



**IMPROVING
THE TANKER EMPLOYMENT MODEL
GRADUATE RESEARCH PROJECT**

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AFIT/ILM/ENS/08-02

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Abstract

This Graduate Research Project is an improvement to the Tanker Employment Model developed by Maj. Margaret Romero. Her model which uses Excel VBA is used to determine the tanker capacity requirements needed to perform specific user defined tanker employment missions. The output is useful for rough-cut analysis of the tanker employment mission.

The improvement to the Tanker Employment Model is the capability to use multiple tanker types simultaneously. The model chooses the optimum order for the tanker types and number of tankers to support a specific tanker employment mission. It also provides additional information to compare the use of multiple tankers.

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Table of Contents

AIR FORCE INSTITUTE OF TECHNOLOGY	v
Abstract	iv
List of Figures	vii
I. Introduction	1
1.1 Background	1
1.2 Problem Motivation	1
1.3 Problem Statement	2
1.4 Research Objectives	2
1.5 Research Questions	3
1.6 Scope	3
1.7 Implications	3
II. Literature Review	4
2.1 Research Question 1: Tanker characteristics	4
2.2 Research Question 2: What are the types of tankers available for operations? ..	5
2.3 Tanker Type Comparisons and Missions	6
III. Methodology	9
3.1 Introduction	9
3.2 Assumptions	9
3.3 Research Question 3: What is the best method to add the multiple tanker capability to the model?	10
3.4 Formula Construction	12
3.5 Tanker Employment Model Modifications	13
3.6 Research Question 4: What is the best technique to assign tanker groups to offload required for receivers?	15
3.7 Input Data for Available Fuel	17
3.8 Visual Basic with Applications (VBA)	19
IV. Results and Analysis	21
4.1 Introduction	21
4.2 Model Verification	21
4.6 Conclusion	25
4.6 Limitations	25
V. Conclusions and Recommendations	26
5.1 Conclusions and Contributions	26
Bibliography	28
Appendix A	29

List of Figures

Figure 1. Tanker Employment Model Main Sheet.....	14
Figure 2. Input Fuel Available Sheet	18
Figure 3. Flow chart of fuel available calculation.....	19

List of Tables

Table 1. Tanker Data.....	6
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IMPROVING THE TANKER EMPLOYMENT MODEL

I. Introduction

1.1 Background

Refueling aircraft while in flight is called air refueling. The aircraft that delivers the fuel is called a tanker aircraft and the aircraft that receives the fuel is called a receiver aircraft. Tanker aircraft indefinitely extend the range of receiver aircraft.

Air refueling is one of the distinguishing characteristics that make the United States the predominant air power nation on the globe. It allows combat and support aircraft to strike targets deeper in enemy territory, extends the time fighter aircraft can protect friendly forces from attack by enemy aircraft, and supports the extension of the United States' military presence around the world (Capehart, 2000:1).

The number of tanker types is increasing with the purchase of the KC-767 and KC-45 tankers by our allies. The USAF signed a contract for the purchase of 175 new KC-45 tankers in March 2008. Tankers have different capabilities and often fly different routes to support the same mission and thus arrive at their offload point with different amounts of fuel available for refueling operations. The variability of fuel available for refueling operations makes it difficult for planners to quickly identify the number and type of tankers needed for a mission.

1.2 Problem Motivation

Major Romero's rough-cut Tanker Employment Model (TEM) provides AMC with an efficient tool for quickly assessing tanker employment capabilities. (Romero, 2006) Unlike Major Romero's model the U. S. Military and its allies use multiple tanker

types. Tankers have a wide range of capabilities and capacities and this directly impacts what missions they are best suited to perform. The number of tanker types is increasing with the purchase of the KC-767 tankers by our allies. (Boeing, 2008) The USAF signed a contract for the purchase of up to 179 new KC-45 tankers in early 2008. (Officials, 2008) Due to the Joint and Coalition nature of today's warfare, a tool must have the capability to model all potential tanker types/characteristics to better represent the reality of the current missions.

1.3 Problem Statement

Air Mobility Command lacks a simple, efficient tool for analysis of strategic tanker capabilities during the employment phase of military operations. The Tanker Employment Model developed by Major Margaret M. Romero, USAF was designed to meet this deficiency. The Tanker Employment Model fails to model the multiple tanker type environments in which the USAF operates. This makes the model less useful for the AMC planners. This model should be modified now because Major Romero has created momentum on the topic and modifying the model may result in a simple efficient tool which is useful for current and future operations.

1.4 Research Objectives

The goal of this research is to add a multiple tanker option to the tanker employment model to produce a simple, efficient rough-cut tool to assist planners in quick turn analysis or gross feasibility checks. The following questions in section 1.5 must be answered in order to improve the current model.

1.5 Research Questions

1. What characteristics of tankers are important in assigning missions to tankers?
2. What are the types of tankers available for operations?
3. What is the best method to add the multiple tanker capability to the model?
4. What is the best technique to assign tankers groups to offload required for receivers?

1.6 Scope

The scope of this research project is limited to adding the multiple tanker type capability to the Tanker Employment Model. It is expected that modifying the model will result in a tool that will be used for planning tanker employment.

1.7 Implications

This research provides a useful, simple, efficient rough-cut tool to assist planners in tanker employment operations. This tool may provide insight into other fueling operations involving multiple fueling locations and multiple users.

II. Literature Review

2.1 Research Question 1: Tanker characteristics

What characteristics of tankers are important in assigning missions to tankers on employment missions?

The USAF recently identified the key characteristics of tankers when they solicited bids for a new tanker to support the USAF. They evaluated the two contenders using objective measurements, called Key Performance Parameters, and subjective ones, called Factors.

Factors:

1. Mission capability (key system requirements, system integration software, product support, program management, technology maturity and demonstration)
2. Risk
3. Past performance
4. Price, lifecycle cost
5. Integrated fleet refueling assessments

Key Performance Parameters

1. Air refueling capability
2. Fuel offload and range at least as great as the KC-135
3. Compliant Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM) equipment
4. Airlift capability

5. Ability to take on fuel while airborne
6. Sufficient force protection measures
7. Ability to network into the information available in the battle space
8. Survivability measures (defensive systems, Electro-Magnetic Pulse (EMP) hardening, chemical/biological protection, etc.)
9. Provisioning for a multipoint refueling system to support Navy and allied aircraft. (DefenseNews, 2008)

More detailed characteristics support the above Factors and Key Performance Parameters. These include, speed, range, maximum takeoffweight, maximum transfer fuel rate, fuel burn rate, maximum cargo weight, maximum passengers, maximum pallets, minimum runway required, and cost per plane.

2.2 Research Question 2: What are the types of tankers available for operations?

The USAF recently awarded a contract to Northrop Grumman / EADS to build 179 tankers. When the first Northrop Grumman / EADS tanker KC-45 is assigned to the USAF in will bring the total count of USAF tanker models to three. Boeing has contested the award of the 179 tanker contract to Northrop Grumman / EADS and it is possible that the contract award could be overturned. Japan and Italy has already ordered the Boeing KC-767 tanker to support their air forces and it is possible that other allies will also purchase the Boeing KC-767. (Boeing, 2008) It is probable that our allies will continue to be our allies and that they will continue to support and fight alongside us. Therefore, it is likely in the near future that USAF tanker planners will be conducting

missions with at least the following four main tanker types, the KC-135, KC-10, KC-45 and the KC-767. Russian and other smaller U.S. tankers may also be used, but most likely will only be used in limited amounts. The below tanker data and information shows some of the differences between tanker types.

Table 1. Tanker Data

Tanker	Co.	Speed mph	Range	Max Take off (lbs)	Max Off-load Avail.	Cargo	Pax	Pallets	Cost \$	Inv
KC-135	Boeing	530	1500m	322,500	200,000	83K lbs	37	6	40	530
KC-10	Boeing	619	4400m		356,000	170 K	75	27	88	59
KC-45	Northrop				300,000 +		280	32	\$	0
KC-767	Boeing			400K+	202,000 +		190	19	\$	0
MC-130	Lockheed	300	2700n m	155K	helos		77			30
F/A 18	McDonnell	M1.8	1275	66K	Fighter	n/a	n/a		57	

Source: (Factsheets, 2008)

These differences make some tankers more useful than others for certain missions.

2.3 Tanker Type Comparisons and Missions

The KC-135 was first deployed in 1956 and is slower, less efficient, transfers the smallest maximum amount of fuel and is least dependable compared to all other tankers. When other aircraft, pilots and ground support is available another tanker should be chosen. The only exception to this is when the probability of being shot down is high,

the KC-135 should then be chosen because they are most expendable and the pilots can be easily replaced by a significant tanker pilot inventory.

The KC-10, which began service in 1981, carries the largest amount of fuel and will continue to carry the largest amount of fuel after the KC-767 and KC-45 enter service. The KC-10 has a significant higher fuel burn rate than all other tankers and thus is best suited for short and quick refueling missions. It will remain the ideal choice of planners to use for missions of refueling other tankers and heavy bombers at short distance from base. The KC-10 also has the second highest pallet capacity and is best used when maximum cube capacity is reached before maximum weight is reached. Another negative of the KC-10 is that it is older and will have an expected lower operational rate than the newer tankers.

The Northrop Grumman / EADS KC-45 is the best aircraft for tanker employment missions that require a large amount of fuel or cargo to be transported, and fuel conservation is not an issue. Although it carries less fuel than the KC-10 its burn rate is less and may have more fuel available for offload at the fuel transfer point. The KC-45 carries significantly more fuel, cargo, passengers and pallets than the KC-767. The KC-45 will be the tanker planner's first choice on long round trip missions that require large amounts of fuel to be transferred on missions such as cargo and heavy bomber missions.

The Boeing KC-767 can access more runways in the world due to its shorter minimum required runway and smaller footprint which leads to a larger Maximum On Ground (MOG) number. These advantages will lead planners to choose this tanker for missions that are fought by a few fighter aircraft in an isolated part of the world. Another

key advantage of the KC-767 is its fuel efficiency. It has the lowest burn rate and therefore may become the tanker of choice when fuel supplies are limited.

III. Methodology

3.1 Introduction

To obtain the approximate number of required tankers by airframe, planners divide a tanker mission by a set number to ascertain how many receivers can be refueled. For instance, to determine the number of aircraft sorties which can be refueled by a KC-10, the number of tankers is divided by 5.6 (18%); to determine the same for a KC-135, the number is divided by 4 or 5. (CWS 401, 2004:2-3). However, these round estimates do not take into account any variables such as available aircrew, in flight refueling of the tanker or base support. (Romero, 2006)

The new Tanker Employment Model provides the capability to use multiple tankers in the model's calculation. The model also provides a limited capability to compare multiple bases. No changes were made to the original formulas of the Tanker Employment Model.

3.2 Assumptions

1. Assumptions:
 - a. The Tanker Employment Model accurately models tanker operations except for the use of multiple tanker types.
 - b. The Tanker Employment Model assumes that the fuel requirement is one receiver "super" aircraft in need of the total fuel requirement. No calculations are made concerning fuel flow or offload times. Tankers arrive at the offload site, stay a predetermined amount of time, offload all fuel required during that time and then return to base.

- c. The KC-767 and KC-30 will be acquired with the promised capabilities and capacities.
- d. You may use up to three bases, but bases may have only one type of tanker operating at that base.
- e. Many details are not incorporated into the calculations. Some of these factors include altitude flown, winds, and effects of gross weight on fuel consumption.

2. Limitations:

- a. Project is due by May 2008.
- b. Zero funding assigned for research.
- c. One researcher working on project.

3.3 Research Question 3: What is the best method to add the multiple tanker capability to the model?

One method considered to add this capability was to use programming software such as Java which would interface with the TEM. Java is more powerful than VBA and would provide the ability to be more creative with user forms and other customer centric capabilities. Three drawbacks are inherent in this method. First, not all government computers are Java enabled or users are not allowed to use all the functions available with Java. The second drawback was that there appeared to be a long learning curve for using Java. This long learning curve impacts two individuals, the author and the ultimate end user. I did not have the available time to learn this new computer programming

language and the average tanker mission planner would also not have the resources available to learn a new computer programming language to make any additions or corrections that the end user will want to make. The third drawback is the inherent problems that arise when any two programs are merged to create one tool. Potential compatibility issues are to be avoided whenever possible if there is an effective alternative available.

Another method considered was to begin from scratch and create an entirely new TEM built to handle multiple tankers. This method is attractive because a programmer is able to create a basic framework that is capable of handling the multiple tanker requirements. Code, variable names, user forms, reports and formula can be developed simply and efficiently. An original model avoids the problems of deciphering what a previous programmer meant in writing code and does not hinder or constrain the alternatives available to programming. There are many ways to code, structure and formulate a problem/program and beginning from scratch enables the programmer to exploit the best possible alternative.

The final method was considered the best and was implemented in this GRP. Modifying the original TEM using only Excel VBA was chosen for three reasons. First, given limited resources one should not create a new program if a current program is working and meeting all the needs of the user. The original TEM was thoroughly tested and validated to be an effective tool in meeting the requirements, therefore there appeared to be little reason to recreate an entirely new program. Secondly, after reviewing the

Tanker Employment Model (TEM) it was believed that the model could be expanded to provide a multiple tanker capacity and enhanced to provide a method to select the best tanker. The final reason for modifying the TEM was that it was based on a well known and widely used and available program, Excel VBA. This common programming language and program ensures that future modification and corrections can easily be made by future tanker planners or other students at the Air Force Institute of Technology or other institutes.

3.4 Formula Construction

1. The formulas used in the basic Tanker Employment Model are located in Maj. Margaret M. Romero's thesis "Algebra of Tankers" at the Air Force Institute of Technology. This thesis was completed in March 2006.
2. Below is the formula used to calculate the number of missions required when using multiple tankers.

$$\text{number of tanker missions} = \frac{\sum_{r=1} \sum_{n=1} \text{off load required}_{rn}}{\sum_{t=1} \sum_{n=1} \text{off load available}_{tn}}$$

r = receiver type
t = tanker type
n = number of aircraft
r, t, n = integers

3.5 Tanker Employment Model Modifications

The main user form of the TEM, the Tanker Employment Calculations sheet provides the capability to compare of three tanker groups simultaneously. Previously only one tanker from one base was considered in all the tanker employment calculations. Now three different tankers groups, with different numbers of tanker aircraft coming from three different bases can simultaneously be evaluated to choose the best tanker group for two different mission types. This is a significant enhancement that provides the user with an increased capability in evaluating the multiple tanker types available for a tanker employment mission. The below screen capture of the main sheet is provided to enable better understanding.

Figure 1. Tanker Employment Model Main Sheet

Tanker Employment Caculations
✕

Instructions
Done
Tanker Employment
Print Form
Cancel

Minimum Missions Calculation

Original Offload Req

Input Data for Offload Req (1)

Remaining Offload Req

Input data for multiple tankers required:
Steps (1), (2) then (3)

Input Data for Offload Available (2)

	Tanker 1	Tanker 2	Tanker 3	Total
Calculate Avail by Type				
Offload Avail				
Aircraft Avail				
by Type Avail				
MIN Tankers (3)				
MAX Booms (3)				

Calculate Minimum Missions Required (3)

Maximum Daily Fuel Calculations

Total Cycle Time Calculations

RTFT

TGT

Cycle Time Hrs

Input data - Cycle Time of one mission

Tanker 1

Tanker 2

Tanker 3

Sortie Generation Calculations

Input data to calculate maximum Sortie Generation Capabilities:

	Tanker 1	Tanker 2	Tanker 3
Aircraft			
Aircrew			
Base			

Calculate Max Fuel Available

Tanker 1	Tanker 2	Tanker 3
--	--	--

Lbs

Grant 2000

The offload available data blocks are pulled from another sheet when the user clicks on the “Input Data for Offload Available (2)” button. This captures data that was calculated in another screen and which will be described after this section. The user then manually inputs data into the “Aircraft Avail” blocks as currently experienced. This data is used with the “Offload Avail” block to calculate the number of aircraft sorties needed to fulfill one of two mission types. If the best tanker group does not have enough tankers available to meet the “Minimum Offload Req” block the TEM will automatically choose the second best until the second best tanker group has no aircraft available. If the third best tanker group fails to meet the requirement the TEM will display that the current asset mix is unable to meet the required minimum offload required.

3.6 Research Question 4: What is the best technique to assign tanker groups to offload required for receivers?

One technique to assign tanker groups to offload required for receivers is to write computer programming code. This technique would result in an efficient method in using VBA and the time required for a programmer to modify this code would be minimal. The major drawback to this method is that any user in the future would need to know computer programming in order to modify or correct the TEM.

The best technique to assign tankers groups to offload required for receivers for the TEM is to use the “IF” “Then” capability of VBA to choose the best tanker groups. The method of using “IF” “Then” statements is more commonly known and thus can be

easier understood by future users. Below is a simple algorithm for choosing the best tanker mix when minimizing tankers:

1. Read all tankers' available fuel quantity.
2. Read all tankers' aircraft availability count.
3. Read offload required quantity.
4. Chose tanker with greatest fuel availability.
5. Are there tankers of this type available to support the mission?
 - a. If yes, then reduce offload required by offload available for this tanker and repeat step 2 until mission completed.
 - b. If no, repeat step 1 with the remaining tankers.
6. If no tankers available notify user that they are unable to meet mission requirements with the current assets.

The algorithm to maximize "booms" is similar to the algorithm to minimize tankers and is presented below:

1. Read all tankers' available fuel quantity.
2. Read all tankers' aircraft availability count.
3. Read offload required quantity.
4. Chose tanker with smallest fuel availability.
5. Are there tankers of this type available to support the mission?
 - a. If yes, then reduce offload required by offload available for this tanker and repeat step 2 until mission completed.
 - b. If no, repeat step 1 with the remaining tankers.

6. If no tankers available notify user that they are unable to meet mission requirements with the current assets.

3.7 Input Data for Available Fuel

Like the other ten user input forms and associated code the “Input Data for Available Fuel” user form is modified to accommodate two additional tanker groups. No new formulas are needed but all the code had to be understood and modified to provide the ability to use multiple tanker groups. The form and the more interesting part of the code to modify this form are included below.

Figure 2. Input Data for Available Fuel

Input Data for Available Fuel

Instructions

Tanker 1

Tanker 2

Tanker 3

Input Total Fuel On Takeoff (lbs)				lbs
Input Fuel Received from Air Refueling (lbs)				lbs
Input Distance to Refuel Point (nm)				nm
Input Time on Track/in Orbit at Refuel Point				☐ Hours ☐ Minutes
Input Distance from Refuel Point (nm)				nm
Input Air Speed (nm/hrs)				AS Air Speed table
Input Average Fuel Burn Rate (lbs/hr)				Flow Fuel Flow table
Input Fuel Amount for Destination Reserve (lbs)				lbs
Offload Utilization ($0 < x < 1$)				

Calculate Total Fuel Available for Offload

Print

Clear Form

Save and Return

Cancel

Maj. Romero’s method to calculate “Fuel Available for Offload” was expanded to three tankers. This involved Excel VBA code changes and a new user form configuration. The flow chart for this method is below.

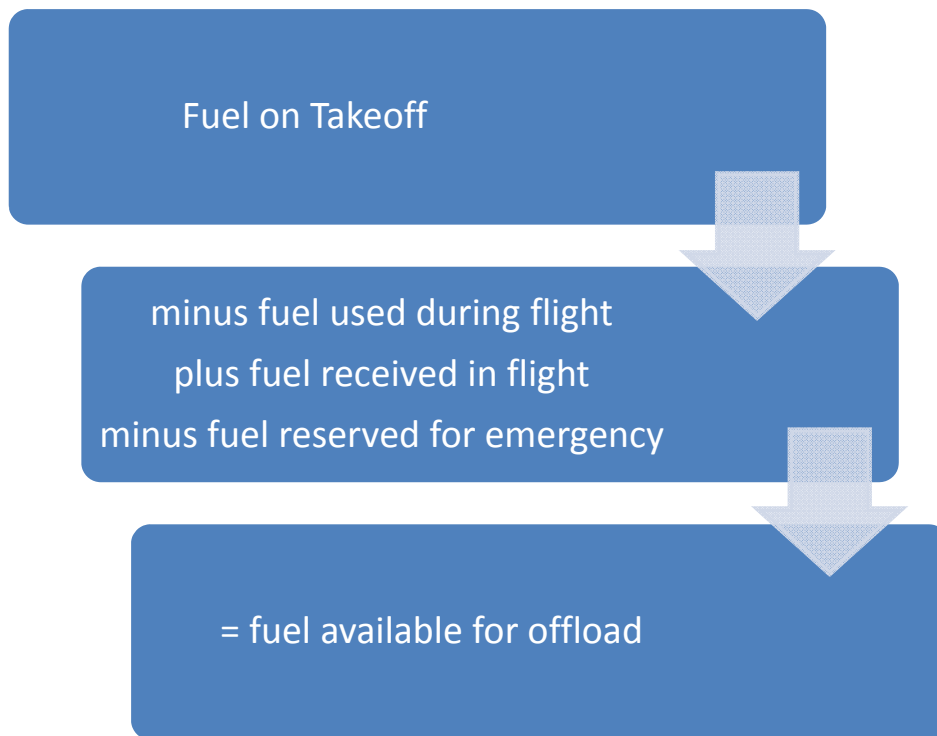


Figure 3. Flow chart of fuel available calculation

3.8 Visual Basic with Applications (VBA)

Visual Basic with Applications (VBA) is Microsoft’s common scripting language used in a variety of Microsoft Office applications, as well other applications from other vendors. One feature of VBA is the ability to create user forms – custom dialog boxes which allow for easy data entry. (Romero, 2006)

Three reasons were instrumental in selecting to use VBA in Excel to develop the tanker employment model. First, AMC desired an easy to use tool (as the current tool,

CMARPS is widely known for being difficult to learn and use). Secondly, Excel is one of the standard software applications in many offices; so many Air Force members have some familiarity with the Excel platform. Last, many of the tanker tools recently developed were also Excel based projects coded in VBA. (Romero, 2006)

The multiple tankers capability and other modifications to the original model were made using Excel 2007 VBA.

IV. Results and Analysis

4.1 Introduction

The Tanker Employment Model provides the ability to use multiple tankers in the calculations. This modification also enables the ability to do simple multiple base comparisons. The model calculates the number and type of tanker needed to meet a required user inputted mission by maximizing the number of booms available or by minimizing the number of tanker aircraft used.

4.2 Model Verification

The New Tanker Employment Model and the original Tanker Employment Model provide the same output for one tanker when the inputs are the same. This verifies that the original capabilities were not lost in the modification. The below scenarios with TEM results and manual calculation results tested the multiple tanker TEM calculations.

Table 2. Verification with multiple scenarios

Scenario 1: Minimize Tankers, Offload Required = 10001, Aircraft Avail by type = 5

<i>Tanker Type</i>	<i>Offload Available</i>	<i>Aircraft Used by TEM</i>	<i>Aircraft Used by Manual Calc</i>	<i>Order Chosen TEM/Manual</i>
1	1000	0	0	3
2	1100	4	4	2
3	1200	5	5	1

Scenario 2: Maximize Booms, Offload Required = 10001, Aircraft Avail by type = 5

<i>Tanker Type</i>	<i>Offload Available</i>	<i>Aircraft Used by TEM</i>	<i>Aircraft Used by Manual Calc</i>	<i>Order Chosen TEM/Manual</i>
1	1000	5	5	1
2	1100	5	5	2
3	1200	0	0	3

Scenario 3: Minimize Tankers, Offload Required = 10001, Aircraft Avail by type = 5

<i>Tanker Type</i>	<i>Offload Available</i>	<i>Aircraft Used by TEM</i>	<i>Aircraft Used by Manual Calc</i>	<i>Order Chosen TEM/Manual</i>
1	1100	4	4	2
2	1200	5	5	1
3	1000	0	0	3

Scenario 4: Maximize Booms, Offload Required = 10001, Aircraft Avail by type = 5

<i>Tanker Type</i>	<i>Offload Available</i>	<i>Aircraft Used by TEM</i>	<i>Aircraft Used by Manual Calc</i>	<i>Order Chosen TEM/Manual</i>
1	1100	5	5	2
2	1200	0	0	3
3	1000	5	5	1

Scenario 5: Minimize Tankers, Offload Required = 10001, Aircraft Avail by type = 4

<i>Tanker Type</i>	<i>Offload Available</i>	<i>Aircraft Used by TEM</i>	<i>Aircraft Used by Manual Calc</i>	<i>Order Chosen TEM/Manual</i>
1	1000	1	1	3
2	1100	4	4	2
3	1200	4	4	1

Scenario 6: Maximize Booms, Offload Required = 10001, Aircraft Avail by type = 4

<i>Tanker Type</i>	<i>Offload Available</i>	<i>Aircraft Used by TEM</i>	<i>Aircraft Used by Manual Calc</i>	<i>Order Chosen TEM/Manual</i>
1	1000	4	4	1
2	1100	4	4	2
3	1200	1	1	3

Scenario 7: Minimize Tankers, Offload Required = 10001, Aircraft Avail by type = 4

<i>Tanker Type</i>	<i>Offload Available</i>	<i>Aircraft Used by TEM</i>	<i>Aircraft Used by Manual Calc</i>	<i>Order Chosen TEM/Manual</i>
1	1200	4	4	1
2	1000	1	1	3
3	1100	4	4	2

Scenario 8: Maximize Booms, Offload Required = 10001, Aircraft Avail by type = 4

<i>Tanker Type</i>	<i>Offload Available</i>	<i>Aircraft Used by TEM</i>	<i>Aircraft Used by Manual Calc</i>	<i>Order Chosen TEM/Manual</i>
1	1200	1	1	3
2	1000	4	4	1
3	1100	4	4	2

Scenario 9: Minimize Tankers, Offload Required = 10001, Aircraft Avail by type = 4

<i>Tanker Type</i>	<i>Offload Available</i>	<i>Aircraft Used by TEM</i>	<i>Aircraft Used by Manual Calc</i>	<i>Order Chosen TEM/Manual</i>
1	1100	4	4	2
2	1200	4	4	1
3	1000	1	1	3

Scenario 10: Maximize Booms, Offload Required = 10001, Aircraft Avail by type = 4

<i>Tanker Type</i>	<i>Offload Available</i>	<i>Aircraft Used by TEM</i>	<i>Aircraft Used by Manual Calc</i>	<i>Order Chosen TEM/Manual</i>
1	1100	4	4	2
2	1200	1	1	3
3	1000	4	4	1

The above scenarios were developed to test each possible order of selection of the three tanker choices. The TEM and manual output were the same for the order of tanker

selection and the number of each tanker. This verifies that the model is working as designed.

4.6 Conclusion

The new Tanker Employment Model provides the ability to use multiple tankers while calculating mission requirements. This capability provides a more realistic estimate of current and future tanker operations.

4.6 Limitations

The new model only gives the user the ability to maximize or minimize the number of tankers used on a mission. The decision of which tanker to choose first does not take into consideration fuel used, time required for mission, bases available or aircrew available. The sole criterion used is fuel available at refueling point.

V. Conclusions and Recommendations

5.1 Conclusions and Contributions

This chapter discusses conclusions and contribution produced by this research and suggestions for future research.

Choosing a GRP topic that builds on the work of another student's work is a good idea because it reduces the time needed to search for a topic, enables past research to continue and demonstrates the value of teamwork.

Modifying a program developed by another user is made easier when the developer makes detailed notes on how and why a procedure is executed. A well documented and organized model/program saves future programmers significant time and energy in modifying the program in the future.

This GRP has demonstrated that a basic model can be expanded into a more robust model. Maj. Romero's decision to use Visual Basic for Applications (VBA) within Excel was based on that it would be portable within the Air Force. VBA is a powerful tool that should be taught to more officers in DoD. It is a tool that will be used often in the future by military personnel who desire to build, optimize and improve useful programs.

The author had not used VBA before this GRP. It was a tedious process to learn how to operate and program VBA. It would have been nice to take a basic VBA course to learn the fundamentals of the programming language. The user help menu was of some value, but information was often needed. There were several instances when the program did not display the correct "answer" even though the logic was sound; this was

often due to a wrong variable designation. This was frustrating and time consuming because my logic was correct, but the VBA format was not correct.

One limitation and strength of VBA is its reliance on “preprogrammed” commands and forms. This makes “programming” easier, but it limits your creativity in designing forms and unique procedures.

This new tool provides greater fidelity into the tanker employment mission. The model now has the ability to model multiple tankers at one time. The method used to choose between multiple alternatives can be used in other programs and decisions in the future.

5.2 Recommendations for Future Research

The Tanker Employment Model could be expanded to consider multiple receiver groups and increased maintenance capabilities. Another possible expansion would be to modify the model to choose the best base of three base choices. A final area of possible research would be to develop a better and more detailed method of selecting a tanker.

Keeping the TEM model simple and uncluttered will be a challenge with any of the recommended research areas. If the model becomes too complicated it will be shunned by tanker planners. Another challenge in developing a single area in TEM is that all areas are linked in some way and modifying one area of TEM will often lead to the need to modify all areas.

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Appendix A.

Tanker Employment Calculations
✕

Instructions
Done
Tanker Employment
Print Form
Cancel

Minimum Missions Calculation

Original Offload Req

Input Data for Offload Req (1)

Remaining Offload Req

Input data for multiple tankers required:
Steps (1), (2) then (3)

Input Data for Offload Available (2)

	Tanker 1	Tanker 2	Tanker 3	Total
Calculate Avail by Type	Offload Avail			
	Aircraft Avail			
	by Type Avail			
MIN Tankers (3)				
MAX Booms (3)				

Calculate Minimum Missions Required (3)

Maximum Daily Fuel Calculations

Total Cycle Time Calculations

RTFT

TGT

Cycle Time Hrs

Input data - Cycle Time of one mission

Tanker 1	Tanker 2	Tanker 3

Sortie Generation Calculations

Input data to calculate maximum Sortie Generation Capabilities:

	Tanker 1	Tanker 2	Tanker 3
Aircraft			
Aircrew			
Base			

Calculate Max Fuel Available

Tanker 1	Tanker 2	Tanker 3
-------------------------------	-------------------------------	-------------------------------

Lbs

Option Explicit

29

```
Dim ws As Worksheet, BoxCheck As Integer, TempOffloadReq As String, Result As Integer
```

```
Private Sub BoomMissionReqbox_Change()
```

```
End Sub
```

```
Private Sub Aircrafttct_Change()
```

```
End Sub
```

```
Private Sub aircraftusedBox3b_Change()
```

```
End Sub
```

```
Private Sub calcmaxtankers_Click()
```

```
Dim maxbooms As Integer, missionsreq1 As Currency, aircraftused1 As Currency, _  
missionsreq2 As Currency, aircraftused2 As Currency, _  
missionsreq3 As Currency, aircraftused3 As Currency
```

```
'resets values
```

```
aircraftusedBox1f = 0
```

```
aircraftusedBox2f = 0
```

```
aircraftusedBox3f = 0
```

```
missionsreq1 = 0
```

```
missionsreq2 = 0
```

```
missionsreq2 = 0
```

```
missionsreq1 = OffloadReqBox / OffloadAvailBox
```

```
missionsreq2 = OffloadReqBox / OffloadAvailBox2
```

```
missionsreq3 = OffloadReqBox / OffloadAvailBox3
```

```
'Calculates Minimum Tankers needed to meet fuel offload required
```

```
If missionsreq1 > missionsreq2 Then ' 1st phase
```

```
If missionsreq1 > missionsreq3 Then
```

```
' aircraftcount calculaton
```

```
If missionsreq1 < aircraft1count Then
```

```
aircraftusedBox1f = missionsreq1
```

```
Else: aircraftusedBox1f = aircraft1count
```

```
End If
```

```

OffloadReqBox = OffloadReqBox - (aircraftusedBox1f * OffloadAvailBox)

missionsreq2 = OffloadReqBox / OffloadAvailBox2
missionsreq3 = OffloadReqBox / OffloadAvailBox3

If missionsreq2 > missionsreq3 Then
    If missionsreq2 < aircraft2count Then
        aircraftusedBox2f = missionsreq2

    Else: aircraftusedBox2f = aircraft2count
    End If

    OffloadReqBox = OffloadReqBox - (aircraftusedBox2f *
OffloadAvailBox2)

    missionsreq3 = OffloadReqBox / OffloadAvailBox3

    If missionsreq3 < aircraft3count Then
        aircraftusedBox3f = missionsreq3
        OffloadReqBox = OffloadReqBox - (aircraftusedBox3f *
OffloadAvailBox3)

    Else: aircraftusedBox3f = aircraft3count
        OffloadReqBox = OffloadReqBox - (aircraftusedBox3f *
OffloadAvailBox3)
        MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
    End If

ElseIf missionsreq3 > missionsreq2 Then

    If missionsreq3 < aircraft3count Then
        aircraftusedBox3f = missionsreq3

    Else: aircraftusedBox3f = aircraft3count
    End If

    OffloadReqBox = OffloadReqBox - (aircraftusedBox3f *
OffloadAvailBox3)

    missionsreq2 = OffloadReqBox / OffloadAvailBox2

    If missionsreq2 < aircraft2count Then
        aircraftusedBox2f = missionsreq2

```

```

        OffloadReqBox = OffloadReqBox - (aircraftusedBox2f *
OffloadAvailBox2)

        Else: aircraftusedBox2f = aircraft2count
        OffloadReqBox = OffloadReqBox - (aircraftusedBox2f *
OffloadAvailBox2)
        MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
        End If
    End If 'check this END IF

ElseIf missionsreq3 > missionsreq1 Then

    ' aircraftcount calculation
    If missionsreq3 < aircraft3count Then
        aircraftusedBox3f = missionsreq3

    Else: aircraftusedBox3f = aircraft3count
    End If

    OffloadReqBox = OffloadReqBox - (aircraftusedBox3f * OffloadAvailBox3)

    missionsreq1 = OffloadReqBox / OffloadAvailBox
    missionsreq2 = OffloadReqBox / OffloadAvailBox2

    If missionsreq1 > missionsreq2 Then
        If missionsreq1 < aircraft1count Then
            aircraftusedBox1f = missionsreq1

        Else: aircraftusedBox1f = aircraft1count
        End If

        OffloadReqBox = OffloadReqBox - (aircraftusedBox1f * OffloadAvailBox)

        missionsreq2 = OffloadReqBox / OffloadAvailBox2

        If missionsreq2 < aircraft2count Then
            aircraftusedBox2f = missionsreq2
            OffloadReqBox = OffloadReqBox - (aircraftusedBox2f *
OffloadAvailBox2)

        Else: aircraftusedBox2f = aircraft2count
            OffloadReqBox = OffloadReqBox - (aircraftusedBox2f *
OffloadAvailBox2)

```


MsgBox "Please adjust fuel available or fuel required to meet mission parameters."

End If

End If

End If

ElseIf missionsreq2 > missionsreq1 Then '2nd phase

If missionsreq2 > missionsreq3 Then
' aircraftcount calculaton

If missionsreq2 < aircraft2count Then
aircraftusedBox2f = missionsreq2

Else: aircraftusedBox2f = aircraft2count
End If

OffloadReqBox = OffloadReqBox - (aircraftusedBox2f * OffloadAvailBox2)

missionsreq1 = OffloadReqBox / OffloadAvailBox
missionsreq3 = OffloadReqBox / OffloadAvailBox3

If missionsreq1 > missionsreq3 Then
If missionsreq1 < aircraft1count Then
aircraftusedBox1f = missionsreq1

Else: aircraftusedBox1f = aircraft1count
End If

OffloadReqBox = OffloadReqBox - (aircraftusedBox1f * OffloadAvailBox)

missionsreq3 = OffloadReqBox / OffloadAvailBox3

If missionsreq3 < aircraft3count Then
aircraftusedBox3f = missionsreq3
OffloadReqBox = OffloadReqBox - (aircraftusedBox3f *
OffloadAvailBox3)

Else: aircraftusedBox3f = aircraft3count
OffloadReqBox = OffloadReqBox - (aircraftusedBox3f *
OffloadAvailBox3)

MsgBox "Please adjust fuel available or fuel required to meet mission parameters."

End If

```

ElseIf missionsreq3 > missionsreq1 Then

    If missionsreq3 < aircraft3count Then
        aircraftusedBox3f = missionsreq3

    Else: aircraftusedBox3f = aircraft3count
    End If

    OffloadReqBox = OffloadReqBox - (aircraftusedBox3f *
OffloadAvailBox3)

    missionsreq1 = OffloadReqBox / OffloadAvailBox

    If missionsreq1 < aircraft1count Then
        aircraftusedBox1f = missionsreq1
        OffloadReqBox = OffloadReqBox - (aircraftusedBox1f *
OffloadAvailBox)

    Else: aircraftusedBox1f = aircraft1count
        OffloadReqBox = OffloadReqBox - (aircraftusedBox1f *
OffloadAvailBox)
        MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
    End If
End If 'check this END IF

ElseIf missionsreq3 > missionsreq2 Then

    ' aircraftcount calculaton
    If missionsreq3 < aircraft3count Then
        aircraftusedBox3f = missionsreq3

    Else: aircraftusedBox3f = aircraft3count
    End If

    OffloadReqBox = OffloadReqBox - (aircraftusedBox3f * OffloadAvailBox3)

    missionsreq1 = OffloadReqBox / OffloadAvailBox
    missionsreq2 = OffloadReqBox / OffloadAvailBox2

    If missionsreq2 > missionsreq1 Then
        If missionsreq2 < aircraft2count Then
            aircraftusedBox2f = missionsreq2

```

```

        Else: aircraftusedBox2f = aircraft2count
        End If

        OffloadReqBox = OffloadReqBox - (aircraftusedBox2f *
OffloadAvailBox2)

        missionsreq1 = OffloadReqBox / OffloadAvailBox

        If missionsreq1 < aircraft1count Then
            aircraftusedBox1f = missionsreq1
            OffloadReqBox = OffloadReqBox - (aircraftusedBox1f *
OffloadAvailBox)

            Else: aircraftusedBox1f = aircraft1count
            OffloadReqBox = OffloadReqBox - (aircraftusedBox1f *
OffloadAvailBox)
            MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
            End If

        End If
        End If
        End If

    End Sub

    Private Sub calcmintankers_Click()

        Dim maxbooms As Integer, missionsreq1 As Currency, aircraftused1 As Currency, _
        missionsreq2 As Currency, aircraftused2 As Currency, _
        missionsreq3 As Currency, aircraftused3 As Currency

        'resets values
        aircraftusedBox1b = 0
        aircraftusedBox2b = 0
        aircraftusedBox3b = 0
        missionsreq1 = 0
        missionsreq2 = 0
        missionsreq3 = 0

        missionsreq1 = OffloadReqBox / OffloadAvailBox
        missionsreq2 = OffloadReqBox / OffloadAvailBox2
        missionsreq3 = OffloadReqBox / OffloadAvailBox3

```

'Calculates Minimum Tankers needed to meet fuel offload required

If missionsreq1 < missionsreq2 Then ' 1st phase

If missionsreq1 < missionsreq3 Then

' aircraftcount calculaton

If missionsreq1 < aircraft1count Then

aircraftusedBox1b = missionsreq1

Else: aircraftusedBox1b = aircraft1count

End If

OffloadReqBox = OffloadReqBox - (aircraftusedBox1b * OffloadAvailBox)

missionsreq2 = OffloadReqBox / OffloadAvailBox2

missionsreq3 = OffloadReqBox / OffloadAvailBox3

If missionsreq2 < missionsreq3 Then

If missionsreq2 < aircraft2count Then

aircraftusedBox2b = missionsreq2

Else: aircraftusedBox2b = aircraft2count

End If

OffloadReqBox = OffloadReqBox - (aircraftusedBox2b *
OffloadAvailBox2)

missionsreq3 = OffloadReqBox / OffloadAvailBox3

If missionsreq3 < aircraft3count Then

aircraftusedBox3b = missionsreq3

OffloadReqBox = OffloadReqBox - (aircraftusedBox3b *
OffloadAvailBox3)

Else: aircraftusedBox3b = aircraft3count

OffloadReqBox = OffloadReqBox - (aircraftusedBox3b *
OffloadAvailBox3)

MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."

End If

ElseIf missionsreq3 < missionsreq2 Then

If missionsreq3 < aircraft3count Then

aircraftusedBox3b = missionsreq3

```

Else: aircraftusedBox3b = aircraft3count
End If

OffloadReqBox = OffloadReqBox - (aircraftusedBox3b *
OffloadAvailBox3)

missionsreq2 = OffloadReqBox / OffloadAvailBox2

If missionsreq2 < aircraft2count Then
    aircraftusedBox2b = missionsreq2
    OffloadReqBox = OffloadReqBox - (aircraftusedBox2b *
OffloadAvailBox2)

Else: aircraftusedBox2b = aircraft2count
    OffloadReqBox = OffloadReqBox - (aircraftusedBox2b *
OffloadAvailBox2)
    MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
End If
End If 'check this END IF

ElseIf missionsreq3 < missionsreq1 Then

' aircraftcount calculaton
If missionsreq3 < aircraft3count Then
    aircraftusedBox3b = missionsreq3

Else: aircraftusedBox3b = aircraft3count
End If

OffloadReqBox = OffloadReqBox - (aircraftusedBox3b * OffloadAvailBox3)

missionsreq1 = OffloadReqBox / OffloadAvailBox
missionsreq2 = OffloadReqBox / OffloadAvailBox2

If missionsreq1 < missionsreq2 Then
    If missionsreq1 < aircraft1count Then
        aircraftusedBox1b = missionsreq1

Else: aircraftusedBox1b = aircraft1count
End If

OffloadReqBox = OffloadReqBox - (aircraftusedBox1b * OffloadAvailBox)

```

```

missionsreq2 = OffloadReqBox / OffloadAvailBox2

    If missionsreq2 < aircraft2count Then
        aircraftusedBox2b = missionsreq2
        OffloadReqBox = OffloadReqBox - (aircraftusedBox2b *
OffloadAvailBox2)

        Else: aircraftusedBox2b = aircraft2count
        OffloadReqBox = OffloadReqBox - (aircraftusedBox2b *
OffloadAvailBox2)
        MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
    End If

End If

End If

ElseIf missionsreq2 < missionsreq1 Then '2nd phase
    If missionsreq2 < missionsreq3 Then
        ' aircraftcount calculaton
        If missionsreq2 < aircraft2count Then
            aircraftusedBox2b = missionsreq2

        Else: aircraftusedBox2b = aircraft2count
        End If

        OffloadReqBox = OffloadReqBox - (aircraftusedBox2b * OffloadAvailBox2)

        missionsreq1 = OffloadReqBox / OffloadAvailBox
        missionsreq3 = OffloadReqBox / OffloadAvailBox3

        If missionsreq1 < missionsreq3 Then
            If missionsreq1 < aircraft1count Then
                aircraftusedBox1b = missionsreq1

            Else: aircraftusedBox1b = aircraft1count
            End If

            OffloadReqBox = OffloadReqBox - (aircraftusedBox1b * OffloadAvailBox)

            missionsreq3 = OffloadReqBox / OffloadAvailBox3

            If missionsreq3 < aircraft3count Then
                aircraftusedBox3b = missionsreq3

```

```

        OffloadReqBox = OffloadReqBox - (aircraftusedBox3b *
OffloadAvailBox3)

        Else: aircraftusedBox3b = aircraft3count
        OffloadReqBox = OffloadReqBox - (aircraftusedBox3b *
OffloadAvailBox3)
        MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
        End If

    ElseIf missionsreq3 < missionsreq1 Then

        If missionsreq3 < aircraft3count Then
            aircraftusedBox3b = missionsreq3

        Else: aircraftusedBox3b = aircraft3count
        End If

        OffloadReqBox = OffloadReqBox - (aircraftusedBox3b *
OffloadAvailBox3)

        missionsreq1 = OffloadReqBox / OffloadAvailBox

        If missionsreq1 < aircraft1count Then
            aircraftusedBox1b = missionsreq1
            OffloadReqBox = OffloadReqBox - (aircraftusedBox1b *
OffloadAvailBox)

        Else: aircraftusedBox1b = aircraft1count
            OffloadReqBox = OffloadReqBox - (aircraftusedBox1b *
OffloadAvailBox)
            MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
            End If
        End If 'check this END IF

    ElseIf missionsreq3 < missionsreq2 Then

        ' aircraftcount calculaton
        If missionsreq3 < aircraft3count Then
            aircraftusedBox3b = missionsreq3

        Else: aircraftusedBox3b = aircraft3count
        End If

```

```

OffloadReqBox = OffloadReqBox - (aircraftusedBox3b * OffloadAvailBox3)

missionsreq1 = OffloadReqBox / OffloadAvailBox
missionsreq2 = OffloadReqBox / OffloadAvailBox2

If missionsreq2 < missionsreq1 Then
    If missionsreq2 < aircraft2count Then
        aircraftusedBox2b = missionsreq2

    Else: aircraftusedBox2b = aircraft2count
    End If

    OffloadReqBox = OffloadReqBox - (aircraftusedBox2b *
OffloadAvailBox2)

    missionsreq1 = OffloadReqBox / OffloadAvailBox

    If missionsreq1 < aircraft1count Then
        aircraftusedBox1b = missionsreq1
        OffloadReqBox = OffloadReqBox - (aircraftusedBox1b *
OffloadAvailBox)

        Else: aircraftusedBox1b = aircraft1count
        OffloadReqBox = OffloadReqBox - (aircraftusedBox1b *
OffloadAvailBox)
        MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
        End If

    End If
End If
End If

End Sub

```

```

Private Sub CmdCalcAircraftInt_Click()
' First checks to ensure user has entered Cycle Time, required for calculations
With CycleTimeBox
    If .Value = "" Or Not IsNumeric(.Value) Then

```



```

        MsgBox "The Cycle Time is required to calculate Sortie Generation Capablity for
aircraft, " _
        & "please enter a nonnumeric value."
        .SetFocus
    Exit Sub
End If
CycleTime = CycleTimeBox
If CycleTime < 0 Then
    MsgBox "The Cycle Time is required to calculate Sortie Generation Capablity for
aircraft, " _
    & "please enter a nonnegative value."
    .SetFocus
    Exit Sub
End If
End With

```

```

With CycleTimeBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Cycle Time is required to calculate Sortie Generation Capablity for
aircraft, " _
        & "please enter a nonnumeric value."
        .SetFocus
    Exit Sub
    End If
    CycleTime2 = CycleTimeBox2
    If CycleTime2 < 0 Then
        MsgBox "The Cycle Time is required to calculate Sortie Generation Capablity for
aircraft, " _
        & "please enter a nonnegative value."
        .SetFocus
    Exit Sub
    End If
End With

```

```

With CycleTimeBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Cycle Time is required to calculate Sortie Generation Capablity for
aircraft, " _
        & "please enter a nonnumeric value."
        .SetFocus
    Exit Sub
    End If
    CycleTime3 = CycleTimeBox3
    If CycleTime3 < 0 Then
        MsgBox "The Cycle Time is required to calculate Sortie Generation Capablity for
aircraft, " _

```

```

        & "please enter a nonnegative value."
    .SetFocus
    Exit Sub
End If
End With
' Calls user form to aircraft assigned, NMC and calculate the aircraft generation capability
InputAircraftIntData.Show
AircraftInt = RoundNear(AircraftInt, 0.1)
With AircraftIntBox
    AircraftIntBox = AircraftInt
End With
AircraftInt2 = RoundNear(AircraftInt2, 0.1)
With AircraftIntBox2
    AircraftIntBox2 = AircraftInt2
End With
AircraftInt3 = RoundNear(AircraftInt3, 0.1)
With AircraftIntBox3
    AircraftIntBox3 = AircraftInt
End With

End Sub

```

```

Private Sub CmdCalcAircrewInt_Click()
' First checks to ensure user has entered Round Trip Flying Time, required for
calculations
    With RTFTBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "The Round Trip Flying Time is required for Sortie Generation
            Capablity for aircrew, " _
                & "please enter a nonnumeric value."
            .SetFocus
            Exit Sub
        End If
        RTFT = RTFTBox
        If RTFT < 0 Then
            MsgBox "The Round Trip Flying Time is required for Sortie Generation
            Capablity for aircrew, " _
                & "please enter a nonnegative value."
            .SetFocus
            Exit Sub
        End If
    End With

    With RTFTBox2
        If .Value = "" Or Not IsNumeric(.Value) Then

```

```

        MsgBox "The Round Trip Flying Time is required for Sortie Generation
        Capablity for aircrew, " _
            & "please enter a nonnumeric value."
        .SetFocus
    Exit Sub
End If
RTFT2 = RTFTBox2
If RTFT2 < 0 Then
    MsgBox "The Round Trip Flying Time is required for Sortie Generation
    Capablity for aircrew, " _
        & "please enter a nonnegative value."
    .SetFocus
    Exit Sub
End If
End With

With RTFTBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Round Trip Flying Time is required for Sortie Generation
        Capablity for aircrew, " _
            & "please enter a nonnumeric value."
        .SetFocus
        Exit Sub
    End If
    RTFT3 = RTFTBox3
    If RTFT < 0 Then
        MsgBox "The Round Trip Flying Time is required for Sortie Generation
        Capablity for aircrew, " _
            & "please enter a nonnegative value."
        .SetFocus
        Exit Sub
    End If
End With

' Calls user form to aircrew assigned, those not available, and the time frame, and
' calculates the aircraft generation capability
InputAircrewIntData.Show

AircrewInt = RoundNear(AircrewInt, 0.1)
With AircrewIntBox
    AircrewIntBox = AircrewInt
End With

AircrewInt2 = RoundNear(AircrewInt2, 0.1)
With AircrewIntBox2
    AircrewIntBox2 = AircrewInt2

```

```

End With

AircrewInt3 = RoundNear(AircrewInt3, 0.1)
With AircrewIntBox3
    AircrewIntBox3 = AircrewInt3
End With
End Sub

Private Sub CmdCalcAircrewInt2_Click()

End Sub

Private Sub CmdCalcMaxFuelAvail_Click()
    Dim FlowInt As Integer, FlowInt2 As Integer, FlowInt3 As Integer
' Calls Subroutine to check inputs and ensure users inputs assigned to a variable
    BoxCheck = 0
    Call CheckInputsMaxFuel
    If BoxCheck = 1 Then
        Exit Sub
    End If
'Calculates Flow Interval by finding the minimum of that aircraft, aircrew and station
intervals
    If AircraftInt < AircrewInt Then
        If AircraftInt < BaseInt Then
            FlowInt = AircraftInt
        Else
            FlowInt = BaseInt
        End If
    ElseIf AircrewInt < AircraftInt Then
        If AircrewInt < BaseInt Then
            FlowInt = AircrewInt
        Else
            FlowInt = BaseInt
        End If
    ElseIf BaseInt < AircraftInt Then
        If BaseInt < AircrewInt Then
            FlowInt = BaseInt
        Else
            FlowInt = AircrewInt
        End If
    End If
'tanker2 Calculates Flow Interval by finding the minimum of that aircraft, aircrew and
station intervals
    If AircraftInt2 < AircrewInt2 Then
        If AircraftInt2 < BaseInt2 Then

```

```

        FlowInt2 = AircraftInt2
    Else
        FlowInt2 = BaseInt2
    End If
ElseIf AircrewInt2 < AircraftInt2 Then
    If AircrewInt2 < BaseInt2 Then
        FlowInt2 = AircrewInt2
    Else
        FlowInt2 = BaseInt2
    End If
ElseIf BaseInt2 < AircraftInt2 Then
    If BaseInt2 < AircrewInt2 Then
        FlowInt2 = BaseInt2
    Else
        FlowInt2 = AircrewInt2
    End If
End If
'tanker3 Calculates Flow Interval by finding the minimum of that aircraft, aircrew and
station intervals
    If AircraftInt3 < AircrewInt3 Then
        If AircraftInt3 < BaseInt3 Then
            FlowInt3 = AircraftInt3
        Else
            FlowInt3 = BaseInt3
        End If
    ElseIf AircrewInt3 < AircraftInt3 Then
        If AircrewInt3 < BaseInt3 Then
            FlowInt3 = AircrewInt3
        Else
            FlowInt3 = BaseInt3
        End If
    ElseIf BaseInt3 < AircraftInt3 Then
        If BaseInt3 < AircrewInt3 Then
            FlowInt3 = BaseInt3
        Else
            FlowInt3 = AircrewInt3
        End If
    End If
' Calculates the Maximum Fuel Available and enters into form and Data Worksheet
    MaxFuelAvail = FlowInt * OffloadAvail
    With MaxFuelAvailBox
        MaxFuelAvailBox = MaxFuelAvail
    End With

'tanker2 Calculates the Maximum Fuel Available and enters into form and Data
Worksheet

```

```

MaxFuelAvail2 = FlowInt2 * OffloadAvail2
With MaxFuelAvailBox2
    MaxFuelAvailBox2 = MaxFuelAvail2
End With

'tanker3 Calculates the Maximum Fuel Available and enters into form and Data
Worksheet
MaxFuelAvail3 = FlowInt3 * OffloadAvail3
With MaxFuelAvailBox3
    MaxFuelAvailBox3 = MaxFuelAvail3
End With
End Sub

Private Sub CmdCalcMissionReq_Click()
' Uses data from Offload Required and Offload Available to calculate the missions
required
' Calls Subroutine to check inputs and ensure users inputs assigned to a variable
    BoxCheck = 0
    Call CheckInputsMissionReq
    If BoxCheck = 1 Then
        Exit Sub
    End If
' Calculates Mission Required and enters the required, available and missions into the
form and onto the data sheet
    If OffloadAvail = 0 Then
        MsgBox "Can not calculate the number of missions required if the offload available
is 0. Please enter a number."
        Exit Sub
    End If
    MissionReq = Application.RoundUp(OffloadReq / OffloadAvailTTTBox, 0)
    With MissionReqBox
        MissionReqBox = MissionReq
    End With
    ' ThisWorkbook.Worksheets("Tanker Employment").Activate **Used for check,
delete later**
End Sub

Private Sub CmdCalcOffloadAvail_Click()

' Calls user form to enter Distance, TAS,Fuel Flow, Total Fuel, Fuel Reserve
' The form then caculates and sets the offload available in the main form and on the data
sheet

    InputFuelAvailData.Show
    With OffloadAvailBox
        OffloadAvailBox = OffloadAvail
    End With

```

```

End With

With OffloadAvailBox2
    OffloadAvailBox2 = OffloadAvail2
End With

With OffloadAvailBox3
    OffloadAvailBox3 = OffloadAvail3
End With

End Sub

Private Sub CmdCalcOffloadReq_Click()

' Calls user form to enter Distance, TAS,Fuel Flow, Total Fuel, Fuel Reserve
' The form then caculates and sets the offload required in the form and on the data sheet
    InputFuelReqData.Show
    With OffloadReqBox
        OffloadReqBox = OffloadReq
    End With
    With OrigninalOffloadReqBox
        OrigninalOffloadReqBox = OffloadReq
    End With
' Mini procedure to automatically calculate mission required, ***not working yet***
' Once Offload required is entered, will check to see if Offload Available has been
entered
' If both have been entered, will call the calculate missions required
'   If IsNumeric(OffloadAvail) Then
'       MissionReq = OffloadReq / OffloadAvail
'       With MissionReqBox
'           MissionReqBox = MissionReq
'       End With
'   End If
End Sub

Private Sub CmdCalcRTFT_Click()
' Prompt to see if user would like to enter general estimate for round trip flying time
' Otherwises, sends user to form to enter data for round trip flying time
    Result = 0
    If TrackRTFTEnter = 1 Then
        Result = MsgBox("Would you like to use the Round Trip Flying Time data entered
from " _
        & "calculating the offload fuel available from above?", _
        vbYesNo, "Use Previous Data for RTFT?")
        If Result = 6 Then

```

```

        RTFT = RoundNear(RTFT, 0.1)
        RTFTBox = RTFT
        RTFT2 = RoundNear(RTFT2, 0.1)
        RTFTBox2 = RTFT2
        RTFT3 = RoundNear(RTFT3, 0.1)
        RTFTBox3 = RTFT3
        Exit Sub
    End If
End If
' Calls user form to enter Distance, TAS, and Time at Refuel Point for each leg of trip
' The form then caculates and sets the Round Trip Flying Time
    InputFirstRTFTData.Show
    RTFT = RoundNear(RTFT, 0.1)
    With RTFTBox
        RTFTBox = RTFT
    End With

    RTFT2 = RoundNear(RTFT2, 0.1)
    With RTFTBox2
        RTFTBox2 = RTFT2
    End With

    RTFT3 = RoundNear(RTFT3, 0.1)
    With RTFTBox3
        RTFTBox3 = RTFT3
    End With

End Sub

Private Sub CmdCalcRTFT3_Click()

End Sub

Private Sub CmdCalcStationInt_Click()
' First checks to ensure user has entered Total Ground Time, Offload required
' And Tanker Fuel Used (in Offload Availalble form) for calculations
    With TotalGroundTimeBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "The Total Ground Time is require to calculate the Sortie Generation
using base inputs," _
                & " please enter a nonnumeric value."
            .SetFocus
        End If
    End With
End Sub

```



```

TotalGroundTime = TotalGroundTimeBox
If RTFT < 0 Then
    MsgBox "The Total Ground Time is require to calculate Sortie Generation using
base inputs," _
        & " please enter a nonnegative value."
    .SetFocus
    Exit Sub
End If
End With
With OffloadReqBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Offload Required by Receivers is require to calculate the Sortie " _
            & "Generation using base inputs, please enter a nonnumeric value."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime = TotalGroundTimeBox
    If RTFT < 0 Then
        MsgBox "The Offload Required by Receivers is require to calculate Sortie
Generation " _
            & "using base inputs, please enter a nonnegative value."
        .SetFocus
        Exit Sub
    End If
End With
'tanker2 First checks to ensure user has entered Total Ground Time, Offload required
' And Tanker Fuel Used (in Offload Availalble form) for calculations
With TotalGroundTimeBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Total Ground Time is require to calculate the Sortie Generation
using base inputs," _
            & " please enter a nonnumeric value."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime2 = TotalGroundTimeBox2
    If RTFT2 < 0 Then
        MsgBox "The Total Ground Time is require to calculate Sortie Generation using
base inputs," _
            & " please enter a nonnegative value."
        .SetFocus
        Exit Sub
    End If
End With
With OffloadReqBox
    If .Value = "" Or Not IsNumeric(.Value) Then

```

```

        MsgBox "The Offload Required by Receivers is require to calculate the Sortie " _
            & "Generation using base inputs, please enter a nonnumeric value."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime2 = TotalGroundTimeBox2
    If RTFT2 < 0 Then
        MsgBox "The Offload Required by Receivers is require to calculate Sortie
Generation " _
            & "using base inputs, please enter a nonnegative value."
        .SetFocus
        Exit Sub
    End If
End With

' tanker3 First checks to ensure user has entered Total Ground Time, Offload required
' And Tanker Fuel Used (in Offload Availalble form) for calculations
With TotalGroundTimeBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Total Ground Time is require to calculate the Sortie Generation
using base inputs," _
            & " please enter a nonnumeric value."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime3 = TotalGroundTimeBox3
    If RTFT3 < 0 Then
        MsgBox "The Total Ground Time is require to calculate Sortie Generation using
base inputs," _
            & " please enter a nonnegative value."
        .SetFocus
        Exit Sub
    End If
End With
With OffloadReqBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Offload Required by Receivers is require to calculate the Sortie " _
            & "Generation using base inputs, please enter a nonnumeric value."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime3 = TotalGroundTimeBox3
    If RTFT3 < 0 Then
        MsgBox "The Offload Required by Receivers is require to calculate Sortie
Generation " _
            & "using base inputs, please enter a nonnegative value."

```

```

        .SetFocus
    Exit Sub
End If
End With
' Calls form to enter the base generation capability
InputBaseIntData.Show

BaseInt = RoundNear(BaseInt, 0.1)
With BaseIntBox
    BaseIntBox = BaseInt
End With
BaseInt2 = RoundNear(BaseInt2, 0.1)
With BaseIntBox2
    BaseIntBox2 = BaseInt2
End With
BaseInt3 = RoundNear(BaseInt3, 0.1)
With BaseIntBox3
    BaseIntBox3 = BaseInt3
End With
End Sub

```

```

Private Sub CmdCancel_Click()
    ThisWorkbook.Worksheets("Tanker Employment").Activate
    Unload Me
End Sub

```

```

Private Sub CmdCycleTime_Click()
' Uses data from RTFT and Total Ground Time information to calculate the Cycle Time
' First checks to ensure data for RTFT and Total Ground Time has been entered
    With RTFTBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the Round Trip Flying Time first."
            .SetFocus
            Exit Sub
        End If
        RTFT = RTFTBox
        If RTFT < 0 Then
            MsgBox "Please enter a nonnegative value for the Round Trip Flying Time."
            .SetFocus
            Exit Sub
        End If
    End With
    With TotalGroundTimeBox
        If .Value = "" Or Not IsNumeric(.Value) Then

```

```

        MsgBox "Please enter a numeric value for the Total Ground Time first."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime = TotalGroundTimeBox
    If TotalGroundTime < 0 Then
        MsgBox "Please enter a nonnegative value for the Total Ground Time."
        .SetFocus
        Exit Sub
    End If
End With

With RTFTBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Round Trip Flying Time first."
        .SetFocus
        Exit Sub
    End If
    RTFT2 = RTFTBox2
    If RTFT2 < 0 Then
        MsgBox "Please enter a nonnegative value for the Round Trip Flying Time."
        .SetFocus
        Exit Sub
    End If
End With
With TotalGroundTimeBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Total Ground Time first."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime2 = TotalGroundTimeBox2
    If TotalGroundTime2 < 0 Then
        MsgBox "Please enter a nonnegative value for the Total Ground Time."
        .SetFocus
        Exit Sub
    End If
End With

With RTFTBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Round Trip Flying Time first."
        .SetFocus
        Exit Sub
    End If
    RTFT3 = RTFTBox3

```

```

    If RTFT3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Round Trip Flying Time."
        .SetFocus
        Exit Sub
    End If
End With
With TotalGroundTimeBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Total Ground Time first."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime3 = TotalGroundTimeBox3
    If TotalGroundTime3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Total Ground Time."
        .SetFocus
        Exit Sub
    End If
End With
' Calculates the Cycle Time
CycleTime = RTFT + TotalGroundTime
CycleTime2 = RTFT2 + TotalGroundTime2
CycleTime3 = RTFT3 + TotalGroundTime3
' Enters the cycle time into the form
CycleTime = RoundNear(CycleTime, 0.1)
With CycleTimeBox
    CycleTimeBox = CycleTime
End With
CycleTime2 = RoundNear(CycleTime2, 0.1)
With CycleTimeBox2
    CycleTimeBox2 = CycleTime2
End With
CycleTime3 = RoundNear(CycleTime3, 0.1)
With CycleTimeBox3
    CycleTimeBox3 = CycleTime3
End With
End Sub

Private Sub CmdDone_Click()
' Informs user clicking button will erase and shut form, and ensures user wishes to
continue
    Result = MsgBox("This will close the form, erasing all data." & vbCrLf _
        & vbCrLf & "Do you want to continue closing this form?", _
        vbYesNo, "Close Forms")
    If Result = 6 Then
        ThisWorkbook.Worksheets("Tanker Employment").Activate
    End If
End Sub

```

```

Unload Me
Unload InputFuelReqData
Unload InputFuelAvailData
Unload InputFirstRTFTData
Unload InputAdditionalRTFTData
Unload InputFinalRTFTData
Unload InputGroundTimeData
Unload InputAircrewIntData
Unload InputBaseIntData
TrackRTFTEnter = 0
ReturnToForm = 0
' Unload InputAircraftIntData *** Hiding this command til debugged.
' (Will only unload if data had been entered into form, otherwise hits a bug)
Else
    Exit Sub
End If
End Sub

```

```

Private Sub CmdInstructions_Click()
' Calls the form to give instructions to the user
    InstructionsPg1.Show
End Sub

```

```

Private Sub Cmdprint_Click()
    MainInput.PrintForm
End Sub

```

```

Private Sub CmdTotalGroundTime_Click()
    Dim Result As Integer

' Calls form to enter total ground time

    InputGroundTimeData.Show

    With TotalGroundTimeBox
        TotalGroundTimeBox = TotalGroundTime
    End With

    With TotalGroundTimeBox2
        TotalGroundTimeBox2 = TotalGroundTime2
    End With

    With TotalGroundTimeBox3
        TotalGroundTimeBox3 = TotalGroundTime3
    End With

```

End Sub

Sub InputTotalGroundTime()

End Sub

Sub CheckInputsMaxFuel()

' Ensures Offload Available and the aircraft, aircrew and stations intervals have been entered

With OffloadAvailBox

If .Value = "" Or Not IsNumeric(.Value) Then

MsgBox "A numerical number for Offload Available is required to calculate the Maximum Fuel Available."

.SetFocus

BoxCheck = 1

Exit Sub

End If

OffloadAvail = OffloadAvailBox

If OffloadReq < 0 Then

MsgBox "That Offload Available should be a nonnegative value in order to calculate the Maximum Fuel Available."

.SetFocus

BoxCheck = 1

Exit Sub

End If

End With

With AircraftIntBox

If .Value = "" Or Not IsNumeric(.Value) Then

MsgBox "A numerical number for Aircraft Sortie Generation rate" & _
" is required to calculate the Maximum Fuel Available."

.SetFocus

BoxCheck = 1

Exit Sub

End If

AircraftInt = AircraftIntBox

If OffloadReq < 0 Then

MsgBox "That Aircraft Sortie Generation rate should be a " & _
"nonnegative value in order to calculate the Maximum Fuel Available."

.SetFocus

BoxCheck = 1

Exit Sub

End If

```

End With
With AircrewIntBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Aircrew Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    AircrewInt = AircrewIntBox
    If OffloadReq < 0 Then
        MsgBox "That Aircrew Sortie Generation rate should be a " & _
            "nonnegative value in order to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With BaseIntBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Base Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    BaseInt = BaseIntBox
    If OffloadReq < 0 Then
        MsgBox "The Base Sortie Generation rate should be a " & _
            "nonnegative value in order to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With

'tanker2
' Ensures Offload Available and the aircraft, aircrew and stations intervals have been
entered
With OffloadAvailBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Offload Available is required to calculate the
Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With

```



```

End If
OffloadAvail2 = OffloadAvailBox2
If OffloadReq < 0 Then
    MsgBox "That Offload Available should be a nonnegative value in order to
calculate the Maximum Fuel Available."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
End With
With AircraftIntBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Aircraft Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    AircraftInt2 = AircraftIntBox2
    If OffloadReq < 0 Then
        MsgBox "That Aircraft Sortie Generation rate should be a " & _
            "nonnegative value in order to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With AircrewIntBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Aircrew Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    AircrewInt2 = AircrewIntBox2
    If OffloadReq < 0 Then
        MsgBox "That Aircrew Sortie Generation rate should be a " & _
            "nonnegative value in order to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With BaseIntBox2
    If .Value = "" Or Not IsNumeric(.Value) Then

```

```

    MsgBox "A numerical number for Base Sortie Generation rate" & _
        " is required to calculate the Maximum Fuel Available."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
BaseInt2 = BaseIntBox2
If OffloadReq < 0 Then
    MsgBox "The Base Sortie Generation rate should be a " & _
        "nonnegative value in order to calculate the Maximum Fuel Available."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
End With

'tanker3
' Ensures Offload Available and the aircraft, aircrew and stations intervals have been
entered
With OffloadAvailBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Offload Available is required to calculate the
Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    OffloadAvail3 = OffloadAvailBox3
    If OffloadReq < 0 Then
        MsgBox "That Offload Available should be a nonnegative value in order to
calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With AircraftIntBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Aircraft Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    AircraftInt3 = AircraftIntBox3
    If OffloadReq < 0 Then

```

```

        MsgBox "That Aircraft Sortie Generation rate should be a " & _
            "nonnegative value in order to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
    Exit Sub
End If
End With
With AircrewIntBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Aircrew Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
    Exit Sub
End If
AircrewInt3 = AircrewIntBox3
If OffloadReq < 0 Then
    MsgBox "That Aircrew Sortie Generation rate should be a " & _
        "nonnegative value in order to calculate the Maximum Fuel Available."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
End With
With BaseIntBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Base Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
    Exit Sub
End If
BaseInt3 = BaseIntBox3
If OffloadReq < 0 Then
    MsgBox "The Base Sortie Generation rate should be a " & _
        "nonnegative value in order to calculate the Maximum Fuel Available."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
End With
End Sub

Sub CheckInputsMissionReq()
' First checks to ensure offload required and offload available data has been entered

```

```

With OffloadReqBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Offload Required."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    OffloadReq = OffloadReqBox
    If OffloadReq < 0 Then
        MsgBox "Please enter a nonnegative value for the Offload Required."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With OffloadAvailBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Offload Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    OffloadAvail = OffloadAvailBox
    If OffloadAvail < 0 Then
        MsgBox "Please enter a nonnegative value for the Offload Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
'tanker2 First checks to ensure offload required and offload available data has been
entered

```

```

With OffloadAvailBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Offload Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    OffloadAvail2 = OffloadAvailBox2
    If OffloadAvail2 < 0 Then
        MsgBox "Please enter a nonnegative value for the Offload Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If

```

```

        End If
    End With
    With OffloadAvailBox3
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the Offload Available."
            .SetFocus
            BoxCheck = 1
            Exit Sub
        End If
        OffloadAvail3 = OffloadAvailBox3
        If OffloadAvail3 < 0 Then
            MsgBox "Please enter a nonnegative value for the Offload Available."
            .SetFocus
            BoxCheck = 1
            Exit Sub
        End If
    End With

End Sub

```

```

Private Sub maxboommissionbox_Change()

End Sub

Private Sub CmdTotalGroundTime2_Click()

End Sub

```

```

Private Sub maxboomtankertypebox_Change()

End Sub

Private Sub Label2_Click()

End Sub

```

```
Private Sub MinMissionFrame_Click()
```

```
End Sub
```

```
Private Sub MissionReqBox_Change()
```

```
End Sub
```

```
Private Sub OffloadAvailBox_Change()
```

```
End Sub
```

```
Private Sub OffloadAvailBox2_Change()
```

```
End Sub
```

```
Private Sub OffloadAvailBox3_Change()
```

```
End Sub
```

```
Private Sub OffloadAvailTT1_Click()
```

```
    With OffloadAvailTT1Box
```

```
        OffloadAvailTT1Box = OffloadAvailBox * aircraft1count
```

```
    End With
```

```
    With OffloadAvailTT2Box
```

```
        OffloadAvailTT2Box = OffloadAvailBox2 * aircraft2count
```

```
    End With
```

```
    With OffloadAvailTT3Box
```

```
        OffloadAvailTT3Box = OffloadAvailBox3 * aircraft3count
```

```
    End With
```

```
    With OffloadAvailTTTBox
```

```
        OffloadAvailTTTBox = OffloadAvailTT1Box * 1 + 1 * OffloadAvailTT2Box + 1 *
```

```
OffloadAvailTT3Box
```

```
    End With
```

```
    With aircrafttcount
```

```
        aircrafttcount = aircraft1count * 1 + aircraft2count * 1 + aircraft3count * 1
```

```
    End With
```

```
End Sub
```

```
Private Sub OffloadAvailTT1Box_Change()
```

End Sub

Private Sub RTFTBox_Change()

End Sub

Private Sub RTFTBox2_Change()

End Sub

Private Sub TextBox13_Change()

End Sub

Private Sub TextBox19_Change()

End Sub

Private Sub TextBox24_Change()

End Sub

Private Sub TextBox6_Change()

End Sub

Private Sub TextBox7_Change()

End Sub

Private Sub UserForm_Click()

End Sub



Tanker Employment Calculations

The Tanker Employment Calculations is designed to give a broad strategic overview of planning tanker support specifically during employments. Using the model, the user inputs data to calculate the amount of fuel available and the amount of fuel required, in order to determine the minimum number of tanker missions required. Additionally, the user can calculate the maximum fuel available per day based upon data inputted to calculate the maximum sortie generation capability based on aircraft, aircrew and base capabilities. When opening the model, users will be directed to the main page. From this page, users can either enter totals directly into the input boxes, or select the corresponding button to input data used to calculate the appropriate information. If the user opts to input information using the buttons, the appropriate forms will be displayed. Specific instructions and information related will be available for each form. Data inputted should be of consistent units. When using forms to input these numbers, the instructions will either provide the user with the ability to convert to the appropriate units, or the form itself will provide the user with the ability to indicate which units is being used. If the user inputs the data manually onto the main form, they must input the data in the correct units. Specifically, all distances should be in nautical miles, fuel quantities should be in pounds, and time in hours. Four sets of calculations, Tanker Offload Available and the three Sortie Generation Capability calculations, Aircraft, Aircrew and Station Interval, allow the user to input an utilization percentage, from zero to one. This utilization factor is designed to aid in modeling real life situations and queuing effects, taking into account scheduling and operational realities driven by characteristics of real world receiver demand. Inputting a number closer to zero will represent a chaotic, unsteady reality. Inputting a number closer to one will indicate the data in the given scenario is perfect. Thus, the user will be able to perform sensitivity analysis on the inputted data. Several reference sheets are accessible via the user forms. These sheets are available for the user to modify as required. To access sheets, go to the tools menu, options submenu. Click on the sheet tabs box to view the datasheets. Modify data is accomplished as the same as any other excel data sheet. The Tanker Employment model is based off an Air Force Institute of Technology Master of Logistics thesis: "The Algebra of Tanker," by Maj Margaret M. Romero. MAJ Scott Grant modified the model to enable multiple tanker calculations.

extra notes: Input total amount of Fuel Required by Receivers, or use button to input data to calculate (lbs) ... Input total amount of Fuel Available from Tankers, or use button to input data to calculate (lbs).... Input Total Ground Time, or use button to calculate...Input Round Trip Flying Time, or use button to input data to calculate...Input Round Trip Flying Time, or use button to input data to calculate...Use buttons to calculate Sortie Generation Capabilities based on Aircraft, Aircrew and Base information, or input daily capabilities per unit directly into the appropriate

Option Explicit

Private Sub CancelCmd_Click()

Unload Me

End Sub

Private Sub CommandButton1_Click()

End Sub

Private Sub NextCmd_Click()

 Unload Me

 InstructionsPg2.Show

End Sub

Private Sub UserForm_Click()

End Sub

Private Sub Cmdprint_Click()

 InstructionsPg1.PrintForm

End Sub

Input Data for Required Fuel

Instructions

Input Total Sortie Duration Time ☐ Hours ☐ Minutes

Input Average Fuel Burn Rate (lbs/hr) Select to view Average Fuel Flow table

Input Fuel Loaded at Takeoff (lbs) lbs Select to view Information on Receivers

Input Fuel Amount for Destination Reserve (lbs) lbs

Input Number of Receivers

Option Explicit

Dim TempSortieDuration As Variant, TempAvgFuelBurn As Long, _
 TempTotalFuel As Long, TempReserve As Long, TempNumber As Long, _
 TempOffload As Variant, BoxCheck As Integer

Private Sub CmdCancel_Click()

Unload Me

End

End Sub

Private Sub CalculateCommandButton_Click()

' Calls subroutine to check if inputs are valid

BoxCheck = 0

Call CheckInputs

If BoxCheck = 1 Then

```

        Exit Sub
    End If
    'Calculate Offload Required and places the value in the box for users to review
    TempOffload = (TempSortieDuration * TempAvgFuelBurn) - TempTotalFuel +
    TempReserve
    OffloadReq = TempOffload * TempNumber
    OffloadReqBox = OffloadReq
End Sub

```

```

Private Sub CancelCommandButton_Click()
    Unload Me
End Sub

```

```

Private Sub ClearCmd_Click()
    'Resets all variables used in form
    TempSortieDuration = 0
    TempAvgFuelBurn = 0
    TempTotalFuel = 0
    TempReserve = 0
    TempNumber = 0
    'Clears form by closing then reopening it
    Unload Me
    InputFuelReqData.Show
End Sub

```

```

Private Sub cmdViewFuelFlow_Click()
    ' Initializes ReturntoForm to return to this form
    ReturnToForm = 1
    ' Activates the worksheet with the chart
    InputFuelReqData.Hide
    MainInput.Hide
    ThisWorkbook.Worksheets("Fuel Flow").Activate
    With AvgFuelBurnBox
        .SetFocus
    End With
End Sub

```

```

Private Sub cmdViewReceiverInfo_Click()
    ' Initializes ReturntoForm to return to this form
    ReturnToForm = 1
    ' Activates the worksheet with the appropriate chart
    InputFuelReqData.Hide
    MainInput.Hide
    ThisWorkbook.Worksheets("Receiver").Activate
    With TotalFuelBox

```

```

        .SetFocus
    End With
End Sub

```

```

Private Sub InstructionsCmd_Click()
' Opens form for instructions for Inputting data for Required Fuel
    InstructionsFuelReq.Show
End Sub

```

```

Sub CheckInputs()
' Checks to ensure users inputs are numeric, and appropriate (converting minutes to hour
if needed)
' Assigns users inputs to temporary variables to calculate receivers' required fuel
    With SortieTimeBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the duration time of the sortie."
            .SetFocus
            BoxCheck = 1
            Exit Sub
        End If
        TempSortieDuration = SortieTimeBox
        If TempSortieDuration < 0 Then
            MsgBox "Please enter a nonnegative value for the duration time of the sortie."
            .SetFocus
            BoxCheck = 1
            Exit Sub
        End If
    End With
    If HoursOption = False And MinutesOption = False Then
        MsgBox "Please indicate if sortie duration is in hours or minutes."
        Exit Sub
    ElseIf MinutesOption = True Then
        TempSortieDuration = TempSortieDuration \ 60
    End If
    With AvgFuelBurnBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the FuelFlow."
            .SetFocus
            BoxCheck = 1
            Exit Sub
        End If
        TempAvgFuelBurn = AvgFuelBurnBox
        If TempAvgFuelBurn < 0 Then
            MsgBox "Please enter a nonnegative value for the Average Fuel Burn Rate."
            .SetFocus
            BoxCheck = 1

```

```

        Exit Sub
    End If
End With
With TotalFuelBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Total Fuel Loaded."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempTotalFuel = TotalFuelBox
    If TempTotalFuel < 0 Then
        MsgBox "Please enter a nonnegative value for the Total Fuel Loaded."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With DestinationReserveBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Destination Reserve fuel desired."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempReserve = DestinationReserveBox
    If TempReserve < 0 Then
        MsgBox "Please enter a nonnegative value for the Destination Reserve fuel
desired."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With NumReceiverBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Number of Receiver Aircraft."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempNumber = NumReceiverBox
    If TempReserve < 0 Then
        MsgBox "Please enter a nonnegative value for the Number of Receiver Aircraft."
        .SetFocus
        BoxCheck = 1

```

```
        Exit Sub
    End If
End With
End Sub
```

```
Private Sub ReturnCmd_Click()
'Returns the user to the main form, saving the data by hiding the form
    InputFuelReqData.Hide
End Sub
```

```
Private Sub UserForm_Click()

End Sub
```

Input Data for Available Fuel

Instructions

	Tanker 1	Tanker 2	Tanker 3	
Input Total Fuel On Takeoff (lbs)				lbs
Input Fuel Received from Air Refueling (lbs)	☐	☐	☐	lbs
Input Distance to Refuel Point (nm)	☐	☐	☐	nm
Input Time on Track/in Orbit at Refuel Point	☐	☐	☐	☐ Hours ☐ Minutes
Input Distance from Refuel Point (nm)	☐	☐	☐	nm
Input Air Speed (nm/hrs)	☐	☐	☐	AS Air Speed table
Input Average Fuel Burn Rate (lbs/hr)	☐	☐	☐	Flow Fuel Flow table
Input Fuel Amount for Destination Reserve (lbs)	☐	☐	☐	lbs
Offload Utilization (0<x<1)	☐	☐	☐	

Calculate Total Fuel Available for Offload

Print

Clear Form

Save and Return

Cancel

Option Explicit

Dim ws As Worksheet, BoxCheck As Integer, TempOffloadReq As String, Result As Integer

Private Sub BoomMissionReqbox_Change()

End Sub

Private Sub Aircraftct_Change()

End Sub

Private Sub aircraftusedBox3b_Change()

End Sub

Private Sub calcmaxtankers_Click()

Dim maxbooms As Integer, missionsreq1 As Currency, aircraftused1 As Currency, _
missionsreq2 As Currency, aircraftused2 As Currency, _
missionsreq3 As Currency, aircraftused3 As Currency

'resets values

aircraftusedBox1f = 0

aircraftusedBox2f = 0

aircraftusedBox3f = 0

missionsreq1 = 0

missionsreq2 = 0

missionsreq2 = 0

missionsreq1 = OffloadReqBox / OffloadAvailBox

missionsreq2 = OffloadReqBox / OffloadAvailBox2

missionsreq3 = OffloadReqBox / OffloadAvailBox3

'Calculates Minimum Tankers needed to meet fuel offload required

If missionsreq1 > missionsreq2 Then ' 1st phase

If missionsreq1 > missionsreq3 Then

' aircraftcount calculaton

If missionsreq1 < aircraft1count Then

aircraftusedBox1f = missionsreq1

Else: aircraftusedBox1f = aircraft1count

End If

OffloadReqBox = OffloadReqBox - (aircraftusedBox1f * OffloadAvailBox)

missionsreq2 = OffloadReqBox / OffloadAvailBox2


```

missionsreq3 = OffloadReqBox / OffloadAvailBox3

If missionsreq2 > missionsreq3 Then
    If missionsreq2 < aircraft2count Then
        aircraftusedBox2f = missionsreq2

    Else: aircraftusedBox2f = aircraft2count
    End If

    OffloadReqBox = OffloadReqBox - (aircraftusedBox2f *
OffloadAvailBox2)

    missionsreq3 = OffloadReqBox / OffloadAvailBox3

    If missionsreq3 < aircraft3count Then
        aircraftusedBox3f = missionsreq3
        OffloadReqBox = OffloadReqBox - (aircraftusedBox3f *
OffloadAvailBox3)

    Else: aircraftusedBox3f = aircraft3count
        OffloadReqBox = OffloadReqBox - (aircraftusedBox3f *
OffloadAvailBox3)
        MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
    End If

ElseIf missionsreq3 > missionsreq2 Then

    If missionsreq3 < aircraft3count Then
        aircraftusedBox3f = missionsreq3

    Else: aircraftusedBox3f = aircraft3count
    End If

    OffloadReqBox = OffloadReqBox - (aircraftusedBox3f *
OffloadAvailBox3)

    missionsreq2 = OffloadReqBox / OffloadAvailBox2

    If missionsreq2 < aircraft2count Then
        aircraftusedBox2f = missionsreq2
        OffloadReqBox = OffloadReqBox - (aircraftusedBox2f *
OffloadAvailBox2)

    Else: aircraftusedBox2f = aircraft2count

```

```

        OffloadReqBox = OffloadReqBox - (aircraftusedBox2f *
OffloadAvailBox2)
        MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
        End If
    End If 'check this END IF

ElseIf missionsreq3 > missionsreq1 Then

    ' aircraftcount calculaton
    If missionsreq3 < aircraft3count Then
        aircraftusedBox3f = missionsreq3

    Else: aircraftusedBox3f = aircraft3count
    End If

    OffloadReqBox = OffloadReqBox - (aircraftusedBox3f * OffloadAvailBox3)

    missionsreq1 = OffloadReqBox / OffloadAvailBox
    missionsreq2 = OffloadReqBox / OffloadAvailBox2

    If missionsreq1 > missionsreq2 Then
        If missionsreq1 < aircraft1count Then
            aircraftusedBox1f = missionsreq1

        Else: aircraftusedBox1f = aircraft1count
        End If

        OffloadReqBox = OffloadReqBox - (aircraftusedBox1f * OffloadAvailBox)

        missionsreq2 = OffloadReqBox / OffloadAvailBox2

        If missionsreq2 < aircraft2count Then
            aircraftusedBox2f = missionsreq2
            OffloadReqBox = OffloadReqBox - (aircraftusedBox2f *
OffloadAvailBox2)

        Else: aircraftusedBox2f = aircraft2count
            OffloadReqBox = OffloadReqBox - (aircraftusedBox2f *
OffloadAvailBox2)
            MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
        End If

    End If
End If

```

```

End If

ElseIf missionsreq2 > missionsreq1 Then '2nd phase
    If missionsreq2 > missionsreq3 Then
        ' aircraftcount calculaton
        If missionsreq2 < aircraft2count Then
            aircraftusedBox2f = missionsreq2

        Else: aircraftusedBox2f = aircraft2count
        End If

        OffloadReqBox = OffloadReqBox - (aircraftusedBox2f * OffloadAvailBox2)

        missionsreq1 = OffloadReqBox / OffloadAvailBox
        missionsreq3 = OffloadReqBox / OffloadAvailBox3

        If missionsreq1 > missionsreq3 Then
            If missionsreq1 < aircraft1count Then
                aircraftusedBox1f = missionsreq1

            Else: aircraftusedBox1f = aircraft1count
            End If

            OffloadReqBox = OffloadReqBox - (aircraftusedBox1f * OffloadAvailBox)

            missionsreq3 = OffloadReqBox / OffloadAvailBox3

            If missionsreq3 < aircraft3count Then
                aircraftusedBox3f = missionsreq3
                OffloadReqBox = OffloadReqBox - (aircraftusedBox3f *
OffloadAvailBox3)

                Else: aircraftusedBox3f = aircraft3count
                OffloadReqBox = OffloadReqBox - (aircraftusedBox3f *
OffloadAvailBox3)
                MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
            End If

            ElseIf missionsreq3 > missionsreq1 Then

                If missionsreq3 < aircraft3count Then
                    aircraftusedBox3f = missionsreq3

```

```

Else: aircraftusedBox3f = aircraft3count
End If

OffloadReqBox = OffloadReqBox - (aircraftusedBox3f *
OffloadAvailBox3)

missionsreq1 = OffloadReqBox / OffloadAvailBox

If missionsreq1 < aircraft1count Then
    aircraftusedBox1f = missionsreq1
    OffloadReqBox = OffloadReqBox - (aircraftusedBox1f *
OffloadAvailBox)

Else: aircraftusedBox1f = aircraft1count
    OffloadReqBox = OffloadReqBox - (aircraftusedBox1f *
OffloadAvailBox)
    MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
End If
End If 'check this END IF

ElseIf missionsreq3 > missionsreq2 Then

' aircraftcount calculaton
If missionsreq3 < aircraft3count Then
    aircraftusedBox3f = missionsreq3

Else: aircraftusedBox3f = aircraft3count
End If

OffloadReqBox = OffloadReqBox - (aircraftusedBox3f * OffloadAvailBox3)

missionsreq1 = OffloadReqBox / OffloadAvailBox
missionsreq2 = OffloadReqBox / OffloadAvailBox2

If missionsreq2 > missionsreq1 Then
    If missionsreq2 < aircraft2count Then
        aircraftusedBox2f = missionsreq2

Else: aircraftusedBox2f = aircraft2count
End If

OffloadReqBox = OffloadReqBox - (aircraftusedBox2f *
OffloadAvailBox2)

```

```

missionsreq1 = OffloadReqBox / OffloadAvailBox

If missionsreq1 < aircraft1count Then
    aircraftusedBox1f = missionsreq1
    OffloadReqBox = OffloadReqBox - (aircraftusedBox1f *
OffloadAvailBox)

    Else: aircraftusedBox1f = aircraft1count
    OffloadReqBox = OffloadReqBox - (aircraftusedBox1f *
OffloadAvailBox)
    MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
End If

End If
End If
End If

End Sub

Private Sub calcmintankers_Click()

    Dim maxbooms As Integer, missionsreq1 As Currency, aircraftused1 As Currency, _
    missionsreq2 As Currency, aircraftused2 As Currency, _
    missionsreq3 As Currency, aircraftused3 As Currency

'resets values
    aircraftusedBox1b = 0
    aircraftusedBox2b = 0
    aircraftusedBox3b = 0
    missionsreq1 = 0
    missionsreq2 = 0
    missionsreq2 = 0

    missionsreq1 = OffloadReqBox / OffloadAvailBox
    missionsreq2 = OffloadReqBox / OffloadAvailBox2
    missionsreq3 = OffloadReqBox / OffloadAvailBox3

'Calculates Minimum Tankers needed to meet fuel offload required

    If missionsreq1 < missionsreq2 Then ' 1st phase
        If missionsreq1 < missionsreq3 Then

```

```

' aircraftcount calculaton
  If missionsreq1 < aircraft1count Then
    aircraftusedBox1b = missionsreq1

  Else: aircraftusedBox1b = aircraft1count
  End If

  OffloadReqBox = OffloadReqBox - (aircraftusedBox1b * OffloadAvailBox)

  missionsreq2 = OffloadReqBox / OffloadAvailBox2
  missionsreq3 = OffloadReqBox / OffloadAvailBox3

  If missionsreq2 < missionsreq3 Then
    If missionsreq2 < aircraft2count Then
      aircraftusedBox2b = missionsreq2

    Else: aircraftusedBox2b = aircraft2count
    End If

    OffloadReqBox = OffloadReqBox - (aircraftusedBox2b *
OffloadAvailBox2)

    missionsreq3 = OffloadReqBox / OffloadAvailBox3

    If missionsreq3 < aircraft3count Then
      aircraftusedBox3b = missionsreq3
      OffloadReqBox = OffloadReqBox - (aircraftusedBox3b *
OffloadAvailBox3)

    Else: aircraftusedBox3b = aircraft3count
      OffloadReqBox = OffloadReqBox - (aircraftusedBox3b *
OffloadAvailBox3)
      MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
    End If

  ElseIf missionsreq3 < missionsreq2 Then

    If missionsreq3 < aircraft3count Then
      aircraftusedBox3b = missionsreq3

    Else: aircraftusedBox3b = aircraft3count
    End If

```

```

        OffloadReqBox = OffloadReqBox - (aircraftusedBox3b *
OffloadAvailBox3)

        missionsreq2 = OffloadReqBox / OffloadAvailBox2

        If missionsreq2 < aircraft2count Then
            aircraftusedBox2b = missionsreq2
            OffloadReqBox = OffloadReqBox - (aircraftusedBox2b *
OffloadAvailBox2)

            Else: aircraftusedBox2b = aircraft2count
            OffloadReqBox = OffloadReqBox - (aircraftusedBox2b *
OffloadAvailBox2)
            MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
            End If
        End If 'check this END IF

ElseIf missionsreq3 < missionsreq1 Then

    ' aircraftcount calculaton
    If missionsreq3 < aircraft3count Then
        aircraftusedBox3b = missionsreq3

    Else: aircraftusedBox3b = aircraft3count
    End If

    OffloadReqBox = OffloadReqBox - (aircraftusedBox3b * OffloadAvailBox3)

    missionsreq1 = OffloadReqBox / OffloadAvailBox
    missionsreq2 = OffloadReqBox / OffloadAvailBox2

    If missionsreq1 < missionsreq2 Then
        If missionsreq1 < aircraft1count Then
            aircraftusedBox1b = missionsreq1

        Else: aircraftusedBox1b = aircraft1count
        End If

        OffloadReqBox = OffloadReqBox - (aircraftusedBox1b * OffloadAvailBox)

        missionsreq2 = OffloadReqBox / OffloadAvailBox2

        If missionsreq2 < aircraft2count Then
            aircraftusedBox2b = missionsreq2

```

```

        OffloadReqBox = OffloadReqBox - (aircraftusedBox2b *
OffloadAvailBox2)

        Else: aircraftusedBox2b = aircraft2count
        OffloadReqBox = OffloadReqBox - (aircraftusedBox2b *
OffloadAvailBox2)
        MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
        End If

    End If

End If

ElseIf missionsreq2 < missionsreq1 Then '2nd phase
    If missionsreq2 < missionsreq3 Then
        ' aircraftcount calculaton
        If missionsreq2 < aircraft2count Then
            aircraftusedBox2b = missionsreq2

        Else: aircraftusedBox2b = aircraft2count
        End If

        OffloadReqBox = OffloadReqBox - (aircraftusedBox2b * OffloadAvailBox2)

        missionsreq1 = OffloadReqBox / OffloadAvailBox
        missionsreq3 = OffloadReqBox / OffloadAvailBox3

        If missionsreq1 < missionsreq3 Then
            If missionsreq1 < aircraft1count Then
                aircraftusedBox1b = missionsreq1

            Else: aircraftusedBox1b = aircraft1count
            End If

            OffloadReqBox = OffloadReqBox - (aircraftusedBox1b * OffloadAvailBox)

            missionsreq3 = OffloadReqBox / OffloadAvailBox3

            If missionsreq3 < aircraft3count Then
                aircraftusedBox3b = missionsreq3
                OffloadReqBox = OffloadReqBox - (aircraftusedBox3b *
OffloadAvailBox3)

            Else: aircraftusedBox3b = aircraft3count

```



```

        OffloadReqBox = OffloadReqBox - (aircraftusedBox3b *
OffloadAvailBox3)
        MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
    End If

    ElseIf missionsreq3 < missionsreq1 Then

        If missionsreq3 < aircraft3count Then
            aircraftusedBox3b = missionsreq3

        Else: aircraftusedBox3b = aircraft3count
        End If

        OffloadReqBox = OffloadReqBox - (aircraftusedBox3b *
OffloadAvailBox3)

        missionsreq1 = OffloadReqBox / OffloadAvailBox

        If missionsreq1 < aircraft1count Then
            aircraftusedBox1b = missionsreq1
            OffloadReqBox = OffloadReqBox - (aircraftusedBox1b *
OffloadAvailBox)

        Else: aircraftusedBox1b = aircraft1count
            OffloadReqBox = OffloadReqBox - (aircraftusedBox1b *
OffloadAvailBox)
            MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
        End If
    End If 'check this END IF

    ElseIf missionsreq3 < missionsreq2 Then

        ' aircraftcount calculaton
        If missionsreq3 < aircraft3count Then
            aircraftusedBox3b = missionsreq3

        Else: aircraftusedBox3b = aircraft3count
        End If

        OffloadReqBox = OffloadReqBox - (aircraftusedBox3b * OffloadAvailBox3)

        missionsreq1 = OffloadReqBox / OffloadAvailBox

```

```

missionsreq2 = OffloadReqBox / OffloadAvailBox2

If missionsreq2 < missionsreq1 Then
    If missionsreq2 < aircraft2count Then
        aircraftusedBox2b = missionsreq2

    Else: aircraftusedBox2b = aircraft2count
    End If

    OffloadReqBox = OffloadReqBox - (aircraftusedBox2b *
OffloadAvailBox2)

    missionsreq1 = OffloadReqBox / OffloadAvailBox

    If missionsreq1 < aircraft1count Then
        aircraftusedBox1b = missionsreq1
        OffloadReqBox = OffloadReqBox - (aircraftusedBox1b *
OffloadAvailBox)

    Else: aircraftusedBox1b = aircraft1count
        OffloadReqBox = OffloadReqBox - (aircraftusedBox1b *
OffloadAvailBox)
        MsgBox "Please adjust fuel available or fuel required to meet mission
parameters."
    End If

End If
End If
End If

End Sub

```

```

Private Sub CmdCalcAircraftInt_Click()
' First checks to ensure user has entered Cycle Time, required for calculations
With CycleTimeBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Cycle Time is required to calculate Sortie Generation Capablity for
aircraft, " _
        & "please enter a nonnumeric value."
        .SetFocus
    End If
End With
Exit Sub

```

```

End If
CycleTime = CycleTimeBox
If CycleTime < 0 Then
    MsgBox "The Cycle Time is required to calculate Sortie Generation Capablity for
aircraft, " _
        & "please enter a nonnegative value."
    .SetFocus
    Exit Sub
End If
End With

```

```

With CycleTimeBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Cycle Time is required to calculate Sortie Generation Capablity for
aircraft, " _
            & "please enter a nonnumeric value."
        .SetFocus
        Exit Sub
    End If
    CycleTime2 = CycleTimeBox2
    If CycleTime2 < 0 Then
        MsgBox "The Cycle Time is required to calculate Sortie Generation Capablity for
aircraft, " _
            & "please enter a nonnegative value."
        .SetFocus
        Exit Sub
    End If
End With

```

```

With CycleTimeBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Cycle Time is required to calculate Sortie Generation Capablity for
aircraft, " _
            & "please enter a nonnumeric value."
        .SetFocus
        Exit Sub
    End If
    CycleTime3 = CycleTimeBox3
    If CycleTime3 < 0 Then
        MsgBox "The Cycle Time is required to calculate Sortie Generation Capablity for
aircraft, " _
            & "please enter a nonnegative value."
        .SetFocus
        Exit Sub
    End If
End With

```

```

' Calls user form to aircraft assigned, NMC and calculate the aircraft generation capability
InputAircraftIntData.Show
AircraftInt = RoundNear(AircraftInt, 0.1)
With AircraftIntBox
    AircraftIntBox = AircraftInt
End With
AircraftInt2 = RoundNear(AircraftInt2, 0.1)
With AircraftIntBox2
    AircraftIntBox2 = AircraftInt2
End With
AircraftInt3 = RoundNear(AircraftInt3, 0.1)
With AircraftIntBox3
    AircraftIntBox3 = AircraftInt
End With

End Sub

```

```

Private Sub CmdCalcAircrewInt_Click()
' First checks to ensure user has entered Round Trip Flying Time, required for
calculations
    With RTFTBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "The Round Trip Flying Time is required for Sortie Generation
Capablity for aircrew, " _
                & "please enter a nonnumeric value."
            .SetFocus
            Exit Sub
        End If
        RTFT = RTFTBox
        If RTFT < 0 Then
            MsgBox "The Round Trip Flying Time is required for Sortie Generation
Capablity for aircrew, " _
                & "please enter a nonnegative value."
            .SetFocus
            Exit Sub
        End If
    End With

    With RTFTBox2
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "The Round Trip Flying Time is required for Sortie Generation
Capablity for aircrew, " _
                & "please enter a nonnumeric value."
            .SetFocus
            Exit Sub
        End If
    End With

```

```

End If
RTFT2 = RTFTBox2
If RTFT2 < 0 Then
    MsgBox "The Round Trip Flying Time is required for Sortie Generation
    Capablity for aircrew, " _
        & "please enter a nonnegative value."
    .SetFocus
    Exit Sub
End If
End With

With RTFTBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Round Trip Flying Time is required for Sortie Generation
        Capablity for aircrew, " _
            & "please enter a nonnumeric value."
        .SetFocus
        Exit Sub
    End If
    RTFT3 = RTFTBox3
    If RTFT < 0 Then
        MsgBox "The Round Trip Flying Time is required for Sortie Generation
        Capablity for aircrew, " _
            & "please enter a nonnegative value."
        .SetFocus
        Exit Sub
    End If
End With

' Calls user form to aircrew assigned, those not available, and the time frame, and
' calculates the aircraft generation capability
InputAircrewIntData.Show

AircrewInt = RoundNear(AircrewInt, 0.1)
With AircrewIntBox
    AircrewIntBox = AircrewInt
End With

AircrewInt2 = RoundNear(AircrewInt2, 0.1)
With AircrewIntBox2
    AircrewIntBox2 = AircrewInt2
End With

AircrewInt3 = RoundNear(AircrewInt3, 0.1)
With AircrewIntBox3
    AircrewIntBox3 = AircrewInt3

```

```
End With
End Sub
```

```
Private Sub CmdCalcAircrewInt2_Click()
```

```
End Sub
```

```
Private Sub CmdCalcMaxFuelAvail_Click()
```

```
    Dim FlowInt As Integer, FlowInt2 As Integer, FlowInt3 As Integer
    ' Calls Subroutine to check inputs and ensure users inputs assigned to a variable
    BoxCheck = 0
    Call CheckInputsMaxFuel
    If BoxCheck = 1 Then
        Exit Sub
    End If
    'Calculates Flow Interval by finding the minimum of that aircraft, aircrew and station
    intervals
    If AircraftInt < AircrewInt Then
        If AircraftInt < BaseInt Then
            FlowInt = AircraftInt
        Else
            FlowInt = BaseInt
        End If
    ElseIf AircrewInt < AircraftInt Then
        If AircrewInt < BaseInt Then
            FlowInt = AircrewInt
        Else
            FlowInt = BaseInt
        End If
    ElseIf BaseInt < AircraftInt Then
        If BaseInt < AircrewInt Then
            FlowInt = BaseInt
        Else
            FlowInt = AircrewInt
        End If
    End If
    'tanker2 Calculates Flow Interval by finding the minimum of that aircraft, aircrew and
    station intervals
    If AircraftInt2 < AircrewInt2 Then
        If AircraftInt2 < BaseInt2 Then
            FlowInt2 = AircraftInt2
        Else
            FlowInt2 = BaseInt2
        End If
    ElseIf AircrewInt2 < AircraftInt2 Then
```

```

    If AircrewInt2 < BaseInt2 Then
        FlowInt2 = AircrewInt2
    Else
        FlowInt2 = BaseInt2
    End If
ElseIf BaseInt2 < AircraftInt2 Then
    If BaseInt2 < AircrewInt2 Then
        FlowInt2 = BaseInt2
    Else
        FlowInt2 = AircrewInt2
    End If
End If
'tanker3 Calculates Flow Interval by finding the minimum of that aircraft, aircrew and
station intervals
    If AircraftInt3 < AircrewInt3 Then
        If AircraftInt3 < BaseInt3 Then
            FlowInt3 = AircraftInt3
        Else
            FlowInt3 = BaseInt3
        End If
    ElseIf AircrewInt3 < AircraftInt3 Then
        If AircrewInt3 < BaseInt3 Then
            FlowInt3 = AircrewInt3
        Else
            FlowInt3 = BaseInt3
        End If
    ElseIf BaseInt3 < AircraftInt3 Then
        If BaseInt3 < AircrewInt3 Then
            FlowInt3 = BaseInt3
        Else
            FlowInt3 = AircrewInt3
        End If
    End If
' Calculates the Maximum Fuel Available and enters into form and Data Worksheet
    MaxFuelAvail = FlowInt * OffloadAvail
    With MaxFuelAvailBox
        MaxFuelAvailBox = MaxFuelAvail
    End With

'tanker2 Calculates the Maximum Fuel Available and enters into form and Data
Worksheet
    MaxFuelAvail2 = FlowInt2 * OffloadAvail2
    With MaxFuelAvailBox2
        MaxFuelAvailBox2 = MaxFuelAvail2
    End With

```

```

'tanker3 Calculates the Maximum Fuel Available and enters into form and Data
Worksheet
    MaxFuelAvail3 = FlowInt3 * OffloadAvail3
    With MaxFuelAvailBox3
        MaxFuelAvailBox3 = MaxFuelAvail3
    End With
End Sub

Private Sub CmdCalcMissionReq_Click()
' Uses data from Offload Required and Offload Available to calculate the missions
required
' Calls Subroutine to check inputs and ensure users inputs assigned to a variable
    BoxCheck = 0
    Call CheckInputsMissionReq
    If BoxCheck = 1 Then
        Exit Sub
    End If
' Calculates Mission Required and enters the required, available and missions into the
form and onto the data sheet
    If OffloadAvail = 0 Then
        MsgBox "Can not calculate the number of missions required if the offload available
is 0. Please enter a number."
        Exit Sub
    End If
    MissionReq = Application.RoundUp(OffloadReq / OffloadAvailTTTBox, 0)
    With MissionReqBox
        MissionReqBox = MissionReq
    End With
    ' ThisWorkbook.Worksheets("Tanker Employment").Activate **Used for check,
delete later**
End Sub

Private Sub CmdCalcOffloadAvail_Click()

' Calls user form to enter Distance, TAS,Fuel Flow, Total Fuel, Fuel Reserve
' The form then caculates and sets the offload available in the main form and on the data
sheet

    InputFuelAvailData.Show
    With OffloadAvailBox
        OffloadAvailBox = OffloadAvail
    End With

    With OffloadAvailBox2
        OffloadAvailBox2 = OffloadAvail2
    End With

```



```

    With OffloadAvailBox3
        OffloadAvailBox3 = OffloadAvail3
    End With

End Sub

Private Sub CmdCalcOffloadReq_Click()

' Calls user form to enter Distance, TAS,Fuel Flow, Total Fuel, Fuel Reserve
' The form then caculates and sets the offload required in the form and on the data sheet
    InputFuelReqData.Show
    With OffloadReqBox
        OffloadReqBox = OffloadReq
    End With
    With OrigninalOffloadReqBox
        OrigninalOffloadReqBox = OffloadReq
    End With
' Mini proceedure to automatically calculate mission required, ***not working yet***
' Once Offload required is entered, will check to see if Offload Available has been
entered
' If both have been entered, will call the calculate missions required
'   If IsNumeric(OffloadAvail) Then
'       MissionReq = OffloadReq / OffloadAvail
'       With MissionReqBox
'           MissionReqBox = MissionReq
'       End With
'   End If
End Sub

Private Sub CmdCalcRTFT_Click()
' Prompt to see if user would like to enter general estimate for round trip flying time
' Otherwise, sends user to form to enter data for round trip flying time
    Result = 0
    If TrackRTFTEnter = 1 Then
        Result = MsgBox("Would you like to use the Round Trip Flying Time data entered
from " _
        & "calculating the offload fuel available from above?", _
        vbYesNo, "Use Previous Data for RTFT?")
    If Result = 6 Then
        RTFT = RoundNear(RTFT, 0.1)
        RTFTBox = RTFT
        RTFT2 = RoundNear(RTFT2, 0.1)
        RTFTBox2 = RTFT2
        RTFT3 = RoundNear(RTFT3, 0.1)
    End If
End Sub

```

```

        RTFTBox3 = RTFT3
    Exit Sub
End If
End If
' Calls user form to enter Distance, TAS, and Time at Refuel Point for each leg of trip
' The form then calculates and sets the Round Trip Flying Time
    InputFirstRTFTData.Show
    RTFT = RoundNear(RTFT, 0.1)
    With RTFTBox
        RTFTBox = RTFT
    End With

    RTFT2 = RoundNear(RTFT2, 0.1)
    With RTFTBox2
        RTFTBox2 = RTFT2
    End With

    RTFT3 = RoundNear(RTFT3, 0.1)
    With RTFTBox3
        RTFTBox3 = RTFT3
    End With

End Sub

Private Sub CmdCalcRTFT3_Click()

End Sub

Private Sub CmdCalcStationInt_Click()
' First checks to ensure user has entered Total Ground Time, Offload required
' And Tanker Fuel Used (in Offload Available form) for calculations
    With TotalGroundTimeBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "The Total Ground Time is require to calculate the Sortie Generation
using base inputs," _
                & " please enter a nonnumeric value."
            .SetFocus
            Exit Sub
        End If
        TotalGroundTime = TotalGroundTimeBox
        If RTFT < 0 Then
            MsgBox "The Total Ground Time is require to calculate Sortie Generation using
base inputs," _
                & " please enter a nonnegative value."

```

```

        .SetFocus
    Exit Sub
End If
End With
With OffloadReqBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Offload Required by Receivers is require to calculate the Sortie " _
            & "Generation using base inputs, please enter a nonnumeric value."
        .SetFocus
    Exit Sub
    End If
    TotalGroundTime = TotalGroundTimeBox
    If RTFT < 0 Then
        MsgBox "The Offload Required by Receivers is require to calculate Sortie
Generation " _
            & "using base inputs, please enter a nonnegative value."
        .SetFocus
    Exit Sub
    End If
End With
' tanker2 First checks to ensure user has entered Total Ground Time, Offload required
' And Tanker Fuel Used (in Offload Availalble form) for calculations
With TotalGroundTimeBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Total Ground Time is require to calculate the Sortie Generation
using base inputs," _
            & " please enter a nonnumeric value."
        .SetFocus
    Exit Sub
    End If
    TotalGroundTime2 = TotalGroundTimeBox2
    If RTFT2 < 0 Then
        MsgBox "The Total Ground Time is require to calculate Sortie Generation using
base inputs," _
            & " please enter a nonnegative value."
        .SetFocus
    Exit Sub
    End If
End With
With OffloadReqBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Offload Required by Receivers is require to calculate the Sortie " _
            & "Generation using base inputs, please enter a nonnumeric value."
        .SetFocus
    Exit Sub
    End If

```

```

TotalGroundTime2 = TotalGroundTimeBox2
If RTFT2 < 0 Then
    MsgBox "The Offload Required by Receivers is require to calculate Sortie
Generation " _
        & "using base inputs, please enter a nonnegative value."
    .SetFocus
    Exit Sub
End If
End With

' tanker3 First checks to ensure user has entered Total Ground Time, Offload required
' And Tanker Fuel Used (in Offload Availalble form) for calculations
With TotalGroundTimeBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Total Ground Time is require to calculate the Sortie Generation
using base inputs," _
            & " please enter a nonnumeric value."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime3 = TotalGroundTimeBox3
    If RTFT3 < 0 Then
        MsgBox "The Total Ground Time is require to calculate Sortie Generation using
base inputs," _
            & " please enter a nonnegative value."
        .SetFocus
        Exit Sub
    End If
End With
With OffloadReqBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "The Offload Required by Receivers is require to calculate the Sortie " _
            & "Generation using base inputs, please enter a nonnumeric value."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime3 = TotalGroundTimeBox3
    If RTFT3 < 0 Then
        MsgBox "The Offload Required by Receivers is require to calculate Sortie
Generation " _
            & "using base inputs, please enter a nonnegative value."
        .SetFocus
        Exit Sub
    End If
End With
' Calls form to enter the base generation capability

```

```

InputBaseIntData.Show

BaseInt = RoundNear(BaseInt, 0.1)
With BaseIntBox
    BaseIntBox = BaseInt
End With
BaseInt2 = RoundNear(BaseInt2, 0.1)
With BaseIntBox2
    BaseIntBox2 = BaseInt2
End With
BaseInt3 = RoundNear(BaseInt3, 0.1)
With BaseIntBox3
    BaseIntBox3 = BaseInt3
End With
End Sub

Private Sub CmdCancel_Click()
    ThisWorkbook.Worksheets("Tanker Employment").Activate
    Unload Me
End Sub

Private Sub CmdCycleTime_Click()
' Uses data from RTFT and Total Ground Time information to calculate the Cycle Time
' First checks to ensure data for RTFT and Total Ground Time has been entered
    With RTFTBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the Round Trip Flying Time first."
            .SetFocus
            Exit Sub
        End If
        RTFT = RTFTBox
        If RTFT < 0 Then
            MsgBox "Please enter a nonnegative value for the Round Trip Flying Time."
            .SetFocus
            Exit Sub
        End If
    End With
    With TotalGroundTimeBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the Total Ground Time first."
            .SetFocus
            Exit Sub
        End If
        TotalGroundTime = TotalGroundTimeBox
    End With
End Sub

```

```

    If TotalGroundTime < 0 Then
        MsgBox "Please enter a nonnegative value for the Total Ground Time."
        .SetFocus
        Exit Sub
    End If
End With

With RTFTBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Round Trip Flying Time first."
        .SetFocus
        Exit Sub
    End If
    RTFT2 = RTFTBox2
    If RTFT2 < 0 Then
        MsgBox "Please enter a nonnegative value for the Round Trip Flying Time."
        .SetFocus
        Exit Sub
    End If
End With
With TotalGroundTimeBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Total Ground Time first."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime2 = TotalGroundTimeBox2
    If TotalGroundTime2 < 0 Then
        MsgBox "Please enter a nonnegative value for the Total Ground Time."
        .SetFocus
        Exit Sub
    End If
End With

With RTFTBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Round Trip Flying Time first."
        .SetFocus
        Exit Sub
    End If
    RTFT3 = RTFTBox3
    If RTFT3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Round Trip Flying Time."
        .SetFocus
        Exit Sub
    End If

```

```

End With
With TotalGroundTimeBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Total Ground Time first."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime3 = TotalGroundTimeBox3
    If TotalGroundTime3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Total Ground Time."
        .SetFocus
        Exit Sub
    End If
End With
' Calculates the Cycle Time
    CycleTime = RTFT + TotalGroundTime
    CycleTime2 = RTFT2 + TotalGroundTime2
    CycleTime3 = RTFT3 + TotalGroundTime3
' Enters the cycle time into the form
    CycleTime = RoundNear(CycleTime, 0.1)
    With CycleTimeBox
        CycleTimeBox = CycleTime
    End With
    CycleTime2 = RoundNear(CycleTime2, 0.1)
    With CycleTimeBox2
        CycleTimeBox2 = CycleTime2
    End With
    CycleTime3 = RoundNear(CycleTime3, 0.1)
    With CycleTimeBox3
        CycleTimeBox3 = CycleTime3
    End With
End Sub

Private Sub CmdDone_Click()
' Informs user clicking button will erase and shut form, and ensures user wishes to
continue
    Result = MsgBox("This will close the form, erasing all data." & vbCrLf _
        & vbCrLf & "Do you want to continue closing this form?", _
        vbYesNo, "Close Forms")
    If Result = 6 Then
        ThisWorkbook.Worksheets("Tanker Employment").Activate
        Unload Me
        Unload InputFuelReqData
        Unload InputFuelAvailData
        Unload InputFirstRTFTData
        Unload InputAdditionalRTFTData
    End If
End Sub

```

```

        Unload InputFinalRTFTData
        Unload InputGroundTimeData
        Unload InputAircrewIntData
        Unload InputBaseIntData
        TrackRTFTEnter = 0
        ReturnToForm = 0
' Unload InputAircraftIntData *** Hiding this command til debugged.
' (Will only unload if data had been entered into form, otherwise hits a bug)
    Else
        Exit Sub
    End If
End Sub

```

```

Private Sub CmdInstructions_Click()
' Calls the form to give instructions to the user
    InstructionsPg1.Show
End Sub

```

```

Private Sub Cmdprint_Click()
    MainInput.PrintForm
End Sub

```

```

Private Sub CmdTotalGroundTime_Click()
    Dim Result As Integer

' Calls form to enter total ground time

    InputGroundTimeData.Show

    With TotalGroundTimeBox
        TotalGroundTimeBox = TotalGroundTime
    End With

    With TotalGroundTimeBox2
        TotalGroundTimeBox2 = TotalGroundTime2
    End With

    With TotalGroundTimeBox3
        TotalGroundTimeBox3 = TotalGroundTime3
    End With
End Sub

```

```

Sub InputTotalGroundTime()

```


End Sub

Sub CheckInputsMaxFuel()

' Ensures Offload Available and the aircraft, aircrew and stations intervals have been entered

With OffloadAvailBox

If .Value = "" Or Not IsNumeric(.Value) Then

MsgBox "A numerical number for Offload Available is required to calculate the Maximum Fuel Available."

.SetFocus

BoxCheck = 1

Exit Sub

End If

OffloadAvail = OffloadAvailBox

If OffloadReq < 0 Then

MsgBox "That Offload Available should be a nonnegative value in order to calculate the Maximum Fuel Available."

.SetFocus

BoxCheck = 1

Exit Sub

End If

End With

With AircraftIntBox

If .Value = "" Or Not IsNumeric(.Value) Then

MsgBox "A numerical number for Aircraft Sortie Generation rate" & _
" is required to calculate the Maximum Fuel Available."

.SetFocus

BoxCheck = 1

Exit Sub

End If

AircraftInt = AircraftIntBox

If OffloadReq < 0 Then

MsgBox "That Aircraft Sortie Generation rate should be a " & _
"nonnegative value in order to calculate the Maximum Fuel Available."

.SetFocus

BoxCheck = 1

Exit Sub

End If

End With

With AircrewIntBox

If .Value = "" Or Not IsNumeric(.Value) Then

MsgBox "A numerical number for Aircrew Sortie Generation rate" & _
" is required to calculate the Maximum Fuel Available."

```

        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    AircrewInt = AircrewIntBox
    If OffloadReq < 0 Then
        MsgBox "That Aircrew Sortie Generation rate should be a " & _
            "nonnegative value in order to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With BaseIntBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Base Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    BaseInt = BaseIntBox
    If OffloadReq < 0 Then
        MsgBox "The Base Sortie Generation rate should be a " & _
            "nonnegative value in order to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With

'tanker2
' Ensures Offload Available and the aircraft, aircrew and stations intervals have been
entered
With OffloadAvailBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Offload Available is required to calculate the
Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    OffloadAvail2 = OffloadAvailBox2
    If OffloadReq < 0 Then
        MsgBox "That Offload Available should be a nonnegative value in order to
calculate the Maximum Fuel Available."

```

```

        .SetFocus
        BoxCheck = 1
    Exit Sub
End If
End With
With AircraftIntBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Aircraft Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
    Exit Sub
End If
AircraftInt2 = AircraftIntBox2
If OffloadReq < 0 Then
    MsgBox "That Aircraft Sortie Generation rate should be a " & _
        "nonnegative value in order to calculate the Maximum Fuel Available."
    .SetFocus
    BoxCheck = 1
Exit Sub
End If
End With
With AircrewIntBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Aircrew Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
    Exit Sub
End If
AircrewInt2 = AircrewIntBox2
If OffloadReq < 0 Then
    MsgBox "That Aircrew Sortie Generation rate should be a " & _
        "nonnegative value in order to calculate the Maximum Fuel Available."
    .SetFocus
    BoxCheck = 1
Exit Sub
End If
End With
With BaseIntBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Base Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
    Exit Sub

```

```

End If
BaseInt2 = BaseIntBox2
If OffloadReq < 0 Then
    MsgBox "The Base Sortie Generation rate should be a " & _
        "nonnegative value in order to calculate the Maximum Fuel Available."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
End With

'tanker3
' Ensures Offload Available and the aircraft, aircrew and stations intervals have been
entered
With OffloadAvailBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Offload Available is required to calculate the
Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    OffloadAvail3 = OffloadAvailBox3
    If OffloadReq < 0 Then
        MsgBox "That Offload Available should be a nonnegative value in order to
calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With AircraftIntBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Aircraft Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    AircraftInt3 = AircraftIntBox3
    If OffloadReq < 0 Then
        MsgBox "That Aircraft Sortie Generation rate should be a " & _
            "nonnegative value in order to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With

```

```

    End If
End With
With AircrewIntBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Aircrew Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    AircrewInt3 = AircrewIntBox3
    If OffloadReq < 0 Then
        MsgBox "That Aircrew Sortie Generation rate should be a " & _
            "nonnegative value in order to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With BaseIntBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "A numerical number for Base Sortie Generation rate" & _
            " is required to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    BaseInt3 = BaseIntBox3
    If OffloadReq < 0 Then
        MsgBox "The Base Sortie Generation rate should be a " & _
            "nonnegative value in order to calculate the Maximum Fuel Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
End Sub

Sub CheckInputsMissionReq()
' First checks to ensure offload required and offload available data has been entered
    With OffloadReqBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the Offload Required."
            .SetFocus
            BoxCheck = 1

```

```

        Exit Sub
    End If
    OffloadReq = OffloadReqBox
    If OffloadReq < 0 Then
        MsgBox "Please enter a nonnegative value for the Offload Required."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With OffloadAvailBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Offload Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    OffloadAvail = OffloadAvailBox
    If OffloadAvail < 0 Then
        MsgBox "Please enter a nonnegative value for the Offload Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
'tanker2 First checks to ensure offload required and offload available data has been
entered

```

```

With OffloadAvailBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Offload Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    OffloadAvail2 = OffloadAvailBox2
    If OffloadAvail2 < 0 Then
        MsgBox "Please enter a nonnegative value for the Offload Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With OffloadAvailBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Offload Available."

```

```

        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    OffloadAvail3 = OffloadAvailBox3
    If OffloadAvail3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Offload Available."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With

```

```
End Sub
```

```
Private Sub maxboommissionbox_Change()
```

```
End Sub
```

```
Private Sub CmdTotalGroundTime2_Click()
```

```
End Sub
```

```
Private Sub maxboomtankertypebox_Change()
```

```
End Sub
```

```
Private Sub Label2_Click()
```

```
End Sub
```

```
Private Sub MinMissionFrame_Click()
```

```
End Sub
```

```
Private Sub MissionReqBox_Change()
```

End Sub

Private Sub OffloadAvailBox_Change()

End Sub

Private Sub OffloadAvailBox2_Change()

End Sub

Private Sub OffloadAvailBox3_Change()

End Sub

Private Sub OffloadAvailTT1_Click()

With OffloadAvailTT1Box

OffloadAvailTT1Box = OffloadAvailBox * aircraft1count

End With

With OffloadAvailTT2Box

OffloadAvailTT2Box = OffloadAvailBox2 * aircraft2count

End With

With OffloadAvailTT3Box

OffloadAvailTT3Box = OffloadAvailBox3 * aircraft3count

End With

With OffloadAvailTTTBox

OffloadAvailTTTBox = OffloadAvailTT1Box * 1 + 1 * OffloadAvailTT2Box + 1 *

OffloadAvailTT3Box

End With

With aircrafttcount

aircrafttcount = aircraft1count * 1 + aircraft2count * 1 + aircraft3count * 1

End With

End Sub

Private Sub OffloadAvailTT1Box_Change()

End Sub

Private Sub RTFTBox_Change()

End Sub


```
Private Sub RTFTBox2_Change()
```

```
End Sub
```

```
Private Sub TextBox13_Change()
```

```
End Sub
```

```
Private Sub TextBox19_Change()
```

```
End Sub
```

```
Private Sub TextBox24_Change()
```

```
End Sub
```

```
Private Sub TextBox6_Change()
```

```
End Sub
```

```
Private Sub TextBox7_Change()
```

```
End Sub
```

```
Private Sub UserForm_Click()
```

```
End Sub
```

Option Explicit

Dim TempDistance As Long, TempBlockSpeed As Long, TempTimeatPoint As Variant,

BoxCheck As Integer, LegTime As Variant, FuelBurn As Long, FuelUse As Long,
 TempDistance2 As Long, _
 BoxCheck2 As Integer, TempBlockSpeed2 As Long, TempTimeatPoint2 As Variant, _
 TempDistance3 As Long, BoxCheck3 As Integer, TempBlockSpeed3 As Long, _
 TempTimeatPoint3 As Variant
 'not needed TempQEfficiency As Variant,

```
Private Sub CancelCommandButton_Click()
    Unload Me
End Sub
```

```
Private Sub cmdContinueWithRTFT_Click()
    Dim Result As Integer
    ' Calls subroutine to check if inputs are valid
    BoxCheck = 0
    Call CheckInputs
    If BoxCheck = 1 Then
        Exit Sub
    End If
```

```

' Calls subroutine to calculate Round Trip Flying Time
  Call CalculateRTFT

' Prompts to see if user would like to add an additional leg to the trip
' If not, continues on to return leg
  Result = MsgBox("Do you want to add another leg to the mision?", _
    vbYesNo, "Add Additional Legs to the Mission?")
  If Result = 6 Then
    ' Sets the input row so that additional rows of info may be added on the data worksheet
    InputAdditionalRTFTData.Show
  Else
    InputFinalRTFTData.Show
  End If
'Unload the form
  Unload Me
End Sub

```

```

Sub CheckInputs()
' Checks to ensure users inputs are numeric
' Assigns users inputs to temporary variables used to calculate Round Trip Flying Time
  With DistanceBox
    If .Value = "" Or Not IsNumeric(.Value) Then
      MsgBox "Please enter a numeric value for the distance."
      .SetFocus
      BoxCheck = 1
      Exit Sub
    End If
    TempDistance = DistanceBox
    If TempDistance < 0 Then
      MsgBox "Please enter a nonnegative value for the distance."
      .SetFocus
      BoxCheck = 1
      Exit Sub
    End If
  End With
  With BlockSpeedBox
    If .Value = "" Or Not IsNumeric(.Value) Then
      MsgBox "Please enter a numeric value for the True Air Speed."
      .SetFocus
      BoxCheck = 1
      Exit Sub
    End If
    TempBlockSpeed = BlockSpeedBox
    If TempBlockSpeed < 0 Then
      MsgBox "Please enter a nonnegative value for the True Air Speed."
      .SetFocus
    End If
  End With

```

```

        BoxCheck = 1
    Exit Sub
End If
End With
With TimeatPointBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the FuelFlow."
        .SetFocus
        BoxCheck = 1
    Exit Sub
    End If
    TempTimeatPoint = TimeatPointBox
    If TempTimeatPoint < 0 Then
        MsgBox "Please enter a nonnegative value for the Average Fuel Burn Rate."
        .SetFocus
        BoxCheck = 1
    Exit Sub
    End If
End With
If HoursOption = False And MinutesOption = False Then
    MsgBox "Please indicate if the time is in hours or minutes."
    BoxCheck = 1
    Exit Sub
ElseIf MinutesOption = True Then
    TempTimeatPoint = TempTimeatPoint \ 60
End If
' With QEfficiencyBox
' If .Value = "" Or Not IsNumeric(.Value) Then
'     MsgBox "Please enter a numeric value for the Receivers' Efficiency."
'     BoxCheck = 1
'     .SetFocus
'     Exit Sub
' End If
' TempQEfficiency = QEfficiencyBox
' If TempQEfficiency < 0 Or TempQEfficiency > 1 Then
'     MsgBox "Please enter a number between 0 and 1 for the base's Receivers'
Efficiency."
'     BoxCheck = 1
'     .SetFocus
'     Exit Sub
' End If
' End With
'tanker2
With DistanceBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the distance."

```

```

        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempDistance2 = DistanceBox2
    If TempDistance2 < 0 Then
        MsgBox "Please enter a nonnegative value for the distance."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With BlockSpeedBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempBlockSpeed2 = BlockSpeedBox2
    If TempBlockSpeed < 0 Then
        MsgBox "Please enter a nonnegative value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With TimeatPointBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the FuelFlow."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempTimeatPoint2 = TimeatPointBox2
    If TempTimeatPoint < 0 Then
        MsgBox "Please enter a nonnegative value for the Average Fuel Burn Rate."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If HoursOption = False And MinutesOption = False Then
    MsgBox "Please indicate if the time is in hours or minutes."
    BoxCheck = 1
    Exit Sub

```

```

ElseIf MinutesOption = True Then
    TempTimeatPoint2 = TempTimeatPoint2 \ 60
End If
' With QEfficiencyBox
' If .Value = "" Or Not IsNumeric(.Value) Then
'     MsgBox "Please enter a numeric value for the Receivers' Efficiency."
'     BoxCheck = 1
'     .SetFocus
'     Exit Sub
' End If
' TempQEfficiency = QEfficiencyBox
' If TempQEfficiency < 0 Or TempQEfficiency > 1 Then
'     MsgBox "Please enter a number between 0 and 1 for the base's Receivers'
Efficiency."
'     BoxCheck = 1
'     .SetFocus
'     Exit Sub
' End If
' End With

```

'tanker 3

With DistanceBox3

```

    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the distance."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempDistance3 = DistanceBox3
    If TempDistance3 < 0 Then
        MsgBox "Please enter a nonnegative value for the distance."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If

```

End With

With BlockSpeedBox3

```

    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempBlockSpeed3 = BlockSpeedBox3
    If TempBlockSpeed3 < 0 Then
        MsgBox "Please enter a nonnegative value for the True Air Speed."
    End If

```

```

        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With TimeatPointBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the FuelFlow."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempTimeatPoint3 = TimeatPointBox3
    If TempTimeatPoint3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Average Fuel Burn Rate."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If HoursOption = False And MinutesOption = False Then
    MsgBox "Please indicate if the time is in hours or minutes."
    BoxCheck = 1
    Exit Sub
ElseIf MinutesOption = True Then
    TempTimeatPoint3 = TempTimeatPoint3 \ 60
End If
' With QEfficiencyBox
' If .Value = "" Or Not IsNumeric(.Value) Then
'     MsgBox "Please enter a numeric value for the Receivers' Efficiency."
'     BoxCheck = 1
'     .SetFocus
'     Exit Sub
' End If
' TempQEfficiency = QEfficiencyBox
' If TempQEfficiency < 0 Or TempQEfficiency > 1 Then
'     MsgBox "Please enter a number between 0 and 1 for the base's Receivers'
Efficiency."
'     BoxCheck = 1
'     .SetFocus
'     Exit Sub
' End If
' End With
End Sub

Sub CalculateRTFT()

```

```

'Calculate Round Trip Flying Time
    RTFT = (TempDistance / TempBlockSpeed + TempTimeatPoint) ' *
TempQEfficiency
    RTFT2 = (TempDistance2 / TempBlockSpeed2 + TempTimeatPoint2) ' *
TempQEfficiency
    RTFT3 = (TempDistance3 / TempBlockSpeed3 + TempTimeatPoint3) ' *
TempQEfficiency
End Sub

```

```

Private Sub CmdInstructions_Click()
    InstructionsRTFT.Show
End Sub

```

```

Private Sub DistanceBox_Change()

End Sub

```

```

Private Sub TextBox3_Change()

End Sub

```

```

Private Sub UserForm_Click()

End Sub

```


Total Ground Time

Enter the total ground time indication how much time the tanker needs to be on the ground before starting its next mission.

Typical ground time for both the KC-10 and KC-135 is 3.25 hours for loading fuel.

Input Total Ground Time

Tanker 1 Tanker 2 Tanker 3

☒ Hours
☐ Minutes

Record Total Ground Time

Cancel

Option Explicit

```
Dim TempDistance As Long, TempBlockSpeed As Long, TempTimeatPoint As Variant,
    _
    BoxCheck As Integer, LegTime As Variant, FuelBurn As Long, FuelUse As Long,
    TempDistance2 As Long, _
    BoxCheck2 As Integer, TempBlockSpeed2 As Long, TempTimeatPoint2 As Variant, _
    TempDistance3 As Long, BoxCheck3 As Integer, TempBlockSpeed3 As Long, _
    TempTimeatPoint3 As Variant
    ' not needed TempQEfficiency As Variant,
```

```
Private Sub CancelCommandButton_Click()
    Unload Me
End Sub
```

```
Private Sub cmdContinueWithRTFT_Click()
    Dim Result As Integer
    ' Calls subroutine to check if inputs are valid
    BoxCheck = 0
    Call CheckInputs
    If BoxCheck = 1 Then
        Exit Sub
    End If
End Sub
```

```

    End If
' Calls subroutine to calculate Round Trip Flying Time
    Call CalculateRTFT

' Prompts to see if user would like to add an additional leg to the trip
' If not, continues on to return leg
    Result = MsgBox("Do you want to add another leg to the mision?", _
        vbYesNo, "Add Additional Legs to the Mission?")
    If Result = 6 Then
' Sets the input row so that additional rows of info may be added on the data worksheet
        InputAdditionalRTFTData.Show
    Else
        InputFinalRTFTData.Show
    End If
'Unload the form
    Unload Me
End Sub

```

```

Sub CheckInputs()
' Checks to ensure users inputs are numeric
' Assigns users inputs to temporary variables used to calculate Round Trip Flying Time
    With DistanceBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the distance."
            .SetFocus
            BoxCheck = 1
            Exit Sub
        End If
        TempDistance = DistanceBox
        If TempDistance < 0 Then
            MsgBox "Please enter a nonnegative value for the distance."
            .SetFocus
            BoxCheck = 1
            Exit Sub
        End If
    End With
    With BlockSpeedBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the True Air Speed."
            .SetFocus
            BoxCheck = 1
            Exit Sub
        End If
        TempBlockSpeed = BlockSpeedBox
        If TempBlockSpeed < 0 Then
            MsgBox "Please enter a nonnegative value for the True Air Speed."

```

```

        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With TimeatPointBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the FuelFlow."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempTimeatPoint = TimeatPointBox
    If TempTimeatPoint < 0 Then
        MsgBox "Please enter a nonnegative value for the Average Fuel Burn Rate."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If HoursOption = False And MinutesOption = False Then
    MsgBox "Please indicate if the time is in hours or minutes."
    BoxCheck = 1
    Exit Sub
ElseIf MinutesOption = True Then
    TempTimeatPoint = TempTimeatPoint \ 60
End If
' With QEfficiencyBox
' If .Value = "" Or Not IsNumeric(.Value) Then
'     MsgBox "Please enter a numeric value for the Receivers' Efficiency."
'     BoxCheck = 1
'     .SetFocus
'     Exit Sub
' End If
' TempQEfficiency = QEfficiencyBox
' If TempQEfficiency < 0 Or TempQEfficiency > 1 Then
'     MsgBox "Please enter a number between 0 and 1 for the base's Receivers'
Efficiency."
'     BoxCheck = 1
'     .SetFocus
'     Exit Sub
' End If
' End With
'tanker2
With DistanceBox2
    If .Value = "" Or Not IsNumeric(.Value) Then

```

```

    MsgBox "Please enter a numeric value for the distance."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
TempDistance2 = DistanceBox2
If TempDistance2 < 0 Then
    MsgBox "Please enter a nonnegative value for the distance."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
End With
With BlockSpeedBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempBlockSpeed2 = BlockSpeedBox2
    If TempBlockSpeed < 0 Then
        MsgBox "Please enter a nonnegative value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With TimeatPointBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the FuelFlow."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempTimeatPoint2 = TimeatPointBox2
    If TempTimeatPoint < 0 Then
        MsgBox "Please enter a nonnegative value for the Average Fuel Burn Rate."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If HoursOption = False And MinutesOption = False Then
    MsgBox "Please indicate if the time is in hours or minutes."
    BoxCheck = 1

```

```

Exit Sub
ElseIf MinutesOption = True Then
    TempTimeatPoint2 = TempTimeatPoint2 \ 60
End If
' With QEfficiencyBox
' If .Value = "" Or Not IsNumeric(.Value) Then
'     MsgBox "Please enter a numeric value for the Receivers' Efficiency."
'     BoxCheck = 1
'     .SetFocus
'     Exit Sub
' End If
' TempQEfficiency = QEfficiencyBox
' If TempQEfficiency < 0 Or TempQEfficiency > 1 Then
'     MsgBox "Please enter a number between 0 and 1 for the base's Receivers'
Efficiency."
'     BoxCheck = 1
'     .SetFocus
'     Exit Sub
' End If
' End With

'tanker 3
With DistanceBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the distance."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempDistance3 = DistanceBox3
    If TempDistance3 < 0 Then
        MsgBox "Please enter a nonnegative value for the distance."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With BlockSpeedBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempBlockSpeed3 = BlockSpeedBox3
    If TempBlockSpeed3 < 0 Then

```

```

        MsgBox "Please enter a nonnegative value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With TimeatPointBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the FuelFlow."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempTimeatPoint3 = TimeatPointBox3
    If TempTimeatPoint3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Average Fuel Burn Rate."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If HoursOption = False And MinutesOption = False Then
    MsgBox "Please indicate if the time is in hours or minutes."
    BoxCheck = 1
    Exit Sub
ElseIf MinutesOption = True Then
    TempTimeatPoint3 = TempTimeatPoint3 \ 60
End If
' With QEfficiencyBox
' If .Value = "" Or Not IsNumeric(.Value) Then
'     MsgBox "Please enter a numeric value for the Receivers' Efficiency."
'     BoxCheck = 1
'     .SetFocus
'     Exit Sub
' End If
' TempQEfficiency = QEfficiencyBox
' If TempQEfficiency < 0 Or TempQEfficiency > 1 Then
'     MsgBox "Please enter a number between 0 and 1 for the base's Receivers'
Efficiency."
'     BoxCheck = 1
'     .SetFocus
'     Exit Sub
' End If
' End With
End Sub

```

```

Sub CalculateRTFT()
'Calculate Round Trip Flying Time
    RTFT = (TempDistance / TempBlockSpeed + TempTimeatPoint) ' *
TempQEfficiency
    RTFT2 = (TempDistance2 / TempBlockSpeed2 + TempTimeatPoint2) ' *
TempQEfficiency
    RTFT3 = (TempDistance3 / TempBlockSpeed3 + TempTimeatPoint3) ' *
TempQEfficiency
End Sub

```

```

Private Sub CmdInstructions_Click()
    InstructionsRTFT.Show
End Sub

```

```

Private Sub DistanceBox_Change()

End Sub

```

```

Private Sub TextBox3_Change()

End Sub

```

```

Private Sub UserForm_Click()

End Sub

```

Input First Leg of Round Trip Flying Time Data

Input Next Leg for Round Trip Flying Time Data

Additional refueling points calculations require distance to the refueling point (in nautical miles), air speed to the point (in nautical miles per hour), and time spent at the refueling point. Once finished, add another point or continue using the appropriate button. Canceling will not record data currently on this form, but will keep any previously calculated RTFT data.

	Tanker 1	Tanker 2	Tanker 3
Input Distance to Refuel Point (nm)			
Input Block Speed to Refuel Point (nm/hrs)			
Input Loiter Time at Refuel Point ☐ Hours ☐ Minutes			

Input Data for Additional Refueling Point(s)

Continue with RTFT Calculations

Cancel

Option Explicit

Dim TempDistance As Single, TempBlockSpeed As Single, TempTimeatPoint As Variant, _

BoxCheck As Integer, Result As Integer, _

LegTime As Variant, FuelUse As Long, FuelBurn As Long, _

TempDistance2 As Single, TempBlockSpeed2 As Single, TempTimeatPoint2 As Variant, _

TempDistance3 As Single, TempBlockSpeed3 As Single, TempTimeatPoint3 As Variant

' TempQEfficiency As Variant

Private Sub CancelCommandButton_Click()

Unload Me

' Checks to see if the user would like to stop calculations on RTFT, or not enter data for
' an addition leg

Result = MsgBox("Data for the final leg has not been entered yet. Do you want to
complete the RTFT " & _

"calculations?" & vbCrLf & vbCrLf _

& "Select Yes to return to main form, No to proceed to inputting data for final leg",

— vbYesNo, "End RTFT Calculations?")

If Result = 7 Then


```

        InputFinalRTFTData.Show
    End If
End Sub

Sub CalculateRTFT()
' Calculates current leg's Round Trip Flying Time and adds to previous legs times
    RTFT = (TempDistance / TempBlockSpeed + TempTimeatPoint + RTFT) ' *
TempQEfficiency
    RTFT2 = (TempDistance2 / TempBlockSpeed2 + TempTimeatPoint2 + RTFT2) ' *
TempQEfficiency
    RTFT3 = (TempDistance3 / TempBlockSpeed3 + TempTimeatPoint3 + RTFT3) ' *
TempQEfficiency
End Sub

Private Sub cmdContinueRTFT_Click()
    BoxCheck = 0
' Calls subroutine to see if each input is a non blank, non negative number, setting the
' variable BoxCheck to 1 if the input is not proper format
    Call CheckInputs
    If BoxCheck = 1 Then
        Exit Sub
    End If
' Calls subroutine to calculate Round Trip Flying Time
    Call CalculateRTFT
' Opens form to input data for return leg of Round Trip Flying Time
    InputFinalRTFTData.Show
'Unload the form
    Unload Me
End Sub

Private Sub CmdInputAdditionPoints_Click()
' Calls subroutine to check if inputs are valid
    BoxCheck = 0
    Call CheckInputs
    If BoxCheck = 1 Then
        Exit Sub
    End If
' Calls subroutine to calculate Round Trip Flying Time
    Call CalculateRTFT
' Resets form for additional inputs
    DistanceBox = ""
    BlockSpeedBox = ""
    TimeAtPointBox = ""
    DistanceBox2 = ""
    BlockSpeedBox2 = ""
    TimeAtPointBox2 = ""

```

```

DistanceBox3 = ""
BlockSpeedBox3 = ""
TimeAtPointBox3 = ""
End Sub

Sub CheckInputs()
' Checks to ensure users inputs are numeric
' Assigns users inputs to temporary variables used to calculate Round Trip Flying Time
  With DistanceBox
    If .Value = "" Or Not IsNumeric(.Value) Then
      Result = MsgBox("Do you want to continue without adding an additional
refueling point?", _
vbYesNo, "Manual Enter")
      If Result = 6 Then
        InputFinalRTFTData.Show
        Unload Me
      End If
      MsgBox "Please enter a numeric value for the distance."
      .SetFocus
      BoxCheck = 1
      Exit Sub
    End If
    TempDistance = DistanceBox
    If TempDistance < 0 Then
      MsgBox "Please enter a nonnegative value for the distance."
      .SetFocus
      BoxCheck = 1
      Exit Sub
    End If
  End With
  With BlockSpeedBox
    If .Value = "" Or Not IsNumeric(.Value) Then
      Result = MsgBox("Do you want to continue without adding an additional
refueling point?", _
vbYesNo, "Manual Enter")
      If Result = 6 Then
        InputFinalRTFTData.Show
        Unload Me
      End If
      MsgBox "Please enter a numeric value for the True Air Speed."
      .SetFocus
      BoxCheck = 1
      Exit Sub
    End If
    TempBlockSpeed = BlockSpeedBox
    If TempBlockSpeed < 0 Then

```

```

        MsgBox "Please enter a nonnegative value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With TimeAtPointBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        Result = MsgBox("Do you want to continue without adding an additional
refueling point?", _
        vbYesNo, "Manual Enter")
        If Result = 6 Then
            InputFinalRTFTData.Show
            Unload Me
        End If
        MsgBox "Please enter a numeric value for the FuelFlow."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempTimeatPoint = TimeAtPointBox
    If TempTimeatPoint < 0 Then
        MsgBox "Please enter a nonnegative value for the Average Fuel Burn Rate."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If HoursOption = False And MinutesOption = False Then
    MsgBox "Please indicate if the time is in hours or minutes."
    BoxCheck = 1
    Exit Sub
ElseIf MinutesOption = True Then
    TempTimeatPoint = TempTimeatPoint \ 60
End If
' With QEfficiencyBox
'     If .Value = "" Or Not IsNumeric(.Value) Then
'         MsgBox "Please enter a numeric value for the Receivers' Efficiency."
'         BoxCheck = 1
'         .SetFocus
'         Exit Sub
'     End If
'     TempQEfficiency = QEfficiencyBox
'     If TempQEfficiency < 0 Or TempQEfficiency > 1 Then
'         MsgBox "Please enter a number between 0 and 1 for the Receivers' Efficiency."
'         BoxCheck = 1

```

```

'      .SetFocus
'      Exit Sub
'      End If
'      End With

'tanker 2
With DistanceBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        Result = MsgBox("Do you want to continue without adding an additional
refueling point?", _
        vbYesNo, "Manual Enter")
        If Result = 6 Then
            InputFinalRTFTData.Show
            Unload Me
        End If
        MsgBox "Please enter a numeric value for the distance."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempDistance2 = DistanceBox2
    If TempDistance < 0 Then
        MsgBox "Please enter a nonnegative value for the distance."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With BlockSpeedBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        Result = MsgBox("Do you want to continue without adding an additional
refueling point?", _
        vbYesNo, "Manual Enter")
        If Result = 6 Then
            InputFinalRTFTData.Show
            Unload Me
        End If
        MsgBox "Please enter a numeric value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempBlockSpeed2 = BlockSpeedBox2
    If TempBlockSpeed < 0 Then
        MsgBox "Please enter a nonnegative value for the True Air Speed."
        .SetFocus
    End If
End With

```

```

        BoxCheck = 1
        Exit Sub
    End If
End With
With TimeAtPointBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        Result = MsgBox("Do you want to continue without adding an additional
refueling point?", _
            vbYesNo, "Manual Enter")
        If Result = 6 Then
            InputFinalRTFTData.Show
            Unload Me
        End If
        MsgBox "Please enter a numeric value for the FuelFlow."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempTimeatPoint2 = TimeAtPointBox2
    If TempTimeatPoint < 0 Then
        MsgBox "Please enter a nonnegative value for the Average Fuel Burn Rate."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If HoursOption = False And MinutesOption = False Then
    MsgBox "Please indicate if the time is in hours or minutes."
    BoxCheck = 1
    Exit Sub
ElseIf MinutesOption = True Then
    TempTimeatPoint2 = TempTimeatPoint2 \ 60
End If
' With QEfficiencyBox
'     If .Value = "" Or Not IsNumeric(.Value) Then
'         MsgBox "Please enter a numeric value for the Receivers' Efficiency."
'         BoxCheck = 1
'         .SetFocus
'         Exit Sub
'     End If
'     TempQEfficiency = QEfficiencyBox
'     If TempQEfficiency < 0 Or TempQEfficiency > 1 Then
'         MsgBox "Please enter a number between 0 and 1 for the Receivers' Efficiency."
'         BoxCheck = 1
'         .SetFocus
'         Exit Sub

```

```

' End If
' End With
With DistanceBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        Result = MsgBox("Do you want to continue without adding an additional
refueling point?", _
            vbYesNo, "Manual Enter")
        If Result = 6 Then
            InputFinalRTFTData.Show
            Unload Me
        End If
        MsgBox "Please enter a numeric value for the distance."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempDistance3 = DistanceBox3
    If TempDistance < 0 Then
        MsgBox "Please enter a nonnegative value for the distance."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With BlockSpeedBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        Result = MsgBox("Do you want to continue without adding an additional
refueling point?", _
            vbYesNo, "Manual Enter")
        If Result = 6 Then
            InputFinalRTFTData.Show
            Unload Me
        End If
        MsgBox "Please enter a numeric value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempBlockSpeed3 = BlockSpeedBox3
    If TempBlockSpeed < 0 Then
        MsgBox "Please enter a nonnegative value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With

```

```

With TimeAtPointBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        Result = MsgBox("Do you want to continue without adding an additional
refueling point?", _
            vbYesNo, "Manual Enter")
        If Result = 6 Then
            InputFinalRTFTData.Show
            Unload Me
        End If
        MsgBox "Please enter a numeric value for the FuelFlow."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempTimeatPoint3 = TimeAtPointBox3
    If TempTimeatPoint < 0 Then
        MsgBox "Please enter a nonnegative value for the Average Fuel Burn Rate."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If HoursOption = False And MinutesOption = False Then
    MsgBox "Please indicate if the time is in hours or minutes."
    BoxCheck = 1
    Exit Sub
ElseIf MinutesOption = True Then
    TempTimeatPoint3 = TempTimeatPoint3 \ 60
End If
' With QEfficiencyBox
'     If .Value = "" Or Not IsNumeric(.Value) Then
'         MsgBox "Please enter a numeric value for the Receivers' Efficiency."
'         BoxCheck = 1
'         .SetFocus
'         Exit Sub
'     End If
'     TempQEfficiency = QEfficiencyBox
'     If TempQEfficiency < 0 Or TempQEfficiency > 1 Then
'         MsgBox "Please enter a number between 0 and 1 for the Receivers' Efficiency."
'         BoxCheck = 1
'         .SetFocus
'         Exit Sub
'     End If
' End With
End Sub

```

```
Private Sub TextBox2_Change()
```

```
End Sub
```

```
Private Sub TimeatPointBox_Change()
```

```
End Sub
```

```
Private Sub UserForm_Click()
```

```
End Sub
```

Input First Leg of Round Trip Flying Time Data

Input Final Leg of Round Trip Flying Time Data

Calculations for the final leg of the trip require distance from the refueling point (in nautical miles) and air speed to to the point (in nautical miles per hour) inputted. Select Finish to calculate all legs of for the RTFT.

	Tanker 1	Tanker 2	Tanker 3
Input Distance to Refuel Point (nm)			
Input Block Speed to Refuel Point (nm/hr)			

Finish Calculating Round Trip Flying Time

Cancel

```
Option Explicit
```

```
Dim TempDistance As Long, TempBlockSpeed As Long, BoxCheck As Integer, _  
    LegTime As Variant, FuelUse As Long, FuelBurn As Long, _  
    TempDistance2 As Long, TempBlockSpeed2 As Long, _  
    TempDistance3 As Long, TempBlockSpeed3 As Long
```

```
Private Sub BlockSpeedBox_Change()
```

```
End Sub
```



```

Private Sub CancelCommandButton_Click()
    Unload Me
End Sub

Private Sub cmdContinueRTFT_Click()
' Calls subroutine to check if inputs are valid
    BoxCheck = 0
    Call CheckInputs
    If BoxCheck = 1 Then
        Exit Sub
    End If
'Calls subroutine to calculate final leg for Round Trip Flying Time
    Call CalculateFinalRTFT
'Unload the form
    Unload Me
End Sub
Sub CheckInputs()
' Checks to ensure users inputs are numeric
' Assigns users inputs to temporary variables used to calculate Round Trip Flying Time
    With DistanceBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the distance."
            .SetFocus
            BoxCheck = 1
            Exit Sub
        End If
        TempDistance = DistanceBox
        If TempDistance < 0 Then
            MsgBox "Please enter a nonnegative value for the distance."
            .SetFocus
            BoxCheck = 1
            Exit Sub
        End If
    End With
    With BlockSpeedBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the True Air Speed."
            .SetFocus
            BoxCheck = 1
            Exit Sub
        End If
        TempBlockSpeed = BlockSpeedBox
        If TempBlockSpeed < 0 Then
            MsgBox "Please enter a nonnegative value for the True Air Speed."
            .SetFocus
            BoxCheck = 1
        End If
    End With
End Sub

```

```

        Exit Sub
    End If
End With

With DistanceBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the distance."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempDistance2 = DistanceBox2
    If TempDistance2 < 0 Then
        MsgBox "Please enter a nonnegative value for the distance."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With

With BlockSpeedBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempBlockSpeed2 = BlockSpeedBox2
    If TempBlockSpeed2 < 0 Then
        MsgBox "Please enter a nonnegative value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With

With DistanceBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the distance."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempDistance3 = DistanceBox3
    If TempDistance3 < 0 Then
        MsgBox "Please enter a nonnegative value for the distance."
        .SetFocus
    End If
End With

```

```

        BoxCheck = 1
        Exit Sub
    End If
End With
With BlockSpeedBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempBlockSpeed3 = BlockSpeedBox3
    If TempBlockSpeed3 < 0 Then
        MsgBox "Please enter a nonnegative value for the True Air Speed."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
End Sub

Sub CalculateFinalRTFT()
' Calculates current leg's Round Trip Flying Time and adds to previous legs times
    RTFT = (TempDistance \ TempBlockSpeed) + RTFT
    RTFT2 = (TempDistance2 \ TempBlockSpeed2) + RTFT2
    RTFT3 = (TempDistance3 \ TempBlockSpeed3) + RTFT3
End Sub

Private Sub DistanceBox_Change()

End Sub

Private Sub UserForm_Click()

End Sub

```

Total Ground Time

Enter the total ground time indication how much time the tanker needs to be on the ground before starting its next mission.

Typical ground time for both the KC-10 and KC-135 is 3.25 hours for loading fuel.

Tanker 1 Tanker 2 Tanker 3

Input Total Ground Time

☐ Hours
☐ Minutes

Record Total Ground Time

Cancel

Option Explicit

Private Sub CmdCancel_Click()

' Returns the user to the previous form without calculating or recording any information

 Unload Me

End Sub

Private Sub CmdContCycleTimeCalc_Click()

' Ensures appropriate number has been entered for total ground time and assigns the value to the ground time variable

 With GroundTimeBox

 If .Value = "" Or Not IsNumeric(.Value) Then

 MsgBox "Please enter a numeric value for the Total Ground Time."

 .SetFocus

 Exit Sub

 End If

 TotalGroundTime = GroundTimeBox

 If TotalGroundTime < 0 Then

 MsgBox "Please enter a nonnegative value for the Total Ground Time."

 .SetFocus

 Exit Sub

 End If

```

End With
If HoursOption = False And MinutesOption = False Then
    MsgBox "Please indicate if this is in hours or minutes."
    Exit Sub
ElseIf MinutesOption = True Then
    TotalGroundTime = TotalGroundTime \ 60
End If

With GroundTimeBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Total Ground Time."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime2 = GroundTimeBox2
    If TotalGroundTime2 < 0 Then
        MsgBox "Please enter a nonnegative value for the Total Ground Time."
        .SetFocus
        Exit Sub
    End If
End With
If HoursOption = False And MinutesOption = False Then
    MsgBox "Please indicate if this is in hours or minutes."
    Exit Sub
ElseIf MinutesOption = True Then
    TotalGroundTime2 = TotalGroundTime2 \ 60
End If

With GroundTimeBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Total Ground Time."
        .SetFocus
        Exit Sub
    End If
    TotalGroundTime3 = GroundTimeBox3
    If TotalGroundTime3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Total Ground Time."
        .SetFocus
        Exit Sub
    End If
End With
If HoursOption = False And MinutesOption = False Then
    MsgBox "Please indicate if this is in hours or minutes."
    Exit Sub
ElseIf MinutesOption = True Then
    TotalGroundTime3 = TotalGroundTime3 \ 60

```

```

End If
Unload Me
End Sub

```

```

Private Sub CmdKC10CycleInfo_Click()
' Displays message box with typical ground times for KC-10
MsgBox "Typical Ground times for KC-10 are as follows: (More details later)", , "KC-10 Typical Ground Times"
End Sub

```

```

Private Sub CmdKC135TGTInfo_Click()
' Displays message box with typical ground times for KC-135
MsgBox "Typical Ground times for KC-135 are as follows: (More details later)", , "KC-135 Typical Ground Times"
End Sub

```

```

Private Sub UserForm_Click()

```

```

End Sub

```

Sortie Generation Capability, Aircraft

Instructions

Tanker 1 Tanker 2 Tanker 3

Available Aircraft Inputs

Input single Aircraft Sortie Generation Rate	☐	☐	☐
Input the Number of Tankers Assigned	☐	☐	☐
Input the Number of NMC Tankers	☐	☐	☐
Input the Number of Tankers Unavailable for Other Reasons	☐	☐	☐
Input the Tankers' Utilization	☐	☐	☐

Calculate Aircraft Sortie Generation Capability ☐ ☐ ☐

Maximum Sorties per Day

Return Cancel

Option Explicit

```
Dim TempAssigned As Integer, TempNMC As Integer, TempOther As Integer, _  
    TempAvailable As Single, TempTankUtilization As Double, _  
    BoxCheck As Integer, OneAircraftDailyGeneration As Double, _  
    TempAssigned2 As Integer, TempNMC2 As Integer, TempOther2 As Integer, _  
    TempAvailable2 As Single, TempTankUtilization2 As Double, _  
    OneAircraftDailyGeneration2 As Double, _  
    TempAssigned3 As Integer, TempNMC3 As Integer, TempOther3 As Integer, _  
    TempAvailable3 As Single, TempTankUtilization3 As Double, _  
    OneAircraftDailyGeneration3 As Double
```

```
Private Sub OneAircraftSortieGenBox_Change()
```

```
End Sub
```

```
Private Sub UserForm_Initialize()
```

```
' Enters sortie generation capability into form
```

```
    If CycleTime = 0 Then
```

```
        Exit Sub
```

```
    End If
```

```
    OneAircraftDailyGeneration = 24 / CycleTime
```

```
    OneAircraftDailyGeneration = RoundNear(OneAircraftDailyGeneration, 0.01)
```

```
    OneAircraftSortieGenBox.Value = OneAircraftDailyGeneration
```

```
  
    OneAircraftDailyGeneration2 = 24 / CycleTime2
```

```
    OneAircraftDailyGeneration2 = RoundNear(OneAircraftDailyGeneration2, 0.01)
```

```
    OneAircraftSortieGenBox2.Value = OneAircraftDailyGeneration2
```

```
  
    OneAircraftDailyGeneration3 = 24 / CycleTime3
```

```
    OneAircraftDailyGeneration3 = RoundNear(OneAircraftDailyGeneration3, 0.01)
```

```
    OneAircraftSortieGenBox3.Value = OneAircraftDailyGeneration3
```

```
End Sub
```

```
Private Sub CmdCalcAircraftInt_Click()
```

```
    BoxCheck = 0
```

```
' Calls subroutine to check if inputs are valid
```

```
    Call CheckInputs
```

```
    If BoxCheck = 1 Then
```

```
        Exit Sub
```

```
    End If
```

```
'Calculate Available Aircraft
```

```
    TempAvailable = (TempAssigned - TempNMC - TempOther) * TempTankUtilization
```

```
    TempAvailable2 = (TempAssigned2 - TempNMC2 - TempOther2) *
```

```
    TempTankUtilization2
```

```

    TempAvailable3 = (TempAssigned3 - TempNMC3 - TempOther3) *
TempTankUtilization3
'Calculate Aircraft Interval
    AircraftInt = TempAvailable * OneAircraftDailyGeneration
    AircraftInt = RoundNear(AircraftInt, 0.1)
    If AircraftInt < 0 Then
        AircraftInt = 0
    End If
    TempAircraftSortieGenBox = AircraftInt

    AircraftInt2 = TempAvailable2 * OneAircraftDailyGeneration2
    AircraftInt2 = RoundNear(AircraftInt2, 0.1)
    If AircraftInt2 < 0 Then
        AircraftInt2 = 0
    End If
    TempAircraftSortieGenBox2 = AircraftInt2

    AircraftInt3 = TempAvailable3 * OneAircraftDailyGeneration3
    AircraftInt3 = RoundNear(AircraftInt3, 0.1)
    If AircraftInt3 < 0 Then
        AircraftInt3 = 0
    End If
    TempAircraftSortieGenBox3 = AircraftInt3

End Sub

Private Sub CmdCancel_Click()
' Returns user to previous form without saving data
    Unload Me
End Sub

Private Sub CmdInstructions_Click()
    InstructionsAircraftInt.Show
End Sub

Sub CheckInputs()
' Checks to ensure users inputs are numeric, the utilization is between 0 and 1, _
' and that NMC and Other aircraft total does not exceed the available aircraft
' Assigns users inputs to temporary variables to calculate available aircraft required
    With OneAircraftSortieGenBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the daily sortie generation capability
of one aircraft."
            .SetFocus
            BoxCheck = 1
        Exit Sub
    End With

```



```

End If
OneAircraftDailyGeneration = OneAircraftSortieGenBox
If OneAircraftDailyGeneration < 0 Then
    MsgBox "Please enter a nonnegative value for the daily sortie generation
capability of one aircraft."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
End With
With AssignedBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Total Assigned Aircraft."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempAssigned = AssignedBox
    If TempAssigned < 0 Then
        MsgBox "Please enter a nonnegative value for the Assigned Aircraft."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With NMCBox
    If Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Non Mission Capable Aircraft."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempNMC = NMCBox
    If TempNMC < 0 Then
        MsgBox "Please enter a nonnegative value for the Non Mission Capable
Aircraft."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    If TempNMC > TempAssigned Then
        MsgBox "The number of the Non Mission Capable Aircraft must be less than " &
        —
        "the number of Assigned Aircraft." & vbCrLf & vbCrLf _
        & "Please reenter the number."
        BoxCheck = 1

```

```

        .SetFocus
    Exit Sub
End If
End With
With OtherBox
    If Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Aircraft Unavailable for Other
Reasons."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempOther = OtherBox
    If TempOther < 0 Then
        MsgBox "Please enter a nonnegative value for the Aircraft Unavailable for Other
Reasons."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    If TempOther > TempAssigned Then
        MsgBox "The number of the Aircraft Unavailable for Other reasons must " & _
            "be less than the number of Assigned Aircraft." & vbCrLf & vbCrLf _
            & "Please reenter the number."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
End With
If TempNMC + TempOther > TempAssigned Then
    MsgBox "The number of Non Mission Capable Aircraft plus the Aircraft
Unavailable for Other " & _
        "Reasons must total less than the number of Assigned Aircraft." & vbCrLf &
vbCrLf _
        & "Please recheck and reenter these numbers."
    BoxCheck = 1
    Exit Sub
End If
With QEfficiencyBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Aircraft's Utilization."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempTankUtilization = QEfficiencyBox

```

```

    If TempTankUtilization < 0 Or TempTankUtilization > 1 Then
        MsgBox "Please enter a number between 0 and 1 for the Aircraft's Utilization."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With

'tanker2

' Checks to ensure users inputs are numeric, the utilization is between 0 and 1, _
' and that NMC and Other aircraft total does not exceed the available aircraft
' Assigns users inputs to temporary variables to calculate available aircraft required
With OneAircraftSortieGenBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the daily sortie generation capability
of one aircraft."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    OneAircraftDailyGeneration2 = OneAircraftSortieGenBox2
    If OneAircraftDailyGeneration2 < 0 Then
        MsgBox "Please enter a nonnegative value for the daily sortie generation
capability of one aircraft."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With AssignedBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Total Assigned Aircraft."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempAssigned2 = AssignedBox2
    If TempAssigned3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Assigned Aircraft."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With NMCBox2

```

```

If Not IsNumeric(.Value) Then
    MsgBox "Please enter a numeric value for the Non Mission Capable Aircraft."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
TempNMC2 = NMCBox2
If TempNMC2 < 0 Then
    MsgBox "Please enter a nonnegative value for the Non Mission Capable
Aircraft."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
If TempNMC2 > TempAssigned2 Then
    MsgBox "The number of the Non Mission Capable Aircraft must be less than " &
-
        "the number of Assigned Aircraft." & vbCrLf & vbCrLf _
        & "Please reenter the number."
    BoxCheck = 1
    .SetFocus
    Exit Sub
End If
End With
With OtherBox2
    If Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Aircraft Unavailable for Other
Reasons."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempOther2 = OtherBox2
    If TempOther2 < 0 Then
        MsgBox "Please enter a nonnegative value for the Aircraft Unavailable for Other
Reasons."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    If TempOther2 > TempAssigned2 Then
        MsgBox "The number of the Aircraft Unavailable for Other reasons must " & _
            "be less than the number of Assigned Aircraft." & vbCrLf & vbCrLf _
            & "Please reenter the number."
        BoxCheck = 1
        .SetFocus

```

```

        Exit Sub
    End If
End With
If TempNMC2 + TempOther2 > TempAssigned2 Then
    MsgBox "The number of Non Mission Capable Aircraft plus the Aircraft
Unavailable for Other " & _
        "Reasons must total less than the number of Assigned Aircraft." & vbCrLf &
vbCrLf _
        & "Please recheck and reenter these numbers."
    BoxCheck = 1
    Exit Sub
End If
With QEfficiencyBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Aircraft's Utilization."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempTankUtilization2 = QEfficiencyBox2
    If TempTankUtilization2 < 0 Or TempTankUtilization2 > 1 Then
        MsgBox "Please enter a number between 0 and 1 for the Aircraft's Utilization."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With

'tanker3

' Checks to ensure users inputs are numeric, the utilization is between 0 and 1, _
' and that NMC and Other aircraft total does not exceed the available aircraft
' Assigns users inputs to temporary variables to calculate available aircraft required
    With OneAircraftSortieGenBox3
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the daily sortie generation capability
of one aircraft."
            .SetFocus
            BoxCheck = 1
            Exit Sub
        End If
        OneAircraftDailyGeneration3 = OneAircraftSortieGenBox3
        If OneAircraftDailyGeneration3 < 0 Then
            MsgBox "Please enter a nonnegative value for the daily sortie generation
capability of one aircraft."
            .SetFocus

```

```

        BoxCheck = 1
    Exit Sub
End If
End With
With AssignedBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Total Assigned Aircraft."
        .SetFocus
        BoxCheck = 1
    Exit Sub
    End If
    TempAssigned3 = AssignedBox3
    If TempAssigned3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Assigned Aircraft."
        .SetFocus
        BoxCheck = 1
    Exit Sub
    End If
End With
With NMCBox3
    If Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Non Mission Capable Aircraft."
        .SetFocus
        BoxCheck = 1
    Exit Sub
    End If
    TempNMC3 = NMCBox3
    If TempNMC3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Non Mission Capable
Aircraft."
        .SetFocus
        BoxCheck = 1
    Exit Sub
    End If
    If TempNMC3 > TempAssigned3 Then
        MsgBox "The number of the Non Mission Capable Aircraft must be less than " &
        — "the number of Assigned Aircraft." & vbCrLf & vbCrLf _
        & "Please reenter the number."
        BoxCheck = 1
        .SetFocus
    Exit Sub
    End If
End With
With OtherBox3
    If Not IsNumeric(.Value) Then

```

```

        MsgBox "Please enter a numeric value for the Aircraft Unavailable for Other
Reasons."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempOther3 = OtherBox3
    If TempOther3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Aircraft Unavailable for Other
Reasons."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    If TempOther3 > TempAssigned3 Then
        MsgBox "The number of the Aircraft Unavailable for Other reasons must " & _
            "be less than the number of Assigned Aircraft." & vbCrLf & vbCrLf _
            & "Please reenter the number."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
End With
If TempNMC3 + TempOther3 > TempAssigned3 Then
    MsgBox "The number of Non Mission Capable Aircraft plus the Aircraft
Unavailable for Other " & _
        "Reasons must total less than the number of Assigned Aircraft." & vbCrLf &
vbCrLf _
        & "Please recheck and reenter these numbers."
    BoxCheck = 1
    Exit Sub
End If
With QEfficiencyBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Aircraft's Utilization."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempTankUtilization3 = QEfficiencyBox3
    If TempTankUtilization3 < 0 Or TempTankUtilization3 > 1 Then
        MsgBox "Please enter a number between 0 and 1 for the Aircraft's Utilization."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End If

```

End With
End Sub

Private Sub ReturnCmd_Click()
'Unload the form
 InputAircraftIntData.Hide
End Sub

Option Explicit
Dim TempAssigned As Integer, TempNonAvail As Integer, TempTimeFrame As Double, _
 TempAvail As Double, TempCrewUtilization As Double, _
 WeekMaxHrs As Double, MonthMaxHrs As Double, ThreeMonthMaxHrs As Double, _
 TempWeek As Double, TempMonth As Double, TempThreeMonth As Double, _


```

        BoxCheck As Integer, HoursCheck As Integer, _
        TempAssigned2 As Integer, TempNonAvail2 As Integer, TempTimeFrame2 As
Double, _
        TempAvail2 As Double, TempCrewUtilization2 As Double, _
        WeekMaxHrs2 As Double, MonthMaxHrs2 As Double, ThreeMonthMaxHrs2 As
Double, _
        TempWeek2 As Double, TempMonth2 As Double, TempThreeMonth2 As Double,
-
        TempAssigned3 As Integer, TempNonAvail3 As Integer, TempTimeFrame3 As
Double, _
        TempAvail3 As Double, TempCrewUtilization3 As Double, _
        WeekMaxHrs3 As Double, MonthMaxHrs3 As Double, ThreeMonthMaxHrs3 As
Double, _
        TempWeek3 As Double, TempMonth3 As Double, TempThreeMonth3 As Double

```

```

Private Sub UserForm_Initialize()
' Hides hours boxes and units until a time frame is selected

```

```

    OneWeekHrsBox.Visible = False
    OneMonthHrsBox.Visible = False
    ThreeMonthHrsBox.Visible = False

```

```

    OneWeekHrsBox2.Visible = False
    OneMonthHrsBox2.Visible = False
    ThreeMonthHrsBox2.Visible = False

```

```

    OneWeekHrsBox3.Visible = False
    OneMonthHrsBox3.Visible = False
    ThreeMonthHrsBox3.Visible = False

```

```

End Sub

```

```

Private Sub ConsiderAllOption_Click()

```

```

' Unhides the appropriate box for user to enter max flying hours for all time frames

```

```

    OneWeekHrsBox.Visible = True

```

```

    OneMonthHrsBox.Visible = True

```

```

    ThreeMonthHrsBox.Visible = True

```

```

    OneWeekHrsBox2.Visible = True

```

```

    OneMonthHrsBox2.Visible = True

```

```

    ThreeMonthHrsBox2.Visible = True

```

```

    OneWeekHrsBox3.Visible = True

```

OneMonthHrsBox3.Visible = True

ThreeMonthHrsBox3.Visible = True

End Sub

Private Sub OneMonthOption_Click()

' Unhides the appropriate box for user to enter max flying hours for one month

OneWeekHrsBox.Visible = False

OneMonthHrsBox.Visible = True

ThreeMonthHrsBox.Visible = False

OneWeekHrsBox2.Visible = False

OneMonthHrsBox2.Visible = True

ThreeMonthHrsBox2.Visible = False

OneWeekHrsBox3.Visible = False

OneMonthHrsBox3.Visible = True

ThreeMonthHrsBox3.Visible = False

End Sub

Private Sub OneWeekOption_Click()

' Unhides the appropriate box for user to enter max flying hours for one week

OneWeekHrsBox.Visible = True

OneMonthHrsBox.Visible = False

ThreeMonthHrsBox.Visible = False

OneWeekHrsBox2.Visible = True

OneMonthHrsBox2.Visible = False

ThreeMonthHrsBox2.Visible = False

OneWeekHrsBox3.Visible = True

OneMonthHrsBox3.Visible = False

ThreeMonthHrsBox3.Visible = False

End Sub

Private Sub ThreeMonthOption_Click()

' Unhides the appropriate box for user to enter max flying hours for three months

OneWeekHrsBox.Visible = False

OneMonthHrsBox.Visible = False

ThreeMonthHrsBox.Visible = True

OneWeekHrsBox2.Visible = False

OneMonthHrsBox2.Visible = False

ThreeMonthHrsBox2.Visible = True

OneWeekHrsBox3.Visible = False

OneMonthHrsBox3.Visible = False

ThreeMonthHrsBox3.Visible = True

End Sub

Private Sub CmdCalcAircrewInt_Click()

' Initializes NonAvailBox to allow users to assume all crews are available

BoxCheck = 0

' Calls subroutine to check if inputs are valid

Call CheckInputs

If BoxCheck = 1 Then

Exit Sub

End If

' Calculate Available Aircrew

TempAvail = (TempAssigned - TempNonAvail) * TempCrewUtilization

TempAvail2 = (TempAssigned2 - TempNonAvail2) * TempCrewUtilization2

```

    TempAvail3 = (TempAssigned3 - TempNonAvail3) * TempCrewUtilization3
' Calculate Aircrew Interval
    AircrewInt = TempAvail * TempTimeFrame / RTFT
    If AircrewInt < 0 Then
        AircrewInt = 0
    End If
    TempAircrewSortieGenBox = AircrewInt

    AircrewInt2 = TempAvail2 * TempTimeFrame2 / RTFT2
    If AircrewInt2 < 0 Then
        AircrewInt2 = 0
    End If
    TempAircrewSortieGenBox2 = AircrewInt2

    AircrewInt3 = TempAvail3 * TempTimeFrame3 / RTFT3
    If AircrewInt3 < 0 Then
        AircrewInt3 = 0
    End If
    TempAircrewSortieGenBox3 = AircrewInt3
End Sub

Private Sub CmdCancel_Click()
' Closes the form without saving any data
    Unload Me
End Sub

Private Sub CmdInstructions_Click()
    InstructionsAircrewInt.Show
End Sub

Private Sub ReturnCmd_Click()
' Returns used to the main form, saving data by hiding the form
    InputAircrewIntData.Hide
End Sub

Sub CheckInputs()
' Assigns users inputs to temporary variables to calculate available aircrew required
    With AssignedBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the Total Assigned Aircrew."
            BoxCheck = 1
            .SetFocus
            Exit Sub
        End If
        TempAssigned = AssignedBox
        If TempAssigned < 0 Then

```

```

        MsgBox "Please enter a nonnegative value for the Assigned Aircrew."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With NonAvailBox
    If Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Unavailable Crews."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
    TempNonAvail = NonAvailBox
    If TempNonAvail < 0 Or TempNonAvail > TempAssigned Then
        MsgBox "Please enter a nonnegative value between 0 and " & TempAssigned & "
for Unavailable Crews."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
End With
With CrewUtilizationBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Aircrew's Utilization."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
    TempCrewUtilization = CrewUtilizationBox
    If TempCrewUtilization < 0 Or TempCrewUtilization > 1 Then
        BoxCheck = 1
        MsgBox "Please enter a number between 0 and 1 for the Aircrew's Utilization."
        .SetFocus
        Exit Sub
    End If
End With
' Assings a number to the hourscheck variable to let CheckFlyingHoursInput proceedure
know which box to check
' Calls proceedure to check box and uses BoxCheck variable to determine if inputs are
acceptable
    If OneWeekOption = True Then
        HoursCheck = 1
        CheckFlyingHoursInput
        If BoxCheck = 1 Then
            Exit Sub
        End If
    End If
End Sub

```

```

    End If
    TempTimeFrame = WeekMaxHrs / 7
ElseIf OneMonthOption = True Then
    HoursCheck = 2
    CheckFlyingHoursInput
    If BoxCheck = 1 Then
        Exit Sub
    End If
    TempTimeFrame = MonthMaxHrs / 30
ElseIf ThreeMonthOption = True Then
    HoursCheck = 3
    CheckFlyingHoursInput
    If BoxCheck = 1 Then
        Exit Sub
    End If
    TempTimeFrame = ThreeMonthMaxHrs / 90
ElseIf ConsiderAllOption = True Then
' Determines the most confining variable from max flying hours per time frames
    HoursCheck = 4
    CheckFlyingHoursInput
    If BoxCheck = 1 Then
        Exit Sub
    End If
    TempWeek = WeekMaxHrs / 7
    TempMonth = MonthMaxHrs / 30
    TempThreeMonth = ThreeMonthMaxHrs / 90
    If TempWeek < TempMonth And TempWeek < TempThreeMonth Then
        TempTimeFrame = TempWeek
    ElseIf TempMonth < TempWeek And TempMonth < TempThreeMonth Then
        TempTimeFrame = TempMonth
    Else
        TempTimeFrame = TempThreeMonth
    End If
Else
    MsgBox "At least one time frame must be selected."
    BoxCheck = 1
    Exit Sub
End If

```

'tanker2

```

'Assigns users inputs to temporary variables to calculate available aircrew required
With AssignedBox2
    If .Value = "" Or Not IsNumeric(.Value) Then

```

```

    MsgBox "Please enter a numeric value for the Total Assigned Aircrew."
    BoxCheck = 1
    .SetFocus
    Exit Sub
End If
TempAssigned2 = AssignedBox2
If TempAssigned2 < 0 Then
    MsgBox "Please enter a nonnegative value for the Assigned Aircrew."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
End With
With NonAvailBox2
    If Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Unavailable Crews."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
    TempNonAvail2 = NonAvailBox2
    If TempNonAvail2 < 0 Or TempNonAvail2 > TempAssigned2 Then
        MsgBox "Please enter a nonnegative value between 0 and " & TempAssigned2 & "
for Unavailable Crews."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
End With
With CrewUtilizationBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Aircrew's Utilization."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
    TempCrewUtilization2 = CrewUtilizationBox2
    If TempCrewUtilization2 < 0 Or TempCrewUtilization2 > 1 Then
        BoxCheck = 1
        MsgBox "Please enter a number between 0 and 1 for the Aircrew's Utilization."
        .SetFocus
        Exit Sub
    End If
End With
' Assings a number to the hourscheck variable to let CheckFlyingHoursInput proceeedure
know which box to check

```

```

' Calls procedure to check box and uses BoxCheck variable to determine if inputs are
acceptable
    If OneWeekOption = True Then
        HoursCheck = 1
        CheckFlyingHoursInput
        If BoxCheck = 1 Then
            Exit Sub
        End If
        TempTimeFrame2 = WeekMaxHrs2 / 7
    ElseIf OneMonthOption = True Then
        HoursCheck = 2
        CheckFlyingHoursInput
        If BoxCheck = 1 Then
            Exit Sub
        End If
        TempTimeFrame2 = MonthMaxHrs2 / 30
    ElseIf ThreeMonthOption = True Then
        HoursCheck = 3
        CheckFlyingHoursInput
        If BoxCheck = 1 Then
            Exit Sub
        End If
        TempTimeFrame2 = ThreeMonthMaxHrs2 / 90
    ElseIf ConsiderAllOption = True Then
' Determines the most confining variable from max flying hours per time frames
        HoursCheck = 4
        CheckFlyingHoursInput
        If BoxCheck = 1 Then
            Exit Sub
        End If
        TempWeek2 = WeekMaxHrs2 / 7
        TempMonth2 = MonthMaxHrs2 / 30
        TempThreeMonth2 = ThreeMonthMaxHrs2 / 90
        If TempWeek2 < TempMonth2 And TempWeek2 < TempThreeMonth2 Then
            TempTimeFrame2 = TempWeek2
        ElseIf TempMonth2 < TempWeek2 And TempMonth2 < TempThreeMonth2 Then
            TempTimeFrame2 = TempMonth2
        Else
            TempTimeFrame2 = TempThreeMonth2
        End If
    Else
        MsgBox "At least one time frame must be selected."
        BoxCheck = 1
        Exit Sub
    End If

```


'tanker3

```
'Assigns users inputs to temporary variables to calculate available aircrew required
With AssignedBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Total Assigned Aircrew."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
    TempAssigned3 = AssignedBox3
    If TempAssigned3 < 0 Then
        MsgBox "Please enter a nonnegative value for the Assigned Aircrew."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With NonAvailBox3
    If Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Unavailable Crews."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
    TempNonAvail3 = NonAvailBox3
    If TempNonAvail3 < 0 Or TempNonAvail3 > TempAssigned3 Then
        MsgBox "Please enter a nonnegative value between 0 and " & TempAssigned3 & "
for Unavailable Crews."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
End With
With CrewUtilizationBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the Aircrew's Utilization."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
    TempCrewUtilization3 = CrewUtilizationBox3
    If TempCrewUtilization3 < 0 Or TempCrewUtilization3 > 1 Then
        BoxCheck = 1
        MsgBox "Please enter a number between 0 and 1 for the Aircrew's Utilization."
```

```

        .SetFocus
    Exit Sub
End If
End With
' Assings a number to the hourscheck variable to let CheckFlyingHoursInput procedure
know which box to check
' Calls procedure to check box and uses BoxCheck variable to determine if inputs are
acceptable
    If OneWeekOption = True Then
        HoursCheck = 1
        CheckFlyingHoursInput
        If BoxCheck = 1 Then
            Exit Sub
        End If
        TempTimeFrame3 = WeekMaxHrs3 / 7
    ElseIf OneMonthOption = True Then
        HoursCheck = 2
        CheckFlyingHoursInput
        If BoxCheck = 1 Then
            Exit Sub
        End If
        TempTimeFrame3 = MonthMaxHrs3 / 30
    ElseIf ThreeMonthOption = True Then
        HoursCheck = 3
        CheckFlyingHoursInput
        If BoxCheck = 1 Then
            Exit Sub
        End If
        TempTimeFrame3 = ThreeMonthMaxHrs3 / 90
    ElseIf ConsiderAllOption = True Then
        ' Determines the most confining variable from max flying hours per time frames
        HoursCheck = 4
        CheckFlyingHoursInput
        If BoxCheck = 1 Then
            Exit Sub
        End If
        TempWeek3 = WeekMaxHrs3 / 7
        TempMonth3 = MonthMaxHrs3 / 30
        TempThreeMonth3 = ThreeMonthMaxHrs3 / 90
        If TempWeek3 < TempMonth3 And TempWeek3 < TempThreeMonth3 Then
            TempTimeFrame3 = TempWeek3
        ElseIf TempMonth3 < TempWeek3 And TempMonth3 < TempThreeMonth3 Then
            TempTimeFrame3 = TempMonth3
        Else
            TempTimeFrame3 = TempThreeMonth3
        End If
    End If
End Sub

```

```

Else
    MsgBox "At least one time frame must be selected."
    BoxCheck = 1
    Exit Sub
End If

End Sub

Sub CheckFlyingHoursInput()
'Assigns users inputs for max flying hours to temporary variables to calculate
TempTimeFrame
' Exits procedure if entry to box does not meet appropriate criteria
    If HoursCheck = 1 Or HoursCheck = 4 Then
        With OneWeekHrsBox
            If .Value = "" Or Not IsNumeric(.Value) Then
                MsgBox "Please enter a numeric value for the maximum number of hours a
crew can fly in one week."
                BoxCheck = 1
                .SetFocus
                Exit Sub
            End If
            WeekMaxHrs = OneWeekHrsBox
            If WeekMaxHrs < 0 Or WeekMaxHrs > 168 Then
                BoxCheck = 1
                MsgBox "Please enter a number between 0 and 168 for the maximum number
of hours a crew can fly in one week."
                Exit Sub
            End If
        End With
    End If
    If HoursCheck = 2 Or HoursCheck = 4 Then
        With OneMonthHrsBox
            If .Value = "" Or Not IsNumeric(.Value) Then
                MsgBox "Please enter a numeric value for the maximum number of hours a
crew can fly in one month."
                BoxCheck = 1
                .SetFocus
                Exit Sub
            End If
            MonthMaxHrs = OneMonthHrsBox
            If MonthMaxHrs < 0 Or MonthMaxHrs > 720 Then
                BoxCheck = 1
                MsgBox "Please enter a number between 0 and 720 for the maximum number
of hours a crew can fly in one month."
                Exit Sub
            End If
        End With
    End If
End Sub

```

```

        End With
    End If
    If HoursCheck = 3 Or HoursCheck = 4 Then
        With ThreeMonthHrsBox
            If .Value = "" Or Not IsNumeric(.Value) Then
                MsgBox "Please enter a numeric value for the maximum number of hours a
crew can fly in three months."
                BoxCheck = 1
                .SetFocus
            Exit Sub
        End If
        ThreeMonthMaxHrs = ThreeMonthHrsBox
        If ThreeMonthMaxHrs < 0 Or ThreeMonthMaxHrs > 2160 Then
            BoxCheck = 1
            MsgBox "Please enter a number between 0 and 2160 for the maximum number
of hours a crew can fly in three months."
            Exit Sub
        End If
    End With
End If

```

'tanker2

```

'Assigns users inputs for max flying hours to temporary variables to calculate
TempTimeFrame
' Exits procedure if entry to box does not meet appropriate criteria
    If HoursCheck = 1 Or HoursCheck = 4 Then
        With OneWeekHrsBox2
            If .Value = "" Or Not IsNumeric(.Value) Then
                MsgBox "Please enter a numeric value for the maximum number of hours a
crew can fly in one week."
                BoxCheck = 1
                .SetFocus
            Exit Sub
        End If
        WeekMaxHrs2 = OneWeekHrsBox2
        If WeekMaxHrs < 0 Or WeekMaxHrs > 168 Then
            BoxCheck = 1
            MsgBox "Please enter a number between 0 and 168 for the maximum number
of hours a crew can fly in one week."
            Exit Sub
        End If
    End With
End If

```

```

If HoursCheck = 2 Or HoursCheck = 4 Then
    With OneMonthHrsBox2
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the maximum number of hours a
crew can fly in one month."
            BoxCheck = 1
            .SetFocus
            Exit Sub
        End If
        MonthMaxHrs2 = OneMonthHrsBox2
        If MonthMaxHrs2 < 0 Or MonthMaxHrs2 > 720 Then
            BoxCheck = 1
            MsgBox "Please enter a number between 0 and 720 for the maximum number
of hours a crew can fly in one month."
            Exit Sub
        End If
    End With
End If
If HoursCheck = 3 Or HoursCheck = 4 Then
    With ThreeMonthHrsBox2
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the maximum number of hours a
crew can fly in three months."
            BoxCheck = 1
            .SetFocus
            Exit Sub
        End If
        ThreeMonthMaxHrs2 = ThreeMonthHrsBox2
        If ThreeMonthMaxHrs2 < 0 Or ThreeMonthMaxHrs2 > 2160 Then
            BoxCheck = 1
            MsgBox "Please enter a number between 0 and 2160 for the maximum number
of hours a crew can fly in three months."
            Exit Sub
        End If
    End With
End If
'tanker3

```

```

'Assigns users inputs for max flying hours to temporary variables to calculate
TempTimeFrame
' Exits proceedure if entry to box does not meet appropriate criteria
If HoursCheck = 1 Or HoursCheck = 4 Then
    With OneWeekHrsBox3
        If .Value = "" Or Not IsNumeric(.Value) Then

```

```

        MsgBox "Please enter a numeric value for the maximum number of hours a
crew can fly in one week."
        BoxCheck = 1
        .SetFocus
        Exit Sub
    End If
    WeekMaxHrs3 = OneWeekHrsBox3
    If WeekMaxHrs < 0 Or WeekMaxHrs > 168 Then
        BoxCheck = 1
        MsgBox "Please enter a number between 0 and 168 for the maximum number
of hours a crew can fly in one week."
        Exit Sub
    End If
End With
End If
If HoursCheck = 2 Or HoursCheck = 4 Then
    With OneMonthHrsBox3
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the maximum number of hours a
crew can fly in one month."
            BoxCheck = 1
            .SetFocus
            Exit Sub
        End If
        MonthMaxHrs3 = OneMonthHrsBox3
        If MonthMaxHrs3 < 0 Or MonthMaxHrs3 > 720 Then
            BoxCheck = 1
            MsgBox "Please enter a number between 0 and 720 for the maximum number
of hours a crew can fly in one month."
            Exit Sub
        End If
    End With
End If
If HoursCheck = 3 Or HoursCheck = 4 Then
    With ThreeMonthHrsBox3
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the maximum number of hours a
crew can fly in three months."
            BoxCheck = 1
            .SetFocus
            Exit Sub
        End If
        ThreeMonthMaxHrs3 = ThreeMonthHrsBox3
        If ThreeMonthMaxHrs3 < 0 Or ThreeMonthMaxHrs3 > 2160 Then
            BoxCheck = 1

```

MsgBox "Please enter a number between 0 and 2160 for the maximum number of hours a crew can fly in three months."

Exit Sub

End If

End With

End If

End Sub

The screenshot shows a Windows-style dialog box titled "Input Data for Sortie Generation Rates, Base". It has a blue title bar with a close button. The main area is light blue and contains an "Instructions" tab. Below the tab are three columns labeled "Tanker 1", "Tanker 2", and "Tanker 1". Each column has a set of input fields. The first three rows are for "Input the Base's Maximum on Ground", "Input the Base Total Operating Hours (hrs)", and "Input the Base Queuing Factor". The next two rows are for "Input the Fuel Used in Flight by the Tanker" and "Input Maximum Fuel available at Base", each with radio buttons for "Pounds" and "Gallons". At the bottom, there is a "Calculate Sortie Generation Capability" button and two empty text boxes. At the very bottom are "Return" and "Cancel" buttons.

Option Explicit

```
Dim TempMOG As Double, TempOpHours As Double, TempQFactor As Double, _
    TempBaseFuel As Double, BoxCheck As Integer, _
    MOGCapability As Double, FuelCapability As Double, _
    TempMOG2 As Double, TempOpHours2 As Double, TempQFactor2 As Double, _
    TempBaseFuel2 As Double, _
    MOGCapability2 As Double, FuelCapability2 As Double, _
    TempMOG3 As Double, TempOpHours3 As Double, TempQFactor3 As Double, _
    TempBaseFuel3 As Double, _
    MOGCapability3 As Double, FuelCapability3 As Double
```

Private Sub TextBox6_Change()

End Sub

```

Private Sub UserForm_Initialize()
' Checks to see if tanker fuel was inputted before during available fuel calculations
' If it was, value is inputted into the box
    If Not TankerFuelUsed = 0 Then
        TankerFuelUsedBox.Value = TankerFuelUsed
        TankerPoundsOption = True
    End If
    If Not TankerFuelUsed2 = 0 Then
        TankerFuelUsedBox2.Value = TankerFuelUsed2
        TankerPoundsOption = True
    End If
    If Not TankerFuelUsed3 = 0 Then
        TankerFuelUsedBox3.Value = TankerFuelUsed3
        TankerPoundsOption = True
    End If
End Sub
Private Sub CmdCalcStationInt_Click()
    BoxCheck = 0
' Calls subroutine to check if inputs are valid
    Call CheckInputs
    If BoxCheck = 1 Then
        Exit Sub
    End If
'Calculate Sortie Generation based on base's data considering MOG and time and fuel
capacity
    MOGCapability = TempMOG * TempOpHours / TotalGroundTime * TempQFactor
    FuelCapability = TempBaseFuel / (TankerFuelUsed + OffloadReq)

    MOGCapability2 = TempMOG2 * TempOpHours2 / TotalGroundTime2 *
TempQFactor2
    FuelCapability2 = TempBaseFuel2 / (TankerFuelUsed2 + OffloadReq)

    MOGCapability3 = TempMOG3 * TempOpHours3 / TotalGroundTime3 *
TempQFactor3
    FuelCapability3 = TempBaseFuel3 / (TankerFuelUsed3 + OffloadReq)

    MsgBox "The maximum sortie generation based on MOG is " & MOGCapability &
vbCrLf & _
        "The maximum sortie generation based on fuel is " & FuelCapability
    If MOGCapability < FuelCapability Then
        BaseInt = MOGCapability
    Else
        BaseInt = FuelCapability
    End If
    If BaseInt < 0 Then
        BaseInt = 0
    End If

```



```

End If
TempBaseIntBox = BaseInt

If MOGCapability2 < FuelCapability2 Then
    BaseInt2 = MOGCapability2
Else
    BaseInt2 = FuelCapability2
End If
If BaseInt2 < 0 Then
    BaseInt2 = 0
End If
TempBaseIntBox2 = BaseInt2

If MOGCapability3 < FuelCapability3 Then
    BaseInt3 = MOGCapability3
Else
    BaseInt3 = FuelCapability3
End If
If BaseInt3 < 0 Then
    BaseInt3 = 0
End If
TempBaseIntBox3 = BaseInt3
End Sub

Private Sub CmdCancel_Click()
' Closes the form without saving any data
    Unload Me
End Sub

Private Sub InstructionsCmd_Click()
    InstructionsBaseInt.Show
End Sub

Private Sub ReturnCmd_Click()
    InputBaseIntData.Hide
End Sub

Sub CheckInputs()
'Assigns users inputs to temporary variables to calculate Station Interval
    With MOGBox
        If .Value = "" Or Not IsNumeric(.Value) Then
            MsgBox "Please enter a numeric value for the base's Maximum Aircraft on
Ground."
            .SetFocus
            BoxCheck = 1
        Exit Sub
    End With

```

```

End If
TempMOG = MOGBox
If TempMOG < 0 Then
    MsgBox "Please enter a nonnegative value for the base's Maximum Aircraft on
Ground."
    .SetFocus
    BoxCheck = 1
    Exit Sub
End If
End With
With OpHoursBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the base's Operating Hours."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempOpHours = OpHoursBox
    If TempOpHours < 0 Or TempOpHours > 24 Then
        MsgBox "Please enter a number between 0 and 24 Hours for the base's Operating
Hours."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With BaseFuelBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the fuel available from the base."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempBaseFuel = BaseFuelBox
    If TempBaseFuel < 0 Then
        MsgBox "Please enter a non negative value for the fuel available from the base."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If PoundsOption = False And GallonsOption = False Then
    MsgBox "Please indicate if base fuel is in pounds or gallons."
    Exit Sub
ElseIf GallonsOption = True Then
    TempBaseFuel = TempBaseFuel * 6.79

```

```

End If
With QFactorBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the base's Queuing Efficiency."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempQFactor = QFactorBox
    If TempQFactor < 0 Or TempQFactor > 1 Then
        MsgBox "Please enter a number between 0 and 1 for the base's Queuing Factor."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With TankerFuelUsedBox
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the fuel used by the Tanker."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TankerFuelUsed = TankerFuelUsedBox
    If TankerFuelUsed < 0 Then
        MsgBox "Please enter a non negative value for the fuel used by the Tanker."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If TankerPoundsOption = False And TankerGallonsOption = False Then
    MsgBox "Please indicate if tanker fuel is in pounds or gallons."
    Exit Sub
ElseIf TankerGallonsOption = True Then
    TankerFuelUsed = TankerFuelUsed * 6.799
End If

'tanker2

'Assigns users inputs to temporary variables to calculate Station Interval
With MOGBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the base's Maximum Aircraft on
Ground."
        .SetFocus

```

```

        BoxCheck = 1
        Exit Sub
    End If
    TempMOG2 = MOGBox2
    If TempMOG2 < 0 Then
        MsgBox "Please enter a nonnegative value for the base's Maximum Aircraft on
Ground."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With OpHoursBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the base's Operating Hours."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempOpHours2 = OpHoursBox2
    If TempOpHours2 < 0 Or TempOpHours2 > 24 Then
        MsgBox "Please enter a number between 0 and 24 Hours for the base's Operating
Hours."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With BaseFuelBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the fuel available from the base."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempBaseFuel2 = BaseFuelBox2
    If TempBaseFuel2 < 0 Then
        MsgBox "Please enter a non negative value for the fuel available from the base."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If PoundsOption = False And GallonsOption = False Then
    MsgBox "Please indicate if base fuel is in pounds or gallons."
    Exit Sub

```

```

ElseIf GallonsOption = True Then
    TempBaseFuel2 = TempBaseFuel2 * 6.79
End If
With QFactorBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the base's Queuing Efficiency."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempQFactor2 = QFactorBox2
    If TempQFactor2 < 0 Or TempQFactor2 > 1 Then
        MsgBox "Please enter a number between 0 and 1 for the base's Queuing Factor."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With TankerFuelUsedBox2
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the fuel used by the Tanker."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TankerFuelUsed2 = TankerFuelUsedBox2
    If TankerFuelUsed2 < 0 Then
        MsgBox "Please enter a non negative value for the fuel used by the Tanker."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If TankerPoundsOption = False And TankerGallonsOption = False Then
    MsgBox "Please indicate if tanker fuel is in pounds or gallons."
    Exit Sub
ElseIf TankerGallonsOption = True Then
    TankerFuelUsed2 = TankerFuelUsed2 * 6.799
End If

'tanker3

'Assigns users inputs to temporary variables to calculate Station Interval
With MOGBox3
    If .Value = "" Or Not IsNumeric(.Value) Then

```

```

        MsgBox "Please enter a numeric value for the base's Maximum Aircraft on
Ground."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempMOG3 = MOGBox3
    If TempMOG3 < 0 Then
        MsgBox "Please enter a nonnegative value for the base's Maximum Aircraft on
Ground."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With OpHoursBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the base's Operating Hours."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempOpHours3 = OpHoursBox3
    If TempOpHours3 < 0 Or TempOpHours3 > 24 Then
        MsgBox "Please enter a number between 0 and 24 Hours for the base's Operating
Hours."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With BaseFuelBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the fuel available from the base."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempBaseFuel3 = BaseFuelBox3
    If TempBaseFuel3 < 0 Then
        MsgBox "Please enter a non negative value for the fuel available from the base."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With

```

```

If PoundsOption = False And GallonsOption = False Then
    MsgBox "Please indicate if base fuel is in pounds or gallons."
    Exit Sub
ElseIf GallonsOption = True Then
    TempBaseFuel3 = TempBaseFuel3 * 6.79
End If
With QFactorBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the base's Queuing Efficiency."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TempQFactor3 = QFactorBox3
    If TempQFactor3 < 0 Or TempQFactor3 > 1 Then
        MsgBox "Please enter a number between 0 and 1 for the base's Queuing Factor."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
With TankerFuelUsedBox3
    If .Value = "" Or Not IsNumeric(.Value) Then
        MsgBox "Please enter a numeric value for the fuel used by the Tanker."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
    TankerFuelUsed3 = TankerFuelUsedBox3
    If TankerFuelUsed3 < 0 Then
        MsgBox "Please enter a non negative value for the fuel used by the Tanker."
        .SetFocus
        BoxCheck = 1
        Exit Sub
    End If
End With
If TankerPoundsOption = False And TankerGallonsOption = False Then
    MsgBox "Please indicate if tanker fuel is in pounds or gallons."
    Exit Sub
ElseIf TankerGallonsOption = True Then
    TankerFuelUsed3 = TankerFuelUsed3 * 6.799
End If
End Sub

```

Below is the code of the Module in VBA
Option Explicit

```

Public OffloadReq As Long, OffloadAvail As Long, MissionReq As Long, RTFT As
Double, _
    CycleTime As Double, AircraftInt As Double, AircrewInt As Double, _
    TotalGroundTime As Double, BaseInt As Double, MaxFuelAvail As Long, _
    CurrentFuel As Long, TankerFuelUsed As Double, CurrentTime As Variant, _
    ReturnToForm As Integer, TrackRTFTEnter As Integer, OffloadAvail2 As Long,
BoomMissionReq As Integer, _
    maxboommissionbox As Integer, mintankersMissionReq As Integer, RTFT2 As
Double, RTFT3 As Double, _
    CycleTime2 As Double, AircraftInt2 As Double, AircrewInt2 As Double, _
    TotalGroundTime2 As Double, BaseInt2 As Double, MaxFuelAvail2 As Long, _
    CycleTime3 As Double, AircraftInt3 As Double, AircrewInt3 As Double, _
    TotalGroundTime3 As Double, BaseInt3 As Double, MaxFuelAvail3 As Long, _
    TankerFuelUsed2 As Double, TankerFuelUsed3 As Double, OffloadAvail3 As Long

```

```

Sub Instructions()

```

```

' Opens the first page of instructions, which gives a broad overview of the program
' Allows the user to advance to more detailed instructions or return to the starting sheet

```

```

    InstructionsPg1.Show

```

```

End Sub

```

```

Sub ToMainForm()

```

```

' Calls the form which the user will enter and calculate all data

```

```

    TankerFuelUsed = 0

```

```

    MainInput.Show

```

```

End Sub

```

```

Sub EnterDataManually()

```

```

' Place holder for routine to check if user wants to enter data manually

```

```

' Instead of asking in each routine

```

```

End Sub

```

```

Sub ReturnToMainForm()

```

```

' Places the main sheet in the background again and returns to the main form

```

```

    ThisWorkbook.Worksheets("Tanker Employment").Activate

```

```

' Using ReturnToForm, selects which form to return the user to

```

```

    Select Case ReturnToForm

```

```

        Case 1

```

```

            InputFuelReqData.Show

```

```

            MainInput.Show

```

```

        Case 2

```



```

        InputFuelAvailData.Show
        MainInput.Show
    Case 3
        MainInput.Show
    Case 4
        InstructionsRTFT.Show
        InputFirstRTFTData.Show
        MainInput.Show
    Case Else
        ThisWorkbook.Worksheets("Tanker Employment").Activate
    End Select
End Sub

Sub PrintChart()
' Will allow the user to print the chart
    MsgBox "Place holder to allow user to print chart"

End Sub

Sub ToBeginningSheet()
' Calls the form which the user will enter and calculate all data
    ThisWorkbook.Worksheets("Tanker Employment").Activate
End Sub

Function RoundNear(varNumber As Variant, varDelta As Variant) As Variant

' by Dejan Mladenovic, <<http://advisor.com/doc/08884>> accessed 31 Jan 05
' Rounds varnumber to the nearest multiple of varDelta

    Dim varDec As Variant
    Dim intX As Integer
    Dim varX As Variant

    varX = varNumber / varDelta
    intX = Int(varX)
    varDec = CDec(varX) - intX

    If varDec >= 0.5 Then
        RoundNear = varDelta * (intX + 1)
    Else
        RoundNear = varDelta * intX
    End If
End Function

```

Instructions for Entering Data to Calculate Aircraft Interval 

To calculate Sortie Generation Rates based upon aircraft data, the individual sortie generation rate, the number of available aircraft, aircraft utilization, and the cycle time (in hours) are used.

When this form is opened, a number will be in the single Aircraft Sortie Generation Rate box. This number is calculated using Cycle Time calculations inputted earlier *. The user can modify this number to reflect the number of times a tanker can be generated in one day.

To calculate the number of available aircraft, enter the number of assigned tankers and the number of unavailable aircraft due being Non Mission Capable, or unavailable for other reasons (including alert status, programmed for depot, etc.)

Aircraft Utilization is a number between 0 and 1, which accounts for scheduling and operational realities. (For example, just because aircraft is available does not mean there is a mission to fly.)

* The cycle time can only be entered on the main form, by either entering the data manually or using the button to open a form to input data to calculate the time.

Done

Option Explicit

```
Private Sub CmdCancel_Click()
    Unload Me
End Sub
```

```
Private Sub UserForm_Click()

End Sub
```

Instructions, Data Entry for Sortie Generation, Aircrew

To calculate Sortie Generation Rates based upon aircrew data,, the number of available aircrew, aircrew utilization, the maximum flying hours in a given time frame, and Round Trip Flying time, are used.

To calculate the number of available aircrew, enter the number of assigned aircrew and the number of unavailable due for any reason such as being DNIF, being TDY, etc.)

Aircrew Utilization is a number between 0 and 1, which accounts for scheduling and operational realities. (For example, just because a crew is ready to fly does not mean there is a mission to fly.)

Selecting a time frame will prompt the user to enter the maximum number of flying hours for that period into the form. Additionally, the user can select to consider all time periods and enter the maximum hours for each period. If consider all is selected, the most restrictive hours will be used in the final calculation.

The Round Trip Flying Time can only be entered on the main form, either manually or using the button to open a form to calculate the time.

Done

Option Explicit

```
Private Sub CmdCancel_Click()
    Unload Me
End Sub
```

```
Private Sub UserForm_Click()

End Sub
```

Instructions, Data Entry for Sortie Generation, BAsE

To calculate Sortie Generation Rates based upon base capabilities, the bases maximum (aircraft) on ground, total operating hours, a queuing factor, fuel used by the tanker, fuel available at a base, and total ground time are used. The rate will be the minimum between MOG considerations over one day, and fuel availability versus requirements over one day.

MOG values can either be for fueling or parking. If the two numbers are not equal, use the lower value. MOG values can be determined by contacting the base or TACC.

Base Hours should be inputted as the total hours per day the base is open. The number should be between 0 and 24.

Queuing Factor is a number between 0 and 1, which accounts for scheduling and operational realities. (For example, just because the base can service an aircraft does not mean there is an aircraft requiring servicing.) The factor used in AFI 10-1403 is .85 but can be adjusted to base's individual circumstances."

The fuel used in flight will be calculated earlier from the main form, and inputted into this form. The user will have the option to accept it or modify the number.

The Maximum Fuel available at a base is a factor of how much fuel can be delivered daily to a base, and of that, how much can be dispensed daily.

The total ground time can only be entered on the main form, by either entering the data manually or using the button to open a form to input data to calculate the time.

Done

Option Explicit

```
Private Sub CmdCancel_Click()  
    Unload Me  
End Sub
```

```
Private Sub UserForm_Click()  
  
End Sub
```

Instructions for Entering Available Fuel

To calculate the fuel available for offload, the amount of fuel on board at takeoff, fuel received in air, the sortie duration, fuel burn, destinate reserve fuel, and offload utilization must be inputed into the form. (Sortie durations is calculated using distance to refueling point, time at point, and return distance multiplied by air speed.)

Note: Not all tanker aircraft can receive fuel in air.

Offload utilization is a number between 0 and 1, which accounts for scheduling and operational realities. (For example, just because a tanker is in air does does not mean there is a receiver requiring fuel.)

Two charts, air speed and fuel burn, are available for reference. Selecting these will take the user to the chart. (To return to this form, select "Return" on the chart.) The information on the charts can be modified by the user as required. (See Main Instructions, page 5, for more details on updating charts.)

Distance must be in nautical miles.
Air Speed must be in nautical miles per hour.
Fuel Burn Rate must be in pounds per hour.
Total Fuel, Received Fuel and Reserve Fuel must be in pounds.

Use conversion buttons below if required

Convert Miles to Nautical Miles

Convert Gallons to Pounds

Convert Minutes to Hours

Done

Option Explicit

Dim Miles As Variant, NauticalMiles As Long, Gallons As Variant, Pounds As Long
Dim Hours As Long, Minutes As Variant

```
Private Sub CmdCancel_Click()
    Unload Me
End Sub
```

```

Private Sub GallonConversionCmd_Click()
' Opens input box to allow user to input gallons and returns the number of pounds
    Gallons = InputBox("Enter the number of gallons to convert to pounds:", _
        "Gallons to Pounds Conversion")
    If Gallons = "" Or Not IsNumeric(Gallons) Then
        MsgBox "You must enter a numerical value to be converted."
        Exit Sub
    End If
    Pounds = Gallons * 6.799
    MsgBox "The number of Pounds is " & Pounds

End Sub

Private Sub MileConversionCmd_Click()
' Opens input box to allow user to input miles and returns the number of nautical miles
    Miles = InputBox("Enter the number of miles to convert to nautical miles:", _
        "Miles to Nautical Mile Conversion")
    If Miles = "" Or Not IsNumeric(Miles) Then
        MsgBox "You must enter a numerical value to be converted."
        Exit Sub
    End If
    NauticalMiles = Miles * 0.868976242
    MsgBox "The number of Nautical Miles is " & NauticalMiles

End Sub

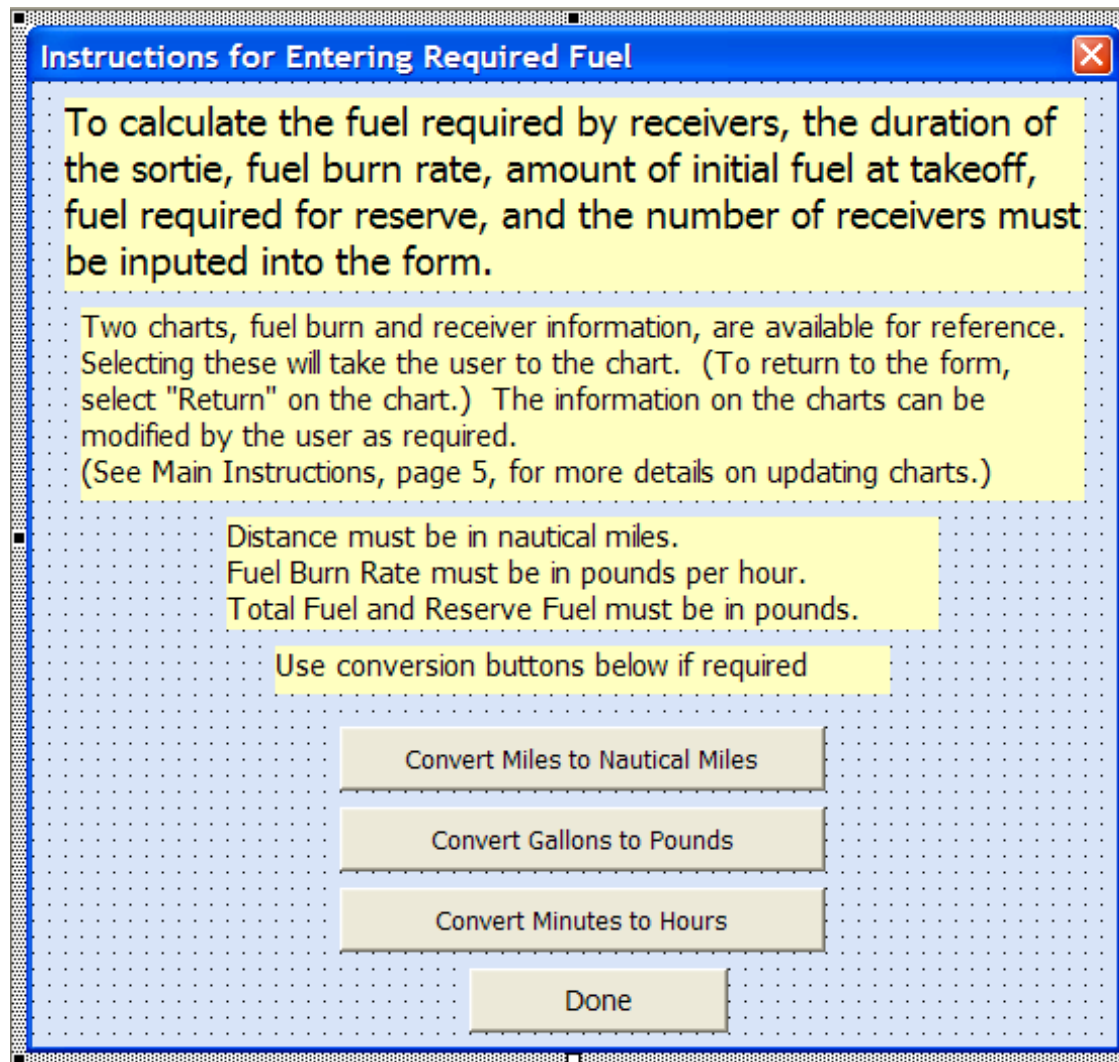
Private Sub MinuteConversionCmd_Click()
' Opens input box to allow user to input miles and returns the number of nautical miles
    Minutes = InputBox("Enter the number of minutes to convert to hours:", _
        "Minutes to Hours Conversion")
    If Minutes = "" Or Not IsNumeric(Minutes) Then
        MsgBox "You must enter a numerical value to be converted."
        Exit Sub
    End If
    Hours = Minutes \ 60
    MsgBox "The number of Hours is " & Hours

End Sub

Private Sub UserForm_Click()

End Sub

```



Option Explicit

Dim Miles As Variant, NauticalMiles As Long, Gallons As Variant, Pounds As Long
 Dim Hours As Long, Minutes As Variant

```
Private Sub CmdCancel_Click()
    Unload Me
End Sub
```

```
Private Sub GallonConversionCmd_Click()
' Opens input box to allow user to input gallons and returns the number of pounds
    Gallons = InputBox("Enter the number of gallons to convert to pounds:", _
        "Gallons to Pounds Conversion")
    If Gallons = "" Or Not IsNumeric(Gallons) Then
        MsgBox "You must enter a numerical value to be converted."
```

```

        Exit Sub
    End If
    Pounds = Gallons * 6.799
    MsgBox "The number of Pounds is " & Pounds
End Sub

```

```

Private Sub MileConversionCmd_Click()
' Opens input box to allow user to input miles and returns the number of nautical miles
    Miles = InputBox("Enter the number of miles to convert to nautical miles:", _
        "Miles to Nautical Mile Conversion")
    If Miles = "" Or Not IsNumeric(Miles) Then
        MsgBox "You must enter a numerical value to be converted."
        Exit Sub
    End If
    NauticalMiles = Miles * 0.868976242
    MsgBox "The number of Nautical Miles is " & NauticalMiles
End Sub

```

```

Private Sub MinuteConversionCmd_Click()
' Opens input box to allow user to input miles and returns the number of nautical miles
    Minutes = InputBox("Enter the number of minutes to convert to hours:", _
        "Minutes to Hours Conversion")
    If Minutes = "" Or Not IsNumeric(Minutes) Then
        MsgBox "You must enter a numerical value to be converted."
        Exit Sub
    End If
    Hours = Minutes \ 60
    MsgBox "The number of Hours is " & Hours
End Sub

```

```

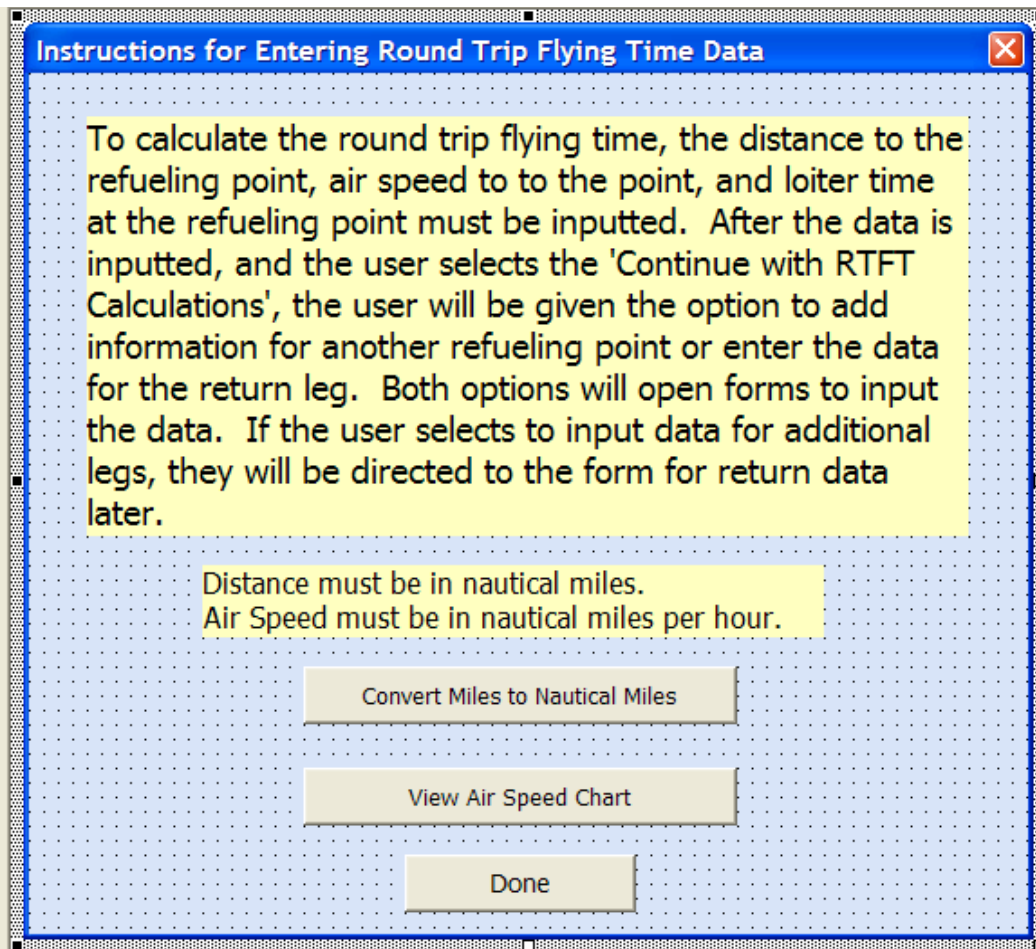
Private Sub UserForm_Click()

```

```

End Sub

```

Fuel Burn Rates

Aircraft Type	Fuel Burn Rate (Lbs/Hr)
A/OA-10	4,160
B-707	13,916
B-747	26,800
B-767	10,552
C-130	5,109
C-141	13,768
C-17	19,643
C-5	23,132
C-9	6,661
DC-10	20,616
DC-8	13,916
F-117	9,197
F-15C	10,822
F-15E	12,669
F-16	5,854
F-18	5,829
F-22A	13,154
KC-10	17,830
KC-135R	10,718
L-1011	17,219
MD-11	17,511

Source: Air Force Pamphlet 10-1403

Return

Receiver Planning Factors (Data format in work)

Return

TYPE ACFT	MAX FUEL (10,000 LBS)			PPH BURN RATE			PLN AIRSPEED Low - Med/Hi	MAX Dist to AAR	MAX ON LOAD	OPT AAR ALT
	Internal	External	# Bags	Low	Med	Hi				
A-6E	15.9	2	3 (5)	8	6	5	435T - 0.8M	450NM	10-14K	150-200
A-10	10.7	4.0-	2 (3)	5.3	4.5	4	310T - 0.5M	500NM	5.5K	100-200
AC-130H	40	-	-	8	6.2	-	240T - 300T	800NM	30K	80-150
AC-130U	40	-	-	7	6	5	240T - 300T	1500NM	30K	80-150
AMX-B/R	6.2	1.0/1.9	2or2	5.3	4.2	3.8	420T - 0.7M	500NM	6K	150-220
AV-8B	7.7	2	2 (4)	8	5.8	5	480T - 0.8M	400NM	7.0K	150-240
B-1B	220	-	-	39	18	16	500T - 0.85M	4400NM	190K	160-220
B-2	180+	-	-	17	14	12	420T - 0.7M	4000NM	150+	240-270
B-52	305	4.7	2	26.5	22	15	360T - 0.8M	6400NM	270K	240-310
C-5	332	-	-	30	25	24	420T - 0.8M	2000+	90K+	180-260
C-17	184/274	-/37.5	-/2	24	22	17	420T - 0.8M	2000+	90K+	120-310
C-135/707 (all)	85-155	-	-	14	12	11	200I - 275I	4000NM	60/100K	200-260
C-141	153	-	-	15	13.5	12	420T - 0.85M	2000+	120K	200-260
CV-22	13.5	-	-	9	7	6	275T - 275I	700NM	10K	100-180
E-3A/C	160	-	-	15	14	13	200I - 0.72M	2500NM	100K	200-260
E-3D/F	155	-	-	15	14	13	200I - 0.72M	2500NM	90K	200-260
E-4	343	-	-	26	24	22	460T - 0.9M	5000NM	240K	200-260
F-22	18	2 (4)	11.8	8.6	7.6	250I - 0.85M	700NM	18K	No Data	Burn Rates: 40K/30K/20K'
F-22	18	0 (4)	8.6	6.3	5.5	250I - 0.85M	450NM	14K	No Data	Burn Rates: 40K/30K/20K'
F-117	18.2	-	9	7.5	6.5	500T - 0.85M	450NM	14K	180-260	
GR-7 (AV-8)	7.7	2 (4)	8	5	4	480T - 0.8M	400NM	7.7K	150-250	
Jaguar (all)	7.8	3/2wng	8	6.4	5.8	450T - 0.8M	450NM	7K	100-180	
Joint Strike Fighter	18.3	2 (2)	6	5.5	5.4	250I - 0.85M	1000NM	18K	No Data	Burn Rates: 40K/30K/20K'
Joint Strike Fighter	18.3	0 (2)	5.1	4.7	4.4	250I - 0.85M	750NM	15K	No Data	Burn Rates: 40K/30K/20K'
M2000C (A-A)	7	1-Feb	8	6	5	470T - 0.9M	400NM	8K	220-270	
M2000D/K (Gnd Attk)	8.2	1-Feb	9	7	6	470T - 0.9M	400NM	9K	150-230	
MC-130H	60	-	6.2	5.3	4.8	260T - 300T	3600NM	55K	80-160	

B	C	D	E	F	G	H	I	J	K	L
C-5	332	-	-	30	25	24	420T - 0.8M	2000+	90K+	180-260
C-17	184/274	-/37.5	-/2	24	22	17	420T - 0.8M	2000+	90K+	120-310
C-135/707 (all)	85-155	-	-	14	12	11	200I - 275I	4000NM	60/100K	200-260
C-141	153	-	-	15	13.5	12	420T - 0.85M	2000+	120K	200-260
CV-22	13.5	-	-	9	7	6	275T - 275I	700NM	10K	100-180
E-3A/C	160	-	-	15	14	13	200I - 0.72M	2500NM	100K	200-260
E-3D/F	155	-	-	15	14	13	200I - 0.72M	2500NM	90K	200-260
E-4	343	-	-	26	24	22	460T - 0.9M	5000NM	240K	200-260
F-22	18	2 (4)	11.8	8.6	7.6	250I - 0.85M	700NM	18K	No Data	Burn Rates: 40K/30K/20K'
F-22	18	0 (4)	8.6	6.3	5.5	250I - 0.85M	450NM	14K	No Data	Burn Rates: 40K/30K/20K'
F-117	18.2	-	9	7.5	6.5	500T - 0.85M	450NM	14K	180-260	
GR-7 (AV-8)	7.7	2 (4)	8	5	4	480T - 0.8M	400NM	7.7K	150-250	
Jaguar (all)	7.8	3/2wng	8	6.4	5.8	450T - 0.8M	450NM	7K	100-180	
Joint Strike Fighter	18.3	2 (2)	6	5.5	5.4	250I - 0.85M	1000NM	18K	No Data	Burn Rates: 40K/30K/20K'
Joint Strike Fighter	18.3	0 (2)	5.1	4.7	4.4	250I - 0.85M	750NM	15K	No Data	Burn Rates: 40K/30K/20K'
M2000C (A-A)	7	1-Feb	8	6	5	470T - 0.9M	400NM	8K	220-270	
M2000D/K (Gnd Attk)	8.2	1-Feb	9	7	6	470T - 0.9M	400NM	9K	150-230	
MC-130H	60	-	6.2	5.3	4.8	260T - 300T	3600NM	55K	80-160	
MC-130P	60-82	-	6.2	5.3	4.8	210I - 300T	3600NM	55K	80-160	
MIR F-1 CR/CT	7.6	1-Feb	6	5	4	475T - 0.9M	400NM	7K	150-220	
Rafale	9.4	2or2(4)	9	6.5	5	480T - 335I	750NM	9K	200-290	
RC-135S (Cobra Ball)	155	-	16	13	12.5	420T - 0.84	4000NM	100K	200-260	
RC-135V/W (RJ)	155	-	15.4	12.4	12	420T - 0.84	4000NM	100K	200-260	
RC-135U (Cbt Sent)	155	-	17	15	14	400T - 0.78	3500NM	100K	180-250	
S-3	13.1	1	2.8	2.6	2.4	210T - 440T	1200NM	6.0K	120-200	
SHARF (Sea Harrier)	7.7	2 (4)	8	5	4	480T - 0.8M	400NM	7.0K	150-250	
Tornado F-3 (ADV)	11.2	2-3(4)	8	6.4	5.8	450T - 0.85M	750NM	11	150-230	2.2K Bags also used
Tornado (all others)	11.2	2+2or4	8	6.4	5.8	450T - 0.85M	750NM	11	150-230	2.2K Bags also used

Source: All data derived from multiple unclassified internet sources; CAPES Course Nellis AFB; "Janes" data, PFPS, and aircraft T.O. data

Return

Block Speeds

Aircraft Type	Mach	500 nm	1000 nm	1500 nm	2000 nm	2500 nm	3000 nm	3500 nm	4000 nm	4500 nm	5000 nm	5500 nm	6000 nm
C-9	0.78	344	397	414	420	421	-	-	-	-	-	-	-
C-130	0.49	242	266	272	273	272	271	-	-	-	-	-	-
C-141	0.74	332	380	396	401	401	401	404	407	409	410	-	-
C-17	0.76	335	384	400	405	406	406	409	412	-	-	-	-
C-5	0.77	341	393	410	415	416	416	420	422	424	426	428	429
KC-10	0.81	354	410	428	435	436	437	440	443	446	447	449	450
KC-135	0.79	348	401	419	425	426	426	430	433	435	437	438	439
B-707	0.8	351	405	424	430	431	432	435	438	-	-	-	-
B-747	0.84	363	422	442	450	451	452	456	459	461	463	465	466
B-767	0.81	354	410	428	435	436	437	440	443	446	447	-	-
DC-8	0.8	351	405	424	430	431	432	435	438	440	442	-	-
DC-10	0.83	360	418	438	445	446	447	451	454	456	458	-	-
L-1011	0.81	354	410	428	435	436	437	440	443	446	447	-	-
MD-11	0.83	360	418	438	445	446	447	451	454	456	458	460	461

For speed of combat, please reference the applicable flight manual speeds

Source: Air Force Pamphlet 10-1403

Return

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14. ABSTRACT This Graduate Research Project is an improvement to the Tanker Employment Model developed by Maj. Margaret Romero. Her model which uses Excel VBA is used to determine the tanker capacity requirements needed to perform specific user defined tanker employment missions. The output is useful for rough-cut analysis of the tanker employment mission. The improvement to the Tanker Employment Model is the capability to use multiple tanker types simultaneously. The model chooses the optimum order for the tanker types and number of tankers to support a specific tanker employment mission. It also provides additional information to compare the use of multiple tankers.					
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