraft Type/ Special Equipment	4. True Airspeed	5. Departure Point	6. Departure Time Proposed (Z)	7. Cruising Altitude	
VFR							
IFR			Knots				
DVFR							
8. Route of Flight							
9. Destination (Name of airport and city)				10. Est. Time Enroute		11. Remarks	
				Hours	Minutes		
12. Fuel on board		13. Alternate Airport(s)		14. Pilot's Name, Address, Tel # & Aircraft Home Base		15. # Aboard	
Hours	Minutes						
16. Color of Aircraft				17. Destination Contact/ Telephone (Optional)			

Position Report						
Act. Ident.	Position	Time	Alt.	IFR/VFR	Est. Next Fk	Name Following Fk

CLOSE VFR FLIGHT PLAN WITH		FSS ON ARRIVAL
Special Equipment Suffix /X-No Transponder /T-Transponder with no altitude encoding capability /U-Transponder with altitude encoding capability /D-DME, no transponder	/C-RNAV, transponder with no altitude encoding capability /W-RNAV, no transponder /G-Global Positioning System (GPS)/Global Navigation Satellite System (GNSS) equipped aircraft with oceanic, enroute, terminal, and GPS approach capability.	



Temperature Conversion

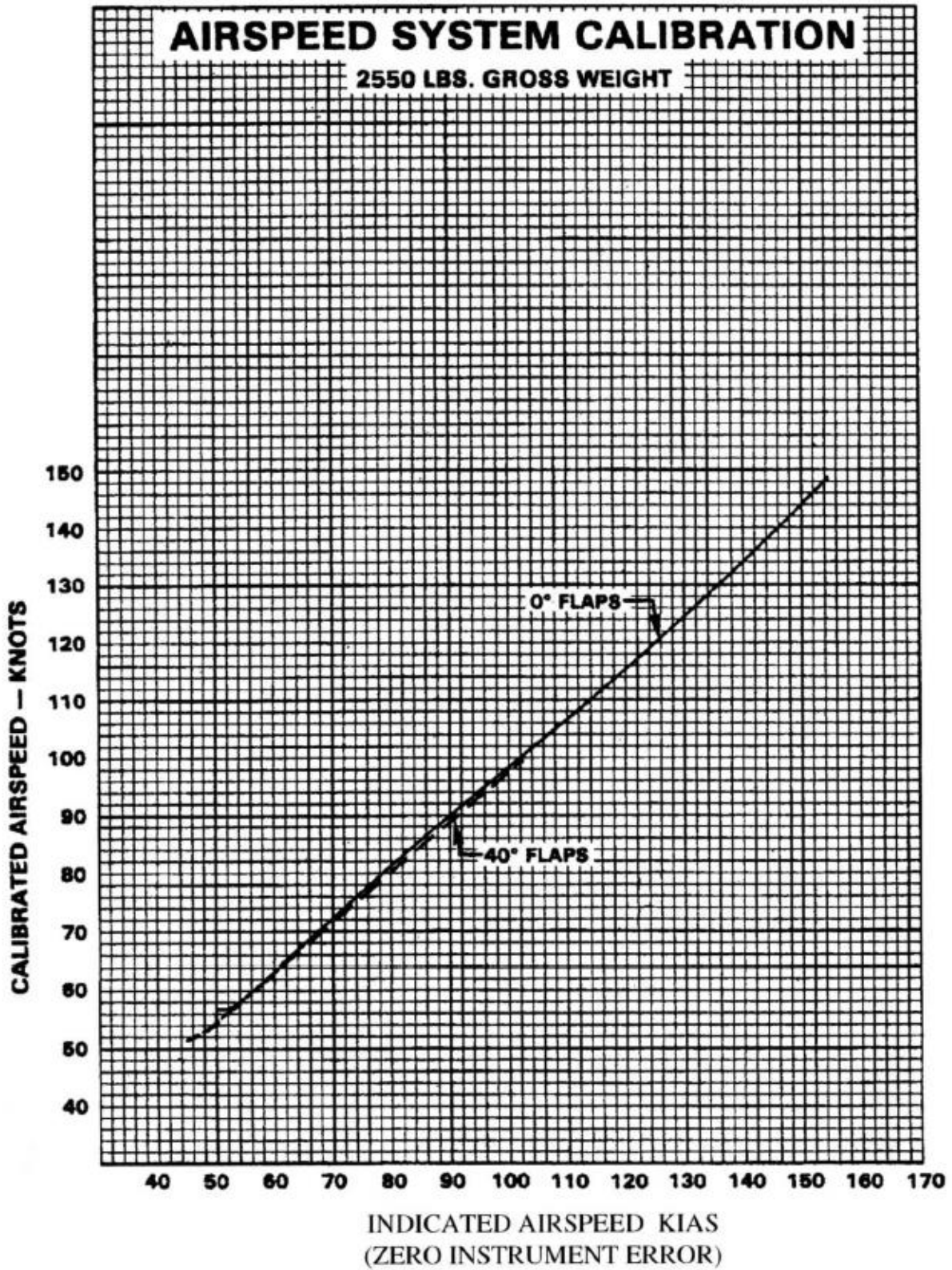


TEMPERATURE CONVERSION

Figure 5-1



Calibrated Airspeed

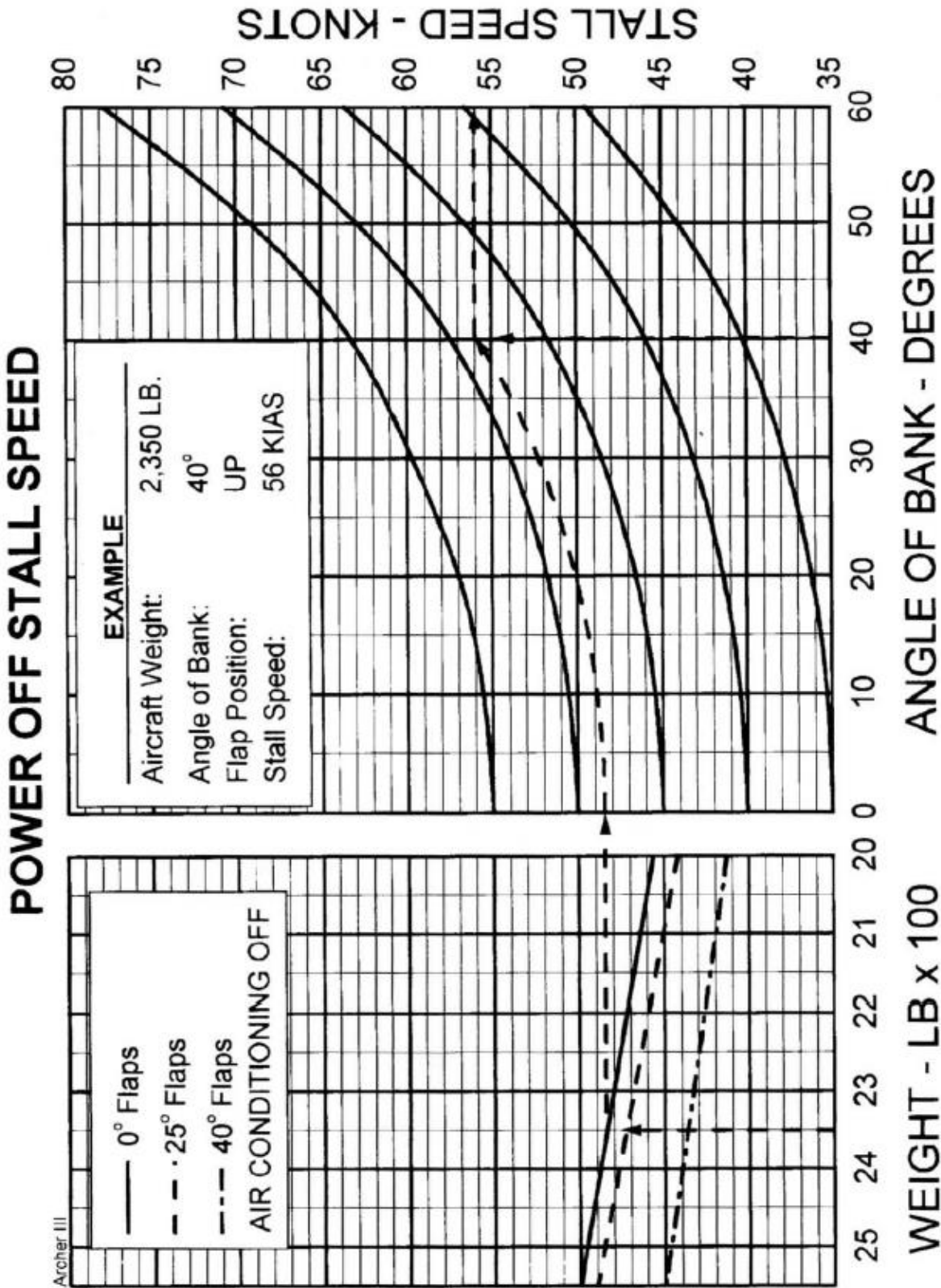


AIRSPEED SYSTEM CALIBRATION

Figure 5-3



Stall Speeds



STALL SPEEDS

Figure 5-5



Flaps Up Takeoff Performance

FLAPS UP TAKEOFF PERFORMANCE

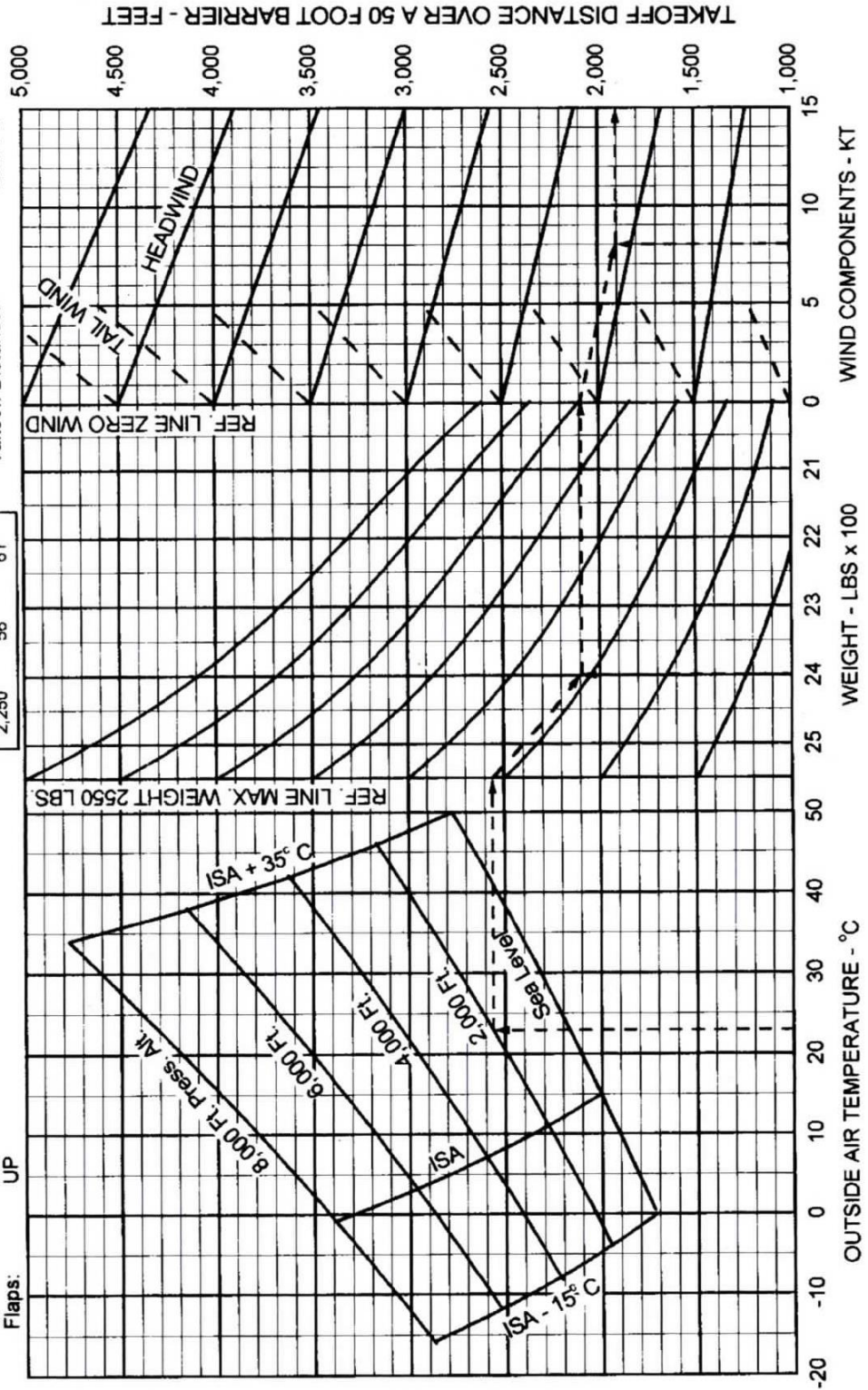
ASSOCIATED CONDITIONS:

Power: FULL THROTTLE BEFORE BRAKE RELEASE
 Air Conditioner: OFF
 Runway: PAVED, LEVEL, & DRY
 Airspeed: REFER TO TABLE AT RIGHT
 Propeller: SENSENICH 76EM8S14-0-62
 Flaps: UP

EXAMPLE:

Depart Airport Pressure Alt: 2,000 Ft.
 Temperature: 23° C
 Gross Weight: 2,400 Lb.
 Headwind: 8 Kt.
 Takeoff Distance: 1907 Ft.

TAKEOFF SPEEDS		KIAS
WT	LIFTOFF	50 FT
2,550	60	65
2,450	58	64
2,350	57	63
2,250	56	61



FLAPS UP TAKEOFF PERFORMANCE

Figure 5-7



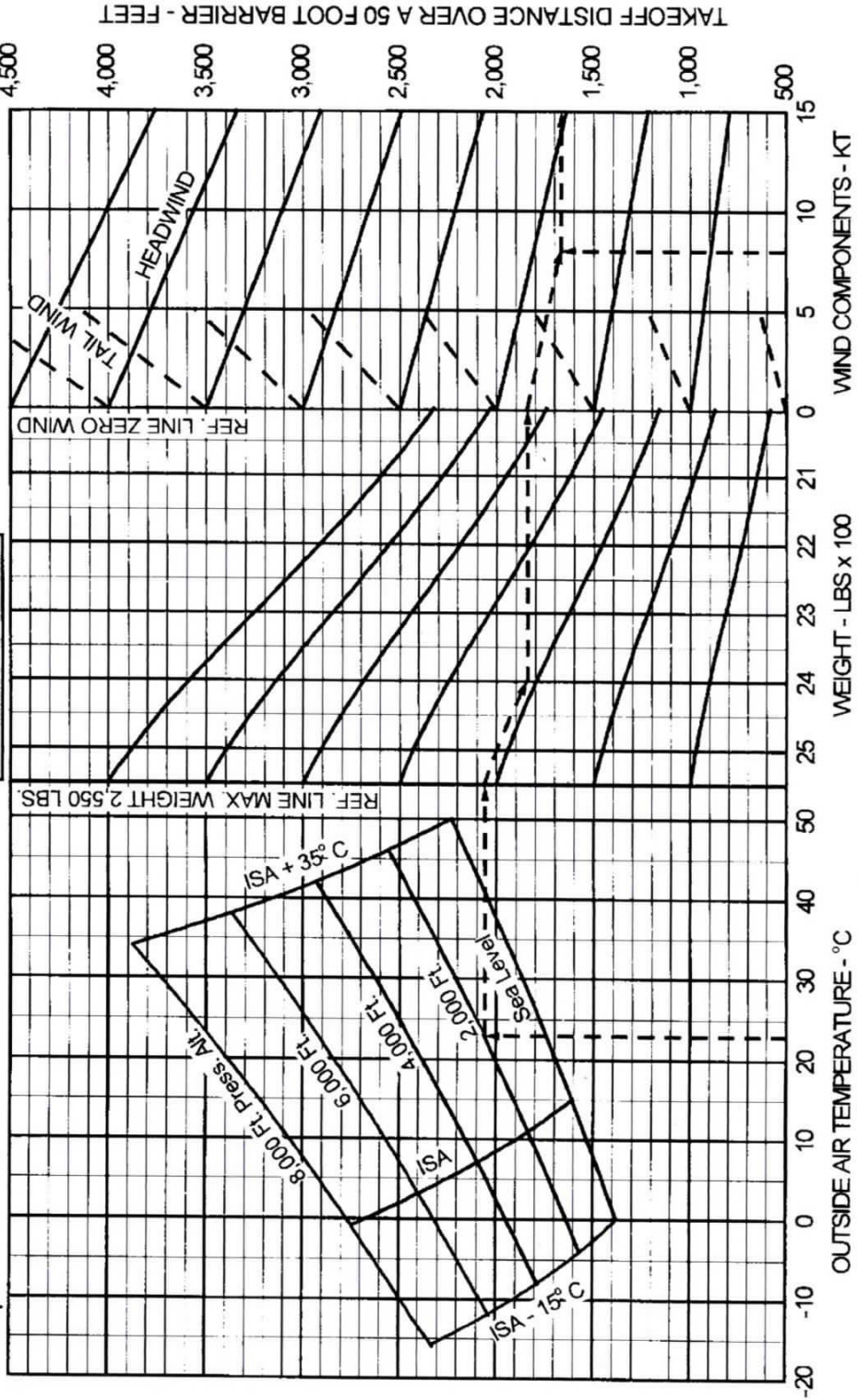
25* Flaps Takeoff Performance

FLAPS 25° TAKEOFF PERFORMANCE

ASSOCIATED CONDITIONS
 Power: FULL THROTTLE BEFORE BRAKE RELEASE
 Air Conditioner: OFF
 Runway: PAVED, LEVEL, & DRY
 Airspeed: REFER TO TABLE AT RIGHT
 Propeller: SENSENICH 76EMBS14-0-62
 Flaps: 25°

TAKEOFF SPEEDS		KIAS
WT	LIFTOFF	50 FT
2,550	55	60
2,450	55	58
2,350	53	56
2,250	50	54

EXAMPLE
 Depart Airport Pressure Alt: 2,000 Ft.
 Temperature: 23° C
 Gross Weight: 2,400 Lb.
 Headwind: 8 Kt.
 Takeoff Distance: 1674 Ft.



25° FLAPS TAKEOFF PERFORMANCE

Figure 5-9



Flaps Up Ground Roll

FLAPS UP TAKEOFF GROUND ROLL

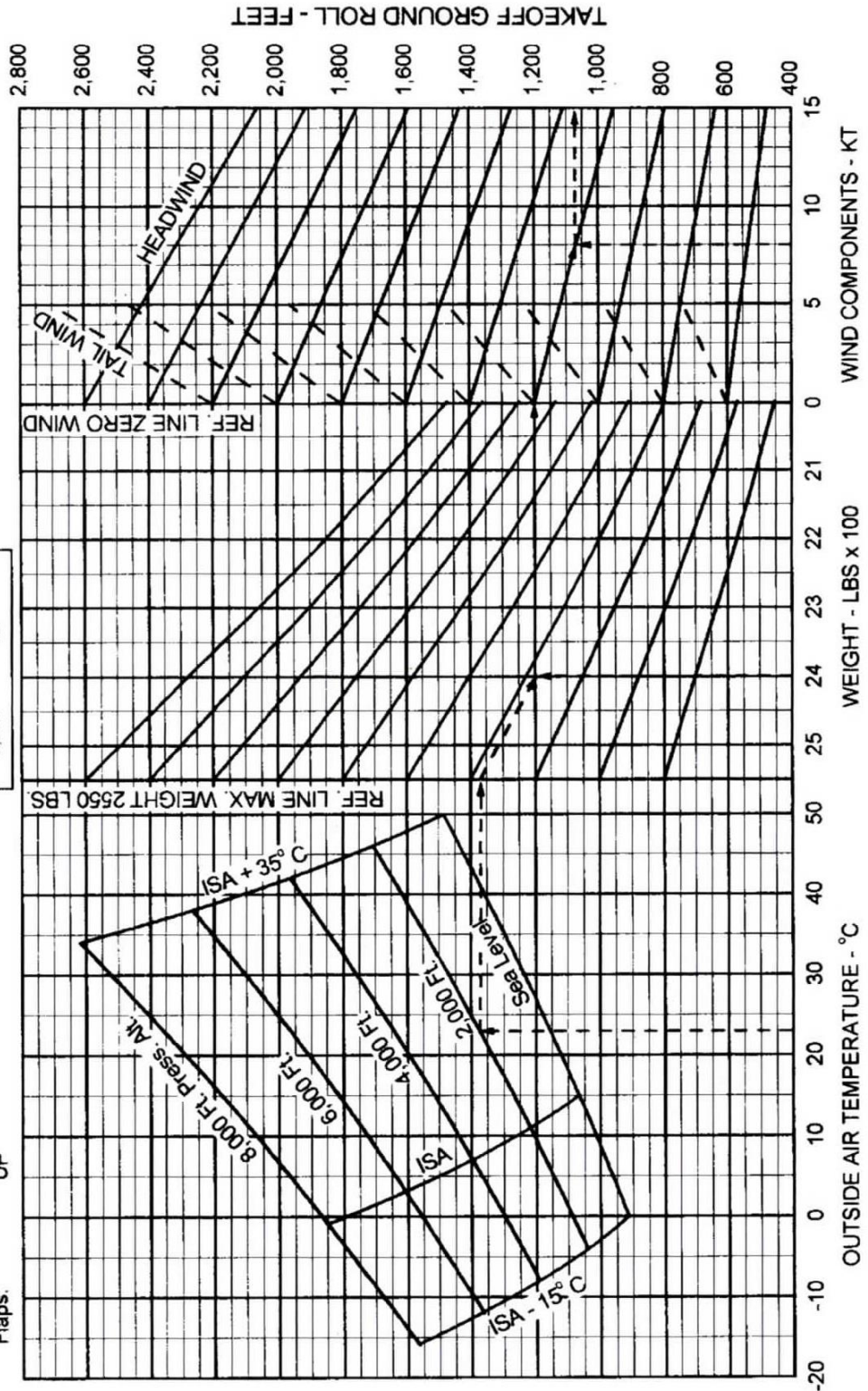
ASSOCIATED CONDITIONS:

Power: FULL THROTTLE BEFORE BRAKE RELEASE
 Air Conditioner: OFF
 Runway: PAVED, LEVEL, & DRY
 Airspeed: REFER TO TABLE AT RIGHT
 Propeller: SENSENICH 76EM8S14-0-62
 Flaps: UP

EXAMPLE:

Depart Airport Pressure Alt: 2,000 Ft.
 Temperature: 23° C
 Gross Weight: 2,400 Lb.
 Headwind: 8 Kt.
 Takeoff Ground Roll: 1073 Ft.

WT	TAKEOFF SPEEDS KIAS	LIFTOFF
2,550	60	
2,450	58	
2,350	57	
2,250	56	



FLAPS UP TAKEOFF GROUND ROLL

Figure 5-11



25* Flaps Takeoff Ground Roll

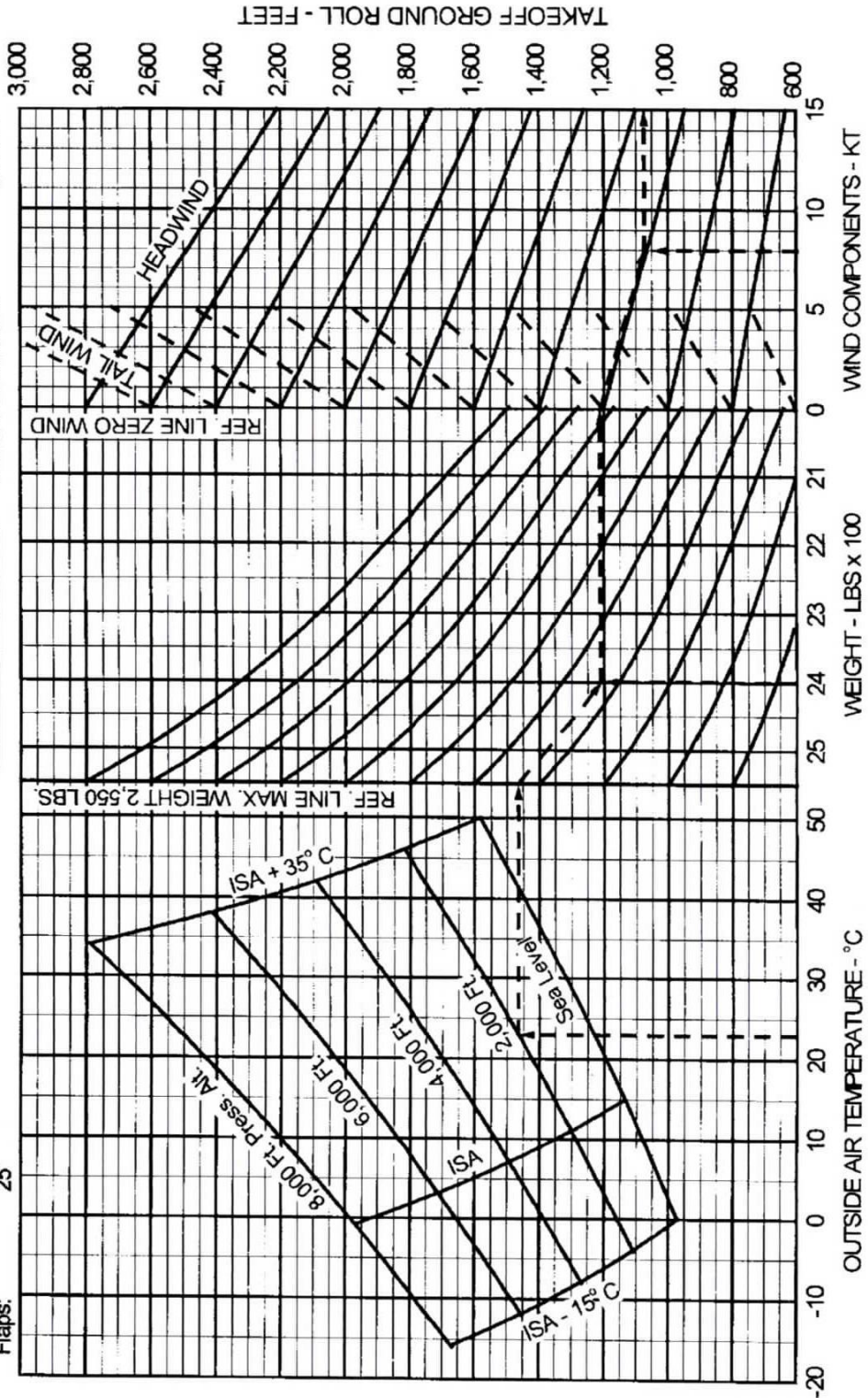
FLAPS 25° TAKEOFF GROUND ROLL

ASSOCIATED CONDITIONS

Power: FULL THROTTLE BEFORE BRAKE RELEASE
 Air Conditioner: OFF
 Runway: PAVED, LEVEL, & DRY
 Airspeed: REFER TO TABLE AT RIGHT
 Propeller: SENSENICH 76EMBS14-0-62
 Flaps: 25°

TAKEOFF SPEEDS		KIAS
WT	LIFTOFF	
2,550	55	
2,450	55	
2,350	53	
2,250	50	

EXAMPLE
 Depart Airport Pressure Alt: 2,000 Ft.
 Temperature: 23° C
 Gross Weight: 2,400 Lb.
 Headwind: 8 Kt.
 Takeoff Ground Roll: 1,071 Ft.



25° FLAPS TAKEOFF GROUND ROLL

Figure 5-13



Climb Performance

CLIMB PERFORMANCE

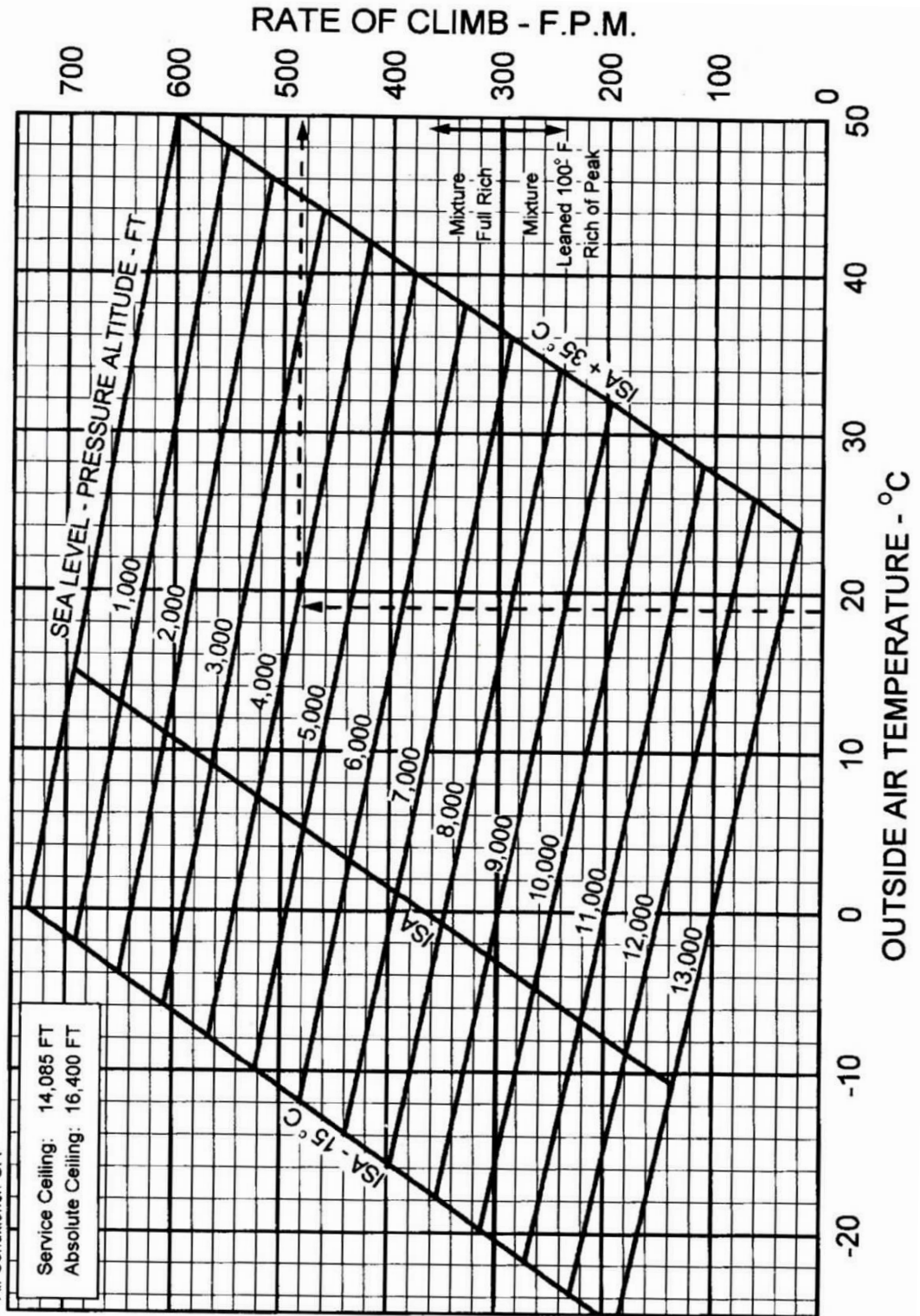
ASSOCIATED CONDITIONS:

Gross Weight: 2550 LBS.
 Power: FULL THROTTLE
 Airspeed: 76 KIAS
 Flaps: UP
 Air Conditioner: OFF

Service Ceiling: 14,085 FT
 Absolute Ceiling: 16,400 FT

EXAMPLE:

Climb Pressure Alt. 4000 FT.
 Temperature: 19° C
 Rate of Climb: 487 F/Min.



CLIMB PERFORMANCE

Figure 5-15



Time, Distance, And Fuel To Climb

TIME, FUEL, DISTANCE TO CLIMB

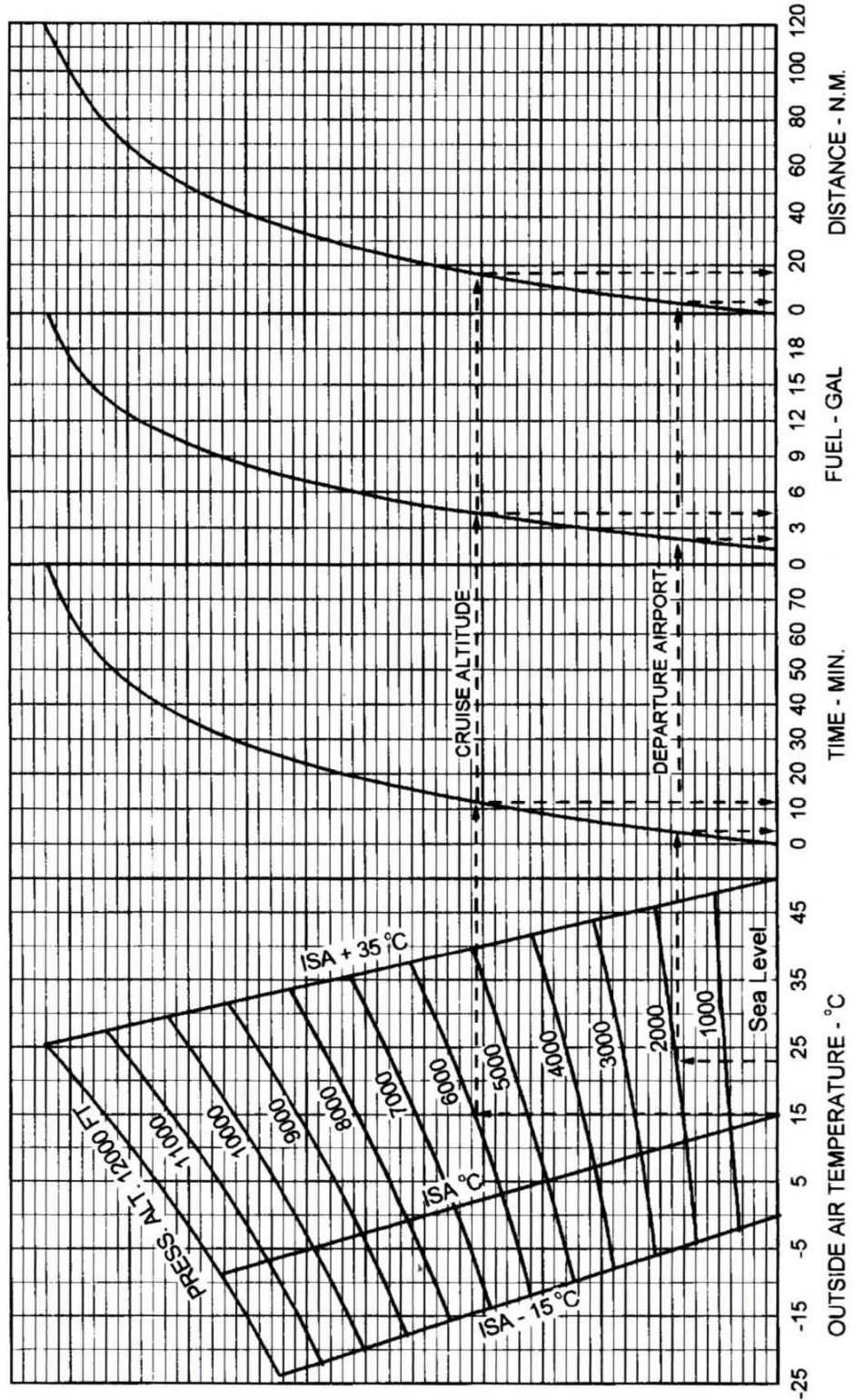
ASSOCIATED CONDITIONS

Gross Weight: 2550 LB
 Power: FULL THROTTLE
 Flaps: UP
 Airspeed: 76 KIAS

EXAMPLE

Depart Airport Press Alt.: 2000 FT.
 Cruise Press Alt.: 6000 FT.
 Time to Climb: 12 min. minus 3 min. = 9 min
 Fuel to Climb: 4 gal. minus 2 gal = 2 gal
 Distance to Climb: 17 n.m. minus 5 n.m. = 12 n.m.

NOTE: This chart includes fuel allowance for start, taxi, & takeoff.



TIME, DISTANCE AND FUEL TO CLIMB

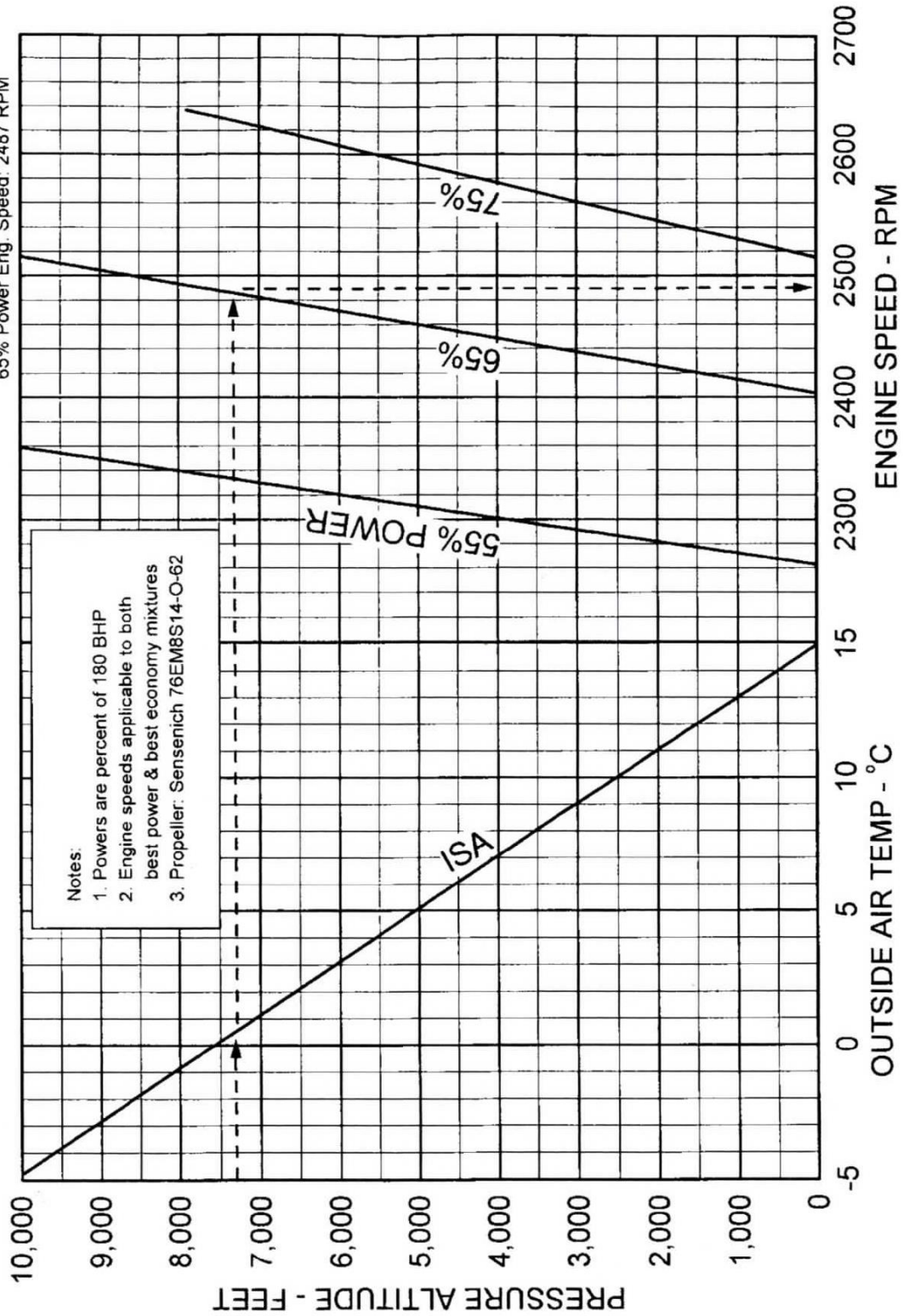
Figure 5-17



Engine Performance

ENGINE PERFORMANCE POWER VERSUS RPM @ ISA

EXAMPLE:
 Pressure Altitude: 7,375 Ft.
 Temperature: ISA
 65% Power Eng. Speed: 2487 RPM



ENGINE PERFORMANCE

Figure 5-19



55% Power Cruise Performance

Engine / Cruise Performance for Non-ISA OAT*					
RPM for Constant 55% Power					
Fuel Flow: Best Economy Mixture, 8.2 GPH					
Pressure Altitude Feet	Indicated Outside Air Temperature			Engine Speed RPM	True Air Speed Knots **
	°C	°C	°F		
Sea Level	ISA-15	0	32	2245	105
	ISA	15	59	2265	
	ISA +10	25	77	2275	
	ISA +20	35	95	2285	
	ISA +30	45	113	2295	
2000	ISA -15	-4	25	2265	106
	ISA	11	52	2280	
	ISA +10	21	70	2295	
	ISA +20	31	88	2305	
	ISA +30	41	106	2315	
4000	ISA -15	-8	18	2285	106
	ISA	7	45	2300	
	ISA +10	17	63	2315	
	ISA +20	27	81	2325	
	ISA +30	37	99	2335	
6000	ISA -15	-12	10	2305	107
	ISA	3	37	2320	
	ISA +10	13	55	2330	
	ISA +20	23	73	2345	
	ISA +30	33	91	2355	
8000	ISA -15	-16	3	2320	107
	ISA	-1	30	2340	
	ISA +10	9	48	2350	
	ISA +17.5	16.5	62	2360	
9000	ISA -15	-18	0	2330	107
	ISA	-3	27	2350	
	ISA +8.5	5.5	42	2360	
10000	ISA - 15	-20	-4	2340	107
	ISA	-5	23	2360	

NOTE: * Aircraft weight 2550 Lbs., Wheel pants and strut fairings installed
 ** Subtract 3 KTAS if wheel pants are removed.

ENGINE/CRUISE PERFORMANCE (55%)

Figure 5-21



65% Power Cruise Performance

Engine / Cruise Performance for Non-ISA OAT* RPM for Constant 65% Power Fuel Flow: Best Economy Mixture, 9.5 GPH					
Pressure Altitude Feet	Indicated Outside Air Temperature			Engine Speed RPM	True Air Speed Knots **
	°C	°C	°F		
Sea Level	ISA-15	0	32	2385	113
	ISA	15	59	2405	
	ISA +10	25	77	2415	
	ISA +20	35	95	2430	
	ISA +30	45	113	2440	
2000	ISA -15	-4	25	2405	114
	ISA	11	52	2425	
	ISA +10	21	70	2440	
	ISA +20	31	88	2450	
	ISA +30	41	106	2465	
4000	ISA -15	-8	18	2430	115
	ISA	7	45	2450	
	ISA +10	17	63	2460	
	ISA +20	27	81	2475	
	ISA +30	37	99	2485	
6000	ISA -15	-12	10	2450	116
	ISA	3	37	2470	
	ISA +10	13	55	2485	
	ISA +20	23	73	2495	
	ISA +30	33	91	2510	
8000	ISA -15	-16	3	2475	117
	ISA	-1	30	2495	
	ISA +10	9	48	2505	
	ISA +17.5	16.5	62	2515	
9000	ISA -15	-18	0	2485	117
	ISA	-3	27	2505	
	ISA +8.5	5.5	42	2515	
10000	ISA -15	-20	-4	2495	118
	ISA	-5	23	2515	

NOTE: * Aircraft weight 2550 Lbs., Wheel pants and strut fairings installed
 ** Subtract 3 KTAS if wheel pants are removed.

ENGINE/CRUISE PERFORMANCE (65%)

Figure 5-23



75% Power Cruise Performance

Engine / Cruise Performance for Non-ISA OAT*
RPM for Constant 75% Power
Fuel Flow: Best Economy Mixture, 11.0 GPH

Pressure Altitude Feet	Indicated Outside Air Temperature			Engine Speed RPM	True Air Speed Knots **
	°C	°C	°F		
Sea Level	ISA-15	0	32	2485	119
	ISA	15	59	2515	
	ISA +10	25	77	2535	
	ISA +20	35	95	2550	
	ISA +30	45	113	2565	
2000	ISA -15	-4	25	2520	121
	ISA	11	52	2545	
	ISA +10	21	70	2565	
	ISA +20	31	88	2580	
	ISA +30	41	106	2600	
3000	ISA -15	-6	21	2535	122
	ISA	9	48	2560	
	ISA +10	19	66	2580	
	ISA +20	29	84	2595	
	ISA +30	39	102	2615	
4000	ISA -15	-8	18	2550	123
	ISA	7	45	2575	
	ISA +10	17	63	2595	
	ISA +20	27	81	2610	
	ISA +30	37	99	2630	
5000	ISA -15	-10	14	2565	124
	ISA	5	41	2590	
	ISA +10	15	59	2610	
	ISA +20	25	77	2625	
	ISA +25	30	86	2635	
6000	ISA -15	-12	10	2580	125
	ISA	3	37	2605	
	ISA +10	13	55	2625	
	ISA +15	18	64	2635	
	ISA +20	23	73	2645	
7000	ISA -15	-14	6.8	2595	126
	ISA	1	34	2625	
	ISA +7.5	8.5	47	2635	

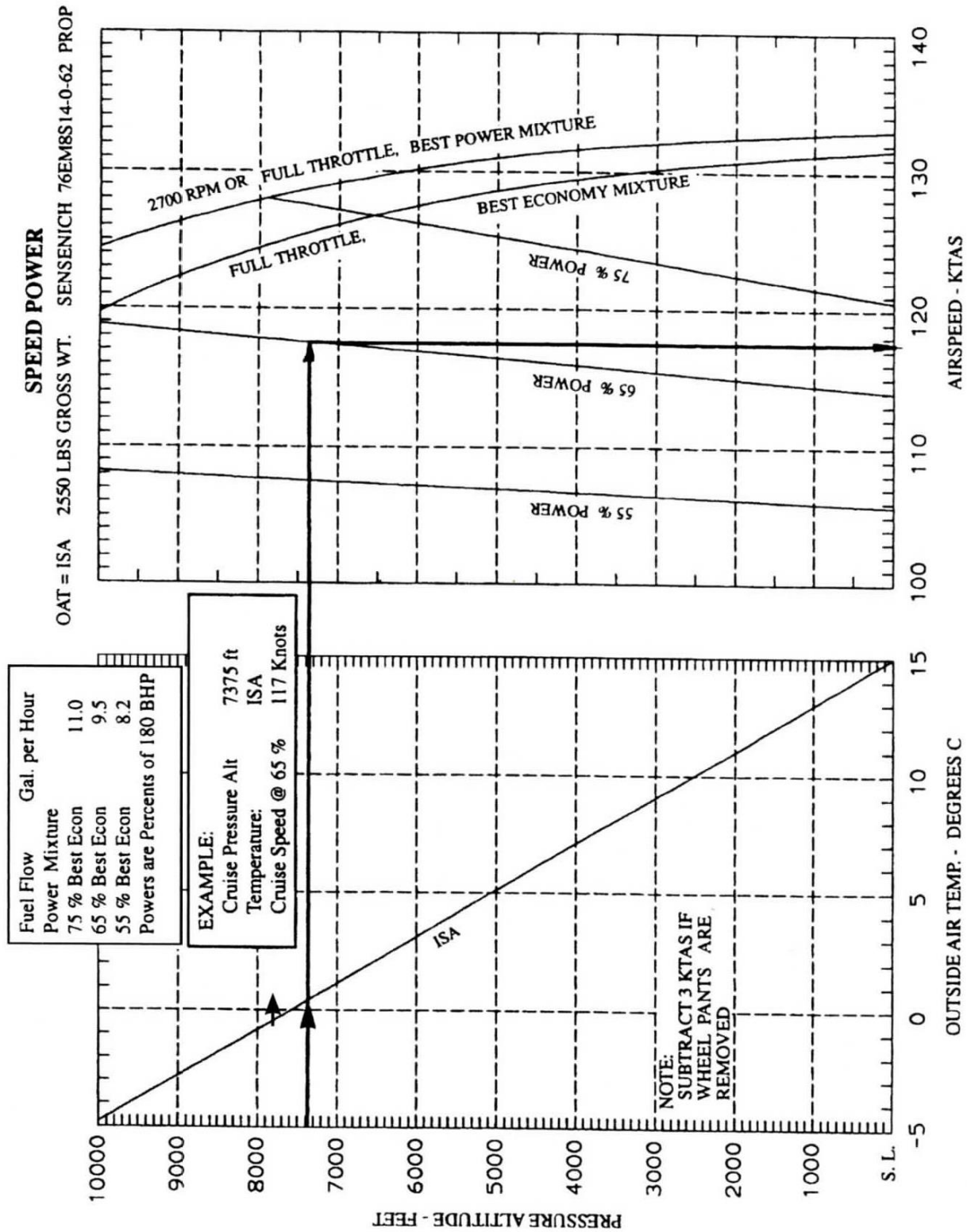
NOTE: * Aircraft weight 2550 Lbs., Wheel pants and strut fairings installed
 ** Subtract 3 KTAS if wheel pants are removed.

ENGINE/CRUISE PERFORMANCE (75%)

Figure 5-25



Speed/ Power Chart



SPEED POWER

Figure 5-27

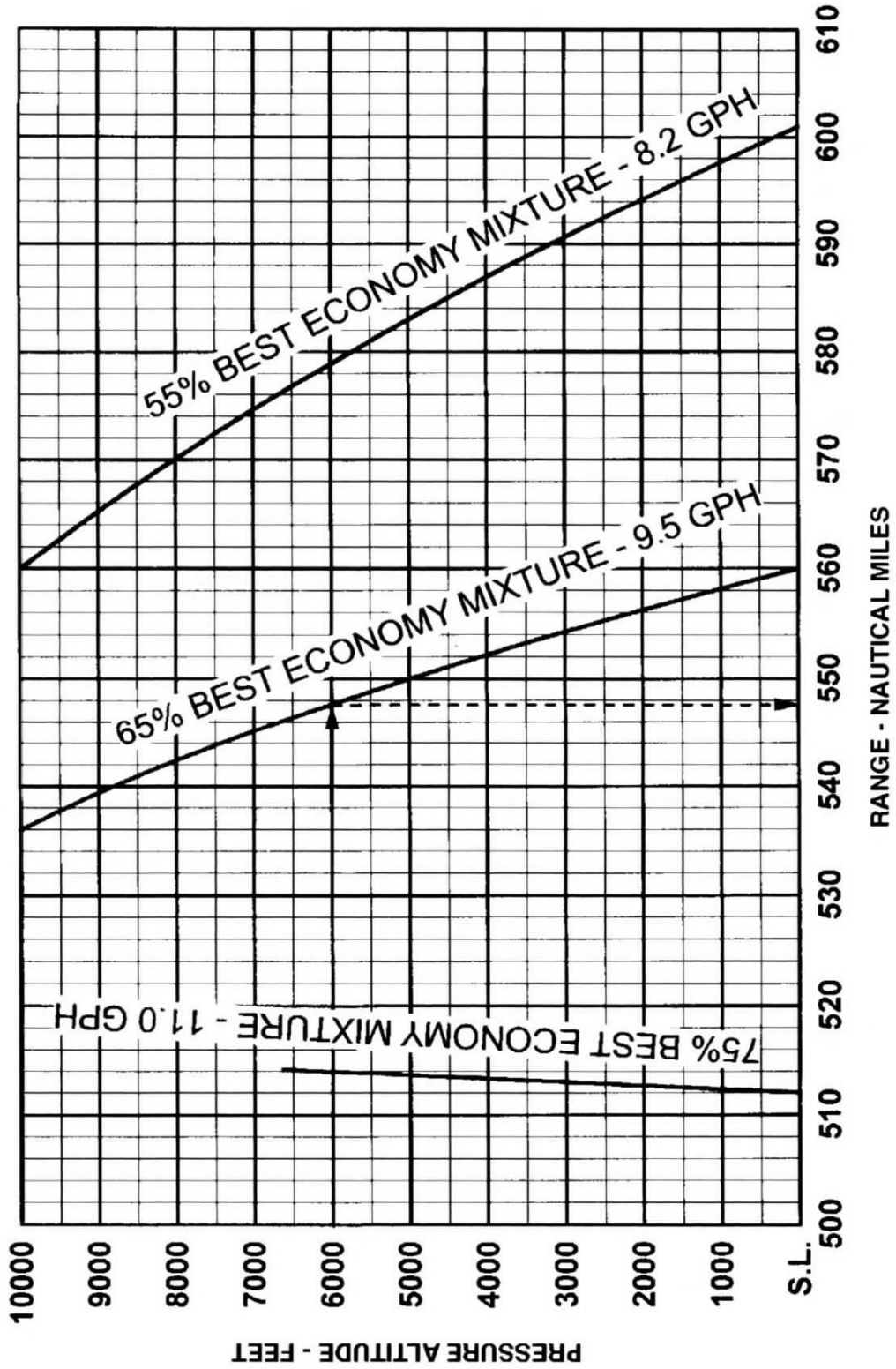


Range (NO RESERVE)

NOTE:
 REDUCE RANGE 3% IF
 WHEEL PANTS ARE
 REMOVED

EXAMPLE:
 Cruise Pressure Alt. 6000 Ft.
 Power 65% Best Economy
 Range with No Reserves 547 n.m.

RANGE WITHOUT 45 MIN. RESERVE
 48 GAL USABLE FUEL 2550 LBS GROSS WT.
 SENSENICH 76EM8S14-0-62 PROP
 RANGE INCLUDES CLIMB AND DESCENT DISTANCE



RANGE (NO RESERVE)

Figure 5-29

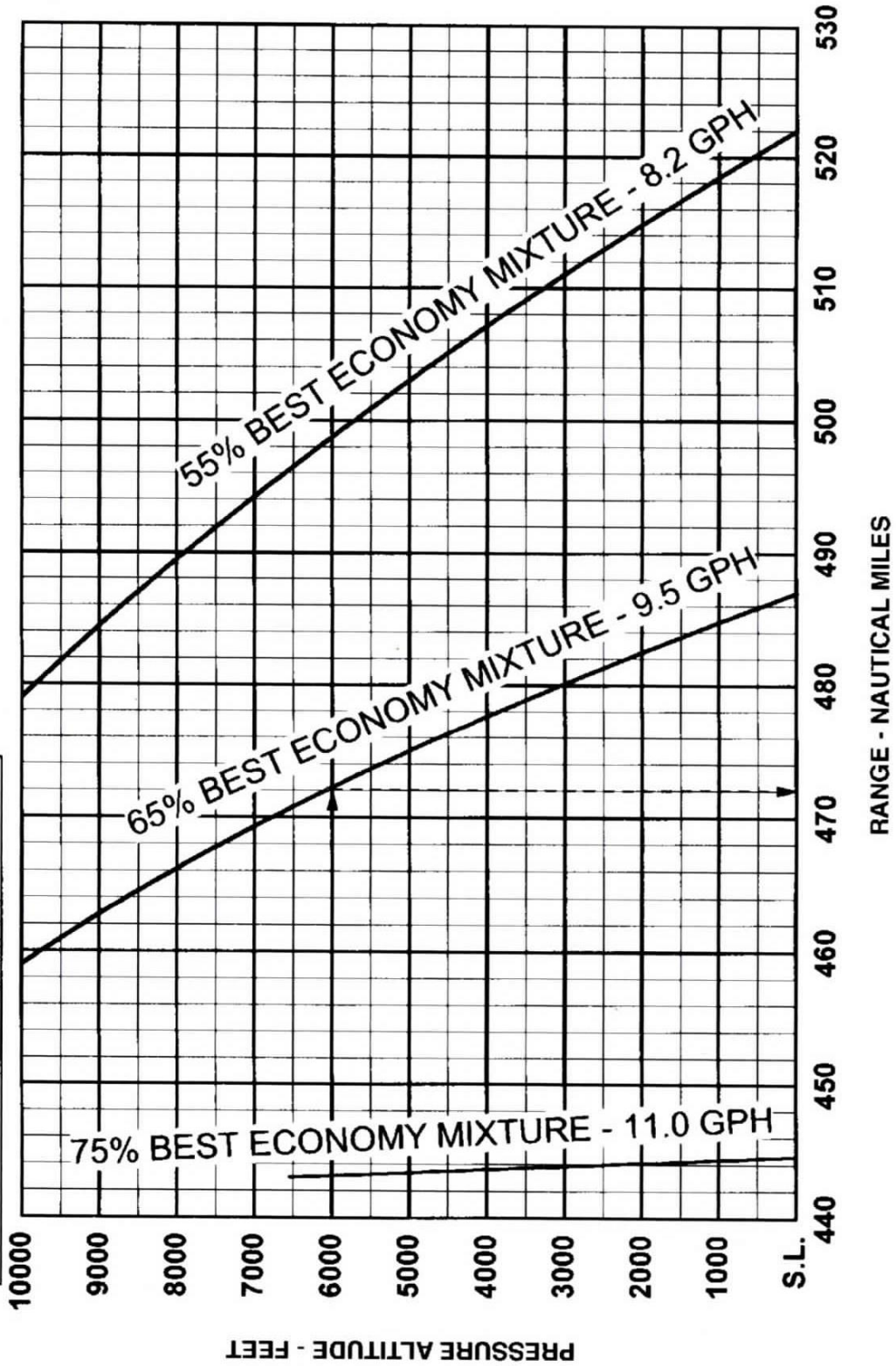


Range (45 Minute Reserve)

NOTE:
 REDUCE RANGE 3% IF
 WHEEL PANTS ARE
 REMOVED

EXAMPLE:
 Cruise Pressure Alt. 6000 Ft.
 Power 65% Best Economy
 Range with Reserves 472 n.m.

RANGE WITH 45 MIN. RESERVE
 48 GAL USABLE FUEL 2550 LBS GROSS WT.
 SENSENICH 76EM8S14-0-62 PROP
 RANGE INCLUDES CLIMB AND DESCENT DISTANCE
 RESERVE FUEL = 45 MIN. AT 55% POWER

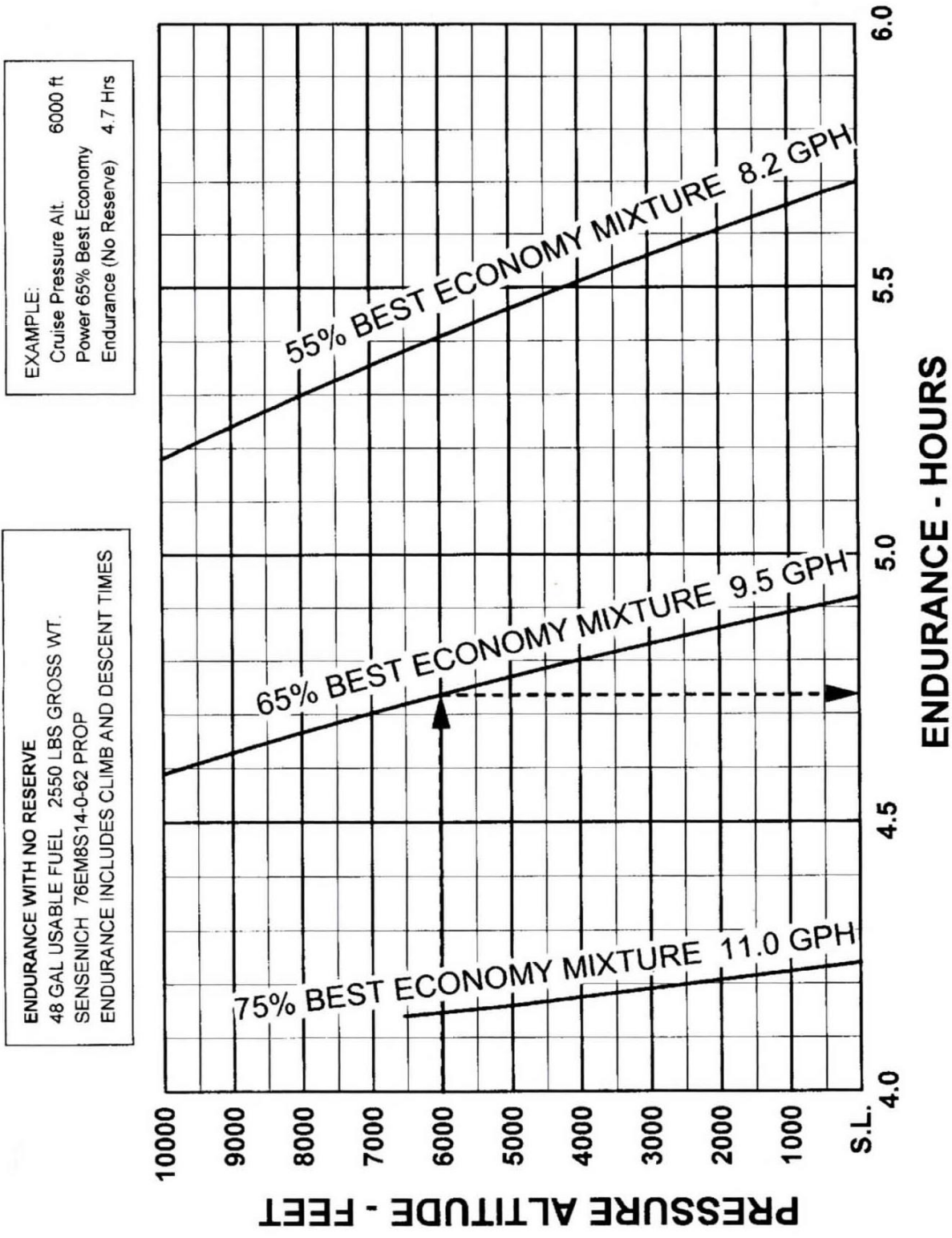


RANGE (45 MIN. RESERVE)

Figure 5-31



Endurance (NO RESERVE)

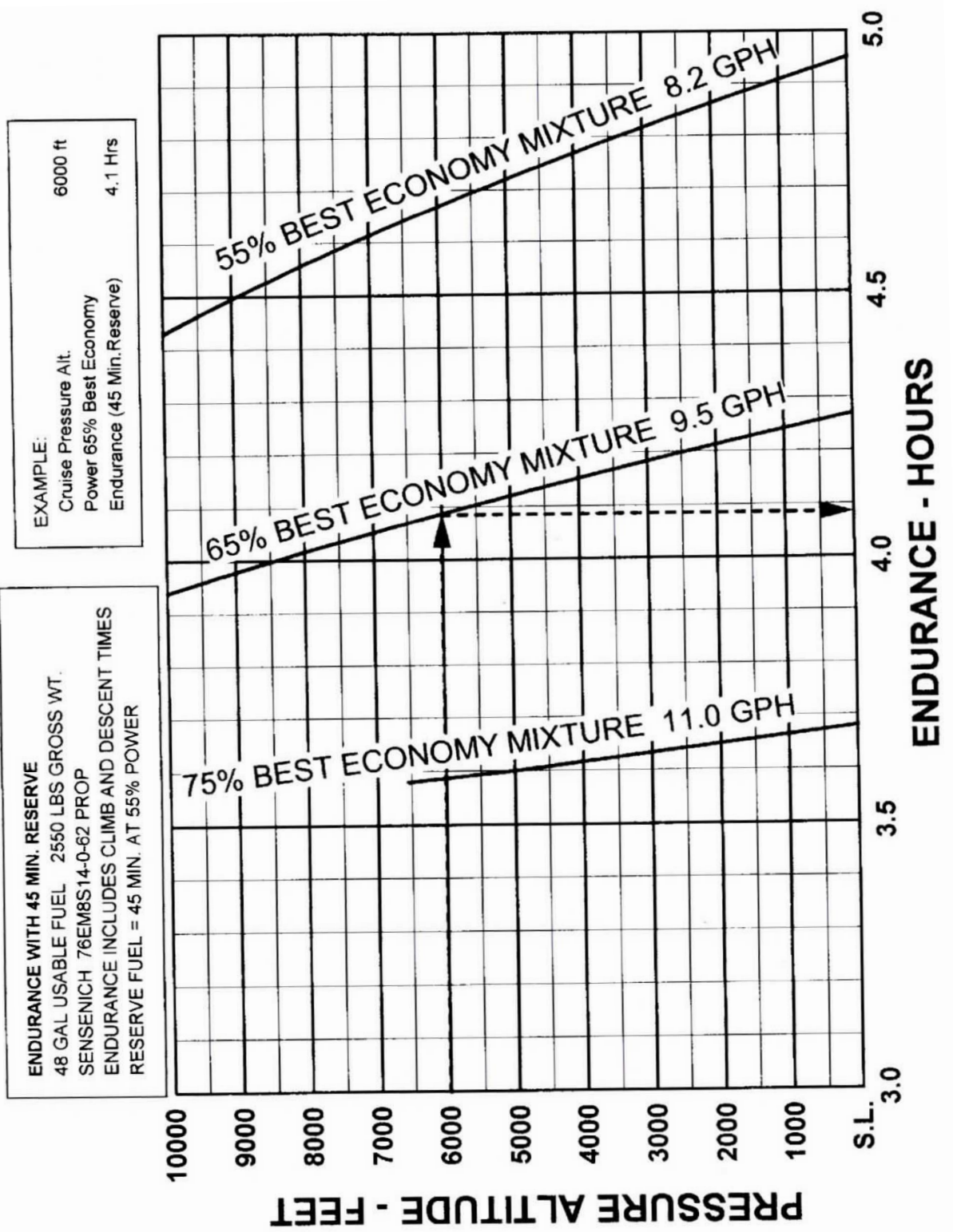


ENDURANCE (NO RESERVE)

Figure 5-33



Endurance (45 Minute Reserve)



ENDURANCE (45 MIN. RESERVE)

Figure 5-35



Time, Distance, And Fuel To Descend

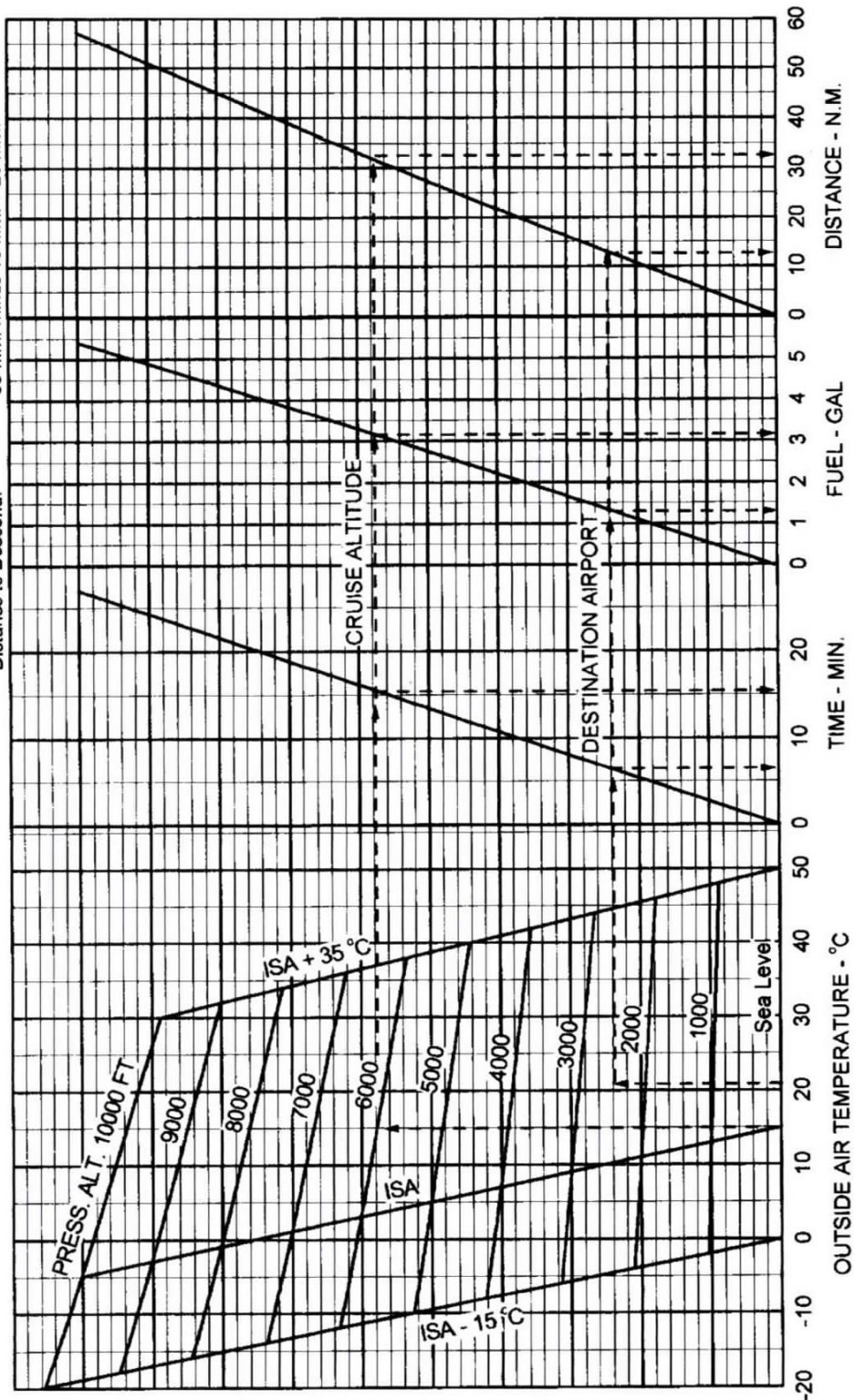
TIME, FUEL, DISTANCE TO DESCEND

ASSOCIATED CONDITIONS

Gross Weight: 2550 LB
 Engine RPM: 2500
 Airspeed: 122 KIAS
 Flaps: UP

EXAMPLE

Depart Airport Press Alt.: 2500 FT. Temperature: 21 °C
 Cruise Press Alt.: 6000 FT. Cruise OAT: 15 °C
 Time to Descend: 16 min. minus 6 min. = 10 min
 Fuel to Descend: 3.2 gal. minus 1.3 gal = 1.9 gal
 Distance to Descend: 33 n.m. minus 13 n.m. = 20 n.m.



TIME, DISTANCE AND FUEL TO DESCEND

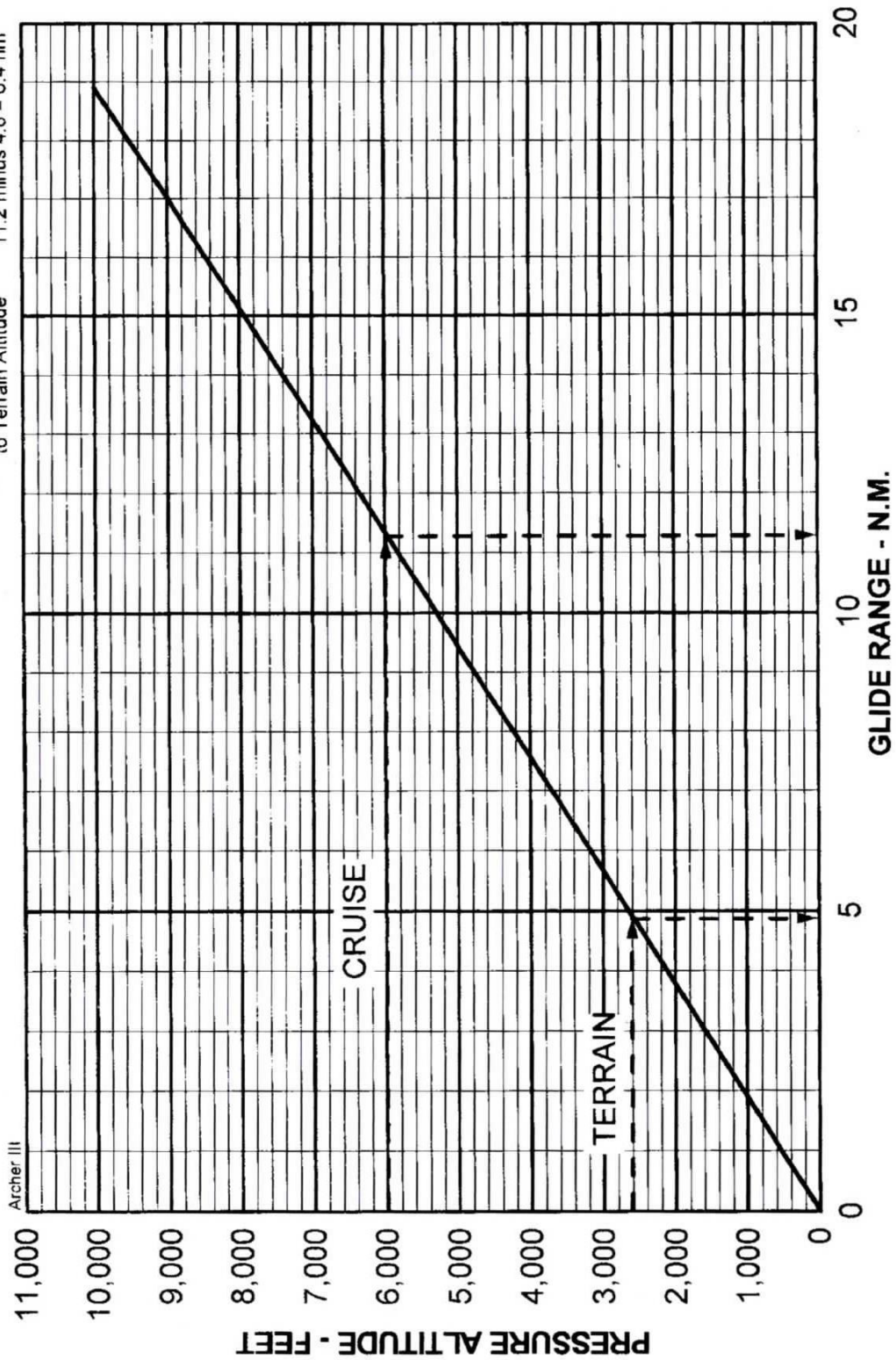
Figure 5-37



Glide Range

EXAMPLE:
 Glide Distance from 6,000 ft Cruise Alt. 11.2 nm
 Glide Distance from 2,600 ft Terrain above sea level 4.8 nm
 Glide Distance from Cruise Altitude to Terrain Altitude 11.2 minus 4.8 = 6.4 nm

GLIDE RANGE
 POWER OFF, FLAP UP, 76 KIAS
 2,250 LB GROSS WT., NO WIND



GLIDE RANGE
 Figure 5-39



Landing Performance

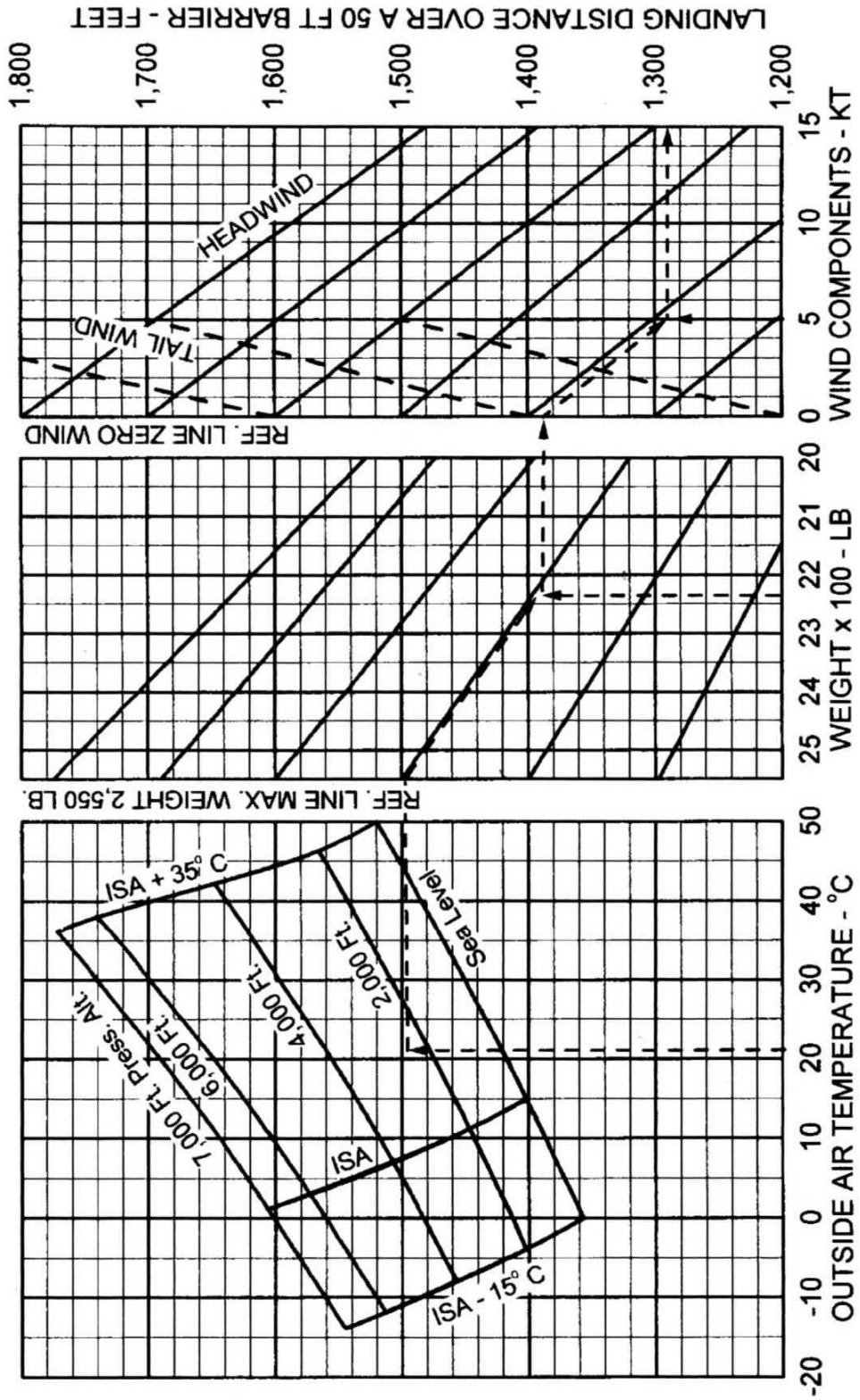
LANDING PERFORMANCE

ASSOCIATED CONDITIONS

Power Off Approach, 40° Flaps, 66 KIAS, Full Stall
 Touchdown, Maximum Braking, Paved, Level, Dry Runway

EXAMPLE:

Airport Pressure Altitude: 2,500 FT.
 O.A.T.: 21°C
 Gross Weight: 2,240 LB.
 Headwind: 5 KT.
 Landing Distance: 1,290 FT.



LANDING PERFORMANCE

Figure 5-41



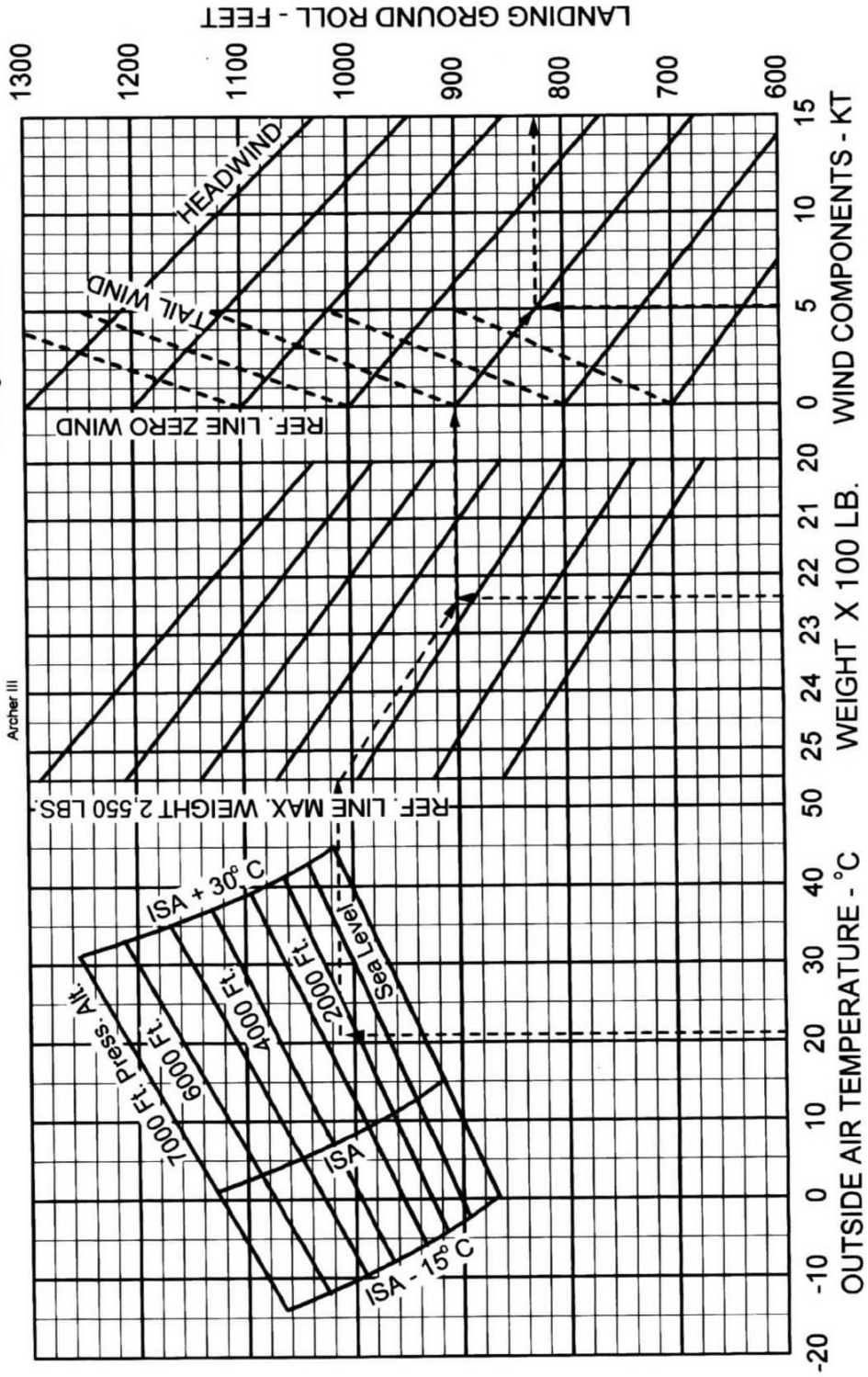
Landing Ground Roll

LANDING GROUND ROLL ASSOCIATED CONDITIONS

Power Off Approach, 40° Flaps, Full Stall Touchdown
Maximum Braking, Paved level, Dry Runway

EXAMPLE:

Airport Pressure Altitude: 2500 Ft.
O.A.T.: 21°C
Gross Weight: 2240 LB.
Headwind: 5 Kt.
Landing Ground Roll: 820 Ft.



LANDING GROUND ROLL

Figure 5-43

VFR NAVIGATION LOG

Aircraft Number	N	Notes

Check Points (Fixes)	VOR	Course (Route)	Altitude	Wind		CAS	TC -L / +R WCA	TH -E / +W Var.	MH ± Dev.	CH	Dist.	GS	Time Off		GPH	Airport & ATIS Advisories				
	Ident			Dir.	Vel.						Leg	Est.	ETE	ETA	Fuel	Departure			Destination	
	Freq.			Temp	TAS						Rem.	Act.	ATE	ATA	Rem.					
Totals »																				

Flight Plan and Weather Log on Reverse Side
Block In Log Time
Block Out

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MUX36183H

WEATHER LOG

	Ceiling, Visibility and Precipitation		Winds Aloft	Icing and Freezing Level	Turbulence and Cloud Tops	Position of Fronts, Lows and Highs
	Reported	Forecast				
Departure						
Enroute						
Destination						
Alternate						

FLIGHT PLAN

1.	Type	2. Aircraft Identification	3. Aircraft Type/ Special Equipment	4. True Airspeed	5. Departure Point	6. Departure Time		7. Cruising Altitude
	VFR			Knots		Proposed (Z)	Actual (Z)	
	IFR							
	DVFR							
8. Route of Flight								
9. Destination (Name of airport and city)			10. Est. Time Enroute		11. Remarks			
			Hours	Minutes				
12. Fuel on board		13. Alternate Airport(s)		14. Pilot's Name, Address, Tel # & Aircraft Home Base			15. # Aboard	
Hours	Minutes							
16. Color of Aircraft				17. Destination Contact / Telephone (Optional)				

Notes and NOTAMs

CLOSE VFR FLIGHT PLAN WITH _____ FSS ON ARRIVAL

<p>Special Equipment Suffix</p> <p>/X-No Transponder</p> <p>/T-Transponder with no altitude encoding capability</p> <p>/U-Transponder with altitude encoding capability</p> <p>/D-DME, no transponder</p>	<p>/B-DME, transponder with no altitude encoding capability</p> <p>/A-DME, transponder with altitude encoding capability</p> <p>/R-RNAV, transponder with altitude encoding capability</p>
<p>/C-RNAV, transponder with no altitude encoding capability</p> <p>/W-RNAV, no transponder</p> <p>/G-Global Positioning System (GPS)/Global Navigation Satellite System (GNSS) equipped aircraft with oceanic, enroute, terminal, and GPS approach capability.</p>	

Position Report

Acft. Ident.	Position	Time	Alt.	IFR/VFR	Est. Next Fix	Name Following Fix
Report Conditions Aloft - Cloud Tops, Bases, Layers, Visibility, Turbulence, Haze, Ice, Thunderstorms						