LEVEL III

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TRASANA

TECHNICAL REPORT NO. 3-78

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FLIGHT PROFILE PERFORMANCE HANDBOOK

VOLUME VIIB – CH-47B (CHINOOK)

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DEPARTMENT OF THE ARMY
US ARMY TRADOC SYSTEMS ANALYSIS ACTIVITY
WHITE SANDS MISSILE RANGE
NEW MEXICO 88002

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TRASANA

(9) TECHNICAL REPORT, NO. 3-78

(6) # FLIGHT PROFILE PERFORMANCE HANDBOOK.

VOLUME VIIB, CH-47B (CHINOOK)

AD-E

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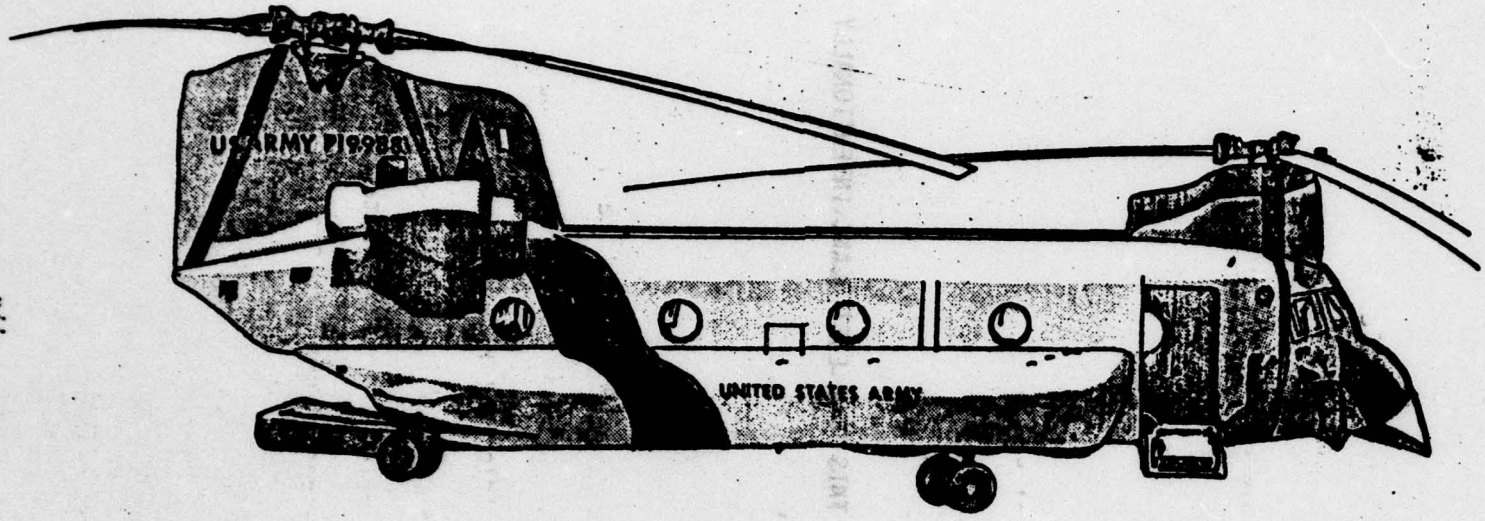
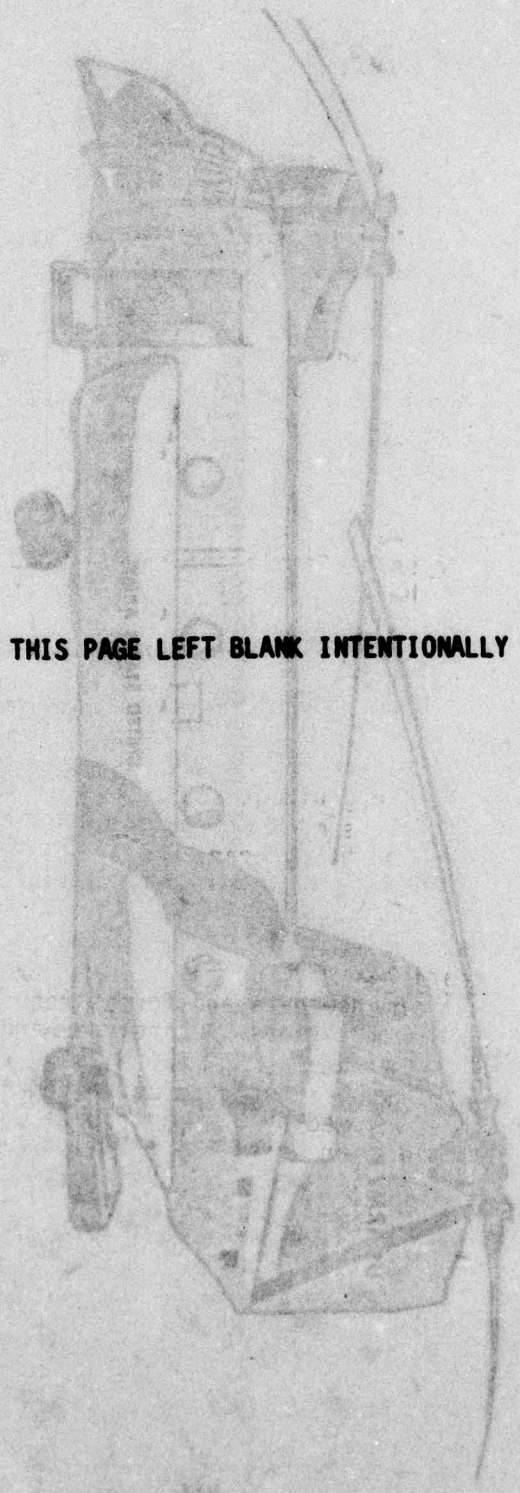


CH-47 CHINOOK



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CHAPTER 1

INTRODUCTION

1. PURPOSE

The purpose for preparing this handbook series is fourfold: (a) to validate CHINOOK performance data quickly, (b) to reduce the manpower and time to prepare accurate flight profiles, (c) to standardize performance data so that the analysis community can benefit from a single reference in conducting studies and (d) to provide a handbook that can be used for training in the mission profile planning area.

2. BACKGROUND

The CHINOOK performance data contained in this Flight Profile Performance Handbook (FPPH) series was originally acquired as a data base for the Aircraft Mission Processing Simulation (AMPS) model. AMPS is a computer program developed by the Aviation Systems Analysis Branch of the US Army TRADOC Systems Analysis Activity (TRASANA) to support Cost and Operational Effectiveness Analyses (COEAs). AMPS generates detailed flight profiles for a wide variety of helicopter missions. The data was provided TRASANA by the Army Aviation Research and Development Command (AVRADCOM) and was the most accurate data available to AVRADCOM at the time of handbook publication. In structuring the data base for AMPS it was noted that the data, when properly organized, could provide a method of doing quick and simple flight profile simulations. This volume presents the CHINOOK data and explains how it can be used.

3. OBJECTIVES OF THE HANDBOOK

a. Data Validation. This volume of the handbook contains tables with the precise performance data and format required to develop flight profiles for computer simulations. Using the handbooks as a reference, the individual project manager (PM) will be able to quickly validate or update as required all associated data contained in the different tables. If this procedure is followed by the various PMs, support of Helicopter COEAs and other analyses can be efficiently implemented.

b. Flight Profile Development. Much of the manpower and time spent in preparing flight profiles for supporting aircraft COEAs is dedicated to look-up, correlation and validation of performance data. Once the procedure contained in this handbook is implemented, flight profiles can be easily prepared. What normally took one man 4 to 5 days to prepare can now be prepared in 3 to 4 hours.

c. Standardization of Performance Data. Each of the PMs has been contacted by AVRADCOM to validate the performance data contained in each handbook in this series. Once each handbook is published, the data contained will be kept current as of the publication date. Since the requests for current information are constantly being forwarded to the PMs by analysis groups, this handbook can be a reference and assure a commonality in studies within the community.

d. Training for Planning Missions and Flight Profiles. For training purposes each handbook can stand alone. It is only a matter of following the example provided and applying the proper data to fit the flight profile desired. Although the example shown is simplistic, the methodology may be expanded to apply to any flight profile no matter how complex.

4. OTHER VOLUMES

This handbook is one of a series that covers the helicopters in the US Army inventory. The complete set of handbooks and their subjects are:

Volume I - FPPH Description

Volume II - UH-60A (BLACKHAWK)

Volume III - AH-1G (COBRA)

Volume IV - AH-1S (COBRA)

Volume V - YAH-64 (Advanced Attack Helicopter [AAH])

Volume VI - OH-58C (KIOWA)

Volume VII - CH-47 (CHINOOK)

Volume VIII - CH-54 (TARHE)

Volume IX - UH-1H (HUEY)

5. GENERAL HANDBOOK DESCRIPTION

a. Performance Data. The data contained in these volumes is CHINOOK performance data compiled from the results of actual experiments. It is not engineering data and is not intended to serve as a base for future helicopter construction or acquisition. The more mature the helicopter becomes, the less likely there will be a change in the basic performance data.

b. Handbook Organization. This volume is one of a series of volumes as identified in paragraph 4 above. Volume I is a description of the methodology used to develop the tables for each of the other volumes. This volume and all other volumes except Volume I provides a simplified flight profile example in Chapter 2. Chapter 3 provides an explanation of each of the five types of data tables contained in the handbook. The five types of tables deal with: (1) Basic Fuel Flow Data, (2) Delta Fuel Flow for Drag Data, (3) Ground Idle Fuel Flow Data, (4) Gross Weight Limits Data and, (5) Velocity Limits data. Chapter 4 contains the actual tables to be used for developing flight profiles.

c. Volume VII Organization. The US Army has four different versions of the CH-47 CHINOOK. Due to the large amount of data for these four versions and to allow for easier reference, there is a separate section of Volume VII for each. Volume VIIA contains data for the CH-47A. In the same manner, Volume VIIB contains CH-47B data, Volume VIIC contains CH-47C data, and Volume VIID contains CH-47D data.

6. CH-47B OPERATION RATES

The CH-47B engine operates at two different rates which are dependent on the aircraft's gross weight. At gross weights of 37,000 lbs or less the engine runs at 225 RPM, above 37,000 lbs the rate is 230 RPM. Consequently, separate tables are provided in this volume for the different RPMs. The tables for 225 RPM are in Chapter 4 of this volume, while Chapter 5 contains the tables for 230 RPM.

CHAPTER 2

FLIGHT PROFILE EXAMPLE

1. GENERAL

This chapter provides an example of how to develop a flight profile, albeit simple, that can be extended to cover any number of stops, loads and distances all depending on helicopter capability and fuel available.

2. DISCUSSION

a. The main question this example of a flight profile will answer is, "Do I have enough fuel to fly the proposed mission?"

b. Suppose a pilot is to fly a simple resupply mission in a CH-47B CHINOOK helicopter that calls for flying (as shown in illustration 2-1) from point A (the air base), to point B (the pick up area) to point C (the drop off area) and return to A.

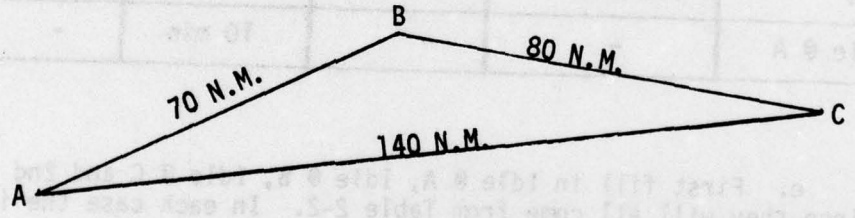

Illustration 2-1

c. The other information given is airspeed (AS) from A to B which is to be 70 knots (kts), from B to C 40 kts, and from C to A 70 kts. The CHINOOK helicopter is to be flown, at 4,000 ft for all legs at an ambient temperature of 15°C, and an idle altitude for take off, pick-up and drop off areas (ground level) of 2000 ft*. The mission plan also shows 10 minutes idle at A before take off, 20 minutes idle at B while loading, 20 minutes idle at C while unloading and 10 minutes idle on return to A before shut down. The CHINOOK will be flown empty at a gross weight (GW) of 20,000 lbs from A to B and from C to A, while the cargo from B to C will be 12,000 lbs.

**All altitudes are in reference to sea level.*

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d. The flight plan is prepared by drawing up a table similar to Table 2-1 below. By filling in the blanks under fuel, it can be determined if the total is too large for the helicopter.

TABLE 2-1

Helicopter: CHINOOK (CH-47B)

Altitude: 4000 ft flight/2000 ft idle

Temperature: 15°C

LEG	DISTANCE	AS	TIME	GW (lbs)	FUEL
Idle @ A	-	-	10 min	-	
A-B	70 N.M.	70 kts	1 hr	20,000	
Idle @ B	-	-	20 min	-	
B-C	80 N.M.	40 kts	2 hr	32,000	
Idle @ C	-	-	20 min	-	
C-A	140 N.M.	70 kts	2 hr	20,000	
Idle @ A	-	-	10 min	-	

e. First fill in Idle @ A, Idle @ B, Idle @ C and 2nd Idle @ A since they will all come from Table 2-2. In each case the idle is at 2000 ft and a temperature of 15°C. Consulting the ground idle fuel shown in Table 2-2, the value of 1124 lbs/hr is at the intersection of 2000 ft and 15°C.

1st Idle @ A = 1/6 X 1124 = 187 lbs

Idle @ B = 1/3 X 1124 = 375 lbs

Idle @ C = 1/3 X 1124 = 375 lbs

2nd Idle @ A = 1/6 X 1124 = 187 lbs

TABLE 2-2

GROUND IDLE FUEL FLOW

AIRCRAFT - CH-47B

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	1220	1164	1072	1000	932	860
	-5 C	1200	1144	1052	980	912	840
	15 C	1180	1124	1032	960	892	820
	35 C	1160	1104	1012	940	872	800

ENTRIES ARE AIRCRAFT FUEL FLOW RATES IN LBS/HR

TABLE 2-3

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1549	1673	1560	1447	1332	1336	1436	1714	2178	2788
24,000	1775	1934	1790	1645	1489	1467	1549	1815	2268	2914
28,000	2008	2208	2024	1841	1648	1610	1684	1931	2376	3010
32,000	2249	2521	2291	2060	1832	1769	1836	2070	2511	3107
36,000	2530	2862	2588	2313	2032	1946	2006	2229	2673	3312
37,000	2603	2955	2668	2382	2084	1992	2053	2273	2721	3391

Notice the conversion from minutes to hours. These values must be used because fuel flow is in lbs/hr.

f. The fuel flow for the three legs of the mission are calculated next. The heading on Table 2-1 shows a need for the Basic Fuel Flow data chart for the CHINOOK helicopter flying at 4000 ft and at 15°C ambient temperature. Table 2-3 contains the necessary information.

(1) Leg A-B is at 70 kts and 20,000 lbs. This is not one of the values given but 60 kts is 1332 lb/hr and 80 kts is 1336 lb/hr. Interpolation gives the value of 1334 lb/hr for a 70 kts airspeed. Since the leg is one hour long:

Leg A-B = 1 X 1334 = 1334 lbs

(2) Leg B-C is at 40 kts and 32,000 lbs. This value is in the table; 2060 lbs/hr. Since the leg is two hours long:

Leg B-C = 2 X 2060 = 4120 lbs

(3) Leg C-A is at 70 kts and 20,000 lbs. This fuel flow rate was computed above to be 1334 lbs/hr. Since the leg is two hours long:

Leg C-A = 2 X 1334 = 2668 lbs.

g. The flight profile can be finished by filling in Table 2-1 as shown in Table 2-4.

TABLE 2-4

Helicopter: CHINOOK (CH-47B)
Altitude: 4000 ft flight/2000 ft Idle
Temperature: 15°C

LEG	DISTANCE	AS	TIME	GW (lbs)	FUEL
Idle @ A	-		10 min	-	187 lbs
A-B	70 N.M.	70 kts	1 hr	20,000	1334 lbs
Idle @ B	-	-	20 min	-	375 lbs
B-C	80 N.M.	40 kts	2 hr	32,000	4120 lbs
Idle @ C	-	-	20 min	-	375 lbs
C-A	140 N.M.	70 kts	2 hr	20,000	2668 lbs
Idle @ A	-	-	10 min	-	187 lbs
				Total	9246 lbs

h. Although only two look-up tables were used for this example, each type of table has several conditions that are changed so that a wide band of performance parameters can be addressed. The discussion on each of the five types of tables is contained in Chapter 3. A succinct description of each of these five types of tables is:

(1) Basic Fuel Flow Data: Gives the rate the aircraft uses fuel dependent on the given flight conditions.

(2) Delta Fuel Flow for Drag Data: Gives the additional rate of fuel flow to be added to the basic rate for external drag.

(3) Ground Idle Fuel Flow Data: Gives the rate fuel is used when the aircraft is on the ground with its engine running.

(4) Gross Weight Limits Data: A check on whether or not the aircraft has enough lift to take off with a given weight.

(5) Velocity Limits Data: Gives the optimum (long range) speed and maximum rates of speed.

CHAPTER 3

PERFORMANCE DATA TABLE DESCRIPTIONS

1. GENERAL

This chapter describes each of the five basic type tables used for developing flight profiles. The variables within each type of table are described as well as how the specific data required can be extracted.

2. BASIC FUEL FLOW DATA

a. The basic rate of fuel flow* is determined by five variables:

(1) Type of aircraft

(2) Altitude (Air Pressure)**

(3) Temperature***

(4) Gross Weight****

(5) Flight Mode

b. In each table (see Table 3-1) within the basic type, the first three variables are held constant for the whole table, i.e., (a) Type of Aircraft, (b) Altitude (Air Pressure) above sea level, and (c) Temperature. These variables are stated at the top of each table.

c. There are six rows of fixed gross weights for 225 RPM: 20,000 lbs, 24,000 lbs, 28,000 lbs, 32,000 lbs, 36,000 lbs, and 37,000 lbs. (Table 3-1) There are four rows of fixed gross weights for 230 RPM: 37,000 lbs, 38,000 lbs, 39,000 lbs, and 40,000 lbs. (Table 3-2) The ten columns are fixed flight modes.

(1) The first column is Hover In Ground Effect (HIGE). HIGE is used for hovers at a height of 10 feet or less and a component of forward flight 10 kts or less.

(2) The second column is Hover Out of Ground Effect (HOGE). This is used for hovers at a height of more than 10 feet.

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*The basic fuel flow data represents a clean drag configuration with all doors closed, no wing stores, and no external sling loads.

**All altitudes or air pressures are feet above sea level.

***For simplicity, all temperatures are considered to be the average temperature in which the helicopter is operating (Degrees Centigrade).

****Total vehicle weight in pounds.

(3) The third column is Nap of the Earth (NOE). This is defined as all flight for variable speeds from 0 to 40 kts and variable altitudes.

(4) The remaining seven columns are for given airspeeds* (in kts) as the flight mode.

d. There are 24 of these basic fuel flow charts. Each chart is for a different combination of Air Pressure (Altitude) and temperature.

e. The Basic Fuel Flow Data is the main table used in simulating a flight profile. For example, assume a pilot's flight path will require 30 minutes of flight at 80 kts airspeed, 4000 ft. altitude, 15°C and a gross weight of 28000 lbs in a CH-47B helicopter. Using Table 3-1 at a gross weight of 28000 lbs and an airspeed of 80 kts, the helicopter will use 1610 lbs/hr fuel, i.e., for 30 minutes, 805 lbs of fuel will be used.

f. The gross weight values selected provide the basic range of load carrying capability for the ten flight modes of the CHINOOK helicopter. Within the gross weight band shown, linear interpolation** is quite accurate for estimating the fuel flow rates.

g. For example, using Table 3-1, if the helicopter's gross weight was 30,000 lbs and if the flight mode was 60 kts, the fuel flow cannot be found directly. But by interpolating between 60 kts, 28,000 lbs - 1648 lbs/hr and 32,000 lbs - 1832 lbs/hr, the basic fuel flow rate for 30,000 lbs is 1740 lbs/hr. In this example, if the helicopter flies in this mode for 30 minutes, 870 lbs of fuel will be used.

h. As altitude and/or temperature changes occur, different tables are used to look up the aircraft's basic fuel flow rate for each leg of the flight path. Care must be taken that the proper table is used.

i. Appendix A contains a set of functions that will give a good approximation of the basic rate of fuel flow.

3. DELTA FUEL FLOW FOR DRAG DATA

a. The delta fuel flow for drag is also determined by five variables:

(1) Type of Aircraft

(2) Altitude (Air Pressure)

(3) Temperature

(4) Drag Surface (Equivalent Square Footage)

(5) Air Speed

All references to airspeeds are to true airspeeds.

***All references to interpolation are linear interpolations. See FPPH, Volume I, Chapter 3 for a discussion on the accuracy of interpolation.*

TABLE 3-1

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1549	1673	1560	1447	1332	1336	1436	1714	2178	2788
24,000	1775	1934	1790	1645	1489	1467	1549	1815	2268	2914
28,000	2008	2208	2024	1841	1648	1610	1684	1931	2376	3010
32,000	2249	2521	2291	2060	1852	1769	1836	2070	2511	3107
36,000	2530	2862	2588	2313	2052	1946	2006	2229	2673	3312
37,000	2603	2955	2668	2382	2084	1992	2053	2273	2721	3391

TABLE 3-2

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 15 C.

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2610	2956	2678	2400	2110	2011	2068	2283	2723	3378
38,000	2683	3048	2759	2469	2163	2058	2116	2328	2769	3449
39,000	2759	3143	2841	2539	2218	2106	2165	2375	2820	3528
40,000	2838	3242	2926	2610	2275	2156	2219	2426	2876	3616

TABLE 3-3

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	46	110	218	379	599	893
	100	28	93	221	439	759	1197	1786
	150	42	140	334	657	1134	1796	2679
	200	56	187	447	879	1511	2394	3571

b. Like the basic fuel flow tables, there are 24 tables for delta fuel flow for drag.

c. There are four fixed rows of equivalent square feet of drag: 50 equivalent sq ft thru 200 equivalent sq ft.

d. The seven columns are for airspeeds in kts of: 40 kts, 60 kts, 80 kts, 100 kts, 120 kts, 140 kts, and 160 kts.

e. When an external load is placed on the helicopter, the amount of fuel consumed per hour increases. The delta fuel flow for drag tables indicate how much extra fuel consumption to add to the basic fuel flow rate.

f. In the example given earlier, a 30 minute flight at 80 kts airspeed, 4000 ft altitude, 15°C and a gross weight of 28,000 lbs was used. Using the basic fuel flow tables, the basic fuel flow rate was 1610 lbs/hr. Assuming for this new example that part of the load is external and inducing a 100 equivalent sq ft external drag, the delta fuel flow for drag (Table 3-3) shows 221 lbs/hr should be added to the basic fuel flow rate. Thus the basic fuel flow rate becomes 1610 + 221 or 1831 lbs per hour and for a half-hour flight, 916 lbs of fuel will be used instead of the 805 lbs figured without an external load.

g. Appendix B contains a function that will give a good approximation of the delta fuel flow for drag.

4. GROUND IDLE FUEL FLOW DATA

a. The ground idle fuel flow rate is determined by only three variables:

(1) Type of Aircraft

(2) Altitude (Air Pressure)

(3) Temperature

b. There is only one ground idle fuel flow table (shown as Table 2-2). The table has four rows of temperatures: -25°C, -5°C, 15°C and 35°C, and six columns of altitudes: Sea Level, 2000 ft, 4000 ft., 6000 ft., 8000 ft., and 10000 ft.

c. The ground idle fuel flow table is used as discussed in the example flight profile in Chapter 2 (Table 2-2). The CH-47B helicopter idling for 20 minutes at 2000 ft. altitude and 15°C, (across the row labeled 15°C and down the column labeled 2000) find the intersection at 1124. Thus, the CH-47B uses 1124 lbs/hr at these conditions and since it is idling for 20 minutes or 1/3 of an hour, it will use 375 lbs of fuel.

d. If the helicopter had only been 1000 ft. above sea level, the consumption rate would be found by interpolating between the sea level rate of 1180 lbs/hr and the 2000 ft. rate of 1124 lbs/hr which would be 1152 lbs/hr. In 1/3 of an hour 384 lbs of fuel would be used.

e. Appendix C contains a function that will give a good approximation of the ground idle fuel flow.

5. GROSS WEIGHT LIMITS DATA

a. Gross weight limits tables are intended to show whether or not the aircraft can safely take off for four sets of criteria. These criteria are defined in the following paragraphs:

(1) Criteria #1 is based on the helicopter using 100% of Maximum Power for take off and having enough power to lift straight up and above ground effect (See Figure 3-1). Once it is in hovering above ground effect level the helicopter begins forward flight until it acquires, transitional lift and is able to climb at 450 ft/min (a desired standard rate of climb) to the desired altitude. This criteria has some risk since the pilot has no reserve power. It has less risk than Criteria #3 but more than Criteria #2 thus it is considered to be "Middle of the Road" risk.

(2) Criteria #2 (Figure 3-1) is based on the helicopter using 95% of Maximum Power for take off and enough power to immediately begin to climb at a rate of 450 ft/min. This is the least risky criteria since the pilot has power in reserve and is still able to climb at a satisfactory rate.

(3) Criteria #3 (Figure 3-1) has the most risk. Using 100% of Maximum Power the helicopter will only hover in ground effect. Therefore, at an altitude of 10 feet or less, the pilot must begin forward flight and gradually increase airspeed to acquire transitional lift to climb. The reasons for its high risk are readily apparent. First, there is no power in reserve. Second, the pilot must begin forward flight at a very low altitude.

(4) Criteria #4. Structural Gross Weight Limits is the total upper limit of gross weight the helicopter can carry under any take off criteria.

b. Gross Weight Limits are determined by four variables:

(1) Type of Aircraft

(2) Criteria Chosen

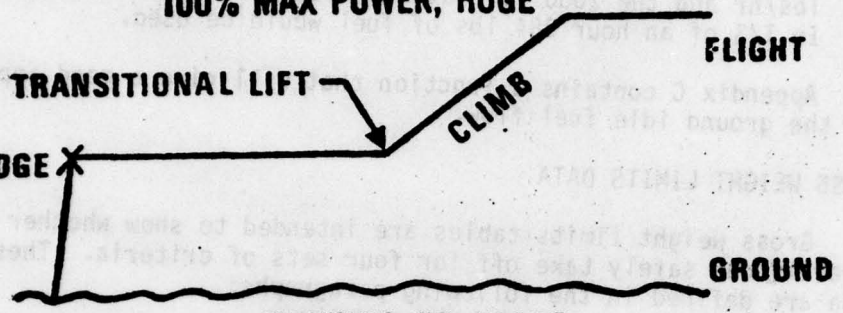
(3) Altitude (Air Pressure)

(4) Temperature

CRITERIA #1

(MIDDLE OF THE ROAD)

100% MAX POWER, HOGE

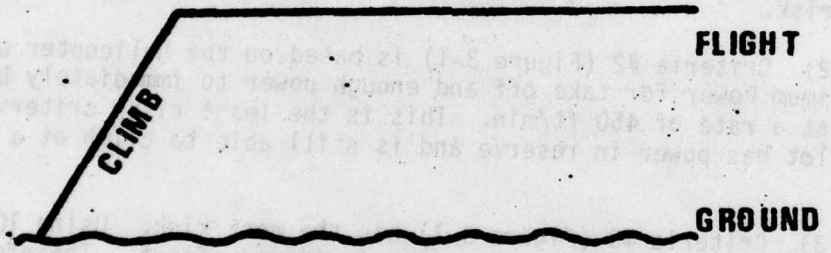


NOTHING TO SPARE.

CRITERIA #2

(LEAST RISKY)

95% OF RATED POWER. VERTICAL RATE OF CLIMB 450 FT/MIN, HOGE

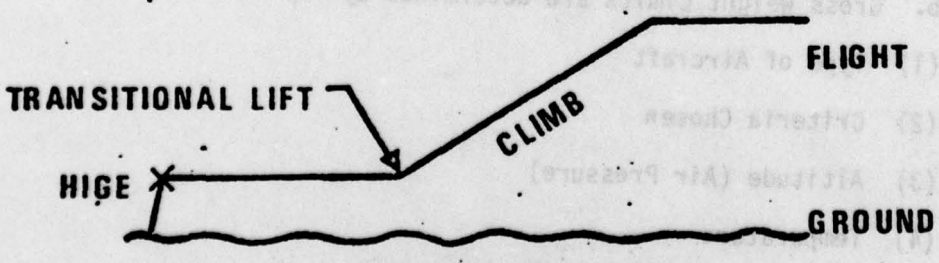


POWER LEFT

CRITERIA #3

(MOST RISKY)

100% MAX POWER, HIGE



NOTHING TO SPARE.

Figure 3-1

c. Additionally, Criteria #1, #2, and #3 differ due to engine power limits or transmission power limits of the aircraft. Thus there are six tables:

(1) Criteria #1 (Due to engine)

(2) Criteria #1 (Due to transmission)

(3) Criteria #2 (Due to engine)

(4) Criteria #2 (Due to transmission)

(5) Criteria #3 (Due to engine)

(6) Criteria #3 (Due to transmission)

d. The structural gross weight limit is a single value for each helicopter and is only dependent on the type helicopter. The CH-47B structural gross weight limit is given as 40,000 lbs and is listed at the bottom of each table. As the name implies, it is simply not safe to expect the CH-47B structure to maneuver normally when the total weight is larger than that value.

e. In simulating inflight profile, the gross weight limits tables are used to check whether the aircraft is going to be too heavy to take off under the given conditions. As an example, assume the pilot of a CH-47B planned a mission that called for using take off criteria #1 and the take off was to be at 8000 ft., 15°C, and a gross weight of 31,200. Three checks would be required: First, does this gross weight exceed the structural gross weight limit? Second, does it exceed Criteria #1 (due to transmission)? Third, does it exceed Criteria #1 (due to engine)? In the example given, the answer to all three questions is "No", the take off will not exceed aircraft limits. (Tables 3-4 and 3-5)

f. If the assigned gross weight had been 33,000 lbs, it would have exceeded the value given for 8,000 ft. and 15°C at Criteria #1 (Due to engine). (Table 3-4) The mission could not be flown as planned. The plan could be changed, for example to take off at 6000 ft. (which might not be practical) or change to take off Criteria #3 (which is more risky but has higher limits).

g. If the assigned gross weight had been 41,000 lbs., it would have exceeded the structural limits. To perform the mission the only choices would be to lighten the load or get another type helicopter.

h. Appendix D contains a set of functions that will give a good approximation of the gross weight limits for takeoff.

TABLE 3-4

GROSS WEIGHT LIMITS
(DUE TO ENGINE)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HOGE)
AIRCRAFT - CH-47B 230 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	51426	48680	45886	43055	40000	37109
	-5 C	48259	45389	42347	39244	36389	33551
	15 C	44026	41097	38124	35361	32652	30149
	35 C	38611	36074	33530	31033	28690	26498

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

TABLE 3-5

GROSS WEIGHT LIMITS
(DUE TO TRANSMISSION)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HOGE)
AIRCRAFT - CH-47B 230 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	41649	40829	39948	39042	38107	37109
	-5 C	40775	39904	39009	38087	37106	36079
	15 C	39915	39033	38124	37160	36149	35149
	35 C	39102	38208	37263	36267	35277	34295

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

6. VELOCITY LIMITS DATA

a. There are various types of data given in these tables but like the gross weight limits tables, they are primarily restraints on what can be expected of a helicopter in planning a mission profile. Velocity limits tables are influenced by five variables:

(1) Type of aircraft

(2) Air pressure (altitude)

(3) Temperature

(4) Gross weight

(5) Condition or limit

b. Items (1) through (4) are self-explanatory. There are five types of information that can be listed under (5):

(1) Long range

(2) Maximum continuous power

(3) Maximum power (due to engine limits)

(4) Transmission limits

(5) V_{ne} (velocity never exceed)

c. For each aircraft, there are 24 Velocity Limits Tables depending on air pressure and temperature combination. Table 3-6 is an example of the content of the Velocity Limits Table.

d. The two columns under Long Range (Table 3-6) give the optimum speed and fuel flow for each set of variables #1 through #4 above. Thus the CH-47B operating at 2000 ft., temperature 15°C, and having a gross weight of 28,000 lbs will fly a longer distance if the velocity is kept at 125 kts and will use 2114 lbs/hr of fuel at that velocity.

e. Maximum continuous power gives the fastest speed at which a helicopter can fly for long periods (30 minutes or more) and the associated fuel flow rate. An example from Table 3-6 would be a CH-47B at 2000 ft. and 15° weighing 28,000 lbs could fly 154 kts with a fuel usage of 2945 lbs/hr.

TABLE 3-6

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	121	1841	160	2945	173	3391	165	3111	157	2861
24,000	121	1927	156	2945	169	3391	161	3111	157	2973
28,000	125	2114	154	2945	165	3391	158	3111	157	3079
32,000	128	2300	151	2945	163	3391	155	3111	157	3175
36,000	130	2513	146	2945	160	3391	151	3111	140	2758
37,000	131	2565	145	2945	158	3391	150	3111	134	2644

f. Maximum power (engine and transmission limits) show the maximum speeds the aircraft can structurally attain for short periods of time (less than 30 minutes). Thus the CH-47B helicopter at 2000 ft and 15°C weighing 28,000 lbs has an engine that is capable of producing enough power to fly 165 kts but the transmission limits the aircraft to 158 kts. Between these two columns then, the flight cannot exceed 158 kts with a fuel flow rate of 3111 lbs/hr.

g. There is another limiting factor called V_{ne} (velocity never exceed). This velocity limit is determined by helicopter structural considerations. V_{ne}'s are used in the same manner as maximum power limits described in paragraph f above. Since a value of 157 kts is listed for 2,000 ft., 15°C, and 28,000 lbs, this implies that the value in f. cannot be reached.

7. DETAILED FLIGHT PROFILE USING ALL PERFORMANCE DATA TABLES

The example of a Flight Profile in Chapter 2 was intentionally simplified to assure clarity. The description of the various tables in this handbook, however, indicates a more complex set of considerations are normally encountered in developing the flight profile. With the description provided in this chapter, additional information should be included in the flight plan beyond that shown in the example and a suggested format is provided below in Table 3-7.

TABLE 3-7

Helicopter:
Altitude:
Temperature:

LEG	DISTANCE	AS	CHECK VELOCITY LIMIT	TIME	GW (LBS)	DRAG	FUEL

Needed for each take off:
Weight at take off:
Type of take off:
Check transmission limits:
Check engine limits:
Check structural gross weight limit:

CHAPTER 4

CHINOOK (CH-47B) PERFORMANCE DATA TABLES (225 RPM)

GENERAL

The following tables are the major information presented in this handbook. If the procedure for using them is understood, a flight profile for the CHINOOK (CH-47B) helicopter can be prepared in a matter of a few hours. The performance data contained have been reviewed for accuracy and are corrected to the best of our knowledge. The tables are organized in the following manner:

Tables 4-1 to 4-24	Basic Fuel Flow Data
Tables 4-25 to 4-48	Delta Fuel Flow for Drag Data
Table 4-49	Ground Idle Fuel Flow Data
Tables 4-50 to 4-55	Gross Weight Limits Data
Tables 4-56 to 4-79	Velocity Limits Data

BASIC FUEL FLOW DATA

TABLES

(225 RPM)

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TABLE 4-1

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 KPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1558	1667	1561	1454	1361	1420	1606	2039	2725	3561
24,000	1753	1897	1761	1625	1504	1541	1709	2129	2806	3697
28,000	1968	2146	1985	1823	1660	1669	1821	2233	2900	3802
32,000	2196	2407	2217	2028	1823	1808	1947	2345	3008	4038
36,000	2429	2680	2451	2222	1986	1958	2091	2471	3129	4196
37,000	2488	2749	2510	2271	2029	1997	2129	2506	3195	4234

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TABLE 4-2

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1595	1767	1598	1488	1390	1432	1587	1962	2571	3316
24,000	1796	1944	1807	1671	1539	1554	1688	2052	2651	3422
28,000	2019	2201	2037	1872	1697	1685	1800	2155	2744	3559
32,000	2252	2466	2268	2070	1855	1823	1930	2268	2848	3678
36,000	2483	2753	2511	2269	2023	1975	2077	2394	2966	3810
37,000	2542	2829	2575	2322	2068	2016	2116	2430	3000	3858

TABLE 4-3

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1631	1747	1635	1524	1422	1451	1583	1914	2461	3141
24,000	1839	1991	1854	1717	1576	1574	1685	2005	2540	3256
28,000	2068	2254	2085	1916	1733	1706	1800	2108	2632	3380
32,000	2301	2526	2318	2111	1891	1848	1935	2223	2739	3476
36,000	2537	2804	2579	2325	2070	2005	2084	2358	2869	3567
37,000	2600	2915	2649	2383	2118	2047	2124	2395	2905	3596

TABLE 4-4

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1668	1786	1674	1562	1455	1471	1585	1884	2383	3019
24,000	1882	2036	1898	1761	1612	1597	1690	1976	2463	3137
28,000	2114	2304	2129	1953	1767	1733	1812	2080	2554	3258
32,000	2347	2590	2373	2155	1932	1879	1950	2202	2665	3319
36,000	2598	2918	2653	2387	2142	2042	2104	2346	2806	3432
37,000	2667	3004	2727	2449	2172	2085	2145	2384	2846	3477

TABLE 4-5

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1515	1628	1518	1409	1314	1362	1528	1926	2561	3343
24,000	1718	1867	1729	1591	1463	1486	1634	2022	2647	3503
28,000	1941	2122	1959	1797	1623	1619	1753	2129	2748	3679
32,000	2172	2390	2192	1995	1786	1764	1890	2249	2862	3845
36,000	2407	2669	2431	2193	1956	1921	2041	2387	3034	3998
37,000	2466	2744	2495	2247	2001	1962	2080	2425	3076	4057

TABLE 4-6

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1551	1667	1556	1445	1343	1374	1511	1854	2417	3114
24,000	1761	1914	1776	1637	1497	1499	1615	1950	2503	3238
28,000	1991	2175	2007	1839	1655	1632	1735	2058	2601	3371
32,000	2223	2451	2243	2035	1817	1779	1876	2177	2712	3476
36,000	2462	2753	2501	2248	1998	1940	2030	2319	2846	3617
37,000	2526	2853	2570	2307	2047	1982	2070	2358	2885	3655

TABLE 4-7

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1587	1707	1595	1483	1375	1391	1506	1810	2314	2956
24,000	1804	1961	1821	1681	1532	1518	1613	1906	2399	3083
28,000	2038	2227	2051	1876	1688	1655	1738	2015	2497	3192
32,000	2270	2517	2298	2080	1856	1805	1881	2141	2617	3281
36,000	2525	2842	2577	2311	2049	1971	2040	2288	2763	3405
37,000	2596	2926	2650	2374	2099	2015	2082	2328	2803	3455

TABLE 4-8

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1624	1746	1633	1521	1407	1411	1509	1783	2242	2846
24,000	1846	2005	1862	1719	1564	1541	1621	1880	2326	2965
28,000	2080	2279	2096	1912	1721	1682	1751	1991	2426	3051
32,000	2319	2589	2360	2131	1900	1837	1898	2126	2554	3159
36,000	2597	2931	2656	2380	2101	2010	2064	2279	2714	3328
37,000	2673	3021	2734	2447	2152	2056	2110	2320	2760	3402

TABLE 4-9

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1477	1595	1482	1370	1271	1308	1456	1821	2407	3168
24,000	1689	1842	1703	1565	1426	1435	1567	1923	2500	3327
28,000	1918	2103	1936	1769	1589	1574	1694	2036	2608	3502
32,000	2151	2377	2171	1964	1754	1726	1840	2165	2761	3658
36,000	2388	2677	2429	2180	1935	1890	1998	2317	2929	3817
37,000	2449	2758	2499	2240	1984	1933	2040	2357	2977	3865

TABLE 4-10

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1513	1654	1521	1408	1301	1319	1439	1754	2274	2952
24,000	1733	1889	1748	1608	1458	1448	1549	1856	2366	3067
28,000	1965	2155	1980	1805	1617	1588	1680	1969	2469	3186
32,000	2198	2447	2227	2008	1788	1742	1829	2100	2592	3315
36,000	2454	2769	2506	2243	1982	1912	1990	2256	2747	3467
37,000	2522	2855	2581	2307	2052	1956	2033	2298	2791	3524

TABLE 4-11

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1549	1673	1560	1447	1332	1336	1436	1714	2178	2788
24,000	1775	1934	1790	1645	1489	1467	1549	1815	2268	2914
28,000	2008	2208	2024	1841	1648	1610	1684	1931	2376	3010
32,000	2249	2521	2291	2060	1832	1769	1836	2070	2511	3107
36,000	2530	2862	2588	2313	2032	1946	2006	2229	2673	3312
37,000	2603	2955	2668	2382	2084	1996	2053	2273	2721	3391

TABLE 4-12

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1585	1711	1598	1484	1363	1356	1439	1689	2111	2687
24,000	1815	1977	1828	1678	1519	1490	1559	1791	2201	2792
28,000	2049	2265	2073	1881	1685	1637	1697	1914	2313	2873
32,000	2307	2598	2358	2118	1878	1802	1855	2061	2460	3005
36,000	2608	2963	2675	2388	2086	1989	2040	2231	2649	3301
37,000	2686	3063	2763	2462	2143	2041	2094	2287	2711	3398

TABLE 4-13

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1444	1567	1452	1338	1234	1259	1390	1725	2265	2991
24,000	1665	1820	1681	1541	1393	1390	1507	1831	2364	3164
28,000	1897	2089	1914	1739	1556	1536	1644	1952	2480	3330
32,000	2132	2373	2158	1943	1730	1695	1797	2094	2655	3483
36,000	2381	2698	2439	2180	1925	1867	1964	2256	2847	3680
37,000	2451	2783	2513	2242	1977	1915	2010	2299	2900	3749

TABLE 4-14

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1480	1606	1491	1377	1263	1269	1373	1663	2141	2767
24,000	1709	1866	1722	1578	1421	1402	1491	1770	2238	2901
28,000	1940	2143	1959	1775	1584	1549	1632	1890	2350	3006
32,000	2184	2451	2223	1995	1769	1715	1788	2037	2490	3153
36,000	2459	2796	2523	2251	1971	1894	1963	2204	2667	3391
37,000	2535	2889	2603	2318	2024	1939	2012	2250	2718	3479

TABLE 4-15

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1516	1645	1530	1414	1293	1286	1371	1625	2052	2634
24,000	1749	1910	1760	1610	1449	1421	1493	1732	2149	2748
28,000	1981	2203	2009	1815	1619	1572	1637	1859	2269	2857
32,000	2245	2531	2292	2054	1815	1742	1799	2011	2420	2982
36,000	2541	2903	2615	2328	2024	1951	1989	2193	2619	3298
37,000	2621	3004	2702	2401	2083	1985	2045	2252	2687	3398

TABLE 4-16

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1552	1682	1565	1448	1322	1305	1376	1603	1989	2535
24,000	1785	1955	1798	1641	1478	1444	1504	1712	2087	2626
28,000	2026	2266	2064	1862	1658	1600	1652	1848	2216	2719
32,000	2312	2614	2365	2117	1861	1777	1824	2005	2384	2941
36,000	2626	3013	2713	2413	2091	1986	2043	2236	2643	3324
37,000	2711	3117	2805	2493	2159	2045	2110	2319	2739	3435

TABLE 4-17

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1417	1543	1428	1313	1201	1215	1329	1636	2134	2855
24,000	1645	1803	1660	1517	1363	1351	1454	1748	2240	3008
28,000	1878	2078	1896	1713	1529	1504	1601	1879	2393	3164
32,000	2118	2387	2162	1937	1715	1670	1762	2034	2569	3332
36,000	2395	2751	2459	2188	1923	1855	1945	2206	2785	3620
37,000	2470	2823	2540	2256	1977	1905	1995	2254	2847	3721

TABLE 4-18

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1453	1583	1466	1350	1229	1224	1313	1579	2019	2615
24,000	1686	1847	1698	1548	1387	1362	1442	1691	2121	2737
28,000	1920	2141	1947	1753	1560	1518	1591	1823	2246	2865
32,000	2182	2471	2233	1996	1757	1690	1757	1984	2408	3042
36,000	2481	2843	2555	2266	1972	1884	1956	2172	2643	3396
37,000	2560	2944	2642	2341	2032	1939	2015	2232	2717	3506

TABLE 4-19

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1489	1621	1502	1384	1256	1240	1312	1544	1935	2487
24,000	1722	1893	1736	1579	1414	1381	1445	1658	2041	2586
28,000	1966	2208	2004	1800	1599	1542	1598	1798	2177	2688
32,000	2252	2558	2310	2061	1801	1722	1774	1963	2349	2931
36,000	2570	2959	2657	2355	2040	1936	2005	2210	2632	3331
37,000	2656	3064	2751	2437	2110	1999	2075	2293	2732	3448

TABLE 4-20

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1523	1657	1535	1413	1282	1259	1320	1523	1877	2386
24,000	1757	1941	1777	1613	1445	1405	1457	1643	1986	2469
28,000	2019	2276	2064	1852	1639	1571	1615	1791	2135	2610
32,000	2324	2653	2392	2131	1853	1765	1811	1978	2344	2940
36,000	2665	3075	2767	2459	2128	2006	2081	2307	2728	3404
37,000	2756	3192	2875	2558	2208	2077	2158	2407	2855	3561

TABLE 4-21

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1395	1523	1408	1292	1172	1173	1274	1555	2013	2688
24,000	1626	1798	1641	1491	1334	1317	1409	1674	2127	2856
28,000	1862	2078	1888	1698	1509	1477	1564	1818	2302	3010
32,000	2121	2410	2175	1940	1710	1653	1737	1983	2502	3236
36,000	2421	2783	2498	2214	1927	1855	1941	2208	2761	3645
37,000	2500	2884	2586	2288	1985	1909	1999	2277	2845	3770

TABLE 4-22

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1431	1562	1444	1325	1196	1185	1260	1502	1905	2471
24,000	1663	1837	1679	1521	1358	1326	1400	1621	2015	2578
28,000	1910	2148	1946	1745	1545	1495	1557	1769	2159	2728
32,000	2194	2502	2254	2006	1751	1676	1739	1942	2346	3009
36,000	2515	2906	2605	2304	1992	1899	1978	2198	2674	3449
37,000	2601	3011	2699	2387	2061	1962	2047	2287	2782	3577

TABLE 4-23

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1466	1599	1476	1353	1220	1199	1261	1470	1828	2343
24,000	1698	1888	1722	1556	1388	1348	1404	1594	1946	2433
28,000	1966	2219	2008	1798	1584	1519	1567	1747	2099	2591
32,000	2269	2605	2341	2078	1802	1716	1770	1949	2324	2942
36,000	2615	3050	2723	2416	2083	1968	2050	2291	2733	3452
37,000	2706	3148	2832	2517	2162	2038	2126	2397	2866	3601

TABLE 4-24

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1497	1655	1507	1379	1244	1218	1270	1451	1774	2241
24,000	1736	1943	1769	1596	1422	1372	1416	1585	1900	2352
28,000	2026	2294	2074	1854	1625	1551	1591	1744	2073	2569
32,000	2348	2701	2431	2160	1870	1771	1828	2012	2376	2977
36,000	2713	3167	2864	2561	2191	2055	2135	2419	2892	3657
37,000	2811	3292	2968	2684	2281	2130	2214	2534	3050	3825

DELTA FUEL FLOW FOR DRAG DATA

TABLES
(225 RPM)

TABLE 4-25

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 KPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	18	62	147	296	512	805	1201
	100	37	124	297	590	1016	1608	2402
	150	55	187	450	888	1523	2412	3602
	200	74	250	601	1178	2029	3216	4805

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TABLE 4-26

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	17	58	136	271	472	743	1111
	100	34	115	274	545	942	1488	2222
	150	51	173	414	817	1411	2232	3333
	200	68	231	555	1093	1879	2976	4445

TABLE 4-27

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KIS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	16	54	127	250	439	694	1035
	100	32	108	254	505	882	1388	2069
	150	48	161	384	758	1314	2081	3103
	200	63	215	514	1014	1751	2774	4137

TABLE 4-28

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	50	119	232	412	653	966
	100	30	101	238	470	823	1298	1933
	150	44	151	358	709	1230	1946	2899
	200	59	201	479	945	1659	2594	3866

TABLE 4-29

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	17	58	138	275	476	748	1116
	100	35	116	278	549	945	1495	2233
	150	52	174	420	826	1415	2243	3349
	200	70	234	560	1095	1886	2991	4466

TABLE 4-30

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	16	53	127	253	439	690	1033
	100	32	107	256	507	874	1382	2066
	150	48	161	386	762	1311	2074	3100
	200	64	215	517	1017	1747	2766	4133

TABLE 4-31

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	50	118	234	408	645	962
	100	30	99	237	471	819	1290	1923
	150	45	149	358	706	1222	1934	2884
	200	60	200	480	945	1627	2578	3846

TABLE 4-32

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	47	110	217	383	606	899
	100	28	93	221	439	766	1207	1798
	150	42	140	333	659	1143	1810	2697
	200	56	186	447	880	1523	2412	3596

TABLE 4-33

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	16	54	129	256	442	695	1037
	100	33	109	260	510	878	1390	2074
	150	49	164	391	767	1315	2084	3111
	200	65	219	521	1017	1752	2779	4147

TABLE 4-34

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	50	119	236	408	640	959
	100	30	100	239	471	811	1283	1919
	150	45	151	361	709	1217	1926	2878
	200	60	202	482	944	1622	2569	3838

TABLE 4-35

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	46	110	218	379	599	893
	100	28	93	221	439	759	1197	1786
	150	42	140	334	657	1134	1796	2679
	200	56	187	447	879	1511	2394	3571

TABLE 4-36

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	43	102	203	355	562	835
	100	26	86	206	409	712	1121	1670
	150	39	130	311	613	1061	1681	2505
	200	52	174	417	820	1414	2240	3340

TABLE 4-37

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	51	121	237	409	645	962
	100	30	102	243	474	814	1290	1924
	150	46	153	364	711	1220	1934	2886
	200	61	205	484	943	1626	2579	3848

TABLE 4-38

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	47	111	220	379	593	890
	100	28	94	224	437	753	1190	1780
	150	42	141	336	659	1129	1787	2671
	200	56	189	448	875	1504	2383	3561

TABLE 4-39

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	43	103	204	351	555	828
	100	26	87	207	407	703	1110	1657
	150	39	131	312	611	1052	1665	2485
	200	52	175	416	817	1401	2220	3313

TABLE 4-40

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	12	40	96	190	329	521	776
	100	24	81	193	381	660	1040	1550
	150	37	122	291	570	984	1559	2325
	200	49	163	389	763	1311	2078	3099

TABLE 4-41

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	48	113	219	378	598	892
	100	28	95	225	439	754	1195	1783
	150	42	143	337	657	1130	1792	2675
	200	56	190	449	874	1506	2390	3566

TABLE 4-42

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	44	104	204	352	551	825
	100	26	88	208	406	698	1103	1650
	150	39	132	312	611	1046	1656	2475
	200	52	176	415	809	1394	2209	3300

TABLE 4-43

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	12	41	96	190	326	514	767
	100	24	82	194	377	650	1028	1535
	150	36	123	291	568	974	1542	2303
	200	49	164	387	757	1298	2056	3071

TABLE 4-44

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	38	90	177	304	482	719
	100	23	76	180	353	611	963	1437
	150	34	114	271	529	912	1444	2154
	200	45	153	362	708	1215	1925	2872

TABLE 4-45

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	44	104	202	348	553	825
	100	26	88	208	407	697	1106	1651
	150	39	132	311	606	1045	1659	2476
	200	51	175	417	808	1394	2212	3301

TABLE 4-46

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	12	41	97	188	326	511	764
	100	24	82	193	376	647	1023	1527
	150	36	122	288	564	969	1534	2291
	200	48	163	385	748	1291	2046	3055

TABLE 4-47

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	38	90	175	303	474	711
	100	22	76	180	349	601	950	1421
	150	33	114	269	526	901	1427	2132
	200	45	152	358	698	1201	1903	2843

TABLE 4-48

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	10	35	84	164	282	445	665
	100	21	71	168	327	564	891	1330
	150	31	107	252	491	844	1336	1994
	200	42	142	335	656	1124	1781	2659

GROUND IDLE FUEL FLOW DATA

TABLE

TABLE 4-49

GROUND IDLE FUEL FLOW

AIRCRAFT - CH-47B

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	1220	1164	1072	1000	932	860
	-5 C	1200	1144	1052	980	912	840
	15 C	1180	1124	1032	960	892	820
	35 C	1160	1104	1012	940	872	800

ENTRIES ARE AIRCRAFT FUEL FLOW RATES IN LBS/HR

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GROSS WEIGHT LIMITS DATA

TABLES

(225 RPM)

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TABLE 4-50

GROSS WEIGHT LIMITS

(DUE TO ENGINE)

FOR TAKEOFF CRITERIA #1

100% OF MAXIMUM POWER (HOGE)

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	51395	48620	45810	42973	39827	36988
	-5 C	48254	45382	42240	39094	36123	33330
	15 C	43812	41028	38058	35197	32542	30042
	35 C	38554	36119	33518	31019	28674	26426

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

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TABLE 4-51

GROSS WEIGHT LIMITS

(DUE TO TRANSMISSION)

FOR TAKEOFF CRITERIA #1

100% OF MAXIMUM POWER (HOGE)

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	41819	40934	40020	39082	38087	37055
	-5 C	40877	39975	39048	38067	37034	36008
	15 C	39986	39073	38108	37090	36076	35073
	35 C	39146	38198	37196	36193	35205	34161

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

TABLE 4-52

GROSS WEIGHT LIMITS

(DUE TO ENGINE)

FOR TAKEOFF CRITERIA #2

95% OF RATED POWER. VERTICAL RATE OF CLIMB 450 FT/MIN. OGE

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	47752	45234	42667	40056	37124	34485
	-5 C	44881	42247	39528	36992	33619	31012
	15 C	40674	38110	35547	32682	30213	27886
	35 C	35673	33431	31023	28707	26535	24448

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

TABLE 4-53

GROSS WEIGHT LIMITS

(DUE TO TRANSMISSION)

FOR TAKEOFF CRITERIA #2

TRANSMISSION POWER LIMIT VERTICAL RATE OF CLIMB 450 FT/MIN. OGE

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	39925	39171	38360	37523	36655	35724
	-5 C	39121	38319	37493	36637	35721	34764
	15 C	38329	37515	36672	35771	34828	33900
	35 C	37580	36750	35867	34938	34019	33096

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

TABLE 4-54

GROSS WEIGHT LIMITS

(DUE TO ENGINE)

FOR TAKEOFF CRITERIA #3

100% OF MAXIMUM POWER (HIGE)

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	57596	54492	51348	48171	44646	41464
	-5 C	54078	50862	47342	43815	40484	37354
	15 C	49094	45977	42648	39441	36466	33664
	35 C	43203	40474	37559	34759	32131	29613

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

TABLE 4-55

GROSS WEIGHT LIMITS

(DUE TO TRANSMISSION)

FOR TAKEOFF CRITERIA #3

100% OF MAXIMUM POWER (HIGE)

AIRCRAFT - CH-47B 225 RPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	46912	45901	44853	43792	42682	41517
	-5 C	45834	44802	43755	42659	41511	40369
	15 C	44815	43782	42704	41573	40444	39319
	35 C	43864	42805	41691	40574	39467	38295

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

VELOCITY LIMITS DATA

TABLES
(225 RPM)

TABLE 4-56

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	105	1672	162	3671	171	4048	149	3109	163	3694
24,000	106	1827	159	3671	167	4048	147	3109	163	3847
28,000	115	2106	157	3671	163	4048	145	3109	163	4037
32,000	116	2246	153	3671	160	4048	142	3109	163	4209
36,000	120	2477	151	3671	157	4048	140	3109	146	3406
37,000	121	2523	150	3671	157	4048	138	3109	140	3195

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TABLE 4-57

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	106	1703	166	3532	176	3903	155	3137	163	3428
24,000	118	2004	163	3532	172	3903	153	3137	163	3543
28,000	117	2098	159	3532	168	3903	150	3137	163	3695
32,000	121	2302	157	3532	165	3903	148	3137	163	3819
36,000	125	2513	154	3532	162	3903	145	3137	146	3175
37,000	125	2556	154	3532	161	3903	144	3137	140	3000

TABLE 4-58

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	121	1930	161	3183	174	3609	161	3163	163	3243
24,000	121	2028	158	3183	169	3609	158	3163	163	3373
28,000	122	2154	155	3183	166	3609	154	3163	163	3507
32,000	126	2353	153	3183	163	3609	152	3163	163	3600
36,000	129	2560	150	3183	161	3609	149	3163	146	3051
37,000	130	2617	149	3183	160	3609	148	3163	140	2905

TABLE 4-59

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	124	1961	154	2814	167	3233	165	3191	158	2940
24,000	124	2058	151	2814	163	3233	162	3191	158	3049
28,000	120	2201	148	2814	160	3233	159	3191	158	3147
32,000	130	2413	145	2814	158	3233	156	3191	158	3232
36,000	133	2630	140	2814	154	3233	153	3191	140	2815
37,000	134	2687	139	2814	153	3233	151	3191	135	2699

TABLE 4-60

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	104	1601	165	3534	173	3853	153	3060	163	3461
24,000	110	1819	161	3534	168	3853	150	3060	163	3652
28,000	115	2024	157	3534	163	3853	147	3060	163	3834
32,000	118	2203	154	3534	160	3853	145	3060	163	4005
36,000	122	2439	151	3534	157	3853	141	3060	146	3282
37,000	123	2502	150	3534	156	3853	140	3060	140	3076

TABLE 4-61

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	110	1680	165	3290	176	3687	159	3086	163	3217
24,000	117	1895	161	3290	172	3687	156	3086	163	3355
28,000	119	2043	158	3290	168	3687	153	3086	163	3498
32,000	124	2276	156	3290	165	3687	150	3086	163	3602
36,000	126	2453	153	3290	161	3687	147	3086	146	3035
37,000	126	2506	152	3290	161	3687	146	3086	140	2882

TABLE 4-62

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	121	1841	160	2945	173	3391	165	3111	157	2861
24,000	121	1927	156	2945	169	3391	161	3111	157	2973
28,000	125	2114	154	2945	165	3391	158	3111	157	3079
32,000	128	2300	151	2945	163	3391	155	3111	157	3175
36,000	130	2513	146	2945	160	3391	151	3111	140	2758
37,000	131	2565	145	2945	158	3391	150	3111	134	2644

TABLE 4-63

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	124	1857	152	2603	166	3037	169	3134	152	2587
24,000	125	1972	150	2603	165	3037	165	3134	152	2682
28,000	128	2140	146	2603	160	3037	162	3134	152	2777
32,000	132	2363	142	2603	157	3037	160	3134	152	2884
36,000	135	2587	136	2603	151	3037	154	3134	134	2573
37,000	135	2640	134	2603	149	3037	152	3134	129	2486

TABLE 4-64

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	105	1543	165	3380	172	3651	156	3013	163	3293
24,000	114	1806	161	3380	167	3651	153	3013	163	3477
28,000	116	1955	157	3380	163	3651	150	3013	163	3650
32,000	121	2181	154	3380	160	3651	146	3013	163	3813
36,000	125	2430	151	3380	157	3651	142	3013	146	3161
37,000	125	2478	150	3380	156	3651	141	3013	140	2977

TABLE 4-65

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
20,000	116	1679	164	3072	175	3440	163	3036	157	2827
24,000	117	1805	160	3072	170	3440	159	3036	157	2949
28,000	122	2009	157	3072	167	3440	156	3036	157	3063
32,000	125	2210	154	3072	163	3440	153	3036	157	3186
36,000	127	2419	149	3072	159	3440	149	3036	140	2737
37,000	129	2488	148	3072	158	3440	147	3036	134	2616

TABLE 4-66

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
20,000	121	1737	158	2740	172	3152	169	3060	151	2513
24,000	122	1852	155	2740	167	3152	165	3060	151	2610
28,000	126	2049	152	2740	164	3152	161	3060	151	2709
32,000	130	2263	148	2740	161	3152	159	3060	151	2827
36,000	132	2474	142	2740	155	3152	153	3060	134	2521
37,000	133	2536	141	2740	153	3152	151	3060	128	2434

TABLE 4-67

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
20,000	124	1758	151	2415	165	2825	173	3083	146	2268
24,000	126	1893	148	2415	161	2825	169	3083	146	2359
28,000	131	2104	144	2415	158	2825	167	3083	146	2467
32,000	134	2323	138	2415	154	2825	163	3083	146	2609
36,000	135	2539	130	2415	146	2825	154	3083	122	2268
37,000	136	2604	127	2415	144	2825	152	3083	110	2157

TABLE 4-68

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
20,000	108	1510	164	3181	172	3443	159	2968	157	2875
24,000	115	1740	160	3181	167	3443	155	2968	157	3040
28,000	119	1926	157	3181	163	3443	152	2968	157	3199
32,000	123	2164	153	3181	159	3443	148	2968	157	3350
36,000	123	2341	149	3181	155	3443	143	2968	140	2843
37,000	123	2383	147	3181	153	3443	142	2968	134	2701

TABLE 4-69

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
20,000	117	1619	163	2878	173	3189	167	2991	151	2470
24,000	119	1752	159	2878	168	3189	162	2991	151	2577
28,000	124	1978	156	2878	165	3189	160	2991	151	2688
32,000	126	2166	153	2878	161	3189	156	2991	151	2818
36,000	131	2423	146	2878	155	3189	149	2991	134	2495
37,000	131	2482	145	2878	153	3189	148	2991	128	2408

TABLE 4-70

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	121	1642	157	2552	169	2920	172	3012	145	2196
24,000	124	1814	154	2552	165	2920	168	3012	145	2293
28,000	128	2005	151	2552	163	2920	166	3012	145	2406
32,000	131	2216	145	2552	158	2920	161	3012	145	2554
36,000	134	2471	138	2552	150	2920	152	3012	119	2181
37,000	135	2550	135	2552	147	2920	150	3012	107	2090

TABLE 4-71

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	124	1675	150	2260	163	2621	177	3033	140	1993
24,000	127	1837	147	2260	160	2621	174	3033	140	2090
28,000	132	2060	142	2260	156	2621	172	3033	140	2219
32,000	135	2280	134	2260	149	2621	163	3033	140	2387
36,000	136	2550	121	2260	139	2621	152	3033	94	2018
37,000	136	2635	116	2260	136	2621	149	3033	84	2050

TABLE 4-72

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	112	1509	163	2965	170	3198	162	2927	151	2488
24,000	116	1678	159	2965	165	3198	158	2927	151	2642
28,000	121	1903	155	2965	161	3198	154	2927	151	2790
32,000	125	2139	151	2965	157	3198	150	2927	151	2965
36,000	129	2285	145	2965	151	3198	144	2927	134	2585
37,000	129	2334	143	2965	149	3198	142	2927	128	2469

TABLE 4-73

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
20,000	117	1534	162	2684	171	2952	171	2948	145	2155
24,000	122	1723	158	2684	166	2952	166	2948	145	2255
28,000	125	1922	155	2684	162	2952	162	2948	145	2378
32,000	129	2153	149	2684	157	2952	157	2948	145	2552
36,000	131	2399	141	2684	149	2952	149	2948	118	2136
37,000	131	2466	139	2684	147	2952	147	2948	106	2053

TABLE 4-74

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	121	1566	157	2386	167	2706	176	2968	139	1922
24,000	126	1758	153	2386	164	2706	173	2968	139	2028
28,000	130	1970	149	2386	161	2706	170	2968	139	2165
32,000	133	2193	142	2386	153	2706	161	2968	139	2336
36,000	134	2496	130	2386	143	2706	151	2968	90	1962
37,000	135	2596	125	2386	139	2706	147	2968	81	2000

TABLE 4-75

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	125	1604	149	2102	162	2430	182	2987	139	1857
24,000	131	1805	145	2102	159	2430	180	2987	139	1966
28,000	134	2024	138	2102	153	2430	175	2987	139	2115
32,000	136	2253	128	2102	143	2430	161	2987	139	2322
36,000	135	2616	102	2102	127	2430	149	2987	0	0
37,000	135	2734	94	2102	121	2430	144	2987	0	0

TABLE 4-76

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	115	1472	161	2752	168	2980	165	2888	145	2155
24,000	119	1651	157	2752	163	2980	161	2888	145	2290
28,000	124	1892	150	2752	158	2980	154	2888	145	2462
32,000	123	2056	148	2752	154	2980	151	2888	145	2666
36,000	124	2312	140	2752	146	2980	143	2888	118	2163
37,000	124	2386	137	2752	143	2980	141	2888	106	2042

TABLE 4-77

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	118	1472	160	2486	169	2729	174	2907	139	1882
24,000	124	1696	157	2486	165	2729	171	2907	139	1995
28,000	127	1886	153	2486	160	2729	166	2907	139	2137
32,000	131	2145	145	2486	152	2729	157	2907	139	2321
36,000	132	2435	134	2486	142	2729	147	2907	88	1922
37,000	132	2535	130	2486	138	2729	144	2907	0	0

TABLE 4-78

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	125	1520	155	2209	166	2504	181	2925	134	1708
24,000	128	1719	151	2209	163	2504	179	2925	134	1827
28,000	131	1931	145	2209	157	2504	173	2925	134	1984
32,000	134	2205	135	2209	147	2504	160	2925	134	2192
36,000	135	2595	115	2209	131	2504	146	2925	0	0
37,000	134	2698	111.7	2209	125	2504	142	2925	0	0

TABLE 4-79

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 225 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
20,000	127	1546	148	1952	160	2246	188	2943	102	1281
24,000	132	1766	143	1952	156	2246	187	2943	102	1426
28,000	135	1984	134	1952	148	2246	174	2943	102	1598
32,000	136	2284	116	1952	134	2246	159	2943	102	1839
36,000	134	2721	0	1952	108	2246	142	2943	0	0
37,000	132	2813	0	1952	91	2246	137	2943	0	0

CHAPTER 5

CHINOOK (CH-47B) PERFORMANCE DATA TABLES (230 RPM)

GENERAL

These tables are the additional ones needed when the CH-47B is operated at a gross weight in excess of 37,000 lbs. These are for 230 RPM engine usage and are supplemental to the tables in Chapter 4. The tables are organized in the following manner:

Tables 5-1 to 5-24	Basic Fuel Flow Data
Tables 5-25 to 5-48	Delta Fuel Flow for Drag Data
Table 5-49	Ground Idle Fuel Flow Data
Table 5-50 to 5-55	Gross Weight Limits Data
Tables 5-56 to 5-79	Velocity Limits Data

BASIC FUEL FLOW DATA

TABLES

(230 RPM)

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TABLE 5-1

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2512	2770	2539	2309	2067	2035	2167	2551	3282	4397
38,000	2572	2839	2600	2360	2110	2075	2206	2587	3323	4444
39,000	2631	2909	2661	2412	2154	2116	2244	2624	3365	4490
40,000	2691	2983	2724	2466	2199	2157	2284	2662	3409	4538

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TABLE 5-3

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2621	2925	2666	2408	2144	2070	2143	2409	2918	3637
38,000	2685	3005	2736	2466	2193	2112	2184	2446	2956	3667
39,000	2751	3087	2807	2527	2244	2156	2225	2485	2994	3702
40,000	2819	3171	2880	2590	2295	2200	2268	2525	3034	3741

TABLE 5-4

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2680	3011	2740	2470	2196	2104	2160	2390	2848	3484
38,000	2750	3096	2814	2533	2248	2148	2202	2429	2888	3525
39,000	2823	3181	2890	2598	2300	2193	2246	2469	2929	3573
40,000	2898	3270	2967	2665	2352	2239	2291	2509	2972	3630

TABLE 5-5

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2490	2759	2521	2283	2036	1998	2116	2468	3161	4210
38,000	2549	2835	2586	2338	2082	2040	2157	2507	3208	4258
39,000	2608	2913	2654	2394	2130	2082	2199	2547	3257	4307
40,000	2668	2993	2723	2453	2179	2126	2243	2587	3307	4359

TABLE 5-6

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2546	2843	2588	2333	2074	2009	2096	2381	2913	3748
38,000	2609	2925	2659	2393	2123	2053	2138	2422	2953	3788
39,000	2673	3009	2732	2455	2174	2096	2180	2463	2995	3832
40,000	2739	3094	2807	2519	2225	2141	2224	2506	3039	3882

TABLE 5-7

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2608	2932	2664	2396	2124	2037	2100	2340	2813	3471
38,000	2678	3018	2739	2460	2175	2081	2144	2381	2854	3515
39,000	2749	3107	2817	2527	2227	2127	2188	2423	2896	3585
40,000	2821	3198	2896	2595	2280	2173	2234	2466	2940	3648

TABLE 5-8

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2680	3023	2744	2465	2177	2073	2122	2325	2755	3364
38,000	2755	3114	2824	2534	2230	2119	2168	2366	2798	3427
39,000	2832	3209	2907	2605	2283	2167	2217	2410	2846	3500
40,000	2908	3308	2993	2678	2338	2216	2267	2458	2896	3581

TABLE 5-9

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2469	2768	2518	2269	2016	1968	2076	2397	3064	4040
38,000	2531	2849	2589	2329	2067	2012	2120	2438	3116	4094
39,000	2595	2932	2660	2389	2119	2058	2166	2481	3171	4153
40,000	2663	3017	2734	2450	2173	2104	2212	2550	3227	4218

TABLE 5-10

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2534	2861	2595	2330	2059	1982	2059	2321	2816	3598
38,000	2602	2947	2671	2394	2112	2027	2104	2364	2890	3654
39,000	2673	3035	2747	2460	2165	2073	2150	2407	2939	3717
40,000	2748	3126	2826	2526	2220	2120	2199	2451	2990	3791

TABLE 5-11

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2610	2956	2678	2400	2110	2011	2068	2283	2723	3378
38,000	2683	3048	2759	2469	2163	2058	2116	2328	2769	3449
39,000	2759	3143	2841	2539	2218	2106	2165	2375	2820	3528
40,000	2838	3242	2926	2610	2275	2156	2219	2426	2876	3616

TABLE 5-12

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2690	3057	2766	2476	2163	2051	2098	2275	2682	3314
38,000	2767	3157	2854	2550	2220	2102	2151	2328	2738	3401
39,000	2847	3260	2943	2626	2281	2155	2207	2389	2803	3495
40,000	2930	3365	3034	2703	2345	2211	2268	2458	2879	3595

TABLE 5-13

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2463	2790	2528	2266	2010	1947	2047	2337	2988	3906
38,000	2532	2876	2603	2330	2064	1995	2095	2411	3046	3976
39,000	2604	2964	2680	2395	2119	2043	2143	2463	3106	4055
40,000	2677	3054	2759	2464	2173	2093	2192	2515	3168	4144

TABLE 5-14

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2541	2890	2613	2336	2053	1962	2035	2269	2768	3508
38,000	2617	2982	2693	2403	2108	2011	2085	2314	2822	3590
39,000	2694	3078	2776	2474	2165	2061	2138	2362	2880	3681
40,000	2772	3177	2862	2547	2222	2114	2192	2414	2944	3779

TABLE 5-15

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2624	2997	2705	2414	2104	1995	2052	2244	2661	3344
38,000	2705	3098	2792	2486	2164	2048	2108	2301	2724	3438
39,000	2786	3202	2882	2562	2226	2104	2168	2363	2795	3539
40,000	2870	3307	2975	2642	2292	2163	2232	2434	2876	3646

TABLE 5-16

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2709	3110	2805	2499	2168	2045	2097	2272	2662	3324
38,000	2795	3216	2897	2578	2236	2105	2162	2349	2750	3429
39,000	2884	3323	2993	2662	2309	2169	2232	2434	2849	3544
40,000	2974	3434	3093	2753	2384	2237	2304	2525	2958	3672

TABLE 5-17

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2476	2824	2551	2278	2010	1936	2028	2327	2931	3834
38,000	2551	2916	2632	2348	2064	1986	2079	2382	2996	3932
39,000	2628	3012	2716	2420	2119	2037	2131	2439	3065	4040
40,000	2707	3111	2802	2493	2177	2087	2187	2501	3140	4156

TABLE 5-18

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2564	2937	2646	2355	2055	1956	2027	2233	2724	3495
38,000	2644	3039	2735	2431	2115	2010	2085	2291	2795	3601
39,000	2725	3143	2826	2508	2176	2068	2145	2358	2875	3714
40,000	2809	3248	2918	2588	2241	2127	2208	2434	2968	3833

TABLE 5-19

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2653	3057	2750	2443	2119	2001	2064	2250	2660	3371
38,000	2740	3163	2845	2526	2188	2063	2132	2329	2752	3484
39,000	2829	3271	2942	2613	2259	2129	2201	2418	2857	3609
40,000	2920	3383	3044	2705	2335	2197	2273	2516	2972	3747

TABLE 5-20

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2749	3174	2860	2545	2204	2068	2130	2333	2733	3394
38,000	2842	3290	2966	2642	2283	2139	2205	2430	2853	3513
39,000	2935	3410	3078	2746	2365	2212	2280	2534	2983	3674
40,000	3030	3534	3197	2859	2451	2288	2357	2643	3122	3858

TABLE 5-21

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2503	2877	2591	2305	2013	1931	2023	2313	2904	3843
38,000	2583	2979	2680	2381	2074	1985	2083	2382	2987	3967
39,000	2665	3084	2772	2459	2138	2043	2146	2459	3080	4098
40,000	2749	3189	2865	2540	2206	2105	2214	2545	3185	4236

TABLE 5-22

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2598	3004	2699	2393	2072	1967	2042	2251	2744	3545
38,000	2685	3110	2794	2477	2142	2029	2110	2336	2849	3672
39,000	2774	3219	2893	2566	2217	2095	2183	2428	2965	3810
40,000	2866	3333	2996	2660	2296	2165	2260	2552	3092	3964

TABLE 5-23

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2700	3129	2815	2501	2159	2032	2102	2326	2748	3464
38,000	2793	3246	2924	2601	2240	2102	2177	2428	2887	3620
39,000	2887	3369	3039	2709	2327	2176	2255	2535	3025	3798
40,000	2982	3494	3160	2826	2417	2254	2336	2646	3172	4000

TABLE 5-24

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
37,000	2802	3268	2956	2644	2267	2116	2179	2443	2886	3566
38,000	2899	3394	3080	2765	2359	2193	2257	2554	3034	3772
39,000	3000	3522	3209	2895	2456	2274	2338	2669	3191	3999
40,000	3106	3651	3341	3031	2555	2360	2421	2787	3354	4244

DELTA FUEL FLOW FOR DRAG DATA

TABLES

(230 RPM)

TABLE 5-25

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG
PRESSURE: SEA LEVEL TEMPERATURE: -25 C
AIRCRAFT - CH-47B 230 RPM
CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	19	63	150	296	504	805	1201
	100	38	127	301	591	1011	1609	2402
	150	57	190	454	882	1518	2413	3602
	200	76	254	606	1175	2024	3218	4803

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TABLE 5-26

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	17	59	140	272	471	746	1111
	100	35	118	279	548	940	1490	2222
	150	53	176	419	816	1408	2234	3334
	200	70	235	561	1088	1877	2979	4445

TABLE 5-27

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	16	55	131	253	442	689	1035
	100	32	110	260	509	875	1383	2069
	150	49	164	389	764	1312	2075	3103
	200	65	219	521	1012	1748	2768	4137

TABLE 5-28

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	52	122	238	412	646	967
	100	30	103	244	475	818	1293	1934
	150	45	154	365	715	1227	1941	2900
	200	61	205	486	950	1635	2589	3867

TABLE 5-29

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	18	59	140	277	469	748	1116
	100	36	118	282	547	939	1496	2233
	150	53	178	424	821	1410	2244	3349
	200	71	238	562	1093	1881	2992	4466

TABLE 5-30

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	17	54	129	255	435	693	1033
	100	33	109	259	510	871	1385	2066
	150	50	164	391	758	1307	2077	3099
	200	66	219	522	1012	1743	2769	4132

TABLE 5-31

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	51	120	235	410	644	961
	100	31	101	241	474	814	1288	1923
	150	46	152	362	707	1219	1932	2884
	200	61	203	485	941	1625	2576	3845

TABLE 5-32

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	47	113	219	385	599	899
	100	29	95	225	443	761	1201	1798
	150	43	142	338	664	1140	1804	2697
	200	57	190	453	880	1520	2406	3596

TABLE 5-33

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	16	56	132	256	437	695	1037
	100	32	112	264	506	874	1389	2074
	150	48	167	393	760	1311	2084	3111
	200	64	223	520	1013	1749	2778	4147

TABLE 5-34

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	51	121	239	402	643	959
	100	30	103	243	471	807	1285	1919
	150	45	155	365	705	1212	1928	2878
	200	60	206	484	939	1617	2571	3838

TABLE 5-35

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	48	112	221	376	599	893
	100	28	95	225	441	753	1197	1786
	150	42	144	339	656	1130	1795	2679
	200	56	192	452	875	1507	2394	3571

TABLE 5-36

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	44	104	206	355	559	835
	100	26	89	210	413	706	1118	1670
	150	39	134	316	614	1058	1677	2505
	200	52	179	422	818	1410	2237	3340

TABLE 5-37

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	51	122	232	407	644	962
	100	30	102	242	468	812	1289	1924
	150	45	153	360	703	1218	1933	2886
	200	60	202	481	938	1624	2578	3848

TABLE 5-38

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	48	114	219	374	597	890
	100	27	95	226	434	750	1193	1780
	150	41	142	336	652	1125	1790	2671
	200	55	189	446	869	1501	2386	3561

TABLE 5-39

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	45	106	206	347	555	828
	100	25	89	211	405	697	1110	1657
	150	38	133	315	608	1046	1665	2485
	200	51	177	416	809	1395	2220	3314

TABLE 5-40

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	12	42	99	193	324	519	775
	100	24	83	197	380	651	1038	1549
	150	36	125	295	568	978	1557	2324
	200	48	166	391	758	1305	2076	3098

TABLE 5-41

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	46	110	216	376	597	892
	100	28	92	220	434	752	1195	1783
	150	42	139	332	652	1128	1792	2675
	200	56	186	444	870	1504	2389	3566

TABLE 5-42

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	43	103	198	349	553	825
	100	26	85	205	401	697	1105	1650
	150	39	128	307	602	1045	1658	2475
	200	52	171	411	803	1393	2211	3300

TABLE 5-43

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	12	40	97	185	324	514	768
	100	24	79	191	373	648	1029	1535
	150	36	119	286	560	972	1543	2303
	200	48	159	382	747	1296	2057	3071

TABLE 5-44

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	37	91	173	304	481	718
	100	22	74	179	348	607	962	1436
	150	34	111	267	524	909	1443	2154
	200	45	149	357	699	1212	1924	2871

TABLE 5-45

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	44	103	202	348	553	825
	100	26	88	207	404	696	1106	1651
	150	39	131	310	605	1045	1659	2476
	200	52	175	413	807	1393	2212	3301

TABLE 5-46

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	12	41	94	187	322	512	764
	100	24	81	190	374	644	1023	1527
	150	36	122	286	560	966	1535	2291
	200	48	162	381	747	1289	2047	3055

TABLE 5-47

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	38	88	174	300	476	711
	100	22	76	177	347	600	952	1421
	150	33	113	266	521	899	1428	2132
	200	44	151	355	695	1199	1904	2843

TABLE 5-48

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	10	35	82	163	280	445	665
	100	21	71	166	325	561	890	1329
	150	31	106	249	488	841	1336	1994
	200	42	141	332	650	1122	1781	2658

GROUND IDLE FUEL FLOW DATA

TABLE

TABLE 5-49

GROUND IDLE FUEL FLOW
AIRCRAFT - CH-47B
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	1220	1164	1072	1000	932	860
	-5 C	1200	1144	1052	980	912	840
	15 C	1180	1124	1032	960	892	820
	35 C	1160	1104	1012	940	872	800

ENTRIES ARE AIRCRAFT FUEL FLOW RATES IN LBS/HR

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GROSS WEIGHT LIMITS DATA

TABLES

(230 RPM)

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TABLE 5-50

GROSS WEIGHT LIMITS
(DUE TO ENGINE)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HOGE)
AIRCRAFT - CH-47B 230 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	51426	48680	45886	43055	40000	37109
	-5 C	48259	45389	42347	39244	36389	33551
	15 C	44026	41097	38124	35361	32652	30149
	35 C	38611	36074	33530	31033	28690	26498

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

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TABLE 5-51

GROSS WEIGHT LIMITS
(DUE TO TRANSMISSION)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HOGE)
AIRCRAFT - CH-47B 230 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	41649	40829	39948	39042	38107	37109
	-5 C	40775	39904	39009	38087	37106	36079
	15 C	39915	39033	38124	37160	36149	35149
	35 C	39102	38208	37263	36267	35277	34295

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

TABLE 5-52

GROSS WEIGHT LIMITS
(DUE TO ENGINE)
FOR TAKEOFF CRITERIA #2
95% OF RATED POWER. VERTICAL RATE OF CLIMB 450 FT/MIN. OGE
AIRCRAFT - CH-47B 230 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	47643	45147	42601	40007	37176	34495
	-5 C	44746	42116	39306	36422	33774	31132
	15 C	40777	38072	35315	32755	30240	27918
	35 C	35662	33326	30978	28668	26500	24473

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

TABLE 5-53

GROSS WEIGHT LIMITS

(DUE TO TRANSMISSION)

FOR TAKEOFF CRITERIA #2

TRANSMISSION POWER LIMIT. VERTICAL RATE OF CLIMB 450 FT/MIN. OGE

AIRCRAFT - CH-47B 230 RPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	39660	38989	38235	37427	36597	35730
	-5 C	38944	38197	37399	36579	35724	34808
	15 C	38207	37420	36612	35771	34871	33936
	35 C	37483	36686	35861	34979	34057	33149

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

TABLE 5-54

GROSS WEIGHT LIMITS
(DUE TO ENGINE)
FOR TAKEOFF CRITERIA #3
100% OF MAXIMUM POWER (HIGE)
AIRCRAFT - CH-47B 230 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	57622	54547	51420	48251	44828	41589
	-5 C	54076	50861	47453	43975	40776	37596
	15 C	49333	46051	42719	39623	36588	33783
	35 C	43277	40432	37581	34783	32157	29701

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

TABLE 5-55

GROSS WEIGHT LIMITS
(DUE TO TRANSMISSION)
FOR TAKEOFF CRITERIA #3
100% OF MAXIMUM POWER (HIGE)
AIRCRAFT - CH-47B 230 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	46708	45801	44792	43754	42698	41589
	-5 C	45739	44741	43718	42677	41583	40444
	15 C	44754	43745	42719	41643	40520	39405
	35 C	43824	42814	41758	40651	39548	38447

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 40,000 LBS

VELOCITY LIMITS DATA

TABLES

(230 RPM)

TABLE 5-56

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
37,000	120	2560	148	3671	154	4048	136	3109	151	3846
38,000	121	2620	147	3671	154	4048	135	3109	148	3724
39,000	122	2673	146	3671	153	4048	134	3109	138	3276
40,000	122	2733	146	3671	152	4048	132	3109	125	2815

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TABLE 5-57

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	125	2581	153	3531	159	3898	143	3137	151	3463
38,000	125	2630	151	3531	159	3898	142	3137	148	3398
39,000	126	2682	150	3531	158	3898	141	3137	138	3030
40,000	127	2739	149	3531	157	3898	140	3137	125	2691

TABLE 5-58

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
GROSS WEIGHTS (LBS)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	130	2642	148	3192	160	3629	148	3163	151	3289
38,000	131	2691	147	3192	159	3629	146	3163	148	3216
39,000	131	2742	146	3192	158	3629	145	3163	138	2934
40,000	132	2798	145	3192	157	3629	144	3163	125	2631

TABLE 5-59

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
37,000	135	2710	139	2814	153	3243	151	3191	147	3049
38,000	135	2764	137	2814	152	3243	150	3191	143	2983
39,000	136	2814	136	2814	150	3243	149	3191	134	2765
40,000	136	2864	134	2814	149	3243	147	3191	121	2533

TABLE 5-60

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	122	2529	148	3534	154	3853	137	3060	151	3694
38,000	123	2590	147	3534	153	3853	136	3060	148	3585
39,000	123	2631	148	3534	151	3853	129	3060	138	3172
40,000	123	2672	145	3534	151	3853	134	3060	125	2735

TABLE 5-61

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
37,000	126	2535	150	3293	158	3681	145	3086	151	3350
38,000	127	2596	149	3293	158	3681	144	3086	148	3264
39,000	128	2664	148	3293	157	3681	142	3086	138	2925
40,000	130	2740	147	3293	155	3681	141	3086	125	2617

TABLE 5-62

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	132	2591	145	2954	158	3396	150	3111	146	3005
38,000	132	2648	143	2954	157	3396	148	3111	143	2939
39,000	133	2710	142	2954	155	3396	147	3111	134	2724
40,000	134	2777	140	2954	154	3396	146	3111	121	2489

TABLE 5-63

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	136	2653	134	2603	150	3037	153	3134	142	2811
38,000	136	2706	132	2603	148	3037	151	3134	139	2775
39,000	137	2760	130	2603	147	3037	150	3134	130	2600
40,000	137	2823	128	2603	145	3037	148	3134	108	2312

TABLE 5-64

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	123	2475	147	3380	153	3651	139	3013	151	3563
38,000	123	2517	146	3380	152	3651	137	3013	148	3470
39,000	123	2559	145	3380	151	3651	136	3013	138	3091
40,000	123	2640	144	3380	149	3651	135	3013	125	2691

TABLE 5-65

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	130	2533	147	3076	156	3445	146	3036	146	3046
38,000	130	2594	145	3076	155	3445	144	3036	143	2985
39,000	131	2649	144	3076	154	3445	143	3036	133	2726
40,000	131	2704	142	3076	152	3445	141	3036	121	2473

TABLE 5-66

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	134	2569	141	2745	154	3156	151	3060	142	2769
38,000	135	2640	139	2745	152	3156	150	3060	139	2733
39,000	136	2710	137	2745	151	3156	148	3060	129	2556
40,000	136	2761	135	2745	149	3156	146	3060	106	2257

TABLE 5-67

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	137	2612	128	2415	145	2830	154	3083	137	2621
38,000	138	2681	125	2415	143	2830	151	3083	134	2602
39,000	138	2757	122	2415	141	2830	149	3083	113	2295
40,000	138	2836	117	2415	138	2830	147	3083	93	2239

TABLE 5-68

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	122	2409	145	3181	151	3443	139	2968	146	3254
38,000	123	2491	143	3181	149	3443	138	2968	143	3166
39,000	123	2536	142	3181	148	3443	137	2968	134	2867
40,000	122	2583	140	3181	146	3443	135	2968	121	2548

TABLE 5-69

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
37,000	131	2502	143	2882	152	3198	147	2991	141	2816
38,000	131	2556	142	2882	151	3198	145	2991	138	2771
39,000	131	2612	140	2882	149	3198	143	2991	129	2543
40,000	132	2672	138	2882	147	3198	141	2991	106	2230

TABLE 5-70

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
37,000	136	2556	136	2559	149	2934	151	3012	137	2588
38,000	135	2613	134	2559	147	2934	149	3012	132	2532
39,000	135	2682	131	2559	145	2934	147	3012	110	2240
40,000	136	2766	127	2559	142	2934	144	3012	91	2191

TABLE 5-71

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
37,000	138	2622	119	2260	139	2626	152	3033	114	2197
38,000	138	2700	113	2260	135	2626	149	3033	106	2201
39,000	138	2791	103	2260	131	2626	146	3033	91	2187
40,000	138	2899	94	2260	126	2626	143	3033	0	0

TABLE 5-72

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
GROSS WEIGHTS (LBS)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	122	2391	141	2965	147	3207	140	2927	142	2991
38,000	122	2442	139	2965	145	3207	138	2927	139	2941
39,000	122	2499	138	2965	143	3207	136	2927	129	2686
40,000	122	2561	136	2965	142	3207	135	2927	106	2232

TABLE 5-73

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	132	2472	139	2690	147	2973	147	2948	137	2623
38,000	127	2459	136	2690	145	2973	145	2948	131	2542
39,000	128	2532	134	2690	143	2973	142	2948	109	2212
40,000	127	2611	131	2690	140	2973	139	2948	90	2158

TABLE 5-74

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
37,000	136	2557	128	2386	142	2715	150	2968	110	2135
38,000	136	2652	123	2386	139	2715	147	2968	103	2149
39,000	136	2756	118	2386	135	2715	144	2968	88	2141
40,000	136	2864	112	2386	130	2715	140	2968	0	0

TABLE 5-75

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	138	2679	97	2102	126	2434	149	2987	84	2068
38,000	138	2793	0	2102	120	2434	145	2987	0	0
39,000	137	2904	0	2102	116	2434	140	2987	0	0
40,000	136	3018	0	2102	94	2434	136	2987	0	0

TABLE 5-76

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
GROSS WEIGHTS (LBS)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	122	2369	136	2757	142	2984	140	2888	137	2792
38,000	124	2488	134	2757	140	2984	137	2888	131	2681
39,000	124	2571	131	2757	138	2984	135	2888	109	2258
40,000	124	2663	128	2757	135	2984	132	2888	90	2148

TABLE 5-77

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
37,000	127	2415	131	2491	140	2746	145	2907	108	2102
38,000	127	2498	127	2491	137	2746	142	2907	101	2116
39,000	126	2584	123	2491	133	2746	138	2907	86	2106
40,000	131	2809	117	2491	128	2746	134	2907	0	0

TABLE 5-78

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
37,000	136	2648	112	2209	130	2514	146	2925	0	0
38,000	135	2741	102	2209	124	2514	141	2925	0	0
39,000	134	2860	101	2209	119	2514	137	2925	0	0
40,000	133	2972	0	2209	116	2514	133	2925	0	0

TABLE 5-79

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47B 230 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
37,000	136	2790	0	1952	96	2255	142	2943	0	0
38,000	135	2909	0	1952	100	2255	137	2943	0	0
39,000	133	2997	0	1952	0	2255	132	2943	0	0
40,000	131	3084	0	1952	0	2255	127	2943	0	0

APPENDIX A

FUNCTIONS FOR CALCULATING BASIC FUEL FLOW

1. CH-47B Operating at 225 RPM

There are four functions that can be used to calculate the basic fuel flow for the CH-47B helicopter operating at 225 RPM. In order to use the functions the following data is needed:

1. Flight Mode
2. Temperature
3. Pressure (altitude)
4. Gross weight

Which of the four functions will be used depends on the flight mode. The first function is for HIGE (Hover In Ground Effect).

$$FF\ (HIGE) = f\ (TEMP, ALT, GW)$$

The second function is for HOGE (Hover Out of Ground Effect).

$$FF\ (HOGE) = f\ (TEMP, ALT, GW)$$

The third function is for NOE (Nap of the Earth).

$$FF\ (NOE) = f\ (TEMP, ALT, GW)$$

The fourth function is for Forward Flight.

$$FF\ (Forward\ Flight) = f\ (AS, TEMP, ALT, GW)$$

The equation for FF (HIGE) is:

$$FF\ (HIGE) = A\ (ALT) + B\ (TEMP) + C\ (GW) + D\ (ALT)(TEMP) + E\ (ALT)\ (GW) + F\ (TEMP)\ (GW) + G\ (ALT)\ (TEMP)\ (GW) + K$$

Where ALT is the altitude, TEMP is the temperature and GW is the gross weight and the constants have the following values:

$A = -4.61702715 \times 10^{-2}$ $\quad$ $E = 1.37115987 \times 10^{-6}$

$B = 6.40335783 \times 10^{-1}$ $\quad$ $F = 5.94156736 \times 10^{-5}$

$C = 5.56014264 \times 10^{-2}$ $\quad$ $G = 1.59960301 \times 10^{-8}$

$D = -3.81002334$ $\quad$ $K = 4.72597931 \times 10^{2}$

The equation for FF (HOGE) is exactly the same form as FF (HIGE). A new set of values for the constants is used. These values are:

$A = -5.87926949 \times 10^{-2}$ $\quad E = 2.05332455 \times 10^{-6}$

$B = -7.93196566 \times 10^{-1}$ $\quad F = 1.26924446 \times 10^{-4}$

$C = 6.58447044 \times 10^{-2}$ $\quad G = 1.66085032 \times 10^{-8}$

$D = -3.59832127 \times 10^{-4}$ $\quad K = 3.73129303 \times 10^{2}$

The equation for FF (NOE) is once again the same as FF (HIGE). The new values for the constants are:

$A = -5.48598277 \times 10^{-2}$ $\quad E = 1.79103192 \times 10^{-6}$

$B = 1.96384981 \times 10^{-1}$ $\quad F = 8.06580138 \times 10^{-5}$

$C = 5.71278753 \times 10^{-2}$ $\quad G = 2.00339594 \times 10^{-8}$

$D = -4.65883044 \times 10^{-4}$ $\quad K = 4.45467682 \times 10^{2}$

For the Forward Flight modes the form of the equation is:

$$FF = A(AS) + B(AS^2) + C(AS^3) + D(TEMP) + E(GW) + F(ALT) + G(AS^3)(TEMP)$$
$$+ H(AS^2)(TEMP) + I(AS)(TEMP) + J(AS^3)(GW) + K(AS^2)(GW)$$
$$+ L(AS)(GW) + M(AS^3)(ALT) + N(AS^2)(ALT) + O(AS)(ALT) + P(TEMP)(GW)$$
$$+ Q(TEMP)(ALT) + R(GW)(ALT) + S(TEMP)(GW)(ALT) + T$$

Where AS is the air speed in kts and the values of the constants are:

$A = -8.80385256$ $\quad K = -6.21839206 \times 10^{-7}$

$B = 9.87290759 \times 10^{-2}$ $\quad L = -4.27730381 \times 10^{-4}$

$C = 1.8343702 \times 10^{-4}$ $\quad M = -4.22321436 \times 10^{-8}$

$D = 3.3153846$ $\quad N = 6.71878615 \times 10^{-6}$

$E = 6.58309292 \times 10^{-2}$ $\quad O = -5.24116447 \times 10^{-4}$

$F = -2.83557344 \times 10^{-2}$ $\quad P = 2.1382421 \times 10^{-5}$

$G = -6.67641933 \times 10^{-6}$ $\quad Q = 2.55803116 \times 10^{-5}$

$H = 1.12381099 \times 10^{-3}$ $\quad R = 1.10589838 \times 10^{-6}$

$I = -8.5652709 \times 10^{-2}$ $\quad S = 2.45258373 \times 10^{-10}$

$J = 1.31523453 \times 10^{-8}$ $\quad T = 6.95736298 \times 10^{2}$

These functions allow anyone with a simple calculator to figure the fuel flow of the aircraft and bypass both looking up the values and interpolating for points in between the data points in the tables.

The above equations calculate the basic fuel flow for the CH-47B helicopter operating at 225 RPM with the following accuracies:

FF (HIGE) - 99.64%

FF (HOGE) - 99.54%

FF (NOE) - 99.47%

FF (Forward Flight) - 99.44%

2. CH-47B Operating at 230 RPM

There are four functions that can be used to calculate the basic fuel flow for the CH-47B helicopter operating at 230 RPM. In order to use the functions the following data is needed:

1. Flight Mode
2. Temperature
3. Pressure (altitude)
4. Gross weight

Which of the four functions will be used depends on the flight mode. The first function is for HIGE (Hover In Ground Effect).

$$FF\ (HIGE) = f\ (TEMP, ALT, GW)$$

The second function is for HOGE (Hover Out of Ground Effect).

$$FF\ (HOGE) = f\ (TEMP, ALT, GW)$$

The third function is for NOE (Nap of the Earth).

$$FF\ (NOE) = f\ (TEMP, ALT, GW)$$

The fourth function is for Forward Flight.

$$FF\ (Forward\ Flight) = f\ (AS, TEMP, ALT, GW)$$

The equation for FF (HIGE) is:

$$FF\ (HIGE) = A\ (ALT) + B\ (TEMP) + C\ (GW) + D\ (ALT)(TEMP) + E\ (ALT)\ (GW) + F\ (TEMP)\ (GW) + G\ (ALT)\ (TEMP)\ (GW) + K$$

Where ALT is the altitude, TEMP is the temperature and GW is the gross weight and the constants have the following values:

$A = -9.25630601 \times 10^{-2}$ $\quad$ $E = 2.61715525 \times 10^{-6}$

$B = -6.68697202$ $\quad$ $F = 2.54929997 \times 10^{-4}$

$C = 6.22293353 \times 10^{-2}$ $\quad$ $G = -2.35182049 \times 10^{-9}$

$D = 3.16956106 \times 10^{-4}$ $\quad$ $K = 2.55646027 \times 10^{2}$

The equation for FF (HOGE) is exactly the same form as FF (HIGE). new set of values for the constants is used. These values are:

$A = -1.06445056 \times 10^{-1}$ $E = 3.33738353 \times 10^{-6}$

$B = -6.5242281$ $F = 2.81714834 \times 10^{-4}$

$C = 7.75390863 \times 10^{-2}$ $G = -2.35957049 \times 10^{-10}$

$D = 2.65679631 \times 10^{-4}$ $K = -3.05105286 \times 10$

The equation for FF (NOE) is once again the same as FF (HIGE). The new values for the constants are:

$A = -1.15865572 \times 10^{-1}$ $E = 3.43923034 \times 10^{-6}$

$B = -4.67301321$ $F = 2.12110579 \times 10^{-4}$

$C = 6.62516356 \times 10^{-2}$ $G = 2.09664508 \times 10^{-8}$

$D = -5.05613658 \times 10^{-4}$ $K = 1.40741119 \times 10^{2}$

For the Forward Flight modes the form of the equation is:

$$FF = A(AS) + B(AS^2) + C(AS^3) + D(TEMP) + E(GW) + F(ALT) + G(AS^3)(TEMP)$$
$$+ H(AS^2)(TEMP) + I(AS)(TEMP) + J(AS^3)(GW) + K(AS^2)(GW)$$
$$+ L(AS)(GW) + M(AS^3)(ALT) + N(AS^2)(ALT) + O(AS)(ALT) + P(TEMP)(GW)$$
$$+ Q(TEMP)(ALT) + R(GW)(ALT) + S(TEMP)(GW)(ALT) + T$$

Where AS is the air speed in kts and the values of the constants are:

$A = 2.48220417$ $K = 3.43891804 \times 10^{-6}$

$B = -1.66443847 \times 10^{-2}$ $L = -8.007586 \times 10^{-4}$

$C = 5.2223634 \times 10^{-4}$ $M = -8.30491462 \times 10^{-8}$

$D = 5.27718383$ $N = 1.91262891 \times 10^{-5}$

$E = 8.66340864 \times 10^{-2}$ $O = -1.64952299 \times 10^{-3}$

$F = 4.93448263 \times 10^{-3}$ $P = 4.44708858 \times 10^{-5}$

$G = -1.07220363 \times 10^{-5}$ $Q = 5.94951031 \times 10^{-4}$

$H = 1.80055597 \times 10^{-3}$ $R = 1.08313091 \times 10^{-6}$

$I = -1.40366418 \times 10^{-1}$ $S = -1.57275322 \times 10^{-8}$

$J = -6.73745504 \times 10^{-11}$ $T = 1.78298035 \times 10$

These functions allow anyone with a simple calculator to figure the fuel flow of the aircraft and bypass both looking up the values and interpolating for points in between the data points in the tables.

The above equations calculate the basic fuel flow for the CH-47B helicopter operating at 230 RPM with the following accuracies:

FF (HIGE) - 97.81%

FF (HOGE) - 98.33%

FF (NOE) - 97.26%

FF (Forward Flight) - 99.33%

APPENDIX B

FUNCTIONS FOR CALCULATING DELTA FUEL FLOW FOR DRAG

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1. CH-47B Operating at 225 RPM

The function below will calculate the delta fuel flow for drag for the CH-47B helicopter operating at 225 RPM. Recall from the discussion in chapter three that this value is added to the basic fuel flow value whenever drag is increasing the rate of fuel flow.*

In order to use the function the following data is needed:

1. Air Speed (AS)
2. Equivalent Square Footage of Drag (SQ)
3. Temperature (TEMP) in degrees centigrade
4. Altitude (ALT) in feet above sea level

That is:

$$FF\ (Drag) = f(AS, SQ, TEMP, ALT)$$

The equation for FF (Drag) is:

$$FF\ (Drag) = A(AS) + B(AS^2) + C(AS^3) + D(TEMP) + E(SQ) + F(ALT)$$
$$+ G(AS^3)(TEMP) + H(AS^2)(TEMP) + I(AS)(TEMP) + J(AS^3)(SQ) + K(AS^2)(SQ)$$
$$+ L(AS)(SQ) + M(AS^3)(ALT) + N(AS^2)(ALT) + O(AS)(ALT) + P(TEMP)(SQ)$$
$$+ Q(TEMP)(ALT) + R(SQ)(ALT) + S(SQ)(ALT)(TEMP) + T$$

Where the constants have the following values:

$A = -1.25196528$	$K = -3.05088247 \times 10^{-5}$
$B = 1.40879075 \times 10^{-2}$	$L = 3.28588486 \times 10^{-3}$
$C = 6.59073385 \times 10^{-5}$	$M = -1.57229121 \times 10^{-8}$
$D = 3.22824508$	$N = -1.4745705 \times 10^{-6}$
$E = 1.26174283$	$O = 1.32419169 \times 10^{-4}$
$F = 2.72059236 \times 10^{-2}$	$P = -2.80175551 \times 10^{-2}$
$G = -2.37200825 \times 10^{-6}$	$Q = -1.32025707 \times 10^{-6}$
$H = 1.19079516 \times 10^{-4}$	$R = -2.47727552 \times 10^{-4}$
$I = -1.09635592 \times 10^{-2}$	$S = 8.9789021 \times 10^{-7}$
$J = 4.49367928 \times 10^{-6}$	$T = -1.3597625 \times 10^{2}$

*There is no delta fuel flow for drag for HIGE, HOGE or NOE flight.

This equation calculates the delta fuel flow for drag value with an accuracy of 99.67%. It should be noted that in some instances the computed value will be negative. If this occurs, zero (Ø) should be used as the value for delta fuel flow.

2. CH-47B Operating at 230 RPM

The function below will calculate the delta fuel flow for drag for the CH-47B helicopter operating at 230 RPM. Recall from the discussion in chapter three that this value is added to the basic fuel flow value whenever drag is increasing the rate of fuel flow.*

In order to use the function the following data is needed:

1. Air Speed (AS)
2. Equivalent Square Footage of Drag (SQ)
3. Temperature (TEMP) in degrees centigrade
4. Altitude (ALT) in feet above sea level

That is:

$$FF\ (Drag) = f(AS, SQ, TEMP, ALT)$$

The equation for FF (Drag) is:

$$FF\ (Drag) = A(AS) + B(AS^2) + C(AS^3) + D(TEMP) + E(SQ) + F(ALT)$$
$$+ G(AS^3)(TEMP) + H(AS^2)(TEMP) + I(AS)(TEMP) + J(AS^3)(SQ) + K(AS^2)(SQ)$$
$$+ L(AS)(SQ) + M(AS^3)(ALT) + N(AS^2)(ALT) + O(AS)(ALT) + P(TEMP)(SQ)$$
$$+ Q(TEMP)(ALT) + R(SQ)(ALT) + S(SQ)(ALT)(TEMP) + T$$

Where the constants have the following values:

$A = 9.51979216 \times 10^{-3}$	$K = -3.14629142 \times 10^{-5}$
$B = 5.16340137 \times 10^{-4}$	$L = 2.88915634 \times 10^{-3}$
$C = 1.09157067 \times 10^{-4}$	$M = -2.13324689 \times 10^{-8}$
$D = 2.91942126$	$N = 3.15199411 \times 10^{-7}$
$E = 1.28689334$	$O = -3.66419554 \times 10^{-5}$
$F = 3.15235285 \times 10^{-2}$	$P = -2.7944278 \times 10^{-2}$
$G = -2.01532308 \times 10^{-6}$	$Q = -3.42952262 \times 10^{-7}$
$H = 1.95831512 \times 10^{-6}$	$R = -2.48567256 \times 10^{-4}$
$I = 4.53233719 \times 10^{-4}$	$S = 8.77988086 \times 10^{-7}$
$J = 4.51088698 \times 10^{-6}$	$T = -1.67979713 \times 10^{2}$

There is no delta fuel flow for drag for HIGE, HOGE or NOE flight.

This equation calculates the delta fuel flow for drag value with an accuracy of 99.68%. It should be noted that in some instances the computed value will be negative. If this occurs, zero (Ø) should be used as the value for delta fuel flow.

APPENDIX C

FUNCTIONS FOR CALCULATING GROUND IDLE FUEL FLOW

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The function below will calculate the ground idle fuel flow rate for the CH-47B helicopter. In order to use the function the following data is needed:

1. Temperature (TEMP) in degrees centigrade.

2. Altitude (ALT) in feet above sea level.

That is:

$$FF\ (Idle) = f\ (TEMP, ALT)$$

The equation, for FF (Idle) is:

$$FF\ (Idle) = A(TEMP) + B(ALT) + C(TEMP)(ALT) + D(TEMP^2) + E(ALT^2) + F$$

Where the constants have the following values:

$A = -9.99999985 \times 10^{-1}$ $\qquad$ $D = 1.60979201 \times 10^{-9}$

$B = -3.73999695 \times 10^{-2}$ $\qquad$ $E = 7.14257675 \times 10^{-8}$

$C = -1.07357118 \times 10^{-11}$ $\qquad$ $F = 1.20071422 \times 10^{3}$

This equation calculates the ground idle fuel flow rate with an accuracy of 99.75%.

APPENDIX D

FUNCTIONS FOR CALCULATING GROSS WEIGHT LIMITS FOR TAKEOFF

1. CH-47B Operating at 225 RPM

The functions given below will calculate the gross weight limits for take off for the CH-47B helicopter operating at 225 RPM. Each of the functions is of the same basic form with the values of the constants changing depending on which take off criteria is being used. In all cases the Structural Gross Weight Limit of the CH-47B helicopter is 40,000 lbs.

In order to use the functions the following data is needed:

1. Temperature (TEMP) in degrees centigrade

2. Altitude (ALT) in feet above sea level

That is:

GW (Limit) = f (TEMP, ALT)

The basic equation for GW (Limit) is:

GW (Limit) = A(TEMP) + B(ALT) + C(TEMP)(ALT) + D

For take off criteria #1 the equation must be used twice, once using the engine limit constants and once using the transmission limit constants. For take off criteria #1 the constants for engine limits are:

$A = -2.17938816 \times 10^{2}$ $C = 3.97893076 \times 10^{-3}$

$B = -1.41074102$ $D = 4.65866338 \times 10^{4}$

For take off criteria #1 the constants for transmission limits are:

$A = -4.50966721 \times 10$ $C = -3.53499094 \times 10^{-4}$

$B = -4.87621792 \times 10^{-1}$ $D = 4.07345547 \times 10^{4}$

For take off criteria #2 two checks must also be made. The constants for engine limits, take off criteria #2 are:

$A = -2.05524782 \times 10^{2}$ $C = 3.59228952 \times 10^{-3}$

$B = -1.30679001$ $D = 4.32852666 \times 10^{4}$

For take off criteria #2 the constants for transmission limits are:

$A = -3.94242868 \times 10$ $C = -5.09142679 \times 10^{-4}$

$B = -4.3486141 \times 10^{-1}$ $D = 3.89957397 \times 10^{4}$

Also for take off criteria #3 two checks must be made. The constants for engine limits, take off criteria #3 are:

$A = -2.44355938 \times 10^{2}$ $\quad C = 4.44135594 \times 10^{-3}$

$B = -1.58051027$ $\quad D = 5.22083384 \times 10^{4}$

For take off criteria #3 the constants for transmission limits are:

$A = -5.11538081 \times 10$ $\quad C = -2.98571696 \times 10^{-4}$

$B = -5.47035679 \times 10^{-1}$ $\quad D = 4.56617446 \times 10^{4}$

This equation with the various sets of constants gives results that are 99.73% accurate or better.

2. CH-47B Operating at 230 RPM

The functions given below will calculate the gross weight limits for take off for the CH-47B helicopter operating at 230 RPM. Each of the functions is of the same basic form with the values of the constants changing depending on which take off criteria is being used. In all cases the Structural Gross Weight Limit of the CH-47B helicopter is 40,000 lbs.

In order to use the functions the following data is needed:

1. Temperature (TEMP) in degrees centigrade

2. Altitude (ALT) in feet above sea level

That is:

GW (Limit) = f (TEMP, ALT)

The basic equation for GW (Limit) is:

GW (Limit) = A(TEMP) + B(ALT) + C(TEMP)(ALT) + D

For take off criteria #1 the equation must be used twice, once using the engine limit constants and once using the transmission limit constants. For take off criteria #1 the constants for engine limits are:

$A = -2.17639074 \times 10^{2}$ $C = 3.70614778 \times 10^{-3}$

$B = -1.39994501$ $D = 4.66277666 \times 10^{4}$

For take off criteria #1 the constants for transmission limits are:

$A = -4.27742863 \times 10$ $C = -4.86142744 \times 10^{-4}$

$B = -4.68419265 \times 10^{-1}$ $D = 4.06342041 \times 10^{4}$

For take off criteria #2 two checks must also be made. The constants for engine limits, take off criteria #2 are:

$A = -2.03827135 \times 10^{2}$ $C = 3.29792855 \times 10^{-3}$

$B = -1.2926003$ $D = 4.320173 \times 10^{4}$

For take off criteria #2 the constants for transmission limits are:

$A = -3.67504745 \times 10$ $C = -6.67071632 \times 10^{-4}$

$B = -4.13932476 \times 10^{-1}$ $D = 3.88251328 \times 10^{4}$

Also for take off criteria #3 two checks must be made. The constants for engine limits, take off criteria #3 are:

$A = -2.4368 \times 10^{2}$ $\quad C = 4.13300109 \times 10^{-3}$

$B = -1.56838638$ $\quad D = 5.22495898 \times 10^{4}$

For take off criteria #3 the constants for transmission limits are:

$A = -4.86859508 \times 10$ $\quad C = -4.32143082 \times 10^{-4}$

$B = -5.27189255 \times 10^{-1}$ $\quad D = 4.55598457 \times 10^{4}$

This equation with the various sets of constants gives results that are 99.71% accurate or better.

APPENDIX E

SHORT DESCRIPTION OF CHINOOK (CH-47B) DATA SOURCE

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DRDAV-EQA(A)
SUBJECT: Short Description of CH-47B Performance Data Provided to TRADOC Systems Analysis Activity (TRASANA)

MFR:

1. References:

a. United Kingdom CH-47C, Hover-out-of Ground Effect (HOGE), Power Required (Boeing Vertol IOM 8-7442-1-439).

b. Determination of the Effects of Rotor Blade Compressibility on the Performance of the UH-1F; FTC-TR-65-17.

c. Airworthiness and Qualification Test (Phase D), CH-47B Helicopter, USAASTA Project No. 66-23.

d. Operator's Manual, Army Model CH-47B and CH-47C Helicopters, TM55-1520-227-10.

2. The performance data presented to TRASANA is the result of combining the helicopter power required, engine power available and engine fuel flow characteristics. The CH-47B power required was calculated from a non-dimensional representation of engine power required (coefficient of power) v.s. gross weight (coefficient of thrust) and true airspeed (advance ratio). The non-dimensional power required was obtained from reference 1a and 1c. All performance in ground effect represents a 10 foot skid height. A temperature dependent correction, based on the method outlined in reference 1b, was made to the power required to account for compressibility which could not be accounted for in the non-dimensional representation.

3. The T55-L-7C engine power available to the CH-47B (which was used in combination with the power required to find helicopter take-off and speed limits) was used as a function of altitude and temperature, from reference 1c.

4. The engine fuel flow at a particular altitude and temperature combination was derived from a representative referred fuel flow as a function of referred engine power. The referred fuel flow curve for the T55-L-7C engine was taken from reference 1c. The calculated fuel flows reflect 5% conservatism. A referred parameter is one which is divided by temperature and pressure ratios in order to represent all atmospheric conditions by one function.

5. The never exceed speeds (Vn.e.) were calculated from those shown graphically in reference 1d.

6. The Structural Gross Weight limit of the CH-47B is 40000 lbs.

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