TRASANA

TECHNICAL REPORT NO. 3-78

FLIGHT PROFILE PERFORMANCE HANDBOOK

VOLUME VIIC – CH-47C (CHINOOK)

APRIL 1979

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

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FLIGHT PROFILE PERFORMANCE HANDBOOK,

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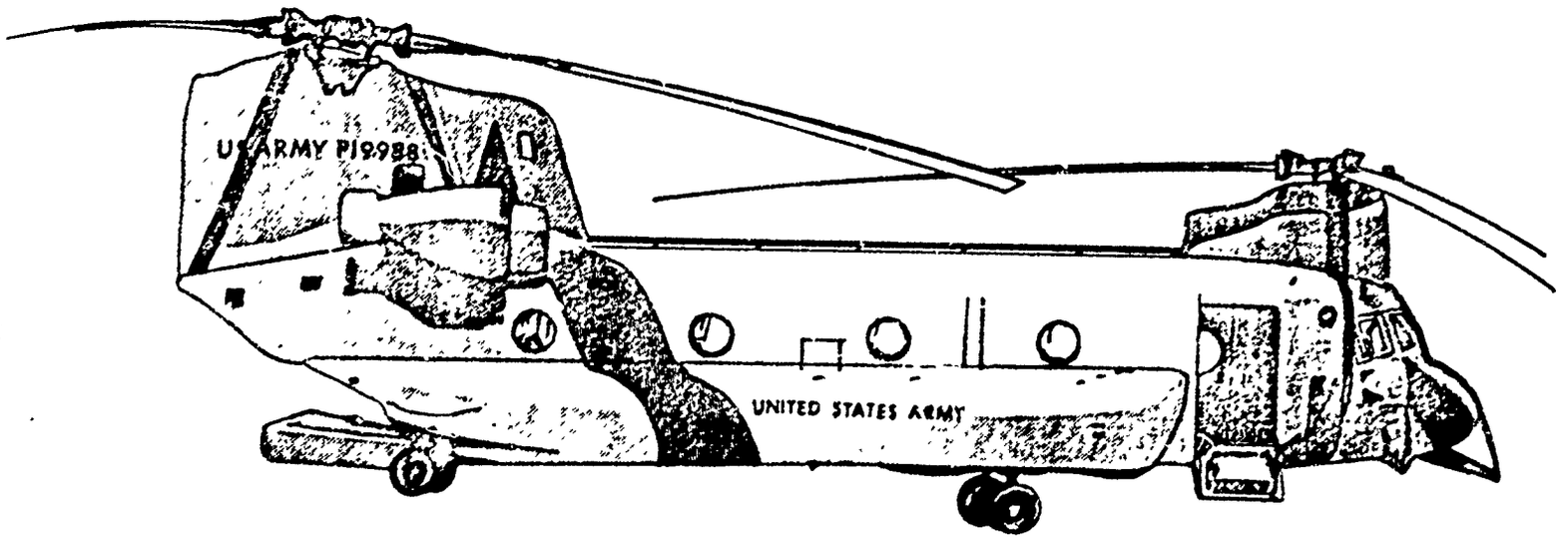
TABLE OF CONTENTS

INDEX OF TABLES AND FIGURES



CH-47 CHINOOK

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-47C OPERATION RATES

The CH-47C engine operates at two different rates which are dependent on the aircraft's gross weight. At gross weights of 40,000 lbs or less the engine runs at 235 RPM, above 40,000 lbs the rate is 245 RPM. Consequently, separate tables are provided in this volume for the different RPMs. The tables for 235 RPM are in Chapter 4 of this volume, while Chapter 5 contains the tables for 245 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-47C 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.

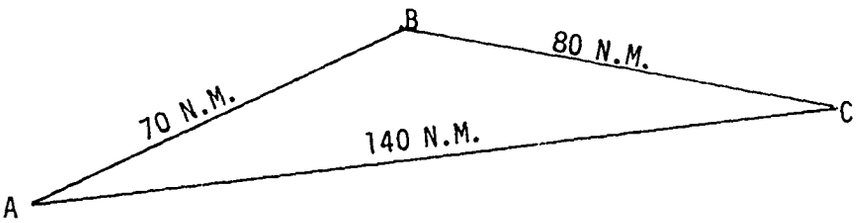


Illustration 2-1

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 16,000 lbs.

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

CHAPTER 2

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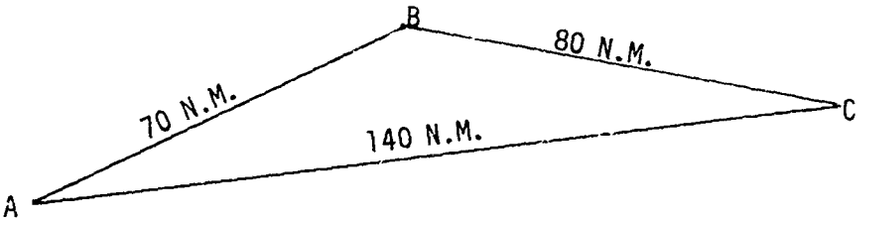

Illustration 2-1

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 16,000 lbs.

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

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-47C)

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	36,000	
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 1374 lbs/hr is at the intersection of 2000 ft and 15°C.

1st Idle @ A = 1/6 X 1374 = 229 lbs

Idle @ B = 1/3 X 1374 = 458 lbs

Idle @ C = 1/3 X 1374 = 458 lbs

2nd Idle @ A = 1/6 X 1374 = 229 lbs

TABLE 2-2

GROUND IDLE FUEL FLOW

AIRCRAFT - CH-47C

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	1480	1400	1280	1188	1104	1040
	-5 C	1468	1388	1268	1176	1092	1028
	15 C	1454	1374	1254	1162	1078	1014
	35 C	1440	1360	1240	1148	1064	1000

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-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1527	1644	1572	1499	1362	1321	1407	1686	2127	2710
24,000	1739	1891	1768	1645	1492	1461	1529	1777	2212	2812
28,000	1967	2154	1986	1818	1639	1601	1662	1888	2309	2917
32,000	2197	2429	2229	2029	1811	1749	1806	2021	2429	3023
36,000	2437	2737	2498	2259	2006	1915	1968	2172	2576	3190
40,000	2711	3075	2792	2510	2213	2096	2151	2335	2744	3421

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 1362 lb/hr and 80 kts is 1321 lb/hr. Interpolation gives the value of 1342 lb/hr for a 70 kts airspeed. Since the leg is one hour long:

Leg A-B = 1 X 1342 = 1342 lbs

(2) Leg B-C is at 40 kts and 36,000 lbs. This value is in the table; 2259 lbs/hr. Since the leg is two hours long:

Leg B-C = 2 X 2259 = 4518 lbs

(3) Leg C-A is at 70 kts and 20,000 lbs. This fuel flow rate was computed above to be 1342 lbs/hr. Since the leg is two hours long:

Leg C-A = 2 X 1342 = 2684 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-47C)
Altitude: 4000 ft flight/2000 ft Idle
Temperature: 15°C

LEG	DISTANCE	AS	TIME	GW (lbs)	FUEL
Idle @ A	-		10 min	-	229 lbs
A-B	70 N.M.	70 kts	1 hr	20,000	1342 lbs
Idle @ B	-	-	20 min	-	458 lbs
B-C	80 N.M.	40 kts	2 hr	36,000	4518 lbs
Idle @ C	-	-	20 min	-	458 lbs
C-A	140 N.M.	70 kts	2 hr	20,000	2684 lbs
Idle @ A	-	-	10 min	-	229 lbs
				Total	9918 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 c.. 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 235 RPM: 20,000 lbs, 24,000 lbs, 28,000 lbs, 32,000 lbs, 36,000 lbs and 40,000 lbs (Table 3-1) There are four rows of fixed gross weights for 245 RPM: 40,000 lbs, 42,000 lbs, 44,000 lbs, and 46,000 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-47C helicopter. Using Table 3-1 at a gross weight of 28000 lbs and an airspeed of 80 kts, the helicopter will use 1601 lbs/hr fuel, i.e., for 30 minutes, 801 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 - 1639 lbs/hr and 32,000 lbs - 1811 lbs/hr, the basic fuel flow rate for 30,000 lbs is 1725 lbs/hr. In this example, if the helicopter flies in this mode for 30 minutes, 863 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-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1527	1644	1572	1499	1362	1321	1407	1684	2127	2710
24,000	1739	1891	1768	1645	1492	1461	1529	1777	2212	2812
28,000	1969	2154	1986	1818	1639	1601	1662	1888	2309	2917
32,000	2197	2429	2229	2029	1811	1749	1806	2021	2429	3023
36,000	2437	2737	2498	2259	2006	1915	1968	2172	2576	3190
40,000	2711	3075	2792	2510	2213	2096	2151	2335	2744	3421

TABLE 3-2

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2727	3083	2816	2550	2273	2155	2203	2393	2853	3564
42,000	2870	3256	2971	2684	2383	2250	2299	2480	2955	3695
44,000	3019	3446	3135	2826	2495	2347	2401	2574	3063	3850
46,000	3173	3650	3311	2973	2613	2450	2509	2681	3180	4042

TABLE 3-3

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	44	104	203	359	552	807
	100	26	88	208	410	708	1105	1818
	150	39	131	312	618	1056	1691	2838
	200	52	175	418	821	1403	2368	3857

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 1601 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 208 lbs/hr should be added to the basic fuel flow rate. Thus the basic fuel flow rate becomes 1601 + 208 or 1809 lbs per hour and for a half-hour flight, 905 lbs of fuel will be used instead of the 801 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-47C 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 1374. Thus, the CH-47C uses 1374 lbs/hr at these conditions and since it is idling for 20 minutes or 1/3 of an hour, it will use 458 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 1454 lbs/hr and the 2000 ft. rate of 1374 lbs/hr which would be 1414 lbs/hr. In 1/3 of an hour 471 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

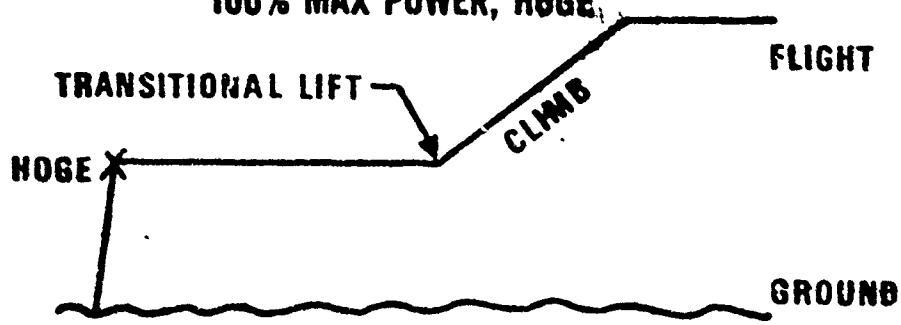
(3) Altitude (Air Pressure)

(4) Temperature

CRITERIA #1

(MIDDLE OF THE ROAD)

100% MAX POWER, HOGE

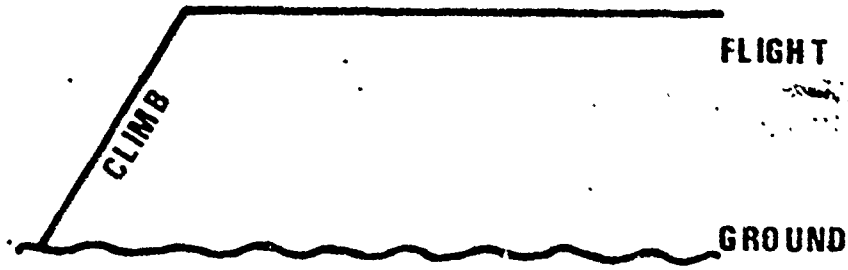


NOTHING TO SPARE.

CRITERIA #2

(LEAST RISKY)

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

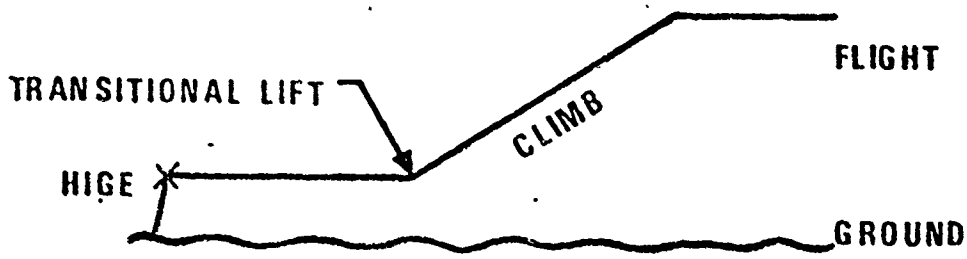


POWER LEFT

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-47C structural gross weight limit is given as 46,000 lbs and is listed at the bottom of each table. As the name implies, it is simply not safe to expect the CH-47C 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-47C 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 38,200. 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 42,000 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 46,300 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 (HUGE)

AIRCRAFT - CH-47C 245 KPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	+25 C	59997	56757	52912	48952	45261	41916
	-5 C	56570	53172	48993	45428	42063	38876
	15 C	52434	48807	45302	42050	38958	36022
	35 C	48494	45181	41937	38897	36014	33279

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 LBS

TABLE 3-5

GROSS WEIGHT LIMITS
(DUE TO TRANSMISSION)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HUGE)
AIRCRAFT - CH-47C 245 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	47577	46627	45616	44587	43513	42328
	-5 C	46566	45567	44545	43484	42341	41143
	15 C	45580	44569	43525	42411	41240	40103
	35 C	44649	43621	42532	41389	40257	39132

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 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-47C 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 2072 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 3-5 would be a CH-47C at 2000 ft. and 15° weighing 28,000 lbs could fly 167 kts with a fuel usage of 3334 lbs/hr.

TABLE 3-6

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 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	116	1718	174	3334	191	3915	177	3450	170	3211
24,000	122	1910	170	3334	187	3915	174	3450	170	3319
28,000	125	2072	167	3334	183	3915	170	3450	170	3438
32,000	129	2267	164	3334	180	3915	167	3450	170	3542
36,000	133	2506	160	3334	176	3915	163	3450	170	3701
40,000	136	2733	156	3334	171	3915	159	3450	145	2951

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-47C helicopter at 2000 ft and 15°C weighing 28,000 lbs has an engine that is capable of producing enough power to fly 183 kts but the transmission limits the aircraft to 170 kts. Between these two columns then, the flight cannot exceed 170 kts with a fuel flow rate of 3450 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 170 kts is listed for 2,000 ft., 15°C, and 28,000 lbs, this implies that the aircraft can reach its transmission limit under these conditions.

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-47C) PERFORMANCE DATA TABLES (235 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-47C) 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

(235 RPM)

TABLE 4-1

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1505	1608	1554	1499	1383	1356	1549	1989	2634	3558
24,000	1688	1820	1749	1678	1528	1491	1652	2084	2722	3687
28,000	1884	2052	1942	1831	1661	1630	1770	2184	2850	3850
32,000	2099	2298	2141	1984	1792	1774	1903	2291	2977	4046
36,000	2322	2546	2349	2152	1939	1921	2045	2410	3121	4269
40,000	2540	2802	2575	2348	2108	2075	2197	2545	3286	4518

TABLE 4-2

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1560	1667	1612	1556	1426	1385	1536	1921	2493	3235
24,000	1750	1887	1806	1725	1565	1520	1641	2009	2574	3320
28,000	1958	2128	2000	1872	1694	1659	1762	2104	2661	3469
32,000	2178	2384	2206	2027	1830	1801	1894	2209	2758	3608
36,000	2406	2641	2429	2217	1987	1945	2035	2334	2870	3754
40,000	2628	2915	2672	2429	2167	2099	2188	2474	3038	3911

TABLE 4-3

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1614	1725	1666	1608	1470	1423	1545	1887	2402	3073
24,000	1811	1954	1860	1767	1604	1559	1654	1970	2480	3158
28,000	2025	2203	2058	1913	1735	1699	1778	2063	2566	3262
32,000	2254	2466	2275	2085	1881	1839	1910	2174	2663	3367
36,000	2484	2738	2515	2292	2049	1985	2052	2304	2778	3472
40,000	2717	3035	2776	2517	2239	2145	2208	2450	2918	3625

TABLE 4-4

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1667	1782	1718	1654	1512	1464	1565	1873	2339	2963
24,000	1872	2020	1913	1806	1644	1603	1679	1955	2415	3049
28,000	2094	2276	2118	1960	1781	1743	1806	2050	2503	3147
32,000	2325	2548	2349	2150	1939	1884	1940	2165	2606	3244
36,000	2560	2840	2605	2370	2118	2036	2085	2300	2732	3346
40,000	2814	3158	2884	2610	2316	2202	2247	2452	2879	3485

TABLE 4-5

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1462	1568	1514	1459	1338	1308	1475	1882	2479	3350
24,000	1650	1788	1707	1627	1478	1444	1583	1979	2570	3493
28,000	1855	2028	1903	1779	1608	1586	1710	2082	2710	3672
32,000	2077	2276	2106	1935	1746	1732	1847	2195	2847	3884
36,000	2298	2527	2325	2123	1907	1883	1997	2324	3004	4124
40,000	2519	2799	2564	2330	2088	2042	2154	2501	3189	4394

TABLE 4-6

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1516	1625	1567	1510	1376	1335	1464	1816	2346	3035
24,000	1711	1853	1760	1667	1510	1472	1575	1906	2429	3130
28,000	1925	2104	1959	1814	1640	1612	1702	2007	2520	3293
32,000	2154	2360	2174	1988	1787	1754	1839	2122	2625	3436
36,000	2377	2626	2410	2194	1959	1904	1988	2257	2750	3587
40,000	2605	2922	2668	2414	2151	2070	2149	2406	2945	3763

TABLE 4-7

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1568	1682	1618	1554	1415	1370	1473	1783	2260	2884
24,000	1772	1919	1811	1704	1546	1508	1589	1869	2341	2979
28,000	1994	2177	2018	1858	1682	1649	1717	1970	2431	3085
32,000	2225	2444	2248	2051	1841	1791	1854	2092	2538	3189
36,000	2455	2730	2501	2272	2023	1945	2005	2233	2669	3329
40,000	2705	3049	2778	2507	2223	2116	2173	2387	2823	3493

TABLE 4-8

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1620	1738	1666	1593	1453	1418	1493	1769	2201	2782
24,000	1833	1934	1862	1741	1584	1549	1614	1856	2281	2876
28,000	2060	2248	2080	1912	1731	1698	1744	1960	2375	2973
32,000	2292	2530	2325	2120	1901	1835	1884	2087	2491	3071
36,000	2538	2839	2596	2353	2093	1996	2039	2233	2632	3192
40,000	2812	3178	2903	2608	2300	2174	2217	2394	2791	3389

TABLE 4-9

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1424	1532	1475	1418	1294	1263	1407	1782	2334	3158
24,000	1618	1761	1668	1575	1428	1401	1523	1881	2455	3316
28,000	1833	2007	1867	1727	1560	1545	1656	1988	2583	3513
32,000	2056	2256	2079	1901	1711	1694	1800	2111	2731	3741
36,000	2273	2519	2311	2103	1886	1850	1955	2273	2905	4000
40,000	2499	2811	2565	2320	2075	2017	2118	2452	3116	4278

TABLE 4-10

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1476	1588	1525	1461	1327	1288	1397	1718	2207	2850
24,000	1678	1827	1718	1610	1457	1426	1516	1812	2294	2989
28,000	1902	2082	1924	1767	1594	1568	1648	1918	2391	3129
32,000	2129	2341	2151	1961	1755	1713	1792	2046	2507	3276
36,000	2352	2626	2402	2178	1941	1873	1949	2191	2684	3440
40,000	2600	2942	2675	2409	2140	2048	2118	2349	2870	3661

TABLE 4-11

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1527	1644	1572	1499	1362	1321	1407	1686	2127	2710
24,000	1739	1891	1768	1645	1492	1461	1529	1777	2212	2812
28,000	1969	2154	1986	1818	1639	1601	1662	1888	2309	2917
32,000	2197	2429	2229	2029	1811	1749	1806	2021	2429	3023
36,000	2437	2737	2498	2259	2006	1915	1968	2172	2576	3190
40,000	2711	3075	2792	2510	2213	2096	2151	2335	2744	3421

TABLE 4-12

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 35°C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1579	1700	1616	1533	1396	1359	1428	1673	2071	2616
24,000	1798	1954	1819	1685	1531	1499	1554	1766	2157	2713
28,000	2029	2226	2051	1878	1690	1641	1688	1881	2261	2810
32,000	2266	2522	2311	2100	1873	1794	1836	2020	2391	2916
36,000	2530	2850	2599	2347	2075	1966	2005	2176	2544	3080
40,000	2824	3218	2918	2619	2295	2160	2206	2362	2736	3356

TABLE 4-13

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1389	1501	1438	1375	1250	1221	1345	1689	2198	2983
24,000	1592	1740	1634	1528	1381	1362	1469	1790	2331	3158
28,000	1813	1988	1837	1686	1521	1508	1607	1905	2469	3371
32,000	2033	2242	2060	1879	1686	1660	1758	2037	2631	3617
36,000	2253	2524	2307	2090	1872	1824	1918	2223	2829	3885
40,000	2499	2839	2581	2322	2068	1996	2091	2417	3067	4218

TABLE 4-14

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1440	1557	1484	1411	1279	1244	1337	1627	2078	2679
24,000	1652	1805	1681	1558	1409	1385	1462	1726	2169	2833
28,000	1880	2061	1897	1734	1557	1527	1600	1842	2274	2976
32,000	2103	2332	2138	1944	1734	1680	1751	1980	2432	3131
36,000	2340	2639	2404	2169	1930	1850	1918	2134	2609	3326
40,000	2613	2977	2698	2420	2133	2031	2099	2303	2812	3641

TABLE 4-15

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1491	1612	1528	1443	1310	1276	1348	1596	2003	2549
24,000	1711	1868	1732	1596	1445	1416	1475	1694	2092	2655
28,000	1942	2135	1963	1790	1605	1559	1613	1817	2200	2759
32,000	2174	2428	2221	2014	1791	1717	1767	1961	2336	2903
36,000	2436	2756	2506	2256	1995	1893	1942	2119	2497	3098
40,000	2730	3126	2828	2530	2212	2088	2145	2310	2702	3421

TABLE 4-16

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1542	1666	1570	1475	1343	1311	1369	1584	1951	2462
24,000	1768	1928	1785	1641	1486	1451	1499	1686	2044	2559
28,000	2000	2211	2031	1851	1658	1598	1639	1813	2160	2658
32,000	2251	2526	2307	2088	1853	1762	1798	1962	2305	2790
36,000	2536	2879	2615	2351	2066	1947	1987	2133	2476	3026
40,000	2850	3276	2963	2650	2310	2167	2218	2384	2755	3387

TABLE 4-17

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1359	1476	1404	1331	1207	1183	1290	1601	2092	2824
24,000	1572	1721	1602	1482	1339	1326	1422	1708	2219	3017
28,000	1794	1970	1814	1658	1491	1475	1566	1831	2368	3246
32,000	2011	2239	2051	1863	1670	1633	1722	1999	2549	3506
36,000	2247	2543	2316	2088	1863	1802	1890	2187	2775	3810
40,000	2517	2890	2615	2339	2068	1984	2079	2396	3047	4232

TABLE 4-18

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1409	1531	1446	1361	1233	1204	1283	1542	1958	2549
24,000	1631	1785	1651	1516	1367	1345	1414	1647	2054	2688
28,000	1857	2045	1879	1712	1531	1492	1559	1776	2171	2835
32,000	2084	2338	2135	1931	1720	1655	1719	1924	2355	3008
36,000	2346	2664	2418	2172	1921	1833	1895	2086	2548	3273
40,000	2638	3047	2747	2447	2138	2027	2099	2313	2798	3717

TABLE 4-19

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1460	1585	1488	1391	1262	1234	1295	1512	1888	2401
24,000	1687	1847	1703	1559	1406	1374	1426	1621	1984	2506
28,000	1917	2124	1948	1772	1580	1523	1572	1756	2105	2634
32,000	2164	2439	2223	2006	1778	1693	1738	1909	2257	2793
36,000	2449	2792	2530	2268	1989	1880	1930	2083	2440	3071
40,000	2763	3202	2886	2569	2235	2101	2162	2347	2766	3513

TABLE 4-20

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1510	1638	1530	1422	1294	1267	1315	1502	1840	2317
24,000	1740	1908	1759	1609	1450	1408	1449	1615	1942	2414
28,000	1979	2207	2021	1834	1634	1563	1598	1755	2074	2523
32,000	2250	2543	2314	2086	1840	1739	1774	1914	2231	2710
36,000	2554	2927	2649	2371	2071	1945	1999	2131	2463	3028
40,000	2895	3365	3040	2716	2356	2199	2250	2467	2861	3532

TABLE 4-21

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1334	1456	1371	1286	1166	1147	1241	1521	1982	2681
24,000	1555	1704	1575	1446	1304	1293	1378	1633	2117	2891
28,000	1773	1960	1800	1640	1471	1446	1530	1767	2282	3139
32,000	1999	2250	2053	1856	1660	1612	1693	1960	2489	34.7
36,000	2258	2581	2335	2098	1860	1788	1874	2161	2745	3796
40,000	2554	2998	2686	2374	2081	1988	2108	2410	3102	4331

TABLE 4-22

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1385	1511	1413	1314	1189	1167	1235	1465	1847	2410
24,000	1612	1767	1627	1486	1335	1309	1372	1580	1951	2552
28,000	1835	2041	1869	1697	1513	1464	1524	1719	2109	2709
32,000	2081	2355	2141	1927	1711	1637	1693	1876	2292	2926
36,000	2364	2715	2453	2191	1920	1824	1887	2059	2516	3314
40,000	2684	3160	2828	2496	2171	2049	2127	2373	2882	3871

TABLE 4-23

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1434	1564	1454	1344	1218	1194	1246	1437	1781	2262
24,000	1665	1830	1682	1535	1376	1336	1383	1558	1887	2366
28,000	1898	2126	1943	1760	1564	1496	1538	1704	2025	2511
32,000	2170	2462	2235	2008	1770	1676	1720	1865	2192	2735
36,000	2474	2855	2576	2297	2001	1884	1937	2093	2465	3118
40,000	2821	3335	2992	2649	2293	2142	2204	2443	2908	3761

TABLE 4-24

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
20,000	1483	1615	1498	1381	1252	1224	1266	1430	1738	2181
24,000	1715	1896	1741	1587	1421	1370	1405	1555	1853	2279
28,000	1989	2213	2019	1826	1618	1536	1567	1705	1999	2418
32,000	2260	2577	2337	2096	1836	1728	1765	1889	2187	2685
36,000	2589	2993	2705	2417	2101	1966	2012	2187	2531	3113
40,000	2957	3525	3187	2848	2437	2257	2299	2582	3049	3911

DELTA FUEL FLOW FOR DRAG DATA

TABLES

(235 RPM)

TABLE 4-25

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	17	58	137	270	465	730	1286
	100	34	116	274	545	924	1521	2632
	150	51	173	413	813	1384	2426	3978
	200	69	231	553	1078	1866	3328	5324

TABLE 4-26

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	16	54	129	250	442	680	1068
	100	32	108	256	505	870	1372	2326
	150	48	162	385	762	1299	2157	3583
	200	64	216	515	1011	1731	3002	4841

TABLE 4-27

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	51	121	235	415	640	964
	100	30	102	241	472	822	1280	2093
	150	45	153	361	713	1224	1950	3263
	200	60	203	482	952	1626	2734	4444

TABLE 4-28

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	48	114	222	388	611	900
	100	28	96	228	444	778	1213	1868
	150	43	144	341	670	1157	1823	2985
	200	57	192	455	897	1537	2484	4098

TABLE 4-29

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	16	54	127	252	431	679	1207
	100	32	107	255	507	857	1423	2458
	150	48	161	385	756	1286	2265	3710
	200	64	215	516	1002	1738	3103	4961

TABLE 4-30

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	50	119	233	410	632	1001
	100	30	100	238	471	808	1277	2173
	150	45	151	358	708	1206	2016	3342
	200	60	201	480	939	1609	2799	4511

TABLE 4-31

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	47	112	218	386	595	899
	100	28	94	224	440	764	1190	1946
	150	42	142	336	664	1138	1817	3044
	200	56	189	449	885	1511	2541	4142

TABLE 4-32

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	45	106	206	361	566	837
	100	26	89	211	413	723	1126	1745
	150	39	134	317	624	1075	1695	2785
	200	53	178	423	835	1428	2315	3820

TABLE 4-33

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	50	118	235	398	633	1133
	100	30	100	238	472	795	1338	2295
	150	45	150	359	701	1194	2120	3457
	200	60	201	481	930	1618	2898	4620

TABLE 4-34

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG
PRESSURE: 4000 FT TEMPERATURE: -5 C
AIRCRAFT - CH-47C 35 RPM
CHINOOK

DRAG IN SQUARE FEET	AIR SPEED IN KTS						
	40	60	80	100	120	140	160
50	14	47	110	217	380	587	947
100	28	93	221	439	749	1189	2037
150	42	140	334	658	1119	1884	3124
200	56	187	447	871	1495	2609	4210

TABLE 4-35

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	44	104	203	359	552	857
	100	26	88	208	410	708	1105	1818
	150	39	131	312	618	1056	1691	2838
	200	52	175	418	821	1403	2368	3857

TABLE 4-36

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	12	41	98	191	337	524	779
	100	24	83	196	384	672	1045	1631
	150	37	124	294	581	993	1574	2597
	200	49	165	393	776	1326	2157	3558

TABLE 4-37

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	46	110	220	368	589	1063
	100	28	93	222	437	736	1255	2141
	150	42	140	335	649	1108	1979	3219
	200	56	188	448	862	1506	2702	4298

TABLE 4-38

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	43	103	203	351	545	893
	100	26	87	206	409	693	1106	1904
	150	39	130	311	610	1037	1760	2912
	200	52	174	417	808	1387	2431	3919

TABLE 4-39

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	12	41	96	189	333	511	780
	100	24	81	193	382	656	1025	1697
	150	36	122	291	574	979	1574	2644
	200	49	163	389	761	1301	2206	3590

TABLE 4-40

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG
PRESSURE: 6000 FT TEMPERATURE: 35 C
AIRCRAFT - CH-47C 235 RPM
CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	38	91	178	314	485	723
	100	23	77	182	358	622	968	1523
	150	34	115	273	541	925	1461	2419
	200	46	153	366	720	1230	2009	3311

TABLE 4-41

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG
PRESSURE: 8000 FT TEMPERATURE: -25 C
AIRCRAFT - CH-47C 235 RPM
CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	43	103	204	340	548	995
	100	26	87	208	404	681	1180	1994
	150	39	131	312	600	1028	1848	2993
	200	52	175	415	798	1403	2517	3993

TABLE 4-42

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	12	40	96	190	323	505	844
	100	24	81	192	380	641	1029	1779
	150	37	121	290	564	959	1645	2713
	200	49	162	388	748	1286	2264	3646

TABLE 4-43

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	38	89	176	308	474	727
	100	23	76	180	356	606	951	1584
	150	34	114	271	532	905	1467	2461
	200	46	152	363	705	1205	2055	3338

TABLE 4-44

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	35	84	165	292	448	671
	100	21	71	169	334	576	896	1422
	150	32	107	254	502	857	1356	2252
	200	43	143	341	667	1139	1872	3079

TABLE 4-45

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG
PRESSURE: 10000 FT TEMPERATURE: -25 C
AIRCRAFT - CH-47C 235 RPM
CHINOOK

DRAG IN SQUARE FEET	AIR SPEED IN KTS						
	40	60	80	100	120	140	160
50	12	41	97	189	315	511	927
100	24	82	194	371	630	1112	1852
150	36	122	289	554	954	1726	2777
200	48	163	383	736	1309	2346	3702

TABLE 4-46

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	38	89	177	297	468	795
	100	23	76	180	351	591	958	1661
	150	34	114	270	521	886	1528	2525
	200	45	152	360	691	1192	2107	3389

TABLE 4-47

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	35	83	165	283	439	677
	100	21	71	168	330	559	882	1478
	150	32	106	253	492	836	1368	2289
	200	43	142	338	651	1114	1914	3101

TABLE 4-48

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG
PRESSURE: 10000 FT TEMPERATURE: 35 C
AIRCRAFT - CH-47C 235 RPM
CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	10	33	78	154	270	414	623
	100	20	66	157	311	531	828	1329
	150	30	100	237	465	792	1258	2095
	200	40	133	317	616	1052	1747	2861

GROUND IDLE FUEL FLOW DATA

TABLE

TABLE 4-49

GROUND IDLE FUEL FLOW

AIRCRAFT - CH-47C

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	1480	1400	1280	1188	1104	1040
	-5 C	1468	1388	1268	1176	1092	1028
	15 C	1454	1374	1254	1162	1078	1014
	35 C	1440	1360	1240	1148	1064	1000

ENTRIES ARE AIRCRAFT FUEL FLOW RATES IN LBS/HR

GROSS WEIGHT LIMITS DATA

TABLES

(235 RPM)

TABLE 4-50

GROSS WEIGHT LIMITS
(DUE TO ENGINE)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HOGE)
AIRCRAFT - CH-47C 235 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	60343	56204	52244	48370	44756	41399
	-5 C	56111	52268	48523	44996	41681	38416
	15 C	51925	48312	44864	41579	38454	35575
	35 C	48055	44752	41564	38535	35661	32939

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 LBS

TABLE 4-51

GROSS WEIGHT LIMITS
(DUE TO TRANSMISSION)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HOGE)
AIRCRAFT - CH-47C 235 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	47872	46822	45746	44601	43375	42153
	-5 C	46753	45688	44562	43370	42179	41006
	15 C	45701	44593	43422	42250	41096	39875
	35 C	44683	43531	42371	41234	40040	38789

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 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-47C 225 RPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	56370	52507	48808	45187	41808	38671
	-5 C	52395	48809	45310	42017	38920	35867
	15 C	48470	45098	41879	38812	35892	33204
	35 C	44838	41759	38785	35957	33273	30730

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 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-47C 235 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	45804	44872	43912	42917	41844	40706
	-5 C	44812	43862	42879	41828	40722	39632
	15 C	43874	42905	41873	40787	39713	38633
	35 C	42982	41970	40901	39838	38779	37644

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 LBS

TABLE 4-54

GROSS WEIGHT LIMITS
(DUE TO ENGINE)
FOR TAKEOFF CRITERIA #3
100% OF MAXIMUM POWER (HIGE)
AIRCRAFT - CH-47C 225 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	67707	63064	58621	54273	50217	46449
	-5 C	62917	58608	54408	50454	46736	43074
	15 C	58211	54159	50295	46612	43108	39880
	35 C	53868	50165	46593	43197	39975	36923

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 LBS

TABLE 4-55

GROSS WEIGHT LIMITS
(DUE TO TRANSMISSION)
FOR TAKEOFF CRITERIA #3
100% OF MAXIMUM POWER (HIGE)
AIRCRAFT - CH-47C 235 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	53683	52476	51255	49983	48644	47304
	-5 C	52399	51194	49937	48618	47297	45984
	15 C	51210	49971	48671	47366	46074	44703
	35 C	50071	48790	47500	46226	44886	43482

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 LBS

VELOCITY LIMITS DATA

TABLES

(235 RPM)

TABLE 4-56

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 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	104	1634	177	4526	181	4732	156	3376	170	4090
24,000	108	1794	174	4526	178	4732	151	3376	170	4248
28,000	113	2027	171	4526	174	4732	151	3376	170	4470
32,000	116	2189	167	4526	170	4732	149	3376	170	4734
36,000	121	2433	163	4526	166	4732	146	3376	170	5004
40,000	122	2620	160	4526	163	4732	142	3376	150	3805

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TABLE 4-57

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 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	110	1711	180	4035	189	4452	165	3442	170	3628
24,000	114	1892	178	4035	187	4452	163	3442	170	3717
28,000	118	2056	172	4035	180	4452	159	3442	170	3931
32,000	123	2278	168	4035	176	4452	157	3442	170	4118
36,000	126	2468	166	4035	174	4452	154	3442	170	4254
40,000	130	2707	162	4035	170	4452	150	3442	150	3432

TABLE 4-58

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: 15.C

AIRCRAFT - CH-47C 235 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	115	1793	174	3574	192	4200	172	3507	170	3424
24,000	120	1974	172	3574	189	4200	170	3507	170	3517
28,000	124	2157	168	3574	185	4200	167	3507	170	3636
32,000	126	2306	165	3574	181	4200	163	3507	170	3749
36,000	131	2537	162	3574	179	4200	161	3507	170	3849
40,000	135	2777	159	3574	174	4200	157	3507	150	3231

TABLE 4-59

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 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	120	1874	165	3137	192	3989	179	3570	170	3284
24,000	125	2060	162	3137	188	3989	176	3570	170	3383
28,000	128	2202	160	3137	184	3989	172	3570	170	3495
32,000	132	2400	157	3137	182	3989	169	3570	170	3589
36,000	136	2624	154	3137	179	3989	167	3570	170	3675
40,000	139	2845	149	3137	176	3989	162	3570	145	3016

TABLE 4-60

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 2000 FT TEMPERATURE: -25 C
AIRCRAFT - CH-47C 235 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	105	1566	177	4265	180	4420	160	3329	170	3852
24,000	111	1777	174	4265	176	4420	156	3329	170	4035
28,000	114	1957	170	4265	172	4420	154	3329	170	4287
32,000	119	2175	166	4265	168	4420	151	3329	170	4554
36,000	122	2393	162	4265	164	4420	147	3329	170	4822
40,000	122	2547	158	4265	161	4420	144	3329	150	3691

TABLE 4-61

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 2000 FT TEMPERATURE: -5 C
AIRCRAFT - CH-47C 235 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	1652	180	3775	189	4159	170	3390	170	3400
24,000	115	1819	177	3775	186	4159	167	3390	170	3506
28,000	121	2022	171	3775	178	4159	162	3390	170	3746
32,000	125	2227	167	3775	175	4159	159	3390	170	3894
36,000	128	2436	164	3775	172	4159	156	3390	170	4063
40,000	131	2651	160	3775	168	4159	152	3390	150	3312

TABLE 4-62

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 2000 FT TEMPERATURE: 15 C
AIRCRAFT - CH-47C 235 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	116	1718	174	3334	191	3915	177	3450	170	3211
24,000	122	1910	170	3334	187	3915	174	3450	170	3319
28,000	125	2072	167	3334	183	3915	170	3450	170	3438
32,000	129	2267	164	3334	180	3915	167	3450	170	3542
36,000	133	2506	160	3334	176	3915	163	3450	170	3701
40,000	136	2733	156	3334	171	3915	159	3450	145	2951

TABLE 4-63

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 2000 FT TEMPERATURE: 35 C
AIRCRAFT - CH-47C 235 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	122	1804	165	2938	191	3722	184	3510	170	3084
24,000	126	1968	162	2938	187	3722	180	3510	170	3193
28,000	130	2149	159	2938	183	3722	177	3510	170	3297
32,000	134	2353	056	2938	181	3722	174	3510	170	3385
36,000	139	2573	152	2938	178	3722	171	3510	168	3426
40,000	141	2808	146	2938	170	3722	163	3510	140	2787

TABLE 4-64

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 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	1513	177	4003	179	4118	163	3290	170	3635
24,000	113	1744	173	4003	175	4118	159	3290	170	3849
28,000	116	1909	168	4003	170	4118	156	3290	170	4113
32,000	121	2148	164	4003	166	4118	152	3290	170	4382
36,000	122	2317	160	4003	162	4118	149	3290	170	4651
40,000	121	2481	156	4003	158	4118	144	3290	150	3611

TABLE 4-65

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 4000 FT TEMPERATURE: -5 C
AIRCRAFT - CH-47C 235 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	114	1610	179	3519	188	3868	174	3345	170	3190
24,000	117	1766	173	3519	181	3868	169	3345	170	3386
28,000	123	1988	169	3519	176	3868	164	3345	170	3573
32,000	126	2179	166	3519	173	3868	162	3345	170	3712
36,000	131	2407	162	3519	169	3868	158	3345	170	3893
40,000	127	2511	157	3519	164	3868	153	3345	145	3021

TABLE 4-66

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 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	119	1662	173	3107	190	3642	182	3400	170	3016
24,000	124	1857	169	3107	185	3642	178	3400	170	3135
28,000	126	2009	166	3107	182	3642	175	3400	170	3247
32,000	132	2242	162	3107	179	3642	172	3400	170	3345
36,000	136	2482	158	3107	173	3642	166	3400	167	3447
40,000	139	2683	151	3107	166	3642	159	3400	139	2727

TABLE 4-67

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 4000 FT TEMPERATURE: 35 C
AIRCRAFT - CH-47C 235 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	1748	164	2738	170	3464	189	3455	170	2901
24,000	127	1893	161	2738	165	3464	185	3455	170	3013
28,000	132	2091	158	2738	162	3464	182	3455	170	3107
32,000	136	2311	154	2738	159	3464	179	3455	170	3197
36,000	140	2547	148	2738	153	3464	173	3455	156	2970
40,000	141	2770	140	2738	143	3464	162	3455	114	2296

TABLE 4-68

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 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	110	1488	176	3729	177	3816	166	3262	170	3441
24,000	114	1682	171	3729	172	3816	162	3262	170	3686
28,000	120	1907	166	3729	168	3816	158	3262	170	3953
32,000	122	2097	162	3729	163	3816	154	3262	170	4220
36,000	121	2257	158	3729	159	3816	150	3262	170	4499
40,000	123	2512	152	3729	154	3816	144	3262	145	3283

TABLE 4-69

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 6000 FT TEMPERATURE: -5 C
AIRCRAFT - CH-47C 235 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	1542	178	3268	187	3593	179	3309	170	3000
24,000	121	1736	171	3268	179	3593	172	3309	170	3222
28,000	125	1938	167	3268	175	3593	168	3309	170	3373
32,000	130	2165	163	3268	171	3593	164	3309	170	3545
36,000	131	2358	159	3268	166	3593	160	3309	167	3637
40,000	126	2451	152	3268	159	3593	153	3309	139	2786

TABLE 4-70

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 6000 FT TEMPERATURE: 15 C
AIRCRAFT - CH-47C 235 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	1615	172	2887	188	3382	187	3358	170	2840
24,000	125	1781	168	2887	183	3382	183	3358	170	2959
28,000	130	1983	164	2887	180	3382	179	3358	170	3063
32,000	135	2221	160	2887	175	3382	174	3358	170	3224
36,000	137	2431	153	2887	169	3382	168	3358	153	2869
40,000	138	2668	146	2887	159	3382	158	3358	111	2209

TABLE 4-71

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 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	126	1674	163	2548	188	3218	195	3407	170	2732
24,000	130	1847	160	2548	184	3218	190	3407	170	2838
28,000	135	2053	156	2548	181	3218	188	3407	170	2926
32,000	138	2276	151	2548	176	3218	184	3407	166	2946
36,000	141	2503	143	2548	166	3218	172	3407	124	2188
40,000	142	2796	130	2548	156	3218	161	3407	82	2166

TABLE 4-72

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 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	112	1464	174	3477	175	3536	170	3256	170	3270
24,000	116	1638	169	3477	170	3536	164	3256	170	3531
28,000	122	1872	164	3476	165	3536	160	3256	170	3800
32,000	122	2036	159	3476	161	3536	155	3256	170	4072
36,000	120	2197	154	3477	155	3536	151	3256	167	4232
40,000	124	2491	148	3477	149	3536	144	3256	139	3014

TABLE 4-73

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 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	116	1488	174	3024	182	3336	181	3289	170	2883
24,000	123	1705	169	3024	176	3336	175	3289	170	3069
28,000	127	1900	165	3024	173	3336	172	3289	170	3212
32,000	131	2120	160	3024	168	3336	167	3289	170	3405
36,000	127	2224	154	3024	161	3336	160	3289	151	2908
40,000	131	2557	146	3024	153	3336	152	3289	109	2159

TABLE 4-74

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 8008 FT TEMPERATURE: 15 C
AIRCRAFT - CH-47C 235 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	123	1566	170	2670	186	3132	193	3327	170	2676
24,000	126	1724	166	2670	182	3132	188	3327	170	2790
28,000	132	1956	161	2670	177	3132	183	3327	170	2931
32,000	136	2185	156	2670	171	3132	177	3327	162	2869
36,000	138	2399	148	2670	162	3132	167	3327	120	2086
40,000	135	2638	137	2670	151	3132	156	3327	0	0

TABLE 4-75

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 8000 FT TEMPERATURE: 35 C
AIRCRAFT - CH-47C 235 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	1602	161	2356	186	2983	200	3369	155	2183
24,000	132	1794	158	2356	182	2983	197	3369	155	2279
28,000	137	2013	153	2356	179	2983	194	3369	155	2396
32,000	141	2245	146	2356	170	2983	185	3369	134	2118
36,000	141	2498	135	2356	159	2983	170	3369	92	1962
40,000	141	2893	116	2356	144	2983	156	3369	0	0

TABLE 4-76

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 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	114	1420	172	3206	173	3277	173	3261	170	3122
24,000	120	1635	166	3206	168	3277	167	3261	170	3390
28,000	122	1819	161	3206	163	3277	162	3261	170	3658
32,000	121	1981	156	3206	158	3277	157	3261	170	3948
36,000	124	2247	150	3206	151	3277	151	3261	151	3289
40,000	123	2503	142	3206	143	3277	143	3261	109	2213

TABLE 4-77

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 10000 FT TEMPERATURE: -5 C
AIRCRAFT - CH-47C 235 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	120	1459	172	2787	180	3075	185	3292	170	2736
24,000	125	1662	167	2787	175	3075	180	3292	170	2893
28,000	130	1885	162	2787	170	3075	176	3292	170	3067
32,000	127	2005	156	2787	164	3075	169	3292	160	2927
36,000	126	2187	148	2787	155	3075	160	3292	118	2030
40,000	131	2618	137	2787	145	3075	150	3292	0	0

TABLE 4-78

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 10000 FT TEMPERATURE: 15 C
AIRCRAFT - CH-47C 235 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	125	1507	168	2465	184	2904	198	3317	151	2018
24,000	130	1699	163	2465	180	2904	194	3317	151	2123
28,000	135	1942	158	2465	174	2904	187	3317	151	2256
32,000	137	2144	151	2465	166	2904	178	3317	130	2003
36,000	135	2355	140	2465	155	2904	164	3317	88	1893
40,000	135	2775	121	2465	140	2904	151	3317	0	0

TABLE 4-79

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 10000 FT TEMPERATURE: 35 C
AIRCRAFT - CH-47C 235 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	129	1551	160	2175	184	2761	207	3347	123	1464
24,000	134	1760	156	2175	181	2761	205	3347	123	1588
28,000	139	1987	149	2175	175	2761	199	3347	123	1738
32,000	141	2216	139	2175	162	2761	162	3347	102	1771
36,000	142	2569	119	2175	149	2761	167	3347	0	0
40,000	136	2947	0	2175	129	2761	148	3347	0	0

CHAPTER 5

CHINOOK (CH-47C) PERFORMANCE DATA TABLES (245 RPM)

GENERAL

These tables are the additional ones needed when the CH-47C is operated at a gross weight in excess of 40,000 lbs. These are for 245 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
Tables 5-50 to 5-55	Gross Weight Limits Data
Tables 5-56 to 5-79	Velocity Limits Data

BASIC F'IEL FLOW DATA

TABLES

(245 RPM)

TABLE 5-1

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2584	2845	2643	2441	2214	2180	2324	2776	3661	5254
42,000	2698	2979	2760	2541	2304	2264	2406	2874	3777	5429
44,000	2811	3116	2880	2643	2394	2349	2490	2976	3901	5609
46,000	2925	3258	3004	2750	2488	2436	2593	3083	4037	5797

TABLE 5-2

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 KPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2675	2950	2726	2502	2248	2181	2275	2569	3225	4261
42,000	2789	3092	2849	2605	2341	2266	2359	2648	3316	4383
44,000	2905	3241	2978	2715	2438	2355	2444	2756	3415	4517
46,000	3026	3398	3114	2830	2540	2445	2531	2850	3522	4667

TABLE 5-3

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2760	3058	2816	2573	2301	2208	2274	2512	2985	3807
42,000	2879	3213	2950	2687	2402	2297	2357	2594	3098	3971
44,000	3003	3375	3091	2806	2507	2388	2446	2673	3191	3996
46,000	3136	3543	3237	2932	2615	2481	2538	2757	3288	4108

TABLE 5-4

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2846	3174	2915	2656	2370	2254	2293	2494	2912	3571
42,000	2974	3340	3060	2780	2478	2345	2382	2576	2992	3654
44,000	3112	3514	3211	2910	2589	2439	2475	2659	3076	3749
46,000	3258	3690	3367	3045	2701	2535	2573	2745	3163	3856

TABLE 5-5

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2562	2834	2623	2411	2185	2145	2277	2720	3570	5132
42,000	2676	2974	2744	2515	2277	2231	2362	2825	3700	5316
44,000	2791	3121	2873	2625	2373	2319	2471	2934	3846	5511
46,000	2909	3276	3010	2742	2475	2410	2573	3048	4011	5717

TABLE 5-6

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2648	2945	2709	2474	2222	2149	2233	2500	3129	4137
42,000	2766	3098	2842	2586	2342	2238	2320	2614	3233	4280
44,000	2890	3259	2983	2706	2425	2329	2409	2710	3344	4434
46,000	3022	3427	3130	2833	2532	2422	2502	2811	3464	4618

TABLE 5-7

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 KPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2735	3064	2809	2554	2283	2178	2233	2448	2924	3669
42,000	2864	3229	2953	2677	2390	2271	2324	2531	3019	3775
44,000	3002	3400	3103	2807	2499	2365	2416	2616	3119	3895
46,000	3147	3579	3261	2943	2609	2460	2514	2706	3222	4035

TABLE 5-8

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2830	3187	2916	2646	2356	2224	2258	2433	2822	3441
42,000	2972	3362	3070	2778	2468	2319	2354	2519	2907	3543
44,000	3122	3545	3231	2918	2580	2417	2455	2609	2997	3663
46,000	3277	3741	3403	3065	2697	2520	2562	2710	3101	3806

TABLE 5-9

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 KPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2542	2834	2612	2390	2162	2115	2253	2677	3567	5033
42,000	2659	2987	2745	2504	2261	2205	2353	2789	3663	5234
44,000	2781	3150	2887	2624	2366	2298	2458	2907	3841	5448
46,000	2911	3324	3038	2752	2476	2394	2569	3031	4036	5679

TABLE 5-10

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2630	2956	2708	2461	2207	2124	2198	2475	3057	4054
42,000	2758	3121	2853	2585	2313	2216	2289	2574	3173	4242
44,000	2895	3295	3006	2716	2422	2307	2385	2678	3297	4400
46,000	3040	3481	3167	2853	2534	2403	2486	2787	3428	4607

TABLE 5-11

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2727	3083	2816	2550	2273	2155	2203	2393	2853	3564
42,000	2870	3258	2971	2684	2383	2250	2299	2480	2955	3695
44,000	3019	3446	3135	2825	2495	2347	2401	2574	3063	3850
46,000	3173	3650	3311	2973	2613	2450	2509	2681	3188	4042

TABLE 5-12

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2834	3212	2930	2649	2348	2202	2236	2383	2743	3346
42,000	2987	3402	3097	2793	2462	2302	2340	2479	2840	3480
44,000	3145	3608	3276	2945	2583	2409	2451	2591	2959	3643
46,000	3310	3825	3465	3106	2715	2526	2570	2727	3137	3843

TABLE 5-13

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 KPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2529	2854	2619	2385	2152	2093	2237	2648	3488	4965
42,000	2655	3024	2766	2509	2260	2188	2345	2769	3677	5188
44,000	2792	3206	2923	2640	2369	2286	2460	2899	3866	5432
46,000	2939	3408	3094	2780	2482	2387	2582	3038	4065	5698

TABLE 5-14

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2629	2985	2725	2466	2202	2104	2173	2441	3007	4005
42,000	2770	3165	2882	2600	2313	2197	2272	2548	3135	4198
44,000	2920	3361	3051	2741	2427	2296	2377	2663	3274	4417
46,000	3077	3585	3238	2891	2547	2402	2491	2792	3439	4667

TABLE 5-15

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2739	3118	2840	2562	2266	2137	2185	2346	2796	3505
42,000	2891	3315	3011	2707	2383	2237	2290	2449	2913	3680
44,000	3050	3532	3196	2860	2507	2346	2404	2569	3056	3904
46,000	3219	3771	3397	3023	2643	2467	2528	2748	3238	4186

TABLE 5-16

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2852	3261	2965	2669	2346	2190	2228	2355	2693	3309
42,000	3014	3474	3150	2826	2473	2303	2343	2481	2854	3493
44,000	3186	3700	3347	2994	2614	2428	2469	2635	3034	3724
46,000	3370	3954	3567	3180	2771	2566	2603	2812	3253	4024

TABLE 5-17

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2533	2898	2647	2395	2151	2080	2235	2635	3508	4937
42,000	2677	3092	2812	2531	2269	2180	2353	2770	3704	5194
44,000	2831	3314	2996	2677	2381	2283	2481	2919	3912	5478
46,000	2996	3553	3194	2835	2503	2393	2619	3094	4143	5796

TABLE 5-18

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2647	3037	2761	2485	2204	2089	2161	2422	2978	4005
42,000	2801	3248	2940	2631	2322	2192	2274	2545	3132	4242
44,000	2965	3499	3143	2788	2448	2305	2390	2690	3326	4518
46,000	3144	3756	3357	2956	2586	2429	2548	2866	3584	4838

TABLE 5-19

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2764	3186	2888	2590	2274	2131	2182	2332	2773	3525
42,000	2929	3417	3063	2749	2405	2246	2302	2496	2939	3784
44,000	3108	3674	3298	2922	2550	2376	2433	2667	3152	4087
46,000	3302	3952	3536	3120	2710	2518	2572	2862	3416	4447

TABLE 5-20

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2884	3339	3023	2708	2366	2200	2238	2379	2738	3356
42,000	3064	3580	3243	2886	2517	2333	2369	2549	2942	3627
44,000	3255	3865	3479	3092	2685	2481	2510	2736	3165	3971
46,000	3459	4173	3766	3339	2869	2642	2656	2934	3468	4414

TABLE 5-21

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2563	2983	2703	2424	2161	2075	2249	2646	3543	4964
42,000	2724	3224	2900	2577	2281	2182	2383	2810	3765	5264
44,000	2903	3478	3111	2745	2411	2312	2531	3015	4022	5614
46,000	3106	3732	3334	2936	2557	2453	2696	3263	4326	6007

TABLE 5-22

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2684	3141	2831	2524	2219	2091	2168	2434	3004	4077
42,000	2856	3408	3047	2687	2353	2211	2318	2598	3236	4380
44,000	3051	3661	3267	2872	2502	2344	2463	2794	3526	4737
46,000	3274	3936	3517	3095	2668	2492	2623	3037	3858	5153

TABLE 5-23

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2810	3303	2971	2639	2306	2151	2203	2403	2834	3666
42,000	2998	3581	3204	2827	2461	2268	2340	2590	3079	4004
44,000	3206	3867	3460	3052	2634	2440	2485	2800	3391	4411
46,000	3440	4173	3755	3337	2829	2606	2639	3030	3747	4883

TABLE 5-24

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
40,000	2942	3468	3126	2783	2422	2241	2271	2463	2855	3551
42,000	3141	3780	3396	3015	2601	2398	2417	2657	3124	3955
44,000	3362	4084	3691	3297	2798	2567	2570	2864	3445	4424
46,000	3624	4398	4022	3646	3016	2747	2729	3109	3819	4946

DELTA FUEL FLOW FOR DRAG DATA

TABLES

(245 RPM)

TABLE 5-25

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	17	58	137	264	459	862	1346
	100	34	115	273	530	932	1759	2694
	150	51	173	408	795	1456	2661	4038
	200	68	230	544	1063	2028	3563	5384

TABLE 5-26

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	16	55	131	250	428	696	1257
	100	32	109	259	497	856	1496	2515
	150	47	163	386	746	1296	2337	3773
	200	63	217	512	993	1770	3180	5031

TABLE 5-27

CORRECTION FUEL FLOW LBS/HR FOR EATERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 KPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	52	124	239	402	640	1071
	100	30	104	246	472	805	1308	2255
	150	45	155	366	704	1208	2087	3450
	200	60	206	485	937	1625	2671	4617

TABLE 5-28

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	49	117	227	382	602	921
	100	28	98	233	449	761	1211	2015
	150	42	147	348	668	1141	1867	3147
	200	56	195	461	887	1523	2614	4242

TABLE 5-29

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 246 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	16	53	126	246	428	824	1251
	100	32	106	252	493	879	1663	2504
	150	47	159	378	740	1394	2501	3754
	200	63	212	505	992	1922	3339	5006

TABLE 5-30

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	50	119	230	399	659	1174
	100	29	100	237	460	799	1425	2343
	150	44	149	354	691	1216	2209	3514
	200	59	199	472	922	1680	2992	4684

TABLE 5-31

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 246 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	47	113	218	373	596	1034
	100	28	94	225	434	747	1233	2127
	150	41	141	336	651	1125	1966	3224
	200	55	188	446	867	1519	2702	4324

TABLE 5-32

CORRECTION FUEL FLOW LBS/HR FOR EATERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	45	108	208	352	560	87?
	100	26	89	214	412	705	1132	190?
	150	39	134	319	616	1058	1762	294?
	200	52	178	423	820	1417	2461	397?

TABLE 5-33

CORRECTION FUEL FLOW LBS/HR FOR EATERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	15	49	117	230	404	782	1164
	100	29	99	234	458	842	1560	2325
	150	44	148	352	690	1334	2339	3487
	200	59	198	469	930	1825	3118	4649

TABLE 5-34

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 KPH

CHINOOK

DRAG IN SQUARE FEET	AIR SPEED IN KTS						
	40	60	80	100	120	140	160
50	14	46	109	213	370	634	1084
100	27	92	218	428	746	1362	2166
150	41	138	328	642	1196	2090	3254
200	55	184	438	857	1601	2017	4340

TABLE 5-35

CORRECTION FUEL FLOW LBS/HR FOR EATERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	43	103	200	347	559	980
	100	26	86	206	401	695	1175	2008
	150	39	130	308	603	1050	1862	3027
	200	52	173	411	803	1426	2545	4047

TABLE 5-36

CORRECTION FUEL FLOW LBS/HR FOR EATERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	12	41	98	190	327	521	850
	100	24	82	195	379	655	1060	1815
	150	36	122	292	569	983	1673	2771
	200	49	163	388	758	1323	2319	3737

TABLE 5-37

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	14	46	109	212	386	720	1078
	100	27	92	218	426	823	1443	2157
	150	41	138	327	646	1280	2165	3235
	200	54	184	436	877	1735	2888	4313

TABLE 5-38

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	43	101	199	344	624	1006
	100	25	86	203	398	701	1301	2015
	150	38	129	305	597	1093	1976	3023
	200	51	172	407	800	1521	2651	4030

TABLE 5-39

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

DRAG IN SQUARE FEET	AIR SPEED IN KTS						
	40	60	80	100	120	140	160
50	12	40	95	186	323	529	945
100	24	81	190	373	647	1135	1891
150	36	121	286	559	983	1769	2837
200	48	161	382	747	1350	2402	3783

TABLE 5-40

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	38	90	175	304	487	847
	100	22	76	179	351	608	1009	1736
	150	34	114	269	527	918	1605	2628
	200	45	152	359	703	1243	2203	3520

TABLE 5-41

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	13	42	101	198	380	670	999
	100	25	85	202	401	804	1339	1999
	150	38	127	303	614	1226	2009	2998
	200	51	170	405	844	1648	2678	3998

TABLE 5-42

CORRECTION FUEL FLOW LBS/HR FOR EATERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	12	40	95	184	324	615	934
	100	24	80	189	368	669	1240	1860
	150	36	119	283	557	1063	1856	2801
	200	48	159	377	750	1454	2492	3735

TABLE 5-43

CORRECTION FUEL FLOW LBS/HR FOR EATERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	37	89	173	299	516	875
	100	22	75	177	346	607	1105	1754
	150	33	112	266	520	938	1692	2627
	200	45	149	354	697	1311	2279	3505

TABLE 5-44

CORRECTION FUEL FLOW LBS/HR FOR EATERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	10	35	84	163	281	468	828
	100	21	71	167	326	568	1005	1655
	150	32	106	251	489	867	1558	2484
	200	42	141	334	654	1194	2112	3307

TABLE 5-45

CORRECTION FUEL FLOW LBS/HR FOR EATERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 KPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	12	40	93	189	391	620	9?5
	100	25	80	188	387	778	1240	18?0
	150	37	120	284	603	1168	1859	2776
	200	50	160	381	837	1558	2479	3701

TABLE 5-46

CORRECTION FUEL FLOW LBS/HR FOR EATERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	37	87	171	314	581	869
	100	23	74	174	347	670	1160	1749
	150	34	111	262	528	1036	1739	2593
	200	46	148	351	721	1400	2318	3458

TABLE 5-47

CORRECTION FUEL FLOW LBS/HR FOR EATERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 246 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	11	35	82	160	286	536	814
	100	22	69	164	321	592	1080	1629
	150	32	104	246	487	937	1624	2435
	200	43	139	328	658	1277	2168	3247

TABLE 5-48

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	50	10	33	77	151	266	491	765
	100	20	65	154	302	545	1005	1531
	150	31	98	232	456	854	1517	2290
	200	41	131	309	614	1180	2030	3064

GROUND IDLE FUEL FLOW DATA

TABLE

TABLE 5-49

GROUND IDLE FUEL FLOW

AIRCRAFT - CH-47C

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	1480	1400	1280	1188	1104	1040
	-5 C	1468	1388	1268	1176	1092	1028
	15 C	1454	1374	1254	1162	1076	1014
	35 C	1440	1360	1240	1148	1064	1000

ENTRIES ARE AIRCRAFT FUEL FLOW RATES IN LBS/HR

GROSS WEIGHT LIMITS DATA

TABLES

(245 RPM)

TABLE 5-50

GROSS WEIGHT LIMITS
(DUE TO ENGINE)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HUGE)
AIRCRAFT - CH-47C 245 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	59997	56757	52912	48952	45261	41916
	-5 C	56570	53172	48993	45428	42063	38676
	15 C	52434	48807	45302	42050	38958	36042
	35 C	48494	45181	41937	38897	36014	33279

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 LBS

TABLE 5-51

GROSS WEIGHT LIMITS
(DUE TO TRANSMISSION)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HUGE)
AIRCRAFT - CH-47C 245 RPM
CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	47577	46627	45616	44587	43513	42328
	-5 C	46566	45567	44545	43484	42341	41143
	15 C	45580	44569	43525	42411	41240	40103
	35 C	44649	43621	42532	41389	40259	39132

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 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-47C 245 RPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	55693	52779	49223	45525	42062	38473
	-5 C	52585	49474	45554	42236	39105	36137
	15 C	48715	45350	42090	39070	36197	33460
	35 C	45016	41947	38934	36110	33430	30866

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 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-47C 245 RPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	45323	44542	43669	42743	41800	40777
	-5 C	44490	43627	42711	41774	40788	39716
	15 C	43639	42735	41809	40841	39800	38726
	35 C	42807	41894	40944	39927	38871	37835

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 LBS

TABLE 5-54

GROSS WEIGHT LIMITS

(DUE TO ENGINE)

FOR TAKEOFF CRITERIA #3

100% OF MAXIMUM POWER (HIGE)

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	67234	63633	59328	54883	50741	46991
	-5 C	63405	59607	54915	50918	47146	43573
	15 C	58761	54697	50768	47124	43657	40366
	35 C	54341	50630	46994	43588	40354	37271

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 LBS

TABLE 5-55

GROSS WEIGHT LIMITS

(DUE TO TRANSMISSION)

FOR TAKEOFF CRITERIA #3

100% OF MAXIMUM POWER (HIGE)

AIRCRAFT - CH-47C 245 RPM

CHINOOK

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	53362	52307	51145	49957	48740	47469
	-5 C	52235	51087	49916	48721	47465	46158
	15 C	51102	49947	48770	47531	46245	44974
	35 C	50038	48879	47663	46395	45137	43873

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 LBS

VELOCITY LIMITS DATA

TABLES

(245 RPM)

TABLE 5-56

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 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)										
40,000	116	2654	152	4526	154	4666	134	3376	165	5713
42,000	116	2769	150	4526	152	4666	132	3376	150	4424
44,000	117	2892	149	4526	150	4666	130	3376	135	3617
46,000	118	3025	147	4526	148	4666	128	3376	120	3083

TABLE 5-57

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 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)										
40,000	124	2676	157	4050	163	4481	145	3442	165	4567
42,000	124	2757	155	4050	161	4481	143	3442	160	3779
44,000	125	2911	153	4050	160	4481	141	3442	135	3216
46,000	126	3020	151	4050	158	4481	138	3442	120	2650

TABLE 5-58

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: 15°C

AIRCRAFT - CH-47C 245 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)										
40,000	135	2859	155	3574	169	4233	153	3507	165	[illegible]
42,000	134	2902	153	3574	167	4233	151	3507	150	[illegible]
44,000	133	2964	150	3574	165	4233	149	3507	135	3023
46,000	133	3066	148	3574	162	4233	146	3507	120	2757

TABLE 5-59

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 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)
40,000	140	2704	147	3123	172	4016	160	3670	160	3555
42,000	141	3018	143	3123	170	4016	159	3670	145	3116
44,000	142	3130	142	3123	167	4016	156	3670	130	2831
46,000	142	3227	142	3123	160	4016	154	3670	115	2676

TABLE 5-60

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 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)
40,000	117	2632	150	4282	152	4458	135	3329	165	3573
42,000	118	2760	148	4282	150	4458	133	3329	150	4411
44,000	119	2900	146	4282	148	4458	130	3329	135	3558
46,000	120	3044	144	4282	146	4458	127	3329	120	3048

TABLE 5-61

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 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)
40,000	124	2601	154	3792	162	4244	146	3390	165	4465
42,000	126	2766	152	3792	159	4244	144	3390	156	3678
44,000	126	2878	150	3792	157	4244	141	3390	135	3150
46,000	127	2996	147	3792	155	4244	138	3390	120	2809

TABLE 5-62

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 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)
40,000	134	2736	152	3347	167	3948	155	3450	154	3631
42,000	133	2820	150	3347	163	3948	152	3450	144	3386
44,000	133	2907	147	3347	161	3948	150	3450	129	2766
46,000	135	3067	144	3347	158	3948	147	3450	114	2625

TABLE 5-63

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 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)
40,000	141	2859	127	2929	169	3750	154	3510	154	3215
42,000	142	2973	141	2929	166	3750	159	3510	139	2878
44,000	142	3068	139	2929	162	3750	156	3510	124	2665
46,000	143	3189	134	2929	159	3750	153	3510	109	2607

TABLE 5-64

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 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)										
40,000	118	2631	148	4020	150	4172	136	3290	165	5453
42,000	120	2778	146	4020	148	4172	130	3290	150	4:11
44,000	120	2915	143	4020	145	4172	130	3290	135	3535
46,000	120	3047	140	4020	142	4172	127	3290	120	3031

TABLE 5-65

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 4000 FT TEMPERATURE: -5 C
AIRCRAFT - CH-47C 245 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)
40,000	126	2624	151	3526	158	3901	147	3345	159	3985
42,000	126	2739	148	3526	155	3901	144	3345	144	3335
44,000	127	2863	145	3526	152	3901	141	3345	124	2914
46,000	128	2998	142	3526	150	3981	138	3345	114	2669

TABLE 5-06

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 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)
40,000	133	2662	148	3116	167	3671	156	3400	153	3293
42,000	135	2810	145	3116	159	3671	153	3400	138	2905
44,000	135	2920	142	3116	156	3671	150	3400	123	2635
46,000	135	3043	138	3116	153	3671	146	3400	108	2561

TABLE 5-67

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 4000 FT TEMPERATURE: 35 C
AIRCRAFT - CH-47C 245 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)
40,000	142	2601	140	2729	161	3487	161	3455	148	<2966
42,000	143	2916	136	2729	160	3487	159	3455	131	<2654
44,000	143	3051	129	2729	156	3487	155	3455	111	<2510
46,000	141	3158	120	2729	152	3487	151	3455	91	<2532

TABLE 5-68

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSITION 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)
40,000	120	2651	144	3756	146	3862	136	3262	154	4895
42,000	120	2782	141	3758	143	3862	133	3262	144	3946
44,000	120	2917	138	3758	140	3862	129	3262	124	3252
46,000	121	3060	135	3758	137	3862	126	3262	114	2865

TABLE 5-69

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 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)										
40,000	127	2604	147	3279	154	3624	147	3309	153	3588
42,000	127	2734	144	3279	151	3624	144	3309	138	3062
44,000	128	2875	140	3279	147	3624	141	3309	123	2731
46,000	129	3021	136	3279	144	3624	137	3309	108	2591

TABLE 5-70

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6500 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 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)										
40,000	135	2662	143	2896	158	3415	157	3358	147	3021
42,000	135	2780	139	[illegible]	154	3415	153	3356	128	2610
44,000	135	2910	134	[illegible]	150	3415	149	3358	108	2455
46,000	136	3117	127	2896	145	3415	143	3356	88	2469

TABLE 5-71

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 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)										
40,000	143	2772	133	2536	158	3240	162	3407	120	2357
42,000	141	2873	122	2536	154	3240	158	3407	100	2344
44,000	141	3050	110	2536	147	3240	152	3407	80	2427
46,000	139	3223	0	2536	140	3240	145	3407	0	0

TABLE 5-72

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 245 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)
40,000	120	2650	140	3500	141	3574	136	3256	153	4392
42,000	121	2790	136	3500	138	3574	132	3256	138	3574
44,000	120	2939	133	3500	134	3574	128	3256	123	3031
46,000	120	3092	129	3500	130	3574	124	3256	108	2768

TABLE 5-73

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES
PRESSURE: 8000 FT TEMPERATURE: -5 C
AIRCRAFT - CH-47C 245 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)
40,000	128	2609	142	3035	149	3362	147	3269	146	3236
42,000	129	2754	137	3035	145	3362	144	3269	120	2668
44,000	128	2900	133	3035	141	3362	139	3269	106	2468
46,000	126	3051	124	3035	135	3362	134	3269	86	2434

TABLE 5-74

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 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)
40,000	135	2646	136	2679	152	3170	156	3327	117	2289
42,000	136	2832	130	2679	147	3170	151	3327	97	2284
44,000	135	3018	120	2679	140	3170	145	3327	0	0
46,000	134	3225	124	2679	140	3170	142	3327	0	0

TABLE 5-75

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 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)										
40,000	141	2755	127	2347	150	3006	160	3369	89	<199
42,000	140	2940	95	2347	142	3006	154	3369	0	0
44,000	141	3216	0	2347	133	3006	146	3369	0	0
46,000	137	3381	0	2347	124	3006	137	3369	0	0

TABLE 5-76

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT - CH. 47C 245 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)										
40,000	121	2665	134	3240	136	3319	135	3261	146	3942
42,000	120	2819	130	3240	132	3319	131	3261	120	3060
44,000	116	2910	125	3240	127	3319	126	3261	106	2646
46,000	114	3070	119	3240	121	3319	120	3261	86	2499

TABLE 5-77

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 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)
40,000	128	2631	134	2793	143	3113	146	3292	114	2393
42,000	127	2760	128	2793	137	3113	141	3292	94	2264
44,000	125	2937	120	2793	130	3113	135	3292	0	0
46,000	123	3145	110	2793	122	3113	127	3292	0	0

TABLE 5-78

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 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)
40,000	136	2723	122	2467	143	2938	153	3317	85	2148
42,000	135	2924	123	2467	137	2938	146	3317	0	0
44,000	132	3108	97	2467	126	2938	138	3317	0	0
46,000	126	3208	0	2467	115	2938	129	3317	0	0

TABLE 5-79

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 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)
40,000	138	2806	0	2175	137	2784	156	3347	0	0
42,000	139	3093	0	2175	127	2784	147	3347	0	0
44,000	131	3169	0	2175	115	2784	137	3347	0	0
46,000	127	3329	0	2175	109	2784	128	3347	0	0

APPENDIX A

FUNCTIONS FOR CALCULATING BASIC FUEL FLOW

1. CH-47C Operating at 235 RPM

There are four functions that can be used to calculate the basic fuel flow for the CH-47B helicopter operating at 235 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:

$A = -4.18033488 \times 10^{-2}$ $\quad$ $E = 1.11825291 \times 10^{-6}$

$B = 1.08751586$ $\quad$ $F = 8.07031975 \times 10^{-5}$

$C = 5.33395773 \times 10^{-2}$ $\quad$ $G = 1.36606525 \times 10^{-8}$

$D = -3.51402949 \times 10^{-4}$ $\quad$ $K = 4.84275543 \times 10^{2}$

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:

$A = -5.88115812 \times 10^{-2}$ $\quad E = 1.93141847 \times 10^{-6}$

$B = -8.84728134 \times 10^{-2}$ $\quad F = 1.38394884 \times 10^{-4}$

$C = 6.1890916 \times 10^{-2}$ $\quad G = 1.60426457 \times 10^{-8}$

$D = -3.78898469 \times 10^{-4}$ $\quad K = 4.17171783 \times 10^{2}$

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

$A = -6.06951821 \times 10^{-2}$ $\quad E = 1.82329043 \times 10^{-6}$

$B = -7.06558749 \times 10^{-2}$ $\quad F = 1.16511314 \times 10^{-4}$

$C = 5.2232069 \times 10^{-2}$ $\quad G = 1.72442876 \times 10^{-8}$

$D = -4.1362632 \times 10^{-4}$ $\quad K = 5.56116821 \times 10^{2}$

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:

$A = -3.77404814 \times 10$ $\quad K = -1.8393742 \times 10^{-5}$

$B = 4.24010076 \times 10^{-1}$ $\quad L = 1.12421578 \times 10^{-3}$

$C = -1.01004529 \times 10^{-3}$ $\quad M = -1.37884145 \times 10^{-7}$

$D = 1.03554213 \times 10$ $\quad N = 3.06267834 \times 10^{-5}$

$E = 1.26485201 \times 10^{-2}$ $\quad O = -2.34560855 \times 10^{-3}$

$F = -2.29212269 \times 10^{-2}$ $\quad P = 3.11250682 \times 10^{-4}$

$G = -3.12955658 \times 10^{-5}$ $\quad Q = 4.4806207 \times 10^{-4}$

$H = 7.16897036 \times 10^{-3}$ $\quad R = 2.23874594 \times 10^{-6}$

$I = -5.56602478 \times 10^{-1}$ $\quad S = -4.34590968 \times 10^{-8}$

$J = 7.77223859 \times 10^{-8}$ $\quad T = 1.8023027 \times 10^{3}$

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-47C helicopter operating at 235 RPM with the following accuracies:

FF (HIGE) - 99.64%

FF (HOGE) - 99.33%

FF (NOE) - 98.19%

FF (Forward Flight) - 93.86%

2. CH-47C Operating at 245 RPM

There are four functions that can be used to calculate the basic fuel flow for the CH-47B helicopter operating at 245 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:

$A = -..49443232 \times 10^{-1}$	$E = 3.76395468 \times 10^{-6}$
$B = -4.85268086$	$F = 2.2449065 \times 10^{-4}$
$C = 5.69947064 \times 10^{-2}$	$G = 1.40213223 \times 10^{-8}$
$D = -3.51416853 \times 10^{-4}$	$K = 3.89716461 \times 10^{2}$

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:

$A = -2.29995189 \times 10^{-1}$ $E = 6.22147991 \times 10^{-6}$

$B = -5.28438944$ $F = 2.65626702 \times 10^{-4}$

$C = 7.02132583 \times 10^{-2}$ $G = 2.42121925 \times 10^{-8}$

$D = -7.11802662 \times 10^{-4}$ $K = 1.28996002 \times 10^{2}$

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

$A = -2.04558648 \times 10^{-1}$ $E = 5.37683025 \times 10^{-6}$

$B = -2.73703614$ $F = 1.7907843 \times 10^{-4}$

$C = 6.0988307 \times 10^{-2}$ $G = 4.52854692 \times 10^{-8}$

$D = -1.5812756 \times 10^{-3}$ $K = 2.78352539 \times 10^{2}$

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:

$A = 1.4591177 \times 10$ $K = 3.95673749 \times 10^{-6}$

$B = -1.27493959 \times 10^{-1}$ $L = -8.94904137 \times 10^{-4}$

$C = 6.56571239 \times 10^{-4}$ $M = -8.69541026 \times 10^{-8}$

$D = 3.87899423$ $N = 2.29792088 \times 10^{-5}$

$E = 8.85471553 \times 10^{-2}$ $O = -2.08567723 \times 10^{-3}$

$F = 6.71030849 \times 10^{-3}$ $P = 4.72741376 \times 10^{-5}$

$G = -9.21962567 \times 10^{-6}$ $Q = 1.11335551 \times 10^{-3}$

$H = 4.26615639 \times 10^{-4}$ $R = 1.22879437 \times 10^{-6}$

$I = -1.24208927 \times 10^{-2}$ $S = -3.21402496 \times 10^{-8}$

$J = 4.83834617 \times 10^{-9}$ $T = -3.04298401 \times 10^{2}$

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-47C helicopter operating at 245 RPM with the following accuracies:

FF (HIGE) - 98.26%

FF (HOGE) - 97.70%

FF (NOE) - 97.39%

FF (Forward Flight) - 98.17%

APPENDIX B

FUNCTIONS FOR CALCULATING DELTA FUEL FLOW FOR DRAG

1. CH-47C Operating at 235 RPM

The function below will calculate the delta fuel flow for drag for the CH-47C helicopter operating at 235 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 followirg 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:

$A = 1.92351665$	$K = -1.84985049 \times 10^{-3}$
$B = -1.58761502 \times 10^{-2}$	$L = 1.34020805 \times 10^{-1}$
$C = 1.22072934 \times 10^{-4}$	$M = -3.96785356 \times 10^{-8}$
$D = 6.74994808$	$N = 5.21734358 \times 10^{-6}$
$E = -1.57020617$	$O = -4.03765589 \times 10^{-4}$
$F = 4.01374176 \times 10^{-2}$	$P = -3.25795538 \times 10^{-2}$
$G = -1.169635 \times 10^{-5}$	$Q = -1.83679713 \times 10^{-5}$
$H = 2.24108415 \times 10^{-3}$	$R = -2.4964305 \times 10^{-4}$
$I = -1.54114246 \times 10^{-1}$	$S = 1.04480392 \times 10^{-6}$
$J = 1.2006097 \times 10^{-5}$	$T = -2.27549515 \times 10^{2}$

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 99.56%. 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-47C Operating at 245 RPM

The function below will calculate the delta fuel flow for drag for the CH-47C helicopter operating at 245 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:

$A = 1.43925276 \times 10$	$K = -3.73952542 \times 10^{-4}$
$B = -1.76786033 \times 10^{-1}$	$L = 9.51766968 \times 10^{-3}$
$C = 7.34766239 \times 10^{-4}$	$M = -1.05205952 \times 10^{-7}$
$D = -3.62632334$	$N = 2.35495875 \times 10^{-5}$
$E = 1.40438998$	$O = -1.89449638 \times 10^{-3}$
$F = 7.3855726 \times 10^{-2}$	$P = -3.31104305 \times 10^{-2}$
$G = 7.62190552 \times 10^{-6}$	$Q = 3.00417855 \times 10^{-5}$
$H = -3.03890294 \times 10^{-3}$	$R = -2.39477551 \times 10^{-4}$
$I = 2.72080421 \times 10^{-1}$	$S = 1.2046344 \times 10^{-6}$
$J = 6.97609534 \times 10^{-6}$	$T = -5.04253357 \times 10^{2}$

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 99.59%. 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

FUNCTION FOR CALCULATING GROUND IDLE FUEL FLOW

The function below will calculate the ground idle fuel flow rate for the CH-47C 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:

$A = -6.5749985 \times 10^{-1}$ $\qquad$ $D = -1.24999922 \times 10^{-3}$

$B = -5.54285311 \times 10^{-2}$ $\qquad$ $E = 9.99996317 \times 10^{-7}$

$C = -3.00133252 \times 10^{-11}$ $\qquad$ $F = 1.47358652 \times 10^{3}$

This equation calculates the ground idle fuel flow rate with an accuracy of 99.67%.

APPENDIX D

FUNCTIONS FOR CALCULATING GROSS WEIGHT LIMITS FOR TAKEOFF

1. CH-47C Operating at 235 RPM

The functions given below will calculate the gross weight limits for take off for the CH-47C helicopter operating at 235 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-47C helicopter is 46,000 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:

$A = -2.04521187 \times 10^{2}$ $C = 6.45157177 \times 10^{-3}$

$B = -1.73651493$ $D = 5.48574741 \times 10^{4}$

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

$A = -5.41285706 \times 10$ $C = -2.38285902 \times 10^{-4}$

$B = -5.78837119 \times 10^{-1}$ $D = 4.65754517 \times 10^{4}$

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

$A = -1.91924759 \times 10^{2}$ $C = 6.05328596 \times 10^{-3}$

$B = -1.62188777$ $D = 5.1224647 \times 10^{4}$

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

$A = -4.7751194 \times 10$ $C = -4.11927958 \times 10^{-4}$

$B = -5.19843929 \times 10^{-1}$ $D = 4.46686484 \times 10^{4}$

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

$A = -2.30310486 \times 10^{2}$ $\quad C = 7.26843113 \times 10^{-3}$

$B = -1.94757777$ $\quad D = 6.15208135 \times 10^{4}$

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

$A = -6.06521425 \times 10^{1}$ $\quad C = -3.0357156 \times 10^{-4}$

$B = -6.45660659 \times 10^{-1}$ $\quad D = 5.21943193 \times 10^{4}$

This equation with the various sets of constants gives results that are 99.89% accurate or better.

2. CH-47C Operating at 245 RPM

The functions given below will calculate the gross weight limits for take off for the CH-47C helicopter operating at 245 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-47C helicopter is 46,000 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:

$A = -2.00498346 \times 10^{2}$ $C = 5.51400252 \times 10^{-3}$

$B = -1.72648424$ $D = 5.52583125 \times 10^{4}$

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

$A = -4.92673783 \times 10$ $C = -5.14857456 \times 10^{-4}$

$B = -5.39397113 \times 10^{-1}$ $D = 4.64107769 \times 10^{4}$

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

$A = -1.87090488 \times 10^{2}$ $C = 5.07593085 \times 10^{-3}$

$B = -1.60321172$ $D = 5.13487373 \times 10^{4}$

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

$A = -4.23669033 \times 10$ $C = -7.50785934 \times 10^{-4}$

$B = -4.76228192 \times 10^{-1}$ $D = 4.43537026 \times 10^{4}$

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

$A = -2.25033333 \times 10^{2}$ $C = 6.16950123 \times 10^{-3}$

$B = -1.93471529$ $D = 6.19340469 \times 10^{4}$

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

$A = -5.60299997 \times 10$ $C = -4.62999953 \times 10^{-4}$

$B = -6.05156399 \times 10^{-1}$ $D = 5.20308398 \times 10^{4}$

This equation with the various sets of constants gives results that are 99.88% accurate or better.

APPENDIX E

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

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

MFR:

1. References:

a. United Kingdom CH-47C, Hover-out-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 Flight Characteristics Test, CH-47C Helicopter (Chinook) USAASTA Project No. 66-29.

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-47C 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-11 engine power available to the CH-47C (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-11 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-47C is 46000 lbs.

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