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Performance Data

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Prepared by the worldwide aviation specialists at RidgeAire, Inc.

SECTION VII

FLIGHT PLANNING AND PERFORMANCE

CONTENTS

WEIGHT AND BALANCE

The center-of-gravity (CG) of an airplane can be defined as the point on the longitudinal axis about which the airplane would balance. The force of weight always acts through the center-of-gravity. The forces of lift attempt to rotate the airplane about the center-of-gravity.

In flight, the forces of gravity and lift from the wing and horizontal stabilizer must balance about the center-of-gravity so that stability is achieved.

CENTER-OF-GRAVITY FORCES

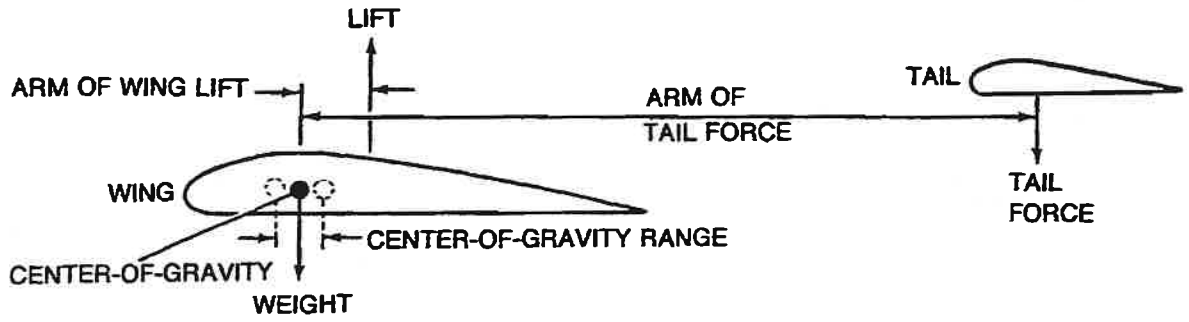

Figure 7-1

As the center-of-gravity changes forward or aft due to airplane loading, the lever or moment arm of the wing and tail lifting surfaces change.

The horizontal stabilizer must be capable of providing an equalizing moment to that which is produced by the remainder of the airplane. Since the amount of lift produced by the horizontal stabilizer is limited, the range of movement of the center-of-gravity is restricted so that equilibrium can be maintained. Loading must be calculated as being within the allowable envelope to achieve proper stability and control.

The center-of-gravity of an empty airplane is found by accurate weighing to determine the balance point. This point is then defined by labeling it in inches aft of a fixed reference line located forward of the airplane nose. This line is called the Reference Datum Line. Selection of the Reference Datum line is arbitrary, but it does provide a standard from which center-of-gravity movement along the longitudinal axis can be measured.

SAMPLE LOADING PROBLEM

Standard Airplane.
Basic Empty Weight - 8227 pounds.*
Crew of 170 and 170 pounds in Seats 1 and 2.
One 170-pound Passenger in Seat 3.
One 170-pound Passenger in Seat 4.
One 170-pound Passenger in Seat 5.
One 170-pound Passenger in Seat 6.

*Includes all undrainable fluids and a full service of oil.

100 pounds of baggage at station 74 in the nose.
180 pounds of baggage at station 442 in the tailcone baggage compartment.
5723 pounds of fuel.
2000-pound fuel burnoff during trip.
200-pound fuel burnoff during taxi.

Determine the operational takeoff weight and center-of-gravity. Loading tables are found in this manual and in the Weight and Balance Data Sheets. The following step-by-step procedure illustrates a logical manner in which to approach the loading problem.

NOTE

During computation of the following sample problem, weights are rounded to nearest whole number (pound) for entry on the Weight and Balance Computation Form.

1. Use the Crew and Passenger Loading Table obtained from Weight and Balance Data Sheets to determine the moment for each load station. Enter the figures for each load station in the Weight and Balance Computation Form.
2. Use the Cabinet Loading Table obtained from Weight and Balance Data Sheet to determine the moment for any cabinet contents and enter the figures in the Weight and Balance Computation Form.
3. Use the Cargo Loading Table obtained from Weight and Balance Data Sheet to determine the moment for cargo loading in the nose, aft cabin and tailcone compartments. Enter the weight and moments for each load station in the Weight and Balance Computation Form.
4. Use the Surface Anti-Icing Fluid Table obtained from the Weight and Balance Data Sheet.

NOTE

When entering the surface anti-icing fluid amount on the Weight and Balance Computation Form, do not include 1.5 gallons (13.70 pounds) of the total amount since this amount is included in the basic empty weight. Example: If the surface anti-icing fluid tank contains 7.0 gallons of fluid at takeoff, subtract 1.5 gallons to obtain 5.5 gallons (50.22 pounds) of payload fluid.

5. Total the payload items and enter the totals on the Weight and Balance Computation Form (two places).

13. Determine the estimated weight of the surface anti-icing fluid to be used to arrive at the destination. Use the Surface Anti-Icing Fluid Table (refer to Figure 2-22) to determine the weight and moment.

NOTE

Example: 7.0 gallons of surface anti-icing fluid existed at takeoff; 4.0 gallons (36.52 pounds) were to be used during flight which provides 3.0 gallons remaining upon landing.

14. Subtract the weight and moment of the fuel and surface anti-icing fluid to be used to arrive at the destination from the weight and moment at takeoff to determine the landing weight and moment. Check landing weight and moment for approved limits.

NOTE

To check approved limits, divide moment by weight and multiply by 100 and obtain center-of-gravity. Locate the weight versus center-of-gravity point on the approved Center-of-Gravity Limits Envelope Graph (refer to Figure 7-5). Approved points are points located inside the shaded area below 14,400 pounds.

WEIGHT AND BALANCE COMPUTATION FORM

PAYLOAD COMPUTATIONS			
ITEM	ARM	WEIGHT (POUNDS)	MOMENT/ 100
OCCUPANTS			
SEAT 1	131.00	170	222.70
SEAT 2	131.00	170	222.70
SEAT 3	214.00	170	363.80
SEAT 4	208.00	170	353.60
SEAT 5	251.00	170	426.70
SEAT 6	251.00	170	426.70
SEAT —			
SEAT —			
SEAT —			
SEAT —			
TOILET	325.00		
CARGO			
NOSE	74.00	100	74.00
AFT CABIN	321.00		
	338.00		
TAILCONE	414.00		
	442.00	180	795.60
CABINET CONTENTS			
*SURFACE ANTI-ICING FLUID	57.00	50	28.50
PAYLOAD		1350	2914.30

ITEM	WEIGHT (POUNDS)	MOMENT/ 100
1. BASIC EMPTY WEIGHT **Airplane CG = 291.0	8227	23,940.57
2. PAYLOAD	1350	2914.30
3. ZERO FUEL WEIGHT (sub-total) (Do not exceed maximum zero fuel weight of 11,200 pounds)	9577	26854.87
4. FUEL LOADING	5723	16,170.53
5. RAMP WEIGHT (sub-total) (Do not exceed maximum ramp weight of 15,300 pounds)	15,300	43,025.40
6. LESS FUEL FOR TAXIING	200	565.86
7.***TAKEOFF WEIGHT (Do not exceed maximum takeoff weight of 15,100 pounds) **Airplane CG = 281.19 ****	**** 15,100	42,459.54
8. LESS FUEL TO DESTINATION	2000	5744.82
9. LESS SURFACE ANTI-ICING FLUID TO DESTINATION	37	20.82
10.***LANDING WEIGHT (Do not exceed maximum landing weight of 14,400 pounds) **Airplane CG = 280.90****	**** 13,063	36,693.90

*1.5 gallons (13.70 pounds) of Surface Anti-icing Fluid is included in the Basic Empty Weight. Do not include this amount as Payload.

**Airplane CG = $\frac{\text{MOMENT/100}}{\text{WEIGHT}}$ X 100

***Totals must be within approved weight and center-of-gravity limits. It is the responsibility of the operator to ensure that the airplane is loaded properly. The Basic Empty Weight CG is noted on the Airplane Weighing Form. If the airplane has been altered, refer to the Weight and Balance Record for information.

****Enter on the Center-of-Gravity Limits Envelope Graph to check if within approved limits (shaded area).

Figure 7-3

1715-6

CENTER-OF-GRAVITY MOMENT ENVELOPE

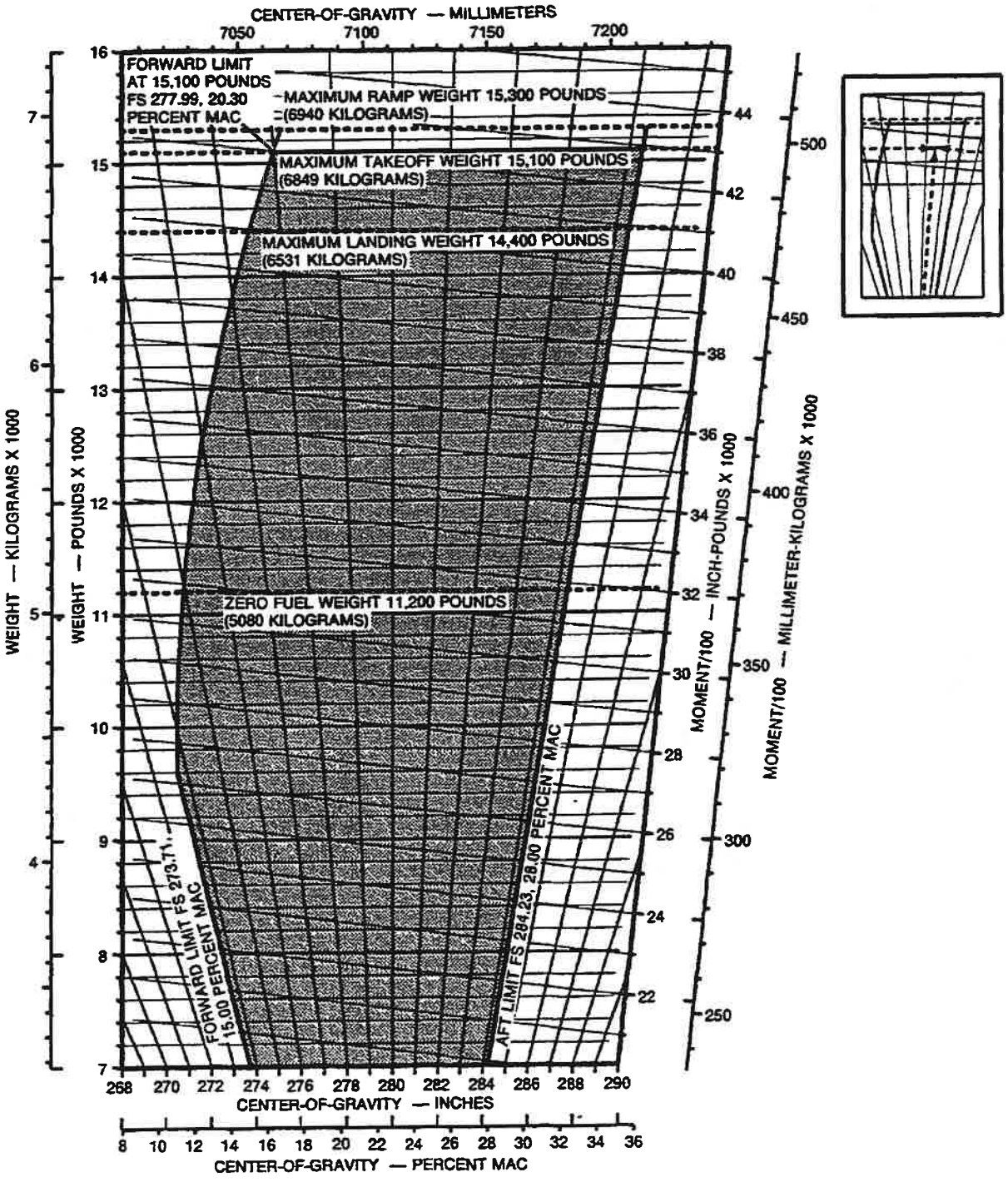

Figure 7-5

1714-2

FLIGHT PLANNING

Thorough flight planning suggests establishing a preflight goal such as maximum range, mimimum time enroute, or maximum fuel reserve within the parameters defined by the Airplane Flight Manual takeoff, climb and landing requirements. Graphs for Maximum Cruise Thrust, 100 percent N_1, and Long Range Cruise are presented in this chapter to aid the crew in determining how best to achieve that goal. Maximum cruise thrust results in minimum time, long range cruise in optimum fuel consumption and 100 percent N_1 represents a balance between the two.

Maximum range at a given altitude is dependent upon airframe efficiency and can be defined in still air as that point on the total drag curve where the relationship of velocity to total airplane drag is most favorable. The cruise angle-of-attack necessary to achieve that point is constant, but airspeed required is affected by airplane weight. The higher the weight, the higher the airspeed necessary to achieve optimum cruise angle-of-attack. This is in evidence when the long range cruise FLIGHT PLANNING graphs are used and result in longer block times for the lighter weights. Enroute, as fuel burnoff occurs, thrust and airspeed required for best range will decrease as specific range increases due to improved performance at the lower operating weights. This should be considered when planning short stage lengths to avoid carrying excessive weight in stored fuel not operationally necessary.

Wind existing at cruise altitudes requires a more involved planning process to realize best range because it requires a true airspeed faster or slower than that at which optimum range angle-of-attack is achieved in still air. This minimizes the effects of a headwind, or takes maximum advantage of a tailwind. The airplane's broad altitude capability also brings into consideration engine efficiency. Since the fuel flow necessary for a given true airspeed decreases with an increase in altitude, a higher headwind component may be tolerated at the upper flight level with best results in terms of ground distance covered to fuel consumed. Conversely, large increases in headwind velocity with altitude may dictate a lower cruise level to obtain the best fuel to distance relationship.

To assist altitude selection taking into account upper winds, SPECIFIC RANGE vs CRUISE WIND graphs are presented for maximum cruise thrust, 100 percent N_1, and long range cruise. Their purpose is to provide a comparative reference for determining the best altitude/wind combination to achieve a maximum range goal. They also illustrate the increase in engine efficiency with altitude.

Once the cruise mode and altitude have been determined, enroute time and fuel required can be approximated from the appropriate FLIGHT PLANNING graphs.

The following criteria are used:

1. 200 pounds of taxi fuel.
2. 225-knot climb schedule for maximum cruise thrust and 100 percent N_1 graphs, sea level through 35,000 feet. Maximum rate climb schedule for long range cruise, sea level through 43,000 feet, and maximum cruise thrust and 100 percent N_1 graphs 37,000 through 43,000 feet.
3. Sixty percent of the cruise wind factor applied to climb; 40 percent to descent.
4. Descent to 10,000 feet from cruise altitude at 2000 feet per minute using 600 pounds per hour fuel flow.
5. Thirty nautical miles from destination at 10,000 feet and long range cruise airspeed.
6. Ten minutes approach fuel at 850 pounds per hour total fuel flow.

FLIGHT PLANNING

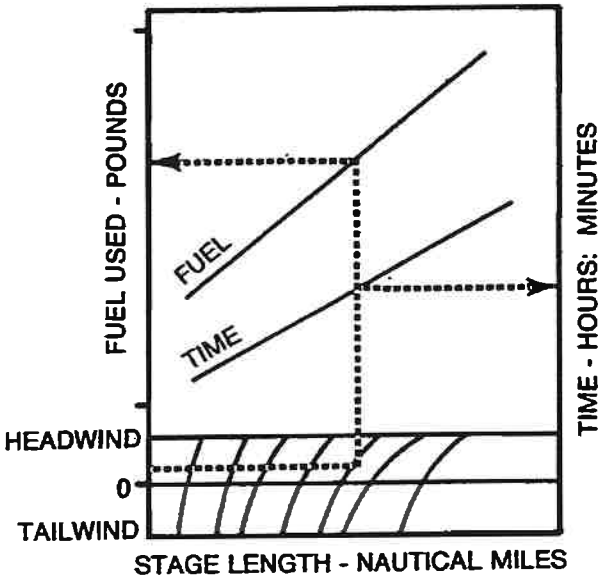

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Figure 7-8

SPECIFIC RANGE VS CRUISE WIND

MAXIMUM CRUISE THRUST

STANDARD DAY

12,000 POUNDS AVERAGE CRUISE WEIGHT

FAN SETTING FOR MAXIMUM CRUISE THRUST	
ALTITUDE - FT.	N_1 - % RPM
25,000	103.6
27,000	104.5
29,000	105.4
31,000	106.0
33,000	106.0
35,000	106.0
37,000	106.0
39,000	106.0
41,000	106.0
43,000	106.0

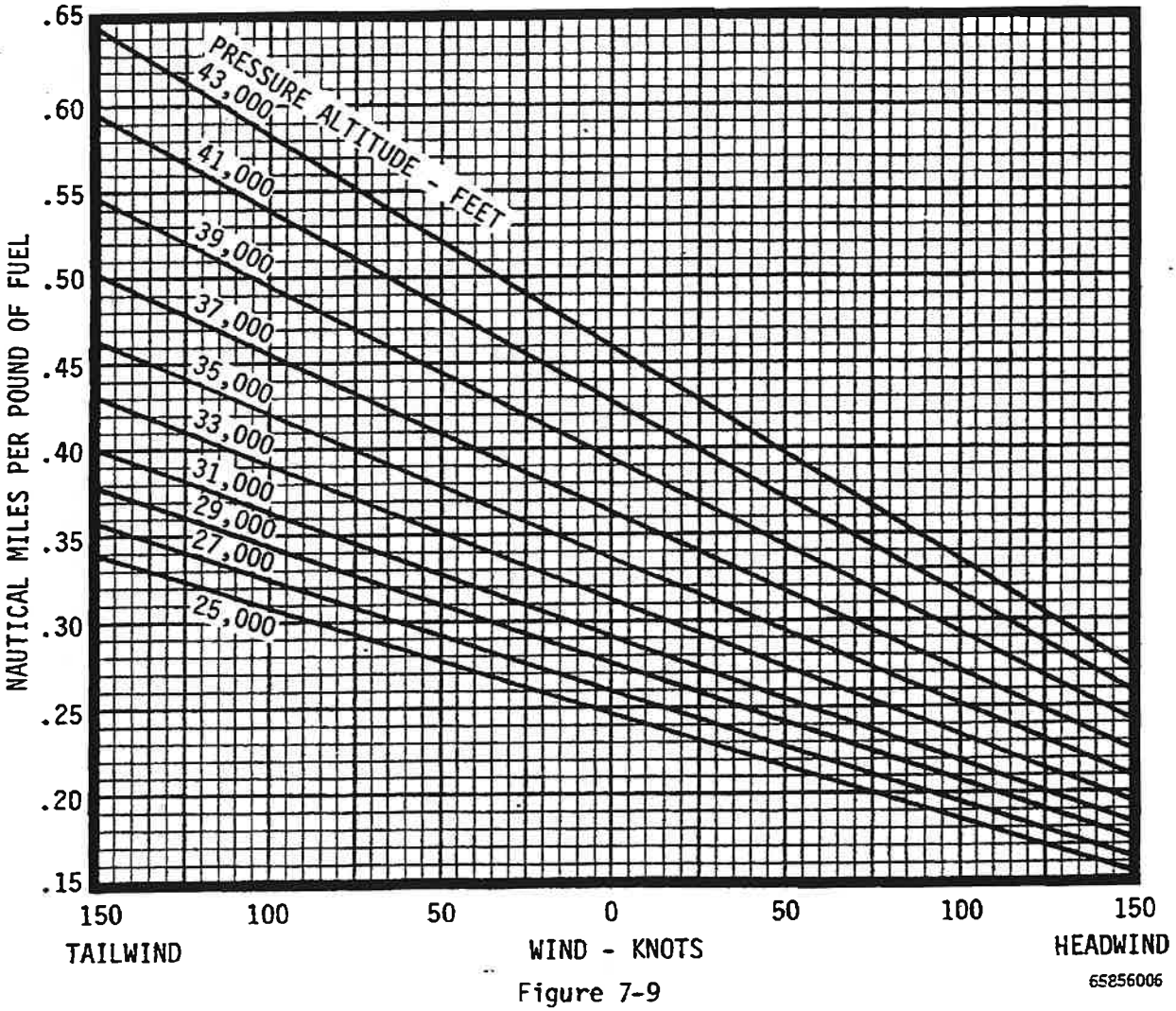

Figure 7-9

SPECIFIC RANGE VS CRUISE WIND

LONG RANGE CRUISE

STANDARD DAY

12,000 POUNDS AVERAGE CRUISE WEIGHT

FAN SETTING FOR LONG RANGE CRUISE							
	TAILWIND				HEADWIND		
ALTITUDE - FT.	150	100	50	0	50	100	150
25,000	75.2	76.3	78.3	79.5	84.8	88.3	94.5
27,000	77.1	77.8	79.7	81.8	85.0	89.5	95.0
29,000	79.1	79.8	81.2	83.4	86.2	91.4	95.3
31,000	81.0	81.8	83.2	84.9	87.9	91.5	95.4
33,000	83.4	84.2	85.3	86.8	89.0	93.7	95.8
35,000	85.3	86.1	87.1	89.2	91.0	93.6	97.0
37,000	88.3	88.8	89.7	90.7	92.3	95.4	97.8
39,000	91.1	91.6	92.3	93.6	95.5	97.2	99.7
41,000	94.4	94.8	95.5	97.3	98.2	100.5	101.9
43,000	98.0	98.5	99.3	99.9	100.5	101.5	105.3

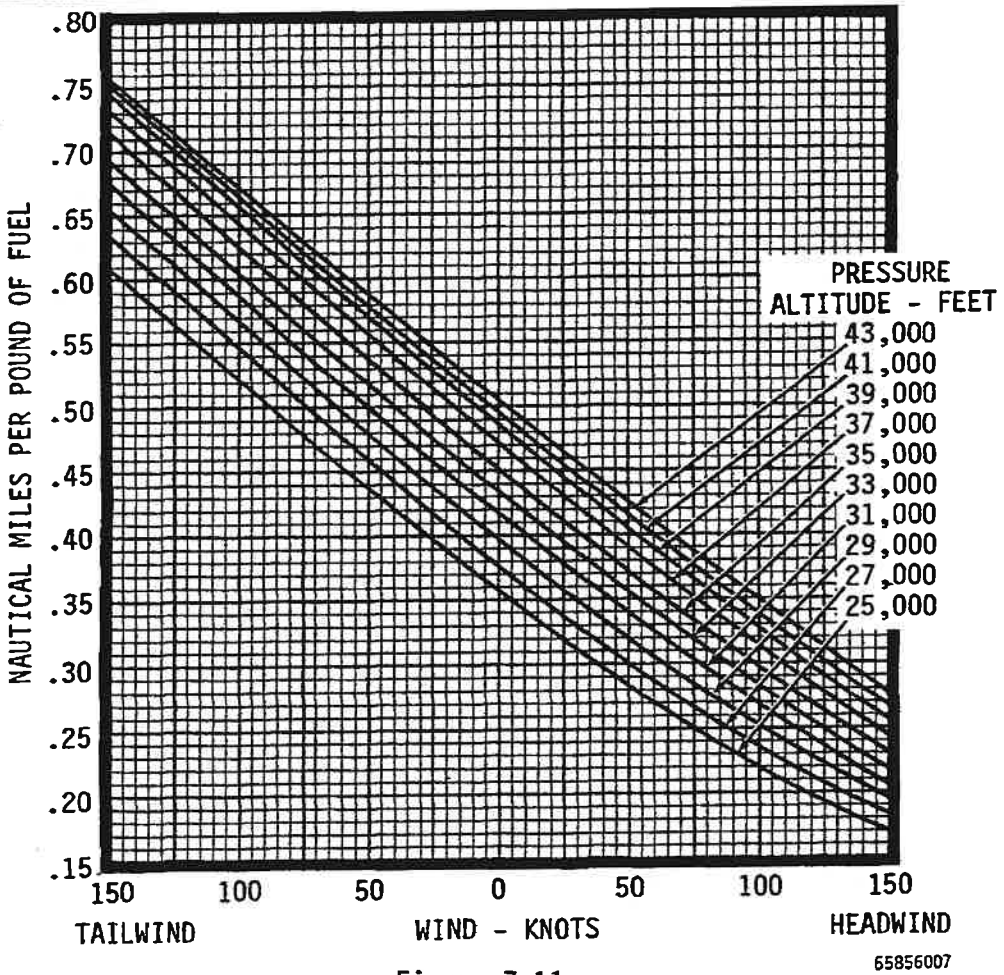

Figure 7-11

MAXIMUM THRUST

CRUISE (99.8% N_1)

STANDARD DAY **CRUISE ALITITUDE 23,000 FEET**

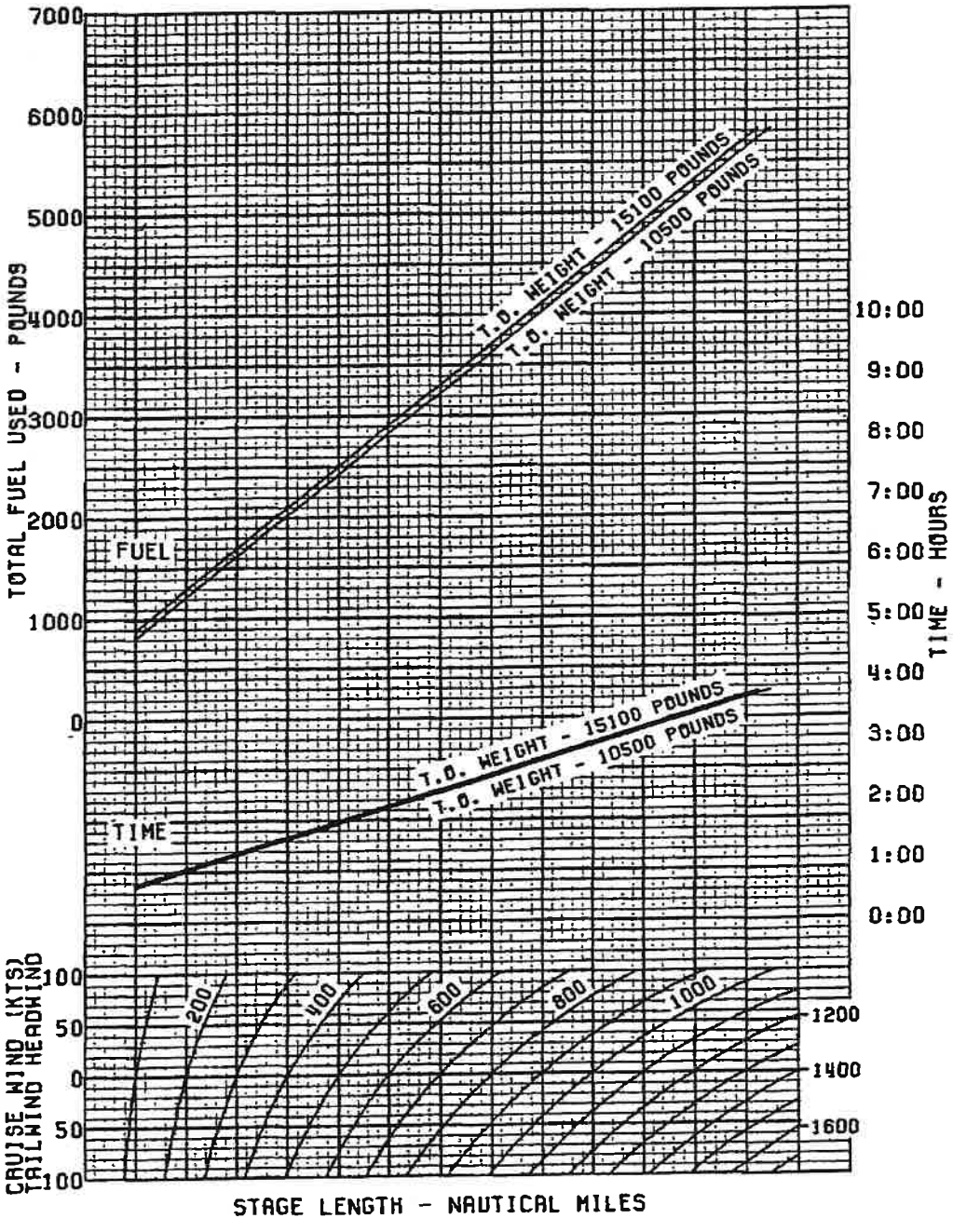

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Figure 7-12 (Sheet 2 of 10)

MAXIMUM THRUST

CRUISE (106.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 31,000 FEET**

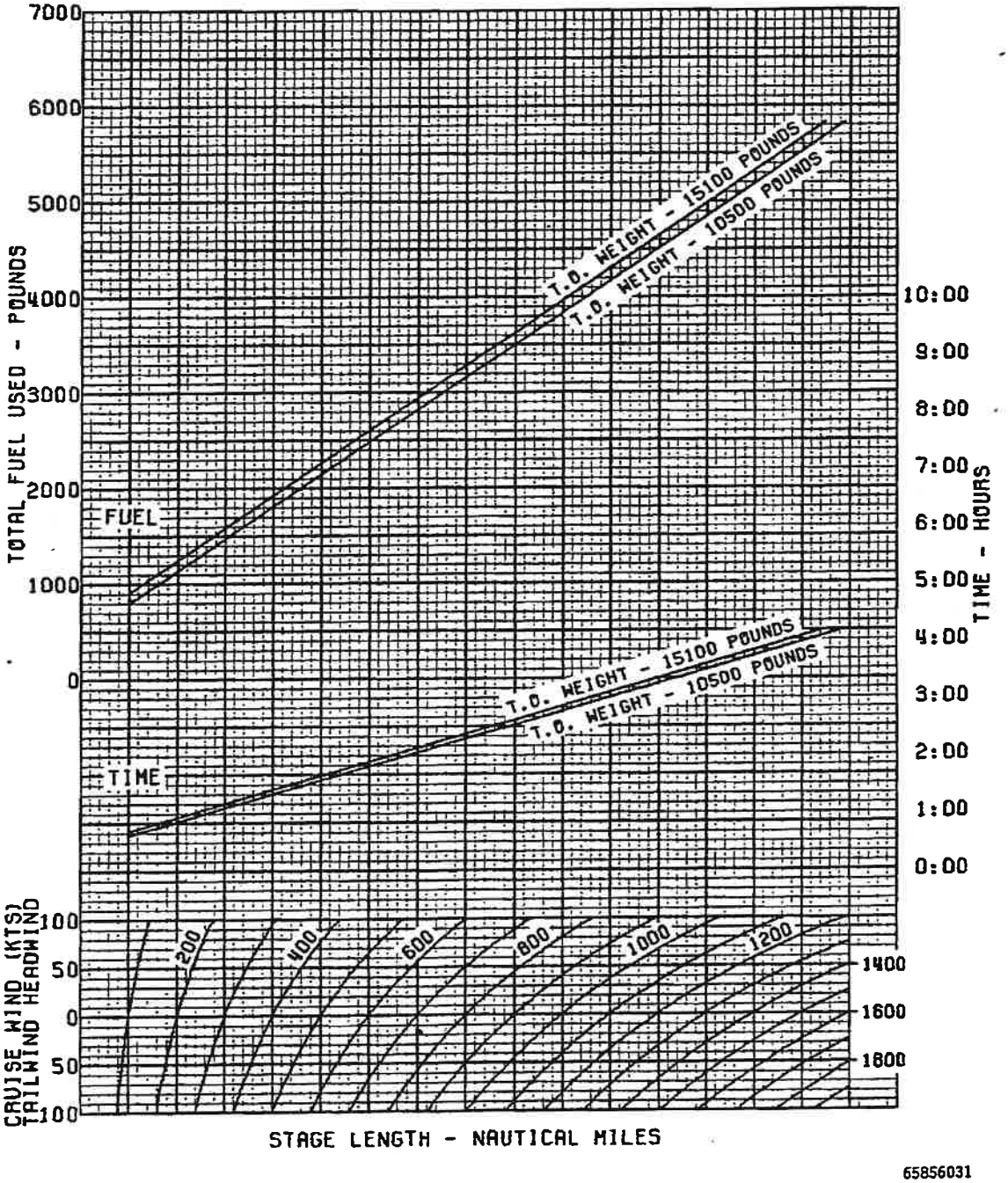

Figure 7-12 (Sheet 4 of 10)

MAXIMUM THRUST

CRUISE (106.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 35,000 FEET**

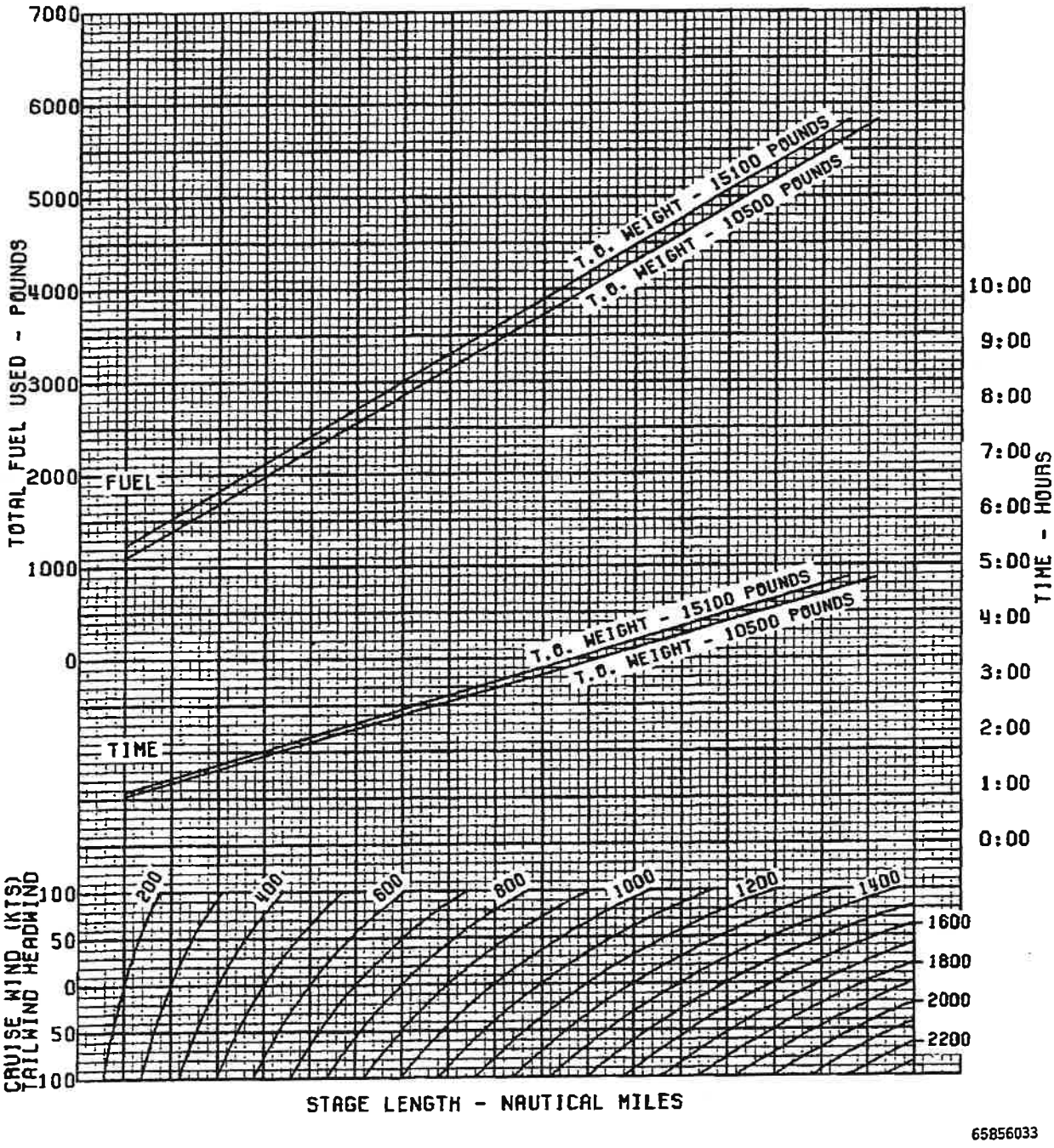

Figure 7-12 (Sheet 6 of 10)

MAXIMUM THRUST

CRUISE (106.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 39,000 FEET**

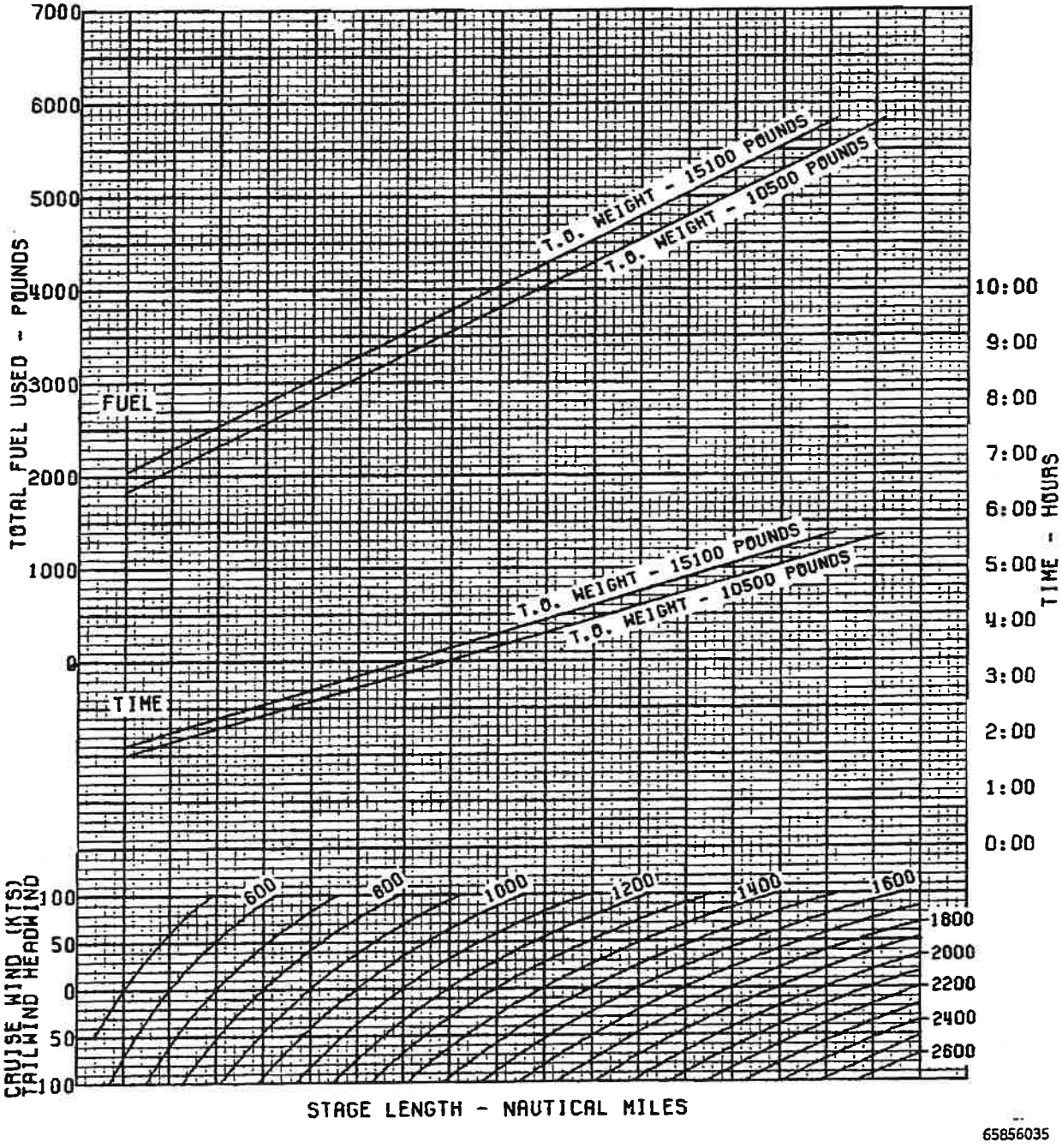

Figure 7-12 (Sheet 8 of 10)

MAXIMUM THRUST

CRUISE (106.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 43,000 FEET**

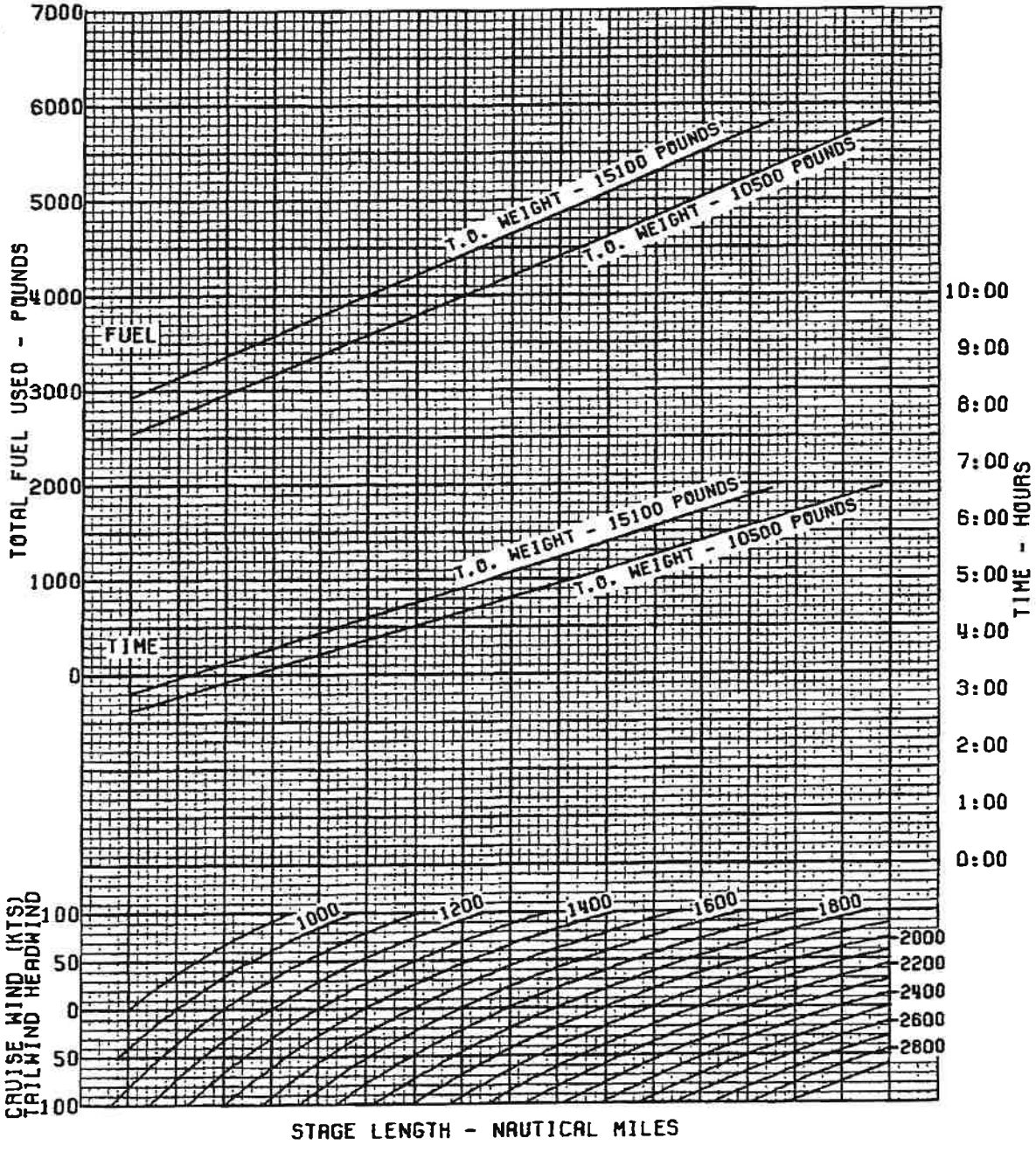

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Figure 7-12 (Sheet 10 of 10)

NORMAL CRUISE THRUST

CRUISE (100.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 31,000 FEET**

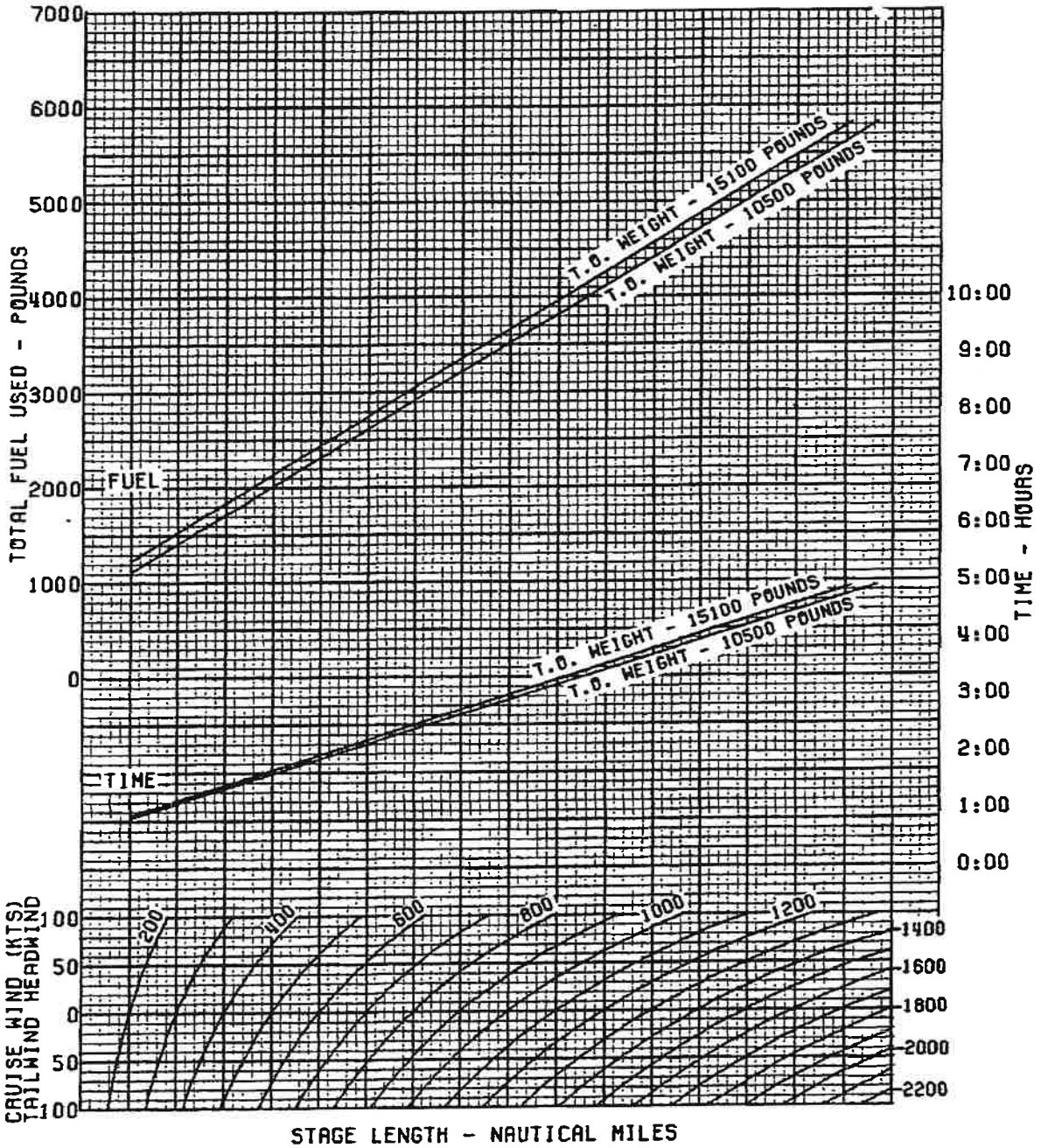

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Figure 7-13 (Sheet 2 of 8)

NORMAL CRUISE THRUST

CRUISE (100.0% N_1)

STANDARD DAY — **CRUISE ALITITUDE 35,000 FEET**

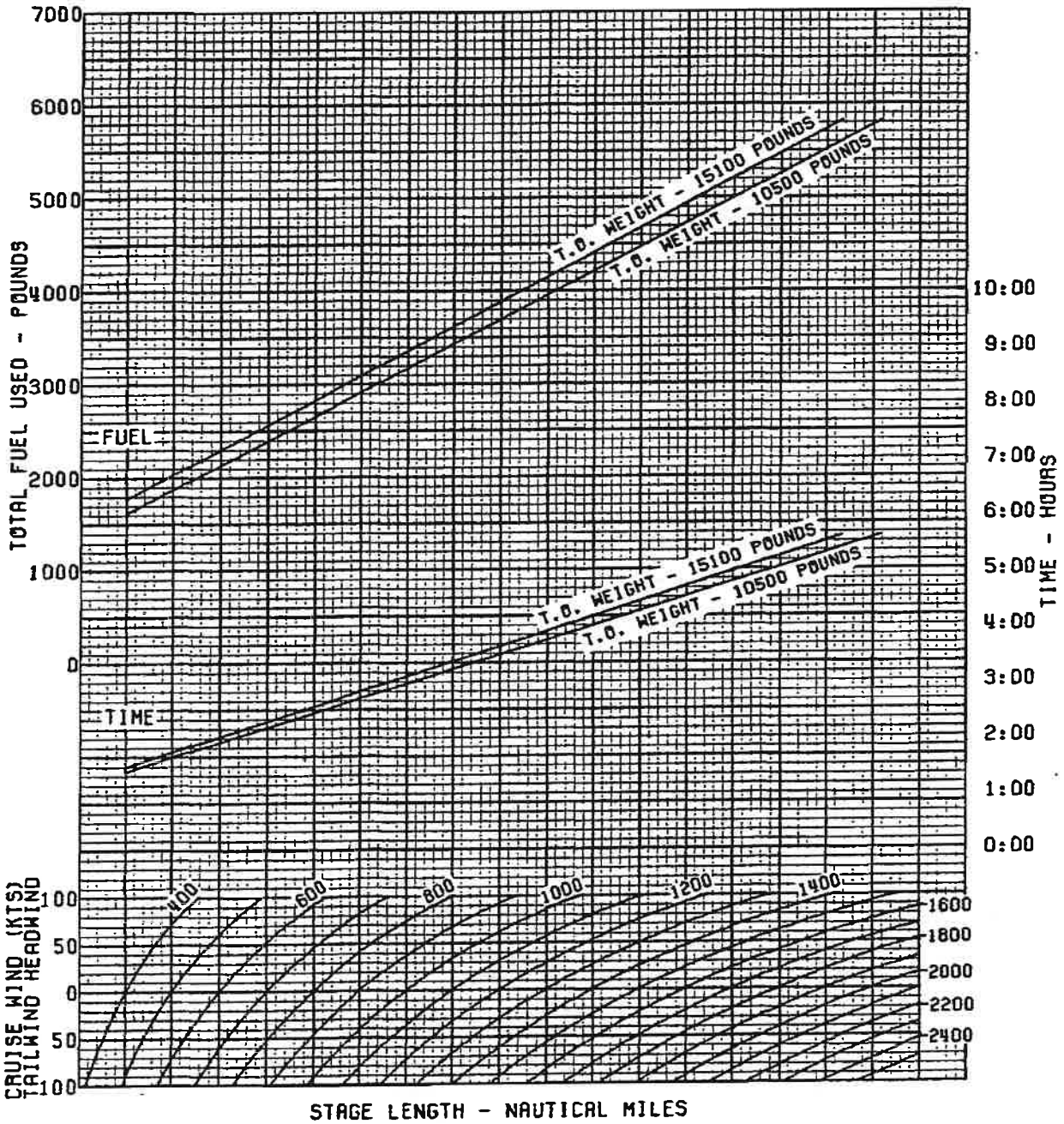

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Figure 7-13 (Sheet 4 of 8)

NORMAL CRUISE THRUST

CRUISE (100.0% N_1)

STANDARD DAY — **CRUISE ALITITUDE 39,000 FEET**

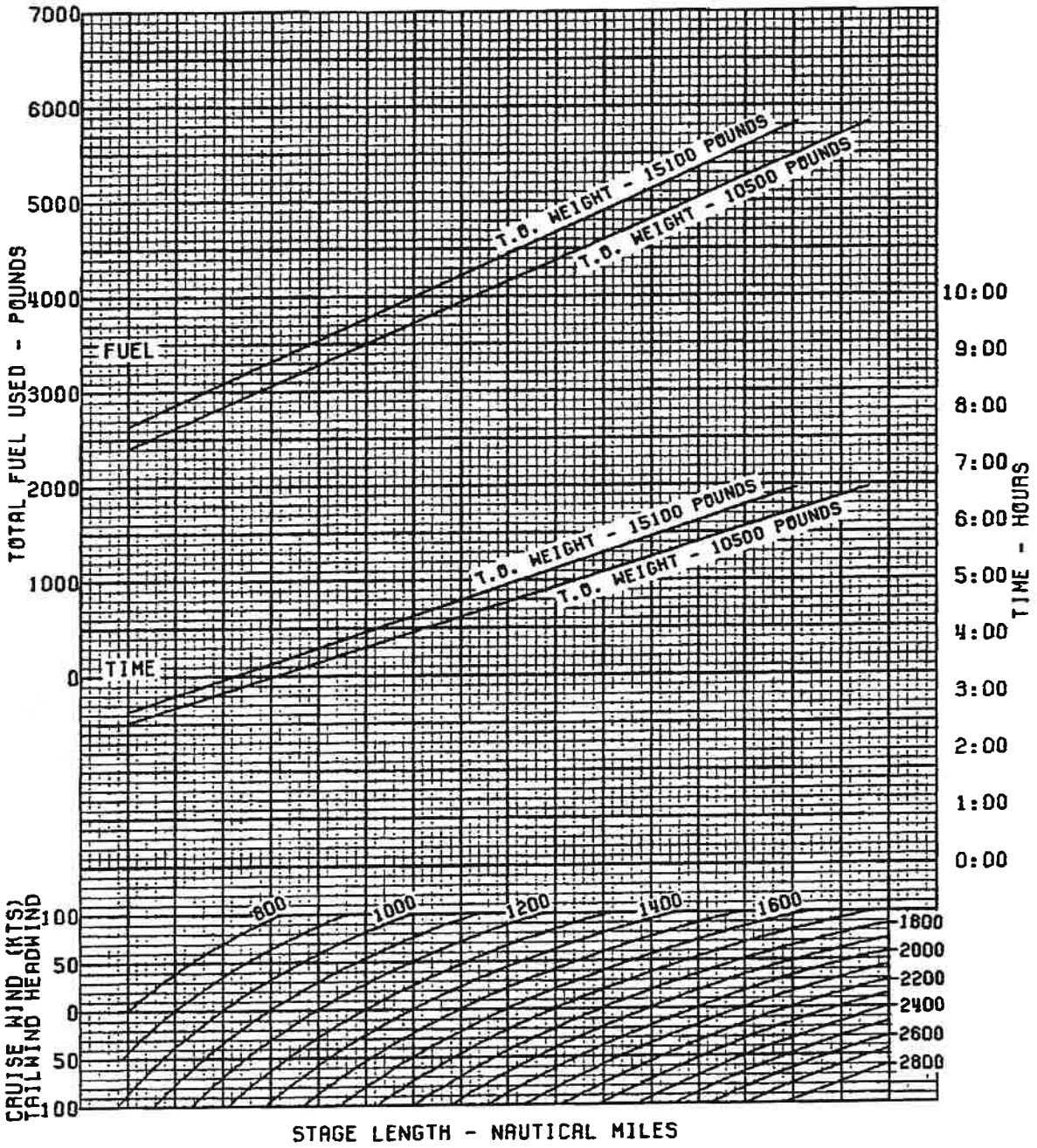

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Figure 7-13 (Sheet 6 of 8)

NORMAL CRUISE THRUST

CRUISE (100.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 43,000 FEET**

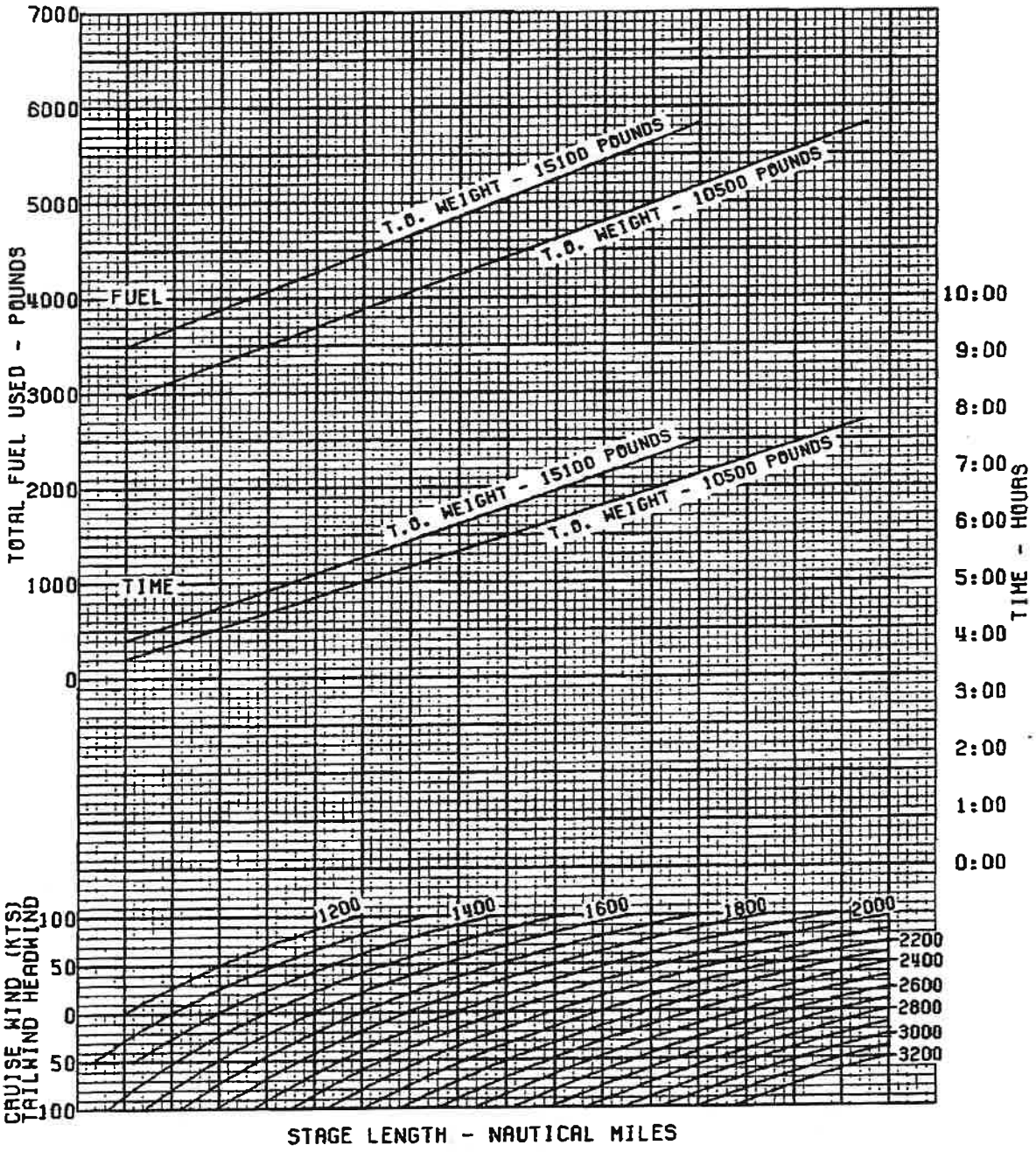

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Figure 7-13 (Sheet 8 of 8)

LONG RANGE CRUISE

STANDARD DAY

CRUISE ALTITUDE 23,000 FEET

FAN SETTING FOR LONG RANGE

	WIND	CRUISE WEIGHT 15000	14000	13000	12000	11000
TAILWIND	-100	80.3	78.5	77.4	74.4	72.1
	-50	81.5	79.6	78.1	76.0	73.6
	0	84.2	82.0	80.8	78.5	76.3
HEADWIND	50	86.9	85.8	84.2	82.4	80.9
	100	91.3	89.9	88.7	87.7	86.9

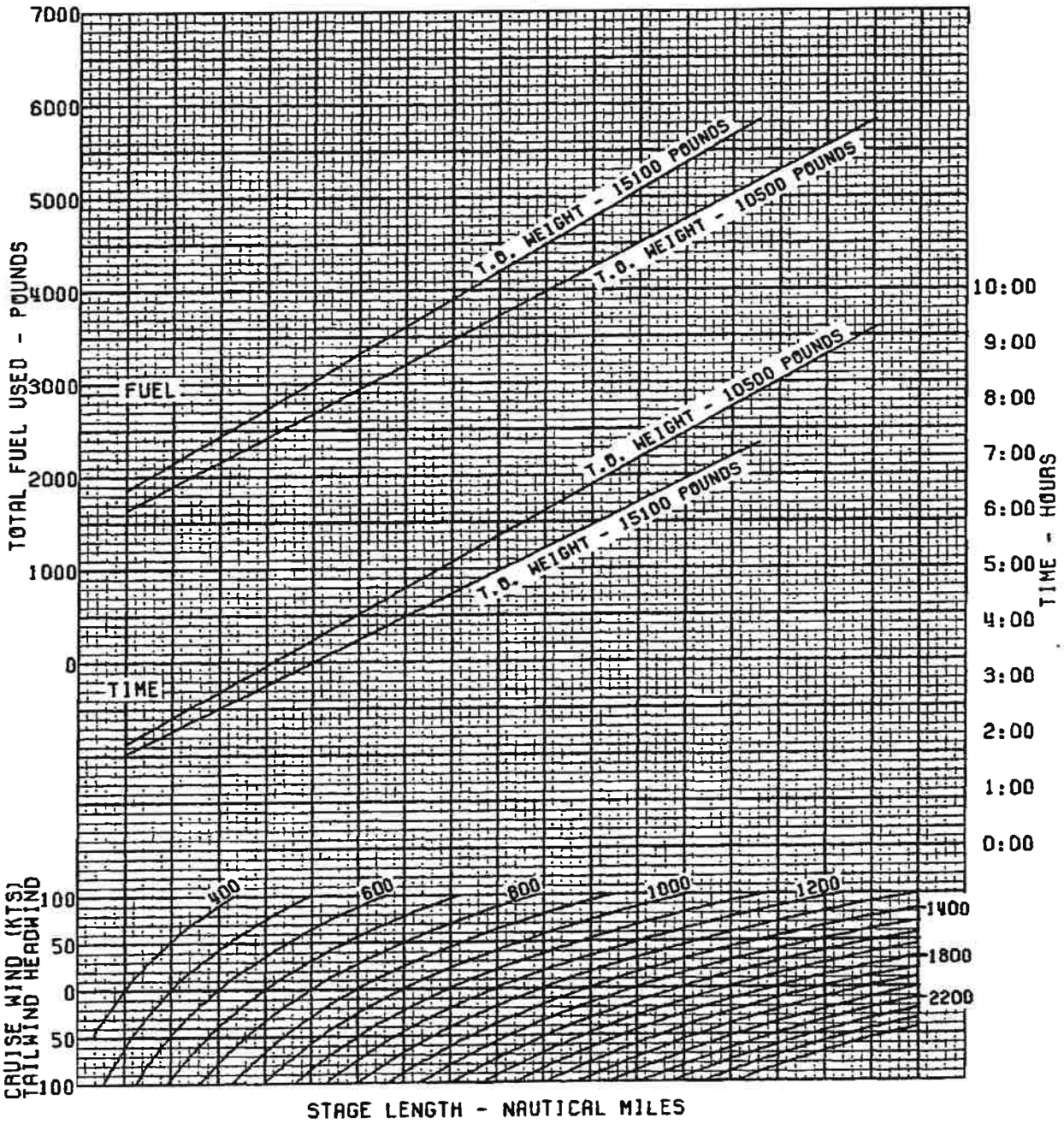

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Figure 7-14 (Sheet 2 of 10)

LONG RANGE CRUISE

STANDARD DAY **CRUISE ALTITUDE 31,000 FEET**

FAN SETTING FOR LONG RANGE

	WIND	CRUISE WEIGHT 15000	14000	13000	12000	11000
TAILWIND	-100	88.6	86.6	84.4	81.8	79.3
	-50	89.5	87.6	85.5	83.2	80.8
	0	90.9	88.9	87.1	84.9	82.8
HEADWIND	50	93.3	91.9	89.4	87.9	85.8
	100	95.7	94.6	93.4	91.5	89.9

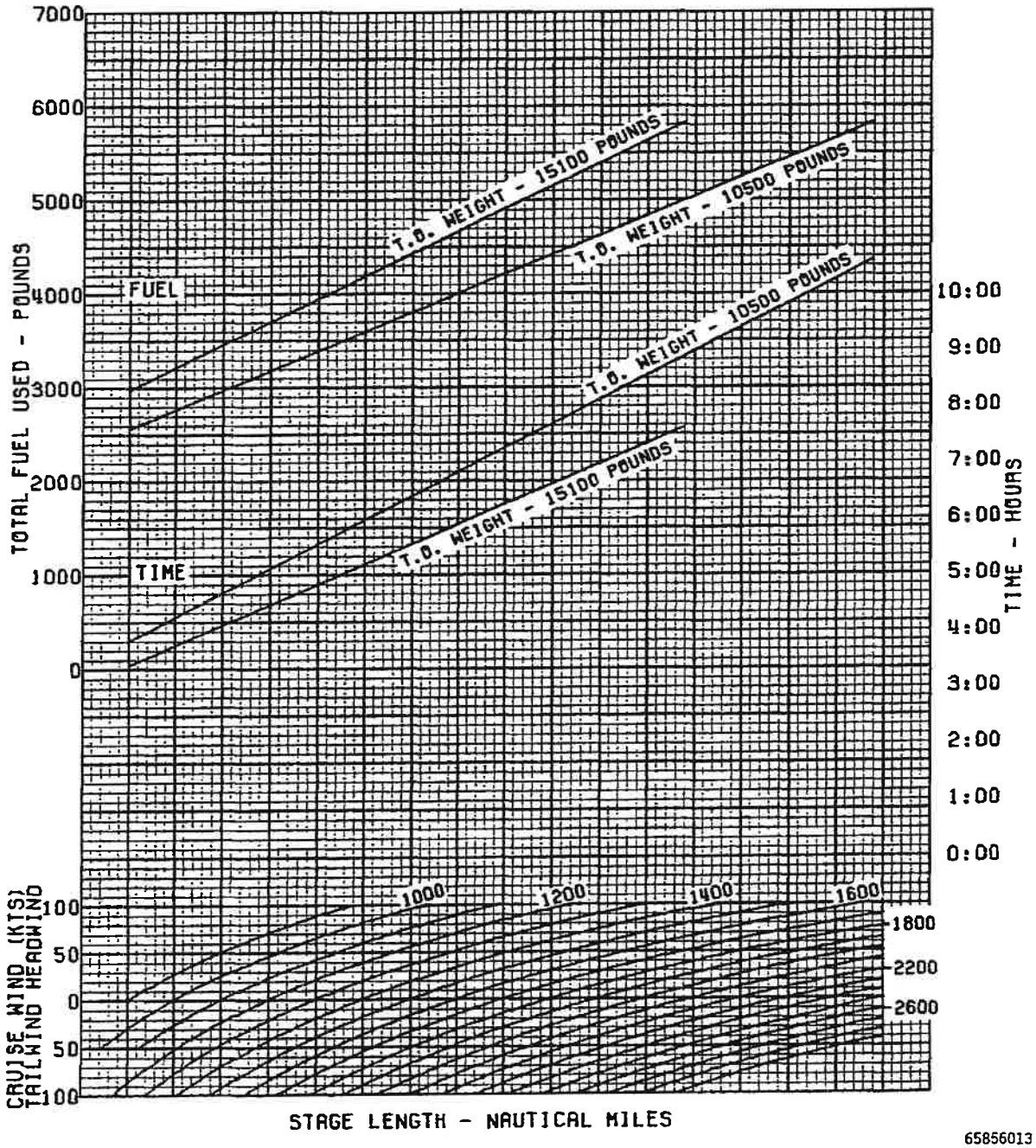

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Figure 7-14 (Sheet 4 of 10)

LONG RANGE CRUISE

STANDARD DAY

CRUISE ALTITUDE 35,000 FEET

FAN SETTING FOR LONG RANGE

		CRUISE WEIGHT				
	WIND	15000	14000	13000	12000	11000
TAILWIND	-100	93.0	90.9	88.6	86.1	83.8
	-50	93.8	92.1	89.6	87.1	84.9
	0	95.0	92.5	90.9	89.2	86.2
HEADWIND	50	96.7	94.7	92.5	91.1	88.7
	100	98.2	96.8	95.5	93.6	92.1

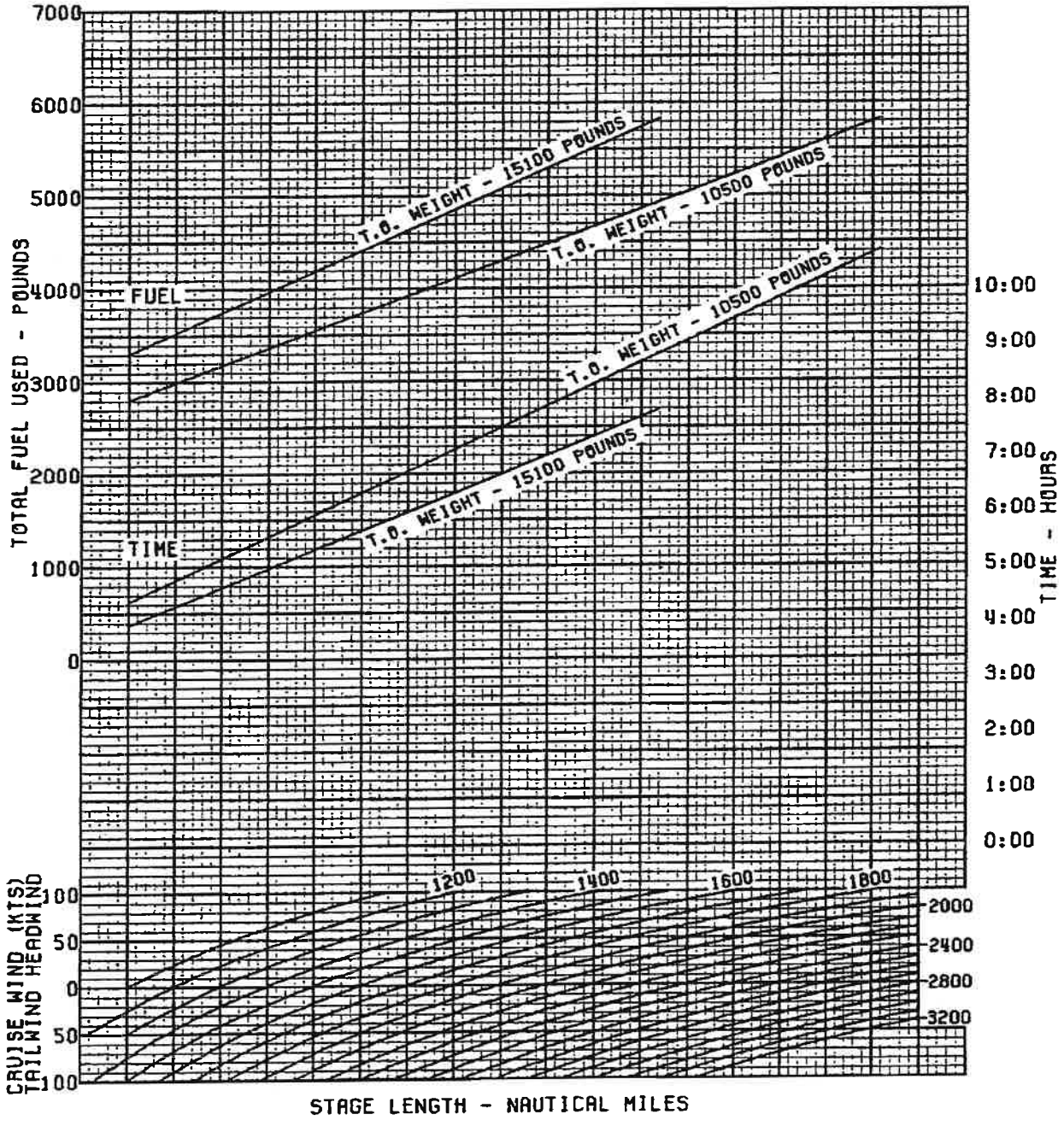

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Figure 7-14 (Sheet 6 of 10)

LONG RANGE CRUISE

STANDARD DAY

CRUISE ALTITUDE 39,000 FEET

FAN SETTING FOR LONG RANGE

	WIND	CRUISE WEIGHT 15000	14000	13000	12000	11000
TAILWIND	-100	99.7	97.0	94.3	91.6	89.1
	-50	100.2	97.7	95.1	92.3	89.9
	0	100.6	98.8	96.1	93.6	1.4
HEADWIND	50	101.9	99.7	97.7	95.5	92.7
	100	101.8	100.6	99.1	97.2	95.6

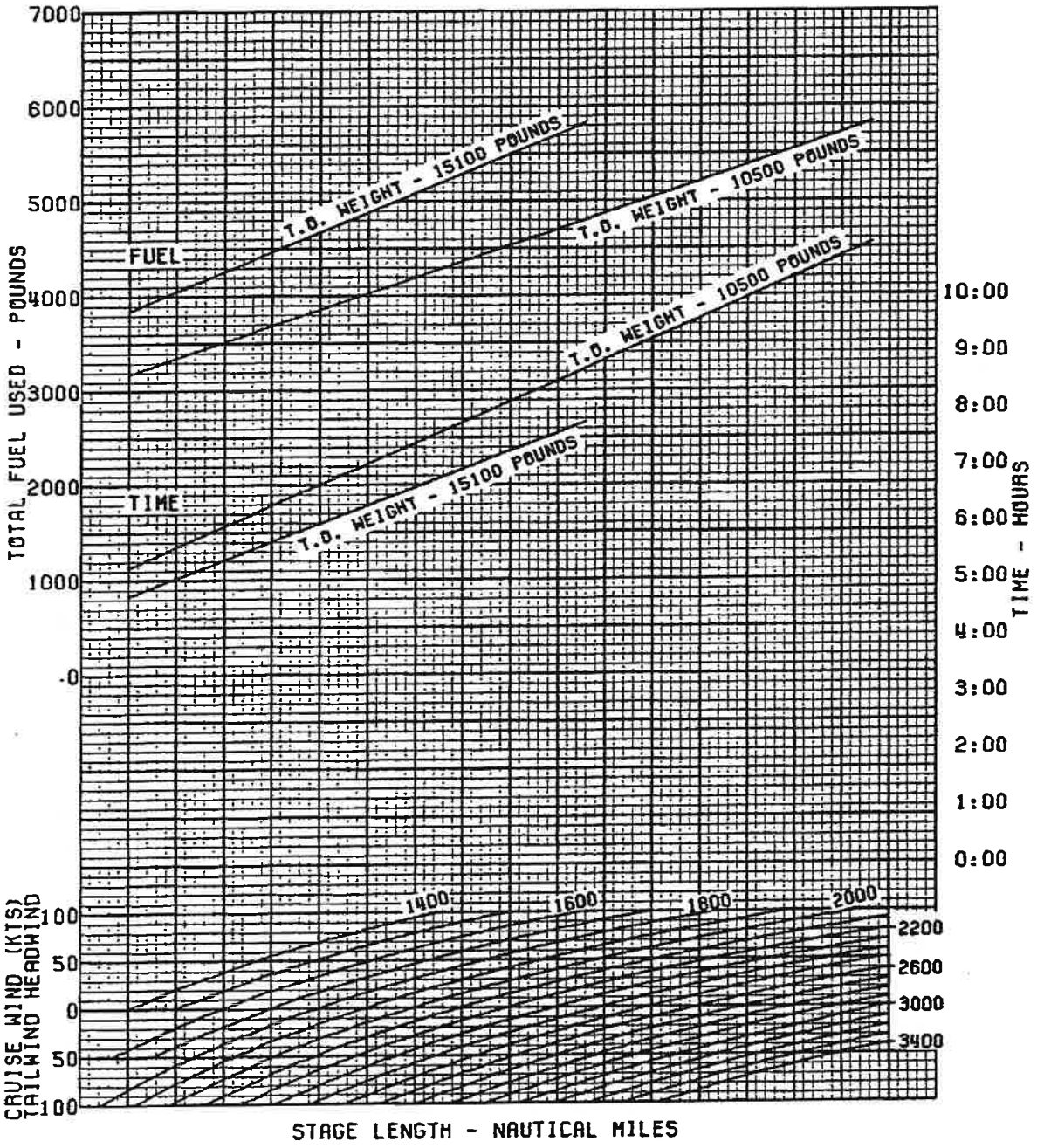

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Figure 7-14 (Sheet 8 of 10)

LONG RANGE CRUISE

STANDARD DAY

CRUISE ALTITUDE 43,000 FEET

FAN SETTING FOR LONG RANGE

		CRUISE WEIGHT				
	WIND	14000	13000	12000	11000	10000
TAILWIND	-100	103.3	101.4	98.5	95.1	92.5
	-50	103.5	101.6	99.3	95.9	92.9
	0	103.9	101.8	99.9	97.7	94.6
HEADWIND	50	105.8	102.0	100.5	98.5	95.6
	100	106.0	102.9	101.6	99.8	97.6

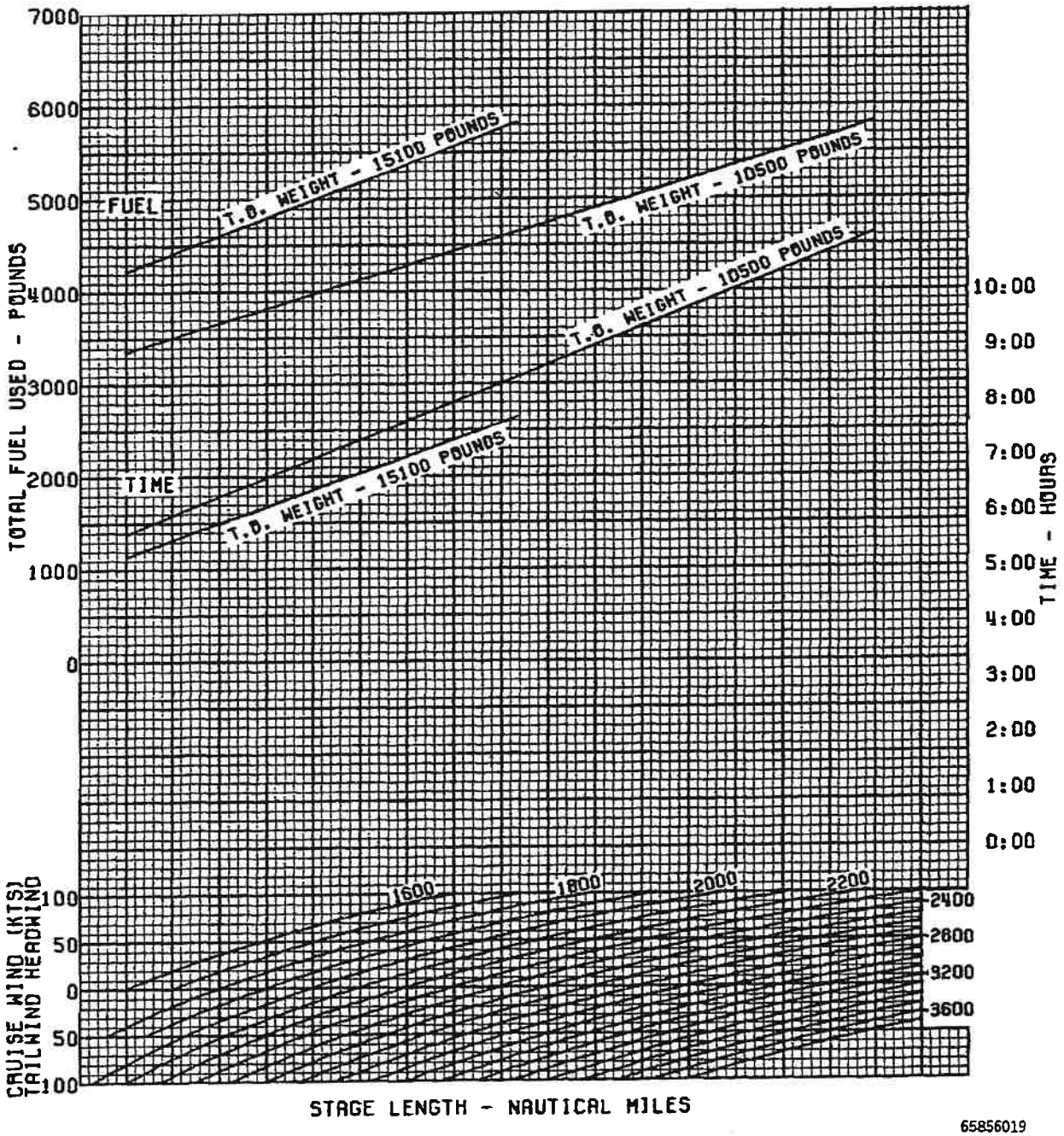

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Figure 7-14 (Sheet 10 of 10)

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE SEA LEVEL**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	93.2	98	99	102	108	2950	2540	157	92.0	90.6			
	-20	94.7	98	99	102	108	3050	2630	157	93.5	92.0			
	-10	96.2	98	99	102	108	3150	2720	157	94.9	93.4			
	0	97.7	98	99	102	108	3250	2810	157	96.4	94.8			
	10	99.2	98	99	102	108	3400	2960	157	97.2	96.3			
	20	97.4	99	100	102	108	3730	3250	157	95.1	94.3			
	30	95.4	101	102	103	108	4260	3710	157	93.0	92.0			
	40	93.4	103	103	104	108	4860	4240	157	90.6	89.6			
14500	-30	93.2	96	97	99	106	2730	2340	156	92.0	90.6			
	-20	94.7	95	97	99	106	2830	2440	156	93.5	92.0			
	-10	96.2	95	96	99	106	2920	2510	156	94.9	93.4			
	0	97.7	95	96	99	106	3010	2600	156	96.4	94.8			
	10	99.2	95	96	99	106	3150	2730	156	97.2	96.3			
	20	97.4	96	97	100	106	3450	3000	156	95.1	94.3			
	30	95.4	98	99	101	106	3930	3420	156	93.0	92.0			
	40	93.4	100	101	102	106	4490	3910	156	90.6	89.6			
14400	-30	93.2	95	96	99	105	2690	2310	156	92.0	90.6	105	2420	2090
	-20	94.7	95	96	99	105	2790	2400	156	93.5	92.0	105	2470	2140
	-10	96.2	95	96	99	105	2880	2480	156	94.9	93.4	105	2520	2190
	0	97.7	94	96	99	105	2970	2560	156	96.4	94.8	105	2570	2230
	10	99.2	95	96	99	105	3110	2700	156	97.2	96.3	105	2620	2280
	20	97.4	96	97	100	105	3410	2960	156	95.1	94.3	105	2670	2320
	30	95.4	98	99	100	105	3880	3360	156	93.0	92.0	105	2720	2370
	40	93.4	100	100	101	105	4430	3860	156	90.6	89.6			
13500	-30	93.2	91	92	95	102	2390	2040	155	92.0	90.6	102	2330	2020
	-20	94.7	91	92	95	102	2470	2120	155	93.4	92.0	102	2380	2060
	-10	96.2	90	92	95	102	2550	2190	155	94.9	93.4	102	2420	2100
	0	97.7	90	91	95	102	2630	2260	155	96.4	94.8	102	2470	2150
	10	99.2	91	92	95	102	2750	2380	155	97.2	96.3	102	2510	2190
	20	97.4	92	93	96	102	3020	2610	155	95.1	94.3	102	2560	2230
	30	95.4	94	95	97	102	3430	2970	155	93.0	92.0	102	2610	2270
	40	93.4	96	97	98	102	3910	3400	155	90.6	89.6	102	2650	2320
12500	-30	93.2	87	88	92	100	2110	1800	154	92.0	90.6	98	2240	1940
	-20	94.7	87	88	92	100	2190	1870	154	93.4	92.0	98	2280	1980
	-10	96.2	86	88	92	100	2260	1930	154	94.9	93.4	98	2320	2020
	0	97.7	86	87	92	100	2330	2000	154	96.4	94.8	98	2360	2050
	10	99.2	86	87	92	99	2420	2080	154	97.3	96.3	98	2400	2090
	20	97.4	87	88	91	99	2610	2250	154	95.1	94.3	98	2450	2130
	30	95.4	89	90	92	99	2960	2560	154	93.0	92.0	98	2490	2170
	40	93.4	91	92	93	99	3380	2920	154	90.6	89.6	98	2530	2200
11500	-30	93.2	83	84	89	98	1890	1600	152	91.9	90.6	94	2160	1860
	-20	94.7	83	84	89	98	1950	1660	152	93.4	92.0	94	2190	1900
	-10	96.2	83	84	89	98	2020	1720	152	94.9	93.4	94	2230	1930
	0	97.7	82	84	89	98	2080	1780	152	96.4	94.8	94	2270	1960
	10	99.2	82	84	89	97	2160	1850	152	97.3	96.3	94	2300	2000
	20	97.4	83	84	88	96	2290	1970	152	95.2	94.3	94	2340	2030
	30	95.4	84	85	88	95	2530	2180	152	93.0	92.0	94	2370	2070
	40	93.4	86	87	89	95	2880	2490	152	90.6	89.6	94	2410	2100
10500	-30	93.2	80	80	87	96	1720	1420	151	91.9	90.6	90	2080	1790
	-20	94.7	80	80	87	96	1780	1480	151	93.4	92.0	90	2110	1820
	-10	96.2	80	80	87	96	1840	1520	151	94.9	93.4	90	2140	1850
	0	97.7	80	80	87	96	1910	1580	151	96.4	94.8	90	2170	1880
	10	99.2	79	80	86	96	1940	1640	151	97.3	96.3	90	2200	1910
	20	97.4	79	80	86	94	2030	1740	151	95.2	94.3	90	2230	1940
	30	95.4	79	80	84	92	2190	1880	151	93.0	92.0	90	2270	1970
	40	93.4	81	82	84	91	2430	2090	151	90.7	89.6	90	2300	2000
9500	-30	93.2	81	81	87	97	1720	1430	150	91.9	90.6	86	2000	1720
	-20	94.7	81	81	87	97	1780	1480	150	93.4	92.0	86	2030	1740
	-10	96.2	81	81	87	97	1840	1540	150	94.9	93.4	86	2050	1770
	0	97.7	81	81	87	97	1910	1590	150	96.4	94.8	86	2080	1790
	10	99.2	80	80	87	96	1940	1620	150	97.3	96.3	86	2110	1820
	20	97.4	77	77	83	93	1890	1570	150	95.2	94.3	86	2130	1850
	30	95.4	75	76	81	90	1910	1640	150	93.0	92.0	86	2160	1870
	40	93.4	76	77	80	88	2070	1770	150	90.7	89.6	86	2190	1900

Figure 7-15 (Sheet 1 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE SEA LEVEL**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 – KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	93.2	95	97	102	108	3110	2650	157	92.0	90.6			
	-20	94.7	95	96	102	108	3230	2760	157	93.5	92.0			
	-10	96.2	94	96	102	108	3340	2860	157	94.9	93.4			
	0	97.7	94	96	102	108	3450	2980	157	96.4	94.8			
	10	99.2	94	96	102	108	3630	3120	157	97.2	96.3			
	20	97.4	95	97	102	108	4000	3440	157	95.1	94.3			
	30	95.4	97	99	103	108	4590	3950	157	93.0	92.0			
	40	93.4	99	100	104	108	5290	4550	157	90.6	89.6			
14500	-30	93.2	92	94	99	106	2870	2460	156	92.0	90.6			
	-20	94.7	92	94	99	106	2980	2550	156	93.5	92.0			
	-10	96.2	92	93	99	106	3070	2630	156	94.9	93.4			
	0	97.7	91	93	99	106	3180	2720	156	96.4	94.8			
	10	99.2	91	93	99	106	3340	2870	156	97.2	96.3			
	20	97.4	93	94	100	106	3680	3160	156	95.1	94.3			
	30	95.4	95	96	101	106	4210	3620	156	93.0	92.0			
	40	93.4	97	98	102	106	4840	4160	156	90.6	89.6			
14400	-30	93.2	92	93	99	105	2830	2430	156	92.0	90.6	105	2790	2360
	-20	94.7	92	93	99	105	2930	2520	156	93.5	92.0	105	2860	2420
	-10	96.2	91	93	99	105	3030	2600	156	94.9	93.4	105	2940	2490
	0	97.7	91	93	99	105	3130	2690	156	96.4	94.8	105	3020	2550
	10	99.2	91	93	99	105	3290	2830	156	97.2	96.3	105	3100	2620
	20	97.4	92	94	100	105	3620	3120	156	95.1	94.3	105	3190	2690
	30	95.4	94	96	100	105	4150	3570	156	93.0	92.0	105	3270	2760
	40	93.4	96	98	101	105	4770	4100	156	90.6	89.6			
13500	-30	93.2	87	88	95	102	2510	2150	155	92.0	90.6	102	2650	2280
	-20	94.7	87	88	95	102	2600	2230	155	93.4	92.0	102	2710	2330
	-10	96.2	87	88	95	102	2670	2310	155	94.9	93.4	102	2780	2370
	0	97.7	87	88	95	102	2750	2380	155	96.4	94.8	102	2850	2420
	10	99.2	87	88	95	102	2890	2500	155	97.2	96.3	102	2920	2470
	20	97.4	89	90	96	102	3180	2740	155	95.1	94.3	102	2990	2530
	30	95.4	91	92	97	102	3630	3120	155	93.0	92.0	102	3060	2590
	40	93.4	93	94	98	102	4160	3580	155	90.6	89.6	102	3130	2660
12500	-30	93.2	83	84	92	100	2230	1900	154	92.0	90.6	98	2540	2200
	-20	94.7	83	84	92	100	2310	1970	154	93.4	92.0	98	2580	2240
	-10	96.2	82	84	92	100	2380	2040	154	94.9	93.4	98	2620	2280
	0	97.7	82	84	92	100	2460	2110	154	96.4	94.8	98	2680	2330
	10	99.2	82	84	92	99	2550	2200	154	97.3	96.3	98	2730	2370
	20	97.4	84	85	91	99	2740	2370	154	95.1	94.3	98	2790	2410
	30	95.4	86	87	92	99	3110	2690	154	93.0	92.0	98	2850	2450
	40	93.4	88	90	93	99	3550	3060	154	90.6	89.6	98	2910	2490
11500	-30	93.2	79	80	89	98	2040	1700	152	91.9	90.6	94	2450	2120
	-20	94.7	79	80	89	98	2110	1770	152	93.4	92.0	94	2490	2160
	-10	96.2	79	80	89	98	2190	1830	152	94.9	93.4	94	2530	2190
	0	97.7	79	79	89	98	2260	1890	152	96.4	94.8	94	2570	2230
	10	99.2	78	80	89	97	2300	1970	152	97.3	96.3	94	2610	2270
	20	97.4	79	80	88	96	2420	2090	152	95.2	94.3	94	2650	2310
	30	95.4	81	82	88	95	2670	2300	152	93.0	92.0	94	2680	2340
	40	93.4	83	84	89	95	3030	2620	152	90.6	89.6	94	2720	2380
10500	-30	93.2	80	80	87	96	2050	1690	151	91.9	90.6	90	2370	2030
	-20	94.7	80	80	87	96	2120	1760	151	93.4	92.0	90	2400	2070
	-10	96.2	80	80	87	96	2200	1830	151	94.9	93.4	90	2440	2100
	0	97.7	80	80	87	96	2270	1890	151	96.4	94.8	90	2470	2140
	10	99.2	79	79	86	96	2310	1930	151	97.3	96.3	90	2500	2170
	20	97.4	76	76	86	94	2250	1870	151	95.2	94.3	90	2540	2200
	30	95.4	75	77	84	92	2320	1990	151	93.0	92.0	90	2570	2240
	40	93.4	77	78	84	91	2570	2210	151	90.7	89.6	90	2610	2270
9500	-30	93.2	81	81	87	97	2090	1730	150	91.9	90.6	86	2280	1950
	-20	94.7	81	81	87	97	2150	1790	150	93.4	92.0	86	2310	1980
	-10	96.2	81	81	87	97	2230	1860	150	94.9	93.4	86	2340	2010
	0	97.7	81	81	87	97	2300	1930	150	96.4	94.8	86	2370	2040
	10	99.2	80	80	87	96	2340	1960	150	97.3	96.3	86	2400	2070
	20	97.4	77	77	83	93	2270	1890	150	95.2	94.3	86	2430	2100
	30	95.4	73	73	81	90	2140	1770	150	93.0	92.0	86	2460	2130
	40	93.4	72	73	80	88	2200	1880	150	90.7	89.6	86	2500	2160

Figure 7-15 (Sheet 1 of 8)

Airplanes -0057 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0057 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 2000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 – KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	96.8	98	99	102	108	3140	2710	156	95.6	93.8			
	-20	98.4	98	99	102	108	3250	2820	156	97.2	95.3			
	-10	100.0	98	99	102	108	3360	2920	156	98.7	96.9			
	0	101.3	97	99	102	108	3480	3020	156	99.3	98.4			
	10	99.4	99	100	102	108	3840	3340	156	97.2	96.6			
	20	97.4	100	101	103	108	4310	3760	156	95.1	94.3			
	30	95.4	102	103	104	108	4910	4290	156	92.9	91.9			
14500	-30	96.8	95	96	99	106	2910	2510	155	95.6	93.8			
	-20	98.4	95	96	99	106	3010	2600	155	97.1	95.3			
	-10	100.0	95	96	99	106	3110	2700	155	98.7	96.9			
	0	101.3	95	96	99	106	3220	2800	155	99.3	98.4			
	10	99.4	96	97	100	106	3550	3090	155	97.2	96.6			
	20	97.4	98	99	101	106	3980	3470	155	95.1	94.3			
	30	95.4	99	100	101	106	4530	3960	155	92.9	91.9			
	40	93.4	101	102	102	106	5170	4520	155	90.6	89.6			
14400	-30	96.8	95	96	99	105	2870	2470	155	95.6	93.8	105	2510	2180
	-20	98.4	95	96	99	105	2970	2570	155	97.1	95.3	105	2570	2230
	-10	100.0	94	96	99	105	3070	2660	155	98.7	96.9	105	2620	2280
	0	101.3	94	95	99	105	3170	2760	155	99.3	98.4	105	2680	2330
	10	99.4	96	97	99	105	3500	3050	155	97.2	96.6	105	2730	2380
	20	97.4	97	98	100	105	3920	3420	155	95.1	94.3	105	2790	2440
	30	95.4	99	100	101	105	4470	3900	155	92.9	91.9	105	2850	2490
	40	93.4	100	101	102	105	5100	4460	155	90.6	89.6			
13500	-30	96.8	91	92	95	102	2540	2180	154	95.6	93.8	102	2420	2100
	-20	98.4	90	92	95	102	2630	2270	154	97.1	95.3	102	2470	2150
	-10	100.0	90	91	95	102	2720	2350	154	98.7	96.9	102	2520	2190
	0	101.3	90	91	95	102	2810	2430	154	99.3	98.4	102	2570	2240
	10	99.4	91	93	96	102	3100	2690	154	97.2	96.6	102	2620	2280
	20	97.4	93	94	96	102	3460	3010	154	95.1	94.3	102	2670	2330
	30	95.4	95	96	97	102	3940	3430	154	93.0	91.9	102	2720	2380
	40	93.4	97	97	98	102	4490	3920	154	90.6	89.6			
12500	-30	96.8	86	88	92	100	2250	1920	152	95.6	93.8	98	2320	2010
	-20	98.4	86	87	92	100	2330	2000	152	97.1	95.3	98	2370	2050
	-10	100.0	86	87	92	100	2410	2070	152	98.7	96.9	98	2410	2090
	0	101.3	86	87	92	100	2490	2140	152	99.3	98.4	98	2450	2140
	10	99.4	87	88	91	99	2680	2310	152	97.2	96.6	98	2500	2180
	20	97.4	88	90	92	99	3000	2590	152	95.1	94.3	98	2540	2220
	30	95.4	90	91	93	99	3400	2950	152	93.0	91.9	98	2590	2260
	40	93.4	92	93	94	99	3870	3360	152	90.6	89.6	98	2630	2300
11500	-30	96.8	83	84	89	98	2010	1710	151	95.6	93.8	94	2230	1930
	-20	98.4	83	84	89	98	2080	1780	151	97.1	95.3	94	2270	1970
	-10	100.0	82	84	89	98	2150	1840	151	98.7	96.9	94	2310	2000
	0	101.3	82	84	89	98	2220	1910	151	99.3	98.4	94	2340	2040
	10	99.4	83	84	88	96	2360	2030	151	97.2	96.6	94	2380	2080
	20	97.4	83	84	88	95	2560	2200	151	95.1	94.3	94	2420	2110
	30	95.4	85	86	88	95	2910	2510	151	93.0	91.9	94	2460	2150
	40	93.4	87	88	89	95	3300	2860	151	90.6	89.6	94	2500	2190
10500	-30	96.8	80	80	87	96	1830	1520	149	95.5	93.8	90	2140	1850
	-20	98.4	80	80	87	96	1890	1570	149	97.1	95.3	90	2170	1880
	-10	100.0	80	80	87	96	1960	1630	149	98.7	96.9	90	2210	1910
	0	101.3	80	80	87	96	2020	1690	149	99.3	98.4	90	2240	1940
	10	99.4	79	80	86	94	2090	1790	149	97.3	96.6	90	2280	1980
	20	97.4	79	80	84	92	2240	1920	149	95.2	94.3	90	2310	2010
	30	95.4	80	81	84	91	2450	2100	149	93.0	91.9	90	2350	2040
	40	93.4	82	83	85	91	2790	2400	149	90.6	89.6	90	2380	2080
9500	-30	96.8	80	80	87	97	1830	1520	148	95.5	93.8	86	2050	1770
	-20	98.4	80	80	87	97	1890	1580	148	97.1	95.3	86	2080	1800
	-10	100.0	80	80	87	97	1960	1630	148	98.7	96.9	86	2110	1820
	0	101.3	80	80	87	97	2020	1690	148	99.3	98.4	86	2140	1850
	10	99.4	77	77	84	93	1970	1640	148	97.3	96.6	86	2170	1880
	20	97.4	75	76	82	90	1960	1680	148	95.2	94.3	86	2200	1910
	30	95.4	75	77	80	88	2110	1810	148	93.0	91.9	86	2230	1940
	40	93.4	76	77	80	87	2310	1980	148	90.6	89.6	86	2260	1970

Figure 7-15 (Sheet 3 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE 2000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		V2		FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	96.8	94	96	102	108	3330	2850	156	95.6	93.8			
	-20	98.4	94	96	102	108	3460	2970	156	97.2	95.3			
	-10	100.0	94	95	102	108	3580	3080	156	98.7	96.9			
	0	101.3	93	95	102	108	3720	3200	156	99.3	98.4			
	10	99.4	95	96	102	108	4130	3550	156	97.2	96.6			
	20	97.4	96	98	103	108	4660	4020	156	95.1	94.3			
	30	95.4	98	100	104	108	5360	4610	156	92.9	91.9			
14500	-30	96.8	92	94	99	106	3060	2630	155	95.6	93.8			
	-20	98.4	92	93	99	106	3180	2730	155	97.1	95.3			
	-10	100.0	91	93	99	106	3290	2830	155	98.7	96.9			
	0	101.3	91	93	99	106	3420	2940	155	99.3	98.4			
	10	99.4	92	94	100	106	3790	3260	155	97.2	96.6			
	20	97.4	94	96	101	106	4270	3680	155	95.1	94.3			
	30	95.4	96	97	101	106	4900	4220	155	92.9	91.9			
	40	93.4	97	99	102	106	5630	4850	155	90.6	89.6			
14400	-30	96.8	91	93	99	105	3020	2590	155	95.6	93.8	105	2940	2480
	-20	98.4	91	93	99	105	3140	2690	155	97.1	95.3	105	3020	2550
	-10	100.0	91	93	99	105	3250	2790	155	98.7	96.9	105	3110	2630
	0	101.3	90	92	99	105	3370	2900	155	99.3	98.4	105	3200	2700
	10	99.4	92	94	99	105	3730	3210	155	97.2	96.6	105	3300	2780
	20	97.4	94	95	100	105	4210	3630	155	95.1	94.3	105	3400	2860
	30	95.4	95	97	101	105	4820	4160	155	92.9	91.9	105	3500	2940
	40	93.4	97	98	102	105	5550	4770	155	90.6	89.6			
13500	-30	96.8	87	88	95	102	2670	2300	154	95.6	93.8	102	2780	2370
	-20	98.4	87	88	95	102	2760	2390	154	97.1	95.3	102	2850	2420
	-10	100.0	87	88	95	102	2850	2470	154	98.7	96.9	102	2920	2480
	0	101.3	87	88	95	102	2950	2550	154	99.3	98.4	102	3000	2550
	10	99.4	88	90	96	102	3270	2810	154	97.2	96.6	102	3080	2610
	20	97.4	90	92	96	102	3680	3170	154	95.1	94.3	102	3160	2680
	30	95.4	92	93	97	102	4200	3620	154	93.0	91.9	102	3250	2750
	40	93.4	94	95	98	102	4810	4150	154	90.6	89.6			
12500	-30	96.8	82	84	92	100	2370	2030	152	95.6	93.8	98	2620	2280
	-20	98.4	82	84	92	100	2450	2110	152	97.1	95.3	98	2680	2330
	-10	100.0	82	83	92	100	2540	2190	152	98.7	96.9	98	2740	2370
	0	101.3	82	83	92	100	2620	2260	152	99.3	98.4	98	2810	2420
	10	99.4	83	84	91	99	2810	2440	152	97.2	96.6	98	2870	2460
	20	97.4	86	87	92	99	3140	2720	152	95.1	94.3	98	2940	2510
	30	95.4	88	89	93	99	3590	3090	152	93.0	91.9	98	3010	2560
	40	93.4	89	91	94	99	4100	3530	152	90.6	89.6	98	3080	2620
11500	-30	96.8	79	80	89	98	2170	1820	151	95.6	93.8	94	2530	2190
	-20	98.4	79	80	89	98	2240	1890	151	97.1	95.3	94	2570	2240
	-10	100.0	79	79	89	98	2320	1950	151	98.7	96.9	94	2620	2280
	0	101.3	79	79	89	98	2390	2020	151	99.3	98.4	94	2660	2320
	10	99.4	79	80	88	96	2500	2150	151	97.2	96.6	94	2700	2360
	20	97.4	80	81	88	96	2700	2330	151	95.1	94.3	94	2740	2400
	30	95.4	83	83	88	96	3050	2640	151	93.0	91.9	94	2800	2440
	40	93.4	85	86	89	96	3460	3000	151	90.6	89.6	94	2860	2480
10500	-30	96.8	80	80	87	96	2180	1810	149	95.5	93.8	90	2440	2100
	-20	98.4	80	80	87	96	2250	1880	149	97.1	95.3	90	2480	2140
	-10	100.0	80	80	87	96	2330	1950	149	98.7	96.9	90	2510	2180
	0	101.3	80	80	87	96	2400	2010	149	99.3	98.4	90	2550	2210
	10	99.4	77	77	86	94	2340	1950	149	97.3	96.6	90	2590	2250
	20	97.4	75	76	84	92	2370	2040	149	95.2	94.3	90	2630	2290
	30	95.4	76	78	84	91	2590	2230	149	93.0	91.9	90	2670	2330
	40	93.4	79	80	85	91	2930	2530	149	90.6	89.6	90	2700	2360
9500	-30	96.8	80	80	87	97	2210	1840	148	95.5	93.8	86	2340	2010
	-20	98.4	80	80	87	97	2290	1910	148	97.1	95.3	86	2380	2040
	-10	100.0	80	80	87	97	2360	1980	148	98.7	96.9	86	2410	2080
	0	101.3	80	80	87	97	2430	2050	148	99.3	98.4	86	2440	2110
	10	99.4	77	77	84	93	2360	1970	148	97.3	96.6	86	2480	2140
	20	97.4	74	74	82	90	2250	1870	148	95.2	94.3	86	2510	2180
	30	95.4	71	73	80	88	2240	1920	148	93.0	91.9	86	2550	2210
	40	93.4	73	74	80	87	2450	2100	148	90.6	89.6	86	2580	2240

Figure 7-15 (Sheet 3 of 8)

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 4000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 — KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	100.1	98	99	102	108	3350	2910	155	99.0	97.1			
	-20	101.9	97	99	102	108	3470	3020	155	100.7	98.7			
	-10	102.7	98	99	102	108	3680	3200	155	101.3	100.3			
	0	101.3	99	100	102	108	4010	3500	155	99.2	98.9			
	10	99.4	100	101	103	108	4440	3880	155	97.2	96.6			
	20	97.4	100	102	104	108	5080	4340	155	95.1	94.2			
	30	95.4	98	103	104	108	6340	4970	155	92.9	91.9			
14500	-30	100.1	95	96	99	106	3100	2690	154	99.0	97.1			
	-20	101.9	95	96	99	106	3210	2790	154	100.7	98.7			
	-10	102.7	95	96	99	106	3400	2960	154	101.3	100.3			
	0	101.3	96	97	100	106	3710	3230	154	99.2	98.9			
	10	99.4	97	98	101	106	4100	3580	154	97.2	96.6			
	20	97.4	99	100	101	106	4570	4000	154	95.1	94.2			
	30	95.4	100	101	102	106	5220	4570	154	92.9	91.9			
14400	-30	100.1	94	96	99	105	3070	2660	154	99.0	97.1	105	2620	2280
	-20	101.9	94	95	99	105	3170	2750	154	100.7	98.7	105	2680	2330
	-10	102.7	95	96	99	105	3350	2920	154	101.3	100.3	105	2740	2390
	0	101.3	96	97	100	105	3660	3190	154	99.2	98.9	105	2800	2450
	10	99.4	97	98	100	105	4040	3530	154	97.2	96.6	105	2870	2500
	20	97.4	98	99	101	105	4510	3940	154	95.1	94.2	105	2930	2560
	30	95.4	100	101	102	105	5150	4510	154	92.9	91.9			
13500	-30	100.1	90	91	95	102	2710	2340	152	99.0	97.1	102	2520	2190
	-20	101.9	90	91	95	102	2800	2430	152	100.6	98.7	102	2570	2240
	-10	102.7	90	92	95	102	2970	2570	152	101.3	100.3	102	2630	2290
	0	101.3	92	93	96	102	3230	2810	152	99.3	98.9	102	2680	2340
	10	99.4	93	94	96	102	3570	3110	152	97.2	96.6	102	2740	2390
	20	97.4	94	95	97	102	3970	3470	152	95.1	94.2	102	2790	2440
	30	95.4	96	97	98	102	4530	3960	152	92.9	91.9	102	2850	2500
	40	93.4	97	98	99	102	5180	4530	152	90.6	89.6			
12500	-30	100.1	86	87	92	100	2400	2060	150	98.9	97.1	98	2410	2090
	-20	101.9	86	87	92	100	2480	2140	150	100.6	98.7	98	2460	2140
	-10	102.7	86	87	91	99	2600	2240	150	101.3	100.3	98	2500	2180
	0	101.3	87	88	91	99	2800	2420	150	99.3	98.9	98	2550	2230
	10	99.4	88	89	92	99	3080	2670	150	97.2	96.6	98	2600	2270
	20	97.4	90	91	93	99	3420	2980	150	95.1	94.2	98	2650	2320
	30	95.4	92	92	94	99	3910	3400	150	93.0	91.9	98	2700	2360
	40	93.4	93	94	94	99	4450	3880	150	90.6	89.6			
11500	-30	100.1	82	84	89	98	2140	1840	149	98.9	97.1	94	2310	2000
	-20	101.9	82	84	89	98	2210	1910	149	100.6	98.7	94	2350	2040
	-10	102.7	82	84	89	97	2320	2000	149	101.3	100.3	94	2390	2080
	0	101.3	83	84	88	96	2460	2120	149	99.3	98.9	94	2430	2120
	10	99.4	83	84	88	95	2630	2270	149	97.2	96.6	94	2480	2160
	20	97.4	85	86	88	95	2930	2530	149	95.1	94.2	94	2520	2200
	30	95.4	87	88	89	95	3330	2890	149	93.0	91.9	94	2560	2240
	40	93.4	88	89	90	95	3790	3300	149	90.6	89.6	94	2610	2280
10500	-30	100.1	79	80	87	96	1950	1620	147	98.9	97.1	90	2210	1910
	-20	101.9	79	79	87	96	2020	1690	147	100.6	98.7	90	2240	1950
	-10	102.7	78	80	86	95	2050	1760	147	101.4	100.3	90	2280	1980
	0	101.3	79	80	85	94	2170	1870	147	99.3	98.9	90	2320	2020
	10	99.4	79	80	85	93	2310	1990	147	97.2	96.6	90	2360	2050
	20	97.4	79	80	84	91	2470	2130	147	95.1	94.2	90	2390	2090
	30	95.4	81	82	84	91	2800	2420	147	93.0	91.9	90	2430	2120
	40	93.4	83	84	85	91	3190	2760	147	90.6	89.6	90	2470	2160
9500	-30	100.1	80	80	87	97	1940	1620	146	98.9	97.1	86	2110	1820
	-20	101.9	80	80	87	97	2020	1680	146	100.6	98.7	86	2150	1860
	-10	102.7	79	79	86	96	2040	1710	146	101.4	100.3	86	2180	1890
	0	101.3	77	77	83	92	2010	1680	146	99.3	98.9	86	2210	1920
	10	99.4	75	76	82	90	2020	1730	146	97.2	96.6	86	2240	1950
	20	97.4	75	76	81	89	2160	1850	146	95.1	94.2	86	2280	1980
	30	95.4	76	77	79	87	2330	2000	146	93.0	91.9	86	2310	2010
	40	93.4	78	78	80	87	2650	2280	146	90.6	89.6	86	2340	2040

Figure 7-15 (Sheet 5 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE 4000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	100.1	94	96	102	108	3580	3070	155	99.0	97.1			
	-20	101.9	93	95	102	108	3710	3190	155	100.7	98.7			
	-10	102.7	93	95	102	108	3950	3400	155	101.3	100.3			
	0	101.3	94	96	102	108	4330	3740	155	99.2	98.9			
	10	99.4	96	97	103	108	4820	4160	155	97.2	96.6			
	20	97.4	97	99	104	108	5430	4680	155	95.1	94.2			
	30	95.4	99	100	104	108	6270	5400	155	92.9	91.9			
14500	-30	100.1	91	93	99	106	3290	2820	154	99.0	97.1			
	-20	101.9	91	93	99	106	3410	2930	154	100.7	98.7			
	-10	102.7	91	93	99	106	3620	3120	154	101.3	100.3			
	0	101.3	92	94	100	106	3970	3430	154	99.2	98.9			
	10	99.4	93	95	101	106	4410	3810	154	97.2	96.6			
	20	97.4	95	96	101	106	4950	4280	154	95.1	94.2			
	30	95.4	97	98	102	106	5710	4920	154	92.9	91.9			
14400	-30	100.1	91	93	99	105	3240	2780	154	99.0	97.1	105	3110	2620
	-20	101.9	91	92	99	105	3360	2890	154	100.7	98.7	105	3210	2710
	-10	102.7	91	93	99	105	3570	3080	154	101.3	100.3	105	3310	2790
	0	101.3	92	94	100	105	3910	3380	154	99.2	98.9	105	3420	2880
	10	99.4	93	95	100	105	4350	3750	154	97.2	96.6	105	3530	2960
	20	97.4	94	96	101	105	4880	4210	154	95.1	94.2	105	3640	3060
	30	95.4	96	98	102	105	5620	4850	154	92.9	91.9			
13500	-30	100.1	87	88	95	102	2850	2460	152	99.0	97.1	102	2920	2460
	-20	101.9	87	88	95	102	2950	2550	152	100.6	98.7	102	3010	2550
	-10	102.7	87	89	95	102	3130	2700	152	101.3	100.3	102	3090	2620
	0	101.3	88	90	96	102	3420	2950	152	99.3	98.9	102	3180	2700
	10	99.4	89	91	96	102	3800	3270	152	97.2	96.6	102	3270	2770
	20	97.4	91	92	97	102	4250	3670	152	95.1	94.2	102	3370	2850
	30	95.4	93	94	98	102	4870	4210	152	92.9	91.9	102	3470	2930
	40	93.4	94	96	99	102	5600	4840	152	90.6	89.6			
12500	-30	100.1	82	84	92	100	2530	2180	150	98.9	97.1	98	2740	2370
	-20	101.9	82	83	92	100	2610	2260	150	100.6	98.7	98	2810	2420
	-10	102.7	82	84	91	99	2730	2370	150	101.3	100.3	98	2880	2470
	0	101.3	84	85	91	99	2930	2550	150	99.3	98.9	98	2950	2520
	10	99.4	85	86	92	99	3240	2810	150	97.2	96.6	98	3030	2580
	20	97.4	87	88	93	99	3620	3120	150	95.1	94.2	98	3100	2650
	30	95.4	89	90	94	99	4140	3580	150	93.0	91.9	98	3180	2710
	40	93.4	90	92	94	99	4750	4100	150	90.6	89.6			
11500	-30	100.1	79	79	89	98	2300	1950	149	98.9	97.1	94	2620	2280
	-20	101.9	79	79	89	98	2390	2020	149	100.6	98.7	94	2660	2320
	-10	102.7	78	80	89	97	2450	2110	149	101.3	100.3	94	2710	2370
	0	101.3	79	80	88	96	2590	2240	149	99.3	98.9	94	2760	2410
	10	99.4	80	81	88	95	2780	2400	149	97.2	96.6	94	2820	2450
	20	97.4	82	83	88	95	3070	2670	149	95.1	94.2	94	2880	2500
	30	95.4	84	85	89	95	3500	3030	149	93.0	91.9	94	2950	2540
	40	93.4	86	87	90	95	4000	3450	149	90.6	89.6	94	3010	2590
10500	-30	100.1	79	79	87	96	2310	1930	147	98.9	97.1	90	2520	2180
	-20	101.9	79	79	87	96	2400	2010	147	100.6	98.7	90	2560	2220
	-10	102.7	78	78	86	95	2430	2030	147	101.4	100.3	90	2600	2260
	0	101.3	76	76	85	94	2390	2000	147	99.3	98.9	90	2640	2300
	10	99.4	75	76	85	93	2450	2110	147	97.2	96.6	90	2680	2340
	20	97.4	76	77	84	91	2610	2260	147	95.1	94.2	90	2720	2380
	30	95.4	78	79	84	91	2960	2560	147	93.0	91.9	90	2760	2420
	40	93.4	81	81	85	91	3350	2910	147	90.6	89.6	90	2810	2460
9500	-30	100.1	80	80	87	97	2340	1960	146	98.9	97.1	86	2420	2080
	-20	101.9	80	80	87	97	2430	2040	146	100.6	98.7	86	2450	2120
	-10	102.7	79	79	86	96	2450	2060	146	101.4	100.3	86	2490	2150
	0	101.3	77	77	83	92	2410	2020	146	99.3	98.9	86	2530	2190
	10	99.4	74	74	82	90	2340	1950	146	97.2	96.6	86	2560	2230
	20	97.4	71	72	81	89	2290	1970	146	95.1	94.2	86	2600	2260
	30	95.4	72	73	79	87	2470	2130	146	93.0	91.9	86	2640	2300
	40	93.4	74	75	80	87	2800	2410	146	90.6	89.6	86	2670	2330

Figure 7-15 (Sheet 5 of 8)

Airplanes -0057 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0057 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE 6000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
V1	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	103.0	98	99	102	108	3640	3170	153	102.5	99.4			
	-20	103.0	98	99	102	108	3920	3420	153	103.4	101.1			
	-10	102.7	99	100	103	108	4240	3700	153	101.3	101.2			
	0	101.3	100	101	103	108	4660	4080	153	99.2	98.9			
	10	99.4	98	102	104	108	5500	4520	153	97.1	96.5			
	20	97.4	96	103	104	108	6670	5080	153	95.0	94.2			
14500	-30	103.0	95	96	99	106	3370	2930	152	102.5	99.4			
	-20	103.0	96	97	100	106	3620	3150	152	103.4	101.1			
	-10	102.7	96	97	100	106	3910	3420	152	101.3	101.2			
	0	101.3	97	98	101	106	4290	3760	152	99.2	98.9			
	10	99.4	98	99	101	106	4750	4160	152	97.2	96.5			
	20	97.4	98	101	102	106	5510	4670	152	95.0	94.2			
14400	-30	103.0	95	96	99	105	3330	2890	152	102.5	99.4	105	2740	2390
	-20	103.0	95	96	99	105	3570	3110	152	103.4	101.1	105	2810	2450
	-10	102.7	96	97	100	105	3860	3370	152	101.3	101.2	105	2880	2510
	0	101.3	97	98	100	105	4240	3710	152	99.2	98.9	105	2950	2570
	10	99.4	98	99	101	105	4680	4100	152	97.2	96.5	105	3020	2640
	20	97.4	99	100	101	105	5340	4600	152	95.0	94.2			
13500	-30	103.0	90	91	95	102	2940	2550	150	102.5	99.4	102	2630	2290
	-20	103.0	91	92	96	102	3150	2740	150	103.4	101.1	102	2690	2340
	-10	102.7	92	93	96	102	3410	2970	150	101.3	101.2	102	2750	2400
	0	101.3	93	94	97	102	3740	3260	150	99.2	98.9	102	2810	2450
	10	99.4	94	95	97	102	4120	3610	150	97.2	96.5	102	2870	2510
	20	97.4	96	96	98	102	4610	4040	150	95.1	94.2	102	2930	2570
	30	95.4	97	98	98	102	5250	4600	150	92.9	91.9			
12500	-30	103.0	86	87	92	99	2580	2230	148	102.5	99.4	98	2510	2180
	-20	103.0	86	87	91	99	2730	2360	148	103.4	101.1	98	2560	2230
	-10	102.7	87	88	92	99	2950	2550	148	101.3	101.2	98	2610	2280
	0	101.3	88	89	92	99	3220	2810	148	99.3	98.9	98	2670	2330
	10	99.4	90	90	93	99	3550	3100	148	97.2	96.5	98	2720	2380
	20	97.4	91	92	93	99	3970	3470	148	95.1	94.2	98	2780	2430
	30	95.4	93	93	94	99	4510	3940	148	92.9	91.9	98	2830	2480
	40	93.4	94	95	95	99	5150	4510	148	90.5	89.5			
11500	-30	103.0	82	84	89	97	2300	1980	147	102.4	99.4	94	2390	2080
	-20	103.0	82	84	88	97	2430	2090	147	103.4	101.1	94	2440	2120
	-10	102.7	83	84	88	96	2560	2210	147	101.3	101.2	94	2480	2170
	0	101.3	83	84	88	95	2750	2380	147	99.3	98.9	94	2530	2210
	10	99.4	85	85	88	95	3040	2630	147	97.2	96.5	94	2580	2260
	20	97.4	86	87	89	95	3390	2950	147	95.1	94.2	94	2630	2300
	30	95.4	88	89	90	95	3840	3340	147	92.9	91.9	94	2680	2350
	40	93.4	89	90	90	95	4380	3820	147	90.6	89.5			
10500	-30	103.0	79	80	86	95	2050	1750	145	102.4	99.4	90	2280	1980
	-20	103.0	78	80	86	95	2140	1850	145	103.4	101.1	90	2320	2020
	-10	102.7	79	80	85	94	2260	1950	145	101.3	101.2	90	2360	2060
	0	101.3	79	80	84	92	2400	2070	145	99.3	98.9	90	2410	2100
	10	99.4	79	80	84	91	2560	2210	145	97.2	96.5	90	2450	2140
	20	97.4	81	82	84	91	2850	2470	145	95.1	94.2	90	2490	2180
	30	95.4	83	83	85	91	3230	2800	145	93.0	91.9	90	2530	2220
	40	93.4	84	85	86	91	3680	3200	145	90.6	89.5	90	2570	2260
9500	-30	103.0	79	79	86	96	2040	1710	144	102.4	99.4	86	2180	1890
	-20	103.0	78	78	84	94	2050	1710	144	103.4	101.1	86	2210	1920
	-10	102.7	76	76	82	92	2050	1710	144	101.4	101.2	86	2250	1950
	0	101.3	75	76	82	90	2100	1810	144	99.3	98.9	86	2290	1990
	10	99.4	75	76	81	89	2230	1920	144	97.2	96.5	86	2320	2020
	20	97.4	75	76	80	87	2390	2060	144	95.1	94.2	86	2360	2060
	30	95.4	77	78	80	87	2670	2310	144	93.0	91.9	86	2390	2090
	40	93.4	79	80	81	87	3040	2630	144	90.6	89.5	86	2430	2130

Figure 7-15 (Sheet 7 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE 6000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	103.0	93	95	102	108	3910	3370	153	102.5	99.4			
	-20	103.0	94	96	102	108	4220	3640	153	103.4	101.1			
	-10	102.7	94	96	103	108	4590	3960	153	101.3	101.2			
	0	101.3	95	97	103	108	5080	4390	153	99.2	98.9			
	10	99.4	97	98	104	108	5660	4890	153	97.1	96.5			
	20	97.4	97	99	104	108	6590	5540	153	95.0	94.2			
14500	-30	103.0	91	93	99	106	3590	3090	152	102.5	99.4			
	-20	103.0	92	93	100	106	3870	3340	152	103.4	101.1			
	-10	102.7	92	94	100	106	4210	3630	152	101.3	101.2			
	0	101.3	93	95	101	106	4640	4010	152	99.2	98.9			
	10	99.4	94	96	101	106	5170	4470	152	97.2	96.5			
	20	97.4	96	97	102	106	5840	5040	152	95.0	94.2			
14400	-30	103.0	91	93	99	105	3540	3050	152	102.5	99.4	105	3310	2790
	-20	103.0	91	93	99	105	3810	3290	152	103.4	101.1	105	3430	2880
	-10	102.7	92	94	100	105	4140	3580	152	101.3	101.2	105	3550	2980
	0	101.3	93	95	100	105	4580	3950	152	99.2	98.9	105	3670	3080
	10	99.4	94	96	101	105	5090	4400	152	97.2	96.5	105	3800	3180
	20	97.4	95	97	101	105	5750	4960	152	95.0	94.2			
13500	-30	103.0	87	88	95	102	3100	2680	150	102.5	99.4	102	3090	2620
	-20	103.0	88	89	96	102	3340	2880	150	103.4	101.1	102	3190	2700
	-10	102.7	88	90	96	102	3620	3120	150	101.3	101.2	102	3290	2780
	0	101.3	89	91	97	102	3990	3440	150	99.2	98.9	102	3390	2870
	10	99.4	91	92	97	102	4420	3820	150	97.2	96.5	102	3500	2950
	20	97.4	92	93	98	102	4970	4300	150	95.1	94.2	102	3610	3040
	30	95.4	94	95	98	102	5700	4930	150	92.9	91.9			
12500	-30	103.0	82	84	92	99	2710	2350	148	102.5	99.4	98	2880	2470
	-20	103.0	83	84	91	99	2860	2490	148	103.4	101.1	98	2960	2530
	-10	102.7	84	85	92	99	3090	2690	148	101.3	101.2	98	3040	2590
	0	101.3	85	87	92	99	3400	2940	148	99.3	98.9	98	3130	2660
	10	99.4	86	88	93	99	3760	3250	148	97.2	96.5	98	3210	2730
	20	97.4	88	89	93	99	4220	3650	148	95.1	94.2	98	3300	2810
	30	95.4	90	91	94	99	4820	4170	148	92.9	91.9	98	3390	2880
	40	93.4	91	92	95	99	5540	4790	148	90.5	89.5			
11500	-30	103.0	78	80	89	97	2430	2100	147	102.4	99.4	94	2710	2370
	-20	103.0	79	80	88	97	2560	2220	147	103.4	101.1	94	2760	2420
	-10	102.7	79	80	88	96	2700	2340	147	101.3	101.2	94	2830	2460
	0	101.3	80	81	88	95	2900	2520	147	99.3	98.9	94	2900	2510
	10	99.4	82	83	88	95	3190	2770	147	97.2	96.5	94	2970	2560
	20	97.4	83	84	89	95	3560	3090	147	95.1	94.2	94	3040	2610
	30	95.4	85	86	90	95	4050	3500	147	92.9	91.9	94	3110	2660
	40	93.4	87	88	90	95	4640	4020	147	90.6	89.5			
10500	-30	103.0	79	79	86	95	2430	2030	145	102.4	99.4	90	2600	2260
	-20	103.0	77	77	86	95	2440	2040	145	103.4	101.1	90	2650	2310
	-10	102.7	75	76	85	94	2430	2070	145	101.3	101.2	90	2690	2350
	0	101.3	75	76	84	92	2550	2200	145	99.3	98.9	90	2740	2390
	10	99.4	76	77	84	91	2710	2340	145	97.2	96.5	90	2780	2440
	20	97.4	78	79	84	91	3000	2600	145	95.1	94.2	90	2830	2480
	30	95.4	80	81	85	91	3390	2950	145	93.0	91.9	90	2880	2530
	40	93.4	82	83	86	91	3860	3360	145	90.6	89.5	90	2940	2570
9500	-30	103.0	79	79	86	96	2450	2060	144	102.4	99.4	86	2490	2160
	-20	103.0	78	78	84	94	2460	2060	144	103.4	101.1	86	2530	2200
	-10	102.7	76	76	82	92	2440	2050	144	101.4	101.2	86	2570	2240
	0	101.3	73	73	82	90	2390	2000	144	99.3	98.9	86	2610	2270
	10	99.4	71	72	81	89	2370	2040	144	97.2	96.5	86	2650	2310
	20	97.4	72	73	80	87	2540	2190	144	95.1	94.2	86	2690	2350
	30	95.4	74	75	80	87	2830	2440	144	93.0	91.9	86	2730	2390
	40	93.4	76	77	81	87	3210	2780	144	90.6	89.5	86	2780	2430

Figure 7-15 (Sheet 7 of 8)

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE SEA LEVEL**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	93.2	98	99	102	108	3540	3050	157	92.0	90.6			
	-20	94.7	98	99	102	108	3660	3160	157	93.5	92.0			
	-10	96.2	98	99	102	108	3780	3260	157	94.9	93.4			
	0	97.1	98	99	102	108	3900	3370	157	95.3	94.8			
	10	94.7	98	99	102	108	4080	3550	157	92.9	93.2			
14500	-30	93.2	96	97	99	106	3280	2810	156	92.0	90.6			
	-20	94.7	95	97	99	106	3400	2930	156	93.5	92.0			
	-10	96.2	95	96	99	106	3500	3010	156	94.9	93.4			
	0	97.1	95	96	99	106	3610	3120	156	95.3	94.8			
	10	94.7	95	96	99	106	3780	3280	156	92.9	93.2			
14400	-30	93.2	95	96	99	105	3230	2770	156	92.0	90.6	105	2420	2090
	-20	94.7	95	96	99	105	3350	2880	156	93.5	92.0	105	2470	2140
	-10	96.2	95	96	99	105	3460	2980	156	94.9	93.4	105	2520	2190
	0	97.1	94	96	99	105	3560	3070	156	95.3	94.8	105	2570	2230
	10	94.7	95	96	99	105	3730	3240	156	92.9	93.2	105	2620	2280
13500	-30	93.2	91	92	95	102	2870	2450	155	92.0	90.6	102	2330	2020
	-20	94.7	91	92	95	102	2960	2540	155	93.4	92.0	102	2380	2060
	-10	96.2	90	92	95	102	3060	2630	155	94.9	93.4	102	2420	2100
	0	97.1	90	91	95	102	3160	2710	155	95.3	94.8	102	2470	2150
	10	94.7	91	92	95	102	3300	2850	155	92.9	93.2	102	2510	2190
12500	-30	93.2	87	88	92	100	2530	2160	154	92.0	90.6	98	2240	1940
	-20	94.7	87	88	92	100	2630	2240	154	93.4	92.0	98	2280	1980
	-10	96.2	86	88	92	100	2710	2320	154	94.9	93.4	98	2320	2020
	0	97.1	86	87	92	100	2800	2400	154	95.3	94.8	98	2360	2050
	10	94.7	86	87	92	99	2900	2500	154	92.9	93.2	98	2400	2090
11500	-30	93.2	83	84	89	98	2270	1920	152	91.9	90.6	94	2160	1860
	-20	94.7	83	84	89	98	2340	1990	152	93.4	92.0	94	2190	1900
	-10	96.2	83	84	89	98	2420	2060	152	94.9	93.4	94	2230	1930
	0	97.1	82	84	89	98	2500	2140	152	95.3	94.8	94	2270	1960
	10	94.7	82	84	89	97	2590	2220	152	92.9	93.2	94	2300	2000
10500	-30	93.2	80	80	87	96	2060	1700	151	91.9	90.6	90	2080	1790
	-20	94.7	80	80	87	96	2140	1780	151	93.4	92.0	90	2110	1820
	-10	96.2	80	80	87	96	2210	1820	151	94.9	93.4	90	2140	1850
	0	97.1	80	80	87	96	2290	1900	151	95.3	94.8	90	2170	1880
	10	94.7	79	80	86	96	2330	1970	151	93.0	93.2	90	2200	1910
9500	-30	93.2	81	81	87	97	2060	1720	150	91.9	90.6	86	2000	1720
	-20	94.7	81	81	87	97	2140	1780	150	93.4	92.0	86	2030	1740
	-10	96.2	81	81	87	97	2210	1850	150	94.9	93.4	86	2050	1770
	0	97.1	81	81	87	97	2290	1910	150	95.3	94.8	86	2080	1790
	10	94.7	80	80	87	96	2330	1940	150	93.0	93.2	86	2110	1820

Figure 7-16 (Sheet 1 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE SEA LEVEL**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 – KIAS		V-	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	93.2	95	97	102	108	3730	3180	157	92.0	90.6			
	-20	94.7	95	96	102	108	3880	3310	157	93.5	92.0			
	-10	96.2	94	96	102	108	4010	3430	157	94.9	93.4			
	0	97.1	94	96	102	108	4140	3550	157	95.3	94.8			
	10	94.7	94	96	102	108	4360	3740	157	92.9	93.2			
14500	-30	93.2	92	94	99	106	3440	2950	156	92.0	90.6			
	-20	94.7	92	94	99	106	3580	3060	156	93.5	92.0			
	-10	96.2	92	93	99	106	3680	3160	156	94.9	93.4			
	0	97.1	91	93	99	106	3820	3260	156	95.3	94.8			
	10	94.7	91	93	99	106	4010	3440	156	92.9	93.2			
14400	-30	93.2	92	93	99	105	3400	2920	156	92.0	90.6	105	2790	2360
	-20	94.7	92	93	99	105	3520	3020	156	93.5	92.0	105	2850	2420
	-10	96.2	91	93	99	105	3640	3120	156	94.9	93.4	105	2940	2490
	0	97.1	91	93	99	105	3760	3230	156	95.3	94.8	105	3020	2550
	10	94.7	91	93	99	105	3950	3400	156	92.9	93.2	105	3100	2620
13500	-30	93.2	87	88	95	102	3010	2580	155	92.0	90.6	102	2650	2280
	-20	94.7	87	88	95	102	3120	2680	155	93.4	92.0	102	2710	2330
	-10	96.2	87	88	95	102	3200	2770	155	94.9	93.4	102	2780	2370
	0	97.1	87	88	95	102	3300	2860	155	95.3	94.8	102	2850	2420
	10	94.7	87	88	95	102	3470	3000	155	92.9	93.2	102	2920	2470
12500	-30	93.2	83	84	92	100	2680	2280	154	92.0	90.6	98	2540	2200
	-20	94.7	83	84	92	100	2770	2360	154	93.4	92.0	98	2580	2240
	-10	96.2	82	84	92	100	2860	2450	154	94.9	93.4	98	2620	2280
	0	97.1	82	84	92	100	2950	2530	154	95.3	94.8	98	2680	2330
	10	94.7	82	84	92	99	3060	2640	154	92.9	93.2	98	2730	2370
11500	-30	93.2	79	80	89	98	2450	2040	152	91.9	90.6	94	2450	2120
	-20	94.7	79	80	89	98	2530	2120	152	93.4	92.0	94	2490	2160
	-10	96.2	79	80	89	98	2630	2200	152	94.9	93.4	94	2530	2190
	0	97.1	79	79	89	98	2710	2270	152	95.3	94.8	94	2570	2230
	10	94.7	78	80	89	97	2760	2360	152	92.9	93.2	94	2610	2270
10500	-30	93.2	80	80	87	96	2460	2030	151	91.9	90.6	90	2370	2030
	-20	94.7	80	80	87	96	2540	2110	151	93.4	92.0	90	2400	2070
	-10	96.2	80	80	87	96	2640	2200	151	94.9	93.4	90	2440	2100
	0	97.1	80	80	87	96	2720	2270	151	95.3	94.8	90	2470	2140
	10	94.7	79	79	86	96	2770	2320	151	93.0	93.2	90	2500	2170
9500	-30	93.2	81	81	87	97	2510	2080	150	91.9	90.6	86	2280	1950
	-20	94.7	81	81	87	97	2580	2150	150	93.4	92.0	86	2310	1980
	-10	96.2	81	81	87	97	2680	2230	150	94.9	93.4	86	2340	2010
	0	97.1	81	81	87	97	2760	2320	150	95.3	94.8	86	2370	2040
	10	94.7	80	80	87	96	2810	2350	150	93.0	93.2	86	2400	2070

Figure 7-16 (Sheet 1 of 8)

Airplanes -0057 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0057 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 2000 FEET

ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	96.8	98	99	102	108	3770	3250	156	95.6	93.8			
	-20	98.4	98	99	102	108	3900	3360	156	97.2	95.3			
	-10	99.3	98	99	102	108	4030	3500	156	97.6	96.9			
	0	97.1	97	99	102	108	4180	3620	156	95.2	95.6			
	10	94.7	99 100	102	108	4610	4010	156	92.9	93.1				
14500	-30	96.8	95	96	99	106	3490	3010	155	95.6	93.8			
	-20	98.4	95	96	99	106	3610	3120	155	97.1	95.3			
	-10	99.3	95	96	99	106	3730	3240	155	97.6	96.9			
	0	97.1	95	96	99	106	3860	3360	155	95.2	95.6			
	10	94.7	96	97	100	106	4260	3710	155	92.9	93.1			
14400	-30	96.8	95	96	99	105	3440	2960	155	95.6	93.8	105	2510	2180
	-20	98.4	95	96	99	105	3560	3080	155	97.1	95.3	105	2570	2230
	-10	99.3	94	96	99	105	3680	3190	155	97.6	96.9	105	2620	2280
	0	97.1	94	95	99	105	3800	3310	155	95.2	95.6	105	2680	2330
	10	94.7	96	97	99	105	4200	3660	155	92.9	93.1	105	2730	2380
13500	-30	96.8	91	92	95	102	3050	2620	154	95.6	93.8	102	2420	2100
	-20	98.4	90	92	95	102	3160	2720	154	97.1	95.3	102	2470	2150
	-10	99.3	90	91	95	102	3260	2820	154	97.6	96.9	102	2520	2190
	0	97.1	90	91	95	102	3370	2920	154	95.3	95.6	102	2570	2240
	10	94.7	91	93	96	102	3720	3230	154	92.9	93.1	102	2620	2280
12500	-30	96.8	86	88	92	100	2700	2300	152	95.6	93.8	98	2320	2010
	-20	98.4	86	87	92	100	2800	2400	152	97.1	95.3	98	2370	2050
	-10	99.3	86	87	92	100	2890	2480	152	97.6	96.9	98	2410	2090
	0	97.1	86	87	92	100	2990	2570	152	95.3	95.6	98	2450	2140
	10	94.7	87	88	91	99	3220	2770	152	92.9	93.1	98	2500	2180
11500	-30	96.8	83	84	89	98	2410	2050	151	95.6	93.8	94	2230	1930
	-20	98.4	83	84	89	98	2500	2140	151	97.1	95.3	94	2270	1970
	-10	99.3	82	84	89	98	2580	2210	151	97.6	96.9	94	2310	2000
	0	97.1	82	84	89	98	2660	2290	151	95.3	95.6	94	2340	2040
	10	94.7	83	84	88	96	2830	2440	151	92.9	93.1	94	2380	2080
10500	-30	96.8	80	80	87	96	2200	1820	149	95.5	93.8	90	2140	1850
	-20	98.4	80	80	87	96	2270	1880	149	97.1	95.3	90	2170	1880
	-10	99.3	80	80	87	96	2350	1960	149	97.7	96.9	90	2210	1910
	0	97.1	80	80	87	96	2420	2030	149	95.3	95.6	90	2240	1940
	10	94.7	79	80	86	94	2510	2150	149	92.9	93.1	90	2280	1980
9500	-30	96.8	80	80	87	97	2200	1820	148	95.5	93.8	86	2050	1770
	-20	98.4	80	80	87	97	2270	1900	148	97.1	95.3	86	2080	1800
	-10	99.3	80	80	87	97	2350	1960	148	97.7	96.9	86	2110	1820
	0	97.1	80	80	87	97	2420	2030	148	95.3	95.6	86	2140	1850
	10	94.7	77	77	84	93	2360	1970	148	92.9	93.1	86	2170	1880

Figure 7-16 (Sheet 3 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE 2000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 — KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	96.8	94	96	102	108	4000	3420	156	95.6	93.8			
	-20	98.4	94	96	102	108	4150	3560	156	97.2	95.3			
	-10	99.3	94	95	102	108	4300	3700	156	97.6	96.9			
	0	97.1	93	95	102	108	4460	3840	156	95.2	95.6			
	10	94.7	95	96	102	108	4960	4260	156	92.9	93.1			
14500	-30	96.8	92	94	99	106	3670	3160	155	95.6	93.8			
	-20	98.4	92	93	99	106	3820	3280	155	97.1	95.3			
	-10	99.3	91	93	99	106	3950	3400	155	97.6	96.9			
	0	97.1	91	93	99	106	4100	3530	155	95.2	95.6			
	10	94.7	92	94	100	106	4550	3910	155	92.9	93.1			
14400	-30	96.8	91	93	99	105	3620	3110	155	95.6	93.8	105	2940	2480
	-20	98.4	91	93	99	105	3770	3230	155	97.1	95.3	105	3020	2550
	-10	99.3	91	93	99	105	3900	3350	155	97.6	96.9	105	3110	2630
	0	97.1	90	92	99	105	4040	3480	155	95.2	95.6	105	3200	2700
	10	94.7	92	94	99	105	4480	3850	155	92.9	93.1	105	3300	2780
13500	-30	96.8	87	88	95	102	3200	2760	154	95.6	93.8	102	2780	2370
	-20	98.4	87	88	95	102	3310	2870	154	97.1	95.3	102	2850	2420
	-10	99.3	87	88	95	102	3420	2960	154	97.6	96.9	102	2920	2480
	0	97.1	87	88	95	102	3540	3060	154	95.3	95.6	102	3000	2550
	10	94.7	88	90	96	102	3920	3370	154	92.9	93.1	102	3080	2610
12500	-30	96.8	82	84	92	100	2840	2440	152	95.6	93.8	98	2620	2280
	-20	98.4	82	84	92	100	2940	2530	152	97.1	95.3	98	2680	2330
	-10	99.3	82	83	92	100	3050	2630	152	97.6	96.9	98	2740	2370
	0	97.1	82	83	92	100	3140	2710	152	95.3	95.6	98	2810	2420
	10	94.7	83	84	91	99	3370	2930	152	92.9	93.1	98	2870	2460
11500	-30	96.8	79	80	89	98	2600	2180	151	95.6	93.8	94	2530	2190
	-20	98.4	79	80	89	98	2690	2270	151	97.1	95.3	94	2570	2240
	-10	99.3	79	79	89	98	2780	2340	151	97.6	96.9	94	2620	2280
	0	97.1	79	79	89	98	2870	2420	151	95.3	95.6	94	2660	2320
	10	94.7	79	80	88	96	3000	2580	151	92.9	93.1	94	2700	2360
10500	-30	96.8	80	80	87	96	2620	2170	149	95.5	93.8	90	2440	2100
	-20	98.4	80	80	87	96	2700	2260	149	97.1	95.3	90	2480	2140
	-10	99.3	80	80	87	96	2800	2340	149	97.7	96.9	90	2510	2180
	0	97.1	80	80	87	96	2880	2410	149	95.3	95.6	90	2550	2210
	10	94.7	77	77	86	94	2810	2340	149	92.9	93.1	90	2590	2250
9500	-30	96.8	80	80	87	97	2550	2210	148	95.5	93.8	86	2340	2010
	-20	98.4	80	80	87	97	2750	2290	148	97.1	95.3	86	2380	2040
	-10	99.3	80	80	87	97	2830	2380	148	97.7	96.9	86	2410	2080
	0	97.1	80	80	87	97	2920	2460	148	95.3	95.6	86	2440	2110
	10	94.7	77	77	84	93	2830	2360	148	92.9	93.1	86	2480	2140

Figure 7-16 (Sheet 3 of 8)

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°
LANDING - FLAPS LAND

PRESSURE ALTITUDE 4000 FEET
ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. T MP	FAN	V1 – KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	100.1	98	99	102	108	4020	3490	155	99.0	97.1			
	-20	101.2	97	99	102	108	4160	3620	155	99.8	98.7			
	-10	99.3	98	99	102	108	4420	3840	155	97.6	97.9			
	0	97.1	99	100	102	108	4810	4200	155	95.2	95.5			
	10	94.7	100	101	103	108	5330	4660	155	92.8	93.1			
14500	-30	100.1	95	96	99	106	3720	3230	154	99.0	97.1			
	-20	101.2	95	96	99	106	3850	3350	154	99.8	98.7			
	-10	99.3	95	96	98	106	4080	3550	154	97.6	97.9			
	0	97.1	96	97	100	106	4450	3880	154	95.2	95.5			
	10	94.7	97	98	101	106	4920	4300	154	92.8	93.1			
14400	-30	100.1	94	96	99	105	3680	3190	154	99.0	97.1	105	2620	2280
	-20	101.2	94	95	99	105	3800	3300	154	99.8	98.7	105	2680	2330
	-10	99.3	95	96	99	105	4020	3500	154	97.6	97.9	105	2740	2390
	0	97.1	96	97	100	105	4390	3830	154	95.2	95.5	105	2800	2450
	10	94.7	97	98	100	105	4850	4240	154	92.8	93.1	105	2870	2500
13500	-30	100.1	90	91	95	102	3250	2810	152	99.0	97.1	102	2520	2190
	-20	101.2	90	91	95	102	3380	2920	152	99.8	98.7	102	2570	2240
	-10	99.3	90	92	95	102	3560	3080	152	97.6	97.9	102	2630	2290
	0	97.1	92	93	96	102	3880	3370	152	95.2	95.5	102	2680	2340
	10	94.7	93	94	96	102	4280	3730	152	92.9	93.1	102	2740	2390
12500	-30	100.1	86	87	92	100	2880	2470	150	98.9	97.1	98	2410	2090
	-20	101.2	86	87	92	100	2980	2570	150	99.8	98.7	98	2460	2140
	-10	99.3	86	87	91	99	3120	2690	150	97.6	97.9	98	2500	2180
	0	97.1	87	88	91	99	3360	2900	150	95.3	95.5	98	2550	2230
	10	94.7	88	89	92	99	3700	3200	150	92.9	93.1	98	2600	2270
11500	-30	100.1	82	84	89	98	2570	2210	149	98.9	97.1	94	2310	2000
	-20	101.2	82	84	89	98	2650	2290	149	99.8	98.7	94	2350	2040
	-10	99.3	82	84	89	97	2780	2400	149	97.6	97.9	94	2390	2080
	0	97.1	83	84	88	96	2950	2540	149	95.3	95.5	94	2430	2120
	10	94.7	83	84	88	95	3160	2720	149	92.9	93.1	94	2480	2160
10500	-30	100.1	79	80	87	96	2340	1940	147	98.9	97.1	90	2210	1910
	-20	101.2	79	79	87	96	2420	2030	147	99.9	98.7	90	2240	1950
	-10	99.3	78	80	86	95	2460	2110	147	97.6	97.9	90	2280	1980
	0	97.1	79	80	85	94	2600	2240	147	95.3	95.5	90	2320	2020
	10	94.7	79	80	85	93	2770	2390	147	92.9	93.1	90	2360	2050
9500	-30	100.1	80	80	87	97	2330	1940	146	98.9	97.1	86	2110	1820
	-20	101.2	80	80	87	97	2420	2020	146	99.9	98.7	86	2150	1860
	-10	99.3	79	79	86	96	2450	2050	146	97.6	97.9	86	2180	1890
	0	97.1	77	77	83	92	2410	2020	146	95.3	95.5	86	2210	1920
	10	94.7	75	76	82	90	2420	2080	146	92.9	93.1	86	2240	1950

Figure 7-16 (Sheet 5 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE 4000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	100.1	94	96	102	108	4300	3680	155	99.0	97.1			
	-20	101.2	93	95	102	108	4450	3830	155	99.8	98.7			
	-10	99.3	93	95	102	108	4740	4080	155	97.6	97.9			
	0	97.1	94	96	102	108	5200	4490	155	95.2	95.5			
	10	94.7	96	97	103	108	5780	4990	155	92.8	93.1			
14500	-30	100.1	91	93	99	106	3950	3380	154	99.0	97.1			
	-20	101.2	91	93	99	106	4090	3520	154	99.8	98.7			
	-10	99.3	91	93	99	106	4340	3740	154	97.6	97.9			
	0	97.1	92	94	100	106	4760	4120	154	95.2	95.5			
	10	94.7	93	95	101	106	5290	4570	154	92.8	93.1			
14400	-30	100.1	91	93	99	105	3890	3340	154	99.0	97.1	105	3110	2620
	-20	101.2	91	92	99	105	4030	3470	154	99.8	98.7	105	3210	2710
	-10	99.3	91	93	99	105	4280	3700	154	97.6	97.9	105	3310	2790
	0	97.1	92	94	100	105	4690	4060	154	95.2	95.5	105	3420	2880
	10	94.7	93	95	100	105	5220	4500	154	92.8	93.1	105	3530	2960
13500	-30	100.1	87	88	95	102	3420	2950	152	99.0	97.1	102	2920	2480
	-20	101.2	87	88	95	102	3540	3060	152	99.8	98.7	102	3010	2550
	-10	99.3	87	89	95	102	3760	3240	152	97 6	97.9	102	3090	2620
	0	97.1	88	90	96	102	4100	3540	152	95.2	95.5	102	3180	2700
	10	94.7	89	91	96	102	4560	3920	152	92.9	93.1	102	3270	2770
12500	-30	100.1	82	84	92	100	3040	2620	150	98.9	97.1	98	2740	2370
	-20	101.2	82	83	92	100	3130	2710	150	99.8	98.7	98	2810	2420
	-10	99.3	82	84	91	99	3280	2840	150	97.6	97.9	98	2880	2470
	0	97.1	84	85	91	99	3520	3060	150	95.3	95.5	98	2950	2520
	10	94.7	85	86	92	99	3890	3370	150	92.9	93.1	98	3030	2580
11500	-30	100.1	79	79	89	98	2760	2340	149	98.9	97.1	94	2620	2280
	-20	101.2	79	79	89	98	2870	2420	149	99.8	98.7	94	2660	2320
	-10	99.3	78	80	89	97	2940	2530	149	97.6	97.9	94	2710	2370
	0	97.1	79	80	88	96	3110	2690	149	95.3	95.5	94	2760	2410
	10	94.7	80	81	88	95	3340	2880	149	92.9	93.1	94	2820	2450
10500	-30	100.1	79	79	87	96	2770	2320	147	98.9	97.1	90	2520	2180
	-20	101.2	79	79	87	96	2880	2410	147	99.9	98.7	90	2560	2220
	-10	99 3	78	78	86	95	2920	2440	147	97.6	97.9	90	2600	2260
	0	97.1	76	76	85	94	2870	2400	147	95.3	95.5	90	2640	2300
	10	94.7	75	76	85	93	2940	2530	147	92.9	93.1	90	2680	2340
9500	-30	100.1	80	80	87	97	2810	2350	146	98.9	97.1	86	2420	2080
	-20	101.2	80	80	87	97	2920	2450	146	99.9	98.7	86	2450	2120
	-10	99.3	79	79	86	96	2940	2470	146	97.6	97.9	86	2490	2150
	0	97.1	77	77	83	92	2890	2420	146	95.3	95.5	86	2530	2190
	10	94.7	74	74	82	90	2810	2340	146	92.9	93 1	86	2560	2230

Figure 7-16 (Sheet 5 of 8)

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 6000 FEET

ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	102.8	98	99	102	108	4370	3800	153	101.7	99.4			
	-20	101.2	98	99	102	108	4700	4100	153	99.8	99.9			
	-10	99.3	99	100	103	108	5090	4440	153	97.5	97.8			
	0	97.1	100	101	103	108	5590	4900	153	95.2	95.5			
	10	94.7	98	102	104	108	6600	5420	153	92.8	93.0			
14500	-30	102.8	95	96	99	106	4040	3520	152	101.7	99.4			
	-20	101.2	96	97	100	106	4340	3780	152	99.8	99.9			
	-10	99.3	96	97	100	106	4690	4100	152	97.5	97.8			
	0	97.1	97	98	101	106	5150	4510	152	95.2	95.5			
	10	94.7	98	99	101	106	5700	4990	152	92.8	93.0			
14400	-30	102.8	95	96	99	105	4000	3470	152	101.7	99.4	105	2740	2390
	-20	101.2	95	96	99	105	4280	3730	152	99.8	99.9	105	2810	2450
	-10	99.3	96	97	100	105	4630	4040	152	97.5	97.8	105	2880	2510
	0	97.1	97	98	100	105	5090	4450	152	95.2	95.5	105	2950	2570
	10	94.7	98	99	101	105	5620	4920	152	92.8	93.0	105	3020	2640
13500	-30	102.8	90	91	95	102	3530	3060	150	101.7	99.4	102	2630	2290
	-20	101.2	91	92	96	102	3780	3290	150	99.8	99.9	102	2690	2340
	-10	99.3	92	93	96	102	4090	3560	150	97.6	97.8	102	2750	2400
	0	97.1	93	94	97	102	4490	3910	150	95.2	95.5	102	2810	2450
	10	94.7	94	95	97	102	4940	4330	150	92.8	93.0	102	2870	2510
12500	-30	102.8	86	87	92	99	3100	2680	148	101.7	99.4	98	2510	2180
	-20	101.2	86	87	91	99	3280	2830	148	99.8	99.9	98	2560	2230
	-10	99.3	87	88	92	99	3540	3060	148	97.6	97.8	98	2610	2280
	0	97.1	88	89	92	99	3860	3370	148	95.2	95.5	98	2670	2330
	10	94.7	90	90	93	99	4260	3720	148	92.9	93.0	98	2720	2380
11500	-30	102.8	82	84	89	97	2760	2380	147	101.7	99.4	94	2390	2080
	-20	101.2	82	84	88	97	2920	2510	147	99.8	99.9	94	2440	2120
	-10	99.3	83	84	88	96	3070	2650	147	97.6	97.8	94	2480	2170
	0	97.1	83	84	88	95	3300	2860	147	95.2	95.5	94	2530	2210
	10	94.7	85	85	88	95	3650	3160	147	92.9	93.0	94	2580	2260
10500	-30	102.8	79	80	86	95	2460	2100	145	101.7	99.4	90	2280	1980
	-20	101.2	78	80	86	95	2570	2220	145	99.8	99.9	90	2320	2020
	-10	99.3	79	80	85	94	2710	2340	145	97.6	97.8	90	2360	2060
	0	97.1	79	80	84	92	2880	2480	145	95.3	95.5	90	2410	2100
	10	94.7	79	80	84	91	3070	2650	145	92.9	93.0	90	2450	2140
9500	-30	102.8	79	79	86	96	2450	2050	144	101.7	99.4	86	2180	1890
	-20	101.2	78	78	84	94	2460	2050	144	99.9	99.9	86	2210	1920
	-10	99.3	76	76	82	92	2460	2050	144	97.6	97.8	86	2250	1950
	0	97.1	75	76	82	90	2520	2170	144	95.3	95.5	86	2290	1990
	10	94.7	75	76	81	89	2680	2300	144	92.9	93.0	86	2320	2020

Figure 7-16 (Sheet 7 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 6000 FEET

ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 – KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	102.8	93	95	102	108	4690	4040	153	101.7	99.4			
	-20	101.2	94	96	102	108	5060	4370	153	99.8	99.9			
	-10	99.3	94	96	103	108	5510	4750	153	97.5	97.8			
	0	97.1	95	97	103	108	6100	5270	153	95.2	95.5			
	10	94.7	97	98	104	108	6790	5870	153	92.8	93.0			
14500	-30	102.8	91	93	99	106	4310	3710	152	101.7	99.4			
	-20	101.2	92	93	100	106	4640	4010	152	99.8	99.9			
	-10	99.3	92	94	100	106	5050	4360	152	97.5	97.8			
	0	97.1	93	95	101	106	5570	4810	152	95.2	95.5			
	10	94.7	94	96	101	106	6200	5360	152	92.8	93.0			
14400	-30	102.8	91	93	99	105	4250	3660	152	101.7	99.4	105	3310	2790
	-20	101.2	91	93	99	105	4570	3950	152	99.8	99.9	105	3430	2880
	-10	99.3	92	94	100	105	4970	4300	152	97.5	97.8	105	3550	2980
	0	97.1	93	95	100	105	5500	4740	152	95.2	95.5	105	3670	3080
	10	94.7	94	96	101	105	6110	5280	152	92.8	93.0	105	3800	3180
13500	-30	102.8	87	88	95	102	3720	3220	150	101.7	99.4	102	3090	2620
	-20	101.2	88	89	96	102	4010	3460	150	99.8	99.9	102	3190	2700
	-10	99.3	88	90	96	102	4340	3740	150	97.6	97.8	102	3290	2780
	0	97.1	89	91	97	102	4790	4130	150	95.2	95.5	102	3390	2870
	10	94.7	91	92	97	102	5300	4580	150	92.8	93.0	102	3500	2950
12500	-30	102.8	82	84	92	99	3250	2820	148	101.7	99.4	98	2880	2470
	-20	101.2	83	84	91	99	3430	2990	148	99.8	99.9	98	2960	2530
	-10	99.3	84	85	92	99	3710	3230	148	97.6	97.8	98	3040	2590
	0	97.1	85	87	92	99	4080	3530	148	95.2	95.5	98	3130	2660
	10	94.7	86	88	93	99	4510	3900	148	92.9	93.0	98	3210	2730
11500	-30	102.8	78	80	89	97	2920	2520	147	101.7	99.4	94	2710	2370
	-20	101.2	79	80	88	97	3070	2660	147	99.8	99.9	94	2760	2420
	-10	99.3	79	80	88	96	3240	2810	147	97.6	97.8	94	2830	2460
	0	97.1	80	81	88	95	3480	3020	147	95.2	95.5	94	2900	2510
	10	94.7	82	83	88	95	3830	3320	147	92.9	93.0	94	2970	2560
10500	-30	102.8	79	79	86	95	2920	2440	145	101.7	99.4	90	2600	2260
	-20	101.2	77	77	86	95	2930	2450	145	99.8	99.9	90	2650	2310
	-10	99.3	75	76	85	94	2920	2480	145	97.6	97.8	90	2690	2350
	0	97.1	75	76	84	92	3060	2640	145	95.3	95.5	90	2740	2390
	10	94.7	76	77	84	91	3250	2810	145	92.9	93.0	90	2780	2440
9500	-30	102.8	79	79	86	96	2940	2470	144	101.7	99.4	86	2490	2160
	-20	101.2	78	78	84	94	2950	2470	144	99.9	99.9	86	2530	2200
	-10	99.3	76	76	82	92	2930	2450	144	97.6	97.8	86	2570	2240
	0	97.1	73	73	82	90	2870	2400	144	95.3	95.5	86	2610	2270
	10	94.7	71	72	81	89	2840	2450	144	92.9	93.0	86	2650	2310

Figure 7-16 (Sheet 7 of 8)

Airplanes -0057 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0057 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° **PRESSURE ALTITUDE SEA LEVEL**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	93.2	93	94	97	103	2720	2330	157	92.0	90.6			
	-20	94.7	93	94	97	103	2820	2420	157	93.5	92.0			
	-10	96.2	92	93	97	103	2910	2500	157	94.9	93.4			
	0	97.7	92	93	97	103	3000	2590	157	96.4	94.8			
	10	99.2	92	93	97	103	3140	2720	157	97.2	96.3			
	20	97.4	94	95	97	103	3450	2990	157	95.1	94.3			
14500	-30	93.2	90	91	94	101	2520	2150	156	92.0	90.6			
	-20	94.7	90	91	94	101	2610	2240	156	93.5	92.0			
	-10	96.2	90	91	94	101	2690	2310	156	94.9	93.4			
	0	97.7	89	91	94	101	2770	2390	156	96.4	94.8			
	10	99.2	90	91	94	101	2910	2510	156	97.2	96.3			
	20	97.4	91	92	95	101	3190	2760	156	95.1	94.3			
	30	95.4	93	94	96	101	3640	3160	156	93.0	92.0			
14400	-30	93.2	90	91	94	100	2490	2130	156	92.0	90.6	105	2420	2090
	-20	94.7	90	91	94	100	2580	2210	156	93.5	92.0	105	2470	2140
	-10	96.2	89	90	94	100	2660	2280	156	94.9	93.4	105	2520	2190
	0	97.7	89	90	94	100	2740	2350	156	96.4	94.8	105	2570	2230
	10	99.2	89	90	94	100	2870	2480	156	97.2	96.3	105	2620	2280
	20	97.4	91	92	95	100	3150	2720	156	95.1	94.3	105	2670	2320
	30	95.4	93	93	95	100	3600	3120	156	93.0	92.0	105	2720	2370
13500	-30	93.2	85	87	90	97	2200	1870	155	92.0	90.6	102	2330	2020
	-20	94.7	85	86	90	97	2280	1940	155	93.4	92.0	102	2380	2060
	-10	96.2	85	86	90	97	2350	2010	155	94.9	93.4	102	2420	2100
	0	97.7	85	86	90	97	2420	2070	155	96.4	94.8	102	2470	2150
	10	99.2	85	86	90	97	2540	2180	155	97.2	96.3	102	2510	2190
	20	97.4	87	88	91	97	2780	2400	155	95.1	94.3	102	2560	2230
	30	95.4	89	90	92	97	3170	2740	155	93.0	92.0	102	2610	2270
	40	93.4	91	91	93	97	3630	3140	155	90.6	89.6	102	2650	2320
12500	-30	93.2	81	83	87	95	1950	1650	154	92.0	90.6	98	2240	1940
	-20	94.7	81	82	87	95	2020	1710	154	93.4	92.0	98	2280	1980
	-10	96.2	81	82	87	95	2080	1770	154	94.9	93.4	98	2320	2020
	0	97.7	81	82	87	95	2150	1830	154	96.4	94.8	98	2360	2050
	10	99.2	81	82	87	95	2230	1910	154	97.3	96.3	98	2400	2090
	20	97.4	82	83	87	94	2400	2060	154	95.1	94.3	98	2450	2130
	30	95.4	84	85	88	94	2740	2360	154	93.0	92.0	98	2490	2170
	40	93.4	86	87	89	94	3130	2700	154	90.6	89.6	98	2530	2200
11500	-30	93.2	79	79	85	93	1810	1480	152	91.9	90.6	94	2160	1860
	-20	94.7	79	79	85	93	1870	1530	152	93.4	92.0	94	2190	1900
	-10	96.2	79	79	85	93	1940	1600	152	94.9	93.4	94	2230	1930
	0	97.7	79	79	85	93	2010	1660	152	96.4	94.8	94	2270	1960
	10	99.2	78	79	85	93	2040	1700	152	97.3	96.3	94	2300	2000
	20	97.4	78	79	84	92	2120	1810	152	95.2	94.3	94	2340	2030
	30	95.4	79	80	83	90	2340	2000	152	93.0	92.0	94	2370	2070
	40	93.4	81	82	84	90	2670	2290	152	90.6	89.6	94	2410	2100
10500	-30	93.2	80	80	82	91	1810	1490	151	91.9	90.6	90	2080	1790
	-20	94.7	80	80	82	91	1870	1550	151	93.4	92.0	90	2110	1820
	-10	96.2	80	80	82	92	1940	1610	151	94.9	93.4	90	2140	1850
	0	97.7	80	80	82	92	2010	1670	151	96.4	94.8	90	2170	1880
	10	99.2	79	79	82	91	2040	1700	151	97.3	96.3	90	2200	1910
	20	97.4	76	76	81	90	1990	1650	151	95.2	94.3	90	2230	1940
	30	95.4	74	76	80	88	2020	1720	151	93.0	92.0	90	2270	1970
	40	93.4	76	77	80	87	2250	1920	151	90.7	89.6	90	2300	2000
9500	-30	93.2	80	80	83	93	1840	1530	150	91.9	90.6	86	2000	1720
	-20	94.7	80	80	83	93	1900	1590	150	93.4	92.0	86	2030	1740
	-10	96.2	80	80	83	93	1970	1650	150	94.9	93.4	86	2050	1770
	0	97.7	80	80	83	93	2040	1710	150	96.4	94.8	86	2080	1790
	10	99.2	80	80	83	92	2070	1730	150	97.3	96.3	86	2110	1820
	20	97.4	77	77	79	89	2000	1670	150	95.2	94.3	86	2130	1850
	30	95.4	73	73	77	86	1880	1560	150	93.0	92.0	86	2160	1870
	40	93.4	71	72	76	84	1910	1620	150	90.7	89.6	86	2190	1900

Figure 7-17 (Sheet 1 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° — **PRESSURE ALTITUDE SEA LEVEL**

LANDING - FLAPS LAND — **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 – KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	I.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	93.2	90	91	97	103	2850	2440	157	92.0	90.6			
	-20	94.7	89	91	97	103	2960	2530	157	93.5	92.0			
	-10	96.2	89	91	97	103	3060	2620	157	94.9	93.4			
	0	97.7	89	90	97	103	3160	2700	157	96.4	94.8			
	10	99.2	89	91	97	103	3320	2850	157	97.2	96.3			
	20	97.4	90	92	97	103	3670	3140	157	95.1	94.3			
14500	-30	93.2	87	88	94	101	2640	2260	156	92.0	90.6			
	-20	94.7	87	88	94	101	2730	2350	156	93.5	92.0			
	-10	96.2	87	88	94	101	2810	2420	156	94.9	93.4			
	0	97.7	86	88	94	101	2910	2500	156	96.4	94.8			
	10	99.2	86	88	94	101	3050	2630	156	97.2	96.3			
	20	97.4	88	89	95	101	3370	2890	156	95.1	94.3			
	30	95.4	90	91	96	101	3870	3320	156	93.0	92.0			
14400	-30	93.2	86	87	94	100	2610	2230	156	92.0	90.6	105	2790	2360
	-20	94.7	86	87	94	100	2700	2320	156	93.5	92.0	105	2860	2420
	-10	96.2	86	87	94	100	2780	2390	156	94.9	93.4	105	2940	2490
	0	97.7	86	87	94	100	2870	2470	156	96.4	94.8	105	3020	2550
	10	99.2	86	87	94	100	3010	2590	156	97.2	96.3	105	3100	2620
	20	97.4	87	89	95	100	3320	2850	156	95.1	94.3	105	3190	2690
	30	95.4	90	91	95	100	3810	3270	156	93.0	92.0	105	3270	2760
13500	-30	93.2	82	83	90	97	2310	1970	155	92.0	90.6	102	2650	2280
	-20	94.7	82	83	90	97	2400	2050	155	93.4	92.0	102	2710	2330
	-10	96.2	81	83	90	97	2470	2110	155	94.9	93.4	102	2780	2370
	0	97.7	81	82	90	97	2540	2180	155	96.4	94.8	102	2850	2420
	10	99.2	82	83	90	97	2660	2290	155	97.2	96.3	102	2920	2470
	20	97.4	84	85	91	97	2910	2510	155	95.1	94.3	102	2990	2530
	30	95.4	86	87	92	97	3340	2870	155	93.0	92.0	102	3060	2590
	40	93.4	88	89	93	97	3830	3280	155	90.6	89.6	102	3130	2660
12500	-30	93.2	79	79	87	95	2120	1740	154	92.0	90.6	98	2540	2200
	-20	94.7	78	78	87	95	2190	1810	154	93.4	92.0	98	2580	2240
	-10	96.2	79	79	87	95	2270	1880	154	94.9	93.4	98	2620	2280
	0	97.7	79	79	87	95	2350	1950	154	96.4	94.8	98	2680	2330
	10	99.2	78	78	87	95	2390	2010	154	97.3	96.3	98	2730	2370
	20	97.4	78	79	87	94	2530	2170	154	95.1	94.3	98	2790	2410
	30	95.4	81	82	88	94	2870	2470	154	93.0	92.0	98	2850	2450
	40	93.4	84	84	89	94	3270	2830	154	90.6	89.6	98	2910	2490
11500	-30	93.2	79	79	85	93	2130	1760	152	91.9	90.6	94	2450	2120
	-20	94.7	79	79	85	93	2210	1820	152	93.4	92.0	94	2490	2160
	-10	96.2	79	79	85	93	2290	1900	152	94.9	93.4	94	2530	2190
	0	97.7	79	79	85	93	2360	1970	152	96.4	94.8	94	2570	2230
	10	99.2	78	78	85	93	2400	2000	152	97.3	96.3	94	2610	2270
	20	97.4	76	76	84	92	2340	1950	152	95.2	94.3	94	2650	2310
	30	95.4	75	76	83	90	2460	2110	152	93.0	92.0	94	2680	2340
	40	93.4	78	79	84	90	2810	2410	152	90.6	89.6	94	2720	2380
10500	-30	93.2	80	80	82	91	2170	1800	151	91.9	90.6	90	2370	2030
	-20	94.7	80	80	82	91	2240	1860	151	93.4	92.0	90	2400	2070
	-10	96.2	80	80	82	92	2320	1940	151	94.9	93.4	90	2440	2100
	0	97.7	80	80	82	92	2400	2010	151	96.4	94.8	90	2470	2140
	10	99.2	79	79	82	91	2430	2040	151	97.3	96.3	90	2500	2170
	20	97.4	76	76	81	90	2360	1970	151	95.2	94.3	90	2540	2200
	30	95.4	72	72	80	88	2220	1830	151	93.0	92.0	90	2570	2240
	40	93.4	72	73	80	87	2380	2030	151	90.7	89.6	90	2610	2270
9500	-30	93.2	80	80	83	93	2240	1860	150	91.9	90.6	86	2280	1950
	-20	94.7	80	80	83	93	2310	1930	150	93.4	92.0	86	2310	1980
	-10	96.2	80	80	83	93	2390	2000	150	94.9	93.4	86	2340	2010
	0	97.7	80	80	83	93	2470	2070	150	96.4	94.8	86	2370	2040
	10	99.2	80	80	83	92	2500	2100	150	97.3	96.3	86	2400	2070
	20	97.4	77	77	79	89	2410	2010	150	95.2	94.3	86	2430	2100
	30	95.4	73	73	77	86	2240	1860	150	93.0	92.0	86	2460	2130
	40	93.4	68	68	76	84	2100	1720	150	90.7	89.6	86	2500	2160

Figure 7-17 (Sheet 1 of 8)

Airplanes -0001 thru -0114 Except Airplanes
Incorporating SBS550-32-1 and Airplanes
-0001 thru -0160 Incorporating
SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 2000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	96.8	92	94	97	103	2900	2500	156	95.6	93.8			
	-20	98.4	92	93	97	103	3000	2590	156	97.2	95.3			
	-10	100.0	92	93	97	103	3100	2680	156	98.7	96.9			
	0	101.3	92	93	97	103	3210	2780	156	99.3	98.4			
	10	99.4	93	94	97	103	3550	3080	156	97.2	96.6			
	20	97.4	95	96	98	103	3990	3470	156	95.1	94.3			
14500	-30	96.8	90	91	94	101	2690	2310	155	95.6	93.8			
	-20	98.4	90	91	94	101	2780	2390	155	97.1	95.3			
	-10	100.0	89	91	94	101	2870	2480	155	98.7	96.9			
	0	101.3	89	90	94	101	2970	2570	155	99.3	98.4			
	10	99.4	91	92	95	101	3280	2840	155	97.2	96.6			
	20	97.4	92	93	96	101	3680	3200	155	95.1	94.3			
14400	-30	96.8	89	90	94	100	2650	2270	155	95.6	93.8	105	2510	2180
	-20	98.4	89	90	94	100	2740	2360	155	97.1	95.3	105	2570	2230
	-10	100.0	89	90	94	100	2830	2440	155	98.7	96.9	105	2620	2280
	0	101.3	89	90	94	100	2930	2530	155	99.3	98.4	105	2680	2330
	10	99.4	90	91	94	100	3230	2800	155	97.2	96.6	105	2730	2380
	20	97.4	92	93	95	100	3630	3150	155	95.1	94.3	105	2790	2440
13500	-30	96.8	85	86	90	97	2340	2000	154	95.6	93.8	102	2420	2100
	-20	98.4	85	86	90	97	2430	2080	154	97.1	95.3	102	2470	2150
	-10	100.0	85	86	90	97	2500	2150	154	98.7	96.9	102	2520	2190
	0	101.3	85	86	90	97	2590	2230	154	99.3	98.4	102	2570	2240
	10	99.4	86	87	91	97	2860	2470	154	97.2	96.6	102	2620	2280
	20	97.4	88	89	92	97	3210	2780	154	95.1	94.3	102	2670	2330
	30	95.4	90	91	92	97	3650	3170	154	93.0	91.9	102	2720	2380
12500	-30	96.8	81	82	87	95	2070	1770	152	95.6	93.8	98	2320	2010
	-20	98.4	81	82	87	95	2150	1830	152	97.1	95.3	98	2370	2050
	-10	100.0	81	82	87	95	2220	1900	152	98.7	96.9	98	2410	2090
	0	101.3	81	82	87	95	2290	1970	152	99.3	98.4	98	2450	2140
	10	99.4	81	82	87	94	2470	2120	152	97.2	96.6	98	2500	2180
	20	97.4	83	84	88	94	2770	2380	152	95.1	94.3	98	2540	2220
	30	95.4	85	86	88	94	3150	2720	152	93.0	91.9	98	2590	2260
	40	93.4	87	88	89	94	3600	3110	152	90.6	89.6	98	2630	2300
11500	-30	96.8	79	79	85	93	1920	1580	151	95.6	93.8	94	2230	1930
	-20	98.4	79	79	85	93	1990	1640	151	97.1	95.3	94	2270	1970
	-10	100.0	79	79	85	93	2060	1710	151	98.7	96.9	94	2310	2000
	0	101.3	79	79	85	93	2130	1770	151	99.3	98.4	94	2340	2040
	10	99.4	78	79	84	92	2180	1870	151	97.2	96.6	94	2380	2080
	20	97.4	78	79	83	90	2360	2020	151	95.1	94.3	94	2420	2110
	30	95.4	80	81	84	90	2690	2310	151	93.0	91.9	94	2460	2150
	40	93.4	82	83	85	90	3060	2640	151	90.6	89.6	94	2500	2190
10500	-30	96.8	80	80	82	91	1920	1590	149	95.5	93.8	90	2140	1850
	-20	98.4	79	79	82	91	1990	1650	149	97.1	95.3	90	2170	1880
	-10	100.0	79	79	82	92	2060	1720	149	98.7	96.9	90	2210	1910
	0	101.3	79	79	82	92	2130	1780	149	99.3	98.4	90	2240	1940
	10	99.4	76	76	81	90	2070	1720	149	97.3	96.6	90	2280	1980
	20	97.4	74	75	80	88	2070	1770	149	95.2	94.3	90	2310	2010
	30	95.4	75	76	79	87	2260	1930	149	93.0	91.9	90	2350	2040
	40	93.4	77	78	80	87	2580	2210	149	90.6	89.6	90	2380	2080
9500	-30	96.8	80	80	83	93	1950	1630	148	95.5	93.8	86	2050	1770
	-20	98.4	80	80	83	93	2020	1690	148	97.1	95.3	86	2080	1800
	-10	100.0	80	80	83	93	2090	1750	148	98.7	96.9	86	2110	1820
	0	101.3	80	80	83	93	2160	1810	148	99.3	98.4	86	2140	1850
	10	99.4	77	77	80	89	2080	1740	148	97.3	96.6	86	2170	1880
	20	97.4	73	73	78	86	1980	1650	148	95.2	94.3	86	2200	1910
	30	95.4	71	72	76	84	1950	1660	148	93.0	91.9	86	2230	1940
	40	93.4	72	72	76	83	2130	1810	148	90.6	89.6	86	2260	1970

Figure 7-17 (Sheet 3 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° **PRESSURE ALTITUDE 2000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VEMR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	96.8	89	91	97	103	3050	2610	156	95.6	93.8			
	-20	98.4	89	91	97	103	3170	2710	156	97.2	95.3			
	-10	100.0	89	90	97	103	3280	2810	156	98.7	96.9			
	0	101.3	88	90	97	103	3400	2910	156	99.3	98.4			
	10	99.4	90	91	97	103	3770	3240	156	97.2	96.6			
	20	97.4	91	93	98	103	4280	3670	156	95.1	94.3			
14500	-30	96.8	87	88	94	101	2810	2420	155	95.6	93.8			
	-20	98.4	86	88	94	101	2910	2510	155	97.1	95.3			
	-10	100.0	86	88	94	101	3010	2590	155	98.7	96.9			
	0	101.3	86	87	94	101	3120	2680	155	99.3	98.4			
	10	99.4	87	89	95	101	3470	2980	155	97.2	96.6			
	20	97.4	89	91	96	101	3920	3360	155	95.1	94.3			
14400	-30	96.8	86	87	94	100	2770	2390	155	95.6	93.8	105	2940	2480
	-20	98.4	86	87	94	100	2870	2470	155	97.1	95.3	105	3020	2550
	-10	100.0	86	87	94	100	2970	2560	155	98.7	96.9	105	3110	2630
	0	101.3	86	87	94	100	3080	2650	155	99.3	98.4	105	3200	2700
	10	99.4	87	89	94	100	3420	2930	155	97.2	96.6	105	3300	2780
	20	97.4	89	90	95	100	3860	3320	155	95.1	94.3	105	3400	2860
13500	-30	96.8	82	83	90	97	2460	2110	154	95.6	93.8	102	2780	2370
	-20	98.4	81	83	90	97	2550	2190	154	97.1	95.3	102	2850	2420
	-10	100.0	81	82	90	97	2620	2260	154	98.7	96.9	102	2920	2480
	0	101.3	81	82	90	97	2710	2340	154	99.3	98.4	102	3000	2550
	10	99.4	83	84	91	97	2990	2590	154	97.2	96.6	102	3080	2610
	20	97.4	85	86	92	97	3370	2900	154	95.1	94.3	102	3160	2680
	30	95.4	87	88	92	97	3870	3320	154	93.0	91.9	102	3250	2750
12500	-30	96.8	78	78	87	95	2250	1860	152	95.6	93.8	98	2620	2280
	-20	98.4	78	78	87	95	2330	1930	152	97.1	95.3	98	2680	2330
	-10	100.0	78	78	87	95	2410	2010	152	98.7	96.9	98	2740	2370
	0	101.3	78	78	87	95	2490	2080	152	99.3	98.4	98	2810	2420
	10	99.4	78	79	87	94	2590	2230	152	97.2	96.6	98	2870	2460
	20	97.4	80	81	88	94	2900	2500	152	95.1	94.3	98	2940	2510
	30	95.4	83	84	88	94	3300	2850	152	93.0	91.9	98	3010	2560
	40	93.4	85	86	89	94	3780	3250	152	90.6	89.6	98	3080	2620
11500	-30	96.8	79	79	85	93	2270	1880	151	95.6	93.8	94	2530	2190
	-20	98.4	79	79	85	93	2340	1950	151	97.1	95.3	94	2570	2240
	-10	100.0	79	79	85	93	2430	2030	151	98.7	96.9	94	2620	2280
	0	101.3	79	79	85	93	2500	2100	151	99.3	98.4	94	2660	2320
	10	99.4	76	76	84	92	2430	2030	151	97.2	96.6	94	2700	2360
	20	97.4	75	76	83	90	2480	2130	151	95.1	94.3	94	2740	2400
	30	95.4	77	78	84	90	2620	2430	151	93.0	91.9	94	2800	2440
	40	93.4	80	81	85	90	3210	2770	151	90.6	89.6	94	2860	2480
10500	-30	96.8	80	80	82	91	2300	1920	149	95.5	93.8	90	2440	2100
	-20	98.4	79	79	82	91	2380	1990	149	97.1	95.3	90	2480	2140
	-10	100.0	79	79	82	92	2460	2060	149	98.7	96.9	90	2510	2180
	0	101.3	79	79	82	92	2540	2130	149	99.3	98.4	90	2550	2210
	10	99.4	76	76	81	90	2450	2050	149	97.3	96.6	90	2590	2250
	20	97.4	73	73	80	88	2340	1950	149	95.2	94.3	90	2630	2290
	30	95.4	72	73	79	87	2390	2040	149	93.0	91.9	90	2670	2330
	40	93.4	74	75	80	87	2720	2330	149	90.6	89.6	90	2700	2360
9500	-30	96.8	80	80	83	93	2370	1980	148	95.5	93.8	86	2340	2010
	-20	98.4	80	80	83	93	2450	2050	148	97.1	95.3	86	2380	2040
	-10	100.0	80	80	83	93	2530	2130	148	98.7	96.9	86	2410	2080
	0	101.3	80	80	83	93	2610	2200	148	99.3	98.4	86	2440	2110
	10	99.4	77	77	80	89	2500	2100	148	97.3	95.6	86	2480	2140
	20	97.4	73	73	78	86	2370	1970	148	95.2	94.3	86	2510	2180
	30	95.4	69	69	76	84	2220	1840	148	93.0	91.9	86	2550	2210
	40	93.4	68	69	76	83	2260	1920	148	90.6	89.6	86	2580	2240

Figure 7-17 (Sheet 3 of 8)

Airplanes -0001 thru -0114 Except Airplanes
Incorporating SBS550-32-1 and Airplanes
-0001 thru -0160 Incorporating
SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° **PRESSURE ALTITUDE 4000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	100.1	92	93	97	103	3100	2680	155	99.0	97.1			
	-20	101.9	92	93	97	103	3200	2770	155	100.7	98.7			
	-10	102.7	92	93	97	103	3390	2940	155	101.3	100.3			
	0	101.3	93	94	97	103	3710	3230	155	99.2	98.9			
	10	99.4	95	95	98	103	4110	3580	155	97.2	96.6			
14500	-30	100.1	89	91	94	101	2870	2470	154	99.0	97.1			
	-20	101.9	89	90	94	101	2970	2560	154	100.7	98.7			
	-10	102.7	90	91	94	101	3140	2720	154	101.3	100.3			
	0	101.3	91	92	95	101	3430	2970	154	99.2	98.9			
	10	99.4	92	93	96	101	3790	3300	154	97.2	96.6			
14400	-30	100.1	89	90	94	100	2830	2440	154	99.0	97.1	105	2620	2280
	-20	101.9	89	90	94	100	2930	2530	154	100.7	98.7	105	2680	2330
	-10	102.7	89	90	94	100	3100	2680	154	101.3	100.3	105	2740	2390
	0	101.3	90	91	95	100	3380	2930	154	99.2	98.9	105	2800	2450
	10	99.4	92	93	95	100	3740	3250	154	97.2	96.6	105	2870	2500
13500	-30	100.1	85	86	90	97	2500	2150	152	99.0	97.1	102	2520	2190
	-20	101.9	85	86	90	97	2580	2220	152	100.6	98.7	102	2570	2240
	-10	102.7	85	86	91	97	2730	2360	152	101.3	100.3	102	2630	2290
	0	101.3	86	87	91	97	2990	2580	152	99.3	98.9	102	2680	2340
	10	99.4	88	89	92	97	3300	2850	152	97.2	96.6	102	2740	2390
	20	97.4	89	90	92	97	3680	3200	152	95.1	94.2	102	2790	2440
12500	-30	100.1	81	82	87	95	2210	1890	150	98.9	97.1	98	2410	2090
	-20	101.9	81	82	87	95	2290	1960	150	100.6	98.7	98	2460	2140
	-10	102.7	81	82	87	95	2390	2060	150	101.3	100.3	98	2500	2180
	0	101.3	81	83	87	94	2580	2220	150	99.3	98.9	98	2550	2230
	10	99.4	83	84	87	94	2850	2460	150	97.2	96.6	98	2600	2270
	20	97.4	85	86	88	94	3170	2740	150	95.1	94.2	98	2650	2320
	30	95.4	87	87	89	94	3630	3140	150	93.0	91.9	98	2700	2360
11500	-30	100.1	79	79	85	93	2050	1690	149	98.9	97.1	94	2310	2000
	-20	101.9	79	79	85	93	2130	1760	149	100.6	98.7	94	2350	2040
	-10	102.7	78	78	85	93	2160	1830	149	101.3	100.3	94	2390	2080
	0	101.3	77	79	84	92	2260	1940	149	99.3	98.9	94	2430	2120
	10	99.4	78	79	83	90	2430	2080	149	97.2	96.6	94	2480	2160
	20	97.4	80	81	84	90	2700	2330	149	95.1	94.2	94	2520	2200
	30	95.4	82	83	85	90	3090	2660	149	93.0	91.9	94	2560	2240
	40	93.4	84	84	85	90	3530	3050	149	90.6	89.6	94	2610	2280
10500	-30	100.1	79	79	82	91	2050	1700	147	98.9	97.1	90	2210	1910
	-20	101.9	79	79	82	92	2130	1770	147	100.6	98.7	90	2240	1950
	-10	102.7	78	78	82	91	2150	1790	147	101.4	100.3	90	2280	1980
	0	101.3	76	76	81	90	2120	1760	147	99.3	98.9	90	2320	2020
	10	99.4	74	75	80	88	2130	1830	147	97.2	96.6	90	2360	2050
	20	97.4	74	75	79	87	2280	1960	147	95.1	94.2	90	2390	2090
	30	95.4	76	77	80	87	2590	2230	147	93.0	91.9	90	2430	2120
	40	93.4	79	79	81	87	2960	2550	147	90.6	89.6	90	2470	2160
9500	-30	100.1	80	80	83	93	2070	1740	146	98.9	97.1	86	2110	1820
	-20	101.9	80	80	83	93	2150	1800	146	100.6	98.7	86	2150	1860
	-10	102.7	79	79	82	92	2170	1820	146	101.4	100.3	86	2180	1890
	0	101.3	76	76	79	88	2130	1780	146	99.3	98.9	86	2210	1920
	10	99.4	74	74	78	86	2060	1720	146	97.2	96.6	86	2240	1950
	20	97.4	70	71	77	85	1990	1700	146	95.1	94.2	86	2280	1980
	30	95.4	71	72	76	83	2160	1840	146	93.0	91.9	86	2310	2010
	40	93.4	73	74	76	83	2450	2100	146	90.6	89.6	86	2340	2040

Figure 7-17 (Sheet 5 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°
LANDING - FLAPS LAND

PRESSURE ALTITUDE 4000 FEET
ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	100.1	89	90	97	103	3270	2800	155	99.0	97.1			
	-20	101.9	88	90	97	103	3390	2910	155	100.7	98.7			
	-10	102.7	89	90	97	103	3600	3100	155	101.3	100.3			
	0	101.3	90	91	97	103	3960	3410	155	99.2	98.9			
	10	99.4	91	93	98	103	4420	3800	155	97.2	96.6			
14500	-30	100.1	86	88	94	101	3010	2590	154	99.0	97.1			
	-20	101.9	86	87	94	101	3120	2680	154	100.7	98.7			
	-10	102.7	86	88	94	101	3310	2840	154	101.3	100.3			
	0	101.3	87	89	95	101	3630	3120	154	99.2	98.9			
	10	99.4	89	90	96	101	4040	3480	154	97.2	96.6			
14400	-30	100.1	86	87	94	100	2970	2550	154	99.0	97.1	105	3110	2620
	-20	101.9	86	87	94	100	3070	2640	154	100.7	98.7	105	3210	2710
	-10	102.7	86	88	94	100	3260	2800	154	101.3	100.3	105	3310	2790
	0	101.3	87	89	95	100	3580	3080	154	99.2	98.9	105	3420	2880
	10	99.4	88	90	95	100	3980	3430	154	97.2	96.6	105	3530	2960
13500	-30	100.1	82	83	90	97	2620	2260	152	99.0	97.1	102	2920	2480
	-20	101.9	81	82	90	97	2710	2340	152	100.6	98.7	102	3010	2550
	-10	102.7	82	83	91	97	2860	2480	152	101.3	100.3	102	3090	2620
	0	101.3	83	84	91	97	3130	2710	152	99.3	98.9	102	3180	2700
	10	99.4	85	86	92	97	3480	2990	152	97.2	96.6	102	3270	2770
	20	97.4	86	88	92	97	3900	3360	152	95.1	94.2	102	3370	2850
12500	-30	100.1	78	78	87	95	2390	2000	150	98.9	97.1	98	2740	2370
	-20	101.9	78	78	87	95	2480	2070	150	100.6	98.7	98	2810	2420
	-10	102.7	77	78	87	95	2520	2170	150	101.3	100.3	98	2880	2470
	0	101.3	78	79	87	94	2710	2340	150	99.3	98.9	98	2950	2520
	10	99.4	80	81	87	94	2980	2580	150	97.2	96.6	98	3030	2580
	20	97.4	82	83	88	94	3320	2880	150	95.1	94.2	98	3100	2650
	30	95.4	84	85	89	94	3820	3290	150	93.0	91.9	98	3180	2710
11500	-30	100.1	79	79	85	93	2410	2010	149	98.9	97.1	94	2620	2280
	-20	101.9	79	79	85	93	2500	2090	149	100.6	98.7	94	2690	2320
	-10	102.7	78	78	85	93	2530	2120	149	101.3	100.3	94	2710	2370
	0	101.3	75	75	84	92	2490	2080	149	99.3	98.9	94	2760	2410
	10	99.4	74	75	83	90	2550	2200	149	97.2	96.6	94	2820	2450
	20	97.4	77	77	84	90	2840	2450	149	95.1	94.2	94	2880	2500
	30	95.4	79	80	85	90	3240	2800	149	93.0	91.9	94	2950	2540
	40	93.4	81	82	85	90	3690	3200	149	90.6	89.6	94	3010	2590
10500	-30	100.1	79	79	82	91	2440	2040	147	98.9	97.1	90	2520	2180
	-20	101.9	79	79	82	92	2530	2130	147	100.6	98.7	90	2560	2220
	-10	102.7	78	78	82	91	2550	2150	147	101.4	100.3	90	2600	2260
	0	101.3	76	76	81	90	2500	2100	147	99.3	98.9	90	2640	2300
	10	99.4	73	73	80	88	2430	2030	147	97.2	96.6	90	2680	2340
	20	97.4	71	72	79	87	2410	2070	147	95.1	94.2	90	2720	2380
	30	95.4	73	74	80	87	2730	2350	147	93.0	91.9	90	2760	2420
	40	93.4	76	77	81	87	3110	2680	147	90.6	89.6	90	2810	2460
9500	-30	100.1	80	80	83	93	2510	2110	146	98.9	97.1	86	2420	2080
	-20	101.9	80	80	83	93	2600	2190	146	100.6	98.7	86	2450	2120
	-10	102.7	79	79	82	92	2620	2210	146	101.4	100.3	86	2490	2150
	0	101.3	76	76	79	88	2550	2140	146	99.3	98.9	86	2530	2190
	10	99.4	74	74	78	86	2460	2060	146	97.2	96.6	86	2560	2230
	20	97.4	70	70	77	85	2360	1960	146	95.1	94.2	86	2600	2260
	30	95.4	67	68	76	83	2280	1950	146	93.0	91.9	86	2640	2300
	40	93.4	70	71	76	83	2590	2220	146	90.6	89.6	86	2670	2330

Figure 7-17 (Sheet 5 of 8)

Airplanes -0001 thru -0114 Except Airplanes
Incorporating SBS550-32-1 and Airplanes
-0001 thru -0160 Incorporating
SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 6000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT -	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	103.0	92	93	97	103	3360	2920	153	102.5	99.4			
	-20	103.0	93	94	97	103	3620	3140	153	103.4	101.1			
	-10	102.7	94	95	97	103	3920	3410	153	101.3	101.2			
	0	101.3	95	96	98	103	4310	3760	153	99.2	98.9			
14500	-30	103.0	90	91	94	101	3110	2700	152	102.5	99.4			
	-20	103.0	90	91	95	101	3340	2900	152	103.4	101.1			
	-10	102.7	91	92	95	101	3620	3150	152	101.3	101.2			
	0	101.3	92	93	96	101	3970	3460	152	99.2	98.9			
14400	-30	103.0	89	90	94	100	3070	2660	152	102.5	99.4	105	2740	2390
	-20	103.0	90	91	94	100	3300	2860	152	103.4	101.1	105	2810	2450
	-10	102.7	91	92	95	100	3570	3100	152	101.3	101.2	105	2880	2510
	0	101.3	92	93	95	100	3920	3420	152	99.2	98.9	105	2950	2570
	10	99.4	93	94	96	100	4340	3790	152	97.2	96.5	105	3020	2640
13500	-30	103.0	85	86	90	97	2710	2340	150	102.5	99.4	102	2630	2290
	-20	103.0	86	87	91	97	2910	2520	150	103.4	101.1	102	2690	2340
	-10	102.7	87	88	91	97	3150	2730	150	101.3	101.2	102	2750	2400
	0	101.3	88	89	92	97	3460	3000	150	99.2	98.9	102	2810	2450
	10	99.4	89	90	92	97	3820	3320	150	97.2	96.5	102	2870	2510
12500	-30	103.0	81	82	87	95	2380	2050	148	102.5	99.4	98	2510	2180
	-20	103.0	81	82	87	94	2510	2160	148	103.4	101.1	98	2560	2230
	-10	102.7	82	83	87	94	2710	2340	148	101.3	101.2	98	2610	2280
	0	101.3	83	84	88	94	2980	2580	148	99.3	98.9	98	2670	2330
	10	99.4	85	85	88	94	3290	2860	148	97.2	96.5	98	2720	2380
	20	97.4	86	87	89	94	3680	3200	148	95.1	94.2	98	2780	2430
11500	-30	103.0	76	78	85	93	2160	1820	147	102.4	99.4	94	2390	2080
	-20	103.0	77	78	85	92	2230	1920	147	103.4	101.1	94	2440	2120
	-10	102.7	78	79	84	91	2360	2030	147	101.3	101.2	94	2480	2170
	0	101.3	78	79	83	90	2540	2190	147	99.3	98.9	94	2530	2210
	10	99.4	80	80	84	90	2800	2420	147	97.2	96.5	94	2580	2260
	20	97.4	81	82	84	90	3140	2710	147	95.1	94.2	94	2630	2300
	30	95.4	83	84	85	90	3560	3090	147	92.9	91.9	94	2680	2350
10500	-30	103.0	78	78	82	91	2150	1790	145	102.4	99.4	90	2280	1980
	-20	103.0	77	77	82	90	2160	1800	145	103.4	101.1	90	2320	2020
	-10	102.7	75	75	81	89	2160	1790	145	101.3	101.2	90	2360	2060
	0	101.3	74	75	80	88	2220	1900	145	99.3	98.9	90	2410	2100
	10	99.4	74	75	79	87	2370	2030	145	97.2	96.5	90	2450	2140
	20	97.4	76	77	80	87	2630	2270	145	95.1	94.2	90	2490	2180
	30	95.4	78	79	81	87	2990	2580	145	93.0	91.9	90	2530	2220
	40	93.4	80	80	81	87	3420	2960	145	90.6	89.5	90	2570	2260
9500	-30	103.0	79	79	82	92	2170	1820	144	102.4	99.4	86	2160	1890
	-20	103.0	77	77	80	90	2170	1820	144	103.4	101.1	86	2210	1920
	-10	102.7	76	76	78	87	2160	1800	144	101.4	101.2	86	2250	1950
	0	101.3	73	73	78	86	2110	1760	144	99.3	98.9	86	2290	1990
	10	99.4	70	71	77	85	2060	1770	144	97.2	96.5	86	2320	2020
	20	97.4	71	72	76	83	2210	1900	144	95.1	94.2	86	2360	2060
	30	95.4	72	73	76	83	2470	2120	144	93.0	91.9	86	2390	2090
	40	93.4	74	75	77	83	2820	2430	144	90.6	89.5	86	2430	2130

Figure 7-17 (Sheet 7 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° — **PRESSURE ALTITUDE 6000 FEET**

LANDING - FLAPS LAND — **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	103.0	88	90	97	103	3570	3070	153	102.5	99.4			
	-20	103.0	89	91	97	103	3850	3320	153	103.4	101.1			
	-10	102.7	90	92	97	103	4200	3620	153	101.3	101.2			
	0	101.3	91	92	98	103	4650	4000	153	99.2	98.9			
14500	-30	103.0	86	88	94	101	3280	2820	152	102.5	99.4			
	-20	103.0	87	88	95	101	3540	3040	152	103.4	101.1			
	-10	102.7	88	89	95	101	3850	3310	152	101.3	101.2			
	0	101.3	89	90	96	101	4250	3660	152	99.2	98.9			
14400	-30	103.0	86	87	94	100	3230	2780	152	102.5	99.4	105	3310	2790
	-20	103.0	86	88	94	100	3490	3000	152	103.4	101.1	105	3430	2880
	-10	102.7	87	89	95	100	3790	3250	152	101.3	101.2	105	3550	2980
	0	101.3	88	90	95	100	4190	3610	152	99.2	98.9	105	3670	3080
	10	99.4	89	91	96	100	4660	4020	152	97.2	96.5	105	3800	3180
13500	-30	103.0	82	83	90	97	2840	2460	150	102.5	99.4	102	3090	2620
	-20	103.0	83	84	91	97	3050	2640	150	103.4	101.1	102	3190	2700
	-10	102.7	84	85	91	97	3310	2860	150	101.3	101.2	102	3290	2780
	0	101.3	85	86	92	97	3650	3150	150	99.2	98.9	102	3390	2870
	10	99.4	86	87	92	97	4060	3500	150	97.2	96.5	102	3500	2950
12500	-30	103.0	77	78	87	95	2520	2160	148	102.5	99.4	98	2880	2470
	-20	103.0	77	79	87	94	2640	2280	148	103.4	101.1	98	2960	2530
	-10	102.7	79	80	87	94	2850	2470	148	101.3	101.2	98	3040	2590
	0	101.3	80	81	88	94	3120	2710	148	99.3	98.9	98	3130	2660
	10	99.4	82	83	88	94	3460	2990	148	97.2	96.5	98	3210	2730
	20	97.4	83	85	89	94	3890	3350	148	95.1	94.2	98	3300	2810
11500	-30	103.0	78	78	85	93	2530	2120	147	102.4	99.4	94	2710	2370
	-20	103.0	76	76	84	92	2540	2120	147	103.4	101.1	94	2760	2420
	-10	102.7	74	75	84	91	2530	2140	147	101.3	101.2	94	2830	2460
	0	101.3	75	76	83	90	2670	2310	147	99.3	98.9	94	2900	2510
	10	99.4	77	77	84	90	2940	2550	147	97.2	96.5	94	2970	2560
	20	97.4	79	79	84	90	3290	2850	147	95.1	94.2	94	3040	2610
	30	95.4	81	81	85	90	3740	3240	147	92.9	91.9	94	3110	2660
10500	-30	103.0	78	78	82	91	2560	2150	145	102.4	99.4	90	2600	2260
	-20	103.0	77	77	82	90	2560	2150	145	103.4	101.1	90	2650	2310
	-10	102.7	75	75	81	89	2540	2130	145	101.3	101.2	90	2690	2350
	0	101.3	72	72	80	88	2490	2080	145	99.3	98.9	90	2740	2390
	10	99.4	71	72	79	87	2500	2150	145	97.2	96.5	90	2780	2440
	20	97.4	73	74	80	87	2780	2390	145	95.1	94.2	90	2830	2480
	30	95.4	75	76	81	87	3140	2720	145	93.0	91.9	90	2880	2530
	40	93.4	77	78	81	87	3590	3110	145	90.6	89.5	90	2940	2570
9500	-30	103.0	79	79	82	92	2620	2210	144	102.4	99.4	86	2490	2160
	-20	103.0	77	77	80	90	2610	2200	144	103.4	101.1	86	2530	2200
	-10	102.7	76	76	78	87	2580	2170	144	101.4	101.2	86	2570	2240
	0	101.3	73	73	78	86	2510	2110	144	99.3	98.9	86	2610	2270
	10	99.4	70	70	77	85	2440	2030	144	97.2	96.5	86	2650	2310
	20	97.4	67	68	76	83	2340	2010	144	95.1	94.2	86	2690	2350
	30	95.4	69	70	76	83	2610	2240	144	93.0	91.9	86	2730	2390
	40	93.4	72	72	77	83	2980	2560	144	90.6	89.5	86	2780	2430

Figure 7-17 (Sheet 7 of 8)

Airplanes -0001 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0001 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°
LANDING - FLAPS LAND

PRESSURE ALTITUDE SEA LEVEL
ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 – KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	93.2	93	94	97	103	3130	2680	157	92.0	90.6			
	-20	94.7	93	94	97	103	3240	2780	157	93.5	92.0			
	-10	96.2	92	93	97	103	3350	2870	157	94.9	93.4			
	0	97.1	92	93	97	103	3450	2980	157	95.3	94.8			
	10	94.7	92	93	97	103	3610	3130	157	92.9	93.2			
14500	-30	93.2	90	91	94	101	2900	2470	156	92.0	90.6			
	-20	94.7	90	91	94	101	3000	2580	156	93.5	92.0			
	-10	96.2	90	91	94	101	3090	2660	156	94.9	93.4			
	0	97.1	89	91	94	101	3190	2750	156	95.3	94.8			
	10	94.7	90	91	94	101	3350	2890	156	92.9	93.2			
14400	-30	93.2	90	91	94	100	2860	2450	156	92.0	90.6	105	2420	2090
	-20	94.7	90	91	94	100	2970	2540	156	93.5	92.0	105	2470	2140
	-10	96.2	89	90	94	100	3060	2620	156	94.9	93.4	105	2520	2190
	0	97.1	89	90	94	100	3150	2700	156	95.3	94.8	105	2570	2230
	10	94.7	89	90	94	100	3300	2850	156	92.9	93.2	105	2620	2280
13500	-30	93.2	85	87	90	97	2530	2150	155	92.0	90.6	102	2330	2020
	-20	94.7	85	86	90	97	2620	2230	155	93.4	92.0	102	2380	2060
	-10	96.2	85	86	90	97	2700	2310	155	94.9	93.4	102	2420	2100
	0	97.1	85	86	90	97	2780	2380	155	95.3	94.8	102	2470	2150
	10	94.7	85	86	90	97	2920	2510	155	92.9	93.2	102	2510	2190
12500	-30	93.2	81	83	87	95	2240	1900	154	92.0	90.6	98	2240	1940
	-20	94.7	81	82	87	95	2320	1970	154	93.4	92.0	98	2280	1980
	-10	96.2	81	82	87	95	2390	2040	154	94.9	93.4	98	2320	2020
	0	97.1	81	82	87	95	2470	2100	154	95.3	94.8	98	2360	2050
	10	94.7	81	82	87	95	2560	2200	154	92.9	93.2	98	2400	2090
11500	-30	93.2	79	79	85	93	2080	1700	152	91.9	90.6	94	2160	1860
	-20	94.7	79	79	85	93	2150	1760	152	93.4	92.0	94	2190	1900
	-10	96.2	79	79	85	93	2230	1840	152	94.9	93.4	94	2230	1930
	0	97.1	79	79	85	93	2310	1910	152	95.3	94.8	94	2270	1960
	10	94.7	78	79	85	93	2350	1950	152	92.9	93.2	94	2300	2000
10500	-30	93.2	80	80	82	91	2080	1710	151	91.9	90.6	90	2080	1790
	-20	94.7	80	80	82	91	2150	1780	151	93.4	92.0	90	2110	1820
	-10	96.2	80	80	82	92	2230	1850	151	94.9	93.4	90	2140	1850
	0	97.1	80	80	82	92	2310	1920	151	95.3	94.8	90	2170	1880
	10	94.7	79	79	82	91	2350	1950	151	93.0	93.2	90	2200	1910
9500	-30	93.2	80	80	83	93	2120	1760	150	91.9	90.6	86	2000	1720
	-20	94.7	80	80	83	93	2180	1830	150	93.4	92.0	86	2030	1740
	-10	96.2	80	80	83	93	2270	1900	150	94.9	93.4	86	2050	1770
	0	97.1	80	80	83	93	2350	1970	150	95.3	94.8	86	2080	1790
	10	94.7	80	80	83	92	2380	1990	150	93.0	93.2	86	2110	1820

Figure 7-18 (Sheet 1 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° **PRESSURE ALTITUDE SEA LEVEL**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	93.2	90	91	97	103	3280	2810	157	92.0	90.6			
	-20	94.7	89	91	97	103	3400	2910	157	93.5	92.0			
	-10	96.2	89	91	97	103	3520	3010	157	94.9	93.4			
	0	97.1	89	90	97	103	3630	3100	157	95.3	94.8			
	10	94.7	89	91	97	103	3820	3280	157	92.9	93.2			
14500	-30	93.2	87	88	94	101	3040	2600	156	92.0	90.6			
	-20	94.7	87	88	94	101	3140	2700	156	93.5	92.0			
	-10	96.2	87	88	94	101	3230	2780	156	94.9	93.4			
	0	97.1	86	88	94	101	3350	2870	156	95.3	94.8			
	10	94.7	86	88	94	101	3510	3020	156	92.9	93.2			
14400	-30	93.2	86	87	94	100	3000	2560	156	92.0	90.6	105	2790	2360
	-20	94.7	86	87	94	100	3100	2670	156	93.5	92.0	105	2860	2420
	-10	96.2	86	87	94	100	3200	2750	156	94.9	93.4	105	2940	2490
	0	97.1	86	87	94	100	3300	2840	156	95.3	94.8	105	3020	2550
	10	94.7	86	87	94	100	3460	2980	156	92.9	93.2	105	3100	2620
13500	-30	93.2	82	83	90	97	2660	2270	155	92.0	90.6	102	2650	2280
	-20	94.7	82	83	90	97	2760	2360	155	93.4	92.0	102	2710	2330
	-10	96.2	81	83	90	97	2840	2430	155	94.9	93.4	102	2780	2370
	0	97.1	81	82	90	97	2920	2510	155	95.3	94.8	102	2850	2420
	10	94.7	82	83	90	97	3060	2630	155	92.9	93.2	102	2920	2470
12500	-30	93.2	79	79	87	95	2440	2000	154	92.0	90.6	98	2540	2200
	-20	94.7	78	78	87	95	2520	2080	154	93.4	92.0	98	2580	2240
	-10	96.2	79	79	87	95	2610	2160	154	94.9	93.4	98	2620	2280
	0	97.1	79	79	87	95	2700	2240	154	95.3	94.8	98	2680	2330
	10	94.7	78	78	87	95	2750	2310	154	92.9	93.2	98	2730	2370
11500	-30	93.2	79	79	85	93	2450	2020	152	91.9	90.6	94	2450	2120
	-20	94.7	79	79	85	93	2540	2090	152	93.4	92.0	94	2490	2160
	-10	96.2	79	79	85	93	2630	2180	152	94.9	93.4	94	2530	2190
	0	97.1	79	79	85	93	2710	2270	152	95.3	94.8	94	2570	2230
	10	94.7	78	78	85	93	2760	2300	152	92.9	93.2	94	2610	2270
10500	-30	93.2	80	80	82	91	2500	2070	151	91.9	90.6	90	2370	2030
	-20	94.7	80	80	82	91	2580	2140	151	93.4	92.0	90	2400	2070
	-10	96.2	80	80	82	92	2670	2230	151	94.9	93.4	90	2440	2100
	0	97.1	80	80	82	92	2760	2310	151	95.3	94.8	90	2470	2140
	10	94.7	79	79	82	91	2790	2350	151	93.0	93.2	90	2500	2170
9500	-30	93.2	80	80	83	93	2580	2140	150	91.9	90.6	86	2280	1950
	-20	94.7	80	80	83	93	2660	2220	150	93.4	92.0	86	2310	1980
	-10	96.2	80	80	83	93	2750	2300	150	94.9	93.4	86	2340	2010
	0	97.1	80	80	83	93	2840	2380	150	95.3	94.8	86	2370	2040
	10	94.7	80	80	83	92	2870	2410	150	93.0	93.2	86	2400	2070

Figure 7-18 (Sheet 1 of 8)

Airplanes -0001 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0001 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° **PRESSURE ALTITUDE 2000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	96.8	92	94	97	103	3330	2870	156	95.6	93.8			
	-20	98.4	92	93	97	103	3450	2980	156	97.2	95.3			
	-10	99.3	92	93	97	103	3560	3080	156	97.6	96.9			
	0	97.1	92	93	97	103	3690	3200	156	95.2	95.6			
	10	94.7	93	94	97	103	4080	3540	156	92.9	93.1			
14500	-30	96.8	90	91	94	101	3090	2660	155	95.6	93.8			
	-20	98.4	90	91	94	101	3200	2750	155	97.1	95.3			
	-10	99.3	89	91	94	101	3300	2850	155	97.6	96.9			
	0	97.1	89	90	94	101	3420	2960	155	95.2	95.6			
	10	94.7	91	92	95	101	3770	3270	155	92.9	93.1			
14400	-30	96.8	89	90	94	100	3050	2610	155	95.6	93.8	105	2510	2180
	-20	98.4	89	90	94	100	3150	2710	155	97.1	95.3	105	2570	2230
	-10	99.3	89	90	94	100	3250	2810	155	97.6	96.9	105	2620	2280
	0	97.1	89	90	94	100	3370	2910	155	95.2	95.6	105	2680	2330
	10	94.7	90	91	94	100	3710	3220	155	92.9	93.1	105	2730	2380
13500	-30	96.8	85	86	90	97	2690	2300	154	95.6	93.8	102	2420	2100
	-20	98.4	85	86	90	97	2790	2390	154	97.1	95.3	102	2470	2150
	-10	99.3	85	86	90	97	2870	2470	154	97.6	96.9	102	2520	2190
	0	97.1	85	86	90	97	2980	2560	154	95.3	95.6	102	2570	2240
	10	94.7	86	87	91	97	3290	2840	154	92.9	93.1	102	2620	2280
12500	-30	96.8	81	82	87	95	2380	2040	152	95.6	93.8	98	2320	2010
	-20	98.4	81	82	87	95	2470	2100	152	97.1	95.3	98	2370	2050
	-10	99.3	81	82	87	95	2550	2180	152	97.6	96.9	98	2410	2090
	0	97.1	81	82	87	95	2630	2270	152	95.3	95.6	98	2450	2140
	10	94.7	81	82	87	94	2840	2440	152	92.9	93.1	98	2500	2180
11500	-30	96.8	79	79	85	93	2210	1820	151	95.6	93.8	94	2230	1930
	-20	98.4	79	79	85	93	2290	1890	151	97.1	95.3	94	2270	1970
	-10	99.3	79	79	85	93	2370	1970	151	97.6	96.9	94	2310	2000
	0	97.1	79	79	85	93	2450	2040	151	95.3	95.6	94	2340	2040
	10	94.7	78	79	84	92	2510	2150	151	92.9	93.1	94	2380	2080
10500	-30	96.8	80	80	82	91	2210	1830	149	95.5	93.8	90	2140	1850
	-20	98.4	79	79	82	91	2290	1900	149	97.1	95.3	90	2170	1880
	-10	99.3	79	79	82	92	2370	1980	149	97.7	96.9	90	2210	1910
	0	97.1	79	79	82	92	2450	2050	149	95.3	95.6	90	2240	1940
	10	94.7	76	76	81	90	2380	1980	149	92.9	93.1	90	2280	1980
9500	-30	96.8	80	80	83	93	2240	1870	148	95.5	93.8	86	2050	1770
	-20	98.4	80	80	83	93	2320	1940	148	97.1	95.3	86	2080	1800
	-10	99.3	80	80	83	93	2400	2010	148	97.7	96.9	86	2110	1820
	0	97.1	80	80	83	93	2480	2080	148	95.3	95.6	86	2140	1850
	10	94.7	77	77	80	89	2390	2000	148	92.9	93.1	86	2170	1880

Figure 7-18 (Sheet 3 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° **PRESSURE ALTITUDE 2000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	.2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	96.8	89	91	97	103	3510	3000	156	95.6	93.8			
	-20	98.4	89	91	97	103	3650	3120	156	97.2	95.3			
	-10	99.3	89	90	97	103	3770	3230	156	97.6	96.9			
	0	97.1	88	90	97	103	3910	3350	156	95.2	95.6			
	10	94.7	90	91	97	103	4340	3730	156	92.9	93.1			
14500	-30	96.8	87	88	94	101	3230	2780	155	95.6	93.8			
	-20	98.4	86	88	94	101	3350	2890	155	97.1	95.3			
	-10	99.3	86	88	94	101	3460	2980	155	97.6	96.9			
	0	97.1	86	87	94	101	3590	3080	155	95.2	95.6			
	10	94.7	87	89	95	101	3990	3430	155	92.9	93.1			
14400	-30	96.8	86	87	94	100	3190	2750	155	95.6	93.8	105	2940	2480
	-20	98.4	86	87	94	100	3300	2840	155	97.1	95.3	105	3020	2550
	-10	99.3	86	87	94	100	3420	2940	155	97.6	96.9	105	3110	2530
	0	97.1	86	87	94	100	3540	3050	155	95.2	95.6	105	3200	2700
	10	94.7	87	89	94	100	3930	3370	155	92.9	93.1	105	3300	2780
13500	-30	96.8	82	83	90	97	2830	2430	154	95.6	93.8	102	2780	2370
	-20	98.4	81	83	90	97	2930	2520	154	97.1	95.3	102	2850	2420
	-10	99.3	81	82	90	97	3010	2600	154	97.6	96.9	102	2920	2480
	0	97.1	81	82	90	97	3120	2690	154	95.3	95.6	102	3000	2550
	10	94.7	83	84	91	97	3440	2980	154	92.9	93.1	102	3080	2610
12500	-30	96.8	78	78	87	95	2590	2140	152	95.6	93.8	98	2620	2280
	-20	98.4	78	78	87	95	2680	2220	152	97.1	95.3	98	2680	2330
	-10	99.3	78	78	87	95	2770	2310	152	97.6	96.9	98	2740	2370
	0	97.1	78	78	87	95	2860	2390	152	95.3	95.6	98	2810	2420
	10	94.7	78	79	87	94	2980	2560	152	92.9	93.1	98	2870	2460
11500	-30	96.8	79	79	85	93	2610	2160	151	95.6	93.8	94	2530	2190
	-20	98.4	79	79	85	93	2690	2240	151	97.1	95.3	94	2570	2240
	-10	99.3	79	79	85	93	2790	2330	151	97.6	96.9	94	2620	2280
	0	97.1	79	79	85	93	2870	2410	151	95.3	95.6	94	2660	2320
	10	94.7	76	76	84	92	2790	2330	151	92.9	93.1	94	2700	2360
10500	-30	96.8	80	80	82	91	2640	2210	149	95.5	93.8	90	2440	2100
	-20	98.4	79	79	82	91	2740	2290	149	97.1	95.3	90	2480	2140
	-10	99.3	79	79	82	92	2830	2370	149	97.7	96.9	90	2510	2180
	0	97.1	79	79	82	92	2920	2450	149	95.3	95.6	90	2550	2210
	10	94.7	76	76	81	90	2820	2360	149	92.9	93.1	90	2590	2250
9500	-30	96.8	80	80	83	93	2730	2280	148	95.5	93.8	86	2340	2010
	-20	98.4	80	80	83	93	2820	2360	148	97.1	95.3	86	2380	2040
	-10	99.3	80	80	83	93	2910	2450	148	97.7	96.9	86	2410	2080
	0	97.1	80	80	83	93	3000	2530	148	95.3	95.6	86	2440	2110
	10	94.7	77	77	80	89	2870	2410	148	92.9	93.1	86	2480	2140

Figure 7-18 (Sheet 3 of 8)

Airplanes -0001 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0001 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°
LANDING - FLAPS LAND

PRESSURE ALTITUDE 4000 FEET
ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	100.1	92	93	97	103	3560	3080	155	99.0	97.1			
	-20	101.2	92	93	97	103	3680	3190	155	99.8	98.7			
	-10	99.3	92	93	97	103	3900	3380	155	97.6	97.9			
	0	97.1	93	94	97	103	4270	3710	155	95.2	95.5			
	10	94.7	95	95	98	103	4730	4120	155	92.8	93.1			
14500	-30	100.1	89	91	94	101	3300	2840	154	99.0	97.1			
	-20	101.2	89	90	94	101	3420	2940	154	99.8	98.7			
	-10	99.3	90	91	94	101	3610	3130	154	97.6	97.9			
	0	97.1	91	92	95	101	3940	3420	154	95.2	95.5			
	10	94.7	92	93	96	101	4360	3790	154	92.8	93.1			
14400	-30	100.1	89	90	94	100	3250	2810	154	99.0	97.1	105	2620	2280
	-20	101.2	89	90	94	100	3370	2910	154	99.8	98.7	105	2680	2330
	-10	99.3	89	90	94	100	3560	3080	154	97.6	97.9	105	2740	2390
	0	97.1	90	91	95	100	3890	3370	154	95.2	95.5	105	2800	2450
	10	94.7	92	93	95	100	4300	3740	154	92.8	93.1	105	2870	2500
13500	-30	100.1	85	86	90	97	2870	2470	152	99.0	97.1	102	2520	2190
	-20	101.2	85	86	90	97	2970	2550	152	99.8	98.7	102	2570	2240
	-10	99.3	85	86	91	97	3140	2710	152	97.6	97.9	102	2630	2290
	0	97.1	86	87	91	97	3440	2970	152	95.2	95.5	102	2680	2340
	10	94.7	88	89	92	97	3790	3290	152	92.9	93.1	102	2740	2390
12500	-30	100.1	81	82	87	95	2540	2170	150	98.9	97.1	98	2410	2090
	-20	101.2	81	82	87	95	2630	2250	150	99.8	98.7	98	2460	2140
	-10	99.3	81	82	87	95	2750	2370	150	97.6	97.9	98	2500	2180
	0	97.1	81	83	87	94	2970	2550	150	95.3	95.5	98	2550	2230
	10	94.7	83	84	87	94	3260	2830	150	92.9	93.1	98	2600	2270
11500	-30	100.1	79	79	85	93	2360	1940	149	98.9	97.1	94	2310	2000
	-20	101.2	79	79	85	93	2450	2020	149	99.8	98.7	94	2350	2040
	-10	99.3	78	78	85	93	2480	2100	149	97.6	97.9	94	2390	2080
	0	97.1	77	79	84	92	2600	2230	149	95.3	95.5	94	2430	2120
	10	94.7	78	79	83	90	2790	2390	149	92.9	93.1	94	2480	2160
10500	-30	100.1	79	79	82	91	2360	1950	147	98.9	97.1	90	2210	1910
	-20	101.2	79	79	82	92	2450	2040	147	99.9	98.7	90	2240	1950
	-10	99.3	78	78	82	91	2470	2060	147	97.6	97.9	90	2280	1980
	0	97.1	76	76	81	90	2440	2020	147	95.3	95.5	90	2320	2020
	10	94.7	74	75	80	88	2450	2100	147	92.9	93.1	90	2360	2050
9500	-30	100.1	80	80	83	93	2380	2000	146	98.9	97.1	86	2110	1820
	-20	101.2	80	80	83	93	2470	2070	146	99.9	98.7	86	2150	1860
	-10	99.3	79	79	82	92	2500	2090	146	97.6	97.9	86	2180	1890
	0	97.1	76	76	79	88	2450	2050	146	95.3	95.5	86	2210	1920
	10	94.7	74	74	78	86	2370	1980	146	92.9	93.1	86	2240	1950

Figure 7-18 (Sheet 5 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 4000 FEET

ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 – KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	100.1	89	90	97	103	3760	3220	155	99.0	97.1			
	-20	101.2	88	90	97	103	3900	3350	155	99.8	98.7			
	-10	99.3	89	90	97	103	4140	3560	155	97.6	97.9			
	0	97.1	90	91	97	103	4550	3920	155	95.2	95.5			
	10	94.7	91	93	98	103	5080	4370	155	92.8	93.1			
14500	-30	100.1	86	88	94	101	3460	2960	154	99.0	97.1			
	-20	101.2	86	87	94	101	3590	3080	154	99.8	98.7			
	-10	99.3	86	88	94	101	3810	3270	154	97.6	97.9			
	0	97.1	87	89	95	101	4170	3590	154	95.2	95.5			
	10	94.7	89	90	96	101	4650	4000	154	92.8	93.1			
14400	-30	100.1	86	87	94	100	3420	2930	154	99.0	97.1	105	3110	2620
	-20	101.2	86	87	94	100	3530	3040	154	99.8	98.7	105	3210	2710
	-10	99.3	86	88	94	100	3750	3220	154	97.6	97.9	105	3310	2790
	0	97.1	87	89	95	100	4120	3540	154	95.2	95.5	105	3420	2880
	10	94.7	88	90	95	100	4580	3940	154	92.8	93.1	105	3530	2960
13500	-30	100.1	82	83	90	97	3010	2600	152	99.0	97.1	102	2920	2480
	-20	101.2	81	82	90	97	3120	2690	152	99.8	98.7	102	3010	2550
	-10	99.3	82	83	91	97	3290	2850	152	97.6	97.9	102	3090	2620
	0	97.1	83	84	91	97	3600	3120	152	95.2	95.5	102	3180	2700
	10	94.7	85	86	92	97	4000	3440	152	92.9	93.1	102	3270	2770
12500	-30	100.1	78	78	87	95	2750	2300	150	98.9	97.1	98	2740	2370
	-20	101.2	78	78	87	95	2850	2380	150	99.8	98.7	98	2810	2420
	-10	99.3	77	78	87	95	2900	2500	150	97.6	97.9	98	2880	2470
	0	97.1	78	79	87	94	3120	2690	150	95.3	95.5	98	2950	2520
	10	94.7	80	81	87	94	3430	2970	150	92.9	93.1	98	3030	2580
11500	-30	100.1	79	79	85	93	2770	2310	149	98.9	97.1	94	2620	2280
	-20	101.2	79	79	85	93	2870	2400	149	99.8	98.7	94	2660	2320
	-10	99.3	78	78	85	93	2910	2440	149	97.6	97.9	94	2710	2370
	0	97.1	75	75	84	92	2860	2390	149	95.3	95.5	94	2760	2410
	10	94.7	74	75	83	90	2930	2530	149	92.9	93.1	94	2820	2450
10500	-30	100.1	79	79	82	91	2810	2350	147	98.9	97.1	90	2520	2180
	-20	101.2	79	79	82	92	2910	2450	147	99.9	98.7	90	2560	2220
	-10	99.3	78	78	82	91	2930	2470	147	97.6	97.9	90	2600	2260
	0	97.1	76	76	81	90	2870	2410	147	95.3	95.5	90	2640	2300
	10	94.7	73	73	80	88	2790	2330	147	92.9	93.1	90	2680	2340
9500	-30	100.1	80	80	83	93	2890	2430	146	98.9	97.1	86	2420	2080
	-20	101.2	80	80	83	93	2990	2520	146	99.9	98.7	86	2450	2120
	-10	99.3	79	79	82	92	3010	2540	146	97.6	97.9	86	2490	2150
	0	97.1	76	76	79	88	2930	2460	146	95.3	95.5	86	2530	2190
	10	94.7	74	74	78	86	2830	2370	146	92.9	93.1	86	2560	2230

Figure 7-18 (Sheet 5 of 8)

Airplanes -0001 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0001 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°
LANDING - FLAPS LAND

PRESSURE ALTITUDE 6000 FEET
ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	102.8	92	93	97	103	3860	3360	153	101.7	99.4			
	-20	101.2	93	94	97	103	4160	3610	153	99.8	99.9			
	-10	99.3	94	95	97	103	4510	3920	153	97.5	97.8			
	0	97.1	95	96	98	103	4960	4320	153	95.2	95.5			
14500	-30	102.8	90	91	94	101	3580	3100	152	101.7	99.4			
	-20	101.2	90	91	95	101	3840	3330	152	99.8	99.9			
	-10	99.3	91	92	95	101	4160	3620	152	97.5	97.8			
	0	97.1	92	93	96	101	4570	3980	152	95.2	95.5			
14400	-30	102.8	89	90	94	100	3530	3060	152	101.7	99.4	105	2740	2390
	-20	101.2	90	91	94	100	3790	3290	152	99.8	99.9	105	2810	2450
	-10	99.3	91	92	95	100	4110	3560	152	97.5	97.8	105	2880	2510
	0	97.1	92	93	95	100	4510	3930	152	95.2	95.5	105	2950	2570
	10	94.7	93	94	96	100	4990	4360	152	92.8	93.0	105	3020	2640
13500	-30	102.8	85	86	90	97	3120	2590	150	101.7	99.4	102	2630	2290
	-20	101.2	86	87	91	97	3350	2900	150	99.8	99.9	102	2690	2340
	-10	99.3	87	88	91	97	3620	3140	150	97.6	97.8	102	2750	2400
	0	97.1	88	89	92	97	3980	3450	150	95.2	95.5	102	2810	2450
	10	94.7	89	90	92	97	4390	3820	150	92.8	93.0	102	2870	2510
12500	-30	102.8	81	82	87	95	2740	2360	148	101.7	99.4	98	2510	2180
	-20	101.2	81	82	87	94	2890	2480	148	99.8	99.9	98	2560	2230
	-10	99.3	82	83	87	94	3120	2690	148	97.6	97.8	98	2610	2280
	0	97.1	83	84	88	94	3430	2970	148	95.2	95.5	98	2670	2330
	10	94.7	85	85	88	94	3780	3290	148	92.9	93.0	98	2720	2380
11500	-30	102.8	78	78	85	93	2480	2090	147	101.7	99.4	94	2390	2080
	-20	101.2	77	78	84	92	2560	2210	147	99.8	99.9	94	2440	2120
	-10	99.3	78	79	84	91	2710	2330	147	97.6	97.8	94	2480	2170
	0	97.1	78	79	83	90	2920	2520	147	95.2	95.5	94	2530	2210
	10	94.7	80	80	84	90	3220	2780	147	92.9	93.0	94	2580	2260
10500	-30	102.8	78	78	82	91	2470	2060	145	101.7	99.4	90	2280	1980
	-20	101.2	77	77	82	90	2480	2070	145	99.8	99.9	90	2320	2020
	-10	99.3	75	75	81	89	2480	2060	145	97.6	97.8	90	2360	2060
	0	97.1	74	75	80	88	2550	2180	145	95.3	95.5	90	2410	2100
	10	94.7	74	75	79	87	2730	2330	145	92.9	93.0	90	2450	2140
9500	-30	102.8	79	79	82	92	2500	2090	144	101.7	99.4	86	2180	1890
	-20	101.2	77	77	80	90	2500	2090	144	99.9	99.9	86	2210	1920
	-10	99.3	76	76	78	87	2480	2070	144	97.6	97.8	86	2250	1950
	0	97.1	73	73	78	86	2430	2020	144	95.3	95.5	86	2290	1990
	10	94.7	70	71	77	85	2370	2040	144	92.9	93.0	86	2320	2020

Figure 7-18 (Sheet 7 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° **PRESSURE ALTITUDE 6000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 – KIAS		VR	V2	FIELD LENG. 1 - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	102.8	88	90	97	103	4110	3530	153	101.7	99.4			
	-20	101.2	89	91	97	103	4430	3820	153	99.8	99.9			
	-10	99.3	90	92	97	103	4830	4160	153	97.5	97.8			
	0	97.1	91	92	96	103	5350	4600	153	95.2	95.5			
14500	-30	102.8	86	88	94	101	3770	3240	152	101.7	99.4			
	-20	101.2	87	88	95	101	4070	3500	152	99.8	99.9			
	-10	99.3	88	89	95	101	4430	3810	152	97.5	97.8			
	0	97.1	89	90	96	101	4890	4210	152	95.2	95.5			
14400	-30	102.8	86	87	94	100	3710	3200	152	101.7	99.4	105	3310	2790
	-20	101.2	86	88	94	100	4010	3450	152	99.8	99.9	105	3430	2880
	-10	99.3	87	89	95	100	4360	3750	152	97.5	97.8	105	3550	2980
	0	97.1	88	90	95	100	4820	4150	152	95.2	95.5	105	3670	3080
	10	94.7	89	91	96	100	5360	4620	152	92.8	93.0	105	3800	3180
13500	-30	102.8	82	83	90	97	3270	2830	150	101.7	99.4	102	3090	2620
	-20	101.2	83	84	91	97	3510	3040	150	99.8	99.9	102	3190	2700
	-10	99.3	84	85	91	97	3810	3290	150	97.6	97.8	102	3290	2780
	0	97.1	85	86	92	97	4200	3620	150	95.2	95.5	102	3390	2870
	10	94.7	86	87	92	97	4570	4020	150	92.8	93.0	102	3500	2950
12500	-30	102.8	77	78	87	95	2900	2480	148	101.7	99.4	98	2880	2470
	-20	101.2	77	79	87	94	3040	2620	148	99.8	99.9	98	2960	2530
	-10	99.3	79	80	87	94	3280	2840	148	97.6	97.8	98	3040	2590
	0	97.1	80	81	88	94	3590	3120	148	95.2	95.5	98	3130	2660
	10	94.7	82	83	88	94	3980	3440	148	92.9	93.0	98	3210	2730
11500	-30	102.8	78	78	85	93	2910	2440	147	101.7	99.4	94	2710	2370
	-20	101.2	76	76	84	92	2920	2440	147	99.8	99.9	94	2760	2420
	-10	99.3	74	75	84	91	2910	2460	147	97.6	97.8	94	2830	2480
	0	97.1	75	76	83	90	3070	2660	147	95.2	95.5	94	2900	2510
	10	94.7	77	77	84	90	3380	2930	147	92.9	93.0	94	2970	2560
10500	-30	102.8	78	78	82	91	2940	2470	145	101.7	99.4	90	2600	2250
	-20	101.2	77	77	82	90	2940	2470	145	99.8	99.9	90	2650	2310
	-10	99.3	75	75	81	89	2920	2450	145	97.6	97.8	90	2690	2350
	0	97.1	72	72	80	88	2860	2390	145	95.3	95.5	90	2740	2390
	10	94.7	71	72	79	87	2870	2470	145	92.9	93.0	90	2780	2440
9500	-30	102.8	79	79	82	92	3010	2540	144	101.7	99.4	86	2490	2160
	-20	101.2	77	77	80	90	3000	2530	144	99.9	99.9	86	2530	2200
	-10	99.3	76	76	78	87	2970	2500	144	97.6	97.8	86	2570	2240
	0	97.1	73	73	78	86	2890	2430	144	95.3	95.5	86	2610	2270
	10	94.7	70	70	77	85	2810	2330	144	92.9	93.0	86	2650	2310

Figure 7-18 (Sheet 7 of 8)

Airplanes -0001 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0001 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1

THRUST REVERSER

The optional thrust reverser system is used to provide an additional decelerating force during ground operation. The thrust reverser can be used for normal landings, slick runways, no flap landings, in the case of brake failure or during rejected takeoffs. The thrust reverser performance is not to be used to supersede runway length requirements published in Section IV of the FAA Approved Airplane Flight Manual.

The dry hard surface field lengths can be adjusted for cases with thrust reversers deployed on precipitation covered runways by using the following tabulated data. Corrections for takeoff and landing field lengths are presented for wet concrete and ice.

The distances for precipitation covered runways are based on the thrust reversers being operated in accordance with the procedures outlined in the FAA Approved Airplane Flight Manual and also in this manual.

Refer to the FAA Approved Airplane Flight Manual for limitations and procedures for thrust reverser operation.

THRUST REVERSER - LANDING

PRECIPITATION COVERED RUNWAYS

LANDING FIELD LENGTH		
DRY, HARD SURFACE WITHOUT THRUST REVERSER	WET CONCRETE WITH THRUST REVERSER	ICE WITH THRUST REVERSER
1800	1820	2410
2000	2070	2865
2200	2290	3175
*2400	2495	3410
2600	2685	3630
2800	2865	3820
3000	3040	3990
3200	3220	4150
3400	3400	4310
3600	3600	4460
3800	3800	4610
4000	4000	4760

* EXAMPLE:

LANDING FIELD LENGTH-FEET	
NORMAL SURFACE CONDITIONS	2400
WET CONCRETE WITH THRUST REVERSER	2495
ICE WITH THRUST REVERSER	3410

Figure 7-19 (Sheet 2 of 2)

MAXIMUM RATE CLIMB

TIME,DISTANCE,FUEL, AND RATE-OF-CLIMB

ANTI-ICE SYSTEMS OFF

T.O. WEIGHT		15100	14000	13000	12000	11000	15100	14000	13000	12000	11000	15100	14000	13000	12000	11000	15100	14000	13000	12000	11000
PRESSURE ALTITUDE		5000 FEET ISA = 5°C = 41°F					10000 FEET ISA = - 5°C = 23°F					15000 FEET ISA = -15°C = 6°F					17000 FEET ISA = -19°C = - 2°F				
ISA +10°C	MIN	3	2	2	2	2	5	5	4	4	4	8	7	6	6	5	9	8	7	7	6
	NM	7	6	6	5	4	16	14	13	11	10	26	23	21	19	17	31	27	25	22	20
	LB	82	74	68	62	56	16	148	134	122	110	246	221	201	181	163	279	251	227	205	184
	R/C	2214	2448	2691	2970	3288	1998	2222	2455	2722	3032	1744	1954	2166	2415	2704	1656	1862	2073	2317	2599
ISA 0°C	MIN	2	2	2	2	2	4	4	4	3	3	7	6	5	5	5	8	7	6	6	5
	NM	5	5	4	4	3	13	11	10	9	8	21	19	17	15	14	25	22	20	18	16
	LB	73	66	60	55	50	145	132	120	109	99	218	198	180	163	147	248	224	204	185	167
	R/C	2688	2959	3241	3566	3936	2398	2652	2916	3221	3575	2134	2374	2617	2902	3235	2040	2275	2519	2798	3123
ISA -10°C	MIN	2	2	2	2	2	4	3	3	3	3	6	5	5	4	4	6	6	5	5	5
	NM	5	4	4	3	3	11	9	9	8	7	17	16	14	13	11	20	18	17	15	13
	LB	67	61	56	51	47	133	122	111	101	92	200	182	166	151	136	226	206	188	171	154
	R/C	3150	3455	3774	4142	4562	2868	3158	3460	3808	4214	2591	2865	3145	3473	3856	2451	2716	2993	3311	3680
PRESSURE ALTITUDE		19000*FEET ISA = -23°C = - 9°F					21000*FEET ISA = -27°C = -16°F					23000*FEET ISA = -31°C = -23°F					25000*FEET ISA = -35°C = -30°F				
ISA +10°C	MIN	10	9	8	8	7	12	10	9	9	8	13	12	11	10	9	15	13	12	11	10
	NM	36	32	29	25	23	41	37	33	29	26	48	42	38	33	30	55	48	43	38	34
	LB	313	281	254	229	205	348	311	281	253	227	384	344	310	279	249	422	377	339	304	272
	R/C	1550	1751	1957	2194	2469	1430	1624	1822	2049	2312	1291	1461	1662	1876	2153	1215	1402	1579	1786	2015
ISA 0°C	MIN	9	8	7	6	6	10	9	8	7	7	11	10	9	8	7	12	11	10	9	8
	NM	29	26	23	21	18	33	29	27	24	21	38	34	30	27	24	43	39	35	31	27
	LB	278	251	228	206	186	308	278	253	228	205	340	307	278	251	226	373	336	304	274	248
	R/C	1927	2157	2395	2668	2984	1789	2009	2237	2498	2801	1619	1814	2044	2289	2604	1527	1739	1939	2175	2434
ISA -10°C	MIN	7	7	6	6	5	8	7	7	6	6	9	8	8	7	6	10	9	9	8	7
	NM	24	21	19	17	15	27	24	22	20	18	31	28	25	23	20	36	32	29	26	23
	LB	253	230	210	190	172	281	255	232	211	190	310	281	256	232	209	340	308	279	253	228
	R/C	2292	2548	2816	3121	3476	2106	2349	2603	2892	3228	1878	2093	2346	2615	2960	1724	1953	2171	2426	2707
PRESSURE ALTITUDE		27000 FEET ISA = -38°C = -37°F					29000 FEET ISA = -42°C = -44°F					31000 FEET ISA = -46°C = -52°F					33000 FEET ISA = -50°C = -59°F				
ISA +10°C	MIN	16	15	13	12	11	18	16	15	13	12	20	18	16	14	13	23	20	18	16	14
	NM	62	55	48	43	38	70	62	54	48	42	80	69	61	54	47	91	79	69	60	53
	LB	461	410	368	330	294	500	444	398	355	317	543	480	429	382	340	589	518	461	410	364
	R/C	1148	1341	1532	1749	1986	1044	1216	1411	1623	1867	913	1088	1258	1471	1705	760	928	1102	1289	1511
ISA 0°C	MIN	13	12	11	10	9	15	13	12	11	10	17	15	13	12	11	19	17	15	13	12
	NM	49	44	39	35	31	56	49	44	39	35	64	56	50	44	39	73	64	56	50	44
	LB	407	365	330	297	266	442	395	356	320	287	479	427	384	344	308	520	461	414	370	330
	R/C	1406	1621	1833	2075	2339	1238	1425	1637	1868	2135	1067	1256	1440	1669	1923	901	1083	1271	1473	1714
ISA -10°C	MIN	12	10	10	9	8	13	12	11	10	9	14	13	12	11	10	16	14	13	12	11
	NM	41	37	33	29	26	47	42	37	33	29	53	47	42	37	33	61	54	48	42	37
	LB	371	334	303	274	247	403	362	328	296	266	436	391	353	318	285	473	422	380	341	305
	R/C	1598	1830	2060	2322	2609	1420	1622	1852	2103	2392	1238	1443	1642	1891	2167	1062	1259	1463	1683	1945
PRESSURE ALTITUDE		35000 FEET ISA = -54°C = -66°F					37000 FEET ISA = -57°C = -70°F					39000 FEET ISA = -57°C = -70°F					41000 FEET ISA = -57°C = -70°F				
ISA +10°C	MIN	26	23	20	18	16	30	26	22	20	17	37	30	26	22	19	● 60	37	31	26	22
	NM	105	90	78	68	59	125	104	90	77	67	156	125	105	89	76	285	160	128	105	88
	LB	644	562	497	440	389	712	613	538	474	416	810	680	588	513	448	1156	781	655	560	484
	R/C	595	755	919	1107	1324	423	574	729	905	1108	245	387	533	699	889	104	214	354	509	689
ISA 0°C	MIN	21	19	17	15	13	25	21	19	17	15	30	25	22	19	17	39	30	25	22	19
	NM	85	73	64	56	49	100	85	74	64	55	123	101	86	74	63	166	127	104	87	73
	LB	567	500	446	397	353	624	544	482	427	378	701	600	525	461	406	830	677	579	502	437
	R/C	722	894	1072	1275	1510	534	697	865	1056	1275	339	493	651	831	1036	161	305	455	625	820
ISA -10°C	MIN	18	16	15	13	12	21	18	16	15	13	25	21	19	16	14	31	25	22	19	16
	NM	71	61	54	48	42	83	71	62	54	47	100	84	72	62	54	128	102	86	73	62
	LB	514	456	409	366	327	562	495	441	393	349	624	542	479	423	374	714	602	524	459	402
	R/C	871	1059	1252	1473	1730	669	852	1029	1236	1474	460	624	800	995	1218	268	425	589	774	986
PRESSURE ALTITUDE		43000 FEET ISA = -57°C = -70°F																			
ISA +10°C	MIN	● 149	● 75	39	31	26															
	NM	807	371	168	129	104															
	LB	2387	1287	761	625	528															
	R/C	100	100	179	328	498															
ISA 0°C	MIN	● 107	41	32	26	22															
	NM	553	180	132	105	87															
	LB	1805	821	658	555	475															
	R/C	101	119	269	430	615															
ISA -10°C	MIN	● 55	32	26	22	19															
	NM	255	135	106	87	72															
	LB	1055	698	584	502	435															
	R/C	105	218	388	563	764															

● INDICATES STEP CLIMB REQUIRED
NOTE STEP CLIMB DATA INCLUDES TIME, DISTANCE AND FUEL USED IN CRUISE PORTION, BASED ON MAXIMUM CRUISE THRUST.

CLIMB SPEED-KIAS

PRESSURE ALTITUDE	0	5000	10000	15000	20000	25000	30000	35000	40000	43000
15100	196	193	188	182	177	174	164	154	146	142
14000	195	192	187	181	175	173	163	152	142	139
13000	195	191	186	180	174	171	161	150	139	134
12000	194	190	185	179	173	170	159	148	137	131
11000	193	189	184	178	172	169	158	147	135	129

NOTE: FOR CLIMB CONDITIONS REQUIRING A STEP CLIMB, THE FOLLOWING TABLE GIVES THE WEIGHT AT THE END OF STEP CRUISE AT THE STEP ALTITUDE, REQUIRED TO CONTINUE CLIMB.

STEP CRUISE ALT IN FEET	TEMPERATURE ISA -10°C	ISA	ISA +10°C
39000	–	–	14117
41000	14209	13456	12875

WIND EFFECT ON CLIMB DISTANCE - N.M.
(SUBTRACT FOR HEADWIND, ADD FOR TAILWIND)

CLIMB TIME (MIN)	WIND 25KTS	50KTS	100KTS
5	2	4	8
10	4	8	16
15	6	12	25
20	8	16	33
25	10	20	41
30	12	25	50

Figure 7-20 (Sheet 1 of 2)

CRUISE CLIMB

225 KIAS AT SEA LEVEL PRESSURE ALTITUDE

TIME,DISTANCE,FUEL, AND RATE-OF-CLIMB

ANTI-ICE SYSTEMS OFF

T.O. WEIGHT		15100	14000	13000	12000	11000	15100	14000	13000	12000	11000	15100	14000	13000	12000	11000	15100	14000	13000	12000	11000
PRESSURE ALTITUDE		5000 FEET ISA = 5°C = 41°F					10000 FEET ISA = -5°C = 23°F					15000 FEET ISA = -15°C = 8°F					17000 FEET ISA = -19°C = -2°F				
ISA +10°C	MIN	3	3	2	2	2	5	5	5	4	4	9	8	7	6	6	10	9	8	7	7
	NM	9	8	7	6	6	20	18	16	15	13	33	30	27	24	22	39	35	32	29	26
	LB	89	81	74	67	61	178	162	148	134	121	271	245	223	202	182	309	279	253	229	207
	R/C	2052	2262	2479	2729	3021	1810	2004	2206	2437	2706	1565	1745	1930	2143	2390	1472	1646	1825	2031	2269
ISA 0°C	MIN	2	2	2	2	2	4	4	4	4	3	7	6	6	5	5	8	7	7	6	6
	NM	7	6	5	5	4	15	14	13	11	10	25	23	21	19	17	30	27	25	22	20
	LB	76	69	64	58	53	153	139	128	116	105	232	211	192	175	158	264	239	218	198	179
	R/C	2571	2822	3083	3384	3737	2274	2506	2747	3024	3348	2003	2219	2442	2699	2997	1901	2110	2327	2575	2864
ISA -10°C	MIN	2	2	2	2	2	4	4	3	3	3	6	5	5	4	4	7	6	6	5	5
	NM	5	5	4	4	4	12	11	10	9	8	20	18	17	15	14	24	22	20	18	16
	LB	69	63	58	53	48	137	125	115	105	95	206	188	172	157	142	234	213	195	178	161
	R/C	3113	3408	3715	4070	4486	2808	3083	3369	3700	4086	2513	2770	3038	3345	3704	2372	2619	2877	3173	3518
PRESSURE ALTITUDE		19000 FEET ISA = -23°C = -9°F					21000 FEET ISA = -27°C = -16°F					23000 FEET ISA = -31°C = -23°F					25000 FEET ISA = -35°C = -30°F				
ISA +10°C	MIN	11	10	9	8	8	13	12	11	10	9	14	13	12	11	10	16	15	13	12	11
	NM	45	41	37	33	30	53	47	43	38	34	61	54	49	44	40	70	62	56	50	45
	LB	347	313	284	257	232	387	349	316	286	257	429	386	349	315	283	473	424	383	345	310
	R/C	1371	1539	1712	1910	2139	1268	1430	1597	1787	2007	1162	1318	1479	1661	1872	1053	1203	1357	1531	1732
ISA 0°C	MIN	9	8	7	7	6	10	9	8	8	7	11	10	9	9	8	13	12	11	10	9
	NM	35	32	29	26	23	40	36	33	30	27	46	42	38	34	31	53	48	43	39	35
	LB	296	269	245	222	201	330	299	272	247	223	364	329	300	272	245	400	361	328	297	268
	R/C	1787	1990	2199	2439	2718	1686	1862	2053	2294	2562	1542	1730	1924	2146	2403	1420	1601	1788	2000	2246
ISA -10°C	MIN	7	7	6	6	5	8	8	7	6	6	9	9	8	7	7	11	10	9	8	7
	NM	28	25	23	21	19	32	29	26	24	22	37	33	30	27	25	42	38	35	31	28
	LB	262	239	218	199	180	291	265	242	220	199	322	292	267	242	219	354	321	292	265	240
	R/C	2227	2466	2713	2998	3329	2057	2285	2521	2792	3106	1852	2067	2289	2543	2837	1638	1838	2045	2281	2555
PRESSURE ALTITUDE		27000 FEET ISA = -38°C = -37°F					29000 FEET ISA = -42°C = -44°F					31000 FEET ISA = -46°C = -52°F					33000 FEET ISA = -50°C = -59°F				
ISA +10°C	MIN	18	16	15	13	12	21	18	17	15	13	23	21	19	17	15	27	23	21	19	17
	NM	80	71	64	57	51	92	82	73	65	58	107	94	84	75	66	125	109	97	86	76
	LB	519	465	419	377	338	570	508	457	410	367	626	556	498	446	398	691	610	544	486	432
	R/C	940	1083	1230	1396	1588	827	964	1104	1262	1444	694	824	955	1104	1274	547	667	790	927	1084
ISA 0°C	MIN	14	13	12	11	10	16	14	13	12	11	18	16	15	13	12	21	19	17	15	13
	NM	61	54	49	44	40	70	62	56	50	45	81	72	65	58	52	95	84	75	67	59
	LB	438	395	358	324	291	479	431	390	352	316	525	471	425	383	343	578	515	464	416	372
	R/C	1238	1408	1582	1780	2009	1056	1214	1376	1560	1771	882	1030	1180	1350	1545	707	844	983	1140	1319
ISA -10°C	MIN	12	11	10	9	8	13	12	11	10	9	15	14	12	11	10	17	16	14	13	11
	NM	49	44	40	35	32	56	51	46	41	37	66	59	53	47	42	77	68	61	55	49
	LB	388	351	319	290	261	424	383	348	315	284	464	418	379	342	308	509	456	412	372	333
	R/C	1444	1632	1825	2046	2301	1245	1421	1601	1806	2042	1052	1216	1384	1573	1791	866	1018	1174	1349	1550
PRESSURE ALTITUDE		35000 FEET ISA = -54°C = -66°F					37000 FEET ISA = -57°C = -70°F					39000 FEET ISA = -57°C = -70°F					41000 FEET ISA = -57°C = -70°F				
ISA +10°C	MIN	31	27	24	21	19	38	32	28	24	21	● 106	● 44	35	30	25	● 240	● 178	● 116	● 55	33
	NM	150	129	113	99	87	191	159	137	118	103	620	228	181	150	127	1488	1095	707	313	176
	LB	773	675	598	531	470	896	764	669	588	517	2048	948	787	673	582	4165	3065	2065	1065	697
	R/C	402	514	627	754	898	214	314	415	527	652	101	101	194	294	406	102	102	102	102	176
ISA 0°C	MIN	24	21	19	17	15	29	25	22	20	17	● 48	33	27	24	20	● 177	● 112	● 52	31	26
	NM	113	99	88	78	69	143	121	106	93	81	257	164	136	116	99	1079	672	293	161	131
	LB	643	568	508	454	405	734	638	565	501	444	1053	756	650	566	495	3144	2044	1044	680	574
	R/C	523	648	775	918	1079	315	428	542	668	810	100	199	304	418	545	104	104	104	186	297
ISA -10°C	MIN	20	18	16	14	13	24	21	19	16	15	31	26	22	20	17	● 114	● 50	30	24	21
	NM	91	80	72	64	57	113	97	86	76	67	154	125	107	93	81	673	275	149	122	102
	LB	563	501	451	404	362	633	557	497	443	395	754	640	561	494	436	2136	1036	672	571	494
	R/C	669	809	952	1112	1294	442	570	697	840	1001	192	321	441	570	715	102	102	196	322	450
PRESSURE ALTITUDE		43000 FEET ISA = -57°C = -70°F																			
ISA +10°C	MIN	–	● 317	● 256	● 195	● 130															
	NM	–	2016	1628	1234	812															
	LB	–	5099	4099	3099	2099															
	R/C	–	102	102	102	102															
ISA 0°C	MIN	● 311	● 246	● 186	● 123	● 58															
	NM	1949	1543	1163	757	339															
	LB	5146	4045	3046	2046	1046															
	R/C	104	104	104	104	104															
ISA -10°C	MIN	● 238	● 174	● 113	● 50	28															
	NM	1466	1069	682	282	145															
	LB	4055	2955	1955	955	595															
	R/C	102	102	102	102	200															

● INDICATES STEP CLIMB REQUIRED
NOTE: STEP CLIMB DATA INCLUDES TIME, DISTANCE AND FUEL USED IN CRUISE PORTION, BASED ON MAXIMUM CRUISE THRUST

CLIMB SPEED-KIAS

PRESSURE ALTITUDE	0	5000	10000	15000	20000	25000	30000	35000	40000	43000
	225	220	215	210	205	200	195	190	185	182

NOTE: FOR CLIMB CONDITIONS REQUIRING A STEP CLIMB, THE FOLLOWING TABLE GIVES THE WEIGHT AT THE END OF STEP CRUISE AT THE STEP ALTITUDE, REQUIRED TO CONTINUE CLIMB

STEP CRUISE ALT IN FEET	TEMPERATURE ISA -10°C	ISA	ISA +10°C
37000	–	14230	13236
39000	13132	12123	11102
41000	11200	10107	9053

WIND EFFECT ON CLIMB DISTANCE - N.M.
(SUBTRACT FOR HEADWIND, ADD FOR TAILWIND)

CLIMB TIME (MIN)	WIND 25KTS	50KTS	100KTS
5	2	4	8
10	4	8	16
15	6	12	25
20	8	16	33
25	10	20	41
30	12	25	50

Figure 7-21 (Sheet 1 of 2)

CRUISE

Specific performance data are presented on the following pages for various combinations of fan speeds, weights, temperature, altitudes and winds to enable the calculation of the cruise portion of a range profile.

The various fan speeds presented provide the specific ranges between maximum cruise thrust (maximum TAS) and the approximate maximum range thrust. It should be noted that reducing thrust to maintain a constant indicated airspeed as the airplane weight decreases during cruise results in a significant increase in range. The best range, however, results from decreasing thrust to fly a constantly decreasing airspeed as airplane weight decreases per the values shown in the tabulated data.

When the anti-ice systems are ON, increase the fuel flows and decrease the specific ranges that are presented for each altitude by 8 percent. The cruise speeds will remain the same for a given fan RPM (N_1). The maximum allowable fan speeds with anti-ice systems ON are presented on each chart for each altitude. Only fan speeds equal to or lower than these values can be used.

The one engine specific range data is presented for use in the event of an enroute engine failure.

CRUISE
10,000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT. LBS.	FAN D/D RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	89.6	5	18	1698	276	323	13.1	16.1	19.0	22.0	24.9
	(1) 88.3	-5	7	1660	276	317	13.1	16.1	19.1	22.1	25.1
	86.9	-15	-3	1616	276	311	13.1	16.2	19.2	22.3	25.4
	82.0	5	14	1324	235	276	13.3	17.0	20.8	24.6	28.4
	82.0	-5	4	1340	241	278	13.3	17.0	20.7	24.5	28.2
	82.0	-15	-6	1358	248	280	13.2	16.9	20.6	24.3	28.0
	78.0	5	13	1162	213	251	13.0	17.3	21.6	25.9	30.2
	78.0	-5	3	1177	220	254	13.1	17.3	21.6	25.8	30.0
	78.0	-15	-7	1195	226	256	13.1	17.3	21.5	25.6	29.8
	73.0	5	11	1015	191	225	12.3	17.2	22.1	27.0	32.0
	73.0	-5	1	1018	196	226	12.4	17.3	22.2	27.1	32.0
	73.0	-15	-9	1022	201	228	12.5	17.4	22.3	27.2	32.1
	(2) 68.0	5	10	881	162	191	10.4	16.0	21.7	27.4	33.1
	68.0	-5	0	884	169	196	10.8	16.5	22.1	27.8	33.4
	68.0	-15	-10	886	175	199	11.1	16.8	22.4	28.1	33.7
14000	89.4	5	18	1688	276	323	13.2	16.2	19.1	22.1	25.1
	(1) 88.1	-5	7	1650	276	317	13.2	16.2	19.2	22.3	25.3
	86.7	-15	-3	1607	276	311	13.1	16.3	19.4	22.5	25.6
	81.0	5	14	1286	232	272	13.4	17.3	21.2	25.0	28.9
	81.0	-5	4	1300	238	274	13.4	17.2	21.1	24.9	28.8
	81.0	-15	-6	1319	244	276	13.3	17.1	20.9	24.7	28.5
	77.0	5	13	1132	211	249	13.1	17.5	22.0	26.4	30.8
	77.0	-5	3	1143	217	251	13.2	17.5	21.9	26.3	30.7
	77.0	-15	-7	1157	223	253	13.2	17.5	21.8	26.2	30.5
	72.0	5	11	992	190	223	12.5	17.5	22.5	27.6	32.6
	72.0	-5	1	993	194	225	12.6	17.6	22.6	27.7	32.7
	72.0	-15	-9	997	199	226	12.7	17.7	22.7	27.7	32.7
	(2) 67.0	5	10	858	162	192	10.7	16.5	22.4	28.2	34.0
	67.0	-5	0	859	168	195	11.0	16.9	22.7	28.5	34.3
	67.0	-15	-10	863	174	198	11.4	17.2	23.0	28.7	34.5
13000	89.2	5	18	1678	276	323	13.3	16.3	19.2	22.2	25.2
	(1) 87.9	-5	7	1641	276	317	13.2	16.3	19.3	22.4	25.4
	86.5	-15	-3	1599	276	311	13.2	16.3	19.5	22.6	25.7
	81.0	5	14	1288	233	274	13.5	17.4	21.3	25.2	29.0
	81.0	-5	4	1302	239	276	13.5	17.3	21.2	25.0	28.8
	81.0	-15	-6	1320	246	278	13.5	17.2	21.0	24.8	28.6
	76.0	5	12	1105	210	246	13.3	17.8	22.3	26.8	31.4
	76.0	-5	2	1108	214	247	13.3	17.8	22.3	26.8	31.3
	76.0	-15	-7	1121	220	249	13.3	17.8	22.2	26.7	31.1
	70.0	5	11	938	183	216	12.4	17.7	23.0	28.4	33.7
	70.0	-5	1	942	188	218	12.5	17.8	23.1	28.5	33.8
	70.0	-15	-9	945	193	219	12.6	17.9	23.2	28.5	33.8
	(2) 65.0	5	9	808	155	183	10.3	16.5	22.7	28.9	35.1
	65.0	-5	-1	811	162	187	10.8	16.9	23.1	29.3	35.4
	65.0	-15	-11	814	169	191	11.1	17.3	23.4	29.6	35.7
12000	89.0	5	18	1669	276	323	13.3	16.3	19.3	22.3	25.3
	(1) 87.7	-5	7	1632	276	317	13.3	16.4	19.4	22.5	25.6
	86.3	-15	-3	1591	276	311	13.3	16.4	19.6	22.7	25.9
	80.0	5	14	1246	229	270	13.6	17.6	21.6	25.7	29.7
	80.0	-5	4	1263	236	272	13.6	17.5	21.5	25.5	29.4
	80.0	-15	-6	1284	242	274	13.5	17.4	21.3	25.2	29.1
	75.0	5	12	1078	208	244	13.4	18.0	22.7	27.3	31.9
	75.0	-5	2	1082	212	245	13.4	18.0	22.7	27.3	31.9
	75.0	-15	-8	1086	217	245	13.4	18.0	22.6	27.2	31.8
	69.0	5	11	914	182	215	12.5	18.0	23.5	29.0	34.4
	69.0	-5	1	917	187	216	12.7	18.1	23.6	29.0	34.5
	69.0	-15	-9	919	191	217	12.8	18.2	23.6	29.1	34.5
	(2) 63.0	5	9	760	148	175	9.9	16.5	23.1	29.7	36.2
	63.0	-5	-1	763	155	180	10.4	17.0	23.5	30.1	36.6
	63.0	-15	-11	766	161	183	10.8	17.4	23.9	30.4	36.9
11000	88.9	5	18	1663	276	323	13.4	16.4	19.4	22.4	25.4
	(1) 87.5	-5	7	1624	276	317	13.4	16.5	19.5	22.6	25.7
	86.2	-15	-3	1583	276	311	13.3	16.5	19.7	22.8	26.0
	80.0	5	14	1247	231	271	13.7	17.7	21.8	25.8	29.8
	80.0	-5	4	1264	237	273	13.7	17.7	21.6	25.6	29.5
	80.0	-15	-5	1284	244	275	13.7	17.6	21.4	25.3	29.2
	74.0	5	12	1053	206	242	13.5	18.3	23.0	27.8	32.5
	74.0	-5	2	1054	210	243	13.5	18.3	23.0	27.8	32.5
	74.0	-15	-8	1058	214	243	13.5	18.2	23.0	27.7	32.4
	68.0	5	11	889	181	213	12.7	18.3	23.9	29.6	35.2
	68.0	-5	1	892	185	214	12.8	18.4	24.0	29.6	35.2
	68.0	-15	-9	894	189	215	12.9	18.5	24.1	29.6	35.2
	(2) 61.0	5	9	713	141	167	9.4	16.4	23.4	30.5	37.5
	61.0	-5	-1	716	148	172	10.0	17.0	24.0	31.0	38.0
	61.0	-15	-11	719	154	175	10.5	17.4	24.4	31.3	38.3

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON

MAX. FAN %RPM		
5°C	-5°C	-15°C
89.0	87.7	86.3

INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%

Figure 7-22 (Sheet 2 of 17)

CRUISE
17,000 FEET

ANTI-ICE SYSTEMS OFF — TWO ENGINES

WT. LBS.	FAN D/D RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	85.7	-9	7	1629	276	359	15.9	19.0	22.0	25.1	28.2
	(1) 94.2	-19	-4	1588	276	352	15.9	19.0	22.2	25.3	28.5
	92.6	-29	-15	1551	276	345	15.8	19.0	22.3	25.5	28.7
	88.0	-9	3	1249	236	308	16.7	20.7	24.7	28.7	32.7
	88.0	-19	-7	1277	243	311	16.6	20.5	24.4	28.3	32.2
	88.0	-29	-17	1311	251	315	16.4	20.2	24.0	27.8	31.6
	84.0	-9	1	1086	214	280	16.6	21.2	25.8	30.4	35.0
	84.0	-19	-9	1110	222	284	16.6	21.1	25.6	30.1	34.6
	84.0	-29	-19	1137	229	288	16.6	21.0	25.4	29.8	34.2
	79.0	-9	-2	922	187	246	15.8	21.2	26.6	32.1	37.5
	79.0	-19	-11	934	194	249	16.0	21.4	26.7	32.1	37.4
	79.0	-29	-21	948	201	253	16.1	21.4	26.7	32.0	37.2
	(2) 75.0	-9	-3	808	162	213	14.0	20.2	26.4	32.6	38.8
	75.0	-19	-13	820	170	220	14.7	20.8	26.9	33.0	39.1
	75.0	-29	-23	833	179	226	15.1	21.1	27.1	33.1	39.1
14000	95.4	-9	7	1617	276	359	16.0	19.1	22.2	25.3	28.4
	(1) 93.9	-19	-4	1576	276	352	16.0	19.1	22.3	25.5	28.7
	92.4	-29	-15	1540	276	345	15.9	19.2	22.4	25.7	28.9
	87.0	-9	2	1212	233	304	16.9	21.0	25.1	29.2	33.4
	87.0	-19	-7	1238	240	307	16.7	20.8	24.8	28.9	32.9
	87.0	-29	-17	1267	247	310	16.6	20.6	24.5	28.4	32.4
	83.0	-9	0	1050	211	277	16.8	21.6	26.3	31.1	35.9
	83.0	-19	-9	1074	218	281	16.8	21.5	26.1	30.8	35.4
	83.0	-29	-19	1102	226	285	16.8	21.3	25.8	30.4	34.9
	78.0	-9	-2	897	186	245	16.1	21.7	27.3	32.8	38.4
	78.0	-19	-11	907	192	247	16.3	21.8	27.3	32.8	38.3
	78.0	-29	-21	921	199	251	16.4	21.8	27.2	32.6	38.1
	(2) 73.0	-9	-4	765	157	207	14.0	20.5	27.1	33.6	40.2
	73.0	-19	-13	769	163	211	14.5	21.0	27.5	34.0	40.5
	73.0	-29	-23	779	171	217	15.0	21.4	27.8	34.2	40.6
13000	95.2	-9	7	1607	276	359	16.1	19.2	22.3	25.4	28.6
	(1) 93.7	-19	-4	1565	276	352	16.1	19.3	22.5	25.7	28.9
	92.2	-29	-15	1529	276	345	16.0	19.3	22.6	25.8	29.1
	87.0	-9	2	1215	235	307	17.0	21.1	25.3	29.4	33.5
	87.0	-19	-7	1240	242	310	16.9	20.9	25.0	29.0	33.0
	87.0	-29	-17	1269	249	312	16.7	20.7	24.6	28.5	32.5
	81.0	-9	0	988	204	267	16.9	22.0	27.1	32.1	37.2
	81.0	-19	-10	1001	210	270	17.0	22.0	27.0	32.0	37.0
	81.0	-29	-20	1026	218	274	17.0	21.8	26.7	31.6	36.5
	76.0	-9	-2	842	179	235	16.1	22.0	28.0	33.9	39.9
	76.0	-19	-12	853	185	239	16.3	22.2	28.0	33.9	39.7
	76.0	-29	-22	866	192	242	16.4	22.2	28.0	33.8	39.5
	(2) 71.0	-9	-4	728	153	203	14.1	21.0	27.8	34.7	41.6
	71.0	-19	-14	731	159	206	14.6	21.4	28.2	35.1	41.9
	71.0	-29	-23	733	165	209	14.9	21.7	28.5	35.4	42.2
12000	94.9	-9	7	1597	276	359	16.2	19.3	22.5	25.6	28.7
	(1) 93.5	-19	-4	1557	276	352	16.2	19.4	22.6	25.8	29.0
	92.0	-29	-15	1521	276	345	16.1	19.4	22.7	26.0	29.3
	86.0	-9	2	1174	231	302	17.2	21.5	25.7	30.0	34.3
	86.0	-19	-8	1202	238	305	17.1	21.2	25.4	29.6	33.7
	86.0	-29	-17	1227	245	308	16.9	21.0	25.1	29.2	33.2
	80.0	-9	0	960	202	265	17.1	22.3	27.6	32.8	38.0
	80.0	-19	-10	973	207	267	17.2	22.3	27.4	32.6	37.7
	80.0	-29	-20	990	214	270	17.2	22.2	27.3	32.3	37.4
	74.0	-9	-3	794	173	228	16.1	22.4	28.7	35.0	41.3
	74.0	-19	-12	801	179	231	16.3	22.6	28.8	35.1	41.3
	74.0	-29	-22	811	185	234	16.5	22.6	28.8	35.0	41.1
	(2) 69.0	-9	-4	691	150	198	14.2	21.4	28.6	35.9	43.1
	69.0	-19	-14	694	155	201	14.6	21.8	29.0	36.2	43.4
	69.0	-29	-24	697	161	204	15.0	22.2	29.3	36.5	43.7
11000	94.7	-9	7	1587	276	359	16.3	19.4	22.6	25.7	28.9
	(1) 93.3	-19	-4	1549	276	352	16.3	19.5	22.7	25.9	29.2
	91.8	-29	-15	1513	276	345	16.2	19.5	22.8	26.1	29.4
	85.0	-9	2	1136	228	298	17.4	21.8	26.2	30.6	35.0
	85.0	-19	-8	1164	235	301	17.3	21.6	25.9	30.2	34.5
	85.0	-29	-18	1187	242	303	17.1	21.3	25.6	29.8	34.0
	79.0	-9	-1	932	199	261	17.3	22.7	28.1	33.4	38.8
	79.0	-19	-10	945	205	264	17.3	22.6	27.9	33.2	38.5
	79.0	-29	-20	958	211	266	17.4	22.6	27.8	33.0	38.2
	73.0	-9	-3	775	173	228	16.5	23.0	29.4	35.8	42.3
	73.0	-19	-12	778	177	229	16.6	23.0	29.5	35.9	42.3
	73.0	-29	-22	786	183	231	16.7	23.1	29.4	35.8	42.2
	(2) 66.0	-9	-5	636	140	185	13.4	21.3	29.1	37.0	44.8
	66.0	-19	-14	639	146	189	14.0	21.8	29.7	37.5	45.3
	66.0	-29	-24	641	152	193	14.5	22.3	30.1	37.9	45.7

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON		
MAX. FAN %RPM		
-9°C	-19°C	-29°C
96.0	93.5	91.9
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%		

Figure 7-22 (Sheet 4 of 17)

CRUISE
21,000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	99.8	-17	1	1621	276	382	17.4	20.5	23.5	26.6	29.7
	(1) 98.3	-27	-10	1578	276	374	17.3	20.5	23.7	26.9	30.0
	96.6	-37	-21	1539	276	366	17.3	20.5	23.8	27.0	30.3
	92.0	-17	-4	1238	238	331	18.7	22.7	26.7	30.8	34.8
	92.0	-27	-13	1273	246	335	18.4	22.4	26.3	30.2	34.2
	92.0	-37	-23	1310	254	338	18.2	22.0	25.8	29.6	33.4
	88.0	-17	-6	1073	217	303	18.9	23.6	28.2	32.9	37.6
	88.0	-27	-15	1100	225	307	18.8	23.3	27.9	32.4	37.0
	88.0	-37	-25	1132	233	311	18.6	23.0	27.5	31.9	36.3
	83.0	-17	-8	899	189	265	18.3	23.9	29.4	35.0	40.6
	83.0	-27	-18	920	197	270	18.5	23.9	29.4	34.8	40.3
	83.0	-37	-28	942	205	275	18.6	23.9	29.2	34.5	39.8
	(2) 79.0	-17	-10	781	164	230	16.7	23.1	29.5	35.9	42.3
	79.0	-27	-20	794	172	237	17.3	23.6	29.8	36.1	42.4
	79.0	-37	-30	815	181	244	17.7	23.8	30.0	36.1	42.2
14000	99.5	-17	1	1607	276	381	17.5	20.6	23.7	26.8	30.0
	(1) 98.0	-27	-10	1565	276	374	17.5	20.7	23.9	27.1	30.2
	96.3	-37	-21	1528	276	366	17.4	20.7	24.0	27.2	30.5
	91.0	-17	-4	1200	235	327	18.9	23.1	27.3	31.4	35.6
	91.0	-27	-14	1232	243	331	18.7	22.8	26.8	30.9	35.0
	91.0	-37	-23	1266	250	334	18.5	22.4	26.4	30.3	34.3
	86.0	-17	-6	1006	209	293	19.2	24.1	29.1	34.1	39.1
	86.0	-27	-16	1026	217	296	19.1	24.0	28.9	33.8	38.6
	86.0	-37	-26	1055	224	300	19.0	23.7	28.5	33.2	37.9
	82.0	-17	-8	871	187	263	18.7	24.4	30.2	35.9	41.7
	82.0	-27	-18	893	195	268	18.8	24.4	30.0	35.6	41.2
	82.0	-37	-28	913	203	273	18.9	24.4	29.9	35.3	40.8
	(2) 77.0	-17	-11	738	159	224	16.7	23.5	30.3	37.1	43.8
	77.0	-27	-20	748	166	229	17.3	24.0	30.7	37.4	44.0
	77.0	-37	-30	759	174	234	17.7	24.3	30.9	37.5	44.1
13000	99.3	-17	1	1597	276	382	17.6	20.8	23.9	27.0	30.2
	(1) 97.7	-27	-10	1560	276	374	17.6	20.8	24.0	27.2	30.4
	96.1	-37	-21	1517	276	366	17.5	20.8	24.1	27.4	30.7
	90.0	-17	-4	1162	232	324	19.2	23.5	27.8	32.1	36.5
	90.0	-27	-14	1192	239	326	19.0	23.2	27.4	31.6	35.8
	90.0	-37	-24	1226	247	330	18.7	22.8	26.9	31.0	35.0
	85.0	-17	-7	976	207	290	19.5	24.6	29.7	34.8	40.0
	85.0	-27	-16	994	214	293	19.4	24.4	29.5	34.5	39.5
	85.0	-37	-26	1020	221	297	19.3	24.2	29.1	34.0	38.9
	80.0	-17	-9	815	180	253	18.8	24.9	31.1	37.2	43.4
	80.0	-27	-19	833	188	258	19.0	25.0	31.0	37.0	43.0
	80.0	-37	-28	853	195	263	19.1	25.0	30.8	36.7	42.5
	(2) 75.0	-17	-11	694	153	216	16.7	23.9	31.1	38.3	45.5
	75.0	-27	-21	705	161	222	17.4	24.4	31.5	38.6	45.7
	75.0	-37	-30	716	168	228	17.8	24.8	31.8	38.8	45.8
12000	99.0	-17	1	1584	276	381	17.8	20.9	24.1	27.2	30.4
	(1) 97.4	-27	-10	1550	276	374	17.7	20.9	24.1	27.4	30.6
	95.8	-37	-21	1507	276	366	17.7	21.0	24.3	27.6	30.9
	90.0	-17	-4	1165	234	326	19.4	23.7	28.0	32.3	36.6
	90.0	-27	-14	1194	241	329	19.1	23.3	27.5	31.7	35.9
	90.0	-37	-24	1230	249	332	18.8	22.9	27.0	31.0	35.1
	84.0	-17	-7	943	205	286	19.7	25.1	30.4	35.7	41.0
	84.0	-27	-17	963	211	290	19.7	24.9	30.1	35.3	40.5
	84.0	-37	-26	986	219	293	19.6	24.6	29.7	34.8	39.8
	78.0	-17	-9	769	175	246	19.0	25.5	32.0	38.5	45.0
	78.0	-27	-19	779	181	249	19.1	25.5	32.0	38.4	44.8
	78.0	-37	-29	793	187	253	19.2	25.6	31.9	38.2	44.5
	(2) 73.0	-17	-11	653	148	209	16.7	24.4	32.0	39.7	47.3
	73.0	-27	-21	663	156	215	17.4	24.9	32.5	40.0	47.6
	73.0	-37	-31	671	162	220	17.8	25.3	32.7	40.2	47.6
11000	98.7	-17	1	1574	276	381	17.9	21.0	24.2	27.4	30.6
	(1) 97.2	-27	-10	1540	276	374	17.8	21.1	24.3	27.6	30.8
	95.6	-37	-21	1498	276	366	17.8	21.1	24.4	27.8	31.1
	89.0	-17	-4	1123	231	321	19.7	24.2	28.6	33.1	37.5
	89.0	-27	-14	1154	238	324	19.4	23.8	28.1	32.4	36.8
	89.0	-37	-24	1187	245	327	19.1	23.3	27.6	31.8	36.0
	83.0	-17	-7	912	202	283	20.0	25.5	31.0	36.5	42.0
	83.0	-27	-17	932	209	286	20.0	25.3	30.7	36.1	41.4
	83.0	-37	-27	955	216	289	19.8	25.1	30.3	35.5	40.8
	76.0	-17	-10	724	169	238	19.1	26.0	32.9	39.8	46.7
	76.0	-27	-20	734	175	242	19.3	26.1	32.9	39.7	46.5
	76.0	-37	-30	745	181	245	19.4	26.1	32.8	39.5	46.3
	(2) 70.0	-17	-12	603	140	198	16.3	24.6	32.8	41.1	49.4
	70.0	-27	-22	605	146	202	16.8	25.1	33.4	41.6	49.9
	70.0	-37	-32	608	151	205	17.3	25.5	33.7	42.0	50.2

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON		
MAX. FAN %RPM		
-17°C	-27°C	-37°C
96.9	97.4	95.8
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%		

Figure 7-22 (Sheet 6 of 17)

CRUISE
25,000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000.	101.5	-25	-7	1473	262	387	19.5	22.9	26.3	29.7	33.0
	(1) 103.4	-35	-16	1605	276	397	18.5	21.6	24.7	27.9	31.0
	101.6	-45	-27	1566	275	389	18.4	21.6	24.8	28.0	31 2
	97.0	-25	-9	1268	243	361	20.6	24.5	28.4	32 4	36.3
	97 0	-35	-19	1304	250	363	20.1	24.0	27.8	31.6	35.5
	97.0	-45	-29	1347	257	364	19 6	23.3	27.0	30 7	34 5
	92.0	-25	-12	1059	218	325	21.2	26.0	30.7	35 4	40 1
	92.0	-35	-22	1090	226	329	21.0	25.6	30.2	34.8	39 4
	92.0	-45	-31	1126	234	333	20.7	25 1	29.6	34 0	38 5
	87.0	-25	-15	881	190	285	21.0	26.7	32.4	38.0	43 7
	87.0	-35	-24	907	199	291	21.1	26.6	32.1	37 6	43.2
	87.0	-45	-34	935	207	297	21 1	26 4	31.8	37 1	42.5
	(2) 83.0	-25	-17	761	164	247	19.4	25.9	32.5	39 1	45.6
	83 0	-35	-27	782	175	257	20 1	26.5	32.9	39 3	45.6
	83.0	-45	-36	804	184	265	20.5	26 7	32.9	39 2	45 4
14000.	101 6	-25	-7	1475	263	389	19.6	23.0	26.4	29.7	33.1
	(1)103.0	-35	-16	1590	275	397	18.7	21.8	25.0	28.1	31.3
	101.3	-45	-27	1551	275	389	18 6	21.8	25 1	28.3	31.5
	96.0	-25	-9	1229	241	357	20.9	25.0	29.1	33 1	37.2
	96.0	-35	-19	1261	247	359	20.5	24.5	28.5	32 4	36.4
	96.0	-45	-29	1303	255	361	20 0	23.8	27.7	31.5	35 4
	91.0	-25	-12	1026	216	322	21.6	26.5	31.4	36.2	41.1
	91.0	-35	-22	1055	223	326	21 4	26 1	30.9	35.6	40.4
	91.0	-45	-32	1092	232	330	21 1	25.6	30.2	34.8	39 4
	86.0	-25	-15	854	189	284	21.5	27.4	33.2	39 1	44.9
	86.0	-35	-25	879	197	289	21.5	27.2	32.9	38.6	44.3
	86 0	-45	-34	908	206	295	21.5	27.0	32.5	38.0	43.5
	(2) 81.0	-25	-18	715	159	240	19.6	26.5	33.5	40.5	47.5
	81.0	-35	-27	731	168	248	20.2	27.0	33.9	40.7	47.5
	81 0	-45	-37	752	177	256	20 7	27 4	34 0	40.7	47.3
13000	101.6	-25	-6	1478	265	391	19.7	23.0	26.4	29.8	33.2
	(1)102.7	-35	-16	1576	275	397	18 8	22.0	25.2	28.4	31.5
	101.0	-45	-27	1540	276	389	18 8	22 0	25.3	28.5	31.7
	95.0	-25	-10	1189	238	353	21.3	25.5	29.7	33.9	38.1
	95.0	-35	-20	1223	245	356	20.9	25.0	29 1	33.2	37.2
	95.0	-45	-29	1262	252	357	20.4	24 4	28.3	32.3	36.3
	90.0	-25	-12	994	214	319	22.0	27.0	32.1	37.1	42.1
	90.0	-35	-22	1021	221	322	21.8	26.7	31.6	36 5	41.3
	90.0	-45	-32	1057	229	327	21 4	26.2	30.9	35 6	40 4
	84.0	-25	-16	801	183	274	21.8	28.0	34.3	40.5	46.8
	84.0	-35	-25	819	190	279	21 9	28.0	34.1	40.2	46.3
	84.0	-45	-35	845	198	285	21.9	27.8	33.7	39.6	45.5
	(2) 79.0	-25	-18	668	153	232	19.7	27.2	34.7	42.2	49.7
	79.0	-35	-28	685	162	240	20 4	27.7	35.0	42.3	49.6
	79.0	-45	-37	701	171	245	20 8	28.0	35 1	42 2	49 4
12000	101.5	-25	-6	1480	266	392	19 7	23.1	26.5	29.9	33 3
	(1)102.4	-35	-16	1564	275	397	19.0	22.2	25.4	28.6	31.8
	100.7	-45	-27	1527	275	389	18.9	22.2	25.5	28 7	32.0
	94.0	-25	-10	1150	235	349	21.6	26 0	30.3	34.7	39.0
	94.0	-35	-20	1186	242	352	21.3	25.5	29.7	33.9	38.1
	94.0	-45	-30	1221	249	354	20 8	24 9	29.0	33 1	37 1
	88.0	-25	-13	929	207	309	22.4	27.8	33.2	38.6	44.0
	88.0	-35	-23	954	214	312	22.2	27.5	32.7	38.0	43.2
	88 0	-45	-33	983	221	316	22 0	27.0	32.1	37.2	42.3
	82.0	-25	-16	752	177	266	22.1	28.7	35.4	42.0	48.7
	82.0	-35	-26	767	184	270	22.2	28.7	35.2	41.7	48.3
	82.0	-45	-36	788	192	275	22 3	28.6	34 9	41.3	47 6
	(2) 76.0	-25	-19	609	143	215	19.1	27.3	35.5	43.7	52.0
	76.0	-35	-29	618	151	223	20.0	28.1	36.1	44.2	52.3
	76.0	-45	-38	630	159	230	20 6	28.5	36 5	44 4	52.3
11000	101.5	-25	-6	1479	267	393	19 8	23.2	26.6	30.0	33 4
	(1)102 1	-35	-16	1553	276	397	19 1	22.4	25.6	28.8	32.0
	100 4	-45	-27	1515	275	389	19 1	22.4	25.7	29 0	32.3
	94.0	-25	-10	1154	237	351	21.8	26.1	30.5	34.8	39.1
	94.0	-35	-20	1189	244	354	21 4	25.6	29.8	34.0	38.2
	94.0	-45	-30	1224	251	356	20 9	25.0	29.0	33.1	37.2
	87.0	-25	-13	898	204	305	22.9	28.4	34.0	39.6	45 1
	87 0	-35	-23	923	211	309	22.6	28.0	33.5	38.9	44 3
	87.0	-45	-33	951	219	312	22.3	27.6	32.8	38 1	43 4
	80.0	-25	-17	700	171	256	22.3	29.5	36.6	43.8	50.9
	80.0	-35	-26	718	178	261	22.5	29.5	36 4	43 4	50.4
	80.0	-45	-36	737	185	266	22.6	29.4	36.1	42.9	49.7
	(2) 74.0	-25	-19	575	140	212	19 5	28.2	36.9	45.6	54.3
	74.0	-35	-29	583	147	218	20.3	28.6	37 4	46.0	54 5
	74 0	-45	-39	592	154	223	20 8	29.3	37 7	46 2	54.6

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON		
MAX. FAN %RPM		
-25°C	-35°C	-45°C
98 5	100 3	100 7
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%		

Figure 7-22 (Sheet 8 of 17)

CRUISE
29,000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	103.4	-32	-14	1331	247	390	21.8	25.6	29.3	33.1	36.8
	(1) 105.5	-42	-23	1464	261	402	20.6	24.0	27.5	30.9	34.3
	106.0	-52	-33	1547	269	405	19.7	23.0	26.2	29.4	32.7
	101.0	-32	-16	1235	238	377	22.4	26.5	30.5	34.6	38.6
	101.0	-42	-25	1271	244	378	21.9	25.8	29.8	33.7	37.6
	101.0	-52	-35	1319	252	380	21.2	25.0	28.8	32.6	36.4
	96.0	-32	-18	1039	217	345	23.6	28.4	33.2	38.1	42.9
	96.0	-42	-28	1079	225	350	23.2	27.8	32.4	37.1	41.7
	96.0	-52	-38	1113	232	352	22.6	27.1	31.6	36.1	40.6
	92.0	-32	-21	899	196	313	23.7	29.3	34.9	40.4	46.0
	92.0	-42	-30	927	204	319	23.7	29.0	34.4	39.8	45.2
	92.0	-52	-40	960	213	325	23.5	28.7	33.9	39.1	44.3
	(2) 87.0	-32	-24	743	163	264	22.0	28.7	35.5	42.2	48.9
	87.0	-42	-33	767	174	275	22.8	29.3	35.8	42.4	48.9
	87.0	-52	-43	794	185	284	23.2	29.5	35.8	42.1	48.4
14000	103.3	-32	-14	1333	249	393	22.0	25.7	29.5	33.2	37.0
	(1) 105.5	-42	-23	1469	263	405	20.7	24.1	27.5	30.9	34.3
	106.0	-52	-33	1550	271	408	19.9	23.1	26.3	29.5	32.8
	100.0	-32	-16	1201	237	375	22.9	27.0	31.2	35.4	39.5
	100.0	-42	-26	1233	243	376	22.4	26.4	30.5	34.5	38.6
	100.0	-52	-36	1280	250	377	21.7	25.6	29.5	33.4	37.3
	95.0	-32	-19	1008	215	343	24.1	29.0	34.0	39.0	43.9
	95.0	-42	-28	1042	223	347	23.7	28.5	33.3	38.1	42.9
	95.0	-52	-38	1080	230	350	23.1	27.8	32.4	37.0	41.6
	90.0	-32	-22	839	189	304	24.3	30.2	36.2	42.1	48.1
	90.0	-42	-31	870	198	310	24.2	30.0	35.7	41.4	47.2
	90.0	-52	-41	898	206	316	24.0	29.6	35.1	40.7	46.3
	(2) 85.0	-32	-25	696	158	255	22.3	29.5	36.7	43.9	51.0
	85.0	-42	-34	720	169	267	23.2	30.1	37.1	44.0	51.0
	85.0	-52	-43	743	179	275	23.6	30.3	37.1	43.8	50.5
13000	103.3	-32	-14	1334	250	395	22.1	25.9	29.6	33.4	37.1
	(1) 105.4	-42	-23	1471	264	407	20.9	24.3	27.7	31.1	34.4
	106.0	-52	-32	1556	273	411	20.0	23.2	26.4	29.6	32.8
	100.0	-32	-16	1205	239	378	23.1	27.2	31.4	35.5	39.7
	100.0	-42	-25	1237	245	378	22.5	26.6	30.6	34.6	38.7
	100.0	-52	-35	1284	252	380	21.8	25.7	29.6	33.5	37.4
	94.0	-32	-19	979	214	340	24.6	29.7	34.8	39.9	45.0
	94.0	-42	-28	1009	221	344	24.2	29.2	34.1	39.1	44.0
	94.0	-52	-38	1046	228	347	23.6	28.4	33.2	38.0	42.7
	88.0	-32	-22	789	184	295	24.8	31.1	37.4	43.8	50.1
	88.0	-42	-32	810	192	300	24.8	30.9	37.1	43.3	49.4
	88.0	-52	-41	838	200	306	24.6	30.6	36.5	42.5	48.5
	(2) 83.0	-32	-25	652	153	248	22.6	30.3	38.0	45.6	53.3
	83.0	-42	-35	672	163	258	23.5	31.0	38.4	45.8	53.3
	83.0	-52	-44	696	173	267	24.0	31.2	38.4	45.6	52.8
12000	103.2	-32	-14	1336	252	397	22.3	26.0	29.7	33.5	37.2
	(1) 105.3	-42	-23	1474	266	409	21.0	24.4	27.7	31.1	34.5
	106.0	-52	-32	1562	275	413	20.0	23.3	26.5	29.7	32.9
	99.0	-32	-16	1171	237	375	23.5	27.8	32.0	36.3	40.6
	99.0	-42	-26	1202	243	376	22.9	27.1	31.3	35.4	39.6
	99.0	-52	-36	1245	249	377	22.2	26.3	30.3	34.3	38.3
	93.0	-32	-19	950	212	338	25.0	30.3	35.6	40.8	46.1
	93.0	-42	-29	979	219	341	24.7	29.8	34.9	40.0	45.1
	93.0	-52	-38	1015	227	345	24.1	29.0	34.0	38.9	43.8
	87.0	-32	-22	764	183	294	25.4	31.9	38.5	45.0	51.6
	87.0	-42	-32	786	191	299	25.3	31.7	38.0	44.4	50.8
	87.0	-52	-41	811	198	304	25.1	31.3	37.5	43.6	49.8
	(2) 80.0	-32	-26	592	143	232	22.3	30.8	39.2	47.7	56.1
	80.0	-42	-36	607	152	241	23.3	31.5	39.8	48.0	56.2
	80.0	-52	-45	622	161	249	24.0	32.0	40.0	48.1	56.1
11000	103.2	-32	-14	1340	253	400	22.3	26.1	29.8	33.5	37.3
	(1) 105.3	-42	-22	1478	267	411	21.0	24.4	27.8	31.2	34.6
	105.7	-52	-32	1552	276	414	20.2	23.4	26.7	29.9	33.1
	98.0	-32	-16	1137	235	372	24.9	28.4	32.8	37.2	41.6
	98.0	-42	-26	1167	241	373	23.4	27.7	31.9	36.2	40.5
	98.0	-52	-36	1205	247	374	22.7	26.9	31.0	35.1	39.3
	92.0	-32	-19	920	210	335	25.5	31.0	36.4	41.8	47.2
	92.0	-42	-29	950	217	338	25.1	30.4	35.6	40.9	46.2
	92.0	-52	-39	980	224	341	24.6	29.7	34.8	39.9	45.0
	85.0	-32	-23	714	177	285	25.9	32.9	39.9	46.9	53.9
	85.0	-42	-32	736	185	290	25.9	32.7	39.4	46.2	53.0
	85.0	-52	-42	758	192	295	25.7	32.3	38.9	45.5	52.1
	(2) 78.0	-32	-26	555	140	227	22.9	31.9	40.9	49.9	58.9
	78.0	-42	-36	568	148	235	23.7	32.5	41.3	50.2	59.0
	78.0	-52	-46	583	156	242	24.3	32.9	41.5	50.1	58.7

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON

MAX. FAN %RPM		
-32°C	-42°C	-52°C
100.1	101.7	103.0

INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%

Figure 7-22 (Sheet 10 of 17)

CRUISE
33,000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT. LBS.	FAN D/D RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100Kt. TAILWIND
15000	105.3	-40	-22	1202	230	391	24.2	28.3	32.5	36.7	40.8
	(1) 106.0	-50	-32	1275	240	397	23.3	27.2	31.1	35.0	38.9
	106.0	-60	-42	1321	246	397	22.5	26.3	30.1	33.8	37.6
	102.0	-40	-24	1085	218	372	25.1	29.7	34.3	38.9	43.5
	102.0	-50	-34	1121	225	374	24.4	28.9	33.4	37.8	42.3
	102.0	-60	-44	1163	232	376	23.8	28.1	32.4	36.7	41.0
	99.0	-40	-26	980	207	354	25.9	31.0	36.1	41.2	46.3
	99.0	-50	-35	1017	214	357	25.3	30.2	35.1	40.0	45.0
	99.0	-60	-45	1050	220	359	24.6	29.4	34.2	38.9	43.7
	95.0	-40	-28	845	187	321	26.1	32.1	38.0	43.9	49.8
	95.0	-50	-38	880	196	329	26.0	31.7	37.4	43.0	48.7
	95.0	-60	-47	917	205	335	25.7	31.1	36.6	42.0	47.5
	(2) 92.0	-40	-30	752	167	289	25.2	31.8	38.5	45.1	51.8
	92.0	-50	-40	781	178	301	25.7	32.2	38.6	45.0	51.4
	92.0	-60	-49	818	189	311	25.8	31.9	38.0	44.1	50.2
14000	105.2	-40	-22	1204	233	395	24.5	28.6	32.8	36.9	41.1
	(1)106.0	-50	-31	1280	242	400	23.5	27.4	31.3	35.2	39.1
	106.0	-60	-41	1329	248	401	22.6	26.4	30.2	33.9	37.7
	102.0	-40	-24	1091	222	377	25.4	30.0	34.6	39.1	43.7
	102.0	-50	-33	1127	228	379	24.7	29.2	33.6	38.1	42.5
	102.0	-50	-43	1169	235	381	24.0	28.3	32.6	36.8	41.1
	98.0	-40	-26	954	207	353	26.5	31.8	37.0	42.3	47.5
	98.0	-50	-35	989	214	357	25.9	31.0	36.1	41.1	46.2
	98.0	-60	-45	1022	220	358	25.3	30.1	35.0	39.9	44.8
	93.0	-40	-29	791	182	313	26.9	33.2	39.5	45.8	52.2
	93.0	-50	-38	823	191	321	26.8	32.9	39.0	45.0	51.1
	93.0	-60	-48	859	200	328	26.5	32.3	38.1	43.9	49.8
	(2) 89.0	-40	-32	676	155	269	25.0	32.3	39.7	47.1	54.5
	89.0	-50	-41	704	167	283	26.0	33.1	40.2	47.3	54.4
	89.0	-60	-50	731	178	293	26.4	33.2	40.1	46.9	53.8
13000	105.1	-40	-22	1206	235	398	24.7	28.9	33.0	37.2	41.3
	(1)106.0	-50	-31	1286	244	404	23.6	27.5	31.4	35.3	39.2
	106.0	-60	-41	1332	250	403	22.8	26.5	30.3	34.0	37.8
	101.0	-40	-24	1062	221	376	26.0	30.7	35.4	40.1	44.8
	101.0	-50	-33	1097	227	378	25.3	29.9	34.4	39.0	43.5
	101.0	-60	-43	1135	234	379	24.6	29.0	33.4	37.8	42.2
	96.0	-40	-26	897	202	346	27.4	33.0	38.6	44.2	49.7
	96.0	-50	-36	927	209	349	26.9	32.3	37.6	43.0	48.4
	96.0	-60	-46	961	216	352	26.2	31.4	36.6	41.8	47.0
	92.0	-40	-29	771	182	314	27.7	34.2	40.7	47.2	53.7
	92.0	-50	-38	798	191	320	27.6	33.9	40.1	46.4	52.7
	92.0	-60	-48	833	199	327	27.2	33.2	39.2	45.2	51.2
	(2) 87.0	-40	-32	635	152	263	25.7	33.6	41.4	49.3	57.2
	87.0	-50	-41	659	163	276	26.7	34.2	41.8	49.4	57.0
	87.0	-60	-51	687	173	286	27.1	34.4	41.7	48.9	56.2
12000	105.0	-40	-21	1208	237	401	24.9	29.1	33.2	37.4	41.5
	(1)106.0	-50	-31	1291	246	406	23.7	27.6	31.5	35.4	39.2
	106.0	-60	-41	1338	253	407	22.9	26.7	30.4	34.1	37.9
	100.0	-40	-24	1031	220	374	26.6	31.4	36.3	41.1	46.0
	100.0	-50	-34	1067	226	376	25.9	30.5	35.2	39.9	44.6
	100.0	-60	-44	1101	232	377	25.1	29.7	34.2	38.7	43.3
	95.0	-40	-26	869	201	344	28.1	33.9	39.6	45.4	51.2
	95.0	-50	-36	901	208	348	27.5	33.0	38.6	44.1	49.7
	95.0	-60	-46	933	215	350	26.8	32.1	37.5	42.9	48.2
	90.0	-40	-29	724	178	306	28.5	35.4	42.3	49.2	56.1
	90.0	-50	-39	748	185	312	28.3	35.0	41.7	48.4	55.1
	90.0	-60	-48	776	194	318	28.1	34.5	41.0	47.4	53.9
	(2) 85.0	-40	-32	599	149	259	26.5	34.9	43.2	51.6	59.9
	85.0	-50	-42	618	159	269	27.4	35.5	43.6	51.7	59.8
	85.0	-60	-51	641	168	278	27.8	35.6	43.4	51.2	59.0
11000	104.9	-40	-21	1210	239	404	25.1	29.2	33.4	37.5	41.6
	(1)106.0	-50	-30	1293	248	410	23.9	27.8	31.7	35.5	39.4
	105.8	-60	-41	1337	254	409	23.1	26.9	30.6	34.3	38.1
	100.0	-40	-23	1035	222	378	26.8	31.7	36.5	41.3	46.2
	100.0	-50	-33	1071	228	379	26.1	30.7	35.4	40.1	44.7
	100.0	-60	-43	1106	234	380	25.3	29.8	34.3	38.9	43.4
	94.0	-40	-26	842	200	342	28.8	34.7	40.7	46.6	52.6
	94.0	-50	-36	873	207	346	28.1	33.9	39.6	45.3	51.0
	94.0	-60	-46	908	214	348	27.4	32.9	38.4	43.9	49.4
	88.0	-40	-30	676	172	298	29.3	36.7	44.1	51.5	58.9
	88.0	-50	-39	699	180	304	29.1	36.3	43.4	50.6	57.7
	88.0	-60	-49	725	188	309	28.8	35.7	42.6	49.5	56.4
	(2) 82.0	-40	-33	539	139	241	26.3	35.5	44.8	54.1	63.4
	82.0	-50	-43	558	149	253	27.5	36.5	45.4	54.4	63.4
	82.0	-60	-52	576	158	262	28.1	36.8	45.5	54.2	62.8

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON

MAX. FAN %RPM		
-40°C	-50°C	-60°C
101.5	102.8	103.9

INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%

Figure 7-22 (Sheet 12 of 17)

CRUISE
37,000 FEET

ANTI-ICE SYSTEMS OFF — TWO ENGINES

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	106.0	-46	-30	1028	205	377	27.0	31.8	36.7	41.6	46.4
	(1) 106.0	-56	-39	1067	212	380	26.2	30.9	35.6	40.3	45.0
	106.0	-66	-49	1114	219	383	25.4	29.8	34.3	38.8	43.3
	103.0	-46	-31	932	194	359	27.8	33.2	38.5	43.9	49.3
	103.0	-56	-41	969	201	363	27.1	32.3	37.4	42.6	47.7
	103.0	-66	-51	1005	208	365	26.4	31.4	36.3	41.3	46.3
	101.0	-46	-32	875	187	347	28.2	33.9	39.6	45.3	51.1
	101.0	-56	-42	907	194	351	27.7	33.2	38.7	44.2	49.7
	101.0	-66	-52	941	201	354	27.0	32.3	37.6	42.9	48.2
	99.0	-46	-34	816	178	330	28.2	34.3	40.5	46.6	52.7
	99.0	-56	-43	846	186	338	28.1	34.0	39.9	45.8	51.7
	99.0	-66	-53	879	193	342	27.5	33.2	38.9	44.6	50.2
	(2) 97.0	-46	-35	751	163	305	27.4	34.0	40.7	47.3	54.0
	97.0	-56	-44	787	176	320	27.9	34.3	40.6	47.0	53.4
	97.0	-66	-54	821	186	329	27.9	34.0	40.1	46.1	52.2
14000	106.0	-46	-29	1040	210	386	27.5	32.3	37.1	41.9	46.7
	(1)106.0	-56	-39	1076	216	388	26.7	31.4	36.0	40.7	45.3
	106.0	-66	-49	1122	223	389	25.8	30.2	34.7	39.1	43.6
	103.0	-46	-30	941	199	368	28.4	33.6	39.1	44.4	49.7
	103.0	-56	-40	977	206	371	27.7	32.8	37.9	43.0	48.2
	103.0	-66	-50	1014	213	373	26.9	31.8	36.8	41.7	46.6
	100.0	-46	-32	855	189	350	29.2	35.0	40.9	46.7	52.6
	100.0	-56	-42	885	195	353	28.6	34.2	39.9	45.5	51.2
	100.0	-66	-51	919	202	356	27.8	33.3	38.7	44.1	49.6
	97.0	-46	-34	766	174	325	29.3	35.8	42.4	48.9	55.4
	97.0	-56	-43	798	184	333	29.2	35.5	41.8	48.0	54.3
	97.0	-66	-53	829	191	338	28.7	34.7	40.7	46.8	52.8
	(2) 95.0	-46	-36	706	161	301	28.5	35.6	42.7	49.8	56.9
	95.0	-56	-45	739	173	315	29.0	35.8	42.6	49.3	56.1
	95.0	-66	-54	774	183	324	29.0	35.4	41.9	48.4	54.8
13000	106.0	-46	-28	1048	214	393	27.9	32.7	37.5	42.2	47.0
	(1)106.0	-56	-38	1083	220	394	27.1	31.7	36.3	40.9	45.6
	106.0	-66	-48	1131	226	395	26.1	30.5	34.9	39.3	43.7
	102.0	-46	-30	919	200	369	29.2	34.7	40.1	45.6	51.0
	102.0	-56	-40	954	207	372	28.5	33.7	38.9	44.2	49.4
	102.0	-66	-50	989	213	374	27.7	32.7	37.8	42.8	47.9
	99.0	-46	-32	834	190	351	30.1	36.1	42.1	48.1	54.1
	99.0	-56	-42	863	196	354	29.5	35.3	41.1	46.8	52.6
	99.0	-66	-51	894	202	356	28.7	34.3	39.9	45.5	51.0
	96.0	-46	-34	749	177	329	30.5	37.2	43.8	50.5	57.2
	96.0	-56	-43	778	185	335	30.3	36.7	43.1	49.5	56.0
	96.0	-66	-53	810	192	340	29.6	35.7	41.9	48.1	54.2
	(2) 92.0	-46	-37	635	151	284	29.0	36.9	44.8	52.7	60.5
	92.0	-56	-46	666	164	299	29.8	37.3	44.8	52.4	59.9
	92.0	-66	-55	697	174	309	30.0	37.2	44.4	51.5	58.7
12000	106.0	-46	-28	1055	217	398	28.3	33.0	37.8	42.5	47.2
	(1)106.0	-56	-38	1090	223	399	27.4	32.0	36.6	41.2	45.7
	106.0	-66	-48	1138	229	399	26.3	30.7	35.1	39.5	43.9
	102.0	-46	-30	926	204	375	29.7	35.1	40.5	45.9	51.3
	102.0	-56	-40	959	210	377	28.9	34.1	39.4	44.6	49.8
	102.0	-66	-49	996	217	379	28.0	33.0	38.1	43.1	48.1
	98.0	-46	-32	813	190	352	31.1	37.2	43.3	49.5	55.6
	98.0	-56	-42	841	197	355	30.3	36.3	42.2	48.2	54.1
	98.0	-66	-51	870	203	357	29.5	35.2	41.0	46.7	52.5
	94.0	-46	-34	703	173	322	31.6	38.7	45.8	53.0	60.1
	94.0	-56	-44	731	181	329	31.3	38.2	45.0	51.9	58.7
	94.0	-66	-53	760	189	334	30.8	37.3	43.9	50.5	57.1
	(2) 90.0	-46	-37	598	150	281	30.3	38.6	47.0	55.4	63.7
	90.0	-56	-46	623	160	293	31.1	39.1	47.1	55.1	63.2
	90.0	-66	-56	652	170	303	31.1	38.8	46.5	54.1	61.8
11000	106.0	-46	-27	1059	220	402	28.5	33.3	38.0	42.7	47.4
	(1)106.0	-56	-37	1095	225	402	27.6	32.2	36.7	41.3	45.9
	106.0	-66	-47	1141	231	403	26.5	30.9	35.3	39.6	44.0
	101.0	-46	-30	903	204	375	30.5	36.0	41.6	47.1	52.6
	101.0	-56	-40	932	210	377	29.7	35.1	40.4	45.8	51.2
	101.0	-66	-50	970	216	378	28.7	33.9	39.0	44.2	49.3
	96.0	-46	-32	766	187	347	32.2	38.7	45.3	51.8	58.3
	96.0	-56	-42	790	193	349	31.5	37.9	44.2	50.5	56.8
	96.0	-66	-52	822	200	352	30.6	36.7	42.8	48.8	54.9
	92.0	-46	-35	656	169	315	32.8	40.4	48.0	55.7	63.3
	92.0	-56	-44	684	177	322	32.5	39.8	47.1	54.4	61.7
	92.0	-66	-54	714	185	328	32.0	39.0	46.0	53.0	60.0
	(2) 87.0	-46	-38	541	141	266	30.7	39.9	49.2	58.4	67.7
	87.0	-56	-47	562	152	278	31.7	40.6	49.5	58.4	67.3
	87.0	-66	-57	585	161	288	32.1	40.7	49.2	57.8	66.3

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON		
MAX. FAN %RPM		
-46°C	-56°C	-66°C
102.5	103.6	104.3
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%		

Figure 7-22 (Sheet 14 of 17)

CRUISE
41,000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	106.0	-46	-33	824	165	337	28.8	34.9	41.0	47.0	53.1
	(1)106.0	-56	-43	856	172	342	28.2	34.1	39.9	45.8	51.6
	106.0	-66	-52	891	179	348	27.8	33.4	39.0	44.6	50.2
	105.0	-46	-34	798	162	331	28.9	35.1	41.4	47.7	53.9
	105.0	-56	-43	828	168	336	28.5	34.5	40.6	46.6	52.6
	105.0	-66	-53	862	176	341	28.0	33.8	39.6	45.4	51.2
	104.0	-46	-34	775	159	325	29.0	35.4	41.9	48.3	54.5
	104.0	-56	-44	802	165	330	28.6	34.9	41.1	47.4	53.6
	104.0	-66	-53	835	172	334	28.0	34.0	40.0	46.0	52.0
14000	106.0	-46	-31	839	175	356	30.5	36.5	42.4	48.4	54.4
	(1)106.0	-56	-41	870	181	360	29.9	35.6	41.3	47.1	52.8
	106.0	-66	-51	906	188	363	29.0	34.5	40.0	45.6	51.1
	105.0	-46	-32	813	172	350	30.7	36.8	43.0	49.1	55.3
	105.0	-56	-42	841	178	353	30.1	36.1	42.0	48.0	53.9
	105.0	-66	-51	878	185	357	29.3	35.0	40.7	46.4	52.1
	104.0	-46	-33	787	168	343	30.8	37.2	43.5	49.9	56.2
	104.0	-56	-42	813	174	347	30.4	36.5	42.7	48.8	55.0
	104.0	-66	-52	850	182	352	29.6	35.5	41.4	47.3	53.1
	103.0	-46	-33	762	164	336	31.0	37.5	44.1	50.7	57.2
	103.0	-56	-43	789	171	341	30.5	36.9	43.2	49.5	55.9
	103.0	-66	-52	820	178	345	29.9	36.0	42.1	48.2	54.3
	(2)101.0	-46	-35	704	152	311	30.0	37.1	44.2	51.3	58.4
	101.0	-56	-44	740	164	328	30.9	37.6	44.4	51.1	57.9
	101.0	-66	-53	767	171	333	30.3	36.8	43.3	49.8	56.4
13000	106.0	-46	-30	851	182	370	31.7	37.6	43.5	49.4	55.2
	(1)106.0	-56	-40	882	188	373	30.9	36.6	42.3	47.9	53.6
	106.0	-66	-50	922	195	376	29.9	35.4	40.8	46.2	51.6
	104.0	-46	-31	799	176	358	32.3	38.5	44.8	51.1	57.3
	104.0	-56	-41	826	182	361	31.5	37.6	43.6	49.7	55.7
	104.0	-66	-51	864	189	365	30.6	36.4	42.2	48.0	53.8
	102.0	-46	-32	748	169	345	32.8	39.5	46.1	52.8	59.5
	102.0	-56	-42	775	176	349	32.1	38.6	45.0	51.5	57.9
	102.0	-66	-52	803	182	352	31.4	37.6	43.8	50.1	56.3
	101.0	-46	-33	724	166	339	33.0	39.9	46.8	53.7	60.6
	101.0	-56	-43	751	172	343	32.4	39.0	45.7	52.4	59.0
	101.0	-66	-52	779	179	346	31.6	38.1	44.5	50.9	57.3
	(2) 99.0	-46	-35	672	154	316	32.1	39.6	47.0	54.5	61.9
	99.0	-56	-44	700	165	329	32.7	39.8	47.0	54.1	61.3
	99.0	-66	-53	730	172	335	32.1	39.0	45.9	52.7	59.6
12000	106.0	-46	-29	864	189	382	32.6	38.4	44.2	50.0	55.7
	(1)106.0	-56	-39	894	195	384	31.7	37.3	42.9	48.5	54.1
	106.0	-66	-49	932	201	385	30.6	36.0	41.4	46.7	52.1
	103.0	-46	-31	782	179	363	33.6	40.0	46.4	52.8	59.2
	103.0	-56	-41	811	185	366	32.8	39.0	45.1	51.3	57.5
	103.0	-66	-50	842	191	369	31.9	37.8	43.8	49.7	55.6
	101.0	-46	-32	733	173	351	34.3	41.1	47.9	54.7	61.5
	101.0	-56	-42	760	179	354	33.5	40.1	46.6	53.2	59.8
	101.0	-66	-51	789	185	357	32.6	38.9	45.3	51.6	58.0
	98.0	-46	-34	661	160	327	34.3	41.9	49.5	57.0	64.6
	98.0	-56	-43	686	168	335	34.3	41.6	48.8	56.1	63.4
	98.0	-66	-53	712	175	339	33.6	40.6	47.7	54.7	61.7
	(2) 96.0	-46	-36	607	147	302	33.3	41.6	49.8	58.0	66.3
	96.0	-56	-45	637	158	316	34.0	41.9	49.7	57.6	65.4
	96.0	-66	-54	667	168	327	34.0	41.5	49.0	56.5	64.0
11000	106.0	-46	-28	871	193	390	33.3	39.0	44.8	50.5	56.3
	(1)106.0	-56	-38	901	199	391	32.3	37.9	43.4	49.0	54.5
	106.0	-66	-48	940	205	393	31.1	36.4	41.8	47.1	52.4
	102.0	-46	-31	764	181	366	34.8	41.4	47.9	54.5	61.0
	102.0	-56	-40	794	187	369	33.9	40.2	46.5	52.8	59.1
	102.0	-66	-50	822	193	371	33.0	39.1	45.1	51.2	57.3
	99.0	-46	-32	695	171	349	35.8	43.0	50.2	57.4	64.6
	99.0	-56	-42	718	177	352	35.0	42.0	49.0	55.9	62.9
	99.0	-66	-52	746	183	354	34.1	40.8	47.5	54.2	60.9
	96.0	-46	-34	623	158	324	36.0	44.1	52.1	60.1	68.1
	96.0	-56	-43	647	166	332	35.8	43.6	51.3	59.0	66.7
	96.0	-66	-53	675	173	337	35.1	42.5	50.0	57.4	64.8
	(2) 93.0	-46	-37	550	140	290	34.5	43.6	52.7	61.8	70.9
	93.0	-56	-45	577	152	305	35.4	44.1	52.8	61.4	70.1
	93.0	-66	-55	603	161	314	35.5	43.8	52.1	60.4	68.7

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON

MAX. FAN %RPM		
-46°C	-56°C	-66°C
102.7	103.7	104.4

INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%

Figure 7-22 (Sheet 16 of 17)

CRUISE
5000 FEET

ANTI-ICE SYSTEMS OFF — **ONE ENGINE**

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000.	94.9	15	22	1095	222	242	13.0	17.5	22.1	26.7	31.2
	(1) 97.1	5	13	1181	235	252	12.9	17.1	21.4	25.6	29.8
	99.3	-5	3	1260	249	262	12.6	16.5	20.4	24.4	28.3
	91.0	15	21	977	205	224	12.7	17.8	23.0	28.1	33.2
	91.0	5	11	989	211	226	12.8	17.8	22.9	27.9	33.0
	91.0	-5	1	1009	217	228	12.7	17.7	22.6	27.6	32.6
	(2) 82.0	15	19	746	158	173	9.9	16.6	23.3	30.0	36.7
	82.0	5	9	753	166	178	10.4	17.0	23.7	30.3	37.0
	82.0	-5	-1	759	172	182	10.8	17.4	24.0	30.6	37.1
14000.	94.8	15	22	1094	224	244	13.2	17.7	22.3	26.9	31.5
	(1) 97.0	5	13	1181	237	254	13.0	17.3	21.5	25.7	30.0
	99.3	-5	3	1280	250	263	12.7	16.7	20.6	24.5	28.4
	90.0	15	21	950	204	223	12.9	18.2	23.4	28.7	34.0
	90.0	5	11	962	209	224	12.9	18.1	23.3	28.5	33.7
	90.0	-5	1	977	215	226	12.9	18.0	23.1	28.3	33.4
	(2) 80.0	15	18	705	154	169	9.7	16.8	23.9	31.0	38.1
	80.0	5	9	711	161	173	10.3	17.3	24.3	31.4	38.4
	80.0	-5	-1	718	168	177	10.7	17.7	24.6	31.6	38.6
13000	94.8	15	22	1094	225	246	13.3	17.9	22.5	27.0	31.6
	(1) 97.1	5	13	1184	239	256	13.2	17.4	21.6	25.8	30.1
	99.2	-5	3	1281	252	264	12.8	16.7	20.6	24.5	28.5
	89.0	15	21	923	202	221	13.1	18.5	23.9	29.3	34.8
	89.0	5	11	936	207	223	13.1	18.4	23.8	29.1	34.5
	89.0	-5	1	949	213	224	13.1	18.3	23.6	28.9	34.1
	(2) 78.0	15	18	665	149	163	9.5	17.1	24.6	32.1	39.6
	78.0	5	8	672	156	168	10.1	17.6	25.0	32.5	39.9
	78.0	-5	-1	680	163	172	10.6	18.0	25.3	32.7	40.0
12000.	94.8	15	22	1095	227	248	13.5	18.1	22.6	27.2	31.8
	(1) 97.0	5	13	1182	240	257	13.3	17.5	21.7	26.0	30.2
	99.2	-5	3	1282	253	266	12.9	16.8	20.7	24.6	28.5
	87.0	15	21	870	196	214	13.2	18.9	24.6	30.4	36.1
	87.0	5	11	882	202	216	13.2	18.8	24.5	30.2	35.8
	87.0	-5	1	896	207	218	13.2	18.7	24.3	29.9	35.5
	(2) 75.0	15	18	619	142	156	9.0	17.1	25.1	33.2	41.3
	75.0	5	8	619	147	159	9.5	17.5	25.6	33.7	41.8
	75.0	-5	-2	620	152	161	9.9	17.9	26.0	34.1	42.1
11000	94.8	15	22	1095	228	249	13.6	18.2	22.6	27.3	31.9
	(1) 97.0	5	13	1185	241	258	13.4	17.6	21.8	26.0	30.2
	99.2	-5	4	1285	254	267	13.0	16.9	20.8	24.7	28.6
	86.0	15	20	842	194	212	13.3	19.2	25.2	31.1	37.1
	86.0	5	11	856	200	214	13.3	19.2	25.0	30.9	36.7
	86.0	-5	1	869	205	216	13.3	19.1	24.8	30.6	36.3
	(2) 73.0	15	18	592	141	154	9.2	17.7	26.1	34.6	43.0
	73.0	5	8	591	146	157	9.6	18.1	26.5	35.0	43.4
	73.0	-5	-2	592	150	159	9.9	18.4	26.8	35.3	43.7

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

Figure 7-23 (Sheet 1 of 10)

CRUISE
15,000 FEET

ANTI-ICE SYSTEMS OFF — **ONE ENGINE**

WT. LBS.	FAN O/D RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000.	99.5	-5	2	857	193	246	16.8	22.6	28.3	34.1	39.9
	(1) 101.6	-15	-7	947	207	258	16.7	22.0	27.3	32.6	37.9
	103.8	-25	-16	1046	222	271	16.3	21.1	25.9	30.7	35.4
	98.0	-5	2	831	187	238	16.7	22.7	28.7	34.7	40.7
	98.0	-15	-6	846	193	241	16.7	22.6	28.5	34.4	40.3
	98.0	-25	-18	864	199	243	16.6	22.4	28.2	34.0	39.7
	(2) 92.0	-5	0	695	159	203	14.8	22.0	29.2	36.4	43.5
	92.0	-15	-10	709	167	209	15.4	22.5	29.5	36.6	43.6
	92.0	-25	-19	722	174	214	15.7	22.7	29.6	36.5	43.4
14000.	99.4	-5	3	867	196	250	17.3	23.1	28.8	34.6	40.3
	(1)101.6	-15	-7	948	210	262	17.1	22.3	27.6	32.9	38.2
	103.8	-25	-16	1048	224	274	16.6	21.3	26.1	30.9	35.6
	97.0	-5	2	810	188	239	17.2	23.3	29.5	35.7	41.9
	97.0	-15	-6	824	193	241	17.1	23.2	29.2	35.3	41.4
	97.0	-25	-18	841	198	243	17.0	22.9	28.9	34.8	40.8
	(2) 90.0	-5	0	656	155	198	15.0	22.6	30.2	37.9	45.5
	90.0	-15	-10	669	163	205	15.6	23.1	30.6	38.1	45.5
	90.0	-25	-20	683	170	209	16.0	23.3	30.7	38.0	45.3
13000.	99.4	-5	3	871	200	254	17.7	23.4	29.2	34.9	40.7
	(1)101.5	-15	-6	948	212	265	17.4	22.6	27.9	33.2	38.5
	103.7	-25	-16	1047	226	276	16.8	21.6	26.3	31.1	35.9
	95.0	-5	2	767	184	235	17.6	24.1	30.6	37.1	43.6
	95.0	-15	-8	780	189	236	17.5	23.9	30.3	36.7	43.1
	95.0	-25	-18	796	195	238	17.4	23.6	29.9	36.2	42.5
	(2) 87.0	-5	-1	599	146	186	14.4	22.8	31.1	39.4	47.8
	87.0	-15	-10	610	154	193	15.3	23.5	31.7	39.9	48.1
	87.0	-25	-20	623	162	199	15.8	23.9	31.9	39.9	47.9
12000.	99.4	-5	3	872	202	257	18.0	23.8	29.5	35.2	41.0
	(1)101.5	-15	-6	950	215	267	17.6	22.9	28.2	33.4	38.7
	103.7	-25	-16	1049	228	278	17.0	21.7	26.5	31.3	36.0
	94.0	-5	2	747	184	235	18.0	24.7	31.4	38.1	44.8
	94.0	-15	-8	759	189	236	17.9	24.5	31.1	37.7	44.3
	94.0	-25	-18	775	194	238	17.8	24.2	30.7	37.1	43.5
	(2) 85.0	-5	-1	567	144	184	14.8	23.6	32.4	41.3	50.1
	85.0	-15	-10	576	151	189	15.5	24.2	32.9	41.6	50.3
	85.0	-25	-20	585	158	194	16.0	24.6	33.1	41.7	50.2
11000.	99.3	-5	3	870	204	260	18.3	24.1	29.8	35.6	41.3
	(1)101.5	-15	-6	953	217	270	17.8	23.1	28.3	33.6	38.8
	103.6	-25	-15	1049	229	280	17.1	21.9	26.7	31.4	36.2
	93.0	-5	2	727	184	234	18.4	25.3	32.2	39.0	45.9
	93.0	-15	-8	740	189	236	18.3	25.1	31.9	38.6	45.4
	93.0	-25	-18	754	193	237	18.1	24.8	31.4	38.0	44.7
	(2) 82.0	-5	-1	516	135	173	14.1	23.8	33.5	43.2	52.9
	82.0	-15	-11	525	143	179	15.1	24.6	34.1	43.7	53.2
	82.0	-25	-21	536	150	184	15.8	25.1	34.4	43.8	53.1

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

Figure 7-23 (Sheet 3 of 10)

CRUISE
19,000 FEET

ANTI-ICE SYSTEMS OFF — **ONE ENGINE**

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000.	101.4	-13	-6	788	179	243	18.1	24.5	30.8	37.2	43.5
	(1)103.5	-23	-15	872	195	259	18.2	24.0	29.7	35.4	41.2
	105.7	-33	-24	966	210	273	17.9	23.1	28.3	33.4	38.6
	101.0	-13	-6	779	177	240	18.0	24.5	30.9	37.3	43.7
	101.0	-23	-16	802	184	245	18.1	24.3	30.6	36.8	43.0
	101.0	-33	-25	826	191	249	18.0	24.0	30.1	36.1	42.2
	(2) 97.0	-13	-7	687	156	213	16.5	23.8	31.0	38.3	45.6
	97.0	-23	-17	701	164	220	17.1	24.2	31.3	38.5	45.6
	97.0	-33	-27	723	173	226	17.4	24.3	31.3	38.2	45.1
14000.	101.3	-13	-5	791	184	250	18.9	25.2	31.5	37.9	44.2
	(1)103.4	-23	-14	871	198	263	18.7	24.5	30.2	36.0	41.7
	105.5	-33	-24	964	212	276	18.3	23.4	28.6	33.8	39.0
	100.0	-13	-6	757	178	242	18.8	25.4	32.0	38.6	45.2
	100.0	-23	-15	779	185	246	18.7	25.1	31.6	38.0	44.4
	100.0	-33	-25	804	191	249	18.6	24.8	31.0	37.2	43.5
	(2) 94.0	-13	-8	633	151	206	16.7	24.6	32.5	40.4	48.3
	94.0	-23	-17	647	158	212	17.3	25.0	32.8	40.5	48.2
	94.0	-33	-27	660	165	216	17.6	25.2	32.8	40.4	48.0
13000	101.2	-13	-5	790	187	254	19.5	25.9	32.2	38.5	44.9
	(1)103.3	-23	-14	872	201	267	19.2	24.9	30.6	36.4	42.1
	105.5	-33	-23	966	215	279	18.6	23.7	28.9	34.1	39.3
	98.0	-13	-6	719	176	239	19.3	26.3	33.2	40.2	47.2
	98.0	-23	-16	732	181	241	19.3	26.1	33.0	39.8	46.6
	98.0	-33	-26	755	187	244	19.1	25.7	32.4	39.0	45.6
	(2) 91.0	-13	-8	582	144	196	16.5	25.1	33.7	42.3	50.9
	91.0	-23	-18	594	152	204	17.5	25.9	34.3	42.8	51.2
	91.0	-33	-27	607	159	209	17.9	26.2	34.4	42.6	50.9
12000.	101.1	-13	-5	791	191	259	20.1	26.4	32.7	39.0	45.3
	(1)103.3	-23	-14	875	204	271	19.5	25.2	31.0	36.7	42.4
	105.5	-33	-23	963	217	281	18.8	24.0	29.2	34.4	39.6
	97.0	-13	-6	701	177	240	20.0	27.1	34.3	41.4	48.5
	97.0	-23	-16	713	181	242	19.9	26.9	33.9	41.0	48.0
	97.0	-33	-26	732	187	244	19.7	26.5	33.3	40.2	47.0
	(2) 89.0	-13	-8	550	142	195	17.2	26.3	35.4	44.5	53.6
	89.0	-23	-18	561	150	201	18.0	26.9	35.8	44.8	53.7
	89.0	-33	-28	572	157	206	18.5	27.2	36.0	44.7	53.4
11000	101.1	-13	-4	792	193	262	20.5	26.8	33.1	39.4	45.8
	(1)103.3	-23	-14	875	206	274	19.9	25.6	31.3	37.0	42.7
	105.5	-33	-23	966	219	284	19.1	24.2	29.4	34.6	39.8
	96.0	-13	-6	683	177	241	20.6	27.9	35.3	42.6	49.9
	96.0	-23	-16	695	182	242	20.5	27.7	34.8	42.0	49.2
	96.0	-33	-26	710	187	244	20.3	27.3	34.3	41.4	48.4
	(2) 86.0	-13	-9	501	135	185	16.9	26.9	36.8	46.8	56.8
	86.0	-23	-18	512	143	191	17.9	27.6	37.4	47.2	56.9
	86.0	-33	-28	524	150	197	18.5	28.1	37.6	47.1	56.7

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

Figure 7-23 (Sheet 5 of 10)

CRUISE
23,000 FEET

ANTI-ICE SYSTEMS OFF — **ONE ENGINE**

WT. LBS.	FAN 0/0 RMP	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	103.4	-21	-14	719	161	234	18.7	25.6	32.6	39.5	46.5
	(1)105.4	-31	-23	799	180	256	19.5	25.8	32.1	38.3	44.6
	106.0	-41	-32	843	190	264	19.5	25.4	31.3	37.2	43.2
14000.	103.2	-21	-13	720	169	245	20.2	27.1	34.0	41.0	47.9
	(1)105.3	-31	-22	797	185	262	20.4	26.6	32.9	39.2	45.4
	106.0	-41	-32	847	194	270	20.1	26.0	31.9	37.8	43.7
	103.0	-21	-14	717	168	244	20.1	27.1	34.1	41.0	48.0
	103 0	-31	-23	742	175	250	20.2	26.9	33.7	40.4	47.2
	103 0	-41	-33	768	183	255	20.1	26.6	33.1	39.7	46.2
	(2)100.0	-21	-15	648	152	222	18.8	26.5	34.2	42.0	49.7
	100.0	-31	-24	667	161	230	19.4	26.9	34.4	41.9	49.4
	100.0	-41	-34	693	170	237	19.7	26.9	34.1	41.3	48.6
13000	103.1	-21	-13	724	175	254	21.2	28.1	35.0	41.9	48.8
	(1)105.2	-31	-22	800	189	268	21.0	27.3	33.5	39.8	46.0
	106.0	-41	-32	848	198	275	20.6	26.5	32.4	38.3	44.2
	101.0	-21	-14	675	166	241	20.9	28.3	35.7	43.1	50.5
	101.0	-31	-23	697	173	246	20.9	28.1	35.3	42.5	49.7
	101.0	-41	-33	723	180	250	20.8	27.7	34.7	41.6	48.5
	(2) 97.0	-21	-15	590	146	213	19.1	27.6	36.1	44.6	53.0
	97.0	-31	-25	609	155	221	19.9	28.1	36.3	44.5	52.7
	97.0	-41	-34	628	162	227	20.2	28.2	36.1	44.1	52.1
12000	103.0	-21	-13	726	179	260	22.0	28.9	35.8	42.7	49.6
	(1)105.1	-31	-22	799	192	272	21.6	27.9	34.1	40.4	46.6
	106 0	-41	-31	851	201	279	21.0	26.9	32.8	38.6	44.5
	100.0	-21	-13	659	168	244	21.9	29.5	37.1	44.7	52.2
	100.0	-31	-23	677	174	248	21.8	29.2	36.6	43.9	51.3
	100.0	-41	-33	701	180	251	21.6	28 7	35.8	42.9	50.1
	(2) 94.0	-21	-15	545	142	208	19.7	28.9	38.1	47.2	56.4
	94.0	-31	-25	556	149	213	20.3	29.3	38.3	47.3	56.3
	94.0	-41	-35	569	156	218	20.7	29.5	38.3	47.1	55.9
11000.	102.9	-21	-12	725	182	265	22.7	29 6	36.5	43.4	50.3
	(1)105.1	-31	-22	801	195	276	22.0	28.3	34.5	40.8	47.0
	106.0	-41	-31	853	203	282	21.4	27.2	33.1	39.0	44.8
	98.0	-21	-14	618	165	241	22.7	30.8	38.9	47.0	55.1
	98.0	-31	-24	637	171	244	22.6	30.4	38.3	46.1	54.0
	98.0	-41	-33	657	177	247	22.3	29.9	37.5	45.1	52.7
	(2) 90 0	-21	-16	486	133	194	19.4	29.6	39.9	50.2	60.5
	90.0	-31	-26	496	140	201	20 4	30.5	40.5	50.6	60.7
	90.0	-41	-36	508	147	206	20.9	30.7	40.6	50 4	60.3

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

Figure 7-23 (Sheet 7 of 10)

CRUISE
27,000 FEET

ANTI-ICE SYSTEMS OFF — **ONE ENGINE**

WT. LBS.	FAN 0/0 RMP	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
14000.	105.0	-28	-22	649	146	228	19.7	27.4	35.1	42.8	50.6
	(1)106.0	-38	-31	703	163	250	21.3	28.4	35.5	42.6	49.7
	106.0	-48	-41	733	172	257	21.4	28.2	35.0	41.9	48.7
13000	105.0	-28	-21	658	158	247	22.4	30.0	37.6	45.2	52.8
	(1)106.0	-38	-30	707	171	260	22.6	29.7	36.8	43.9	50.9
	106.0	-48	-40	735	178	265	22.4	29.2	36.0	42.8	49.7
	104.0	-28	-22	636	153	239	21.9	29.6	37.7	45.5	53.4
	104.0	-38	-31	661	162	247	22.3	29.9	37.4	45.0	52.6
	104.0	-48	-41	687	170	253	22.3	29.6	36.9	44.2	51.5
	(2)103.0	-28	-22	615	148	232	21.4	29.5	37.6	45.8	53.9
	103.0	-38	-32	638	157	240	22.0	29.8	37.7	45.5	53.4
	103.0	-48	-41	665	166	248	22.2	29.7	37.2	44.7	52.3
12000	104.9	-28	-21	661	165	257	23.8	31.4	39.0	46.5	54.1
	(1)106.0	-38	-30	710	176	268	23.6	30.7	37.7	44.8	51.8
	106.0	-48	-40	737	182	271	23.2	30.0	36.8	43.6	50.4
	103.0	-28	-21	623	158	246	23.5	31.5	39.6	47.6	55.6
	103.0	-38	-31	642	165	251	23.5	31.3	39.1	46.9	54.7
	103.0	-48	-41	668	172	256	23.4	30.8	38.3	45.8	53.3
	(2) 99.0	-28	-23	540	137	215	21.2	30.4	39.7	49.0	58.2
	99.0	-38	-33	560	147	225	22.3	31.2	40.1	49.1	58.0
	99.0	-48	-42	581	155	232	22.7	31.3	39.9	48.5	57.1
11000	104.7	-28	-20	661	170	265	24.9	32.5	40.0	47.6	55.2
	(1)106.0	-38	-30	713	180	274	24.4	31.4	38.4	45.4	52.5
	106.0	-48	-39	739	186	276	23.9	30.7	37.4	44.2	51.0
	101.0	-28	-21	585	156	244	24.6	33.2	41.7	50.3	58.8
	101.0	-38	-31	606	163	249	24.6	32.8	41.1	49.3	57.6
	101.0	-48	-41	626	169	252	24.3	32.3	40.3	48.3	56.3
	(2) 96.0	-28	-23	494	134	209	22.2	32.3	42.4	52.6	62.7
	96.0	-38	-33	511	142	218	23.2	32.9	42.7	52.5	62.3
	96.0	-48	-43	527	150	224	23.6	33.1	42.6	52.1	61.5
10000	104.7	-28	-20	662	174	270	25.7	33.3	40.8	48.4	55.9
	(1)106.0	-38	-29	714	183	279	25.0	32.0	39.0	46.0	53.0
	106.0	-48	-39	741	189	281	24.4	31.2	37.9	44.6	51.4
	99.0	-28	-22	551	155	242	25.8	34.9	43.9	53.0	62.1
	99.0	-38	-31	569	161	246	25.6	34.4	43.2	52.0	60.8
	99.0	-48	-41	589	167	249	25.3	33.8	42.3	50.8	59.3
	(2) 92.0	-28	-24	441	127	199	22.4	33.8	45.1	56.4	67.8
	92.0	-38	-33	451	134	206	23.4	34.5	45.6	56.7	67.8
	92.0	-48	-43	463	141	211	24.1	34.9	45.7	56.5	67.3

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

Figure 7-23 (Sheet 9 of 10)

DESCENT

Performance for two types of descent is presented on the following pages. Time, distance and fuel information are provided for a normal descent of 600 pounds per hour total fuel flow and 2000 feet per minute, and a high speed descent of 600 pounds per hour total fuel and 3000 feet per minute.

This performance is based on controlling the fan speed to obtain the fuel flows, airspeed and rates of descent presented with gear and flaps up, speed brakes retracted and anti-ice systems OFF or ON.

The time, distance and fuel used from a given altitude is based on descending to sea level. If the descent is to another altitude, the difference in time, distance and fuel used between the initial and the final altitude must be determined.

Begin descent at M_{MO} -10 KIAS, reduce power to desired fuel flow. Maintain desired rate of descent when obtained.

The data is based on a gross weight of 10,000 pounds and standard day temperature. However, weight and temperature effects are minimal and the data can be used for all conditions.

HIGH SPEED DESCENT - 3000 FEET PER MINUTE

ANTI-ICE SYSTEMS OFF SPEEDBRAKES RETRACTED GEAR AND FLAPS UP

600 POUNDS PER HOUR (300 POUNDS PER HOUR PER ENGINE)

PRESSURE ALTITUDE FT	TIME MIN	FUEL USED LBS	DISTANCE - NAUTICAL MILES						
			100 KT HEADWIND	50 KT HEADWIND	25 KT HEADWIND	ZERO WIND	25 KT TAILWIND	50 KT TAILWIND	100 KT TAILWIND
43000	14.3	143	54.	66.	72.	78.	83.	89.	101.
41000	13.7	137	51.	62.	68.	73.	79.	85.	96.
39000	13.0	130	47.	58.	63.	69.	74.	80.	90.
37000	12.3	123	44.	54.	59.	64.	70.	75.	85.
35000	11.7	117	41.	50.	55.	60.	65.	70.	79.
33000	11.0	110	37.	47.	51.	56.	60.	65.	74.
31000	10.3	103	34.	43.	47.	51.	55.	60.	68.
29000	9.7	97	31.	39.	43.	47.	51.	55.	63.
27000	9.0	90	28.	35.	39.	43.	46.	50.	58.
25000	8.3	83	25.	32.	35.	39.	42.	46.	53.
23000	7.7	77	22.	29.	32.	35.	38.	41.	48.
21000	7.0	70	20.	26.	28.	31.	34.	37.	43.
19000	6.3	63	17.	23.	25.	28.	30.	33.	38.
17000	5.7	57	15.	20.	22.	24.	27.	29.	34.
15000	5.0	50	13.	17.	19.	21.	23.	25.	29.
10000	3.3	33	8.	11.	12.	13.	15.	16.	19.
5000	1.7	17	4.	5.	6.	6.	7.	8.	9.
0	0.0	0	0.	0.	0.	0.	0.	0.	0.

WHEN THE ANTI-ICE SYSTEMS ARE ON, DECREASE THE DISTANCE 5%.
TIME AND FUEL USED REMAIN THE SAME.

Figure 7-25

HOLDING

Holding fuel in total pounds per hour is presented for various weights at several altitudes.

These data are based on a nominal holding speed with gear and flaps up and speed brakes retracted.

HOLDING FUEL
ANTI-ICE SYSTEMS OFF

SPEEDBRAKE RETRACTED **GEAR AND FLAPS UP**

WEIGHT POUNDS	KIAS	TOTAL POUNDS PER HOUR						
		PRESSURE ALTITUDE - FEET						
		SEA LEVEL	5000	10,000	15,000	20,000	25,000	30,000
14,000	175	1029	956	891	838	795	762	743
13,000	170	982	913	848	794	752	719	698
12,000	165	938	869	806	752	710	676	653
11,000	160	893	826	765	711	668	633	611
10,000	155	851	783	725	672	628	593	570

WHEN THE ANTI-ICE SYSTEMS ARE ON, INCREASE THE FUEL FLOW BY 8 PERCENT.

A MINIMUM OF 60% N_2 IS REQUIRED TO OPEN THE ENGINE ANTI-ICE VALVES.

Figure 7-26

NORMAL DESCENT - 2000 FEET PER MINUTE

ANTI-ICE SYSTEMS OFF SPEEDBRAKES RETRACTED GEAR AND FLAPS UP

600 POUNDS PER HOUR (300 POUNDS PER HOUR PER ENGINE)

PRESSURE ALTITUDE FT	TIME MIN	FUEL USED LBS	DISTANCE - NAUTICAL MILES						
			100 KT HEADWIND	50 KT HEADWIND	25 KT HEADWIND	ZERO WIND	25 KT TAILWIND	50 KT TAILWIND	100 KT TAILWIND
43000	21.5	215	70.	88.	97.	106.	115.	124.	142.
41000	20.5	205	65.	82.	91.	100.	108.	117.	134.
39000	19.5	195	61.	77.	85.	93.	101.	109.	126.
37000	18.5	185	56.	72.	79.	87.	95.	102.	118.
35000	17.5	175	52.	66.	73.	81.	88.	95.	110.
33000	16.5	165	47.	61.	68.	75.	81.	88.	102.
31000	15.5	155	43.	55.	62.	68.	75.	81.	94.
29000	14.5	145	38.	50.	57.	63.	69.	75.	87.
27000	13.5	135	35.	46.	51.	57.	63.	68.	79.
25000	12.5	125	31.	41.	47.	52.	57.	62.	73.
23000	11.5	115	28.	37.	42.	47.	51.	56.	66.
21000	10.5	105	24.	33.	37.	42.	46.	50.	59.
19000	9.5	95	21.	29.	33.	37.	41.	45.	53.
17000	8.5	85	18.	25.	29.	32.	36.	39.	46.
15000	7.5	75.	15.	22.	25.	28.	31.	34.	40.
10000	5.0	50	9.	13.	15.	17.	20.	22.	26.
5000	2.5	25.	4.	6.	7.	8.	9.	10.	12.
0	0.0	0	0.	0.	0.	0.	0.	0.	0.

WHEN THE ANTI-ICE SYSTEMS ARE ON, DECREASE THE DISTANCE 5%.
TIME AND FUEL USED REMAIN THE SAME.

Figure 7-24

CRUISE
29,000 FEET

ANTI-ICE SYSTEMS OFF — ONE ENGINE

WT. LBS.	FAN O/D RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
14000.	(1)106.0	-42	-36	648	145	230	20.1	27.8	35.5	43.2	50.9
	106.0	-52	-45	682	159	245	21.3	28.7	36.0	43.3	50.6
13000.	105.3	-32	-26	614	144	234	21.7	29.9	38.0	46.2	54.3
	(1)106.0	-42	-35	655	158	250	22.9	30.5	38.1	45.8	53.4
	106.0	-52	-45	685	167	257	23.0	30.3	37.6	44.9	52.2
12000.	105.3	-32	-25	623	156	252	24.3	32.3	40.4	48.4	56.4
	(1)106.0	-42	-34	661	166	261	24.4	32.0	39.6	47.1	54.7
	106.0	-52	-44	689	173	266	24.1	31.4	38.7	45.9	53.2
	104.0	-32	-26	593	149	241	23.8	32.2	40.7	49.1	57.5
	104.0	-42	-35	617	157	249	24.1	32.2	40.3	48.4	56.5
	104.0	-52	-45	643	165	255	24.1	31.9	39.7	47.4	55.2
	(2)102.0	-32	-27	551	137	223	22.3	31.3	40.4	49.5	58.5
	102.0	-42	-36	574	148	234	23.4	32.1	40.8	49.5	58.2
	102.0	-52	-45	599	157	242	23.7	32.1	40.4	48.8	57.1
11000.	105.3	-32	-24	627	162	262	25.8	33.8	41.8	49.7	57.7
	(1)106.0	-42	-34	662	171	269	25.5	33.1	40.6	48.2	55.8
	106.0	-52	-44	690	177	273	25.0	32.3	39.5	46.8	54.0
	102.0	-32	-26	560	149	241	25.2	34.2	43.1	52.0	61.0
	102.0	-42	-35	579	156	247	25.4	34.0	42.6	51.3	59.9
	102.0	-52	-45	604	163	252	25.2	33.5	41.8	50.0	58.3
	(2)99.0	-32	-27	503	134	218	23.5	33.5	43.4	53.3	63.3
	99.0	-42	-36	523	143	228	24.4	34.0	43.5	53.1	62.7
	99.0	-52	-46	544	152	235	24.8	34.0	43.2	52.3	61.5
10000.	105.3	-32	-24	630	167	270	26.9	34.9	42.8	50.7	58.7
	(1)106.0	-42	-33	665	175	276	26.4	33.9	41.4	48.9	56.4
	106.0	-52	-43	691	181	278	25.8	33.0	40.2	47.5	54.7
	100.0	-32	-26	528	149	241	26.7	36.2	45.6	55.1	64.6
	100.0	-42	-35	547	155	246	26.6	35.8	44.9	54.0	63.2
	100.0	-52	-45	565	161	249	26.4	35.2	44.1	52.9	61.8
	(2) 95.0	-32	-27	445	127	206	23.8	35.1	46.3	57.6	68.8
	95.0	-42	-37	459	135	214	24.9	35.8	46.7	57.6	68.5
	95.0	-52	-47	475	142	221	25.5	36.0	46.6	57.1	67.6

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

CRUISE
31,000 FEET

ANTI-ICE SYSTEMS OFF — ONE ENGINE

WT. LBS.	FAN O/D RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
13000.	(1)106.0	-46	-40	605	141	231	21.7	29.9	38.2	46.4	54.7
	106.0	-56	-49	640	154	247	22.9	30.7	38.6	46.4	54.2
12000.	106.0	-36	-29	586	144	242	24.2	32.7	41.3	49.8	58.3
	(1)106.0	-46	-39	613	153	252	24.7	32.9	41.1	49.2	57.4
	106.0	-56	-48	640	162	259	24.8	32.6	40.4	48.2	56.0
11000.	106.0	-36	-29	591	153	257	26.6	35.0	43.5	51.9	60.4
	(1)106.0	-46	-38	616	161	263	26.4	34.5	42.7	50.8	58.9
	106.0	-56	-48	644	168	268	26.1	33.9	41.6	49.4	57.1
	104.0	-36	-29	554	145	244	26.0	35.0	44.0	53.1	62.1
	104.0	-46	-39	574	153	251	26.2	34.9	43.8	52.3	61.0
	104.0	-56	-49	601	160	257	26.1	34.4	42.7	51.0	59.4
	(2)102.0	-36	-30	514	135	227	24.7	34.4	44.1	53.9	63.6
	102.0	-46	-40	538	145	238	25.6	34.9	44.2	53.5	62.8
	102.0	-56	-49	559	152	244	25.8	34.8	43.7	52.7	61.6
10000.	106.0	-36	-28	595	160	267	28.1	36.5	44.9	53.3	61.7
	(1)106.0	-46	-38	618	166	271	27.6	35.7	43.8	51.9	60.0
	106.0	-56	-47	645	172	275	27.1	34.8	42.6	50.3	58.1
	102.0	-36	-29	521	146	244	27.7	37.3	46.9	56.4	66.0
	102.0	-46	-39	542	153	250	27.7	36.9	46.1	55.3	64.6
	102.0	-56	-49	562	159	254	27.4	36.3	45.2	54.1	63.0
	(2) 98.0	-36	-31	452	127	214	25.3	36.3	47.4	58.4	69.5
	98.0	-46	-40	470	136	224	26.4	37.0	47.6	58.3	68.9
	98.0	-56	-50	489	144	231	26.8	37.0	47.3	57.5	67.7

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

Figure 7-23 (Sheet 10 of 10)

CRUISE
25,000 FEET

ANTI-ICE SYSTEMS OFF — **ONE ENGINE**

WT. LBS.	FAN 0/0 RMP	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000.	104.4	-25	-19	683	147	222	17.9	25.2	32.5	39.8	47.2
	(1)106.0	-35	-27	754	169	250	19.8	26.5	33.1	39.7	46.4
	106.0	-45	-37	786	178	257	20.0	26.4	32.7	39.1	45.4
14000.	104.2	-25	-18	688	160	241	20.5	27.7	35.0	42.3	49.5
	(1)106.0	-35	-27	759	176	260	21.0	27.6	34.2	40.8	47.4
	106.0	-45	-36	788	184	264	20.9	27.2	33.6	39.9	46.3
	104.0	-25	-18	684	159	239	20.4	27.7	35.0	42.3	49.6
	104.0	-35	-27	710	168	247	20.7	27.8	34.8	41.9	48.9
	104.0	-45	-37	736	175	253	20.8	27.5	34.3	41.1	47.9
	(2)103.0	-25	-18	660	153	231	19.8	27.4	35.0	42.5	50.1
	103.0	-35	-28	683	162	239	20.4	27.7	35.0	42.4	49.7
	103.0	-45	-37	713	171	247	20.6	27.6	34.6	41.7	48.7
13000.	104.0	-25	-17	692	167	252	21.9	29.2	36.4	43.6	50.8
	(1)106.0	-35	-26	762	182	267	21.9	28.5	35.0	41.6	48.2
	106.0	-45	-36	792	189	271	21.6	27.9	34.2	40.5	46.8
	103.0	-25	-17	667	162	245	21.7	29.2	36.7	44.2	51.7
	103.0	-35	-27	690	170	250	21.8	29.0	36.3	43.5	50.8
	103.0	-45	-37	717	177	255	21.7	28.6	35.6	42.6	49.6
	(2)100.0	-25	-19	601	147	222	20.3	28.6	37.0	45.3	53.6
	100.0	-35	-28	622	156	230	21.0	29.0	37.1	45.1	53.2
	100.0	-45	-38	647	164	238	21.3	29.0	36.7	44.5	52.2
12000.	103.9	-25	-17	693	172	259	23.0	30.2	37.4	44.6	51.9
	(1)106.0	-35	-26	764	186	273	22.6	29.1	35.7	42.2	48.8
	106.0	-45	-35	794	192	276	22.2	28.5	34.8	41.0	47.3
	101.0	-25	-18	628	161	242	22.7	30.6	38.6	46.6	54.5
	101.0	-35	-27	649	168	247	22.7	30.4	38.1	45.8	53.5
	101.0	-45	-37	671	174	251	22.5	29.9	37.4	44.8	52.3
	(2) 97.0	-25	-19	548	142	215	21.0	30.1	39.2	48.3	57.4
	97.0	-35	-29	567	151	223	21.7	30.5	39.3	48.1	56.9
	97.0	-45	-38	585	158	228	22.0	30.5	39.1	47.6	56.2
11000.	103.9	-25	-16	694	177	265	23.8	31.0	38.2	45.4	52.6
	(1)106.0	-35	-25	767	189	278	23.2	29.7	36.2	42.7	49.2
	106.0	-45	-35	796	195	280	22.6	28.9	35.2	41.5	47.8
	99.0	-25	-18	593	159	240	23.7	32.1	40.5	49.0	57.4
	99.0	-35	-27	610	165	244	23.6	31.8	40.0	48.2	56.4
	99.0	-45	-37	631	172	247	23.3	31.3	39.2	47.1	55.0
	(2) 93.0	-25	-20	490	134	203	20.9	31.1	41.3	51.5	61.8
	93.0	-35	-29	500	141	209	21.8	31.8	41.8	51.8	61.8
	93.0	-45	-39	513	148	214	22.3	32.0	41.8	51.5	61.3

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

Figure 7-23 (Sheet 8 of 10)

CRUISE
21,000 FEET

ANTI-ICE SYSTEMS OFF — **ONE ENGINE**

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000.	102.4	-17	-10	754	171	240	18.6	25.2	31.8	38.5	45.1
	(1)104.4	-27	-19	835	188	258	18.9	24.9	30.9	36.9	42.9
	106.0	-37	-28	907	201	270	18.7	24.2	29.7	35.3	40.8
	103.0	-17	-10	770	174	244	18.7	25.2	31.7	38.2	44.7
	103.0	-27	-19	796	181	250	18.8	25.1	31.4	37.7	43.9
	103.0	-37	-29	822	189	254	18.7	24.8	30.9	37.0	43.1
	(2)100.0	-17	-11	697	158	222	17.5	24.7	31.9	39.0	46.2
	100.0	-27	-20	717	166	230	18.1	25.0	32.0	39.0	45.9
	100.0	-37	-30	742	175	236	18.3	25.1	31.8	38.6	45.3
14000.	102.2	-17	-9	754	176	248	19.6	26.2	32.8	39.5	46.1
	(1)104.3	-27	-18	836	192	264	19.6	25.5	31.5	37.5	43.5
	106.0	-37	-28	912	204	275	19.2	24.6	30.1	35.6	41.1
	101.0	-17	-10	725	171	241	19.4	26.3	33.2	40.1	46.9
	101.0	-27	-19	747	178	245	19.4	26.1	32.8	39.5	46.2
	101.0	-37	-29	773	185	249	19.3	25.8	32.3	38.7	45.2
	(2) 97.0	-17	-11	637	151	213	17.7	25.5	33.4	41.2	49.1
	97.0	-27	-21	652	159	220	18.3	26.0	33.7	41.3	49.0
	97.0	-37	-31	674	167	226	18.7	26.1	33.6	41.0	48.4
13000.	102.2	-17	-9	758	181	255	20.4	27.0	33.6	40.2	46.8
	(1)104.3	-27	-18	838	195	268	20.1	26.1	32.0	38.0	43.9
	106.0	-37	-27	913	207	278	19.5	25.0	30.5	36.0	41.4
	100.0	-17	-10	707	173	243	20.2	27.3	34.4	41.4	48.5
	100.0	-27	-19	727	179	247	20.2	27.0	33.9	40.8	47.7
	100.0	-37	-29	750	185	250	20.0	26.6	33.3	40.0	46.6
	(2) 94.0	-17	-12	588	146	206	18.0	26.5	35.1	43.6	52.1
	94.0	-27	-21	600	153	212	18.7	27.0	35.3	43.7	52.0
	94.0	-37	-31	612	160	217	19.1	27.2	35.4	43.6	51.7
12000.	102.0	-17	-9	758	185	259	21.0	27.6	34.2	40.8	47.4
	(1)104.3	-27	-18	840	198	272	20.5	26.5	32.4	38.4	44.3
	106.0	-37	-27	915	210	282	19.8	25.3	30.8	36.2	41.7
	98.0	-17	-10	665	170	239	20.9	28.4	36.0	43.5	51.0
	98.0	-27	-20	683	176	242	20.8	28.2	35.5	42.8	50.1
	98.0	-37	-29	705	182	245	20.6	27.7	34.8	41.9	49.0
	(2) 91.0	-17	-12	540	141	199	18.3	27.6	36.8	46.1	55.3
	91.0	-27	-22	551	148	205	19.1	28.2	37.2	46.3	55.4
	91.0	-37	-31	564	155	210	19.5	28.3	37.2	46.1	54.9
11000.	102.0	-17	-8	759	188	264	21.6	28.2	34.8	41.3	47.9
	(1)104.2	-27	-18	839	201	275	20.9	26.9	32.8	38.8	44.7
	106.0	-37	-27	918	212	285	20.1	25.6	31.0	36.5	41.9
	97.0	-17	-10	649	171	241	21.7	29.4	37.1	44.8	52.5
	97.0	-27	-20	662	176	243	21.6	29.1	36.7	44.2	51.8
	97.0	-37	-29	684	182	245	21.3	28.6	35.9	43.2	50.5
	(2) 88.0	-17	-12	494	134	190	18.2	28.3	38.4	48.5	58.6
	88.0	-27	-22	506	143	198	19.3	29.1	39.0	48.9	58.8
	88.0	-37	-32	517	149	203	19.9	29.5	39.2	48.9	58.6

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

Figure 7-23 (Sheet 6 of 10)

CRUISE
17,000 FEET

ANTI-ICE SYSTEMS OFF — **ONE ENGINE**

WT. LBS.	FAN O/D RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000.	100.5	-9	-2	824	186	245	17.5	23.6	29.7	35.8	41.8
	(1) 102.6	-19	-11	909	201	259	17.5	23.0	28.5	34.0	39.5
	104.7	-29	-20	1004	216	272	17.1	22.1	27.1	32.0	37.0
	99.0	-9	-2	791	180	237	17.3	23.6	29.9	36.3	42.6
	99.0	-19	-12	808	186	240	17.4	23.8	29.7	35.9	42.1
	99.0	-29	-22	832	193	244	17.3	23.3	29.3	35.3	41.3
	(2) 94.0	-9	-4	682	156	206	15.6	22.9	30.2	37.6	44.9
	94.0	-19	-13	696	164	212	16.1	23.3	30.5	37.6	44.8
	94.0	-29	-23	710	171	217	16.4	23.5	30.5	37.5	44.6
14000.	100.4	-9	-1	825	190	250	18.2	24.2	30.3	36.3	42.4
	(1)102.5	-19	-10	910	204	263	17.9	23.4	28.9	34.4	39.9
	104.7	-29	-20	1006	218	275	17.4	22.4	27.3	32.3	37.3
	98.0	-9	-2	772	181	238	17.9	24.4	30.9	37.3	43.8
	98.0	-19	-12	786	187	241	17.9	24.3	30.6	37.0	43.4
	98.0	-29	-22	808	193	244	17.8	24.0	30.2	36.4	42.6
	(2) 92.0	-9	-4	646	154	203	16.0	23.7	31.4	39.2	46.9
	92.0	-19	-13	659	162	210	16.6	24.2	31.8	39.4	47.0
	92.0	-29	-23	673	169	214	16.9	24.3	31.8	39.2	46.6
13000.	100.3	-9	-1	827	193	254	18.7	24.7	30.8	36.8	42.8
	(1)102.4	-19	-10	910	207	266	18.3	23.8	29.3	34.8	40.3
	104.6	-29	-20	1006	220	278	17.7	22.6	27.6	32.6	37.5
	97.0	-9	-2	754	182	239	18.5	25.1	31.8	38.4	45.0
	97.0	-19	-12	767	187	241	18.4	24.9	31.5	38.0	44.5
	97.0	-29	-22	783	193	243	18.3	24.7	31.1	37.4	43.8
	(2) 89.0	-9	-4	592	145	192	15.6	24.0	32.5	40.9	49.4
	89.0	-19	-14	603	154	199	16.4	24.7	33.0	41.3	49.6
	89.0	-29	-24	617	161	205	17.0	25.1	33.2	41.3	49.4
12000.	100.2	-9	-1	829	196	258	19.1	25.1	31.1	37.2	43.2
	(1)102.4	-19	-10	913	209	269	18.6	24.0	29.5	35.0	40.5
	104.6	-29	-19	1008	223	280	17.9	22.8	27.8	32.7	37.7
	96.0	-9	-2	734	182	240	19.1	25.9	32.7	39.5	46.3
	96.0	-19	-12	749	187	242	18.9	25.6	32.3	39.0	45.6
	96.0	-29	-22	762	192	243	18.7	25.3	31.9	38.4	45.0
	(2) 87.0	-9	-4	558	143	189	16.0	25.0	33.9	42.9	51.9
	87.0	-19	-14	568	151	195	16.8	25.6	34.4	43.2	52.0
	87.0	-29	-24	581	158	200	17.3	25.9	34.5	43.1	51.8
11000.	100.2	-9	-1	830	199	261	19.4	25.5	31.5	37.5	43.5
	(1)102.4	-19	-10	914	212	272	18.8	24.3	29.8	35.2	40.7
	104.5	-29	-19	1007	224	282	18.1	23.0	28.0	33.0	37.9
	94.0	-9	-2	694	179	235	19.5	26.7	33.9	41.1	48.3
	94.0	-19	-12	708	184	237	19.4	26.4	33.5	40.6	47.6
	94.0	-29	-22	721	188	238	19.2	26.1	33.0	40.0	46.9
	(2) 84.0	-9	-5	510	136	180	15.6	25.4	35.2	45.0	54.8
	84.0	-19	-15	519	143	186	16.5	26.1	35.8	45.4	55.0
	84.0	-29	-24	528	150	190	17.1	26.6	36.0	45.5	55.0

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

Figure 7-23 (Sheet 4 of 10)

CRUISE
10,000 FEET

ANTI-ICE SYSTEMS OFF — **ONE ENGINE**

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000.	97.2	5	12	975	209	245	14.9	20.0	25.2	30.3	35.4
	(1) 99.3	-5	3	1056	222	256	14.8	19.5	24.2	29.0	33.7
	101.5	-15	-6	1153	236	267	14.5	18.8	23.1	27.5	31.8
	94.0	5	12	892	196	231	14.7	20.3	25.9	31.5	37.1
	94.0	-5	2	907	202	233	14.7	20.2	25.7	31.2	36.7
	94.0	-15	-8	922	207	235	14.7	20.1	25.5	30.9	36.3
	(2) 87.0	5	9	720	160	189	12.4	19.3	26.2	33.2	40.1
	87.0	-5	0	732	168	195	13.0	19.8	26.6	33.4	40.3
	87.0	-15	-10	743	175	199	13.3	20.1	26.8	33.5	40.2
14000.	97.2	-15	13	977	211	248	15.2	20.3	25.4	30.6	35.7
	(1) 99.3	-5	3	1056	224	258	15.0	19.7	24.4	29.2	33.9
	101.5	-15	-6	1155	238	269	14.6	18.9	23.3	27.6	31.9
	93.0	5	11	868	195	230	15.0	20.7	26.5	32.3	38.0
	93.0	-5	2	882	201	232	15.0	20.6	26.3	32.0	37.6
	93.0	-15	-8	898	206	234	14.9	20.5	26.1	31.6	37.2
	(2) 85.0	5	9	678	155	183	12.3	19.7	27.1	34.4	41.8
	85.0	-5	-1	690	163	190	13.0	20.2	27.5	34.7	41.9
	85.0	-15	-10	701	170	194	13.4	20.5	27.6	34.8	41.9
13000.	97.1	5	13	976	213	251	15.4	20.6	25.7	30.8	35.9
	(1) 99.3	-5	3	1057	226	260	15.2	19.9	24.6	29.4	34.1
	101.5	-15	-6	1155	239	270	14.8	19.1	23.4	27.8	32.1
	92.0	5	11	844	194	229	15.3	21.2	27.1	33.1	39.0
	92.0	-5	2	859	200	231	15.2	21.1	26.9	32.7	38.5
	92.0	-15	-8	874	205	233	15.2	20.9	26.6	32.3	38.1
	(2) 83.0	5	9	639	151	179	12.3	20.1	28.0	35.8	43.6
	83.0	-5	-1	648	158	184	12.9	20.6	28.4	36.1	43.8
	83.0	-15	-11	660	165	188	13.4	21.0	28.5	36.1	43.7
12000.	97.1	5	13	978	215	253	15.7	20.8	25.9	31.0	36.1
	(1) 99.3	-5	3	1060	228	263	15.3	20.0	24.8	29.5	34.2
	101.4	-15	-6	1155	241	272	14.9	19.2	23.5	27.9	32.2
	91.0	5	11	820	193	227	15.6	21.7	27.7	33.8	39.9
	91.0	-5	1	835	199	230	15.5	21.5	27.5	33.5	39.5
	91.0	-15	-8	850	204	231	15.4	21.3	27.2	33.1	39.0
	(2) 80.0	5	9	590	143	169	11.8	20.3	28.7	37.2	45.7
	80.0	-5	-1	594	149	173	12.4	20.8	29.2	37.6	46.0
	80.0	-15	-11	600	156	177	12.9	21.2	29.5	37.9	46.2
11000.	97.0	5	13	977	217	255	15.9	21.0	26.1	31.2	36.3
	(1) 99.3	-5	3	1060	229	264	15.5	20.2	24.9	29.6	34.3
	101.4	-15	-6	1157	242	274	15.0	19.3	23.6	28.0	32.3
	89.0	5	11	775	188	222	15.7	22.2	28.6	35.1	41.5
	89.0	-5	1	785	193	223	15.7	22.1	28.4	34.8	41.2
	89.0	-15	-9	800	198	225	15.6	21.9	28.1	34.4	40.6
	(2) 78.0	5	8	557	140	166	11.9	20.8	29.8	38.8	47.8
	78.0	-5	-1	562	146	170	12.5	21.4	30.3	39.2	48.1
	78.0	-15	-11	568	152	173	12.9	21.7	30.5	39.3	48.1

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

Figure 7-23 (Sheet 2 of 10)

CRUISE
43,000 FEET

ANTI-ICE SYSTEMS OFF **TWO ENGINES**

WT. LBS.	FAN O/D RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	(1)106.0	-56	-45	762	146	307	27.1	33.7	40.2	46.8	53.4
	106.0	-66	-54	803	156	320	27.4	33.6	39.9	46.1	52.3
14000	106.0	-46	-34	750	154	330	30.7	37.3	44.0	50.7	57.3
	(1)106.0	-56	-43	777	160	335	30.3	36.7	43.2	49.6	56.0
	106.0	-66	-53	808	166	339	29.6	35.8	42.0	48.2	54.4
13000	106.0	-46	-32	759	164	349	32.9	39.5	46.1	52.6	59.2
	(1)106.0	-56	-42	790	170	355	32.3	38.6	44.9	51.3	57.6
	106.0	-66	-51	823	177	359	31.4	37.5	43.6	49.7	55.7
	105.0	-46	-33	737	160	343	33.0	39.8	46.5	53.3	60.1
	105.0	-56	-42	764	167	348	32.5	39.0	45.6	52.1	58.7
	105.0	-66	-52	797	174	353	31.7	38.0	44.3	50.6	56.8
	104.0	-46	-33	716	158	337	33.2	40.1	47.1	54.1	61.1
	104.0	-56	-43	739	163	341	32.7	39.4	46.2	53.0	59.7
	104.0	-66	-52	772	171	347	32.0	38.5	45.0	51.4	57.9
	103.0	-46	-33	693	154	331	33.4	40.5	47.8	55.0	62.3
	(2)103.0	-56	-43	717	160	335	32.7	39.7	46.7	53.7	60.7
	103.0	-66	-53	747	167	340	32.2	38.9	45.6	52.3	59.0
12000	106.0	-46	-31	775	172	367	34.5	40.9	47.4	53.8	60.3
	(1)106.0	-56	-40	804	178	370	33.6	39.8	46.0	52.2	58.5
	106.0	-66	-50	838	185	373	32.6	38.6	44.5	50.5	56.5
	104.0	-46	-32	728	166	355	35.0	41.9	48.8	55.6	62.5
	104.0	-56	-41	751	172	358	34.3	40.9	47.6	54.3	60.9
	104.0	-66	-51	785	179	362	33.4	39.7	46.1	52.5	58.8
	103.0	-46	-32	704	163	349	35.3	42.4	49.5	56.6	63.7
	103.0	-56	-42	728	169	352	34.6	41.5	48.3	55.2	62.1
	103.0	-66	-52	757	175	355	33.7	40.3	46.9	53.5	60.1
	101.0	-46	-33	659	156	334	35.6	43.2	50.8	58.4	66.0
	101.0	-56	-43	684	163	340	35.1	42.5	49.8	57.1	64.4
	101.0	-66	-52	710	169	344	34.4	41.4	48.4	55.5	62.5
	(2) 99.0	-46	-35	610	143	309	34.3	42.5	50.7	58.9	67.1
	99.0	-56	-44	637	155	324	35.2	43.1	50.9	58.8	66.7
	99.0	-66	-53	664	162	332	34.9	42.4	49.9	57.4	65.0
11000	106.0	-46	-29	787	179	380	35.6	42.0	48.3	54.7	61.0
	(1)106.0	-56	-39	816	185	382	34.6	40.8	46.9	53.0	59.1
	106.0	-66	-49	850	191	384	33.5	39.3	45.2	51.1	57.0
	103.0	-46	-31	714	170	362	36.7	43.7	50.7	57.7	64.7
	103.0	-56	-41	740	176	365	35.8	42.6	49.3	56.1	62.8
	103.0	-66	-50	768	182	368	34.8	41.3	47.8	54.3	60.9
	101.0	-46	-32	669	164	350	37.4	44.8	52.3	59.8	67.3
	101.0	-56	-42	693	170	353	36.5	43.7	50.9	58.2	65.4
	101.0	-66	-51	720	176	356	35.6	42.5	49.5	56.4	63.3
	99.0	-46	-33	626	156	335	37.5	45.5	53.5	61.5	69.5
	99.0	-56	-43	648	163	341	37.2	44.9	52.6	60.3	68.0
	99.0	-66	-52	673	169	344	36.3	43.7	51.2	58.6	66.0
	(2) 96.0	-46	-36	554	139	299	36.0	45.0	54.0	63.0	72.1
	96.0	-56	-45	581	150	314	36.9	45.5	54.1	62.7	71.4
	96.0	-66	-54	608	159	325	37.1	45.3	53.5	61.7	69.9

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

Figure 7-22 (Sheet 17 of 17)

CRUISE
39,000 FEET

ANTI-ICE SYSTEMS OFF — TWO ENGINES

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	106 0	-46	-31	923	187	362	28.3	33.8	39.2	44.6	50.0
	(1) 106.0	-56	-41	957	193	365	27.6	32.9	38.1	43.3	48.5
	106 0	-66	-50	1001	200	369	26.8	31.8	36 8	41.8	46 8
	104 0	-46	-32	866	180	349	28.8	34.5	40.3	46.1	51.8
	104.0	-56	-42	896	186	353	28.2	33.8	39 3	44.9	50 5
	104 0	-66	-51	937	193	357	27 4	32.7	38 1	43.4	48 7
	103 0	-46	-33	838	176	342	28.9	34.9	40.9	46.8	52.8
	103.0	-56	-42	869	183	347	28.4	34.2	39.9	45.7	51 4
	103.0	-66	-52	903	190	350	27.7	33.3	38.8	44 4	49.9
	102.0	-46	-33	812	172	336	29 1	35.2	41.4	47.6	53 7
	102 0	-56	-43	842	179	341	28.6	34.5	40.5	46.4	52.3
	102.0	-66	-52	871	186	344	28.0	33.8	39 5	45.2	51 0
	(2) 100.0	-46	-35	749	158	309	27.9	34.6	41 3	48.0	54.6
	100.0	-56	-44	787	172	327	28.9	35.3	41.6	48.0	54 3
	100 0	-66	-53	818	179	332	28.4	34 5	40 6	46.7	52 8
14000	106.0	-46	-30	934	193	373	29.2	34.6	40.0	45.3	50.7
	(1)106.0	-56	-40	970	200	376	28.5	33.6	38 8	43.9	49 1
	106 0	-66	-49	1011	206	379	27.6	32.5	37 4	42.4	47.3
	104.0	-46	-31	877	187	361	29.8	35.5	41.2	46.9	52.6
	104.0	-56	-41	908	193	364	29.1	34.6	40 1	45.6	51.1
	104.0	-66	-50	947	200	367	28.2	33.5	38 8	44.1	49 4
	102.0	-46	-32	821	180	349	30.4	36 4	42.5	48.6	54.7
	102.0	-56	-42	852	186	353	29.7	35 5	41 4	47.3	53.1
	102.0	-66	-52	883	193	355	28.9	34.6	40 2	45 9	51.6
	100.0	-46	-33	769	171	334	30.4	36.9	43 4	49.9	56.5
	100.0	-56	-43	798	179	341	30.2	36 4	42.7	49.0	55.2
	100.0	-66	-52	828	186	344	29.5	35.5	41 5	47.6	53.6
	(2) 98 0	-46	-35	710	158	310	29.6	36.6	43 6	50.7	57.7
	98.0	-56	-44	742	170	324	30.1	36.9	43 6	50.4	57.1
	98 0	-66	-53	773	179	331	29.9	36 4	42 9	49.3	55.8
13000	106 0	-46	-29	948	199	384	29.9	35.2	40.5	45.8	51.0
	(1)106.0	-56	-39	979	205	385	29.1	34 2	39 3	44.5	49.6
	106 0	-66	-49	1024	212	387	28.1	33.0	37.8	42.7	47 6
	103.0	-46	-31	857	189	365	30.9	36.7	42.6	48.4	54.2
	103.0	-56	-40	890	195	368	30.1	35 7	41 3	47 0	52.6
	103.0	-66	-50	924	202	371	29.3	34.7	40 1	45 5	50.9
	100 0	-46	-32	780	179	347	31.7	38.1	44 5	50.9	57.3
	100 0	-56	-42	804	185	350	31.1	37.3	43 5	49.7	55.9
	100.0	-66	-52	837	191	353	30.3	36.2	42.2	48.2	54.2
	98.0	-46	-34	725	169	330	31.7	38.6	45.5	52.4	59 3
	98.0	-56	-43	753	178	338	31.5	38.2	44 8	51 5	58 1
	98.0	-66	-53	781	184	341	30 9	37.3	43 7	50.1	56.5
	(2) 95 0	-46	-36	640	149	293	30.2	38.0	45.8	53.7	61.5
	95.0	-56	-45	672	162	310	31.2	38.6	46 1	53 5	60 9
	95 0	-66	-54	704	172	320	31.3	38 4	45 5	52 6	59.7
12000	106 0	-46	-28	955	203	391	30.5	35.7	40 9	46.2	51.4
	(1)106.0	-56	-38	989	209	392	29.6	34 6	39 7	44 7	49 8
	106 0	-66	-48	1031	215	394	28.5	33.3	38.2	43 0	47 9
	102 0	-46	-30	838	190	367	31.9	37.9	43.8	49 8	55 8
	102.0	-56	-40	870	196	370	31 0	36.8	42 5	48.3	54 0
	102 0	-66	-50	902	202	372	30.2	35.7	41 3	46 8	52 4
	99 0	-46	-32	761	180	350	32.8	39 4	46.0	52.5	59 1
	99.0	-56	-42	787	186	353	32.1	38.5	44.8	51.2	57 5
	99 0	-66	-52	816	192	355	31.2	37 4	43.5	49 6	55.8
	96.0	-46	-34	683	167	326	33 1	40.4	47 7	55 1	62 4
	96.0	-56	-43	709	175	333	32 9	39 9	47 0	54.0	61 1
	96.0	-66	-53	739	182	338	32.2	39 0	45 7	52 5	59 3
	(2) 93.0	-46	-36	602	149	292	31.9	40.2	48.5	56 8	65 1
	93 0	-56	-45	633	160	307	32.6	40.5	48.4	56.3	64 2
	93 0	-66	-55	660	169	316	32.6	40.2	47 8	55 4	62 9
11000	106.0	-46	-28	963	207	398	30.9	36 1	41 3	46 5	51 7
	(1)106 0	-56	-38	997	213	398	29.9	34.9	39 9	45 0	50.0
	106.0	-66	-48	1037	218	398	28.8	33.6	38 4	43 2	48.1
	102.0	-46	-30	845	194	374	32 5	38 4	44 3	50.2	56 1
	102.0	-56	-40	877	200	377	31.6	37.3	43 0	48.7	54.4
	102.0	-66	-50	909	206	378	30.6	36.1	41 6	47 1	52.6
	98.0	-46	-32	742	181	352	33.9	40.6	47 4	54 1	60 8
	98 0	-56	-42	767	187	354	33.1	39 6	46 1	52.7	59.2
	98 0	-66	-51	794	193	356	32.2	38 5	44 8	51 1	57 4
	94.0	-46	-34	642	164	321	34.4	42.2	50.0	57 8	65 6
	94 0	-56	-44	667	172	328	34 2	41.7	49 2	56 7	64.2
	94 0	-66	-53	694	180	333	33 6	40 8	48.0	55.2	62 4
	(2) 90 0	-46	-37	544	141	278	32.7	41 9	51 1	60 3	69.5
	90.0	-56	-46	568	152	292	33.7	42.5	51.3	60 1	68.9
	90 0	-66	-56	595	161	301	33 9	42 3	50 7	59 1	67.5

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON		
MAX. FAN %RPM		
-46°C	-56°C	-66°C
102.6	103 7	104 3
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%		

Figure 7-22 (Sheet 15 of 17)

CRUISE
35,000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL				
							100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	106.0	-44	-26	1133	220	388	25.4	29.8	34.3	38.7	43.1
	(1) 106.0	-54	-36	1171	227	390	24.7	29.0	33.3	37.5	41.8
	106.0	-64	-46	1222	234	391	23.8	27.9	32.0	36.1	40.2
	103.0	-44	-28	1027	209	370	26.3	31.2	36.0	40.9	45.8
	103.0	-54	-38	1065	216	373	25.6	30.3	35.0	39.7	44.4
	103.0	-64	-48	1104	223	375	24.9	29.4	33.9	38.5	43.0
	100.0	-44	-30	931	198	352	27.1	32.4	37.8	43.2	48.5
	100.0	-54	-39	966	205	355	26.4	31.6	36.8	42.0	47.2
	100.0	-64	-49	1001	212	358	25.8	30.8	35.8	40.8	45.8
	97.0	-44	-32	836	184	328	27.2	33.2	39.2	45.2	51.1
	97.0	-54	-41	869	193	336	27.1	32.9	38.6	44.4	50.1
	97.0	-64	-51	907	201	341	26.5	32.1	37.6	43.1	48.6
	(2) 94.0	-44	-34	740	164	294	26.1	32.9	39.7	46.4	53.2
	94.0	-54	-43	774	176	307	26.8	33.2	39.7	46.1	52.6
	94.0	-64	-52	811	187	318	26.9	33.1	39.2	45.4	51.5
14000	106.0	-44	-26	1139	224	394	25.8	30.2	34.6	39.0	43.4
	(1) 106.0	-54	-36	1179	230	395	25.0	29.3	33.5	37.7	42.0
	106.0	-64	-46	1228	237	396	24.1	28.2	32.2	36.3	40.4
	102.0	-44	-28	1002	209	370	27.0	32.0	37.0	42.0	47.0
	102.0	-54	-38	1035	216	372	26.3	31.2	36.0	40.8	45.7
	102.0	-64	-48	1079	223	375	25.5	30.1	34.8	39.4	44.0
	99.0	-44	-30	907	199	353	27.9	33.4	38.9	44.4	49.9
	99.0	-54	-39	940	205	356	27.2	32.5	37.8	43.2	48.5
	99.0	-64	-49	971	212	357	26.5	31.7	36.8	41.9	47.1
	95.0	-44	-32	783	179	320	28.1	34.5	40.9	47.3	53.7
	95.0	-54	-42	815	189	328	28.0	34.2	40.3	46.4	52.5
	95.0	-64	-51	851	197	334	27.6	33.4	39.3	45.2	51.1
	(2) 92.0	-44	-35	691	160	287	27.0	34.3	41.5	48.7	56.0
	92.0	-54	-44	725	172	301	27.7	34.6	41.5	48.4	55.3
	92.0	-64	-53	760	183	311	27.8	34.3	40.9	47.5	54.1
13000	106.0	-44	-25	1147	227	399	26.1	30.4	34.8	39.1	43.5
	(1) 106.0	-54	-35	1188	233	400	25.2	29.4	33.6	37.9	42.1
	106.0	-64	-45	1236	239	400	24.3	28.3	32.4	36.4	40.4
	102.0	-44	-28	1009	213	376	27.4	32.3	37.3	42.2	47.2
	102.0	-54	-37	1041	219	378	26.7	31.5	36.3	41.1	45.9
	102.0	-64	-47	1085	226	380	25.8	30.4	35.0	39.6	44.2
	98.0	-44	-30	883	199	353	28.6	34.3	40.0	45.6	51.3
	98.0	-54	-39	915	205	356	28.0	33.4	38.9	44.4	49.8
	98.0	-64	-49	947	212	357	27.2	32.5	37.7	43.0	48.3
	93.0	-44	-33	732	175	313	29.1	35.9	42.8	49.6	56.4
	93.0	-54	-42	766	184	322	28.9	35.5	42.0	48.5	55.1
	93.0	-64	-52	798	193	328	28.6	34.8	41.1	47.4	53.6
	(2) 89.0	-44	-36	625	149	269	27.0	35.0	43.0	51.0	59.0
	89.0	-54	-45	651	161	283	28.1	35.8	43.5	51.2	58.9
	89.0	-64	-54	678	172	294	28.6	36.0	43.3	50.7	58.1
12000	106.0	-44	-25	1151	229	403	26.3	30.6	35.0	39.3	43.7
	(1) 106.0	-54	-35	1190	235	403	25.4	29.6	33.8	38.0	42.2
	106.0	-64	-45	1239	241	403	24.5	28.5	32.5	36.6	40.6
	101.0	-44	-28	982	213	376	28.1	33.1	38.2	43.3	48.4
	101.0	-54	-37	1014	219	377	27.3	32.3	37.2	42.1	47.1
	101.0	-64	-47	1053	225	379	26.5	31.2	35.9	40.7	45.4
	96.0	-44	-30	832	195	347	29.6	35.6	41.6	47.7	53.7
	96.0	-54	-40	858	201	349	29.0	34.8	40.7	48.5	52.3
	96.0	-64	-50	893	208	352	28.2	33.8	39.4	45.0	50.6
	92.0	-44	-33	715	176	315	30.1	37.1	44.1	51.1	58.1
	92.0	-54	-42	742	184	322	29.9	36.6	43.3	50.1	56.8
	92.0	-64	-52	776	193	328	29.4	35.8	42.3	48.7	55.1
	(2) 87.0	-44	-36	588	147	265	28.1	36.6	45.1	53.6	62.1
	87.0	-54	-45	611	158	277	29.0	37.2	45.4	53.6	61.8
	87.0	-64	-55	635	168	287	29.4	37.3	45.2	53.0	60.9
11000	105.9	-44	-25	1152	231	405	26.5	30.9	35.2	39.5	43.9
	(1) 105.0	-54	-35	1195	237	406	25.6	29.8	34.0	38.2	42.3
	105.8	-64	-45	1235	243	405	24.7	28.8	32.8	36.9	40.9
	100.0	-44	-28	955	212	374	28.7	34.0	39.2	44.4	49.7
	100.0	-54	-38	990	218	376	27.9	33.0	38.0	43.1	48.1
	100.0	-64	-47	1023	224	377	27.1	32.0	36.8	41.7	46.6
	95.0	-44	-30	807	194	346	30.4	36.6	42.8	49.0	55.2
	95.0	-54	-40	835	201	348	29.7	35.7	41.7	47.7	53.7
	95.0	-64	-50	867	207	350	28.9	34.7	40.4	46.2	52.0
	90.0	-44	-33	671	172	308	31.0	38.4	45.9	53.3	60.8
	90.0	-54	-43	693	180	314	30.8	38.0	45.2	52.5	59.7
	90.0	-64	-52	722	188	319	30.4	37.3	44.2	51.2	58.1
	(2) 84.0	-44	-37	532	138	250	28.1	37.5	46.9	56.3	65.7
	84.0	-54	-46	551	149	262	29.4	38.5	47.5	56.6	65.7
	84.0	-64	-56	571	158	271	30.0	38.8	47.5	56.3	65.0

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON

MAX. FAN %RPM		
-44°C	-54°C	-64°C
102.1	103.3	104.2

INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%

Figure 7-22 (Sheet 13 of 17)

CRUISE
31,000 FEET

ANTI-ICE SYSTEMS OFF

TWO ENGINES

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	104.3	-36	-18	1269	239	391	23.0	26.9	30.8	34.8	38.7
	(1) 106.0	-46	-27	1379	251	401	21.8	25.5	29.1	32.7	36.3
	106.0	-56	-37	1431	258	402	21.1	24.6	28.1	31.6	35.1
	102.0	-36	-19	1179	231	378	23.6	27.8	32.1	36.3	40.6
	102.0	-46	-29	1214	237	379	23.0	27.1	31.3	35.4	39.5
	102.0	-56	-39	1255	244	381	22.4	26.4	30.4	34.4	38.3
	97.0	-36	-22	993	210	347	24.8	29.9	34.9	39.9	45.0
	97.0	-46	-32	1031	218	351	24.4	29.2	34.1	38.9	43.8
	97.0	-56	-42	1064	225	353	23.8	28.5	33.2	37.9	42.6
	93.0	-36	-25	855	189	313	24.9	30.8	36.6	42.4	48.3
	93.0	-46	-34	887	198	321	24.9	30.5	36.2	41.8	47.5
	93.0	-56	-44	924	207	327	24.6	30.0	35.4	40.8	46.3
	(2) 89.0	-36	-28	731	161	270	23.2	30.1	36.9	43.7	50.6
	89.0	-46	-37	760	174	283	24.1	30.7	37.2	43.8	50.4
	89.0	-56	-46	789	184	293	24.5	30.8	37.1	43.5	49.8
14000	104.3	-36	-18	1272	241	395	23.2	27.1	31.0	35.0	38.9
	(1)106.0	-46	-27	1383	253	404	22.0	25.6	29.2	32.8	36.4
	106.0	-56	-37	1432	260	404	21.2	24.7	28.2	31.7	35.2
	101.0	-36	-20	1146	230	377	24.1	28.5	32.9	37.2	41.6
	101.0	-46	-29	1180	236	378	23.5	27.8	32.0	36.3	40.5
	101.0	-56	-39	1220	242	379	22.9	27.0	31.1	35.2	39.3
	96.0	-36	-22	964	209	345	25.4	30.6	35.8	41.0	46.2
	96.0	-46	-32	1002	217	350	24.9	29.9	34.9	39.9	44.9
	96.0	-56	-42	1033	224	352	24.3	29.2	34.0	38.9	43.7
	92.0	-36	-25	835	189	314	25.6	31.6	37.6	43.6	49.6
	92.0	-46	-34	861	197	320	25.5	31.3	37.1	42.9	48.7
	92.0	-56	-44	895	206	326	25.2	30.8	36.4	42.0	47.6
	(2) 87.0	-36	-28	687	157	263	23.7	31.0	38.2	45.5	52.8
	87.0	-46	-37	710	168	275	24.6	31.6	38.7	45.7	52.8
	87.0	-56	-47	739	179	285	25.0	31.8	38.6	45.3	52.1
13000	104.2	-36	-18	1271	243	397	23.4	27.3	31.2	35.2	39.1
	(1)106.0	-46	-27	1387	255	407	22.1	25.7	29.3	32.9	36.5
	106.0	-56	-37	1438	262	407	21.4	24.8	28.3	31.8	35.3
	100.0	-36	-20	1114	228	375	24.6	29.1	33.6	38.1	42.6
	100.0	-46	-30	1147	234	376	24.0	28.4	32.8	37.1	41.5
	100.0	-56	-40	1188	241	377	23.3	27.5	31.7	35.9	40.2
	95.0	-36	-22	935	208	343	26.0	31.4	36.7	42.1	47.4
	95.0	-46	-32	970	215	347	25.5	30.7	35.8	41.0	46.1
	95.0	-56	-42	1004	222	350	24.9	29.8	34.8	39.8	44.8
	90.0	-36	-25	780	183	305	26.2	32.7	39.1	45.5	51.9
	90.0	-46	-35	808	192	311	26.2	32.3	38.5	44.7	50.9
	90.0	-56	-45	834	200	316	25.9	31.9	37.9	43.9	49.9
	(2)85.0	-36	-29	645	153	256	24.2	32.0	39.7	47.5	55.2
	85.0	-46	-38	667	164	268	25.1	32.6	40.1	47.6	55.1
	85.0	-56	-47	690	173	276	25.6	32.8	40.1	47.3	54.6
12000	104.2	-36	-17	1275	245	400	23.5	27.5	31.4	35.3	39.2
	(1)106.0	-46	-26	1394	257	410	22.2	25.8	29.4	33.0	36.6
	106.0	-56	-36	1446	264	410	21.5	24.9	28.4	31.8	35.3
	100.0	-36	-19	1118	230	378	24.8	29.3	33.8	38.3	42.7
	100.0	-46	-29	1150	236	379	24.2	28.6	32.9	37.3	41.6
	100.0	-56	-39	1192	243	380	23.5	27.7	31.9	36.1	40.3
	94.0	-36	-23	911	207	342	26.5	32.0	37.5	43.0	48.5
	94.0	-46	-32	939	214	345	26.1	31.4	36.7	42.1	47.4
	94.0	-56	-42	975	221	348	25.4	30.5	35.6	40.8	45.9
	88.0	-36	-26	730	178	296	26.9	33.7	40.6	47.4	54.3
	88.0	-46	-36	753	186	302	26.8	33.5	40.1	46.7	53.4
	88.0	-56	-45	780	194	307	26.6	33.0	39.4	45.8	52.2
	(2) 82.0	-36	-30	582	142	238	23.8	32.4	41.0	49.6	58.2
	82.0	-46	-39	601	153	250	25.0	33.3	41.6	50.0	58.3
	82.0	-56	-48	620	162	259	25.7	33.8	41.8	49.9	58.0
11000	104.0	-36	-17	1274	246	402	23.7	27.6	31.6	35.5	39.4
	(1)106.0	-46	-26	1402	259	413	22.3	25.9	29.5	33.0	36.6
	106.0	-56	-36	1448	266	413	21.6	25.1	28.5	32.0	35.4
	99.0	-36	-20	1086	229	375	25.3	29.9	34.5	39.1	43.8
	99.0	-46	-30	1116	234	376	24.7	29.2	33.7	38.2	42.6
	99.0	-56	-40	1156	241	377	24.0	28.3	32.6	36.9	41.3
	93.0	-36	-23	883	205	339	27.1	32.8	38.4	44.1	49.7
	93.0	-46	-32	910	212	343	26.7	32.2	37.7	43.1	48.6
	93.0	-56	-42	947	219	346	25.9	31.2	36.5	41.8	47.0
	86.0	-36	-27	684	173	288	27.5	34.8	42.1	49.4	56.7
	86.0	-46	-36	704	180	293	27.5	34.6	41.7	48.8	55.9
	86.0	-56	-46	727	188	298	27.3	34.2	41.0	47.9	54.8
	(2) 80.0	-36	-30	548	140	235	24.7	33.8	42.9	52.0	61.2
	80.0	-46	-39	562	148	244	25.6	34.5	43.3	52.2	61.1
	80.0	-56	-49	579	157	252	26.2	34.9	43.5	52.2	60.8

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON		
MAX. FAN %RPM		
-36°C	-46°C	-56°C
100.8	102.4	103.5
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%		

Figure 7-22 (Sheet 11 of 17)

CRUISE
27,000 FEET

ANTI-ICE SYSTEMS OFF — TWO ENGINES

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	102.5	-28	-11	1401	255	389	20.6	24.2	27.7	31.3	34.9
	(1)104.6	-38	-19	1546	269	401	19.5	22.7	26.0	29.2	32.4
	104.6	-48	-29	1597	276	402	18.9	22.0	25.1	28.3	31.4
	99.0	-28	-12	1255	241	370	21.5	25.5	29.4	33.4	37.4
	99.0	-38	-22	1289	248	371	21.0	24.9	28.8	32.6	36.5
	99.0	-48	-32	1332	254	372	20.4	24.2	27.9	31.7	35.5
	95.0	-28	-15	1086	223	342	22.3	26.9	31.5	36.1	40.7
	95.0	-38	-24	1121	231	347	22.0	26.5	30.9	35.4	39.8
	95.0	-48	-34	1165	238	350	21.5	25.8	30.1	34.4	38.6
	90.0	-28	-18	906	196	304	22.5	28.0	33.5	39.0	44.6
	90.0	-38	-27	933	205	309	22.4	27.8	33.2	38.5	43.9
	90.0	-48	-37	966	213	315	22.3	27.4	32.6	37.8	43.0
	(2) 85.0	-28	-21	751	164	255	20.7	27.3	34.0	40.7	47.3
	85.0	-38	-30	776	175	267	21.5	27.9	34.4	40.8	47.2
	85.0	-48	-40	801	185	275	21.9	28.1	34.4	40.6	46.8
14000	102.5	-28	-10	1405	256	391	20.7	24.3	27.8	31.4	35.0
	(1)104.5	-38	-19	1548	271	403	19.6	22.8	26.0	29.3	32.5
	104.2	-48	-29	1579	276	402	19.1	22.3	25.4	28.6	31.8
	99.0	-28	-12	1259	243	372	21.6	25.6	29.6	33.6	37.5
	99.0	-38	-22	1293	249	373	21.1	25.0	28.9	32.7	36.6
	99.0	-48	-32	1335	256	375	20.6	24.3	28.1	31.8	35.5
	93.0	-28	-15	1018	216	333	22.9	27.8	32.7	37.6	42.5
	93.0	-38	-25	1052	224	337	22.5	27.3	32.0	36.8	41.6
	93.0	-48	-35	1084	232	341	22.2	26.8	31.4	36.0	40.6
	88.0	-28	-18	850	190	295	22.9	28.8	34.7	40.5	46.4
	88.0	-38	-28	872	198	300	22.9	28.6	34.4	40.1	45.8
	88.0	-48	-37	900	206	305	22.8	28.3	33.9	39.4	45.0
	(2) 83.0	-28	-21	705	158	247	20.9	28.0	35.1	42.2	49.3
	83.0	-38	-31	723	168	257	21.7	28.6	35.5	42.4	49.4
	83.0	-48	-40	748	179	266	22.2	28.9	35.5	42.2	48.9
13000	102.4	-28	-10	1403	258	393	20.9	24.4	28.0	31.6	35.1
	(1)104.5	-38	-19	1552	272	405	19.7	22.9	26.1	29.3	32.5
	103.8	-48	-29	1562	276	401	19.3	22.5	25.7	28.9	32.1
	98.0	-28	-12	1218	241	369	22.1	26.2	30.3	34.4	38.5
	98.0	-38	-22	1255	247	370	21.5	25.5	29.5	33.5	37.5
	98.0	-48	-32	1297	254	372	20.9	24.8	28.7	32.5	36.4
	92.0	-28	-16	987	214	330	23.3	28.4	33.4	38.5	43.6
	92.0	-38	-25	1018	221	334	23.0	27.9	32.8	37.7	42.6
	92.0	-48	-35	1052	229	338	22.6	27.3	32.1	36.8	41.6
	86.0	-28	-19	793	183	285	23.3	29.6	35.9	42.2	48.5
	86.0	-38	-28	815	191	290	23.3	29.5	35.6	41.7	47.9
	86.0	-48	-38	843	200	296	23.2	29.2	35.1	41.0	47.0
	(2) 80.0	-28	-22	639	147	230	20.4	28.2	36.0	43.8	51.7
	80.0	-38	-32	654	157	240	21.3	29.0	36.6	44.2	51.9
	80.0	-48	-41	671	166	247	22.0	29.4	36.9	44.4	51.8
12000	102.3	-28	-10	1405	259	395	21.0	24.5	28.1	31.6	35.2
	(1)104.5	-38	-19	1556	273	407	19.7	22.9	26.1	29.4	32.6
	103.4	-48	-29	1548	276	401	19.5	22.7	25.9	29.2	32.4
	97.0	-28	-13	1180	239	366	22.5	26.7	31.0	35.2	39.5
	97.0	-38	-22	1216	245	367	22.0	26.1	30.2	34.3	38.4
	97.0	-48	-32	1259	252	369	21.3	25.3	29.3	33.3	37.2
	91.0	-28	-16	956	212	327	23.7	29.0	34.2	39.4	44.6
	91.0	-38	-26	984	219	330	23.4	28.5	33.6	38.6	43.7
	91.0	-48	-35	1019	227	334	23.0	27.9	32.8	37.7	42.6
	84.0	-28	-19	741	177	276	23.7	30.4	37.2	43.9	50.7
	84.0	-38	-29	763	185	281	23.8	30.3	36.9	43.5	50.0
	84.0	-48	-39	785	193	286	23.7	30.1	36.4	42.8	49.2
	(2) 78.0	-28	-23	598	143	224	20.7	29.0	37.4	45.7	54.1
	78.0	-38	-32	613	152	233	21.7	29.8	38.0	46.1	54.3
	78.0	-48	-42	627	160	239	22.2	30.2	38.1	46.1	54.1
11000	102.4	-28	-10	1410	260	397	21.0	24.6	28.1	31.7	35.2
	(1)104.5	-38	-19	1558	274	408	19.8	23.0	26.2	29.4	32.6
	103.1	-48	-29	1535	276	401	19.6	22.9	26.1	29.4	32.6
	96.0	-28	-13	1148	237	363	22.9	27.2	31.6	36.0	40.3
	96.0	-38	-23	1180	243	364	22.4	26.6	30.9	35.1	39.3
	96.0	-48	-33	1221	249	365	21.7	25.8	29.9	34.0	38.1
	89.0	-28	-17	892	205	317	24.3	29.9	35.5	41.1	46.7
	89.0	-38	-26	918	212	320	24.0	29.4	34.9	40.3	45.8
	89.0	-48	-36	948	220	324	23.6	28.9	34.1	39.4	44.7
	83.0	-28	-20	720	177	275	24.2	31.2	38.1	45.1	52.0
	83.0	-38	-29	737	184	279	24.3	31.1	37.9	44.7	51.4
	83.0	-48	-39	760	191	284	24.2	30.8	37.4	43.9	50.5
	(2) 76.0	-28	-23	563	140	219	21.2	30.0	38.9	47.8	56.7
	76.0	-38	-32	571	147	225	21.9	30.7	39.4	48.2	56.9
	76.0	-48	-42	586	155	232	22.6	31.1	39.6	48.2	56.7

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON

MAX. FAN %RPM		
-28°C	-38°C	-48°C
99.3	101.1	102.6

INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%

Figure 7-22 (Sheet 9 of 17)

CRUISE
23,000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	100.8	-21	-3	1550	270	385	18.4	21.6	24.8	28.1	31.3
	(1) 100.7	-31	-13	1592	276	385	17.9	21.1	24.2	27.4	30.5
	99.0	-41	-24	1550	275	377	17.9	21.1	24.3	27.5	30.8
	94.0	-21	-7	1228	238	342	19.7	23.8	27.9	31.9	36.0
	94.0	-31	-16	1267	246	346	19.4	23.4	27.3	31.3	35.2
	94.0	-41	-26	1306	254	349	19.1	22.9	26.7	30.6	34.4
	90.0	-21	-9	1066	218	314	20.1	24.7	29.4	34.1	38.8
	90.0	-31	-19	1095	225	318	19.9	24.5	29.0	33.6	38.2
	90.0	-41	-28	1128	233	322	19.7	24.1	28.5	33.0	37.4
	85.0	-21	-12	891	190	275	19.7	25.3	30.9	36.5	42.1
	85.0	-31	-21	912	198	281	19.8	25.3	30.8	36.3	41.8
	85.0	-41	-31	940	207	287	19.8	25.2	30.5	35.8	41.1
	(2) 81.0	-21	-14	771	164	239	18.0	24.5	31.0	37.5	44.0
	81.0	-31	-23	790	174	247	18.6	25.0	31.3	37.6	43.9
	81.0	-41	-33	811	183	255	19.1	25.3	31.4	37.6	43.8
14000.	100.8	-21	-3	1553	271	387	18.5	21.7	24.9	28.1	31.3
	(1)100.4	-31	-13	1580	276	386	18.1	21.2	24.4	27.6	30.7
	98.7	-41	-24	1538	276	377	18.0	21.3	24.5	27.8	31.0
	93.0	-21	-7	1190	235	338	20.0	24.2	28.4	32.6	36.8
	93.0	-31	-17	1228	243	342	19.7	23.8	27.9	31.9	36.0
	93.0	-41	-26	1267	251	346	19.4	23.3	27.3	31.2	35.2
	89.0	-21	-9	1032	215	311	20.4	25.2	30.1	34.9	39.8
	89.0	-31	-19	1062	223	315	20.2	24.9	29.6	34.3	39.1
	89.0	-41	-29	1092	231	318	20.0	24.6	29.2	33.7	38.3
	84.0	-21	-12	864	189	273	20.1	25.9	31.6	37.4	43.2
	84.0	-31	-21	884	196	279	20.2	25.9	31.5	37.2	42.8
	84.0	-41	-31	908	204	284	20.2	25.7	31.2	36.7	42.2
	(2) 79.0	-21	-14	722	158	230	18.1	25.0	31.9	38.8	45.8
	79.0	-31	-24	738	167	238	18.7	25.5	32.3	39.1	45.8
	79.0	-41	-33	755	175	245	19.1	25.8	32.4	39.0	45.6
13000.	100.7	-21	-3	1550	272	388	18.6	21.8	25.0	28.2	31.5
	(1)100.2	-31	-13	1569	276	386	18.2	21.4	24.6	27.8	31.0
	98.4	-41	-24	1526	276	377	18.2	21.4	24.7	28.0	31.3
	93.0	-21	-7	1194	238	341	20.2	24.4	28.6	32.8	37.0
	93.0	-31	-16	1231	245	345	19.9	23.9	28.0	32.1	36.1
	93.0	-41	-26	1271	253	348	19.5	23.4	27.4	31.3	35.2
	87.0	-21	-10	966	208	301	20.8	26.0	31.1	36.3	41.5
	87.0	-31	-20	990	215	304	20.6	25.7	30.7	35.8	40.8
	87.0	-41	-29	1019	223	308	20.4	25.3	30.2	35.1	40.1
	82.0	-21	-12	808	182	264	20.3	26.5	32.6	38.8	45.0
	82.0	-31	-22	828	190	269	20.4	26.5	32.5	38.5	44.6
	82.0	-41	-32	848	197	274	20.5	26.4	32.3	38.2	44.1
	(2) 77.0	-21	-15	681	154	224	18.2	25.6	32.9	40.2	47.6
	77.0	-31	-24	691	161	230	18.8	26.1	33.3	40.5	47.8
	77.0	-41	-34	704	169	236	19.3	26.4	33.5	40.6	47.7
12000.	100.7	-21	-3	1555	273	390	18.6	21.8	25.1	28.3	31.5
	(1) 99.8	-31	-13	1557	276	386	18.4	21.6	24.8	28.0	31.2
	98.2	-41	-24	1515	276	377	18.3	21.6	24.9	28.2	31.5
	92.0	-21	-7	1157	235	337	20.5	24.8	29.2	33.5	37.8
	92.0	-31	-17	1191	242	341	20.2	24.4	28.6	32.8	37.0
	92.0	-41	-27	1227	250	343	19.8	23.9	28.0	32.1	36.1
	86.0	-21	-10	935	206	297	21.1	26.5	31.8	37.2	42.5
	86.0	-31	-20	957	213	301	21.0	26.2	31.4	36.6	41.9
	86.0	-41	-30	986	220	304	20.7	25.8	30.9	36.0	41.0
	80.0	-21	-13	754	175	254	20.5	27.1	33.7	40.3	47.0
	80.0	-31	-23	773	182	259	20.6	27.1	33.6	40.0	46.5
	80.0	-41	-32	793	190	264	20.7	27.0	33.3	39.6	46.0
	(2) 74.0	-21	-15	622	143	209	17.5	25.5	33.6	41.6	49.7
	74.0	-31	-25	631	151	216	18.4	26.3	34.2	42.1	50.1
	74.0	-41	-35	639	158	221	18.9	26.8	34.6	42.4	50.2
11000.	100.6	-21	-2	1554	274	391	18.7	21.9	25.1	28.4	31.6
	(1) 99.6	-31	-13	1547	276	386	18.5	21.7	24.9	28.2	31.4
	97.9	-41	-24	1505	276	377	18.4	21.7	25.1	28.4	31.7
	91.0	-21	-7	1120	232	333	20.8	25.3	29.7	34.2	38.7
	91.0	-31	-17	1152	239	336	20.5	24.8	29.2	33.5	37.9
	91.0	-41	-27	1187	246	339	20.1	24.4	28.6	32.8	37.0
	85.0	-21	-10	906	203	294	21.4	26.9	32.5	38.0	43.5
	85.0	-31	-20	926	210	297	21.3	26.7	32.1	37.5	42.9
	85.0	-41	-30	954	218	301	21.1	26.3	31.6	36.8	42.0
	79.0	-21	-13	734	174	253	20.9	27.7	34.5	41.3	48.1
	79.0	-31	-23	748	181	257	21.0	27.7	34.4	41.1	47.8
	79.0	-41	-32	767	188	2[illegible]	21.1	27.6	34.1	40.6	47.2
	(2) 72.0	-21	-16	585	139	203	17.6	26.2	34.7	43.3	51.8
	72.0	-31	-25	593	147	210	18.5	26.9	35.3	43.8	52.2
	72.0	-41	-35	601	153	215	19.1	27.4	35.7	44.0	52.3

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON		
MAX. FAN %RPM		
-21°C	-31°C	-41°C
97.7	99.6	98.1
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%		

Figure 7-22 (Sheet 7 of 17)

CRUISE
19,000 FEET

ANTI-ICE SYSTEMS OFF — TWO ENGINES

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	97.6	-13	4	1616	276	370	16.7	19.8	22.9	26.0	29.1
	(1) 96.0	-23	-7	1579	276	363	16.6	19.8	23.0	26.1	29.3
	94.5	-33	-18	1540	276	355	16.6	19.8	23.1	26.3	29.6
	90.0	-13	-1	1242	237	319	17.7	21.7	25.7	29.8	33.8
	90.0	-23	-10	1276	245	323	17.5	21.4	25.3	29.2	33.1
	90.0	-33	-20	1312	253	326	17.3	21.1	24.9	28.7	32.5
	86.0	-13	-3	1082	216	292	17.7	22.4	27.0	31.6	36.2
	86.0	-23	-12	1105	223	296	17.7	22.2	26.8	31.3	35.8
	86.0	-33	-22	1133	231	300	17.6	22.0	26.4	30.9	35.3
	81.0	-13	-5	905	187	254	17.0	22.5	28.0	33.6	39.1
	81.0	-23	-15	925	195	260	17.2	22.7	28.1	33.5	38.9
	81.0	-33	-24	947	203	265	17.4	22.7	27.9	33.2	38.5
	(2) 77.0	-13	-7	796	163	223	15.4	21.7	28.0	34.2	40.5
	77.0	-23	-16	808	172	229	16.0	22.2	28.3	34.5	40.7
	77.0	-33	-26	821	179	234	16.4	22.5	28.6	34.6	40.7
14000	97.3	-13	4	1605	276	370	16.8	19.9	23.0	26.2	29.3
	(1) 95.8	-23	-7	1567	276	363	16.8	20.0	23.1	26.3	29.5
	94.2	-33	-18	1529	276	355	16.7	20.0	23.3	26.5	29.8
	89.0	-13	-1	1201	234	315	17.9	22.1	26.3	30.4	34.6
	89.0	-23	-11	1234	241	319	17.7	21.8	25.8	29.9	33.9
	89.0	-33	-20	1271	249	323	17.5	21.4	25.4	29.3	33.2
	84.0	-13	-3	1011	208	281	17.9	22.9	27.8	32.8	37.7
	84.0	-23	-13	1033	215	285	17.9	22.8	27.6	32.5	37.3
	84.0	-33	-23	1058	223	289	17.9	22.6	27.3	32.0	36.8
	80.0	-13	-5	881	186	253	17.3	23.0	28.7	34.4	40.0
	80.0	-23	-15	894	193	256	17.5	23.1	28.7	34.3	39.9
	80.0	-33	-25	916	201	262	17.6	23.1	28.5	34.0	39.5
	(2) 75.0	-13	-7	749	157	214	15.3	21.9	28.6	35.3	42.0
	75.0	-23	-17	760	165	221	15.9	22.5	29.1	35.6	42.2
	75.0	-33	-27	772	173	227	16.4	22.9	29.3	35.8	42.3
13000	97.0	-13	4	1594	276	370	16.9	20.1	23.2	26.3	29.5
	(1) 95.5	-23	-7	1556	276	363	16.9	20.1	23.3	26.5	29.7
	94.0	-33	-18	1519	276	355	16.8	20.1	23.4	26.7	30.0
	88.0	-13	-1	1164	231	311	18.2	22.5	26.8	31.0	35.3
	88.0	-23	-11	1194	238	315	18.0	22.2	26.4	30.6	34.7
	88.0	-33	-21	1225	246	318	17.8	21.8	25.9	30.0	34.1
	83.0	-13	-3	978	205	278	18.2	23.3	28.4	33.5	38.6
	83.0	-23	-13	1000	212	282	18.2	23.2	28.2	33.2	38.2
	83.0	-33	-23	1026	220	286	18.1	23.0	27.9	32.7	37.6
	78.0	-13	-6	832	180	245	17.5	23.5	29.5	35.5	41.5
	78.0	-23	-15	841	186	248	17.6	23.6	29.5	35.4	41.4
	78.0	-33	-25	855	193	252	17.7	23.6	29.4	35.3	41.1
	(2) 73.0	-13	-8	706	152	207	15.2	22.3	29.4	36.5	43.6
	73.0	-23	-17	714	159	213	15.8	22.8	29.8	36.8	43.8
	73.0	-33	-27	724	167	218	16.3	23.2	30.1	37.1	44.0
12000	96.8	-13	4	1585	276	370	17.0	20.2	23.3	26.5	29.7
	(1) 95.3	-23	-7	1546	276	363	17.0	20.2	23.5	26.7	29.9
	93.7	-33	-18	1509	276	355	16.9	20.2	23.5	26.9	30.2
	88.0	-13	-1	1167	233	314	18.3	22.6	26.9	31.2	35.5
	88.0	-23	-11	1197	240	317	18.1	22.3	26.5	30.7	34.9
	88.0	-33	-21	1228	247	320	17.9	22.0	26.0	30.1	34.2
	82.0	-13	-4	946	202	274	18.4	23.7	29.0	34.3	39.6
	82.0	-23	-13	967	210	278	18.4	23.6	28.8	33.9	39.1
	82.0	-33	-23	991	217	282	18.3	23.4	28.4	33.5	38.5
	76.0	-13	-6	781	174	237	17.5	23.9	30.3	36.7	43.1
	76.0	-23	-16	792	180	240	17.7	24.0	30.3	36.6	43.0
	76.0	-33	-26	804	187	243	17.8	24.1	30.3	36.5	42.7
	(2) 70.0	-13	-8	653	143	196	14.7	22.3	30.0	37.6	45.3
	70.0	-23	-18	656	150	200	15.3	22.9	30.5	38.2	45.8
	70.0	-33	-28	659	156	204	15.8	23.4	30.9	38.5	46.1
11000	96.6	-13	4	1576	276	370	17.1	20.3	23.5	26.7	29.8
	(1) 95.1	-23	-7	1536	276	363	17.1	20.3	23.6	26.9	30.1
	93.5	-33	-18	1501	276	355	17.0	20.4	23.7	27.0	30.4
	87.0	-13	-1	1132	230	310	18.6	23.0	27.4	31.8	36.2
	87.0	-23	-11	1155	236	312	18.4	22.7	27.0	31.4	35.7
	87.0	-33	-21	1186	244	315	18.1	22.4	26.6	30.8	35.0
	81.0	-13	-4	918	200	271	18.7	24.1	29.6	35.0	40.5
	81.0	-23	-14	934	207	274	18.7	24.0	29.4	34.7	40.1
	81.0	-33	-23	958	214	278	18.6	23.8	29.0	34.2	39.5
	74.0	-13	-6	734	168	229	17.6	24.4	31.2	38.0	44.8
	74.0	-23	-16	744	174	232	17.8	24.5	31.2	38.0	44.7
	74.0	-33	-26	753	180	235	17.9	24.6	31.2	37.8	44.5
	(2) 68.0	-13	-8	621	141	192	14.9	22.9	31.0	39.0	47.1
	68.0	-23	-18	623	146	196	15.4	23.5	31.5	39.5	47.5
	68.0	-33	-28	626	152	199	15.9	23.9	31.9	39.9	47.9

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON		
MAX. FAN %RPM		
-13°C	-23°C	-33°C
96.0	95.3	93.7
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%		

Figure 7-22 (Sheet 5 of 17)

CRUISE
15,000 FEET

ANTI-ICE SYSTEMS OFF — TWO ENGINES

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	93.6	-5	10	1643	276	348	15.1	18.1	21.2	24.2	27.3
	(1) 92.4	-15	-1	1605	276	342	15.0	18.2	21.3	24.4	27.5
	90.9	-25	-11	1566	276	335	15.0	18.2	21.4	24.6	27.8
	86.0	-5	6	1256	234	297	15.7	19.6	23.6	27.6	31.6
	86.0	-15	-4	1285	242	300	15.6	19.5	23.4	27.2	31.1
	86.0	-25	-14	1312	249	303	15.5	19.3	23.1	26.9	30.7
	82.0	-5	4	1096	212	270	15.5	20.0	24.6	29.2	33.7
	82.0	-15	-6	1111	219	273	15.5	20.0	24.5	29.0	33.5
	82.0	-25	-16	1139	227	277	15.5	19.9	24.3	28.7	33.1
	77.0	-5	2	936	186	237	14.6	20.0	25.3	30.6	36.0
	77.0	-15	-8	946	192	240	14.8	20.1	25.4	30.7	36.0
	77.0	-25	-18	961	199	244	15.0	20.2	25.4	30.6	35.8
	(2) 73.0	-5	0	828	162	207	13.0	19.0	25.1	31.1	37.1
	73.0	-15	-9	832	169	212	13.4	19.4	25.4	31.5	37.5
	73.0	-25	-19	838	176	216	13.8	19.8	25.7	31.7	37.7
14000	93.6	-5	10	1632	276	348	15.2	18.3	21.3	24.4	27.4
	(1) 92.2	-15	-1	1595	276	342	15.2	18.3	21.4	24.6	27.7
	90.7	-25	-11	1555	276	335	15.1	18.3	21.5	24.8	28.0
	85.0	-5	5	1214	231	292	15.8	19.9	24.1	28.2	32.3
	85.0	-15	-4	1245	238	296	15.8	19.8	23.8	27.8	31.8
	85.0	-25	-14	1270	245	299	15.6	19.6	23.5	27.5	31.4
	81.0	-5	4	1065	210	267	15.6	20.3	25.0	29.7	34.4
	81.0	-15	-6	1078	216	269	15.7	20.3	25.0	29.6	34.3
	81.0	-25	-16	1099	223	273	15.7	20.2	24.8	29.3	33.9
	76.0	-5	2	907	184	235	14.8	20.3	25.9	31.4	36.9
	76.0	-15	-8	918	191	238	15.0	20.5	25.9	31.4	36.8
	76.0	-25	-18	932	197	242	15.2	20.6	25.9	31.3	36.6
	(2) 71.0	-5	0	788	158	202	13.0	19.3	25.7	32.0	38.3
	71.0	-15	-10	791	164	206	13.4	19.7	26.1	32.4	38.7
	71.0	-25	-20	794	170	209	13.8	20.1	26.4	32.7	38.9
13000	93.4	-5	10	1621	276	348	15.3	18.4	21.5	24.5	27.6
	(1) 91.9	-15	-1	1585	276	342	15.2	18.4	21.6	24.7	27.9
	90.5	-25	-11	1544	276	335	15.2	18.4	21.7	24.9	28.2
	85.0	-5	6	1216	232	295	16.0	20.1	24.2	28.3	32.4
	85.0	-15	-4	1247	240	298	15.9	19.9	23.9	27.9	31.9
	85.0	-25	-14	1272	247	301	15.8	19.7	23.6	27.6	31.5
	80.0	-5	4	1034	207	264	15.8	20.7	25.5	30.3	35.2
	80.0	-15	-6	1047	214	266	15.9	20.6	25.4	30.2	35.0
	80.0	-25	-16	1065	220	269	15.9	20.6	25.3	30.0	34.7
	74.0	-5	1	861	179	228	14.9	20.7	26.5	32.3	38.1
	74.0	-15	-8	862	183	229	15.0	20.8	26.6	32.4	38.2
	74.0	-25	-18	873	190	232	15.2	20.9	26.6	32.4	38.1
	(2) 69.0	-5	0	748	154	197	12.9	19.6	26.3	33.0	39.7
	69.0	-15	-10	751	160	200	13.4	20.0	26.7	33.4	40.0
	69.0	-25	-20	754	166	204	13.7	20.4	27.0	33.6	40.3
12000	93.2	-5	10	1612	276	348	15.4	18.5	21.6	24.7	27.8
	(1) 91.7	-15	-1	1576	276	342	15.3	18.5	21.7	24.9	28.0
	90.3	-25	-11	1535	276	335	15.3	18.6	21.8	25.1	28.3
	84.0	-5	5	1178	229	291	16.2	20.4	24.7	28.9	33.2
	84.0	-15	-5	1202	236	293	16.1	20.2	24.4	28.6	32.7
	84.0	-25	-14	1230	243	296	15.9	20.0	24.1	28.1	32.2
	78.0	-5	3	972	200	255	15.9	21.0	26.2	31.3	36.5
	78.0	-15	-7	985	206	257	15.9	21.0	26.1	31.2	36.2
	78.0	-25	-17	999	212	260	16.0	21.0	26.0	31.0	36.0
	73.0	-5	1	839	178	227	15.2	21.1	27.1	33.1	39.0
	73.0	-15	-9	841	183	229	15.3	21.2	27.2	33.1	39.1
	73.0	-25	-18	845	188	230	15.4	21.3	27.2	33.1	39.0
	(2) 67.0	-5	0	708	149	191	12.8	19.9	26.9	34.0	41.1
	67.0	-15	-10	711	155	195	13.3	20.3	27.4	34.4	41.4
	67.0	-25	-20	713	160	197	13.7	20.7	27.7	34.7	41.7
11000	93.0	-5	10	1603	276	348	15.5	18.6	21.7	24.8	27.9
	(1) 91.5	-15	-1	1568	276	342	15.4	18.6	21.8	25.0	28.2
	90.1	-25	-11	1526	276	335	15.4	18.7	21.9	25.2	28.5
	83.0	-5	5	1140	226	286	16.3	20.7	25.1	29.5	33.9
	83.0	-15	-5	1161	232	289	16.2	20.6	24.9	29.2	33.5
	83.0	-25	-15	1189	239	291	16.1	20.3	24.5	28.7	32.9
	77.0	-5	3	942	198	252	16.1	21.4	26.7	32.0	37.3
	77.0	-15	-7	955	203	254	16.1	21.3	26.6	31.8	37.0
	77.0	-25	-17	969	210	256	16.1	21.3	26.4	31.6	36.7
	71.0	-5	1	797	174	221	15.2	21.5	27.8	34.1	40.3
	71.0	-15	-9	799	178	223	15.4	21.6	27.9	34.1	40.4
	71.0	-25	-19	802	183	224	15.4	21.7	27.9	34.1	40.4
	(2) 65.0	-5	-1	669	145	185	12.7	20.2	27.6	35.1	42.6
	65.0	-15	-11	671	150	188	13.2	20.6	28.1	35.5	43.0
	65.0	-25	-20	673	156	191	13.6	21.0	28.4	35.8	43.3

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON

MAX. FAN %RPM		
-5°C	-15°C	-25°C
93.2	91.7	90.3
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%		

Figure 7-22 (Sheet 3 of 17)

CRUISE
5000 FEET

ANTI-ICE SYSTEMS OFF — TWO ENGINES

WT. LBS.	FAN 0/0 RPM	TEMP DEG. C	RAT DEG. C	FUEL FLOW LB/HR	KIAS	KTAS	NAUTICAL MILES/100 LBS. FUEL 100KT. HEADWIND	50KT. HEADWIND	ZERO WIND	50KT. TAILWIND	100KT. TAILWIND
15000	82.9	15	25	1629	261	284	11.3	14.4	17.4	20.5	23.6
	(1) 81.7	5	14	1591	261	279	11.3	14.4	17.6	20.7	23.8
	80.5	-5	4	1548	261	274	11.2	14.5	17.7	20.9	24.2
	76.0	15	22	1335	227	248	11.1	14.8	18.6	22.3	26.1
	76.0	5	12	1336	232	248	11.1	14.8	18.6	22.3	26.1
	76.0	-5	2	1340	237	249	11.1	14.8	18.6	22.3	26.0
	73.0	15	22	1230	214	233	10.8	14.9	19.0	23.0	27.1
	73.0	5	12	1233	218	234	10.9	14.9	19.0	23.0	27.1
	73.0	-5	2	1237	223	235	10.9	15.0	19.0	23.0	27.1
	69.0	15	20	1097	193	211	10.1	14.7	19.2	23.8	28.4
	69.0	5	10	1101	199	213	10.3	14.8	19.4	23.9	28.4
	69.0	-5	1	1105	204	215	10.4	14.9	19.4	24.0	28.5
	(2) 65.0	15	19	970	168	184	8.6	13.8	18.9	24.1	29.3
	65.0	5	9	974	175	188	9.0	14.1	19.3	24.4	29.5
	65.0	-5	-1	978	181	191	9.3	14.4	19.5	24.6	29.7
14000	82.7	15	25	1617	261	284	11.4	14.5	17.6	20 6	23.7
	(1) 81.5	5	14	1581	261	279	11.3	14.5	17.7	20.8	24.0
	80.3	-5	4	1538	261	274	11.3	14.6	17.8	21 1	24.3
	76.0	15	23	1337	229	250	11.2	15.0	18.7	22.4	26.2
	76.0	5	13	1338	233	250	11.2	15.0	18.7	22.4	26.2
	76.0	-5	3	1342	238	250	11.2	14.9	18.7	22.4	26.1
	72.0	15	21	1198	211	231	10.9	15.1	19.3	23.4	27.6
	72.0	5	11	1200	216	231	10.9	15.1	19.3	23.4	27.6
	72.0	-5	2	1205	221	232	11.0	15.1	19.3	23.4	27.6
	68.0	15	20	1067	191	209	10.2	14.9	19.6	24.3	28.9
	68.0	5	10	1071	196	211	10.3	15.0	19.7	24.4	29.0
	68.0	-5	0	1073	201	212	10.5	15.1	19.8	24 4	29.1
	(2) 63.0	15	19	911	159	174	8.1	13.6	19.1	24 6	30.1
	63.0	5	9	915	166	179	8.6	14.1	19.5	25.0	30.5
	63.0	-5	-1	919	173	182	8.9	14.4	19.8	25 3	30.7
13000	82.4	15	25	1608	261	284	11.4	14.5	17.7	20.8	23.9
	(1) 81.3	5	14	1572	261	279	11.4	14.6	17.8	21.0	24.1
	80.1	-5	4	1528	261	274	11.4	14.6	17.9	21.2	24.5
	75.0	15	22	1303	227	247	11.3	15.1	19.0	22.8	26.6
	75.0	5	12	1307	231	248	11.3	15.1	18.9	22.8	26.6
	75.0	-5	2	1308	236	248	11.3	15.1	18.9	22 8	26.6
	70.0	15	21	1133	204	223	10.8	15.2	19.6	24.1	28.5
	70.0	5	11	1136	209	224	10.9	15.3	19.7	24 1	28.5
	70.0	-5	1	1141	214	225	11.0	15.3	19.7	24 1	28.5
	66.0	15	20	1006	184	201	10.0	15.0	19.9	24.9	29.9
	66.0	5	10	1008	189	202	10.2	15.1	20.1	25.0	30.0
	66.0	-5	0	1012	194	204	10.3	15.2	20.2	25.1	30.1
	(2) 61.0	15	18	864	153	168	7.9	13.7	19.4	25.2	31.0
	61.0	5	9	861	158	170	8.2	14.0	19.8	25.6	31.4
	61.0	-5	-1	861	164	173	8.5	14.3	20.1	25.9	31 7
12000	82.2	15	25	1599	261	284	11.5	14.6	17.8	20.9	24.0
	(1) 81.1	5	14	1559	261	279	11.5	14.7	17.9	21 1	24.3
	79.9	-5	4	1520	261	274	11.4	14.7	18.0	21.3	24.6
	74.0	15	22	1270	224	244	11.4	15.3	19.2	23.2	27.1
	74.0	5	12	1272	229	245	11.4	15.3	19.2	23.2	27 1
	74.0	-5	2	1275	233	245	11.4	15.3	19.2	23.1	27.0
	69.0	15	21	1102	201	220	10.9	15.4	20.0	24.5	29.0
	69.0	5	11	1106	206	221	11.0	15.5	20.0	24.5	29.0
	69.0	-5	1	1110	211	222	11.0	15.5	20.0	24.5	29.0
	64.0	15	19	944	175	192	9.7	15.0	20.3	25.6	30.9
	64.0	5	10	948	181	194	9.9	15.2	20.5	25.8	31.0
	64.0	-5	0	952	186	196	10.1	15.4	20.6	25.9	31.1
	(2) 59.0	15	18	821	149	163	7.6	13.7	19.8	25.9	32.0
	59.0	5	8	818	153	165	8.0	14.1	20.2	26.3	32.4
	59.0	-5	-2	815	158	167	8.2	14.3	20.5	26.6	32.7
11000	82.1	15	25	1590	261	284	11.6	14.7	17.9	21.0	24.1
	(1) 80.9	5	14	1551	261	279	11.5	14.8	18.0	21.2	24.4
	79.7	-5	4	1512	261	274	11.5	14.8	18.1	21.4	24.7
	74.0	15	22	1271	225	246	11.5	15.4	19.3	23.3	27.2
	74.0	5	12	1274	230	246	11.5	15.4	19.3	23.2	27.2
	74.0	-5	2	1277	234	246	11.5	15.4	19.3	23.2	27.1
	68.0	15	21	1071	199	217	10.9	15.6	20.3	24.9	29.6
	68.0	5	11	1075	203	218	11.0	15.7	20.3	25.0	29.6
	68.0	-5	1	1077	208	219	11.1	15.7	20.3	25.0	29.6
	63.0	15	19	915	173	189	9.8	15.2	20.7	26.2	31.6
	63.0	5	9	919	178	192	10.0	15.4	20.8	26.3	31.7
	63.0	-5	0	923	183	193	10.1	15.5	21.0	26.4	31.8
	(2) 57.0	15	18	779	144	157	7.4	13.8	20.2	26.6	33 1
	57.0	5	8	776	148	160	7.7	14 1	20.6	27.0	33.5
	57.0	-5	-2	773	153	161	7.9	14.4	20.9	27.4	33.8

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON		
MAX. FAN %RPM		
15°C	5°C	-5°C
82.2	81.0	79.8
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 8%		

Figure 7-22 (Sheet 1 of 17)

CRUISE CLIMB

225 KIAS AT SEA LEVEL PRESSURE ALTITUDE

TIME,DISTANCE,FUEL, AND RATE-OF-CLIMB

ANTI-ICE SYSTEMS ON

T.O. WEIGHT		15100	14000	13000	12000	11000	15100	14000	13000	12000	11000	15100	14000	13000	12000	11000	15100	14000	13000	12000	11000
PRESSURE ALTITUDE		5000 FEET ISA – 5°C – 41°F					10000 FEET ISA – -5°C – 23°F					15000 FEET ISA – -15°C – 6°F					17000 FEET ISA – -19°C – -2°F				
ISA +10°C	MIN	4	3	3	3	3	7	6	6	5	5	11	10	9	8	7	13	11	10	9	8
	NM	11	10	9	8	7	25	23	21	19	17	42	38	34	31	28	50	45	40	36	32
	LB	108	98	89	80	72	217	196	178	161	144	329	296	268	241	217	375	337	304	274	246
	R/C	1577	1749	1927	2131	2368	1413	1576	1744	1937	2161	1226	1379	1536	1716	1924	1152	1300	1452	1626	1827
ISA 0°C	MIN	3	3	2	2	2	5	5	4	4	4	8	7	7	6	6	9	9	8	7	7
	NM	8	7	7	6	5	19	17	15	14	12	31	28	25	23	21	37	33	30	27	24
	LB	88	80	73	67	60	177	160	146	133	120	267	242	220	199	180	304	275	250	226	204
	R/C	2096	2310	2532	2787	3085	1884	2085	2293	2533	2812	1646	1834	2028	2249	2507	1549	1730	1917	2131	2379
ISA -10°C	MIN	2	2	2	2	2	4	4	4	3	3	7	6	6	5	5	8	7	6	6	5
	NM	6	6	5	5	4	14	13	12	11	10	24	22	20	18	16	28	26	23	21	19
	LB	75	69	63	58	52	151	138	126	115	104	228	208	190	172	156	260	236	215	196	177
	R/C	2646	2904	3173	3482	3844	2378	2620	2871	3159	3496	2089	2312	2544	2811	3121	1958	2173	2396	2652	2949
PRESSURE ALTITUDE		19000 FEET ISA – -23°C – - 9°F					21000 FEET ISA – -27°C – -16°F					23000 FEET ISA – -31°C – -23°F					25000 FEET ISA – -35°C – -30°F				
ISA +10°C	MIN	14	13	12	11	9	16	15	13	12	11	18	17	15	13	12	21	19	17	15	13
	NM	59	52	47	42	38	68	60	54	49	43	78	70	62	56	50	91	80	72	64	57
	LB	423	378	341	307	275	472	421	380	341	305	524	467	420	377	336	579	515	462	414	369
	R/C	1071	1214	1362	1530	1724	981	1120	1262	1424	1610	882	1015	1151	1306	1483	781	908	1038	1185	1354
ISA 0°C	MIN	11	10	9	8	7	12	11	10	9	8	14	13	11	10	9	16	14	13	12	10
	NM	43	39	35	31	28	50	45	40	36	33	57	51	46	42	37	66	59	53	48	43
	LB	342	309	281	254	229	382	344	312	282	254	423	380	345	311	279	467	419	379	341	306
	R/C	1442	1617	1798	2004	2243	1326	1494	1667	1865	2093	1199	1359	1524	1712	1929	1069	1222	1378	1556	1762
ISA -10°C	MIN	9	8	7	7	6	10	9	8	7	7	11	10	9	8	8	13	11	10	9	9
	NM	33	30	27	25	22	38	35	31	28	26	44	40	36	33	29	51	46	42	37	34
	LB	292	265	242	220	198	326	295	269	244	220	361	326	297	269	243	398	359	326	295	266
	R/C	1817	2024	2237	2482	2766	1669	1866	2070	2303	2573	1513	1700	1894	2114	2370	1350	1528	1710	1918	2158
PRESSURE ALTITUDE		27000 FEET ISA – -38°C – -37°F					29000 FEET ISA – -42°C – -44°F					31000 FEET ISA – -46°C – -52°F					33000 FEET ISA – -50°C – -59°F				
ISA +10°C	MIN	24	21	19	17	15	27	24	21	19	17	31	27	24	21	19	37	32	28	24	21
	NM	105	92	82	73	65	123	107	95	84	74	145	125	110	97	85	176	149	130	113	99
	LB	641	567	507	453	403	711	625	557	496	441	793	692	614	544	481	898	774	680	599	527
	R/C	666	787	910	1049	1208	554	668	784	915	1064	436	544	653	775	914	314	414	516	629	757
ISA 0°C	MIN	18	16	14	13	12	20	18	16	15	13	23	20	18	16	15	27	23	21	18	16
	NM	76	68	61	55	49	88	78	70	63	56	103	91	81	72	64	123	107	94	83	74
	LB	514	460	415	374	335	567	505	455	408	365	627	556	498	446	397	699	614	548	488	433
	R/C	927	1072	1219	1387	1579	786	922	1061	1218	1397	646	774	904	1050	1217	504	623	745	880	1035
ISA -10°C	MIN	14	13	12	11	10	16	14	13	12	11	18	16	15	13	12	21	18	17	15	13
	NM	59	53	48	43	38	68	61	55	49	44	79	70	63	56	50	93	82	73	65	58
	LB	437	394	357	323	290	480	431	390	352	316	528	472	426	383	343	583	518	466	418	373
	R/C	1187	1355	1526	1722	1947	1025	1183	1344	1527	1737	865	1014	1165	1336	1532	704	843	985	1143	1325
PRESSURE ALTITUDE		35000 FEET ISA – -54°C – -66°F					37000 FEET ISA – -57°C – -70°F					39000 FEET ISA – -57°C – -70°F					41000 FEET ISA – -57°C – -70°F				
ISA +10°C	MIN	46	38	32	28	24	–	–	41	34	29	–	–	–	–	38	–	–	–	–	–
	NM	224	183	156	134	116	–	–	203	168	142	–	–	–	–	194	–	–	–	–	–
	LB	1049	881	763	665	581	–	–	897	762	655	–	–	–	–	790	–	–	–	–	–
	R/C	190	281	375	478	595	–	–	183	273	374	–	–	–	–	154	–	–	–	–	–
ISA 0°C	MIN	32	27	24	21	19	41	33	29	25	22	–	–	38	31	26	–	–	–	–	–
	NM	150	128	112	98	86	200	162	138	118	102	–	–	195	156	130	–	–	–	–	–
	LB	790	686	606	536	474	944	792	687	600	526	–	–	844	705	602	–	–	–	–	–
	R/C	355	465	577	701	842	159	257	356	465	587	–	–	127	224	332	–	–	–	–	–
ISA -10°C	MIN	24	21	19	17	15	29	25	22	19	17	–	32	27	23	20	–	–	–	31	26
	NM	111	97	85	76	67	139	118	103	90	79	–	160	132	112	96	–	–	–	158	128
	LB	649	572	511	456	406	742	643	569	503	446	–	765	656	570	498	–	–	–	690	580
	R/C	531	660	790	936	1102	317	432	548	678	823	–	194	302	418	549	–	–	–	175	289

CLIMB SPEED-KIAS

PRESSURE ALTITUDE	0	5000	10000	15000	20000	25000	30000	35000	40000	43000
	225	220	215	210	205	200	195	190	185	182

WIND EFFECT ON CLIMB DISTANCE - N.M.
(SUBTRACT FOR HEADWIND, ADD FOR TAILWIND)

CLIMB TIME	WIND		
(MIN)	25KTS	50KTS	100KTS
5	2	4	8
10	4	8	16
15	6	12	25
20	8	16	33
25	10	20	41
30	12	25	50

Figure 7-21 (Sheet 2 of 2)

MAXIMUM RATE CLIMB

TIME,DISTANCE,FUEL, AND RATE-OF-CLIMB

ANTI-ICE SYSTEMS ON

T.O. WEIGHT		15100	14000	13000	12000	11000	15100	14000	13000	12000	11000	15100	14000	13000	12000	11000	15100	14000	13000	12000	11000
PRESSURE ALTITUDE		5000 FEET ISA - 5°C = 41°F					10000 FEET ISA = -5°C = 23°F					15000 FEET ISA = -15°C = 5°F					17000 FEET ISA = -19°C = -2°F				
ISA +10°C	MIN	3	3	3	2	2	6	6	5	5	4	9	8	8	7	6	11	10	9	8	7
	NM	8	7	7	6	5	18	16	15	13	11	31	27	24	21	19	36	32	28	25	22
	LB	94	85	77	69	62	187	168	152	136	122	281	251	226	203	182	318	284	256	230	205
	R/C	1810	2016	2229	2508	2796	1662	1856	2062	2274	2534	1453	1642	1839	2057	2323	1383	1572	1758	1982	2230
ISA 0°C	MIN	3	2	2	2	2	5	5	4	4	3	8	7	6	6	5	9	8	7	7	6
	NM	6	6	5	4	4	14	13	12	10	9	24	21	19	17	15	28	25	23	20	18
	LB	81	74	67	61	55	162	146	133	120	108	243	219	199	180	162	276	249	225	203	183
	R/C	2259	2499	2749	3067	3404	2058	2282	2519	2763	3065	1804	2020	2244	2494	2798	1721	1938	2150	2406	2690
ISA -10°C	MIN	2	2	2	2	2	4	4	4	3	3	6	6	5	5	4	7	7	6	6	5
	NM	5	5	4	4	3	12	10	9	8	7	19	17	16	14	12	23	20	18	16	15
	LB	73	66	61	55	50	145	132	120	109	99	218	197	180	163	147	247	223	203	184	166
	R/C	2717	2992	3277	3634	4019	2475	2731	3001	3279	3626	2184	2429	2683	2969	3316	2077	2321	2561	2852	3173
PRESSURE ALTITUDE		19000 FEET ISA = -23°C = -9°F					21000 FEET ISA = -27°C = -16°F					23000 FEET ISA = -31°C = -23°F					25000 FEET ISA = -35°C = -30°F				
ISA +10°C	MIN	12	11	10	9	8	14	12	11	10	9	16	14	13	11	10	18	16	14	12	11
	NM	42	37	33	29	26	48	43	38	33	29	55	49	43	38	33	64	55	49	43	38
	LB	357	318	286	256	229	396	352	316	283	252	437	388	347	310	276	481	424	379	338	300
	R/C	1292	1473	1660	1872	2116	1207	1386	1570	1780	2023	1112	1280	1460	1666	1904	949	1178	1355	1545	1776
ISA 0°C	MIN	10	9	8	7	7	11	10	9	8	8	13	11	10	9	8	14	13	12	10	9
	NM	33	29	26	23	21	38	34	30	27	24	43	38	34	30	27	50	44	39	35	30
	LB	309	278	252	227	204	343	308	278	251	225	378	339	306	275	246	416	371	334	299	268
	R/C	1614	1820	2032	2275	2555	1507	1710	1919	2158	2435	1387	1576	1780	2012	2282	1190	1445	1643	1858	2117
ISA -10°C	MIN	8	8	7	6	6	9	9	8	7	6	11	10	9	8	7	12	11	10	9	8
	NM	27	24	21	19	17	31	27	25	22	20	35	31	28	25	22	40	36	32	28	25
	LB	277	250	227	206	186	307	277	252	228	205	338	305	276	249	224	372	333	301	272	244
	R/C	1941	2172	2411	2685	3001	1809	2035	2269	2537	2848	1668	1877	2104	2363	2663	1441	1724	1943	2181	2468
PRESSURE ALTITUDE		27000 FEET ISA = -38°C = -37°F					29000 FEET ISA = -42°C = -44°F					31000 FEET ISA = -46°C = -52°F					33000 FEET ISA = -50°C = -59°F				
ISA +10°C	MIN	20	17	16	14	12	22	20	17	15	14	25	22	19	17	15	28	24	21	19	17
	NM	73	63	55	49	43	83	72	63	55	48	95	82	71	62	54	110	93	81	70	60
	LB	527	463	413	367	325	575	505	448	397	351	628	548	485	428	378	586	596	524	461	406
	R/C	902	1017	1174	1359	1626	793	944	1111	1301	1466	674	833	990	1175	1379	556	707	866	1041	1249
ISA 0°C	MIN	16	14	13	12	10	18	16	14	13	11	20	18	16	14	13	23	20	18	16	14
	NM	57	50	44	39	34	65	57	50	44	39	74	65	57	50	44	85	73	64	56	49
	LB	455	405	364	326	290	496	440	394	352	314	540	477	426	380	337	589	517	460	408	362
	R/C	1137	1261	1436	1644	1942	1006	1181	1360	1573	1756	868	1039	1221	1428	1656	737	906	1085	1280	1513
ISA -10°C	MIN	13	12	11	10	9	15	13	12	11	10	17	15	13	12	11	19	17	15	13	12
	NM	46	41	36	32	28	53	46	41	36	32	60	53	47	41	36	69	60	53	48	40
	LB	406	363	328	296	265	441	394	356	320	286	479	427	384	344	307	521	462	413	369	329
	R/C	1383	1519	1713	1947	2278	1234	1429	1629	1866	2069	1076	1265	1468	1698	1951	926	1113	1311	1526	1784
PRESSURE ALTITUDE		35000 FEET ISA = -54°C = -66°F					37000 FEET ISA = -57°C = -70°F					39000 FEET ISA = -57°C = -70°F					41000 FEET ISA = -57°C = -70°F				
ISA +10°C	MIN	33	28	24	21	18	38	32	27	23	20	49	38	31	26	23	-	48	37	30	26
	NM	129	107	92	79	68	155	125	105	89	76	201	151	123	102	86	-	198	149	119	98
	LB	759	650	568	497	435	852	714	617	535	466	1005	801	676	580	500	-	949	759	635	540
	R/C	430	575	724	893	1093	298	447	603	774	970	142	289	440	613	807	-	136	282	448	646
ISA 0°C	MIN	26	22	20	17	15	30	25	22	19	17	36	29	25	22	19	48	36	29	25	21
	NM	99	84	73	63	55	118	97	83	71	61	142	114	96	81	69	195	141	113	94	78
	LB	645	561	496	439	387	712	612	536	471	414	805	675	584	508	444	981	766	644	552	477
	R/C	596	764	927	1116	1340	452	614	790	981	1197	280	442	607	795	1007	109	262	423	604	813
ISA -10°C	MIN	21	19	17	15	13	24	21	18	16	14	28	24	21	18	16	36	29	24	21	18
	NM	79	68	59	52	45	92	78	68	59	51	110	91	77	66	57	141	110	91	76	65
	LB	567	499	445	396	352	621	542	480	425	376	690	592	519	457	402	801	660	568	494	431
	R/C	767	946	1131	1338	1584	604	786	973	1182	1418	408	585	765	969	1201	208	377	551	748	974

CLIMB SPEED-KIAS

PRESSURE ALTITUDE	0	5000	10000	15000	20000	25000	30000	35000	40000	41000
15100	187	186	182	177	171	167	158	149	134	131
14000	186	185	181	176	170	162	156	146	132	129
13000	186	184	179	175	168	161	155	145	129	126
12000	185	180	178	174	167	159	153	143	127	124
11000	184	179	178	172	166	158	151	140	125	122

WIND EFFECT ON CLIMB DISTANCE
(SUBTRACT FOR HEADWIND, ADD FOR TAILWIND)

CLIMB TIME (MIN)	WIND 25KTS	50KTS	100KTS
5	2	4	8
10	4	8	16
15	6	12	25
20	8	16	33
25	10	20	41
30	12	25	50

Figure 7-20 (Sheet 2 of 2)

CLIMB

Multi-engine climb performance for two types of climbs is presented in tabulated form on the following pages. The two climbs presented are maximum climb at best rate-of-climb speed and cruise climb based on 225 KIAS at sea level, decreasing at the rate of one knot per thousand feet altitude.

This performance is based on normal climb/maximum cruise thrust setting on both engines (refer to the Normal Climb/Maximum Cruise Thrust Setting Chart, Figure 7-6), gear and flaps up, speed brakes retracted and anti-ice systems OFF. The performance is also presented for anti-ice systems ON.

The time, distance, fuel and rate-of-climb used to any given altitude is based on the climb starting at sea level. If the climb is initiated at some other altitude, it is necessary to go into the data twice, once at the initial altitude and once at the final altitude. The difference in time, distance and fuel between these two altitudes provides the proper values for the climb. The data allows for fuel burnoff in the climb; therefore, the weight presented is at the start of the climb.

The climb data for the conditions requiring a step climb are based on climbing direct to the highest obtainable altitude as shown in the step climb weight table, cruising at the altitude until the desired weight is achieved, and then climbing to the desired altitude or the next step altitude per the step climb weight table.

THRUST REVERSER - TAKEOFF

PRECIPITATION COVERED RUNWAYS

TAKEOFF FIELD LENGTH		
DRY, HARD SURFACE WITHOUT THRUST REVERSER	WET CONCRETE WITH THRUST REVERSER	ICE WITH THRUST REVERSER
1400	1440	2360
1600	1800	2740
1800	2110	3080
2000	2410	3420
2200	2710	3755
2400	2975	4050
2600	3240	4335
2800	3490	4595
3000	3720	4830
*3200	3935	4965
3400	4140	5230
3600	4325	5400
3800	4500	5560
4000	4665	5710
4200	4850	5890
4400	5020	6060
4600	5180	6220
4800	5360	6400
5000	5520	6560
5200	5710	6750
5400	5880	6920
5600	6070	7110
5800	6245	7285
6000	6420	7460
6200	6620	7660
6400	6810	7850
6600	7000	8040
6800	7190	8230
7000	7380	8420
7200	7570	8610
7400	7770	8810
7600	7960	9000
7800	8160	9200
8000	8350	9390

* EXAMPLE:

TAKEOFF FIELD LENGTH-FEET	
DRY, HARD SURFACE WITHOUT THRUST REVERSER	3200
WET CONCRETE WITH THRUST REVERSER	3935
ICE WITH THRUST REVERSER	4965

Figure 7-19 (Sheet 1 of 2)

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°
LANDING - FLAPS LAND

PRESSURE ALTITUDE 7000 FEET
ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	102.8	89	91	97	103	4440	3820	152	101.7	100.2			
	-20	101.2	90	91	97	103	4810	4140	152	99.8	99.9			
	-10	99.3	90	92	98	103	5220	4510	152	97.5	97.8			
14500	-30	102.8	87	89	95	101	4070	3510	151	101.7	100.2			
	-20	101.2	87	89	95	101	4400	3790	151	99.8	99.9			
	-10	99.3	88	90	95	101	4780	4120	151	97.5	97.8			
	0	97.1	89	91	96	101	5290	4570	151	95.2	95.5			
14400	-30	102.8	87	88	94	100	4010	3450	151	101.7	100.2	105	3430	2880
	-20	101.2	87	89	95	100	4340	3740	151	99.8	99.9	105	3550	2980
	-10	99.3	88	89	95	100	4700	4060	151	97.5	97.8	105	3680	3080
	0	97.1	89	90	96	100	5210	4500	151	95.2	95.5	105	3820	3190
13500	-30	102.8	83	84	91	97	3520	3040	149	101.7	100.2	102	3190	2700
	-20	101.2	83	85	91	97	3790	3270	149	99.8	99.9	102	3290	2790
	-10	99.3	84	86	91	97	4110	3540	149	97.5	97.8	102	3400	2870
	0	97.1	85	87	92	97	4530	3910	149	95.2	95.5	102	3510	2960
	10	94.7	87	88	93	97	5050	4360	149	92.8	93.0	102	3620	3060
12500	-30	102.8	78	79	87	94	3040	2620	147	101.7	100.2	98	2960	2530
	-20	101.2	79	80	87	94	3250	2820	147	99.8	99.9	98	3050	2590
	-10	99.3	80	81	87	94	3510	3050	147	97.6	97.8	98	3130	2670
	0	97.1	81	82	88	94	3860	3350	147	95.2	95.5	98	3220	2740
	10	94.7	82	84	88	94	4290	3700	147	92.8	93.0	98	3310	2820
11500	-30	102.8	76	76	84	92	2900	2430	146	101.7	100.2	94	2760	2420
	-20	101.2	75	75	84	91	2910	2460	146	99.8	99.9	94	2830	2470
	-10	99.3	74	75	83	90	3010	2600	146	97.6	97.8	94	2910	2520
	0	97.1	76	77	84	90	3300	2850	146	95.2	95.5	94	2980	2570
	10	94.7	78	78	84	90	3630	3150	146	92.9	93.0	94	3050	2620
10500	-30	102.8	77	77	82	90	2920	2450	144	101.7	100.2	90	2650	2310
	-20	101.2	75	75	81	89	2920	2450	144	99.8	99.9	90	2700	2350
	-10	99.3	73	73	81	89	2910	2440	144	97.6	97.8	90	2740	2400
	0	97.1	71	72	80	87	2860	2440	144	95.2	95.5	90	2790	2440
	10	94.7	72	73	80	87	3070	2640	144	92.9	93.0	90	2840	2490
9500	-30	102.8	77	77	80	90	2980	2520	143	101.7	100.2	86	2540	2200
	-20	101.2	76	76	79	88	2970	2510	143	99.8	99.9	86	2580	2240
	-10	99.3	74	74	78	87	2940	2470	143	97.6	97.8	86	2620	2280
	0	97.1	71	71	77	85	2870	2400	143	95.3	95.5	86	2660	2320
	10	94.7	69	69	76	84	2790	2330	143	92.9	93.0	86	2700	2360

Figure 7-18 (Sheet 8 of 8)

Airplanes -0001 thru -0114 Except Airplanes
Incorporating SBS550-32-1 and Airplanes
-0001 thru -0160 Incorporating
SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° **PRESSURE ALTITUDE 7000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	102.8	93	94	97	103	4160	3620	152	101 7	100.2			
	-20	101.2	93	94	97	103	4480	3910	152	99.8	99.9			
	-10	99.3	94	95	98	103	4850	4230	152	97 5	97.8			
14500	-30	102.8	90	91	95	101	3850	3330	151	101.7	100.2			
	-20	101.2	91	92	95	101	4140	3600	151	99.8	99.9			
	-10	99.3	92	93	95	101	4470	3900	151	97.5	97.8			
	0	97.1	93	94	96	101	4920	4300	151	95.2	95.5			
14400	-30	102.8	90	91	94	100	3790	3290	151	101.7	100.2	105	2810	2450
	-20	101.2	91	92	95	100	4080	3550	151	99.8	99.9	105	2880	2510
	-10	99.3	91	92	95	100	4420	3840	151	97.5	97.8	105	2950	2580
	0	97.1	92	93	96	100	4850	4230	151	95.2	95.5	105	3020	2640
13500	-30	102.8	86	87	91	97	3360	2900	149	101.7	100.2	102	2680	2340
	-20	101.2	87	88	91	97	3600	3130	149	99.8	99.9	102	2750	2400
	-10	99.3	87	88	91	97	3890	3380	149	97.5	97.8	102	2810	2460
	0	97.1	88	89	92	97	4280	3730	149	95.2	95.5	102	2880	2520
	10	94.7	90	90	93	97	4730	4120	149	92.8	93.0	102	2940	2580
12500	-30	102.8	81	82	87	94	2900	2500	147	101.7	100.2	98	2560	2230
	-20	101.2	82	83	87	94	3100	2680	147	99.8	99.9	98	2610	2280
	-10	99.3	83	84	87	94	3360	2900	147	97.6	97.8	98	2670	2330
	0	97.1	84	85	88	94	3680	3200	147	95.2	95.5	98	2730	2380
	10	94.7	85	86	88	94	4070	3530	147	92.8	93.0	98	2780	2440
11500	-30	102.8	77	79	84	92	2580	2210	146	101.7	100.2	94	2440	2120
	-20	101.2	77	79	84	91	2710	2330	146	99.8	99.9	94	2490	2170
	-10	99.3	78	79	83	90	2860	2470	146	97.6	97.8	94	2540	2210
	0	97.1	79	80	84	90	3140	2710	146	95.2	95.5	94	2580	2260
	10	94.7	80	81	84	90	3460	3000	146	92.9	93.0	94	2630	2310
10500	-30	102.8	77	77	82	90	2470	2060	144	101.7	100.2	90	2320	2020
	-20	101.2	75	75	81	89	2480	2070	144	99.8	99.9	90	2370	2060
	-10	99.3	74	75	81	89	2520	2160	144	97.6	97.8	90	2410	2100
	0	97.1	74	75	80	87	2690	2310	144	95.2	95.5	90	2450	2140
	10	94.7	75	76	80	87	2910	2510	144	92 9	93.0	90	2500	2180
9500	-30	102.8	77	77	80	90	2480	2080	143	101.7	100.2	86	2220	1920
	-20	101.2	76	76	79	88	2480	2080	143	99.8	99.9	86	2250	1960
	-10	99.3	74	74	78	87	2470	2070	143	97.6	97.8	86	2290	1990
	0	97.1	71	71	77	85	2430	2020	143	95.3	95.5	86	2330	2030
	10	94.7	71	71	76	84	2500	2140	143	92 9	93.0	86	2360	2060

Figure 7-18 (Sheet 8 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 5000 FEET

ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	101.9	89	90	97	103	3920	3370	154	100.7	98.7			
	-20	101.2	89	90	97	103	4140	3550	154	99.8	100.0			
	-10	99.3	89	91	97	103	4470	3850	154	97.5	97.8			
	0	97.1	90	92	98	103	4930	4240	154	95.2	95.5			
14500	-30	101.9	86	88	94	101	3610	3090	153	100.7	98.7			
	-20	101.2	86	88	94	101	3810	3270	153	99.8	100.0			
	-10	99.3	87	89	95	101	4110	3530	153	97.6	97.8			
	0	97.1	88	90	95	101	4520	3890	153	95.2	95.5			
	10	94.7	89	91	96	101	5040	4340	153	92.8	93.1			
14400	-30	101.9	86	87	94	100	3550	3060	153	100.7	98.7	105	3210	2700
	-20	101.2	86	88	94	100	3750	3220	153	99.8	100.0	105	3310	2790
	-10	99.3	87	88	94	100	4040	3470	153	97.6	97.8	105	3420	2880
	0	97.1	88	89	95	100	4450	3830	153	95.2	95.5	105	3540	2970
	10	94.7	89	90	95	100	4960	4270	153	92.8	93.1	105	3660	3070
13500	-30	101.9	82	83	90	97	3130	2700	151	100.7	98.7	102	3010	2550
	-20	101.2	82	83	91	97	3290	2840	151	99.8	100.0	102	3090	2620
	-10	99.3	83	84	91	97	3540	3060	151	97.6	97.8	102	3190	2700
	0	97.1	84	85	91	97	3890	3350	151	95.2	95.5	102	3280	2780
	10	94.7	85	87	92	97	4310	3710	151	92.9	93.1	102	3380	2860
12500	-30	101.9	78	78	87	95	2830	2380	149	100.7	98.7	98	2810	2420
	-20	101.2	77	78	87	95	2900	2500	149	99.8	100.0	98	2880	2470
	-10	99.3	78	79	87	94	3060	2630	149	97.6	97.8	98	2960	2520
	0	97.1	79	80	87	94	3330	2890	149	95.2	95.5	98	3040	2590
	10	94.7	81	82	88	94	3690	3200	149	92.9	93.1	98	3120	2650
11500	-30	101.9	78	78	85	93	2840	2370	148	100.7	98.7	94	2660	2320
	-20	101.2	78	78	85	93	2900	2430	148	99.8	100.0	94	2710	2370
	-10	99.3	76	76	84	92	2900	2430	148	97.6	97.8	94	2760	2410
	0	97.1	74	75	83	91	2890	2480	148	95.2	95.5	94	2830	2460
	10	94.7	75	76	83	90	3150	2730	148	92.9	93.1	94	2890	2510
10500	-30	101.9	79	79	82	91	2870	2410	146	100.7	98.7	90	2560	2220
	-20	101.2	78	78	82	91	2930	2460	146	99.9	100.0	90	2600	2260
	-10	99.3	77	77	82	90	2920	2460	146	97.6	97.8	90	2640	2300
	0	97.1	74	74	81	89	2860	2400	146	95.3	95.5	90	2690	2350
	10	94.7	71	72	80	88	2790	2350	146	92.9	93.1	90	2730	2390
9500	-30	101.9	80	80	83	92	2960	2480	145	100.7	98.7	86	2450	2120
	-20	101.2	79	79	82	92	3000	2540	145	99.9	100.0	86	2490	2160
	-10	99.3	77	77	80	89	2980	2520	145	97.6	97.8	86	2530	2190
	0	97.1	75	75	78	87	2910	2440	145	95.3	95.5	86	2570	2230
	10	94.7	72	72	77	86	2810	2350	145	92.9	93.1	86	2610	2270

Figure 7-18 (Sheet 6 of 8)

Airplanes -0001 thru -0114 Except Airplanes
Incorporating SBS550-32-1 and Airplanes
-0001 thru -0160 Incorporating
SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 5000 FEET

ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 – KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	101.9	92	93	97	103	3700	3210	154	100.7	98.7			
	-20	101.2	92	93	97	103	3900	3380	154	99.8	100.0			
	-10	99.3	93	94	97	103	4200	3650	154	97.5	97.8			
	0	97.1	94	95	98	103	4600	4000	154	95.2	95.5			
14500	-30	101.9	89	91	94	101	3430	2970	153	100.7	98.7			
	-20	101.2	90	91	94	101	3600	3130	153	99.8	100.0			
	-10	99.3	90	91	95	101	3880	3360	153	97.6	97.8			
	0	97.1	91	92	95	101	4240	3690	153	95.2	95.5			
	10	94.7	93	94	96	101	4690	4090	153	92.8	93.1			
14400	-30	101.9	89	90	94	100	3390	2920	153	100.7	98.7	105	2680	2330
	-20	101.2	89	90	94	100	3550	3080	153	99.8	100.0	105	2740	2390
	-10	99.3	90	91	94	100	3820	3310	153	97.6	97.8	105	2810	2450
	0	97.1	91	92	95	100	4190	3630	153	95.2	95.5	105	2870	2510
	10	94.7	92	93	95	100	4630	4040	153	92.8	93.1	105	2940	2570
13500	-30	101.9	85	86	90	97	2990	2580	151	100.7	98.7	102	2570	2240
	-20	101.2	85	86	91	97	3140	2710	151	99.8	100.0	102	2630	2290
	-10	99.3	86	87	91	97	3370	2920	151	97.6	97.8	102	2680	2340
	0	97.1	87	88	91	97	3690	3210	151	95.2	95.5	102	2740	2400
	10	94.7	88	89	92	97	4080	3540	151	92.9	93.1	102	2800	2450
12500	-30	101.9	81	82	87	95	2630	2270	149	100.7	98.7	98	2460	2140
	-20	101.2	81	82	87	95	2750	2370	149	99.8	100.0	98	2510	2180
	-10	99.3	81	82	87	94	2910	2510	149	97.6	97.8	98	2560	2230
	0	97.1	82	83	87	94	3190	2750	149	95.2	95.5	98	2610	2280
	10	94.7	84	85	88	94	3520	3050	149	92.9	93.1	98	2660	2320
11500	-30	101.9	78	78	85	93	2430	2010	148	100.7	98.7	94	2350	2040
	-20	101.2	78	78	85	93	2480	2100	148	99.8	100.0	94	2390	2080
	-10	99.3	77	78	84	92	2580	2220	148	97.6	97.8	94	2440	2120
	0	97.1	78	79	83	91	2750	2360	148	95.2	95.5	94	2480	2160
	10	94.7	79	80	83	90	3000	2590	148	92.9	93.1	94	2530	2210
10500	-30	101.9	79	79	82	91	2410	2010	146	100.7	98.7	90	2240	1950
	-20	101.2	78	78	82	91	2470	2060	146	99.9	100.0	90	2280	1980
	-10	99.3	77	77	82	90	2470	2060	146	97.6	97.8	90	2320	2020
	0	97.1	74	75	81	89	2440	2070	146	95.3	95.5	90	2360	2060
	10	94.7	74	75	80	88	2590	2220	146	92.9	93.1	90	2400	2090
9500	-30	101.9	80	80	83	92	2450	2050	145	100.7	98.7	86	2150	1850
	-20	101.2	79	79	82	92	2500	2090	145	99.9	100.0	86	2180	1890
	-10	99.3	77	77	80	89	2480	2080	145	97.6	97.8	86	2210	1920
	0	97.1	75	75	78	87	2440	2040	145	95.3	95.5	86	2250	1950
	10	94.7	72	72	77	86	2370	1970	145	92.9	93.1	86	2280	1990

Figure 7-18 (Sheet 6 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 3000 FEET

ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	98.5	89	91	97	103	3630	3100	155	97.3	95.4			
	-20	100.1	89	90	97	103	3760	3220	155	98.9	97.0			
	-10	99.3	88	90	97	103	3930	3370	155	97.6	97.9			
	0	97.1	89	91	97	103	4210	3620	155	95.2	95.6			
	10	94.7	90	92	97	103	4690	4040	155	92.9	93.1			
14500	-30	98.5	87	88	94	101	3350	2870	154	97.3	95.4			
	-20	100.1	86	88	94	101	3460	2980	154	98.9	97.0			
	-10	99.3	86	88	94	101	3610	3100	154	97.6	97.9			
	0	97.1	87	88	95	101	3880	3320	154	95.2	95.6			
	10	94.7	88	90	95	101	4300	3700	154	92.9	93.1			
14400	-30	98.5	86	87	94	100	3300	2840	154	97.3	95.4	105	3020	2550
	-20	100.1	86	87	94	100	3420	2940	154	98.9	97.0	105	3110	2630
	-10	99.3	86	87	94	100	3560	3060	154	97.6	97.9	105	3210	2700
	0	97.1	86	88	94	100	3820	3280	154	95.2	95.6	105	3310	2780
	10	94.7	88	89	95	100	4240	3650	154	92.9	93.1	105	3410	2870
13500	-30	98.5	82	83	90	97	2920	2510	153	97.3	95.4	102	2850	2420
	-20	100.1	81	82	90	97	3010	2600	153	98.9	97.0	102	2930	2480
	-10	99.3	82	83	90	97	3140	2710	153	97.6	97.9	102	3010	2550
	0	97.1	82	83	91	97	3350	2900	153	95.2	95.6	102	3090	2620
	10	94.7	84	85	91	97	3710	3200	153	92.9	93.1	102	3170	2690
12500	-30	98.5	78	78	87	95	2670	2220	151	97.3	95.4	98	2680	2330
	-20	100.1	78	78	87	95	2770	2300	151	98.9	97.0	98	2740	2370
	-10	99.3	78	78	87	95	2840	2390	151	97.6	97.9	98	2810	2420
	0	97.1	77	78	87	94	2920	2510	151	95.3	95.6	98	2880	2470
	10	94.7	79	80	87	94	3200	2760	151	92.9	93.1	98	2950	2510
11500	-30	98.5	79	79	85	93	2690	2230	150	97.2	95.4	94	2570	2230
	-20	100.1	79	79	85	93	2780	2320	150	98.9	97.0	94	2620	2280
	-10	99.3	78	78	85	93	2850	2390	150	97.6	97.9	94	2660	2320
	0	97.1	77	77	84	92	2860	2400	150	95.3	95.6	94	2700	2360
	10	94.7	74	75	83	91	2790	2390	150	92.9	93.1	94	2750	2410
10500	-30	98.5	79	79	82	91	2730	2280	148	97.2	95.4	90	2480	2140
	-20	100.1	79	79	82	91	2820	2360	148	98.9	97.0	90	2520	2180
	-10	99.3	79	79	82	91	2900	2430	148	97.6	97.9	90	2560	2220
	0	97.1	78	78	82	91	2900	2430	148	95.3	95.6	90	2590	2260
	10	94.7	75	75	81	89	2810	2350	148	92.9	93.1	90	2630	2300
9500	-30	98.5	80	80	83	93	2810	2350	147	97.2	95.4	86	2380	2040
	-20	100.1	80	80	83	93	2900	2440	147	98.9	97.0	86	2410	2080
	-10	99.3	80	80	83	93	2980	2510	147	97.7	97.9	86	2450	2110
	0	97.1	78	78	81	91	2970	2500	147	95.3	95.6	86	2480	2150
	10	94.7	75	75	78	87	2850	2390	147	92.9	93.1	86	2520	2180

Figure 7-18 (Sheet 4 of 8)

Airplanes -0001 thru -0114 Except Airplanes
Incorporating SBS550-32-1 and Airplanes
-0001 thru -0160 Incorporating
SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 3000 FEET

ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	98.5	92	93	97	103	3450	2980	155	97.3	95.4			
	-20	100.1	92	93	97	103	3560	3080	155	98.9	97.0			
	-10	99.3	92	93	97	103	3710	3220	155	97.6	97.9			
	0	97.1	93	94	97	103	3970	3440	155	95.2	95.6			
	10	94.7	94	95	97	103	4390	3820	155	92.9	93.1			
14500	-30	98.5	90	91	94	101	3200	2750	154	97.3	95.4			
	-20	100.1	89	91	94	101	3300	2840	154	98.9	97.0			
	-10	99.3	89	91	94	101	3440	2970	154	97.6	97.9			
	0	97.1	90	91	95	101	3670	3170	154	95.2	95.6			
	10	94.7	91	92	95	101	4060	3520	154	92.9	93.1			
14400	-30	98.5	89	90	94	100	3150	2700	154	97.3	95.4	105	2570	2230
	-20	100.1	89	90	94	100	3250	2810	154	98.9	97.0	105	2620	2280
	-10	99.3	89	90	94	100	3390	2930	154	97.6	97.9	105	2680	2330
	0	97.1	90	91	94	100	3620	3140	154	95.2	95.6	105	2740	2390
	10	94.7	91	92	95	100	4000	3470	154	92.9	93.1	105	2800	2440
13500	-30	98.5	85	86	90	97	2780	2380	153	97.3	95.4	102	2470	2140
	-20	100.1	85	86	90	97	2870	2470	153	98.9	97.0	102	2520	2190
	-10	99.3	85	86	90	97	2990	2580	153	97.6	97.9	102	2570	2240
	0	97.1	85	87	91	97	3200	2760	153	95.2	95.6	102	2620	2290
	10	94.7	87	88	91	97	3530	3060	153	92.9	93.1	102	2680	2340
12500	-30	98.5	81	82	87	95	2460	2100	151	97.3	95.4	98	2360	2050
	-20	100.1	81	82	87	95	2550	2180	151	98.9	97.0	98	2410	2090
	-10	99.3	81	82	87	95	2640	2270	151	97.6	97.9	98	2460	2140
	0	97.1	81	82	87	94	2770	2380	151	95.3	95.6	98	2500	2180
	10	94.7	82	83	87	94	3050	2620	151	92.9	93.1	98	2550	2220
11500	-30	98.5	79	79	85	93	2280	1890	150	97.2	95.4	94	2270	1960
	-20	100.1	79	79	85	93	2370	1950	150	98.9	97.0	94	2310	2000
	-10	99.3	78	78	85	93	2440	2020	150	97.6	97.9	94	2350	2040
	0	97.1	77	78	84	92	2470	2120	150	95.3	95.6	94	2390	2080
	10	94.7	78	79	83	91	2640	2270	150	92.9	93.1	94	2430	2120
10500	-30	98.5	79	79	82	91	2290	1900	148	97.2	95.4	90	2170	1880
	-20	100.1	79	79	82	91	2370	1970	148	98.9	97.0	90	2210	1910
	-10	99.3	79	79	82	91	2440	2020	148	97.6	97.9	90	2240	1950
	0	97.1	78	78	82	91	2440	2040	148	95.3	95.6	90	2280	1980
	10	94.7	75	75	81	89	2380	1990	148	92.9	93.1	90	2320	2010
9500	-30	98.5	80	80	83	93	2310	1930	147	97.2	95.4	86	2080	1800
	-20	100.1	80	80	83	93	2390	2000	147	98.9	97.0	86	2110	1820
	-10	99.3	80	80	83	93	2460	2060	147	97.7	97.9	86	2140	1850
	0	97.1	78	78	81	91	2460	2060	147	95.3	95.6	86	2180	1880
	10	94.7	75	75	78	87	2380	1990	147	92.9	93.1	86	2210	1910

Figure 7-18 (Sheet 4 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° **PRESSURE ALTITUDE 1000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	95.0	89	91	97	103	3390	2900	157	93.8	92.2			
	-20	96.5	89	91	97	103	3520	3010	157	95.3	93.7			
	-10	98.1	89	91	97	103	3530	3120	157	96.8	95.1			
	0	97.1	88	90	97	103	3760	3220	157	95.2	95.6			
	10	94.7	89	91	97	103	4050	3470	157	92.9	93.2			
14500	-30	95.0	87	88	94	101	3130	2690	156	93.8	92.2			
	-20	96.5	87	88	94	101	3240	2790	156	95.3	93.7			
	-10	98.1	86	88	94	101	3350	2870	156	96.8	95.1			
	0	97.1	86	88	94	101	3460	2980	156	95.3	95.6			
	10	94.7	87	88	95	101	3730	3200	156	92.9	93.2			
14400	-30	95.0	86	87	94	100	3090	2660	156	93.8	92.2	105	2860	2420
	-20	96.5	86	87	94	100	3200	2750	156	95.3	93.7	105	2940	2480
	-10	98.1	86	87	94	100	3300	2840	156	96.8	95.1	105	3020	2550
	0	97.1	86	87	94	100	3420	2930	156	95.3	95.6	105	3110	2620
	10	94.7	86	88	94	100	3670	3150	156	92.9	93.2	105	3200	2700
13500	-30	95.0	82	83	90	97	2750	2350	154	93.8	92.2	102	2710	2330
	-20	96.5	82	83	90	97	2840	2440	154	95.3	93.7	102	2780	2370
	-10	98.1	81	82	90	97	2920	2510	154	96.8	95.1	102	2850	2420
	0	97.1	81	82	90	97	3010	2600	154	95.3	95.6	102	2920	2480
	10	94.7	82	83	91	97	3220	2780	154	92.9	93.2	102	2990	2540
12500	-30	95.0	78	78	87	95	2520	2070	153	93.8	92.2	98	2580	2240
	-20	96.5	78	78	87	95	2600	2150	153	95.3	93.7	98	2620	2280
	-10	98.1	78	78	87	95	2690	2240	153	96.8	95.1	98	2680	2330
	0	97.1	78	78	87	95	2760	2310	153	95.3	95.6	98	2740	2370
	10	94.7	77	78	87	94	2820	2430	153	92.9	93.2	98	2800	2410
11500	-30	95.0	79	79	85	93	2530	2090	151	93.7	92.2	94	2490	2150
	-20	96.5	79	79	85	93	2610	2170	151	95.3	93.7	94	2530	2190
	-10	98.1	79	79	85	93	2710	2250	151	96.8	95.1	94	2570	2230
	0	97.1	79	79	85	93	2790	2330	151	95.3	95.6	94	2610	2270
	10	94.7	77	77	84	93	2780	2320	151	92.9	93.2	94	2650	2310
10500	-30	95.0	80	80	82	91	2560	2130	150	93.7	92.2	90	2400	2070
	-20	96.5	80	80	82	91	2660	2210	150	95.3	93.7	90	2440	2100
	-10	98.1	80	80	82	92	2750	2300	150	96.8	95.1	90	2470	2140
	0	97.1	80	80	82	92	2840	2380	150	95.3	95.6	90	2510	2170
	10	94.7	78	78	82	91	2820	2360	150	92.9	93.2	90	2550	2210
9500	-30	95.0	80	80	83	93	2640	2210	149	93.7	92.2	86	2310	1980
	-20	96.5	80	80	83	93	2740	2290	149	95.3	93.7	86	2340	2010
	-10	98.1	80	80	83	93	2830	2380	149	96.8	95.1	86	2380	2040
	0	97.1	80	80	83	93	2920	2460	149	95.3	95.6	86	2410	2070
	10	94.7	79	79	81	91	2890	2430	149	93.0	93.2	86	2440	2110

Figure 7-18 (Sheet 2 of 8)

Airplanes -0001 thru -0114 Except Airplanes
Incorporating SBS550-32-1 and Airplanes
-0001 thru -0160 Incorporating
SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 1000 FEET

ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	95.0	93	94	97	103	3230	2770	157	93.8	92.2			
	-20	96.5	92	93	97	103	3350	2890	157	95.3	93.7			
	-10	98.1	92	93	97	103	3450	2980	157	96.8	95.1			
	0	97.1	92	93	97	103	3560	3080	157	95.2	95.6			
	10	94.7	93	94	97	103	3820	3310	157	92.9	93.2			
14500	-30	95.0	90	91	94	101	2990	2560	156	93.8	92.2			
	-20	96.5	90	91	94	101	3100	2660	156	95.3	93.7			
	-10	98.1	90	91	94	101	3200	2750	156	96.8	95.1			
	0	97.1	89	90	94	101	3300	2840	156	95.3	95.6			
	10	94.7	90	91	95	101	3530	3060	156	92.9	93.2			
14400	-30	95.0	90	91	94	100	2960	2530	156	93.8	92.2	105	2460	2140
	-20	96.5	89	90	94	100	3060	2620	156	95.3	93.7	105	2520	2180
	-10	98.1	89	90	94	100	3150	2710	156	96.8	95.1	105	2570	2230
	0	97.1	89	90	94	100	3250	2810	156	95.3	95.6	105	2620	2280
	10	94.7	90	91	94	100	3480	3010	156	92.9	93.2	105	2670	2330
13500	-30	95.0	85	86	90	97	2610	2230	154	93.8	92.2	102	2380	2060
	-20	96.5	85	86	90	97	2700	2310	154	95.3	93.7	102	2420	2100
	-10	98.1	85	86	90	97	2780	2390	154	96.8	95.1	102	2470	2150
	0	97.1	85	86	90	97	2870	2470	154	95.3	95.6	102	2520	2190
	10	94.7	86	87	91	97	3080	2660	154	92.9	93.2	102	2560	2230
12500	-30	95.0	81	82	87	95	2310	1970	153	93.8	92.2	98	2280	1980
	-20	96.5	81	82	87	95	2390	2040	153	95.3	93.7	98	2320	2020
	-10	98.1	81	82	87	95	2470	2100	153	96.8	95.1	98	2370	2050
	0	97.1	81	82	87	95	2550	2180	153	95.3	95.6	98	2410	2090
	10	94.7	81	82	87	94	2680	2300	153	92.9	93.2	98	2450	2130
11500	-30	95.0	79	79	85	93	2140	1760	151	93.7	92.2	94	2190	1900
	-20	96.5	79	79	85	93	2220	1830	151	95.3	93.7	94	2230	1930
	-10	98.1	79	79	85	93	2300	1900	151	96.8	95.1	94	2270	1970
	0	97.1	79	79	85	93	2380	1970	151	95.3	95.6	94	2300	2000
	10	94.7	77	79	84	93	2390	2050	151	92.9	93.2	94	2340	2040
10500	-30	95.0	80	80	82	91	2150	1770	150	93.7	92.2	90	2110	1820
	-20	96.5	80	80	82	91	2220	1840	150	95.3	93.7	90	2140	1850
	-10	98.1	80	80	82	92	2300	1910	150	96.8	95.1	90	2170	1880
	0	97.1	80	80	82	92	2380	1980	150	95.3	95.6	90	2200	1910
	10	94.7	78	78	82	91	2370	1970	150	92.9	93.2	90	2240	1940
9500	-30	95.0	80	80	83	93	2170	1820	149	93.7	92.2	86	2030	1740
	-20	96.5	80	80	83	93	2250	1890	149	95.3	93.7	86	2050	1770
	-10	98.1	80	80	83	93	2330	1950	149	96.8	95.1	86	2080	1800
	0	97.1	80	80	83	93	2410	2020	149	95.3	95.6	86	2110	1820
	10	94.7	79	79	81	91	2390	2000	149	93.0	93.2	86	2140	1850

Figure 7-18 (Sheet 2 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° — **PRESSURE ALTITUDE 7000 FEET**

LANDING - FLAPS LAND — **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	103.0	89	91	97	103	3860	3320	152	104.3	100.2			
	-20	103.0	90	91	97	103	4180	3600	152	103.3	101.9			
	-10	102.7	90	92	98	103	4540	3920	152	101.3	101.2			
14500	-30	103.0	87	89	95	101	3540	3050	151	104.3	100.2			
	-20	103.0	87	89	95	101	3830	3300	151	103.3	101.9			
	-10	102.7	88	90	95	101	4160	3580	151	101.3	101.2			
	0	101.3	89	91	96	101	4600	3970	151	99.2	98.9			
14400	-30	103.0	87	88	94	100	3490	3000	151	104.3	100.2	105	3430	2980
	-20	103.0	87	89	95	100	3770	3250	151	103.3	101.9	105	3550	2980
	-10	102.7	88	89	95	100	4090	3530	151	101.3	101.2	105	3680	3080
	0	101.3	89	90	96	100	4530	3910	151	99.2	98.9	105	3820	3190
13500	-30	103.0	83	84	91	97	3060	2840	149	104.3	100.2	102	3190	2700
	-20	103.0	83	85	91	97	3300	2840	149	103.4	101.9	102	3290	2790
	-10	102.7	84	86	91	97	3570	3080	149	101.3	101.2	102	3400	2870
	0	101.3	85	87	92	97	3940	3400	149	99.2	98.9	102	3510	2960
	10	99.4	87	88	93	97	4390	3790	149	97.2	96.5	102	3620	3060
12500	-30	103.0	78	79	87	94	2640	2280	147	104.3	100.2	98	2960	2530
	-20	103.0	79	80	87	94	2830	2450	147	103.4	101.9	98	3050	2590
	-10	102.7	80	81	87	94	3050	2650	147	101.3	101.2	98	3130	2670
	0	101.3	81	82	88	94	3360	2910	147	99.3	98.9	98	3220	2740
	10	99.4	82	84	88	94	3730	3220	147	97.2	96.5	98	3310	2820
	20	97.4	84	85	89	94	4200	3620	147	95.1	94.2	98	3410	2900
11500	-30	103.0	76	76	84	92	2520	2110	146	104.2	100.2	94	2760	2420
	-20	103.0	75	75	84	91	2530	2140	146	103.4	101.9	94	2830	2470
	-10	102.7	74	75	83	90	2620	2260	146	101.3	101.2	94	2910	2520
	0	101.3	76	77	84	90	2870	2480	146	99.3	98.9	94	2980	2570
	10	99.4	78	78	84	90	3160	2740	146	97.2	96.5	94	3050	2620
	20	97.4	79	80	85	90	3530	3070	146	95.1	94.2	94	3130	2680
	30	95.4	81	82	85	90	4030	3490	146	92.9	91.8	94	3210	2740
10500	-30	103.0	77	77	82	90	2540	2130	144	104.2	100.2	90	2650	2310
	-20	103.0	75	75	81	89	2540	2130	144	103.4	101.9	90	2700	2350
	-10	102.7	73	73	81	89	2530	2120	144	101.3	101.2	90	2740	2400
	0	101.3	71	72	80	87	2490	2120	144	99.3	98.9	90	2790	2440
	10	99.4	72	73	80	87	2670	2300	144	97.2	96.5	90	2840	2490
	20	97.4	74	75	80	87	2980	2570	144	95.1	94.2	90	2890	2540
	30	95.4	76	77	81	87	3380	2930	144	92.9	91.8	90	2950	2580
	40	93.4	78	79	82	87	3850	3340	144	90.6	89.5	90	3020	2630
9500	-30	103.0	77	77	80	90	2590	2190	143	104.2	100.2	86	2540	2200
	-20	103.0	76	76	79	88	2580	2180	143	103.4	101.9	86	2580	2240
	-10	102.7	74	74	78	87	2560	2150	143	101.3	101.2	86	2620	2280
	0	101.3	71	71	77	85	2500	2090	143	99.3	98.9	86	2660	2320
	10	99.4	69	69	76	84	2430	2030	143	97.2	96.5	86	2700	2360
	20	97.4	68	68	75	83	2470	2120	143	95.1	94.2	86	2740	2400
	30	95.4	70	71	76	83	2800	2410	143	93.0	91.8	86	2790	2440
	40	93.4	72	73	77	83	3190	2760	143	90.6	89.5	86	2830	2480

Figure 7-17 (Sheet 8 of 8)

Airplanes -0001 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0001 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 7000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	103.0	93	94	97	103	3620	3150	152	104.3	100.2			
	-20	103.0	93	94	97	103	3900	3400	152	103.3	101.9			
	-10	102.7	94	95	98	103	4220	3680	152	101.3	101.2			
14500	-30	103.0	90	91	95	101	3350	2900	151	104.3	100.2			
	-20	103.0	91	92	95	101	3600	3130	151	103.3	101.9			
	-10	102.7	92	93	95	101	3890	3390	151	101.3	101.2			
	0	101.3	93	94	96	101	4280	3740	151	99.2	98.9			
14400	-30	103.0	90	91	94	100	3300	2860	151	104.3	100.2	105	2810	2450
	-20	103.0	91	92	95	100	3550	3090	151	103.3	101.9	105	2880	2510
	-10	102.7	91	92	95	100	3840	3340	151	101.3	101.2	105	2950	2580
	0	101.3	92	93	96	100	4220	3680	151	99.2	98.9	105	3020	2640
13500	-30	103.0	86	87	91	97	2920	2520	149	104.3	100.2	102	2680	2340
	-20	103.0	87	88	91	97	3130	2720	149	103.4	101.9	102	2750	2400
	-10	102.7	87	88	91	97	3380	2940	149	101.3	101.2	102	2810	2460
	0	101.3	88	89	92	97	3720	3240	149	99.2	98.9	102	2880	2520
	10	99.4	90	90	93	97	4110	3580	149	97.2	96.5	102	2940	2580
12500	-30	103.0	81	82	87	94	2520	2170	147	104.3	100.2	98	2560	2230
	-20	103.0	82	83	87	94	2700	2330	147	103.4	101.9	98	2610	2280
	-10	102.7	83	84	87	94	2920	2520	147	101.3	101.2	98	2670	2330
	0	101.3	84	85	88	94	3200	2780	147	99.3	98.9	98	2730	2380
	10	99.4	85	86	88	94	3540	3070	147	97.2	96.5	98	2780	2440
	20	97.4	87	87	89	94	3960	3450	147	95.1	94.2	98	2840	2490
11500	-30	103.0	77	79	84	92	2240	1920	146	104.2	100.2	94	2440	2120
	-20	103.0	77	79	84	91	2360	2030	146	103.4	101.9	94	2490	2170
	-10	102.7	78	79	83	90	2490	2150	146	101.3	101.2	94	2540	2210
	0	101.3	79	80	84	90	2730	2360	146	99.3	98.9	94	2580	2260
	10	99.4	80	81	84	90	3010	2610	146	97.2	96.5	94	2630	2310
	20	97.4	82	83	85	90	3370	2930	146	95.1	94.2	94	2690	2350
	30	95.4	83	84	85	90	3830	3330	146	92.9	91.8	94	2740	2400
10500	-30	103.0	77	77	82	90	2150	1790	144	104.2	100.2	90	2320	2020
	-20	103.0	75	75	81	89	2160	1800	144	103.4	101 9	90	2370	2060
	-10	102.7	74	75	81	89	2190	1880	144	101.3	101.2	90	2410	2100
	0	101.3	74	75	80	87	2340	2010	144	99.3	98 9	90	2450	2140
	10	99.4	75	76	80	87	2530	2180	144	97.2	96.5	90	2500	2180
	20	97.4	77	78	80	87	2830	2440	144	95.1	94 2	90	2540	2220
	30	95.4	78	79	81	87	3220	2780	144	92.9	91.8	90	2580	2260
	40	93.4	80	81	82	87	3670	3180	144	90.6	89.5	90	2630	2310
9500	-30	103.0	77	77	80	90	2160	1810	143	104.2	100.2	86	2220	1920
	-20	103.0	76	76	79	88	2160	1810	143	103.4	101.9	86	2250	1960
	-10	102.7	74	74	78	87	2150	1800	143	101.3	101.2	86	2290	1990
	0	101.3	71	71	77	85	2110	1760	143	99.3	98.9	86	2330	2030
	10	99.4	71	71	76	84	2170	1860	143	97.2	96.5	86	2360	2060
	20	97.4	71	72	75	83	2340	2000	143	95 1	94.2	86	2400	2100
	30	95.4	73	74	76	83	2660	2280	143	93.0	91.8	86	2440	2140
	40	93.4	75	76	77	83	3030	2610	143	90.6	89.5	86	2480	2170

Figure 7-17 (Sheet 8 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 5000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	101.9	89	90	97	103	3410	2930	154	100.7	98.7			
	-20	103.0	89	90	97	103	3600	3090	154	102.5	100.4			
	-10	102.7	89	91	97	103	3890	3350	154	101.3	101.3			
	0	101.3	90	92	98	103	4250	3690	154	99.2	98.9			
14500	-30	101.9	86	88	94	101	3140	2690	153	100.7	98.7			
	-20	103.0	86	88	94	101	3310	2840	153	102.5	100.4			
	-10	102.7	87	89	95	101	3570	3070	153	101.3	101.3			
	0	101.3	88	90	95	101	3930	3380	153	99.2	98.9			
	10	99.4	89	91	96	101	4380	3770	153	97.2	96.6			
14400	-30	101.9	86	87	94	100	3090	2660	153	100.7	98.7	105	3210	2700
	-20	103.0	86	88	94	100	3260	2800	153	102.5	100.4	105	3310	2790
	-10	102.7	87	88	94	100	3510	3020	153	101.3	101.3	105	3420	2880
	0	101.3	88	89	95	100	3870	3330	153	99.2	98.9	105	3540	2970
	10	99.4	89	90	95	100	4310	3710	153	97.2	96.6	105	3660	3070
13500	-30	101.9	82	83	90	97	2720	2350	151	100.7	98.7	102	3010	2550
	-20	103.0	82	83	91	97	2860	2470	151	102.5	100.4	102	3090	2620
	-10	102.7	83	84	91	97	3080	2660	151	101.3	101.3	102	3190	2700
	0	101.3	84	85	91	97	3380	2910	151	99.3	98.9	102	3280	2780
	10	99.4	85	87	92	97	3750	3230	151	97.2	96.6	102	3380	2860
	20	97.4	87	88	93	97	4220	3640	151	95.1	94.2	102	3480	2940
12500	-30	101.9	78	78	87	95	2460	2070	149	100.7	98.7	98	2810	2420
	-20	103.0	77	78	87	95	2520	2170	149	102.4	100.4	98	2880	2470
	-10	102.7	78	79	87	94	2660	2290	149	101.3	101.3	98	2960	2520
	0	101.3	79	80	87	94	2900	2510	149	99.3	98.9	98	3040	2590
	10	99.4	81	82	88	94	3210	2780	149	97.2	96.6	98	3120	2650
	20	97.4	83	84	88	94	3590	3100	149	95.1	94.2	98	3200	2720
	30	95.4	85	86	89	94	4110	3540	149	92.9	91.9	98	3280	2790
11500	-30	101.9	78	78	85	93	2470	2060	148	100.7	98.7	94	2660	2320
	-20	103.0	78	78	85	93	2520	2110	148	102.4	100.4	94	2710	2370
	-10	102.7	76	76	84	92	2520	2110	148	101.3	101.3	94	2760	2410
	0	101.3	74	75	83	91	2510	2160	148	99.3	98.9	94	2830	2460
	10	99.4	75	76	83	90	2740	2370	148	97.2	96.6	94	2890	2510
	20	97.4	78	79	84	90	3060	2640	148	95.1	94.2	94	2960	2550
	30	95.4	80	81	85	90	3470	3010	148	92.9	91.9	94	3030	2600
10500	-30	101.9	79	79	82	91	2500	2100	146	100.7	98.7	90	2560	2220
	-20	103.0	78	78	82	91	2550	2140	146	102.4	100.4	90	2600	2260
	-10	102.7	77	77	82	90	2540	2140	146	101.4	101.3	90	2640	2300
	0	101.3	74	74	81	89	2490	2090	146	99.3	98.9	90	2690	2350
	10	99.4	71	72	80	88	2430	2040	146	97.2	96.6	90	2730	2390
	20	97.4	72	73	80	87	2580	2220	146	95.1	94.2	90	2770	2430
	30	95.4	74	75	80	87	2930	2530	146	93.0	91.9	90	2820	2470
	40	93.4	77	77	81	87	3340	2890	146	90.6	89.5	90	2860	2510
9500	-30	101.9	80	80	83	92	2570	2160	145	100.7	98.7	86	2450	2120
	-20	103.0	79	79	82	92	2610	2210	145	102.4	100.4	86	2490	2160
	-10	102.7	77	77	80	89	2590	2190	145	101.4	101.3	86	2530	2190
	0	101.3	75	75	78	87	2530	2120	145	99.3	98.9	86	2570	2230
	10	99.4	72	72	77	86	2440	2040	145	97.2	96.6	86	2610	2270
	20	97.4	69	69	76	84	2350	1950	145	95.1	94.2	86	2650	2310
	30	95.4	68	69	76	83	2430	2080	145	93.0	91.9	86	2680	2340
	40	93.4	71	72	76	83	2770	2380	145	90.6	89.5	86	2720	2380

Figure 7-17 (Sheet 6 of 8)

Airplanes -0001 thru -0114 Except Airplanes
Incorporating SBS550-32-1 and Airplanes
-0001 thru -0160 Incorporating
SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 5000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	101.9	92	93	97	103	3220	2790	154	100.7	98.7			
	-20	103.0	92	93	97	103	3390	2940	154	102.5	100.4			
	-10	102.7	93	94	97	103	3650	3170	154	101.3	101.3			
	0	101.3	94	95	98	103	4000	3480	154	99.2	98.9			
14500	-30	101.9	89	91	94	101	2980	2580	153	100.7	98.7			
	-20	103.0	90	91	94	101	3130	2720	153	102.5	100.4			
	-10	102.7	90	91	95	101	3370	2920	153	101.3	101 3			
	0	101.3	91	92	95	101	3690	3210	153	99.2	98.9			
	10	99.4	93	94	96	101	4060	3560	153	97.2	96.6			
14400	-30	101.9	89	90	94	100	2950	2540	153	100.7	98.7	105	2680	2330
	-20	103.0	89	90	94	100	3090	2680	153	102.5	100.4	105	2740	2390
	-10	102.7	90	91	94	100	3320	2880	153	101.3	101.3	105	2810	2450
	0	101.3	91	92	95	100	3640	3160	153	99.2	98.9	105	2870	2510
	10	99.4	92	93	95	100	4030	3510	153	97.2	96.6	105	2940	2570
13500	-30	101.9	85	86	90	97	2600	2240	151	100.7	98.7	102	2570	2240
	-20	103.0	85	86	91	97	2730	2360	151	102.5	100.4	102	2630	2290
	-10	102.7	86	87	91	97	2930	2540	151	101.3	101.3	102	2680	2340
	0	101.3	87	88	91	97	3210	2790	151	99.3	98.9	102	2740	2400
	10	99.4	88	89	92	97	3550	3080	151	97.2	96.6	102	2800	2450
	20	97.4	90	91	93	97	3970	3460	151	95.1	94.2	102	2860	2500
12500	-30	101.9	81	82	87	95	2290	1970	149	100.7	98.7	98	2460	2140
	-20	103.0	81	82	87	95	2390	2060	149	102.4	100.4	98	2510	2180
	-10	102.7	81	82	87	94	2530	2180	149	101.3	101.3	98	2560	2230
	0	101.3	82	83	87	94	2770	2390	149	99.3	98.9	98	2610	2280
	10	99.4	84	85	88	94	3060	2650	149	97.2	96.6	98	2660	2320
	20	97.4	85	86	88	94	3420	2970	149	95.1	94.2	98	2710	2370
	30	95.4	87	88	89	94	3890	3380	149	92.9	91.9	98	2770	2420
11500	-30	101.9	78	78	85	93	2110	1750	148	100.7	98.7	94	2350	2040
	-20	103.0	78	78	85	93	2160	1830	148	102.4	100.4	94	2390	2080
	-10	102.7	77	78	84	92	2240	1930	148	101.3	101.3	94	2440	2120
	0	101.3	78	79	83	91	2390	2050	148	99.3	98.9	94	2480	2160
	10	99.4	79	80	83	90	2610	2250	148	97.2	96.6	94	2530	2210
	20	97.4	80	81	84	90	2910	2510	148	95.1	94.2	94	2570	2250
	30	95.4	82	83	85	90	3310	2870	148	92.9	91.9	94	2620	2290
10500	-30	101.9	79	79	82	91	2100	1750	146	100.7	98.7	90	2240	1950
	-20	103.0	78	78	82	91	2150	1790	146	102.4	100.4	90	2280	1980
	-10	102.7	77	77	82	90	2150	1790	146	101.4	101.3	90	2320	2020
	0	101.3	74	75	81	89	2120	1800	146	99.3	98.9	90	2360	2060
	10	99.4	74	75	80	88	2250	1930	146	97.2	96.6	90	2400	2090
	20	97.4	75	76	80	87	2450	2100	146	95.1	94.2	90	2440	2130
	30	95.4	77	78	80	87	2780	2400	146	93.0	91.9	90	2480	2170
	40	93.4	79	80	81	87	3180	2750	146	90.6	89.5	90	2520	2210
9500	-30	101.9	80	80	83	92	2130	1780	145	100.7	98.7	86	2150	1850
	-20	103.0	79	79	82	92	2170	1820	145	102.4	100.4	86	2180	1890
	-10	102.7	77	77	80	89	2160	1810	145	101.4	101.3	86	2210	1920
	0	101.3	75	75	78	87	2120	1770	145	99.3	98.9	86	2250	1950
	10	99.4	72	72	77	86	2060	1710	145	97.2	96.6	86	2280	1990
	20	97.4	71	72	76	84	2100	1790	145	95.1	94.2	86	2320	2020
	30	95.4	72	72	76	83	2300	1970	145	93.0	91.9	86	2350	2050
	40	93.4	74	74	76	83	2630	2260	145	90.6	89.5	86	2390	2080

Figure 7-17 (Sheet 6 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° — **PRESSURE ALTITUDE 3000 FEET**

LANDING - FLAPS LAND — **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	98.5	89	91	97	103	3160	2700	155	97.3	95.4			
	-20	100.1	89	90	97	103	3270	2800	155	98.9	97.0			
	-10	101.8	88	90	97	103	3420	2930	155	100.5	98.6			
	0	101.3	89	91	97	103	3560	3150	155	99.3	99.0			
	10	99.4	90	92	97	103	4080	3510	155	97.2	96.6			
14500	-30	98.5	87	88	94	101	2910	2500	154	97.3	95.4			
	-20	100.1	86	88	94	101	3010	2590	154	98.9	97.0			
	-10	101.8	86	88	94	101	3140	2700	154	100.5	98.6			
	0	101.3	87	88	95	101	3370	2890	154	99.3	99.0			
	10	99.4	88	90	95	101	3740	3220	154	97.2	96.6			
	20	97.4	90	91	96	101	4210	3620	154	95.1	94.3			
14400	-30	98.5	86	87	94	100	2870	2470	154	97.3	95.4	105	3020	1550
	-20	100.1	86	87	94	100	2970	2560	154	98.9	97.0	105	3110	2630
	-10	101.8	86	87	94	100	3100	2660	154	100.5	98.6	105	3210	2700
	0	101.3	86	88	94	100	3320	2850	154	99.3	99.0	105	3310	2780
	10	99.4	88	89	95	100	3690	3170	154	97.2	96.6	105	3410	2870
	20	97.4	89	91	95	100	4150	3570	154	95.1	94.3	105	3510	2950
13500	-30	98.5	82	83	90	97	2540	2180	153	97.3	95.4	105	2850	2420
	-20	100.1	81	82	90	97	2620	2260	153	98.9	97.0	105	2930	2480
	-10	101.8	82	83	90	97	2730	2360	153	100.5	98.6	102	3010	2550
	0	101.3	82	83	91	97	2910	2520	153	99.3	99.0	102	3090	2620
	10	99.4	84	85	91	97	3230	2780	153	97.2	96.6	102	3170	2690
	20	97.4	86	87	92	97	3620	3110	153	95.1	94.3	102	3260	2760
	30	95.4	88	89	93	97	4170	3580	153	92.9	91.9	102	3350	2830
12500	-30	98.5	78	78	87	95	2320	1930	151	97.3	95.4	98	2680	2330
	-20	100.1	78	78	87	95	2410	2000	151	98.9	97.0	98	2740	2370
	-10	101.8	78	78	87	95	2470	2080	151	100.5	98.6	98	2810	2420
	0	101.3	77	78	87	94	2540	2180	151	99.3	99.0	98	2880	2470
	10	99.4	79	80	87	94	2780	2400	151	97.2	96.6	98	2950	2510
	20	97.4	81	82	88	94	3100	2680	151	95.1	94.3	98	3020	2570
	30	95.4	83	84	89	94	3550	3060	151	93.0	91.9	98	3090	2630
11500	-30	98.5	79	79	85	93	2340	1940	150	97.2	95.4	94	2570	2230
	-20	100.1	79	79	85	93	2420	2020	150	98.9	97.0	94	2620	2280
	-10	101.8	78	78	85	93	2480	2080	150	100.5	98.6	94	2660	2320
	0	101.3	77	77	84	92	2490	2090	150	99.3	99.0	94	2700	2360
	10	99.4	74	75	83	91	2430	2080	150	97.2	96.6	94	2750	2410
	20	97.4	76	77	83	90	2650	2280	150	95.1	94.3	94	2810	2450
	30	95.4	78	79	84	90	3020	2610	150	93.0	91.9	94	2870	2490
	40	93.4	81	81	85	90	3440	2980	150	90.6	89.6	94	2930	2530
10500	-30	98.5	79	79	82	91	2370	1980	148	97.2	95.4	90	2480	2140
	-20	100.1	79	79	82	91	2450	2050	148	98.9	97.0	90	2520	2180
	-10	101.8	79	79	82	91	2520	2110	148	100.5	98.6	90	2560	2220
	0	101.3	78	78	82	91	2520	2110	148	99.3	99.0	90	2590	2260
	10	99.4	75	75	81	89	2440	2040	148	97.2	96.6	90	2630	2300
	20	97.4	71	72	80	87	2350	1960	148	95.1	94.3	90	2670	2330
	30	95.4	72	73	80	87	2550	2190	148	93.0	91.9	90	2710	2370
	40	93.4	75	76	81	87	2910	2500	148	90.6	89.6	90	2750	2410
9500	-30	98.5	80	80	83	93	2440	2040	147	97.2	95.4	86	2380	2040
	-20	100.1	80	80	83	93	2520	2120	147	98.9	97.0	86	2410	2080
	-10	101.8	80	80	83	93	2590	2180	147	100.5	98.6	86	2450	2110
	0	101.3	78	78	81	91	2580	2170	147	99.3	99.0	86	2480	2150
	10	99.4	75	75	78	87	2480	2080	147	97.3	96.6	86	2520	2180
	20	97.4	72	72	77	85	2360	1970	147	95.1	94.3	86	2560	2220
	30	95.4	68	68	76	83	2220	1850	147	93.0	91.9	86	2590	2250
	40	93.4	69	70	76	83	2420	2060	147	90.6	89.6	86	2630	2290

Figure 7-17 (Sheet 4 of 8)

Airplanes -0001 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0001 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

PRESSURE ALTITUDE 3000 FEET

LANDING - FLAPS LAND

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 — KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	98.5	92	93	97	103	3000	2590	155	97.3	95.4			
	-20	100.1	92	93	97	103	3100	2680	155	98.9	97.0			
	-10	101.8	92	93	97	103	3230	2800	155	100.5	98.6			
	0	101.3	93	94	97	103	3450	2990	155	99.3	99.0			
	10	99.4	94	95	97	103	3820	3320	155	97.2	96.6			
14500	-30	98.5	90	91	94	101	2780	2390	154	97.3	95.4			
	-20	100.1	89	91	94	101	2870	2470	154	98.9	97.0			
	-10	101.8	89	91	94	101	2990	2580	154	100.5	98.6			
	0	101.3	90	91	95	101	3190	2760	154	99.3	99.0			
	10	99.4	91	92	95	101	3530	3060	154	97.2	96.6			
	20	97.4	93	94	96	101	3950	3430	154	95.1	94.3			
14400	-30	98.5	89	90	94	100	2740	2350	154	97.3	95.4	105	2570	2230
	-20	100.1	89	90	94	100	2830	2440	154	98.9	97.0	105	2620	2280
	-10	101.8	89	90	94	100	2950	2550	154	100.5	98.6	105	2680	2330
	0	101.3	90	91	94	100	3150	2730	154	99.3	99.0	105	2740	2390
	10	99.4	91	92	95	100	3480	3020	154	97.2	96.6	105	2800	2440
	20	97.4	93	93	95	100	3890	3380	154	95.1	94.3	105	2860	2500
13500	-30	98.5	85	86	90	97	2420	2070	153	97.3	95.4	102	2470	2140
	-20	100.1	85	86	90	97	2500	2150	153	98.9	97.0	102	2520	2190
	-10	101.8	85	86	90	97	2600	2240	153	100.5	98.6	102	2570	2240
	0	101.3	85	87	91	97	2780	2400	153	99.3	99.0	102	2620	2290
	10	99.4	87	88	91	97	3070	2660	153	97.2	96.6	102	2680	2340
	20	97.4	89	89	92	97	3430	2980	153	95.1	94.3	102	2730	2380
	30	95.4	90	91	93	97	3930	3410	153	92.9	91.9	102	2790	2430
12500	-30	98.5	81	82	87	95	2140	1830	151	97.3	95.4	98	2360	2050
	-20	100.1	81	82	87	95	2220	1900	151	98.9	97.0	98	2410	2090
	-10	101.8	81	82	87	95	2300	1970	151	100.5	98.6	98	2460	2140
	0	101.3	81	82	87	94	2410	2070	151	99.3	99.0	98	2500	2180
	10	99.4	82	83	87	94	2650	2280	151	97.2	96.6	98	2550	2220
	20	97.4	84	85	88	94	2960	2550	151	95.1	94.3	98	2600	2270
	30	95.4	86	87	89	94	3380	2930	151	93.0	91.9	98	2640	2310
11500	-30	98.5	79	79	85	93	1980	1640	150	97.2	95.4	94	2270	1960
	-20	100.1	79	79	85	93	2060	1700	150	98.9	97.0	94	2310	2000
	-10	101.8	78	78	85	93	2120	1760	150	100.5	98.6	94	2350	2040
	0	101.3	77	78	84	92	2150	1840	150	99.3	99.0	94	2390	2080
	10	99.4	78	79	83	91	2300	1970	150	97.2	96.6	94	2430	2120
	20	97.4	79	80	83	90	2520	2170	150	95.1	94.3	94	2470	2160
	30	95.4	81	82	84	90	2880	2480	150	93.0	91.9	94	2510	2190
	40	93.4	83	84	85	90	3290	2830	150	90.6	89.6	94	2550	2230
10500	-30	98.5	79	79	82	91	1990	1650	148	97.2	95.4	90	2170	1880
	-20	100.1	79	79	82	91	2060	1710	148	98.9	97.0	90	2210	1910
	-10	101.8	79	79	82	91	2120	1760	148	100.5	98.6	90	2240	1950
	0	101.3	78	78	82	91	2120	1770	148	99.3	99.0	90	2280	1980
	10	99.4	75	75	81	89	2070	1730	148	97.2	96.6	90	2320	2010
	20	97.4	74	75	80	87	2170	1860	148	95.1	94.3	90	2350	2050
	30	95.4	76	77	80	87	2420	2070	148	93.0	91.9	90	2390	2080
	40	93.4	78	79	81	87	2760	2370	148	90.6	89.6	90	2420	2120
9500	-30	98.5	80	80	83	93	2010	1680	147	97.2	95.4	86	2080	1800
	-20	100.1	80	80	83	93	2080	1740	147	98.9	97.0	86	2110	1820
	-10	101.8	80	80	83	93	2140	1790	147	100.5	98.6	86	2140	1850
	0	101.3	78	78	81	91	2140	1790	147	99.3	99.0	86	2180	1880
	10	99.4	75	75	78	87	2070	1730	147	97.3	96.6	86	2210	1910
	20	97.4	72	72	77	85	1990	1650	147	95.1	94.3	86	2240	1940
	30	95.4	71	72	76	83	2050	1750	147	93.0	91.9	86	2270	1970
	40	93.4	72	73	76	83	2280	1950	147	90.6	89.6	86	2300	2000

Figure 7-17 (Sheet 4 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 1000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	95.0	89	91	97	103	2950	2520	157	93.8	92.2			
	-20	96.5	89	91	97	103	3060	2620	157	95.3	93.7			
	-10	98.1	89	91	97	103	3160	2710	157	96.8	95.1			
	0	99.6	88	90	97	103	3270	2800	157	98.4	96.6			
	10	99.4	89	91	97	103	3520	3020	157	97.2	96.7			
	20	97.4	91	92	98	103	3960	3400	157	95.1	94.3			
14500	-30	95.0	87	88	94	101	2720	2340	156	93.8	92.2			
	-20	96.5	87	88	94	101	2820	2430	156	95.3	93.7			
	-10	98.1	86	88	94	101	2910	2500	156	96.8	95.1			
	0	99.6	86	88	94	101	3010	2590	156	98.4	96.6			
	10	99.4	87	88	95	101	3240	2780	156	97.2	96.7			
	20	97.4	88	90	95	101	3630	3120	156	95.1	94.3			
14400	-30	95.0	86	87	94	100	2690	2310	156	93.8	92.2	105	2860	2420
	-20	96.5	86	87	94	100	2780	2390	156	95.3	93.7	105	2940	2480
	-10	98.1	86	87	94	100	2870	2470	156	96.8	95.1	105	3020	2550
	0	99.6	86	87	94	100	2970	2550	156	98.4	96.6	105	3110	2620
	10	99.4	86	88	94	100	3190	2740	156	97.2	96.7	105	3200	2700
	20	97.4	88	90	95	100	3580	3070	156	95.1	94.3	105	3290	2770
	30	95.4	90	92	96	100	4110	3530	156	93.0	92.0	105	3380	2850
13500	-30	95.0	82	83	90	97	2390	2040	154	93.8	92.2	102	2710	2330
	-20	96.5	82	83	90	97	2470	2120	154	95.3	93.7	102	2780	2370
	-10	98.1	81	82	90	97	2540	2180	154	96.8	95.1	102	2850	2420
	0	99.6	81	82	90	97	2620	2260	154	98.3	96.6	102	2920	2480
	10	99.4	82	83	91	97	2800	2420	154	97.2	96.7	102	2990	2540
	20	97.4	84	86	91	97	3140	2700	154	95.1	94.3	102	3070	2600
	30	95.4	87	88	92	97	3590	3080	154	93.0	92.0	102	3150	2670
12500	-30	95.0	78	78	87	95	2190	1800	153	93.8	92.2	98	2580	2240
	-20	96.5	78	78	87	95	2260	1870	153	95.3	93.7	98	2620	2280
	-10	98.1	78	78	87	95	2340	1950	153	96.8	95.1	98	2680	2330
	0	99.6	78	78	87	95	2420	2010	153	98.3	96.6	98	2740	2370
	10	99.4	77	78	87	94	2450	2110	153	97.2	96.7	98	2800	2410
	20	97.4	79	80	87	94	2710	2330	153	95.1	94.3	98	2860	2460
	30	95.4	82	83	88	94	3080	2660	153	93.0	92.0	98	2930	2500
	40	93.4	84	85	89	94	3520	3030	153	90.6	89.6	98	2990	2550
11500	-30	95.0	79	79	85	93	2200	1820	151	93.7	92.2	94	2490	2150
	-20	96.5	79	79	85	93	2270	1890	151	95.3	93.7	94	2530	2190
	-10	98.1	79	79	85	93	2360	1960	151	96.8	95.1	94	2570	2230
	0	99.6	79	79	85	93	2430	2030	151	98.3	96.6	94	2610	2270
	10	99.4	77	77	84	93	2420	2020	151	97.3	96.7	94	2650	2310
	20	97.4	74	75	83	91	2350	2010	151	95.2	94.3	94	2690	2350
	30	95.4	76	77	84	90	2640	2260	151	93.0	92.0	94	2730	2390
	40	93.4	79	80	85	90	3000	2580	151	90.6	89.6	94	2790	2430
10500	-30	95.0	80	80	82	91	2230	1850	150	93.7	92.2	90	2400	2070
	-20	96.5	80	80	82	91	2310	1920	150	95.3	93.7	90	2440	2100
	-10	98.1	80	80	82	92	2390	2000	150	96.8	95.1	90	2470	2140
	0	99.6	80	80	82	92	2470	2070	150	98.3	96.6	90	2510	2170
	10	99.4	78	78	82	91	2450	2050	150	97.3	96.7	90	2550	2210
	20	97.4	74	74	81	89	2350	1950	150	95.2	94.3	90	2580	2250
	30	95.4	71	72	80	87	2250	1920	150	93.0	92.0	90	2620	2280
	40	93.4	73	74	80	87	2540	2170	150	90.6	89.6	90	2660	2320
9500	-30	95.0	80	80	83	93	2300	1920	149	93.7	92.2	86	2310	1980
	-20	96.5	80	80	83	93	2380	1990	149	95.3	93.7	86	2340	2010
	-10	98.1	80	80	83	93	2450	2070	149	96.8	95.1	86	2380	2040
	0	99.6	80	80	83	93	2540	2140	149	98.3	96.6	86	2410	2070
	10	99.4	79	79	81	91	2510	2110	149	97.3	96.7	86	2440	2110
	20	97.4	75	75	78	87	2380	1990	149	95.2	94.3	86	2470	2140
	30	95.4	71	71	77	85	2230	1850	149	93.0	92.0	86	2500	2170
	40	93.4	67	68	76	83	2130	1810	149	90.7	89.6	86	2540	2200

Figure 7-17 (Sheet 2 of 8)

Airplanes -0001 thru -0114 Except Airplanes
Incorporating SBS550-32-1 and Airplanes
-0001 thru -0160 Incorporating
SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 20° — **PRESSURE ALTITUDE 1000 FEET**

LANDING - FLAPS LAND — **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	95.0	93	94	97	103	2810	2410	157	93.8	92.2			
	-20	96.5	92	93	97	103	2910	2510	157	95.3	93.7			
	-10	98.1	92	93	97	103	3000	2590	157	96.8	95.1			
	0	99.6	92	93	97	103	3100	2680	157	98 4	96.6			
	10	99.4	93	94	97	103	3320	2880	157	97.2	96.7			
	20	97.4	94	95	98	103	3710	3220	157	95.1	94.3			
14500	-30	95.0	90	91	94	101	2600	2230	156	93.8	92.2			
	-20	96.5	90	91	94	101	2700	2310	156	95 3	93.7			
	-10	98.1	90	91	94	101	2780	2390	156	96 8	95.1			
	0	99.6	89	90	94	101	2870	2470	156	98.4	96.6			
	10	99.4	90	91	95	101	3070	2660	156	97.2	96.7			
	20	97.4	92	93	95	101	3430	2970	156	95.1	94.3			
14400	-30	95.0	90	91	94	100	2570	2200	156	93.8	92.2	105	2460	2140
	-20	96.5	89	90	94	100	2660	2280	156	95.3	93.7	105	2520	2180
	-10	98.1	89	90	94	100	2740	2360	156	96.8	95.1	105	2570	2230
	0	99.6	89	90	94	100	2830	2440	156	98.4	96.6	105	2620	2280
	10	99.4	90	91	94	100	3030	2620	156	97.2	96.7	105	2670	2330
	20	97.4	91	92	95	100	3390	2930	156	95.1	94.3	105	2730	2380
	30	95.4	93	94	96	100	3850	3350	156	93.0	92.0	105	2780	2430
13500	-30	95.0	85	86	90	97	2270	1940	154	93.8	92.2	102	2380	2060
	-20	96.5	85	86	90	97	2350	2010	154	95.3	93.7	102	2420	2100
	-10	98.1	85	86	90	97	2420	2080	154	96.8	95.1	102	2470	2150
	0	99.6	85	86	90	97	2500	2150	154	98.3	96.6	102	2520	2190
	10	99.4	86	87	91	97	2680	2310	154	97.2	96.7	102	2560	2230
	20	97.4	87	88	91	97	2990	2580	154	95.1	94.3	102	2610	2280
	30	95.4	89	90	92	97	3400	2950	154	93.0	92.0	102	2660	2320
12500	-30	95.0	81	82	87	95	2010	1710	153	93.8	92.2	98	2280	1980
	-20	96.5	81	82	87	95	2080	1770	153	95.3	93.7	98	2320	2020
	-10	98.1	81	82	87	95	2150	1830	153	96.8	95.1	98	2370	2050
	0	99.6	81	82	87	95	2220	1900	153	98 3	96.6	98	2410	2090
	10	99.4	81	82	87	94	2330	2000	153	97.2	96.7	98	2450	2130
	20	97.4	83	84	87	94	2580	2220	153	95.1	94.3	98	2490	2170
	30	95.4	85	86	88	94	2940	2530	153	93.0	92.0	98	2540	2210
	40	93.4	87	87	89	94	3360	2900	153	90.6	89 6	98	2580	2250
11500	-30	95.0	79	79	85	93	1860	1530	151	93.7	92.2	94	2190	1900
	-20	96.5	79	79	85	93	1930	1590	151	95.3	93.7	94	2230	1930
	-10	98.1	79	79	85	93	2000	1650	151	96.8	95.1	94	2270	1970
	0	99.6	79	79	85	93	2070	1710	151	98.3	96.6	94	2300	2000
	10	99.4	77	79	84	93	2080	1780	151	97.3	96.7	94	2340	2040
	20	97.4	78	79	83	91	2230	1910	151	95.2	94.3	94	2380	2070
	30	95.4	80	81	84	90	2510	2150	151	93.0	92.0	94	2420	2110
	40	93.4	82	83	85	90	2860	2460	151	90.6	89.6	94	2460	2140
10500	-30	95.0	80	80	82	91	1870	1540	150	93.7	92.2	90	2110	1820
	-20	96.5	80	80	82	91	1930	1600	150	95.3	93.7	90	2140	1850
	-10	98 1	80	80	82	92	2000	1660	150	96.8	95.1	90	2170	1880
	0	99.6	80	80	82	92	2070	1720	150	98.3	96.6	90	2200	1910
	10	99.4	78	78	82	91	2050	1710	150	97.3	96.7	90	2240	1940
	20	97.4	74	75	81	89	1990	1680	150	95.2	94.3	90	2270	1970
	30	95.4	75	76	80	87	2130	1810	150	93.0	92.0	90	2300	2000
	40	93.4	77	78	80	87	2410	2060	150	90.6	89.6	90	2340	2040
9500	-30	95.0	80	80	83	93	1890	1580	149	93.7	92.2	86	2030	1740
	-20	96.5	80	80	83	93	1960	1640	149	95.3	93.7	86	2050	1770
	-10	98.1	80	80	83	93	2030	1700	149	96 8	95.1	86	2080	1800
	0	99.6	80	80	83	93	2100	1760	149	98.3	96.6	86	2110	1820
	10	99.4	79	79	81	91	2080	1740	149	97.3	96.7	86	2140	1850
	20	97 4	75	75	78	87	1990	1650	149	95.2	94.3	86	2170	1880
	30	95 4	71	71	77	85	1880	1580	149	93.0	92.0	86	2200	1910
	40	93.4	71	72	76	83	2010	1710	149	90.7	89.6	86	2220	1930

Figure 7-17 (Sheet 2 of 8)

Airplanes -0115 thru -0160 Except Airplanes
Incorporating SBS550-32-7 and Airplanes
-0001 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 7000 FEET

ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 — KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	102.8	94	96	102	108	5060	4370	152	101.7	100.2			
	-20	101.2	94	96	102	108	5480	4730	152	99.8	99.9			
	-10	99.3	95	97	103	108	5960	5150	152	97.5	97.8			
	0	97.1	96	98	103	108	6610	5710	152	95.2	95.5			
	10	94.7	97	99	104	108	7450	6370	152	92.8	93.0			
14500	-30	102.8	92	94	100	106	4640	4010	151	101.7	100.2			
	-20	101.2	92	94	100	106	5030	4330	151	99.8	99.9			
	-10	99.3	93	95	100	106	5450	4720	151	97.5	97.8			
	0	97.1	94	96	101	106	6020	5220	151	95.2	95.5			
	10	94.7	95	97	101	106	6720	5810	151	92.8	93.0			
14400	-30	102.8	91	93	99	105	4580	3950	151	101.7	100.2	105	3430	2880
	-20	101.2	92	94	100	105	4940	4270	151	99.8	99.9	105	3550	2980
	-10	99.3	92	94	100	105	5380	4640	151	97.5	97.8	105	3680	3080
	0	97.1	93	95	101	105	5940	5140	151	95.2	95.5	105	3820	3190
	10	94.7	95	96	101	105	6610	5720	151	92.8	93.0	105	3960	3310
13500	-30	102.8	88	89	96	102	4010	3460	149	101.7	100.2	102	3190	2700
	-20	101.2	88	90	96	102	4320	3730	149	99.8	99.9	102	3290	2790
	-10	99.3	89	91	96	102	4680	4040	149	97.5	97.8	102	3400	2870
	0	97.1	90	92	97	102	5160	4460	149	95.2	95.5	102	3510	2960
	10	94.7	91	93	97	102	5740	4970	149	92.8	93.0	102	3620	3060
12500	-30	102.8	83	84	91	99	3440	2990	147	101.7	100.2	98	2960	2530
	-20	101.2	84	85	92	99	3700	3200	147	99.8	99.9	98	3050	2590
	-10	99.3	85	86	92	99	4000	3460	147	97.6	97.8	98	3130	2670
	0	97.1	86	87	93	99	4400	3800	147	95.2	95.5	98	3220	2740
	10	94.7	87	88	93	99	4870	4210	147	92.8	93.0	98	3310	2820
11500	-30	102.8	79	80	88	96	3070	2660	146	101.7	100.2	94	2760	2420
	-20	101.2	79	80	88	96	3240	2810	146	99.8	99.9	94	2830	2470
	-10	99.3	79	80	87	95	3410	2960	146	97.6	97.8	94	2910	2520
	0	97.1	81	82	88	95	3730	3240	146	95.2	95.5	94	2980	2570
	10	94.7	82	83	89	95	4100	3580	146	92.9	93.0	94	3050	2620
10500	-30	102.8	77	77	86	95	2900	2440	144	101.7	100.2	90	2650	2310
	-20	101.2	75	76	85	94	2920	2480	144	99.8	99.9	90	2700	2350
	-10	99.3	75	76	85	93	3020	2620	144	97.6	97.8	90	2740	2400
	0	97.1	75	76	84	91	3220	2780	144	95.2	95.5	90	2790	2440
	10	94.7	77	78	84	91	3480	3010	144	92.9	93.0	90	2840	2490
9500	-30	102.8	78	78	84	94	2930	2460	143	101.7	100.2	86	2540	2200
	-20	101.2	76	76	82	92	2930	2450	143	99.8	99.9	86	2580	2240
	-10	99.3	74	74	82	91	2930	2450	143	97.6	97.8	86	2620	2280
	0	97.1	72	72	81	89	2870	2420	143	95.3	95.5	86	2660	2320
	10	94.7	71	72	80	88	3000	2580	143	92.9	93.0	86	2700	2360

Figure 7-16 (Sheet 8 of 8)

Airplanes -0057 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0057 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE 7000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	102.8	98	99	102	108	4700	4100	152	101.7	100.2			
	-20	101.2	99 100	102	108	5060	4430	152	99.8	99.9				
	-10	99.3	99 100	103	108	5470	4790	152	97.5	97.8				
	0	97.1	98 101	103	108	6350	5280	152	95.2	95.5				
	10	94.7	96 102	104	108	7540	5860	152	92.8	93.0				
14500	-30	102.8	96	97	100	106	4340	3790	151	101.7	100.2			
	-20	101.2	96	97	100	106	4680	4080	151	99.8	99.9			
	-10	99.3	97	98	100	106	5050	4420	151	97.5	97.8			
	0	97.1	98	99	101	106	5540	4870	151	95.2	95.5			
	10	94.7	98 100	101	106	6260	5390	151	92.8	93.0				
14400	-30	102.8	95	96	99	105	4300	3730	151	101.7	100.2	105	2810	2450
	-20	101.2	96	97	100	105	4610	4020	151	99.8	99.9	105	2880	2510
	-10	99.3	97	98	100	105	4980	4360	151	97.5	97.8	105	2950	2580
	0	97.1	98	98	101	105	5470	4800	151	95.2	95.5	105	3020	2640
	10	94.7	98	99	101	105	6070	5320	151	92.8	93.0	105	3100	2710
13500	-30	102.8	91	92	96	102	3790	3300	149	101.7	100.2	102	2680	2340
	-20	101.2	92	93	96	102	4070	3550	149	99.8	99.9	102	2750	2400
	-10	99.3	93	94	96	102	4390	3830	149	97.5	97.8	102	2810	2460
	0	97.1	94	95	97	102	4820	4210	149	95.2	95.5	102	2880	2520
	10	94.7	95	96	97	102	5330	4670	149	92.8	93.0	102	2940	2580
12500	-30	102.8	86	87	91	99	3280	2830	147	101.7	100.2	98	2560	2230
	-20	101.2	87	88	92	99	3520	3050	147	99.8	99.9	98	2610	2280
	-10	99.3	88	89	92	99	3790	3300	147	97.6	97.8	98	2670	2330
	0	97.1	89	90	93	99	4150	3620	147	95.2	95.5	98	2730	2380
	10	94.7	90	91	93	99	4580	4010	147	92.8	93.0	98	2780	2440
11500	-30	102.8	82	84	88	96	2920	2510	146	101.7	100.2	94	2440	2120
	-20	101.2	82	84	88	96	3070	2650	146	99.8	99.9	94	2490	2170
	-10	99.3	83	84	87	95	3240	2810	146	97.6	97.8	94	2540	2210
	0	97.1	84	85	88	95	3550	3070	146	95.2	95.5	94	2580	2260
	10	94.7	85	86	89	95	3910	3400	146	92.9	93.0	94	2630	2310
10500	-30	102.8	79	80	86	95	2570	2220	144	101.7	100.2	90	2320	2020
	-20	101.2	79	80	85	94	2710	2340	144	99.8	99.9	90	2370	2060
	-10	99.3	79	80	85	93	2860	2470	144	97.6	97.8	90	2410	2100
	0	97.1	79	80	84	91	3040	2630	144	95.2	95.5	90	2450	2140
	10	94.7	80	81	84	91	3290	2840	144	92.9	93.0	90	2500	2180
9500	-30	102.8	78	78	84	94	2450	2040	143	101.7	100.2	86	2220	1920
	-20	101.2	76	76	82	92	2460	2050	143	99.8	99.9	86	2250	1960
	-10	99.3	75	76	82	91	2500	2150	143	97.6	97.8	86	2290	1990
	0	97.1	75	76	81	89	2650	2280	143	95.3	95.5	86	2330	2030
	10	94.7	75	76	80	88	2820	2440	143	92.9	93.0	86	2360	2060

Figure 7-16 (Sheet 8 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE 5000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 - KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	101.9	93	95	102	108	4480	3850	154	100.7	98.7			
	-20	101.2	93	95	102	108	4730	4070	154	99.8	100.0			
	-10	99.3	94	96	102	108	5100	4400	154	97.5	97.8			
	0	97.1	95	97	103	108	5630	4860	154	95.2	95.5			
	10	94.7	96	98	103	108	6260	5410	154	92.8	93.1			
14500	-30	101.9	91	93	99	106	4120	3540	153	100.7	98.7			
	-20	101.2	91	93	99	106	4340	3730	153	99.8	100.0			
	-10	99.3	92	94	100	106	4680	4030	153	97.6	97.8			
	0	97.1	93	95	100	106	5150	4440	153	95.2	95.5			
	10	94.7	94	96	101	106	5720	4940	153	92.8	93.1			
14400	-30	101.9	91	93	99	105	4060	3490	153	100.7	98.7	105	3210	2700
	-20	101.2	91	93	99	105	4270	3680	153	99.8	100.0	105	3310	2790
	-10	99.3	91	93	99	105	4610	3980	153	97.6	97.8	105	3420	2880
	0	97.1	92	94	100	105	5080	4380	153	95.2	95.5	105	3540	2970
	10	94.7	94	95	100	105	5640	4870	153	92.8	93.1	105	3660	3070
13500	-30	101.9	87	88	95	102	3560	3070	151	100.7	98.7	102	3010	2550
	-20	101.2	87	89	95	102	3740	3230	151	99.8	100.0	102	3090	2620
	-10	99.3	88	89	96	102	4030	3480	151	97.6	97.8	102	3190	2700
	0	97.1	89	90	96	102	4430	3830	151	95.2	95.5	102	3280	2780
	10	94.7	90	92	97	102	4910	4250	151	92.9	93.1	102	3380	2860
12500	-30	101.9	82	84	92	99	3140	2710	149	100.7	98.7	98	2810	2420
	-20	101.2	82	84	91	99	3280	2830	149	99.8	100.0	98	2880	2470
	-10	99.3	83	84	91	99	3460	3010	149	97.6	97.8	98	2960	2520
	0	97.1	84	86	92	99	3790	3290	149	95.2	95.5	98	3040	2590
	10	94.7	86	87	92	99	4190	3620	149	92.9	93.1	98	3120	2650
11500	-30	101.9	78	79	89	98	2830	2420	148	100.7	98.7	94	2660	2320
	-20	101.2	78	80	89	97	2930	2530	148	99.8	100.0	94	2710	2370
	-10	99.3	79	80	88	96	3080	2660	148	97.6	97.8	94	2760	2410
	0	97.1	79	80	88	95	3280	2830	148	95.2	95.5	94	2830	2460
	10	94.7	81	82	88	95	3560	3100	148	92.9	93.1	94	2890	2510
10500	-30	101.9	79	79	86	96	2840	2380	146	100.7	98.7	90	2560	2220
	-20	101.2	78	78	86	95	2900	2440	146	99.9	100.0	90	2600	2260
	-10	99.3	77	77	86	94	2920	2440	146	97.6	97.8	90	2640	2300
	0	97.1	75	76	85	93	2900	2510	146	95.3	95.5	90	2690	2350
	10	94.7	75	76	84	92	3080	2660	146	92.9	93.1	90	2730	2390
9500	-30	101.9	80	80	87	97	2880	2420	145	100.7	98.7	86	2450	2120
	-20	101.2	79	79	86	96	2940	2470	145	99.9	100.0	86	2490	2160
	-10	99.3	77	77	84	94	2930	2460	145	97.6	97.8	86	2530	2190
	0	97.1	75	75	82	91	2880	2410	145	95.3	95.5	86	2570	2230
	10	94.7	72	72	81	90	2800	2340	145	92.9	93.1	86	2610	2270

Figure 7-16 (Sheet 6 of 8)

Airplanes -0057 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0057 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°
LANDING - FLAPS LAND

PRESSURE ALTITUDE 5000 FEET
ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	101.9	98	99	102	108	4190	3650	154	100.7	98.7			
	-20	101.2	98	99	102	108	4400	3840	154	99.8	100.0			
	-10	99.3	98	99	102	108	4730	4130	154	97.5	97.8			
	0	97.1	99	100	103	108	5180	4540	154	95.2	95.5			
	10	94.7 100	101	103	108	5800	5030	154	92.8	93.1				
14500	-30	101.9	95	96	99	106	3880	3370	153	100.7	98.7			
	-20	101.2	95	96	99	106	4070	3540	153	99.8	100.0			
	-10	99.3	96	97	100	106	4380	3820	153	97.6	97.8			
	0	97.1	97	98	100	106	4790	4180	153	95.2	95.5			
	10	94.7	98	99	101	106	5290	4630	153	92.8	93.1			
14400	-30	101.9	95	96	99	105	3830	3320	153	100.7	98.7	105	2680	2330
	-20	101.2	95	96	99	105	4020	3500	153	99.8	100.0	105	2740	2390
	-10	99.3	95	96	99	105	4320	3760	153	97.6	97.8	105	2810	2450
	0	97.1	96	97	100	105	4730	4130	153	95.2	95.5	105	2870	2510
	10	94.7	98	98	100	105	5220	4570	153	92.8	93.1	105	2940	2570
13500	-30	101.9	90	91	95	102	3380	2930	151	100.7	98.7	102	2570	2240
	-20	101.2	90	92	95	102	3550	3080	151	99.8	100.0	102	2630	2290
	-10	99.3	91	92	96	102	3820	3310	151	97.6	97.8	102	2680	2340
	0	97.1	92	93	96	102	4160	3640	151	95.2	95.5	102	2740	2400
	10	94.7	94	95	97	102	4600	4020	151	92.9	93.1	102	2800	2450
12500	-30	101.9	86	87	92	99	2990	2570	149	100.7	98.7	98	2460	2140
	-20	101.2	86	87	91	99	3110	2690	149	99.8	100.0	98	2510	2180
	-10	99.3	86	87	91	99	3300	2860	149	97.6	97.8	98	2560	2230
	0	97.1	87	89	92	99	3600	3120	149	95.2	95.5	98	2610	2280
	10	94.7	89	90	92	99	3970	3460	149	92.9	93.1	98	2660	2320
11500	-30	101.9	82	84	89	98	2660	2290	148	100.7	98.7	94	2350	2040
	-20	101.2	82	84	89	97	2770	2390	148	99.8	100.0	94	2390	2080
	-10	99.3	82	84	88	96	2930	2520	148	97.6	97.8	94	2440	2120
	0	97.1	83	84	88	95	3110	2680	148	95.2	95.5	94	2480	2160
	10	94.7	84	85	88	95	3400	2940	148	92.9	93.1	94	2530	2210
10500	-30	101.9	79	80	86	96	2400	2020	146	100.7	98.7	90	2240	1950
	-20	101.2	78	80	86	95	2460	2110	145	99.9	100.0	90	2280	1980
	-10	99.3	79	80	86	94	2580	2220	146	97.6	97.8	90	2320	2020
	0	97.1	79	80	85	93	2740	2360	146	95.3	95.5	90	2360	2060
	10	94.7	79	80	84	92	2920	2520	146	92.9	93.1	90	2400	2090
9500	-30	101.9	80	80	87	97	2390	2000	145	100.7	98.7	86	2150	1850
	-20	101.2	79	79	86	96	2450	2040	145	99.9	100.0	85	2180	1890
	-10	99.3	77	77	84	94	2450	2050	145	97.6	97.8	86	2210	1920
	0	97.1	75	76	82	91	2410	2060	145	95.3	95.5	86	2250	1950
	10	94.7	75	76	81	90	2540	2200	145	92.9	93.1	86	2280	1990

Figure 7-16 (Sheet 6 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°
LANDING - FLAPS LAND

PRESSURE ALTITUDE 3000 FEET
ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	98.5	94	96	102	108	4140	3550	155	97.3	95.4			
	-20	100.1	94	95	102	108	4300	3700	155	98.9	97.0			
	-10	99.3	93	95	102	108	4490	3860	155	97.6	97.9			
	0	97.1	94	96	102	108	4810	4150	155	95.2	95.6			
	10	94.7	95	97	103	108	5350	4610	155	92.9	93.1			
14500	-30	98.5	92	93	99	106	3800	3260	154	97.3	95.4			
	-20	100.1	91	93	99	106	3950	3400	154	98.9	97.0			
	-10	99.3	91	93	99	106	4130	3550	154	97.6	97.9			
	0	97.1	92	93	100	106	4420	3800	154	95.2	95.6			
	10	94.7	93	95	100	106	4910	4220	154	92.9	93.1			
14400	-30	98.5	91	93	99	105	3760	3220	154	97.3	95.4	105	3020	2550
	-20	100.1	91	93	99	105	3900	3350	154	98.9	97.0	105	3110	2630
	-10	99.3	91	92	99	105	4070	3490	154	97.6	97.9	105	3210	2700
	0	97.1	91	93	99	105	4360	3760	154	95.2	95.6	105	3310	2780
	10	94.7	92	94	100	105	4840	4160	154	92.9	93.1	105	3410	2870
13500	-30	98.5	87	88	95	102	3300	2860	153	97.3	95.4	102	2850	2420
	-20	100.1	87	88	95	102	3420	2960	153	98.9	97.0	102	2930	2480
	-10	99.3	87	88	95	102	3560	3080	153	97.6	97.9	102	3010	2550
	0	97.1	87	89	95	102	3820	3290	153	95.2	95.6	102	3090	2620
	10	94.7	89	91	96	102	4220	3640	153	92.9	93.1	102	3170	2690
12500	-30	98.5	82	84	92	100	2940	2530	151	97.3	95.4	98	2680	2330
	-20	100.1	82	84	92	100	3040	2620	151	98.9	97.0	98	2740	2370
	-10	99.3	82	83	92	100	3140	2720	151	97.6	97.9	98	2810	2420
	0	97.1	83	84	91	99	3300	2860	151	95.3	95.6	98	2880	2470
	10	94.7	84	85	92	99	3610	3140	151	92.9	93.1	98	2950	2510
11500	-30	98.5	79	80	89	98	2680	2260	150	97.2	95.4	94	2570	2230
	-20	100.1	79	79	89	98	2770	2340	150	98.9	97.0	94	2620	2280
	-10	99.3	79	79	89	98	2860	2440	150	97.6	97.9	94	2660	2320
	0	97.1	78	80	89	97	2960	2560	150	95.3	95.6	94	2700	2360
	10	94.7	79	80	88	95	3160	2720	150	92.9	93.1	94	2750	2410
10500	-30	98.5	80	80	87	96	2690	2240	148	97.2	95.4	90	2480	2140
	-20	100.1	80	80	87	96	2780	2330	148	98.9	97.0	90	2520	2180
	-10	99.3	79	79	87	96	2870	2400	148	97.6	97.9	90	2560	2220
	0	97.1	78	78	86	95	2880	2410	148	95.3	95.6	90	2590	2260
	10	94.7	75	76	85	93	2800	2410	148	92.9	93.1	90	2630	2300
9500	-30	98.5	80	80	87	97	2740	2280	147	97.2	95.4	86	2380	2040
	-20	100.1	80	80	87	97	2830	2360	147	98.9	97.0	86	2410	2080
	-10	99.3	80	80	87	97	2900	2440	147	97.7	97.9	86	2450	2110
	0	97.1	78	78	85	95	2900	2440	147	95.3	95.6	86	2480	2150
	10	94.7	75	75	82	91	2810	2350	147	92.9	93.1	86	2520	2180

Figure 7-16 (Sheet 4 of 8)

Airplanes -0057 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0057 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°
LANDING - FLAPS LAND

PRESSURE ALTITUDE 3000 FEET
ANTI-ICE SYSTEMS ON

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. - FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	98.5	98	99	102	108	3890	3370	155	97.3	95.4			
	-20	100.1	98	99	102	108	4030	3500	155	98.9	97.0			
	-10	99.3	98	99	102	108	4200	3650	155	97.6	97.9			
	0	97.1	98	99	102	108	4480	3900	155	95.2	95.6			
	10	94.7	99 100	103	108	4940	4320	155	92.9	93.1				
14500	-30	98.5	95	96	99	106	3610	3120	154	97.3	95.4			
	-20	100.1	95	96	99	106	3730	3240	154	98.9	97.0			
	-10	99.3	95	96	99	106	3890	3370	154	97.6	97.9			
	0	97.1	95	97	100	106	4140	3600	154	95.2	95.6			
	10	94.7	97	98	100	106	4570	3980	154	92.9	93.1			
14400	-30	98.5	95	96	99	105	3560	3070	154	97.3	95.4	105	2570	2230
	-20	100.1	94	96	99	105	3680	3190	154	98.9	97.0	105	2620	2280
	-10	99.3	94	96	99	105	3830	3320	154	97.6	97.9	105	2680	2330
	0	97.1	95	96	99	105	4090	3560	154	95.2	95.6	105	2740	2390
	10	94.7	96	97	100	105	4510	3940	154	92.9	93.1	105	2800	2440
13500	-30	98.5	90	92	95	102	3160	2710	153	97.3	95.4	102	2470	2140
	-20	100.1	90	91	95	102	3260	2810	153	98.9	97.0	102	2520	2190
	-10	99.3	90	91	95	102	3400	2930	153	97.6	97.9	102	2570	2240
	0	97.1	91	92	95	102	3610	3130	153	95.2	95.6	102	2620	2290
	10	94.7	92	93	96	102	3980	3470	153	92.9	93.1	102	2680	2340
12500	-30	98.5	86	88	92	100	2780	2390	151	97.3	95.4	98	2360	2050
	-20	100.1	86	87	92	100	2880	2480	151	98.9	97.0	98	2410	2090
	-10	99.3	86	87	92	100	2990	2580	151	97.6	97.9	98	2460	2140
	0	97.1	86	87	91	99	3140	2710	151	95.3	95.6	98	2500	2160
	10	94.7	87	88	92	99	3440	2990	151	92.9	93.1	98	2550	2220
11500	-30	98.5	83	84	89	98	2480	2120	150	97.2	95.4	94	2270	1960
	-20	100.1	82	84	89	98	2570	2210	150	98.9	97.0	94	2310	2000
	-10	99.3	82	84	89	98	2660	2290	150	97.6	97.9	94	2350	2040
	0	97.1	82	84	89	97	2800	2410	150	95.3	95.6	94	2390	2060
	10	94.7	83	84	88	95	2990	2570	150	92.9	93.1	94	2430	2120
10500	-30	98.5	80	80	87	96	2270	1880	148	97.2	95.4	90	2170	1880
	-20	100.1	80	80	87	96	2340	1960	148	98.9	97.0	90	2210	1910
	-10	99.3	79	80	87	96	2410	2030	148	97.6	97.9	90	2240	1950
	0	97.1	78	80	86	95	2470	2120	148	95.3	95.6	90	2280	1980
	10	94.7	79	80	85	93	2640	2270	148	92.9	93.1	90	2320	2010
9500	-30	98.5	80	80	87	97	2260	1880	147	97.2	95.4	86	2080	1800
	-20	100.1	80	80	87	97	2340	1960	147	98.9	97.0	86	2110	1820
	-10	99.3	80	80	87	97	2410	2020	147	97.7	97.9	86	2140	1850
	0	97.1	78	78	85	95	2420	2020	147	95.3	95.6	86	2180	1880
	10	94.7	75	76	82	91	2350	1980	147	92.9	93.1	86	2210	1910

Figure 7-16 (Sheet 4 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE 1000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	95.0	95	96	102	108	3850	3300	157	93.8	92.2			
	-20	96.5	94	96	102	108	4010	3430	157	95.3	93.7			
	-10	98.1	94	96	102	108	4150	3550	157	96.8	95.1			
	0	97.1	93	95	102	108	4300	3700	157	95.2	95.6			
	10	94.7	94	96	102	108	4620	3970	157	92.9	93.2			
14500	-30	95.0	92	94	99	106	3550	3050	156	93.8	92.2			
	-20	96.5	92	94	99	106	3700	3170	156	95.3	93.7			
	-10	98.1	91	93	99	106	3820	3280	156	96.8	95.1			
	0	97.1	91	93	99	106	3950	3400	156	95.3	95 6			
	10	94.7	92	94	100	106	4250	3650	156	92.9	93.2			
14400	-30	95.0	92	93	99	105	3500	3010	156	93.8	92.2	105	2860	2420
	-20	96.5	91	93	99	105	3640	3120	156	95.3	93.7	105	2940	2480
	-10	98.1	91	93	99	105	3770	3230	156	96.8	95.1	105	3020	2550
	0	97.1	91	93	99	105	3890	3350	156	95.3	95.6	105	3110	2620
	10	94.7	91	93	99	105	4190	3600	156	92.9	93.2	105	3200	2700
13500	-30	95.0	87	88	95	102	3110	2660	154	93.8	92.2	102	2710	2330
	-20	96.5	87	88	95	102	3220	2770	154	95.3	93 7	102	2780	2370
	-10	98.1	87	88	95	102	3310	2860	154	96.8	95.1	102	2850	2420
	0	97.1	87	88	95	102	3420	2960	154	95.3	95.6	102	2920	2480
	10	94.7	88	89	95	102	3570	3170	154	92.9	93 2	102	2990	2540
12500	-30	95.0	83	84	92	100	2760	2360	153	93.8	92.2	98	2580	2240
	-20	96.5	82	84	92	100	2860	2450	153	95.3	93.7	98	2620	2280
	-10	98.1	82	84	92	100	2950	2530	153	96.8	95.1	98	2680	2330
	0	97.1	82	83	92	100	3050	2630	153	95.3	95.6	98	2740	2370
	10	94.7	83	84	91	99	3190	2760	153	92.9	93.2	98	2800	2410
11500	-30	95.0	79	80	89	98	2520	2110	151	93.7	92.2	94	2490	2150
	-20	96.5	79	80	89	98	2600	2180	151	95.3	93.7	94	2530	2190
	-10	98.1	79	80	89	98	2700	2270	151	96.8	95.1	94	2570	2230
	0	97.1	79	79	89	98	2800	2340	151	95.3	95.6	94	2610	2270
	10	94.7	78	80	89	97	2860	2460	151	92.9	93.2	94	2650	2310
10500	-30	95.0	80	80	87	96	2540	2100	150	93.7	92.2	90	2400	2070
	-20	96.5	80	80	87	96	2630	2180	150	95.3	93.7	90	2440	2100
	-10	98.1	80	80	87	96	2710	2270	150	96.8	95.1	90	2470	2140
	0	97.1	80	80	87	96	2810	2340	150	95.3	95.6	90	2510	2170
	10	94.7	78	78	86	95	2800	2340	150	92.9	93.2	90	2550	2210
9500	-30	95.0	81	81	87	97	2580	2140	149	93.7	92.2	86	2310	1980
	-20	96.5	80	80	87	97	2660	2220	149	95.3	93.7	86	2340	2010
	-10	98.1	81	81	87	97	2760	2300	149	96.8	95.1	86	2380	2040
	0	97.1	80	80	87	97	2840	2390	149	95.3	95.6	86	2410	2070
	10	94.7	79	79	85	95	2830	2360	149	93.0	93.2	86	2440	2110

Figure 7-16 (Sheet 2 of 8)

Airplanes -0057 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0057 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE 1000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS ON**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	95.0	98	99	102	108	3650	3140	157	93.8	92.2			
	-20	96.5	98	99	102	108	3780	3260	157	95.3	93.7			
	-10	98.1	98	99	102	108	3900	3380	157	96.8	95.1			
	0	97.1	98	99	102	108	4030	3500	157	95.2	95.6			
	10	94.7	98	99	102	108	4320	3760	157	92.9	93.2			
14500	-30	95.0	96	97	99	106	3380	2900	156	93.8	92.2			
	-20	96.5	95	96	99	106	3500	3020	156	95.3	93.7			
	-10	98.1	95	96	99	106	3610	3120	156	96.8	95.1			
	0	97.1	95	96	99	106	3730	3230	156	95.3	95.6			
	10	94.7	96	97	100	106	4000	3470	156	92.9	93.2			
14400	-30	95.0	95	96	99	105	3340	2870	156	93.8	92.2	105	2460	2140
	-20	96.5	95	96	99	105	3460	2980	156	95.3	93.7	105	2520	2180
	-10	98.1	95	96	99	105	3560	3080	156	96.8	95.1	105	2570	2230
	0	97.1	94	96	99	105	3680	3190	156	95.3	95.6	105	2620	2280
	10	94.7	95	96	99	105	3940	3420	156	92.9	93.2	105	2670	2330
13500	-30	95.0	91	92	95	102	2950	2530	154	93.8	92.2	102	2380	2060
	-20	96.5	91	92	95	102	3060	2630	154	95.3	93.7	102	2420	2100
	-10	98.1	90	91	95	102	3160	2710	154	96.8	95.1	102	2470	2150
	0	97.1	90	91	95	102	3250	2810	154	95.3	95.6	102	2520	2190
	10	94.7	91	92	95	102	3490	3010	154	92.9	93.2	102	2560	2230
12500	-30	95.0	87	88	92	100	2620	2230	153	93.8	92.2	98	2280	1980
	-20	96.5	86	88	92	100	2700	2320	153	95.3	93.7	98	2320	2020
	-10	98.1	86	87	92	100	2800	2400	153	96.8	95.1	98	2370	2050
	0	97.1	86	87	92	100	2880	2480	153	95.3	95.6	98	2410	2090
	10	94.7	86	87	91	99	3040	2620	153	92.9	93.2	98	2450	2130
11500	-30	95.0	83	84	89	98	2340	1990	151	93.7	92.2	94	2190	1900
	-20	96.5	83	84	89	98	2410	2060	151	95.3	93.7	94	2230	1930
	-10	98.1	83	84	89	98	2500	2140	151	96.8	95.1	94	2270	1970
	0	97.1	82	84	89	98	2580	2210	151	95.3	95.6	94	2300	2000
	10	94.7	83	84	89	97	2700	2330	151	92.9	93.2	94	2340	2040
10500	-30	95.0	80	80	87	96	2120	1760	150	93.7	92.2	90	2110	1820
	-20	96.5	80	80	87	96	2200	1820	150	95.3	93.7	90	2140	1850
	-10	98.1	80	80	87	96	2280	1880	150	96.8	95.1	90	2170	1880
	0	97.1	80	80	87	96	2360	1960	150	95.3	95.6	90	2200	1910
	10	94.7	79	80	86	95	2390	2050	150	92.9	93.2	90	2240	1940
9500	-30	95.0	81	81	87	97	2120	1760	149	93.7	92.2	86	2030	1740
	-20	96.5	80	80	87	97	2200	1840	149	95.3	93.7	86	2050	1770
	-10	98.1	81	81	87	97	2280	1910	149	96.8	95.1	86	2080	1800
	0	97.1	80	80	87	97	2350	1970	149	95.3	95.6	86	2110	1820
	10	94.7	79	79	85	95	2350	1960	149	93.0	93.2	86	2140	1850

Figure 7-16 (Sheet 2 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating
SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating
SBS550-27-2 and SBS550-32-1 but not SBS550-32-7
and Airplanes -0057 thru -0114 Incorporating
SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°
LANDING - FLAPS LAND

PRESSURE ALTITUDE 7000 FEET
ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	103.0	94	96	102	108	4220	3640	152	104.3	100.2			
	-20	103.0	94	96	102	108	4570	3940	152	103.3	101.9			
	-10	102.7	95	97	103	108	4970	4290	152	101.3	101.2			
	0	101.3	96	98	103	108	5510	4760	152	99.2	98.9			
	10	99.4	97	99	104	108	6210	5310	152	97.1	96.5			
14500	-30	103.0	92	94	100	106	3870	3340	151	104.3	100.2			
	-20	103.0	92	94	100	106	4190	3610	151	103.3	101.9			
	-10	102.7	93	95	100	106	4540	3930	151	101.3	101.2			
	0	101.3	94	96	101	106	5020	4350	151	99.2	98.9			
	10	99.4	95	97	101	106	5600	4840	151	97.1	96.5			
	20	97.4	96	98	102	106	6340	5480	151	95.0	94.2			
14400	-30	103.0	91	93	99	105	3820	3290	151	104.3	100.2	105	3430	2880
	-20	103.0	92	94	100	105	4120	3560	151	103.4	101.9	105	3550	2980
	-10	102.7	92	94	100	105	4480	3870	151	101.3	101.2	105	3680	3080
	0	101.3	93	95	101	105	4950	4280	151	99.2	98.9	105	3820	3190
	10	99.4	95	96	101	105	5510	4770	151	97.1	96.5	105	3960	3310
	20	97.4	96	97	102	105	6240	5400	151	95.0	94.2			
13500	-30	103.0	88	89	96	102	3340	2880	149	104.3	100.2	102	3190	2700
	-20	103.0	88	90	96	102	3600	3110	149	103.4	101.9	102	3290	2790
	-10	102.7	89	91	96	102	3900	3370	149	101.3	101.2	102	3400	2870
	0	101.3	90	92	97	102	4300	3720	149	99.2	98.9	102	3510	2960
	10	99.4	91	93	97	102	4780	4140	149	97.2	96.5	102	3620	3060
	20	97.4	92	94	98	102	5390	4660	149	95.1	94.2			
	30	95.4	94	95	99	102	6180	5350	149	92.9	91.8			
12500	-30	103.0	83	84	91	99	2870	2490	147	104.3	100.2	98	2960	2530
	-20	103.0	84	85	92	99	3080	2670	147	103.4	101.9	98	3050	2590
	-10	102.7	85	86	92	99	3330	2880	147	101.3	101.2	98	3130	2670
	0	101.3	86	87	93	99	3670	3170	147	99.3	98.9	98	3220	2740
	10	99.4	87	88	93	99	4060	3510	147	97.2	96.5	98	3310	2820
	20	97.4	88	90	94	99	4560	3950	147	95.1	94.2	98	3410	2900
	30	95.4	90	91	94	99	5210	4510	147	92.9	91.8			
11500	-30	103.0	79	80	88	96	2560	2220	146	104.2	100.2	94	2760	2420
	-20	103.0	79	80	88	96	2700	2340	146	103.4	101.9	94	2830	2470
	-10	102.7	79	80	87	95	2840	2470	146	101.3	101.2	94	2910	2520
	0	101.3	81	82	88	95	3110	2700	146	99.3	98.9	94	2980	2570
	10	99.4	82	83	89	95	3420	2980	146	97.2	96.5	94	3050	2620
	20	97.4	84	85	89	95	3840	3320	146	95.1	94.2	94	3130	2680
	30	95.4	86	87	90	95	4370	3780	146	92.9	91.8	94	3210	2740
	40	93.4	87	88	91	95	5010	4340	146	90.5	89.5			
10500	-30	103.0	77	77	86	95	2420	2030	144	104.2	100.2	90	2650	2310
	-20	103.0	75	76	85	94	2430	2070	144	103.4	101.9	90	2700	2350
	-10	102.7	75	76	85	93	2520	2180	144	101.3	101.2	90	2740	2400
	0	101.3	75	76	84	91	2680	2320	144	99.3	98.9	90	2790	2440
	10	99.4	77	78	84	91	2900	2510	144	97.2	96.5	90	2840	2490
	20	97.4	79	80	85	91	3220	2800	144	95.1	94.2	90	2890	2540
	30	95.4	81	82	85	91	3640	3170	144	92.9	91.8	90	2950	2580
	40	93.4	83	83	86	91	4150	3610	144	90.6	89.5	90	3020	2630
9500	-30	103.0	78	78	84	94	2440	2050	143	104.2	100.2	86	2540	2200
	-20	103.0	76	76	82	92	2440	2050	143	103.4	101.9	86	2580	2240
	-10	102.7	74	74	82	91	2440	2040	143	101.3	101.2	86	2620	2280
	0	101.3	72	72	81	89	2390	2020	143	99.3	98.9	86	2660	2320
	10	99.4	71	72	80	88	2500	2150	143	97.2	96.5	86	2700	2360
	20	97.4	72	73	79	87	2680	2320	143	95.1	94.2	86	2740	2400
	30	95.4	75	76	80	87	3030	2620	143	93.0	91.8	86	2790	2440
	40	93.4	77	78	81	87	3440	2980	143	90.6	89.5	86	2830	2480

Figure 7-15 (Sheet 8 of 8)

Airplanes -0057 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0057 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 7000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	103.0	98	99	102	108	3920	3420	152	104.3	100.2			
	-20	103.0	99	100	102	108	4220	3690	152	103.3	101.9			
	-10	102.7	99	100	103	108	4560	3990	152	101.3	101.2			
	0	101.3	98	101	103	108	5290	4400	152	99.2	98.9			
	10	99.4	96	102	104	108	6280	4880	152	97.1	96.5			
14500	-30	103.0	96	97	100	106	3620	3160	151	104.3	100.2			
	-20	103.0	96	97	100	106	3900	3400	151	103.3	101.9			
	-10	102.7	97	98	100	106	4210	3680	151	101.3	101.2			
	0	101.3	98	99	101	106	4620	4060	151	99.2	98.9			
	10	99.4	98	100	101	106	5220	4490	151	97.1	96.5			
	20	97.4	96	101	102	106	6330	5040	151	95.0	94.2			
14400	-30	103.0	95	96	99	105	3580	3110	151	104.3	100.2	105	2810	2450
	-20	103.0	96	97	100	105	3840	3350	151	103.3	101.9	105	2880	2510
	-10	102.7	97	98	100	105	4150	3630	151	101.3	101.2	105	2950	2580
	0	101.3	98	98	101	105	4560	4000	151	99.2	98.9	105	3020	2640
	10	99.4	98	99	101	105	5060	4430	151	97.1	96.5	105	3100	2710
	20	97.4	97	101	102	105	6110	4970	151	95.0	94.2			
13500	-30	103.0	91	92	96	102	3160	2750	149	104.3	100.2	102	2680	2340
	-20	103.0	92	93	96	102	3390	2960	149	103.4	101.9	102	2750	2400
	-10	102.7	93	94	96	102	3660	3190	149	101.3	101.2	102	2810	2460
	0	101.3	94	95	97	102	4020	3510	149	99.2	98.9	102	2880	2520
	10	99.4	95	96	97	102	4440	3890	149	97.2	96.5	102	2940	2580
	20	97.4	96	97	98	102	4960	4360	149	95.1	94.2			
	30	95.4	97	98	99	102	5650	4970	149	92.9	91.8			
12500	-30	103.0	86	87	91	99	2730	2360	147	104.3	100.2	98	2560	2230
	-20	103.0	87	88	92	99	2930	2540	147	103.4	101.9	98	2610	2280
	-10	102.7	88	89	92	99	3160	2750	147	101.3	101.2	98	2670	2330
	0	101.3	89	90	93	99	3460	3020	147	99.3	98.9	98	2730	2380
	10	99.4	90	91	93	99	3820	3340	147	97.2	96.5	98	2780	2440
	20	97.4	92	92	94	99	4270	3740	147	95.1	94.2	98	2840	2490
	30	95.4	93	94	94	99	4850	4250	147	92.9	91.8			
11500	-30	103.0	82	84	88	96	2430	2090	146	104.2	100.2	94	2440	2120
	-20	103.0	82	84	88	96	2560	2210	146	103.4	101.9	94	2490	2170
	-10	102.7	83	84	87	95	2700	2340	146	101.3	101.2	94	2540	2210
	0	101.3	84	85	88	95	2960	2560	146	99.3	98.9	94	2580	2260
	10	99.4	85	86	89	95	3260	2830	146	97.2	96.5	94	2630	2310
	20	97.4	87	88	89	95	3640	3170	146	95.1	94.2	94	2690	2350
	30	95.4	88	89	90	95	4120	3600	146	92.9	91.8	94	2740	2400
	40	93.4	90	90	91	95	4710	4120	146	90.5	89.5			
10500	-30	103.0	79	80	86	95	2140	1850	144	104.2	100.2	90	2320	2020
	-20	103.0	79	80	85	94	2260	1950	144	103.4	101.9	90	2370	2060
	-10	102.7	79	80	85	93	2380	2060	144	101.3	101.2	90	2410	2100
	0	101.3	79	80	84	91	2530	2190	144	99.3	98.9	90	2450	2140
	10	99.4	80	81	84	91	2740	2370	144	97.2	96.5	90	2500	2180
	20	97.4	81	82	85	91	3060	2650	144	95.1	94.2	90	2540	2220
	30	95.4	83	84	85	91	3470	3010	144	92.9	91.8	90	2580	2260
	40	93.4	85	85	86	91	3950	3440	144	90.6	89.5	90	2630	2310
9500	-30	103.0	78	78	84	94	2040	1700	143	104.2	100.2	86	2220	1920
	-20	103.0	76	76	82	92	2050	1710	143	103.4	101.9	86	2250	1960
	-10	102.7	75	76	82	91	2080	1790	143	101.3	101.2	86	2290	1990
	0	101.3	75	76	81	89	2210	1900	143	99.3	98.9	86	2330	2030
	10	99.4	75	76	80	88	2350	2030	143	97.2	96.5	86	2360	2060
	20	97.4	76	77	79	87	2530	2180	143	95.1	94.2	86	2400	2100
	30	95.4	78	78	80	87	2870	2480	143	93.0	91.8	86	2440	2140
	40	93.4	79	80	81	87	3270	2830	143	90.6	89.5	86	2480	2170

Figure 7-15 (Sheet 8 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7° **PRESSURE ALTITUDE 5000 FEET**

LANDING - FLAPS LAND **ANTI-ICE SYSTEMS OFF**

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 – KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	101.9	93	95	102	108	3730	3210	154	100.7	98.7			
	-20	103.0	93	95	102	108	3940	3390	154	102.5	100.4			
	-10	102.7	94	96	102	108	4250	3670	154	101.3	101.3			
	0	101.3	95	97	103	108	4690	4050	154	99.2	98.9			
	10	99.4	96	98	103	108	5220	4510	154	97.2	96.6			
	20	97.4	97	99	104	108	5900	5090	154	95.1	94.2			
14500	-30	101.9	91	93	99	106	3430	2950	153	100.7	98.7			
	-20	103.0	91	93	99	106	3620	3110	153	102.5	100.4			
	-10	102.7	92	94	100	106	3900	3360	153	101.3	101.3			
	0	101.3	93	95	100	106	4290	3700	153	99.2	98.9			
	10	99.4	94	96	101	106	4770	4120	153	97.2	96.6			
	20	97.4	95	97	101	106	5380	4640	153	95.1	94.2			
	30	95.4	97	98	102	106	6190	5340	153	92.9	91.9			
14400	-30	101.9	91	93	99	105	3380	2910	153	100.7	98.7	105	3210	2700
	-20	103.0	91	93	99	105	3560	3070	153	102.5	100.4	105	3310	2790
	-10	102.7	91	93	99	105	3840	3320	153	101.3	101.3	105	3420	2880
	0	101.3	92	94	100	105	4230	3650	153	99.2	98.9	105	3540	2970
	10	99.4	94	95	100	105	4700	4060	153	97.2	96.6	105	3660	3070
	20	97.4	95	97	101	105	5290	4570	153	95.1	94.2			
	30	95.4	97	98	102	105	6090	5250	153	92.9	91.9			
13500	-30	101.9	87	88	95	102	2970	2560	151	100.7	98.7	102	3010	2550
	-20	103.0	87	89	95	102	3120	2690	151	102.5	100.4	102	3090	2620
	-10	102.7	88	89	96	102	3360	2900	151	101.3	101.3	102	3190	2700
	0	101.3	89	90	96	102	3690	3190	151	99.3	98.9	102	3280	2780
	10	99.4	90	92	97	102	4090	3540	151	97.2	96.6	102	3380	2860
	20	97.4	92	93	97	102	4600	3970	151	95.1	94.2	102	3480	2940
	30	95.4	93	95	98	102	5260	4550	151	92.9	91.9			
12500	-30	101.9	82	84	92	99	2620	2260	149	100.7	98.7	98	2810	2420
	-20	103.0	82	84	91	99	2730	2360	149	102.4	100.4	98	2880	2470
	-10	102.7	83	84	91	99	2880	2510	149	101.3	101.3	98	2960	2520
	0	101.3	84	86	92	99	3160	2740	149	99.3	98.9	98	3040	2590
	10	99.4	86	87	92	99	3490	3020	149	97.2	96.6	98	3120	2650
	20	97.4	87	89	93	99	3910	3380	149	95.1	94.2	98	3200	2720
	30	95.4	89	90	94	99	4460	3860	149	92.9	91.9	98	3280	2790
	40	93.4	91	92	95	99	5130	4430	149	90.6	89.5			
11500	-30	101.9	78	79	89	98	2360	2020	148	100.7	98.7	94	2660	2320
	-20	103.0	78	80	89	97	2440	2110	148	102.4	100.4	94	2710	2370
	-10	102.7	79	80	88	96	2570	2220	148	101.3	101.3	94	2760	2410
	0	101.3	79	80	88	95	2730	2360	148	99.3	98.9	94	2830	2460
	10	99.4	81	82	88	95	2970	2580	148	97.2	96.6	94	2890	2510
	20	97.4	83	84	89	95	3300	2870	148	95.1	94.2	94	2960	2550
	30	95.4	85	86	89	95	3760	3260	148	92.9	91.9	94	3030	2600
	40	93.4	86	88	90	95	4310	3720	148	90.6	89.5	94	3100	2650
10500	-30	101.9	79	79	86	96	2370	1980	146	100.7	98.7	90	2560	2220
	-20	103.0	78	78	86	95	2420	2030	146	102.4	100.4	90	2600	2260
	-10	102.7	77	77	86	94	2430	2030	148	101.4	101.3	90	2640	2300
	0	101.3	75	76	85	93	2420	2090	148	99.3	98.9	90	2690	2350
	10	99.4	75	76	84	92	2570	2220	146	97.2	96.6	90	2730	2390
	20	97.4	77	78	84	91	2800	2420	146	95.1	94.2	90	2770	2430
	30	95.4	79	80	85	91	3160	2740	148	93.0	91.9	90	2820	2470
	40	93.4	81	82	85	91	3590	3120	148	90.6	89.5	90	2860	2510
9500	-30	101.9	80	80	87	97	2400	2020	145	100.7	98.7	86	2450	2120
	-20	103.0	79	79	86	96	2450	2060	145	102.4	100.4	86	2490	2160
	-10	102.7	77	77	84	94	2440	2050	145	101.4	101.3	86	2530	2190
	0	101.3	75	75	82	91	2400	2010	145	99.3	98.9	86	2570	2230
	10	99.4	72	72	81	90	2330	1950	145	97.2	96.6	86	2610	2270
	20	97.4	71	73	80	88	2410	2080	145	95.1	94.2	86	2650	2310
	30	95.4	73	74	80	87	2640	2270	145	93.0	91.9	88	2680	2340
	40	93.4	75	76	80	87	3000	2590	145	90.6	89.5	86	2720	2380

Figure 7-15 (Sheet 6 of 8)

Airplanes -0057 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0057 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 5000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 – KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	101.9	98	99	102	108	3490	3040	154	100.7	98.7			
	-20	103.0	98	99	102	108	3670	3200	154	102.5	100.4			
	-10	102.7	98	99	102	108	3940	3440	154	101.3	101.3			
	0	101.3	99	100	103	108	4320	3780	154	99.2	98.9			
	10	99.4	100	101	103	108	4830	4190	154	97.2	96.6			
	20	97.4	98	103	104	108	5810	4690	154	95.1	94.2			
14500	-30	101.9	95	96	99	106	3230	2810	153	100.7	98.7			
	-20	103.0	95	96	99	106	3390	2950	153	102.5	100.4			
	-10	102.7	96	97	100	106	3650	3180	153	101.3	101.3			
	0	101.3	97	98	100	106	3990	3480	153	99.2	98.9			
	10	99.4	98	99	101	106	4410	3860	153	97.2	96.6			
	20	97.4	99	100	101	106	4930	4320	153	95.1	94.2			
	30	95.4	98	101	102	106	5950	4930	153	92.9	91.9			
14400	-30	101.9	95	96	99	105	3190	2770	153	100.7	98.7	105	2680	2330
	-20	103.0	95	96	99	105	3350	2920	153	102.5	100.4	105	2740	2390
	-10	102.7	95	96	99	105	3600	3130	153	101.3	101.3	105	2810	2450
	0	101.3	96	97	100	105	3940	3440	153	99.2	98.9	105	2870	2510
	10	99.4	98	98	100	105	4350	3810	153	97.2	96.6	105	2940	2570
	20	97.4	99	100	101	105	4860	4260	153	95.1	94.2			
	30	95.4	99	101	102	105	5760	4860	153	92.9	91.9			
13500	-30	101.9	90	91	95	102	2820	2440	151	100.7	98.7	102	2570	2240
	-20	103.0	90	92	95	102	2960	2570	151	102.5	100.4	102	2630	2290
	-10	102.7	91	92	96	102	3180	2760	151	101.3	101.3	102	2680	2340
	0	101.3	92	93	96	102	3470	3030	151	99.3	98.9	102	2740	2400
	10	99.4	94	95	97	102	3830	3350	151	97.2	96.6	102	2800	2450
	20	97.4	95	96	97	102	4280	3750	151	95.1	94.2	102	2860	2500
	30	95.4	97	97	98	102	4870	4260	151	92.9	91.9			
12500	-30	101.9	86	87	92	99	2490	2140	149	100.7	98.7	98	2460	2140
	-20	103.0	86	87	91	99	2590	2240	149	102.4	100.4	98	2510	2180
	-10	102.7	86	87	91	99	2750	2380	149	101.3	101.3	98	2560	2230
	0	101.3	87	89	92	99	3000	2600	149	99.3	98.9	98	2610	2280
	10	99.4	89	90	92	99	3310	2880	149	97.2	96.6	98	2660	2320
	20	97.4	90	91	93	99	3690	3220	149	95.1	94.2	98	2710	2370
	30	95.4	92	93	94	99	4190	3660	149	92.9	91.9	98	2770	2420
	40	93.4	94	94	95	99	4790	4190	149	90.6	89.5			
11500	-30	101.9	82	84	88	98	2220	1910	148	100.7	98.7	94	2350	2040
	-20	103.0	82	84	89	97	2310	1990	148	102.4	100.4	94	2390	2080
	-10	102.7	82	84	88	96	2440	2100	148	101.3	101.3	94	2440	2120
	0	101.3	83	84	88	95	2590	2230	148	99.3	98.9	94	2480	2160
	10	99.4	84	85	88	95	2830	2450	148	97.2	96.6	94	2530	2210
	20	97.4	85	86	89	95	3150	2730	148	95.1	94.2	94	2570	2250
	30	95.4	87	88	89	95	3570	3110	148	92.9	91.9	94	2620	2290
	40	93.4	89	90	90	95	4070	3550	148	90.6	89.5	94	2670	2340
10500	-30	101.9	79	80	86	96	2000	1680	146	100.7	98.7	90	2240	1950
	-20	103.0	78	80	86	95	2050	1760	146	102.4	100.4	90	2280	1980
	-10	102.7	79	80	86	94	2150	1850	146	101.4	101.3	90	2320	2020
	0	101.3	79	80	85	93	2280	1970	146	99.3	98.9	90	2360	2060
	10	99.4	79	80	84	92	2430	2100	146	97.2	96.6	90	2400	2090
	20	97.4	80	81	84	91	2650	2290	146	95.1	94.2	90	2440	2130
	30	95.4	82	83	85	91	3010	2600	146	93.0	91.9	90	2480	2170
	40	93.4	84	85	85	91	3430	2970	146	90.6	89.5	90	2520	2210
9500	-30	101.9	80	80	87	97	1990	1670	145	100.7	98.7	86	2150	1850
	-20	103.0	79	79	86	96	2040	1700	145	102.4	100.4	86	2180	1890
	-10	102.7	77	77	84	94	2040	1710	145	101.4	101.3	86	2210	1920
	0	101.3	75	76	82	91	2010	1720	145	99.3	98.9	86	2250	1950
	10	99.4	75	76	81	90	2120	1830	145	97.2	96.6	86	2280	1990
	20	97.4	75	76	80	88	2270	1950	145	95.1	94.2	86	2320	2020
	30	95.4	76	77	80	87	2490	2140	145	93.0	91.9	86	2350	2050
	40	93.4	78	79	80	87	2840	2450	145	90.6	89.5	86	2390	2080

Figure 7-15 (Sheet 6 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 3000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	98.5	94	96	102	108	3450	2960	155	97.3	95.4			
	-20	100.1	94	95	102	108	3580	3080	155	98.9	97.0			
	-10	101 8	93	95	102	108	3740	3220	155	100.5	98.6			
	0	101.3	94	96	102	108	4010	3460	155	99.3	99 0			
	10	99.4	95	97	103	108	4460	3840	155	97.2	96.6			
	20	97.4	97	98	103	108	5020	4330	155	95.1	94.3			
	30	95.4	98	100	104	108	5800	4990	155	92.9	91.9			
14500	-30	98.5	92	93	99	106	3170	2720	154	97.3	95.4			
	-20	100.1	91	93	99	106	3290	2830	154	98.9	97.0			
	-10	101.8	91	93	99	106	3440	2960	154	100.5	98.6			
	0	101.3	92	93	100	106	3680	3170	154	99.3	99.0			
	10	99.4	93	95	100	106	4090	3520	154	97.2	96.6			
	20	97.4	94	96	101	106	4600	3960	154	95.1	94.3			
	30	95.4	96	98	102	106	5290	4560	154	92.9	91.9			
14400	-30	98.5	91	93	99	105	3130	2680	154	97.3	95.4	105	3020	2550
	-20	100.1	91	93	99	105	3250	2790	154	98.9	97.0	105	3110	2630
	-10	101.8	91	92	99	105	3390	2910	154	100.5	98.6	105	3210	2700
	0	101.3	91	93	99	105	3630	3130	154	99.3	99.0	105	3310	2780
	10	99.4	92	94	100	105	4030	3470	154	97.2	96.6	105	3410	2870
	20	97.4	94	96	100	105	4530	3900	154	95.1	94.3	105	3510	2950
	30	95.4	96	97	101	105	5210	4490	154	92.9	91.9			
13500	-30	98.5	87	88	95	102	2750	2380	153	97.3	95.4	102	2850	2420
	-20	100.1	87	88	95	102	2850	2470	153	98.9	97.0	102	2930	2480
	-10	101.8	87	88	95	102	2970	2570	153	100.5	98.6	102	3010	2550
	0	101.3	87	89	95	102	3180	2740	153	99.3	99.0	102	3090	2620
	10	99.4	89	91	96	102	3520	3030	153	97.2	96.6	102	3170	2690
	20	97 4	90	92	97	102	3950	3400	153	95.1	94.3	102	3260	2760
	30	95.4	92	94	98	102	4530	3900	153	92.9	91.9	102	3350	2830
	40	93.4	94	95	98	102	5190	4470	153	90.6	89.6			
12500	-30	98.5	82	84	92	100	2450	2110	151	97.3	95.4	98	2680	2330
	-20	100.1	82	84	92	100	2530	2180	151	98.9	97.0	98	2740	2370
	-10	101.8	82	83	92	100	2620	2270	151	100.5	98.6	98	2810	2420
	0	101.3	83	84	91	99	2750	2380	151	99.3	99.0	98	2880	2470
	10	99.4	84	85	92	99	3010	2620	151	97.2	96.6	98	2950	2510
	20	97 4	86	87	92	99	3370	2910	151	95.1	94.3	98	3020	2570
	30	95.4	88	90	93	99	3850	3320	151	93.0	91.9	98	3090	2630
	40	93 4	90	91	94	99	4410	3800	151	90.6	89.6	98	3170	2700
11500	-30	98.5	79	80	89	98	2230	1880	150	97.2	95.4	94	2570	2230
	-20	100.1	79	79	89	98	2310	1950	150	98.9	97.0	94	2620	2280
	-10	101.8	79	79	89	98	2380	2030	150	100.5	98.6	94	2660	2320
	0	101.3	78	80	89	97	2470	2130	150	99.3	99.0	94	2700	2360
	10	99 4	79	80	88	95	2630	2270	150	97.2	96 6	94	2750	2410
	20	97.4	81	82	88	95	2880	2490	150	95.1	94.3	94	2810	2450
	30	95.4	83	84	89	95	3260	2830	150	93.0	91.9	94	2870	2490
	40	93.4	85	86	90	95	3720	3220	150	90.6	89 6	94	2930	2530
10500	-30	98.5	80	80	87	96	2240	1870	148	97.2	95.4	90	2480	2140
	-20	100.1	80	80	87	96	2320	1940	148	98.9	97.0	90	2520	2180
	-10	101.8	79	79	87	96	2390	2000	148	100.5	98.6	90	2560	2220
	0	101 3	78	78	86	95	2400	2010	148	99.3	99.0	90	2590	2260
	10	99.4	75	76	85	93	2330	2010	148	97.2	96.6	90	2630	2300
	20	97.4	75	77	84	92	2490	2140	148	95.1	94.3	90	2670	2330
	30	95.4	77	78	84	91	2770	2390	148	93.0	91.9	90	2710	2370
	40	93 4	80	81	85	91	3130	2710	148	90.6	89.6	90	2750	2410
9500	-30	98.5	80	80	87	97	2280	1900	147	97.2	95.4	86	2380	2040
	-20	100.1	80	80	87	97	2360	1970	147	98.9	97.0	86	2410	2080
	-10	101 8	80	80	87	97	2420	2030	147	100.5	98.6	86	2450	2110
	0	101 3	78	78	85	95	2420	2030	147	99.3	99.0	86	2480	2150
	10	99.4	75	75	82	91	2340	1960	147	97.3	96 6	86	2520	2180
	20	97 4	72	72	81	90	2260	1880	147	95.1	94.3	86	2560	2220
	30	95 4	72	73	80	87	2360	2020	147	93.0	91.9	86	2590	2250
	40	93.4	74	75	80	87	2620	2250	147	90.6	89 6	86	2630	2290

Figure 7-15 (Sheet 4 of 8)

Airplanes -0057 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0057 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°

PRESSURE ALTITUDE 3000 FEET

LANDING - FLAPS LAND

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	98.5	98	99	102	108	3240	2810	155	97.3	95.4			
	-20	100.1	98	99	102	108	3360	2920	155	98.9	97.0			
	-10	101.8	98	99	102	108	3500	3040	155	100.5	98.6			
	0	101.3	98	99	102	108	3730	3250	155	99.3	99.0			
	10	99.4	99	100	103	108	4120	3600	155	97.2	96.6			
	20	97.4	101	102	103	108	4610	4040	155	95.1	94.3			
	30	95.4	100	103	104	108	5550	4620	155	92.9	91.9			
14500	-30	98.5	95	96	99	106	3010	2600	154	97.3	95.4			
	-20	100.1	95	96	99	106	3110	2700	154	98.9	97.0			
	-10	101.8	95	96	99	106	3240	2810	154	100.5	98.6			
	0	101.3	95	97	100	106	3450	3000	154	99.3	99.0			
	10	99.4	97	98	100	106	3810	3320	154	97.2	96.6			
	20	97.4	98	99	101	106	4260	3720	154	95.1	94.3			
	30	95.4	100	101	102	106	4860	4250	154	92.9	91.9			
14400	-30	98.5	95	96	99	105	2970	2560	154	97.3	95.4	105	2570	2230
	-20	100.1	94	96	99	105	3070	2660	154	98.9	97.0	105	2620	2280
	-10	101.8	94	96	99	105	3190	2770	154	100.5	98.6	105	2680	2330
	0	101.3	95	96	99	105	3410	2970	154	99.3	99.0	105	2740	2390
	10	99.4	96	97	100	105	3760	3280	154	97.2	96.6	105	2800	2440
	20	97.4	98	99	100	105	4200	3670	154	95.1	94.3	105	2860	2500
	30	95.4	99	100	101	105	4790	4190	154	92.9	91.9			
13500	-30	98.5	90	92	95	102	2630	2260	153	97.3	95.4	102	2470	2140
	-20	100.1	90	91	95	102	2720	2340	153	98.9	97.0	102	2520	2190
	-10	101.8	90	91	95	102	2830	2440	153	100.5	98.6	102	2570	2240
	0	101.3	91	92	95	102	3010	2610	153	99.3	99.0	102	2620	2290
	10	99.4	92	93	96	102	3320	2890	153	97.2	96.6	102	2680	2340
	20	97.4	94	95	97	102	3710	3230	153	95.1	94.3	102	2730	2380
	30	95.4	96	96	98	102	4230	3690	153	92.9	91.9	102	2790	2430
	40	93.4	97	98	98	102	4810	4210	153	90.6	89.6			
12500	-30	98.5	86	88	92	100	2320	1990	151	97.3	95.4	98	2360	2050
	-20	100.1	86	87	92	100	2400	2070	151	98.9	97.0	98	2410	2090
	-10	101.8	86	87	92	100	2490	2150	151	100.5	98.6	98	2460	2140
	0	101.3	86	87	91	99	2620	2260	151	99.3	99.0	98	2500	2180
	10	99.4	87	88	92	99	2870	2490	151	97.2	96.6	98	2550	2220
	20	97.4	89	90	92	99	3200	2780	151	95.1	94.3	98	2600	2270
	30	95.4	91	92	93	99	3650	3170	151	93.0	91.9	98	2640	2310
	40	93.4	93	93	94	99	4150	3610	151	90.6	89.6	98	2690	2360
11500	-30	98.5	83	84	89	98	2070	1770	150	97.2	95.4	94	2270	1960
	-20	100.1	82	84	89	98	2140	1840	150	98.9	97.0	94	2310	2000
	-10	101.8	82	84	89	98	2220	1910	150	100.5	98.6	94	2350	2040
	0	101.3	82	84	89	97	2330	2010	150	99.3	99.0	94	2390	2080
	10	99.4	83	84	88	95	2490	2140	150	97.2	96.6	94	2430	2120
	20	97.4	84	85	88	95	2730	2360	150	95.1	94.3	94	2470	2160
	30	95.4	86	87	89	95	3110	2690	150	93.0	91.9	94	2510	2190
	40	93.4	88	89	90	95	3540	3070	150	90.6	89.6	94	2550	2230
10500	-30	98.5	80	80	87	96	1890	1570	148	97.2	95.4	90	2170	1880
	-20	100.1	80	80	87	96	1950	1630	148	98.9	97.0	90	2210	1910
	-10	101.8	79	80	87	96	2010	1690	148	100.5	98.6	90	2240	1950
	0	101.3	78	80	86	95	2060	1770	148	99.3	99.0	90	2280	1980
	10	99.4	79	80	85	93	2200	1890	148	97.2	96.6	90	2320	2010
	20	97.4	79	80	84	92	2350	2020	148	95.1	94.3	90	2350	2050
	30	95.4	81	82	84	91	2620	2260	148	93.0	91.9	90	2390	2080
	40	93.4	83	84	85	91	2980	2570	148	90.6	89.6	90	2420	2120
9500	-30	98.5	80	80	87	97	1880	1570	147	97.2	95.4	86	2080	1800
	-20	100.1	80	80	87	97	1950	1630	147	98.9	97.0	86	2110	1820
	-10	101.8	80	80	87	97	2010	1680	147	100.5	98.6	86	2140	1850
	0	101.3	78	78	85	95	2020	1680	147	99.3	99.0	86	2180	1880
	10	99.4	75	76	82	91	1960	1650	147	97.3	96.6	86	2210	1910
	20	97.4	75	76	81	90	2050	1760	147	95.1	94.3	86	2240	1940
	30	95.4	76	77	80	87	2220	1900	147	93.0	91.9	86	2270	1970
	40	93.4	77	78	80	87	2470	2120	147	90.6	89.6	86	2300	2000

Figure 7-15 (Sheet 4 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 1000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	95.0	95	96	102	108	3210	2750	157	93.8	92.2			
	-20	96.5	94	96	102	108	3340	2860	157	95.3	93.7			
	-10	98.1	94	96	102	108	3460	2960	157	96.8	95.1			
	0	99.6	93	95	102	108	3580	3080	157	98.4	96.6			
	10	99.4	94	96	102	108	3850	3310	157	97.2	96.7			
	20	97.4	96	97	103	108	4320	3720	157	95.1	94.3			
	30	95.4	97	99	103	108	4960	4270	157	92.9	92.0			
	40	93.4	99	101	104	108	5720	4910	157	90.6	89.6			
14500	-30	95.0	92	94	99	106	2960	2540	156	93.8	92.2			
	-20	96.5	92	94	99	106	3080	2640	156	95.3	93.7			
	-10	98.1	91	93	99	106	3180	2730	156	96.8	95.1			
	0	99.6	91	93	99	106	3290	2830	156	98.4	96.6			
	10	99.4	92	94	100	106	3540	3040	156	97.2	96.7			
	20	97.4	93	95	100	106	3960	3410	156	95.1	94.3			
	30	95.4	95	97	101	106	4540	3910	156	93.0	92.0			
	40	93.4	97	98	102	106	5220	4490	156	90.6	89.6			
14400	-30	95.0	92	93	99	105	2920	2510	156	93.8	92.2	105	2860	2420
	-20	96.5	91	93	99	105	3030	2600	156	95.3	93.7	105	2940	2480
	-10	98.1	91	93	99	105	3140	2690	156	96.8	95.1	105	3020	2550
	0	99.6	91	93	99	105	3240	2790	156	98.4	96.6	105	3110	2620
	10	99.4	91	93	99	105	3490	3000	156	97.2	96.7	105	3200	2700
	20	97.4	93	95	100	105	3910	3360	156	95.1	94.3	105	3290	2770
	30	95.4	95	96	101	105	4470	3850	156	93.0	92.0	105	3380	2850
	40	93.4	97	98	101	105	5140	4420	156	90.6	89.6			
13500	-30	95.0	87	88	95	102	2590	2220	154	93.8	92.2	102	2710	2330
	-20	96.5	87	88	95	102	2680	2310	154	95.3	93.7	102	2780	2370
	-10	98.1	87	88	95	102	2760	2380	154	96.8	95.1	102	2850	2420
	0	99.6	87	88	95	102	2850	2470	154	98.3	96.6	102	2920	2480
	10	99.4	88	89	95	102	3060	2640	154	97.2	96.7	102	2990	2540
	20	97.4	89	91	96	102	3420	2940	154	95.1	94.3	102	3070	2600
	30	95.4	91	93	97	102	3900	3360	154	93.0	92.0	102	3150	2670
	40	93.4	93	95	98	102	4480	3850	154	90.6	89.6	102	3230	2740
12500	-30	95.0	83	84	92	100	2300	1970	153	93.8	92.2	98	2580	2240
	-20	96.5	82	84	92	100	2380	2040	153	95.3	93.7	98	2620	2280
	-10	98.1	82	84	92	100	2460	2110	153	96.8	95.1	98	2680	2330
	0	99.6	82	83	92	100	2540	2190	153	98.3	96.6	98	2740	2370
	10	99.4	83	84	91	99	2660	2300	153	97.2	96.7	98	2800	2410
	20	97.4	85	86	92	99	2930	2540	153	95.1	94.3	98	2850	2460
	30	95.4	87	88	93	99	3340	2880	153	93.0	92.0	98	2930	2500
	40	93.4	89	90	94	99	3820	3280	153	90.6	89.6	98	2990	2550
11500	-30	95.0	79	80	89	98	2100	1760	151	93.7	92.2	94	2490	2150
	-20	96.5	79	80	89	98	2170	1820	151	95.3	93.7	94	2530	2190
	-10	98.1	79	80	89	98	2250	1890	151	96.8	95.1	94	2570	2230
	0	99.6	79	79	89	98	2330	1950	151	98.3	96.6	94	2610	2270
	10	99.4	78	80	89	97	2380	2050	151	97.3	96.7	94	2650	2310
	20	97.4	79	80	88	95	2550	2200	151	95.2	94.3	94	2690	2350
	30	95.4	82	83	88	95	2850	2470	151	93.0	92.0	94	2730	2390
	40	93.4	84	85	89	95	3240	2800	151	90.6	89.6	94	2790	2430
10500	-30	95.0	80	80	87	96	2120	1750	150	93.7	92.2	90	2400	2070
	-20	96.5	80	80	87	96	2190	1820	150	95.3	93.7	90	2440	2100
	-10	98.1	80	80	87	96	2260	1890	150	96.8	95.1	90	2470	2140
	0	99.6	80	80	87	96	2340	1950	150	98.3	96.6	90	2510	2170
	10	99.4	78	78	86	95	2330	1950	150	97.3	96.7	90	2550	2210
	20	97.4	75	76	85	93	2260	1940	150	95.2	94.3	90	2580	2250
	30	95.4	76	77	84	91	2440	2090	150	93.0	92.0	90	2620	2280
	40	93.4	78	79	84	91	2750	2370	150	90.6	89.6	90	2660	2320
9500	-30	95.0	81	81	87	97	2150	1780	149	93.7	92.2	86	2310	1980
	-20	96.5	80	80	87	97	2220	1850	149	95.3	93.7	86	2340	2010
	-10	98.1	81	81	87	97	2300	1920	149	96.8	95.1	86	2380	2040
	0	99.6	80	80	87	97	2370	1990	149	98.3	96.6	86	2410	2070
	10	99.4	79	79	85	95	2360	1970	149	97.3	96.7	86	2440	2110
	20	97.4	75	75	82	91	2260	1880	149	95.2	94.3	86	2470	2140
	30	95.4	71	72	81	89	2140	1830	149	93.0	92.0	86	2500	2170
	40	93.4	72	73	80	87	2310	1970	149	90.7	89.6	86	2540	2200

Figure 7-15 (Sheet 2 of 8)

Airplanes -0057 thru -0114 Except Airplanes Incorporating SBS550-32-1 and Airplanes -0057 thru -0160 Incorporating SBS550-32-7 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 but not SBS550-32-1 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-7 but not SBS550-32-1

TAKEOFF AND LANDING

TAKEOFF - FLAPS 7°

LANDING - FLAPS LAND

PRESSURE ALTITUDE 1000 FEET

ANTI-ICE SYSTEMS OFF

		TAKEOFF							CLIMB			LANDING		
WT	AMB. TEMP	FAN	V1 = KIAS		VR	V2	FIELD LENGTH - FT		VENR	S.E. FAN	M.E. FAN	VREF	FIELD LENGTH - FT	
LBS	DEG C	PERCENT RPM	ZERO WIND	20 KT WIND	KIAS	KIAS	ZERO WIND	20 KT WIND	KIAS	PERCENT RPM	PERCENT RPM	KIAS	ZERO WIND	20 KT WIND
15100	-30	95.0	98	99	102	108	3040	2620	157	93.8	92.2			
	-20	96.5	98	99	102	108	3150	2720	157	95.3	93.7			
	-10	98.1	98	99	102	108	3250	2820	157	96.8	95.1			
	0	99.6	98	99	102	108	3360	2920	157	98.4	96.6			
	10	99.4	98	99	102	108	3500	3130	157	97.2	96.7			
	20	97.4	100	101	103	108	4010	3500	157	95.1	94.3			
	30	95.4	101	102	103	108	4560	3990	157	92.9	92.0			
	40	93.4	102	104	104	108	5300	4560	157	90.6	89.6			
14500	-30	95.0	96	97	99	106	2820	2420	156	93.8	92.2			
	-20	96.5	95	96	99	106	2920	2520	156	95.3	93.7			
	-10	98.1	95	96	99	106	3010	2600	156	96.8	95.1			
	0	99.6	95	96	99	106	3110	2690	156	98.4	96.6			
	10	99.4	96	97	100	106	3330	2890	156	97.2	96.7			
	20	97.4	97	98	100	106	3710	3230	156	95.1	94.3			
	30	95.4	99	100	101	106	4220	3680	156	93.0	92.0			
	40	93.4	100	101	102	106	4810	4200	156	90.6	89.6			
14400	-30	95.0	95	96	99	105	2780	2390	156	93.8	92.2	105	2460	2140
	-20	96.5	95	96	99	105	2880	2480	156	95.3	93.7	105	2520	2180
	-10	98.1	95	96	99	105	2970	2570	156	96.8	95.1	105	2570	2230
	0	99.6	94	96	99	105	3070	2660	156	98.4	96.6	105	2620	2280
	10	99.4	95	96	99	105	3280	2850	156	97.2	96.7	105	2670	2330
	20	97.4	97	98	100	105	3560	3190	156	95.1	94.3	105	2730	2380
	30	95.4	98	99	101	105	4160	3630	156	93.0	92.0	105	2780	2430
	40	93.4	100	101	101	105	4750	4150	156	90.6	89.6			
13500	-30	95.0	91	92	95	102	2460	2110	154	93.8	92.2	102	2380	2060
	-20	96.5	91	92	95	102	2550	2190	154	95.3	93.7	102	2420	2100
	-10	98.1	90	91	95	102	2630	2260	154	96.8	95.1	102	2470	2150
	0	99.6	90	91	95	102	2710	2340	154	98.3	96.6	102	2520	2190
	10	99.4	91	92	95	102	2910	2510	154	97.2	96.7	102	2560	2230
	20	97.4	93	94	96	102	3240	2810	154	95.1	94.3	102	2610	2280
	30	95.4	95	95	97	102	3680	3190	154	93.0	92.0	102	2660	2320
	40	93.4	96	97	98	102	4190	3650	154	90.6	89.6	102	2710	2370
12500	-30	95.0	87	88	92	100	2180	1860	153	93.8	92.2	98	2280	1980
	-20	96.5	86	88	92	100	2250	1930	153	95.3	93.7	98	2320	2020
	-10	98.1	86	87	92	100	2330	2000	153	96.8	95.1	98	2370	2050
	0	99.6	86	87	92	100	2400	2070	153	98.3	96.6	98	2410	2090
	10	99.4	86	87	91	99	2530	2180	153	97.2	96.7	98	2450	2130
	20	97.4	88	89	92	99	2800	2420	153	95.1	94.3	98	2490	2170
	30	95.4	90	91	93	99	3170	2750	153	93.0	92.0	98	2540	2210
	40	93.4	92	93	94	99	3610	3130	153	90.6	89.6	98	2580	2250
11500	-30	95.0	83	84	89	98	1950	1660	151	93.7	92.2	94	2190	1900
	-20	96.5	83	84	89	98	2010	1720	151	95.3	93.7	94	2230	1930
	-10	98.1	83	84	89	98	2080	1780	151	96.8	95.1	94	2270	1970
	0	99.6	82	84	89	98	2150	1840	151	98.3	96.6	94	2300	2000
	10	99.4	83	84	89	97	2250	1940	151	97.3	96.7	94	2340	2040
	20	97.4	83	84	88	95	2410	2070	151	95.2	94.3	94	2380	2070
	30	95.4	85	86	88	95	2710	2340	151	93.0	92.0	94	2420	2110
	40	93.4	87	88	89	95	3090	2670	151	90.6	89.6	94	2460	2140
10500	-30	95.0	80	80	87	96	1770	1470	150	93.7	92.2	90	2110	1820
	-20	96.5	80	80	87	96	1830	1520	150	95.3	93.7	90	2140	1850
	-10	98.1	80	80	87	96	1900	1570	150	96.8	95.1	90	2170	1880
	0	99.6	80	80	87	96	1970	1630	150	98.3	96.6	90	2200	1910
	10	99.4	79	80	86	95	1990	1710	150	97.3	96.7	90	2240	1940
	20	97.4	79	80	85	93	2130	1830	150	95.2	94.3	90	2270	1970
	30	95.4	79	81	84	91	2300	1970	150	93.0	92.0	90	2300	2000
	40	93.4	81	82	84	91	2600	2240	150	90.6	89.6	90	2340	2040
9500	-30	95.0	81	81	87	97	1770	1470	149	93.7	92.2	86	2030	1740
	-20	96.5	80	80	87	97	1830	1530	149	95.3	93.7	86	2050	1770
	-10	98.1	81	81	87	97	1900	1590	149	96.8	95.1	86	2080	1800
	0	99.6	80	80	87	97	1960	1640	149	98.3	96.6	86	2110	1820
	10	99.4	79	79	85	95	1960	1630	149	97.3	96.7	86	2140	1850
	20	97.4	75	76	82	91	1890	1600	149	95.2	94.3	86	2170	1880
	30	95.4	75	76	81	89	2010	1720	149	93.0	92.0	86	2200	1910
	40	93.4	76	77	80	87	2170	1860	149	90.7	89.6	86	2220	1930

Figure 7-15 (Sheet 2 of 8)

Airplanes -0115 thru -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 thru -0056 Incorporating SBS550-27-2 and SBS550-32-1 but not SBS550-32-7 and Airplanes -0057 thru -0114 Incorporating SBS550-32-1 but not SBS550-32-7

TAKEOFF AND LANDING

Takeoff and landing performance is presented in tabulated form on the following pages. These data are for convenience in non-critical operations. The FAA Approved Airplane Flight Manual contains all the mandatory performance data. Where any question exists regarding the correct values to be used or if the field length is critical, the FAA Approved Airplane Flight Manual must be consulted and adhered to. In using the tabulated data, when the gross weight, ambient temperature, or altitude is between the values presented, the next higher value of each should be used. All the tabulated information is based on zero runway gradient. If runway gradient is significant, the FAA Approved Airplane Flight Manual must be used. The obstacle clearance information is presented only in the FAA Approved Airplane Flight Manual and must be consulted when obstacle clearance is a consideration. All data are based on smooth dry hard surface runway conditions. Proper judgment should be exercised if runway conditions are other than as stated.

TAKEOFF

The takeoff performance is based on setting takeoff thrust prior to starting the takeoff roll and retrimming power at approximately 60 KIAS. Rotation is begun at V_R and continued to approximately 10 degrees nose up attitude. The landing gear may be retracted as soon as a positive rate of climb is established. The data, however, are based on the gear activation beginning at 35 feet. With one engine inoperative, the climb is continued to 400 feet at V_2. At 400 feet, the airplane is accelerated to V_2 +10 KIAS, the flaps raised and airplane is accelerated to V_{ENR}. The thrust is set for single engine climb and the climb continued at single engine climb speed.

If an engine is lost during takeoff prior to obtaining V_1 speed, heavy braking is initiated immediately if runway length is critical, throttles are retarded to idle and speed brakes extended.

LANDING

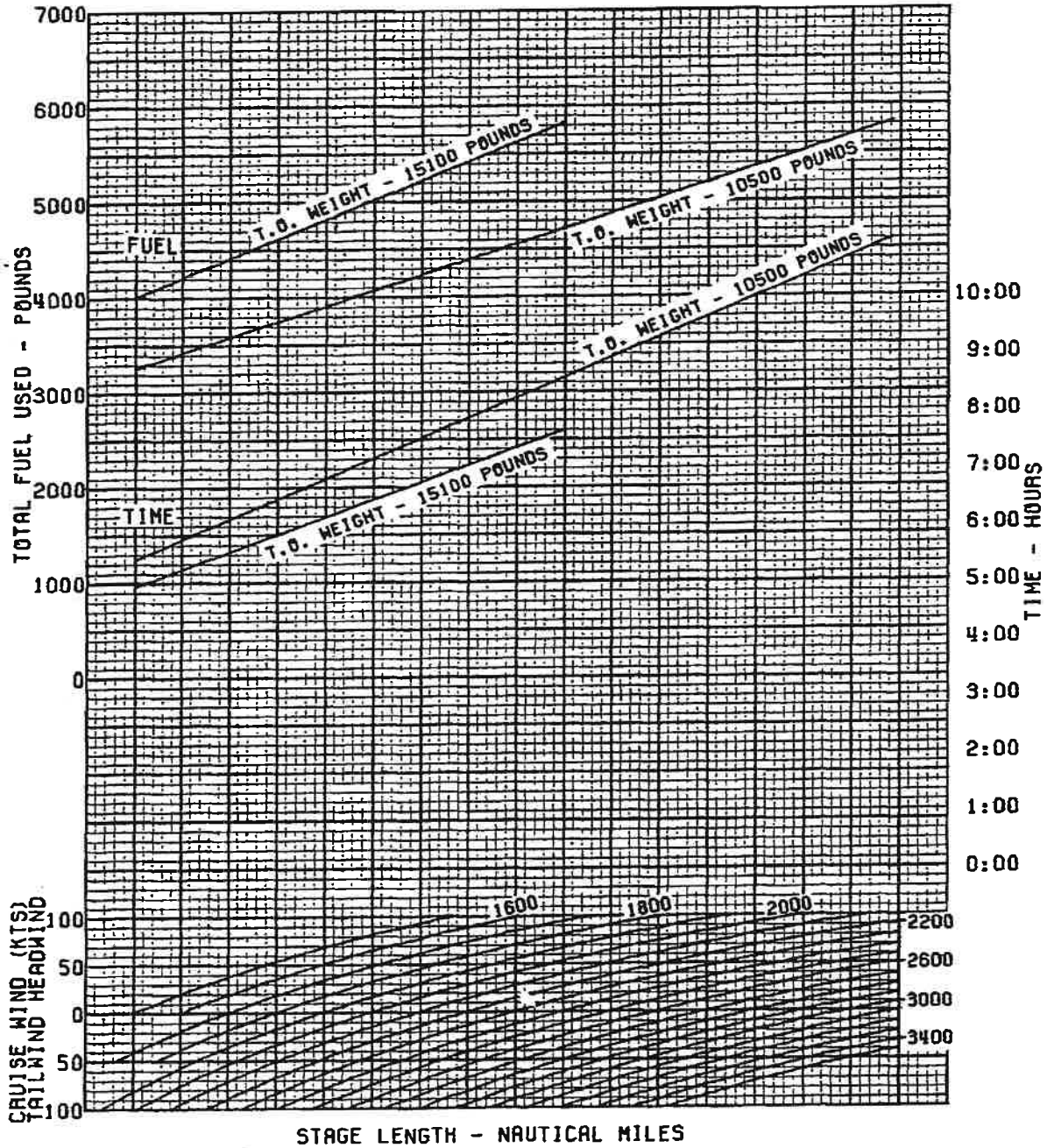
The landing performance charts are based on flying a steady 3° approach at V_{REF} (1.3 V_{SO}) with full flaps extended, to 50 feet above the runway threshold. At that point, thrust is reduced to idle. The landing field length given includes distance from the threshold to touchdown.

LONG RANGE CRUISE

STANDARD DAY **CRUISE ALTITUDE 41,000 FEET**

FAN SETTING FOR LONG RANGE

	WIND	CRUISE WEIGHT 15000	14000	13000	12000	11000
TAILWIND	-100	102.5	100.6	97.9	94.8	91.9
	-50	102.7	101.0	98.7	95.5	92.7
	0	102.9	101.2	99.4	97.3	94.5
HEADWIND	50	103.5	101.5	101.0	98.2	95.7
	100	105.2	102.4	101.1	100.5	97.4



65856018

Figure 7-14 (Sheet 9 of 10)

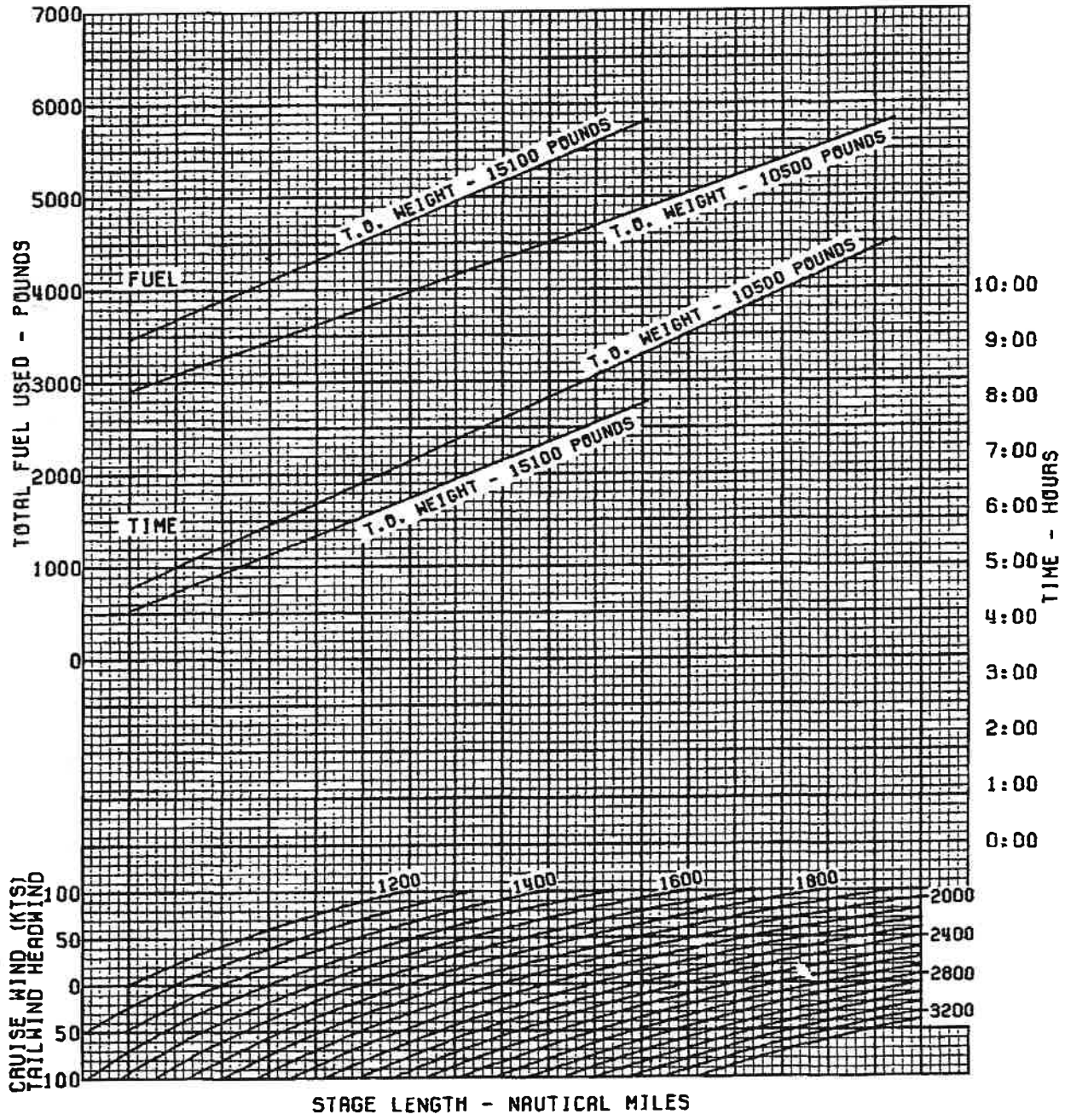
LONG RANGE CRUISE

STANDARD DAY

CRUISE ALTITUDE 37,000 FEET

FAN SETTING FOR LONG RANGE

	WIND	CRUISE WEIGHT 15000	14000	13000	12000	11000
TAILWIND	-100	95.9	93.5	90.9	88.8	86.1
	-50	96.6	94.9	91.7	89.7	87.1
	0	97.8	95.5	93.0	90.7	88.6
HEADWIND	50	99.0	97.1	95.1	92.3	90.7
	100	100.2	98.5	96.8	95.4	94.0



65856016

Figure 7-14 (Sheet 7 of 10)

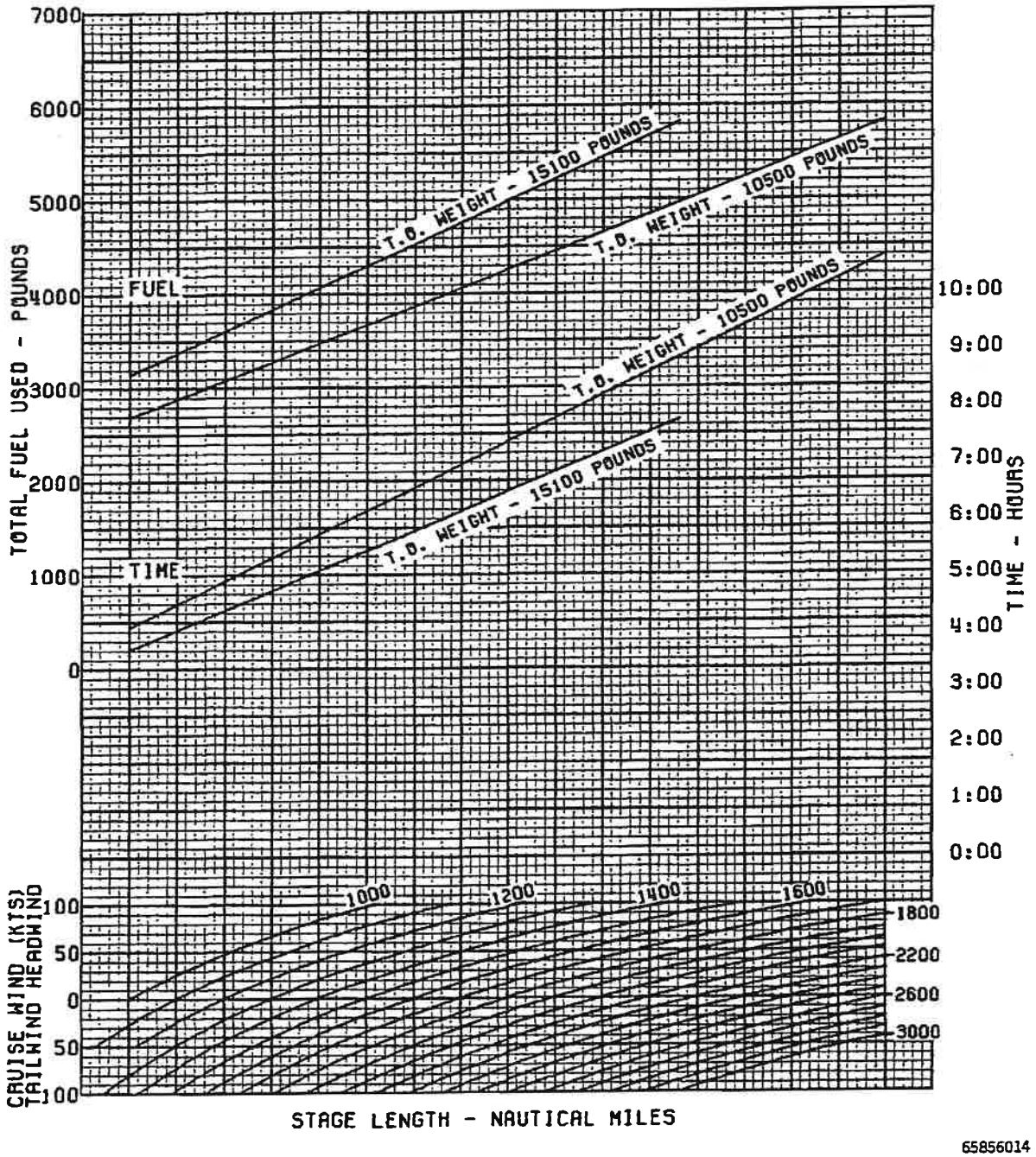
LONG RANGE CRUISE

STANDARD DAY

CRUISE ALTITUDE 33,000 FEET

FAN SETTING FOR LONG RANGE

	WIND	CRUISE WEIGHT 15000	14000	13000	12000	11000
TAILWIND	-100	90.9	88.6	86.5	84.2	81.3
	-50	91.8	89.6	87.4	85.3	82.9
	0	92.8	91.0	89.4	86.8	84.6
HEADWIND	50	95.1	92.9	91.2	89.0	87.2
	100	97.1	95.6	94.8	93.7	91.2



65856014

Figure 7-14 (Sheet 5 of 10)

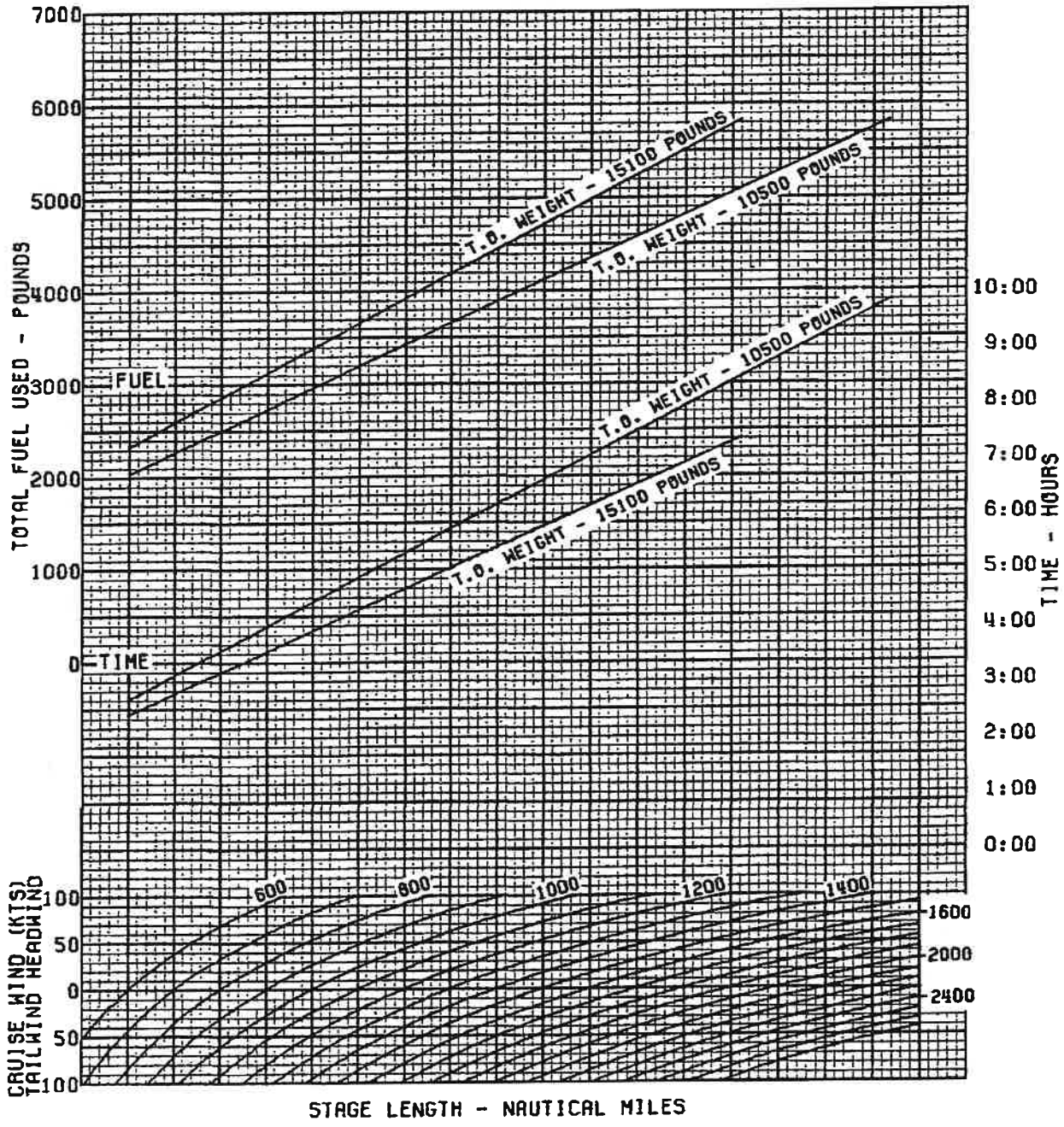
LONG RANGE CRUISE

STANDARD DAY

CRUISE ALTITUDE 27,000 FEET

FAN SETTING FOR LONG RANGE

	WIND	CRUISE WEIGHT				
		15000	14000	13000	12000	11000
TAILWIND	-100	84.3	82.4	80.7	77.9	75.9
	-50	85.6	84.4	81.5	79.7	77.0
	0	87.4	85.4	83.8	81.8	79.1
HEADWIND	50	89.9	88.2	86.5	85.0	83.5
	100	93.3	92.0	91.5	89.5	88.0



65856012

Figure 7-14 (Sheet 3 of 10)

LONG RANGE CRUISE

STANDARD DAY

CRUISE ALTITUDE 19,000 FEET

FAN SETTING FOR LONG RANGE

		CRUISE WEIGHT				
	WIND	15000	14000	13000	12000	11000
TAILWIND	-100	76.9	75.1	73.1	71.0	68.6
	-50	78.4	76.5	74.7	72.7	70.4
	0	80.8	79.1	78.2	75.3	73.4
HEADWIND	50	84.6	83.1	82.1	80.7	79.9
	100	89.6	89.7	88.7	87.0	85.9

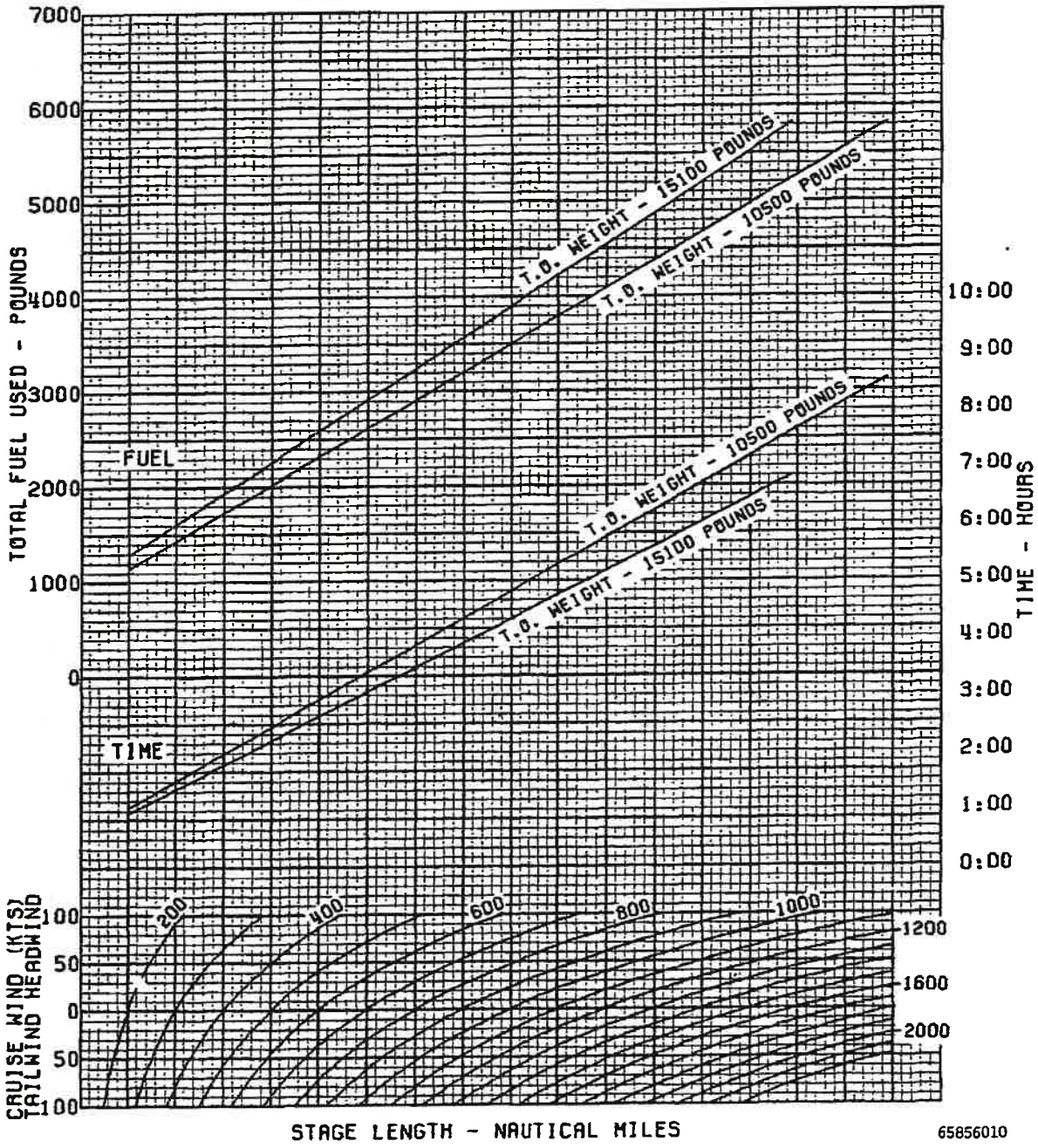


Figure 7-14 (Sheet 1 of 10)

NORMAL CRUISE THRUST

CRUISE (100.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 41,000 FEET**

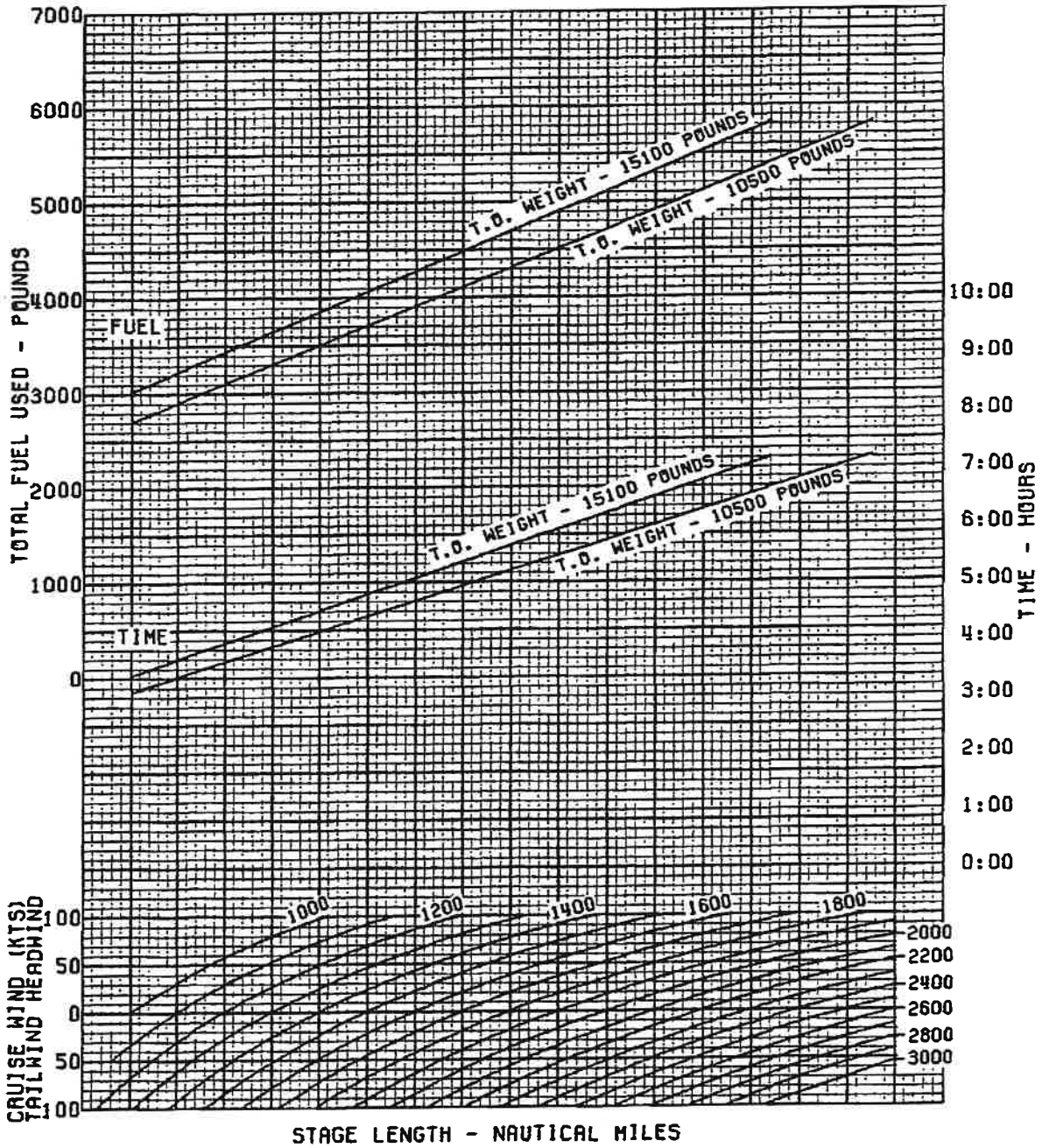


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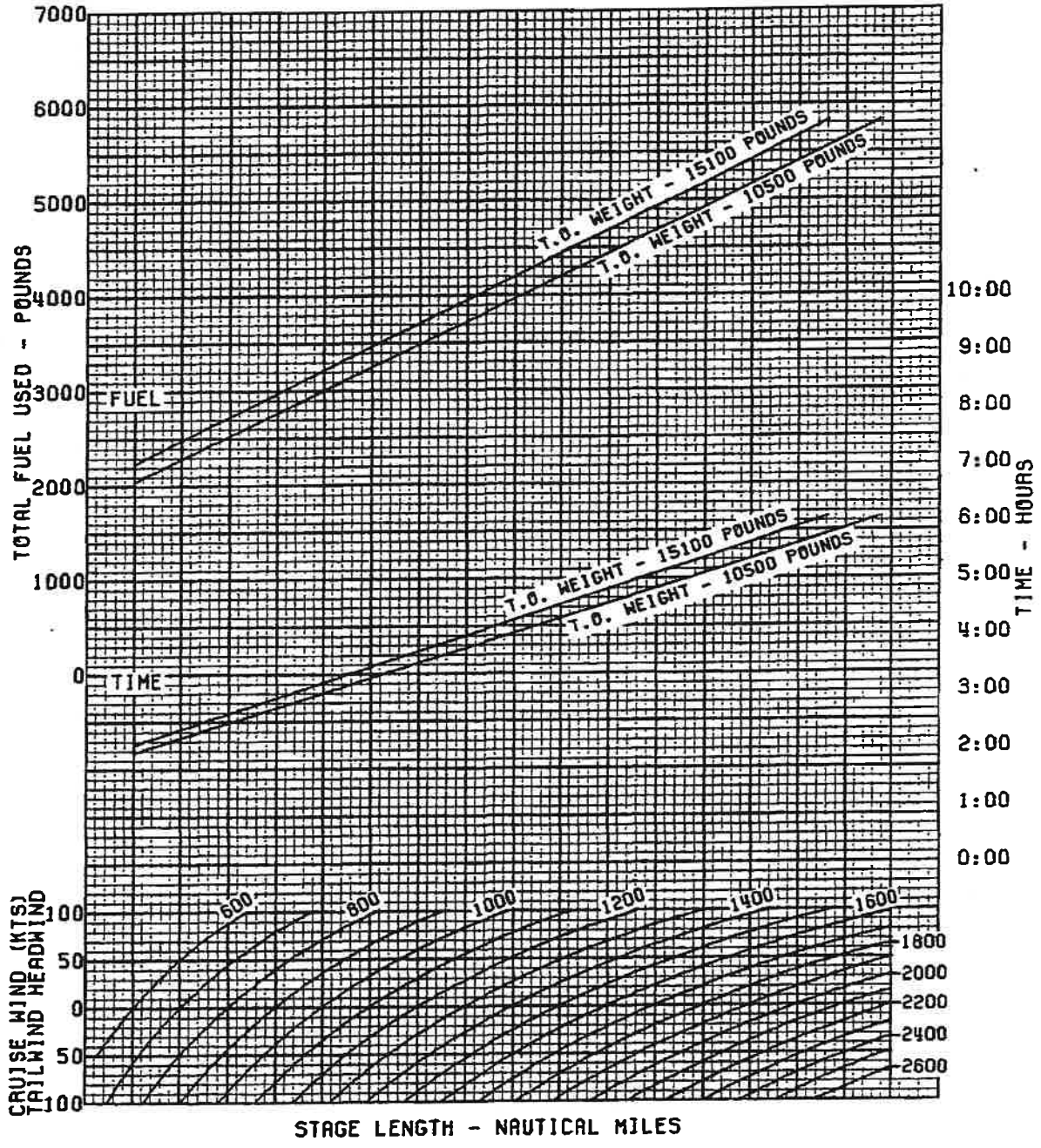
Figure 7-13 (Sheet 7 of 8)

NORMAL CRUISE THRUST

CRUISE (100.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 37,000 FEET**



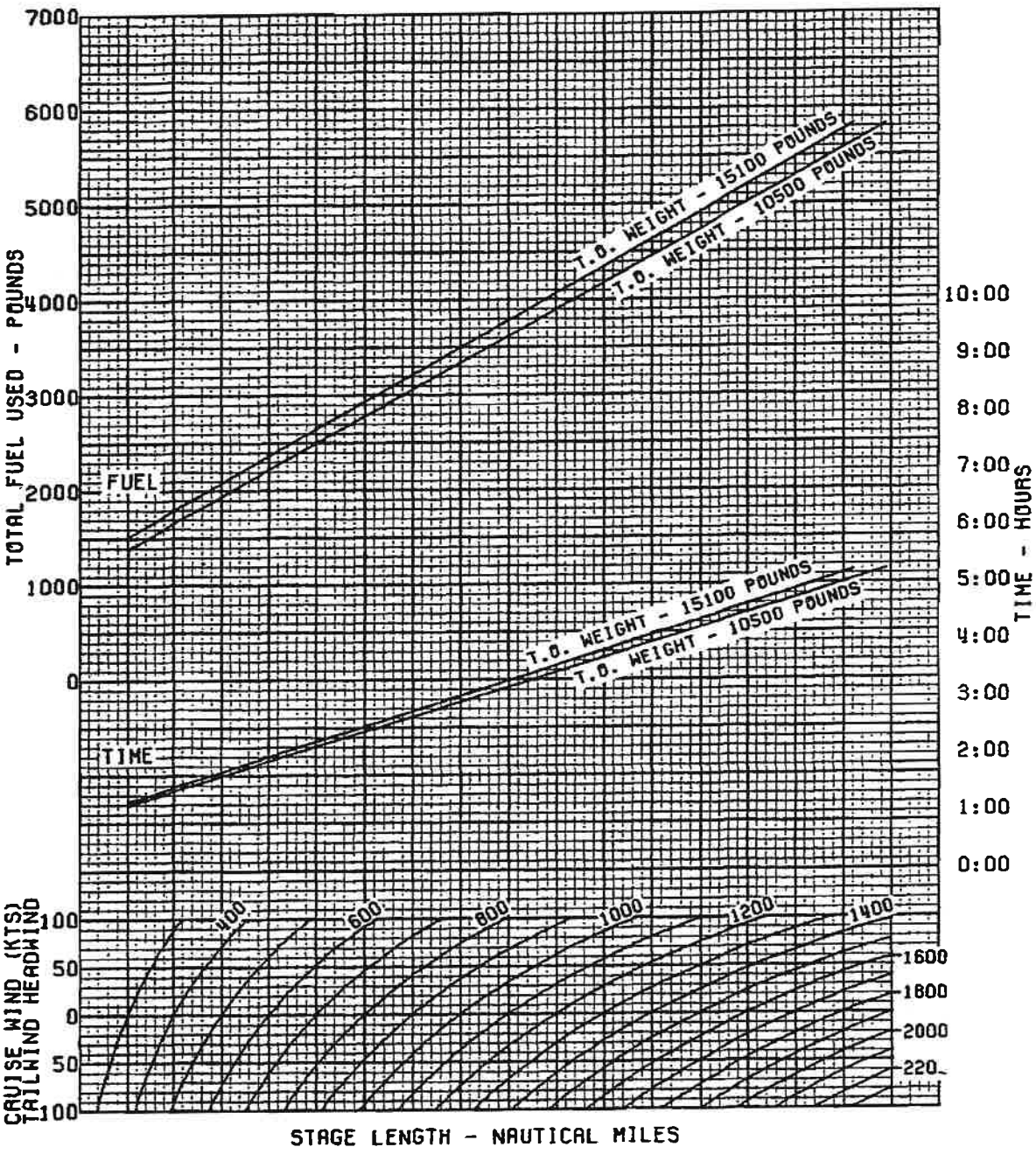
65856024

Figure 7-13 (Sheet 5 of 8)

NORMAL CRUISE THRUST

CRUISE (100.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 33,000 FEET**



65856022

Figure 7-13 (Sheet 3 of 8)

NORMAL CRUISE THRUST

CRUISE (100.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 27,000 FEET**

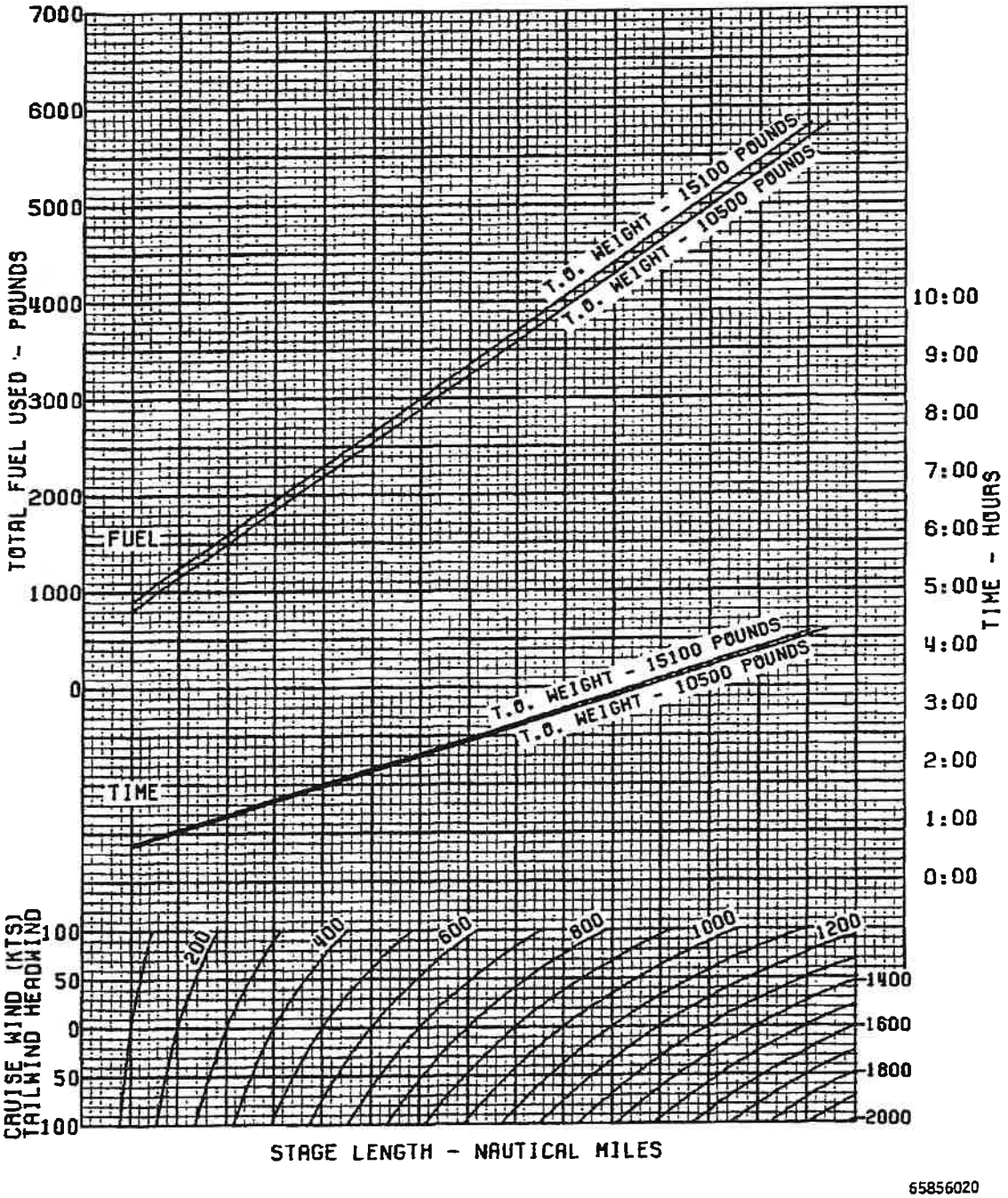
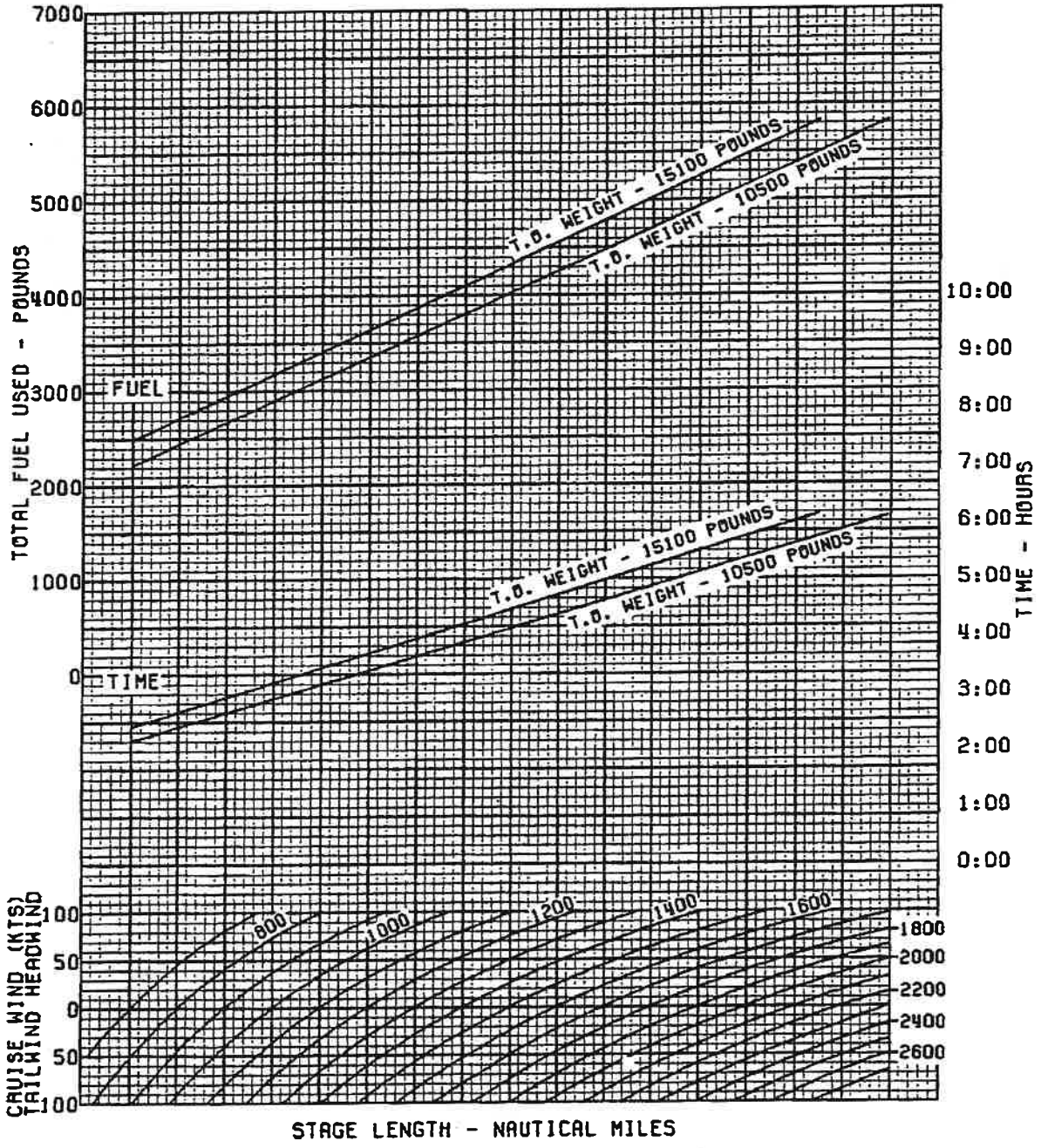


Figure 7-13 (Sheet 1 of 8)

MAXIMUM THRUST

CRUISE (106.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 41,000 FEET**



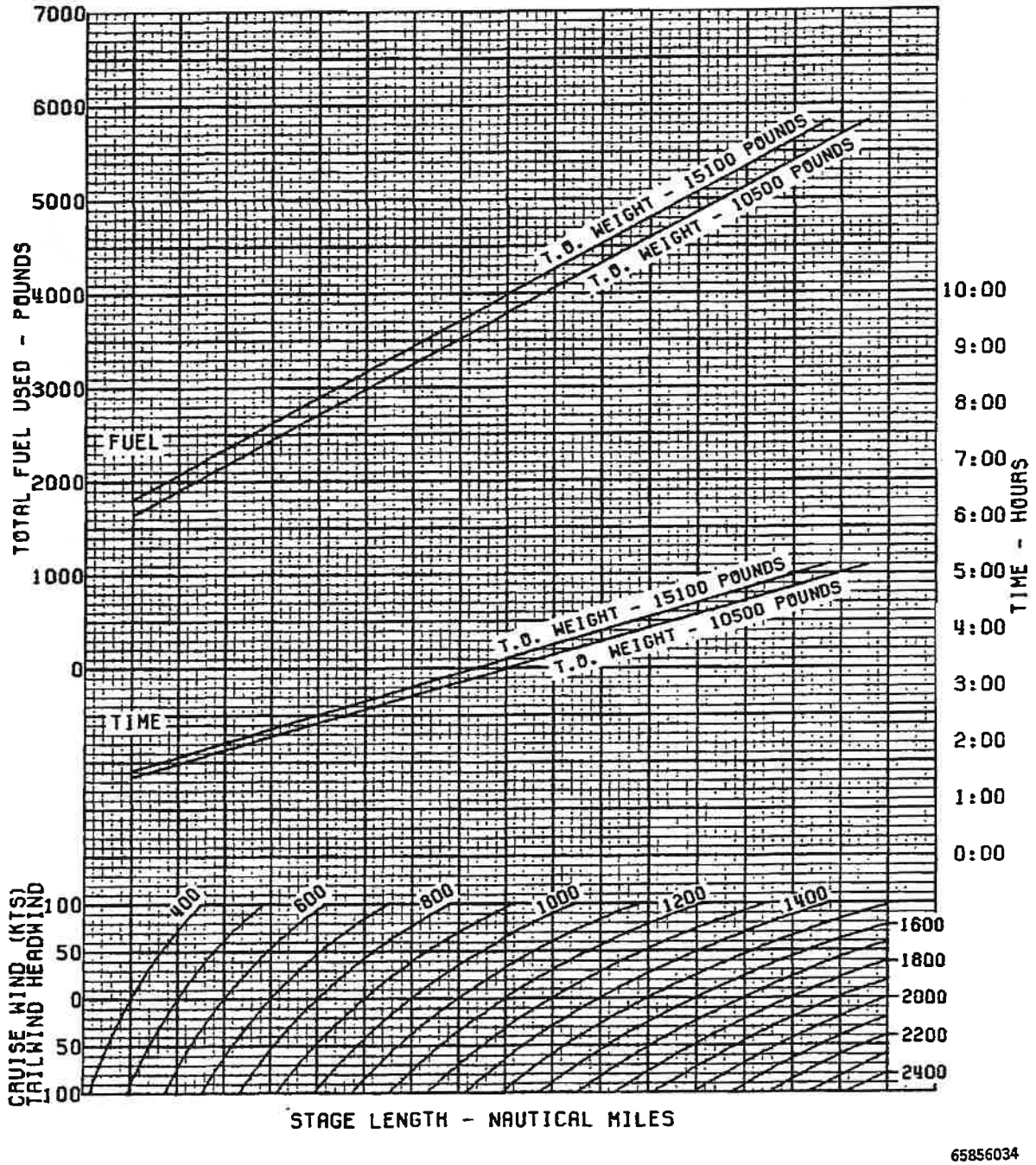
65856036

Figure 7-12 (Sheet 9 of 10)

MAXIMUM THRUST

CRUISE (106.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 37,000 FEET**



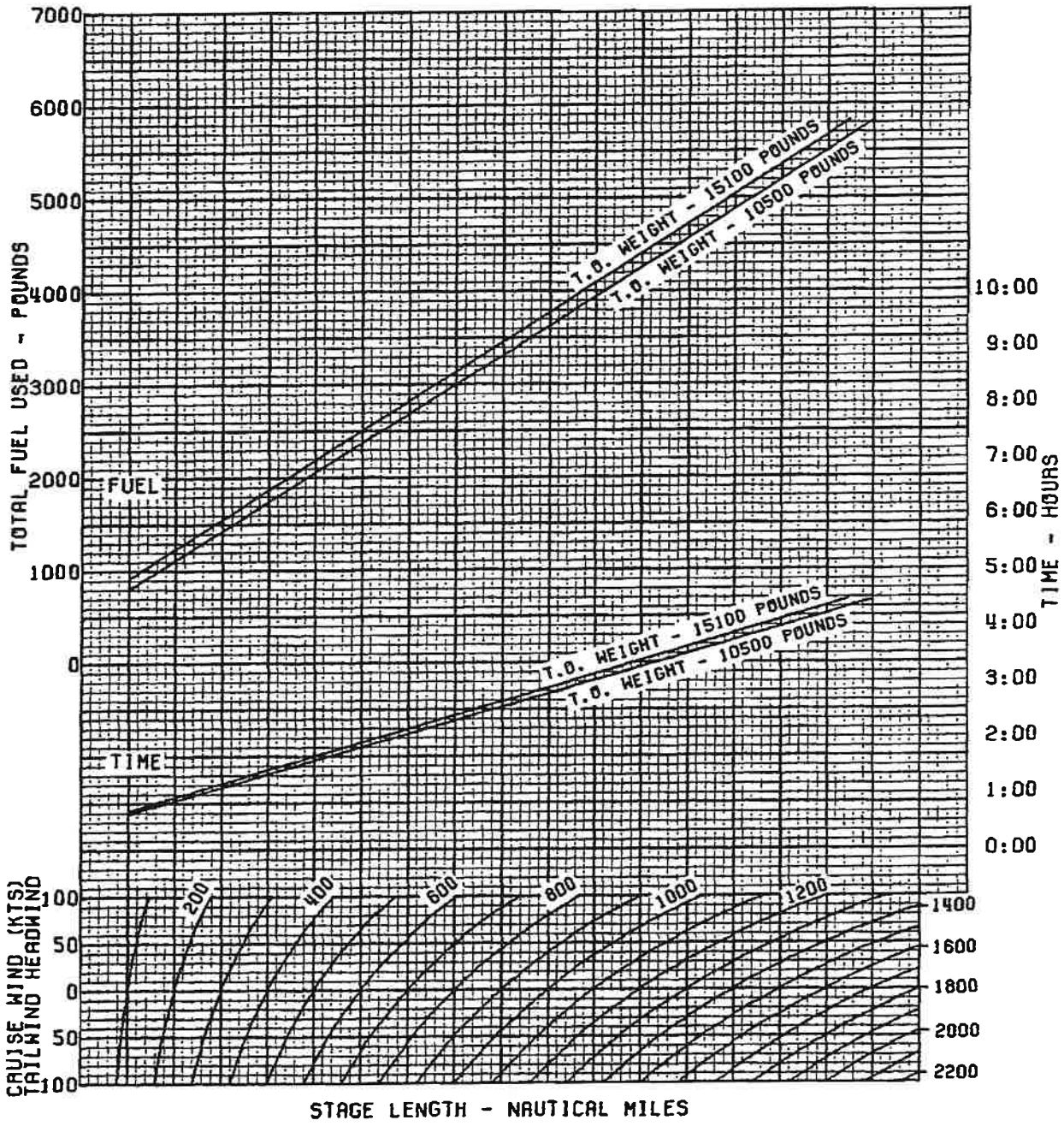
65856034

Figure 7-12 (Sheet 7 of 10)

MAXIMUM THRUST

CRUISE (106.0% N_1)

STANDARD DAY **CRUISE ALITITUDE 33,000 FEET**



65856032

Figure 7-12 (Sheet 5 of 10)

MAXIMUM THRUST

CRUISE (104.5% N_1)

STANDARD DAY **CRUISE ALITITUDE 27,000 FEET**

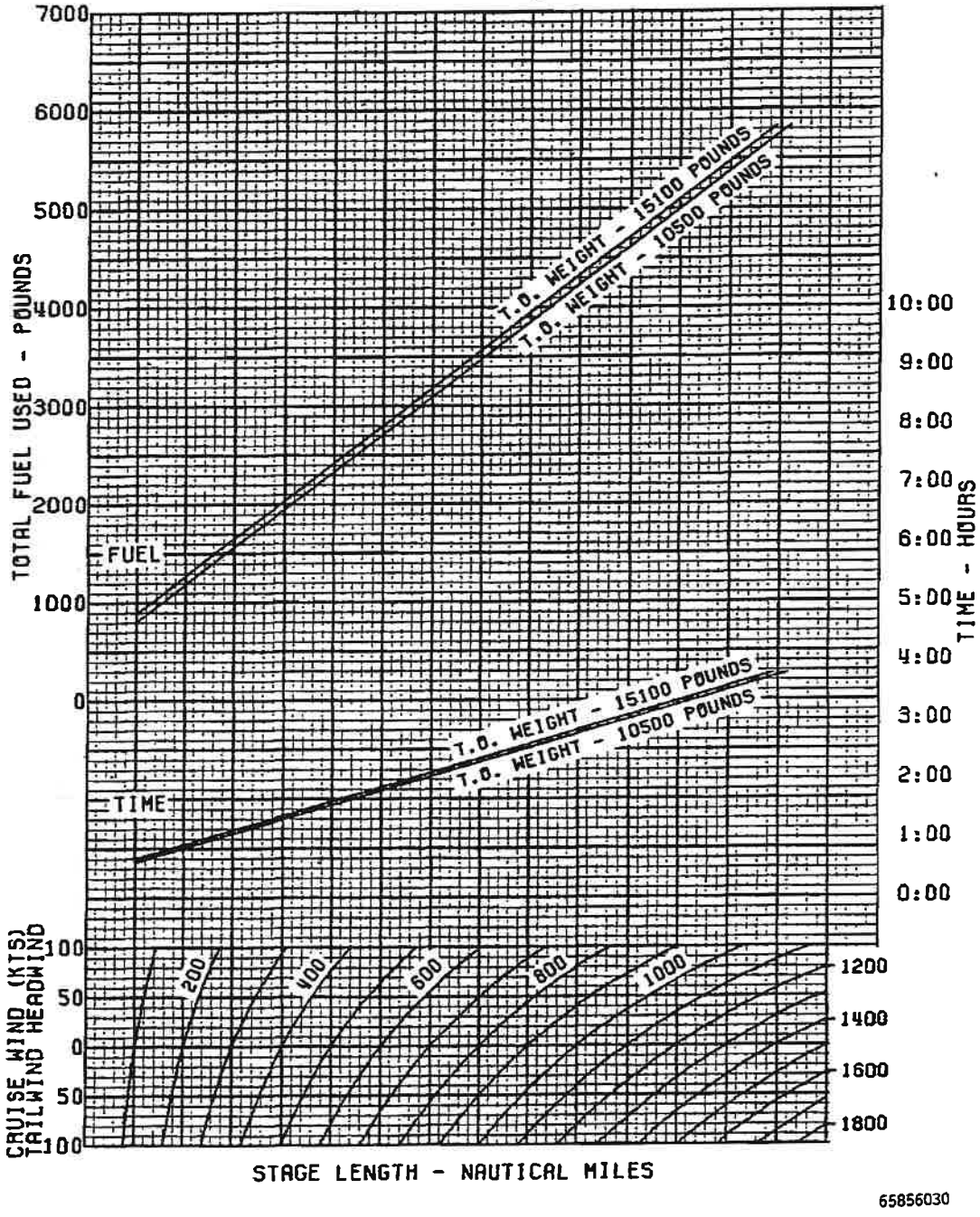


Figure 7-12 (Sheet 3 of 10)

MAXIMUM THRUST

CRUISE (95.3% N_1)

STANDARD DAY **CRUISE ALITITUDE 19,000 FEET**

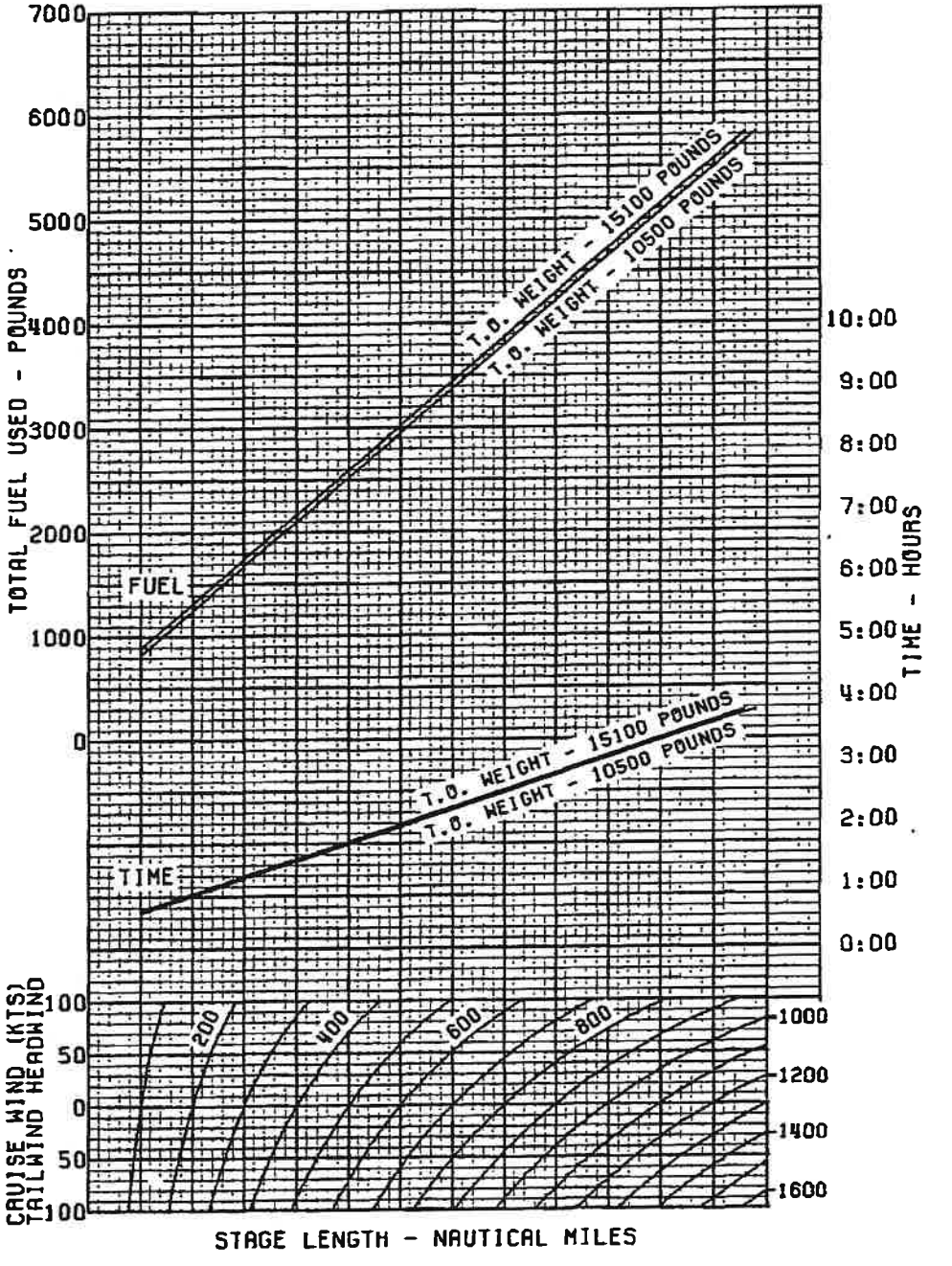


Figure 7-12 (Sheet 1 of 10)

SPECIFIC RANGE VS CRUISE WIND

100% N_1

STANDARD DAY

12,000 POUNDS AVERAGE CRUISE WEIGHT

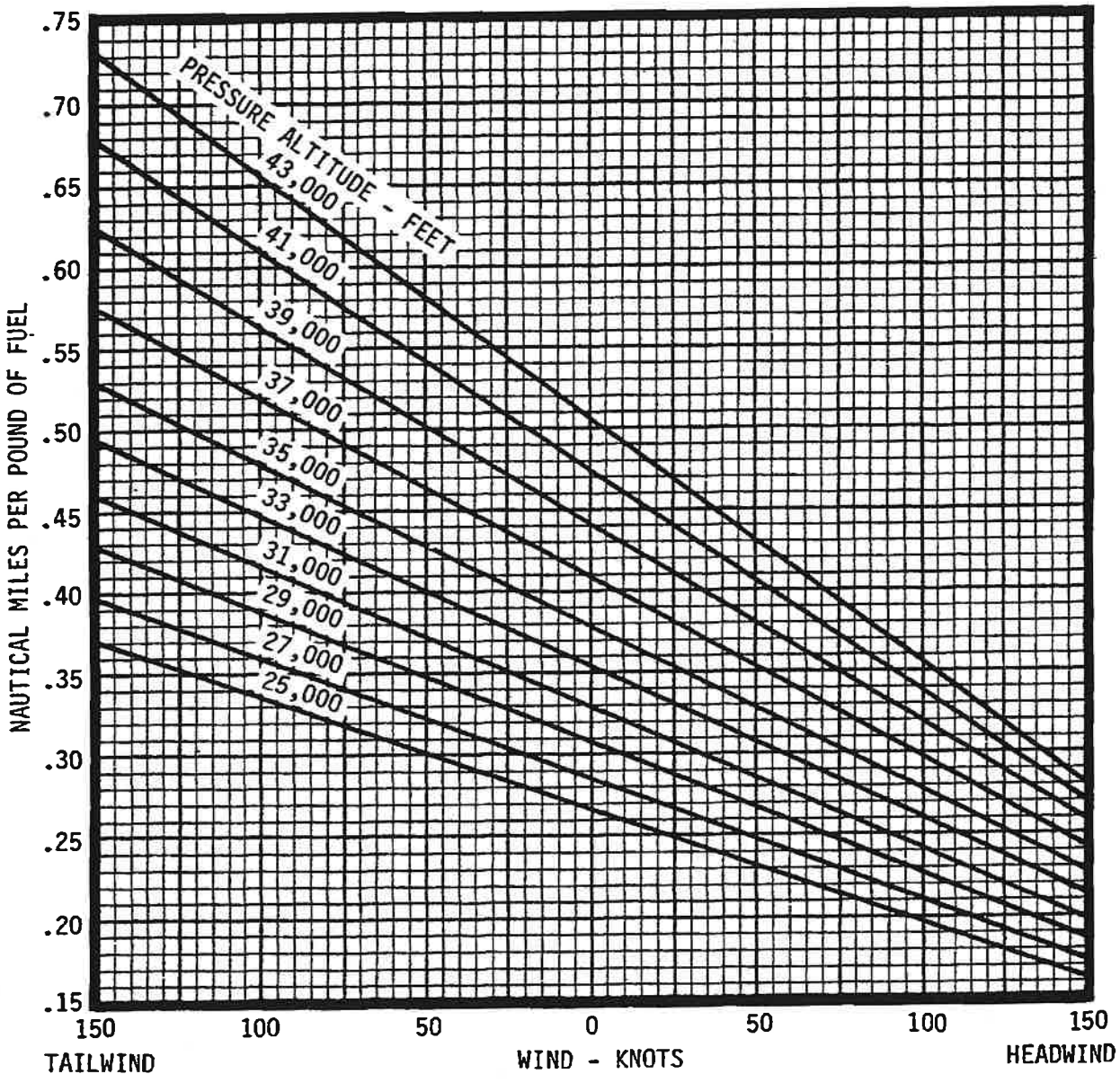


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Figure 7-10

Enter the graph with the headwind or tailwind component at cruise altitude. Read right until intersecting planned stage length and then up to the time line. Time will vary with gross weight so, in most instances, two time lines are shown. Interpolate for gross weights between 10,500 and 15,100 pounds. Trip time is given in hours and minutes on the scale to the right of the graph.

To find trip fuel, continue vertically until intersecting the fuel line. Again, fuel used may vary with gross weight. Interpolate as necessary for gross weights between 10,500 and 15,100 pounds. Total fuel used in pounds is given on the scale to the left of the graph. Reserve fuel requirements can then be added to total fuel used to determine takeoff and landing fuel loads.

If the fuel required is in excess of fuel available or if fuel reserves are inadequate, it may be advantageous to utilize one of the more economical cruise airspeed profiles and repeat the flight planning process. Specific data is presented in the PERFORMANCE chapter for separate computation of the climb, cruise and descent phases. If taxi time is known, 10 pounds per minute fuel flow can be used in lieu of the 200-pound figure.

After airplane loading and flight plan fuel requirements are determined, takeoff, climb and landing gross weights should be rechecked for compliance with the Airplane Flight Manual criteria.

SPECIFIC RANGE VS CRUISE WIND

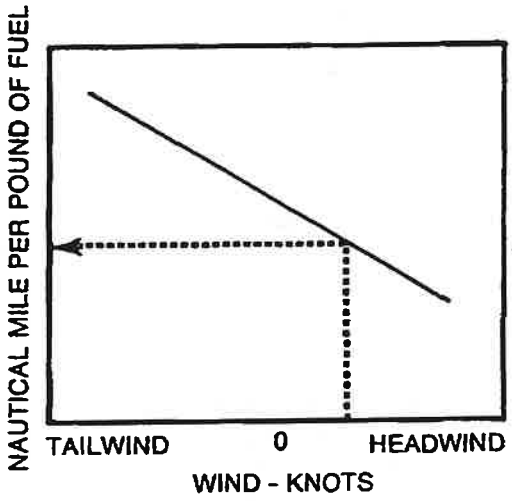
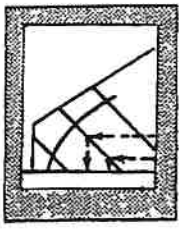


Figure 7-7

Entering with forecast winds, the graph is read vertically until cruise altitude is intersected. Reading horizontally to the left gives specific range in a fraction of a nautical mile per pound of fuel consumed. Moving the decimal two or three places to the right gives distance per 100 and 1000 pounds of fuel respectively. In comparative calculations, the highest number always represents specific range, but high headwinds may suggest an increased power setting to realize a shorter trip time without affecting total fuel burn appreciably. At 35,000 feet with a 90-knot headwind, as an example, long range cruise and maximum cruise thrust give .312 and .262 nautical miles/pounds, respectively. In that case, long range cruise will produce only 50 nautical miles more distance per 1000 pounds of fuel while the ground speed at maximum cruise thrust would be approximately 90 knots faster. However, for the absolute best range or maximum fuel reserve goal, cruising at the altitude/wind/thrust combination with the highest specific range number will produce optimum results.

Climb and descent at maximum speed available to achieve desired vertical rate can be used in conjunction with maximum cruise thrust for the minimum time goal. Fuel economy, however, is better served by using the climb and descent schedules presented in the PERFORMANCE chapter of this section. Optimum range in zero or tailwind conditions dictates a maximum rate schedule to conserve climb fuel for the more efficient operating environment at altitude. With headwinds prevalent, a 225-knot cruise climb schedule may be best to minimize the effect of a lower ground speed. Generally, forecast cruise headwinds of 50 knots or more require a 225-knot cruise climb schedule for best fuel efficiency.

NORMAL CLIMB/MAXIMUM CRUISE THRUST SETTING



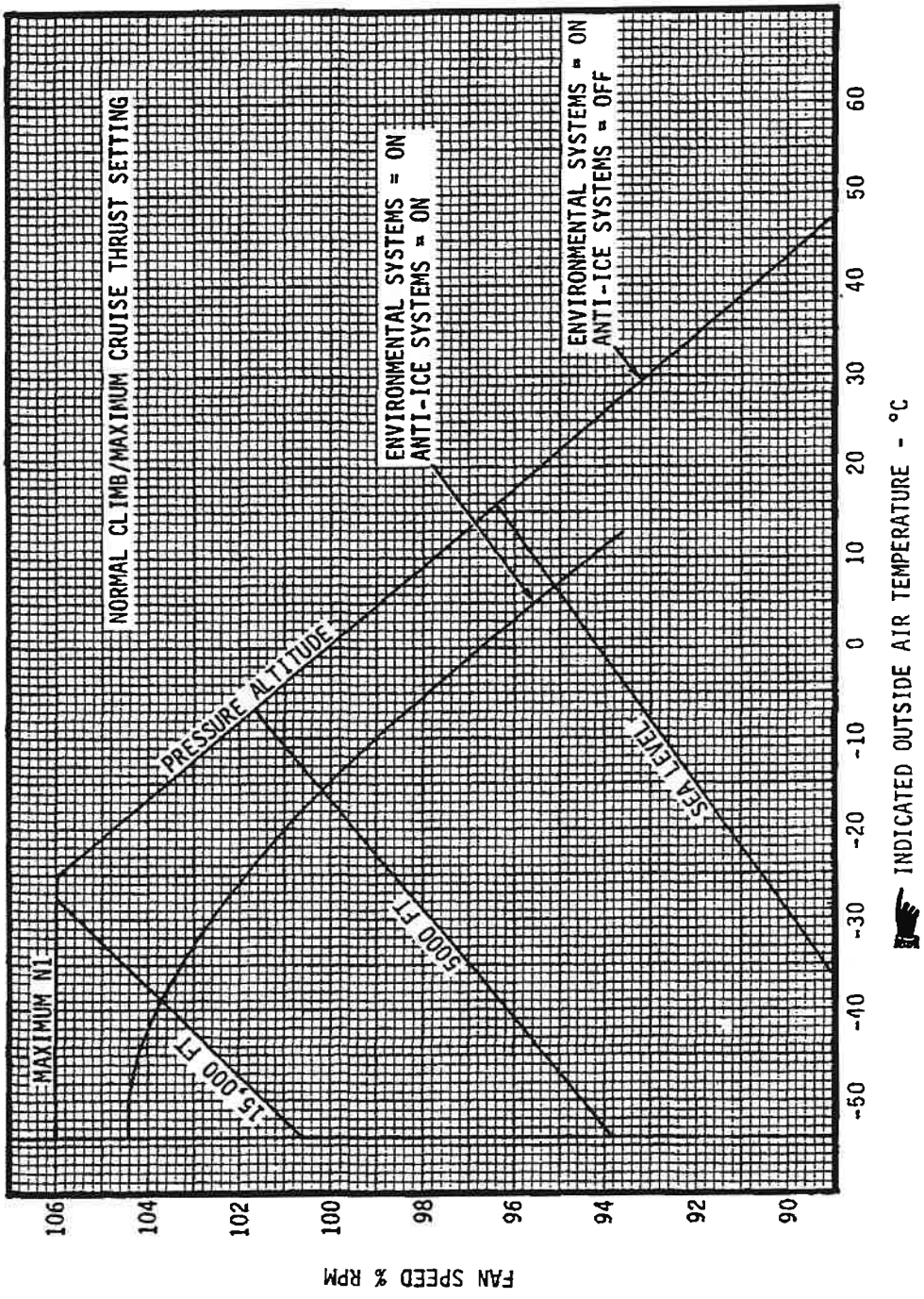


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Figure 7-6

FUEL LOADING TABLE

WEIGHT (POUNDS)	MOMENT/100 ARM VARIES (INCH-POUNDS)
200	570.00
300	850.05
400	1128.40
500	1406.50
600	1684.20
700	1960.70
800	2237.20
900	2514.15
1000	2790.80
1100	3068.12
1200	3346.20
1300	3624.66
1400	3902.64
1500	4181.70
1600	4460.80
1700	4739.94
1800	5020.20
1900	5300.05
2000	5580.00
2100	5860.05
2200	6140.20
2300	6420.45
2400	6700.80
2500	6981.25
2600	7261.80
2700	7542.45
2800	7823.20
2900	8104.05
3000	8385.00
3100	8666.05
3200	8947.20
3300	9228.45
3400	9509.80
3500	9793.00
3600	10076.40
3700	10360.00
3800	10645.70
3900	10929.75
4000	11218.00
4100	11504.60
4200	11792.76
4300	12080.85
4400	12368.40
4500	12656.25
4600	12946.70
4700	13235.20
4800	13524.00
4900	13810.65
5000	14100.00
5100	14389.65
5200	14677.00
5300	14964.55
5400	15252.30
5500	15541.35
5600	15816.64
5700	16104.21
5800	16392.54
5900	16680.46

1663-3

Figure 7-4

6. Enter the Airplane Basic Empty Weight and Moment from the Airplane Weighing Form on the Weight and Balance Computation Form.
7. Total the Basic Empty Weight and Payload and check the zero fuel weight.

NOTE

To check approved limits, locate the weight on the Center-of-Gravity Limits Envelope Graph (refer to Figure 7-5.) Approved points are points located below the Zero Fuel Weight Line.

8. Determine the zero fuel weight center-of-gravity on the Weight and Balance Computation Form; divide moment by weight and multiply by 100.
9. Use the Fuel Loading Table (refer to Figure 7-4) to determine the moment for the amount of fuel being loaded for the flight. Enter the weight and moment of the fuel in the Weight and Balance Computation Form.
10. Total zero fuel weight and fuel loading to obtain ramp weight.

NOTE

To check approved limits, locate the weight on the Center-of-Gravity Limits Envelope Graph (refer to Figure 7-5). Approved points are points located below the Maximum Ramp Weight line.

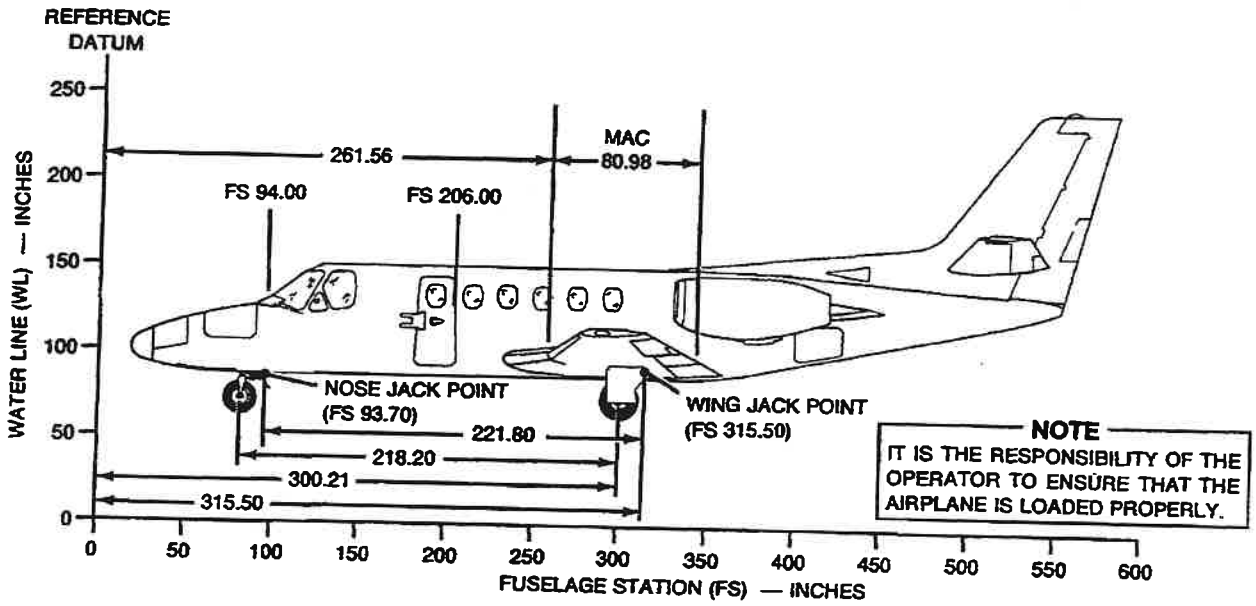
11. Subtract the fuel and moment used for taxi. A standard 200-pound burnoff is assumed. The moment for the taxi fuel is determined by the difference in moments of the fuel loaded and the fuel remaining on board after taxi. Check takeoff weight and moment for approved limits.

NOTE

To check approved limits, divide moment by weight and multiply by 100 and obtain center-of-gravity. Locate the weight versus center-of-gravity point on the Center-of-Gravity Limits Envelope Graph (refer to Figure 7-5). Approved points are points located inside the shaded area.

12. Determine the estimated weight of the fuel to be used to arrive at the destination. The moment is determined by the difference in moments of the fuel remaining after taxi and the fuel remaining after reaching destination. Enter the weight of the fuel burned and the moment in the Weight and Balance Computation Form.

AIRPLANE WEIGHING INFORMATION



1663-1

Figure 7-2

Depending on airplane gross weight, the center-of-gravity of a loaded airplane can move from 277.99 inches to 284.23 inches aft of Datum and remain within limits.

As the airplane is loaded, the center-of-gravity will shift. The amount of shift is dependent on not only the weight added, but the distance the weight is placed from the original center-of-gravity. Both of these factors can be considered by multiplying the weight added by the distance from the Reference Datum Line to produce the loading moment. This information is presented in table form in the Crew and Passenger, Cabinet, Baggage and Fuel Loading Moments tables.

The contribution each load station makes to center-of-gravity shift can be seen by comparing the respective center-of-gravity arm lengths given in the Weight and Moment Table. Any weight placed in the aft baggage bay will shift the center-of-gravity aft since it is aft of the typical standard empty weight center-of-gravity.

Adding fuel, passengers or baggage (in the nose compartment) will shift the center-of-gravity forward since it is forward of the typical standard empty weight center-of-gravity. The magnitude of the shift for any given weight is proportional to the length of the moment arm.