Revision 1

Fall 2005

MODERN AIR COMBAT RULES FOR MINIATURES

Phantoms

Phantoms: Air Combat in the Missile Age

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1.0 Introduction

Phantoms is a quick and easy modern air combat game, it is meant to cover air combat from 1960 to the present. The game was inspired by Avalon Hill's ***Mustangs*** game. *Phantoms* was created with a hex-mat and miniatures in mind, but could be played a regular hex-map with counters.

Phantoms is designed to realistically portray modern air to air combat without getting bogged down in the complexity of most boardgames on the subject. Gamers will be able to fly multiple aircraft even in large games and complete a scenario in a few hours.

Each turn all aircraft must place maneuver counters, which will govern what their planes can do over the various impulses during a turn. During each impulse, aircraft will move and/or fire, depending upon their current speed. This keeps the game from slowing down and ensures that all gamers are actively involved throughout the turn.

2.0 Game Equipment

Players will need the following equipment to play the game:

Aircraft: This can be miniatures or counters. Each miniature or counter represents one aircraft. The information for each type of aircraft is on the Control Card for that aircraft type.

Gameboard (map): The game is played on a hex-mat or hex-map. The playing area should be a minimum of 12 X 18 hexes.

Control Card: Each card shows the game information for a specific aircraft type. The cards are used to track the current status of aircraft in the game. Each card has room for keeping track of two aircraft.

Markers: You will need the following markers for each aircraft in the game:

8 Maneuver Markers: these are placed on the map to show the maneuver an aircraft is doing.

Several Climb/Dive Markers: these are placed on the map to show when an aircraft is making altitude changes.

1-3 Ammunition Marker(s): placed on the Control Card to show how much ammunition (guns and missiles) an aircraft has left.

An alternative to using markers for the control panels is to laminate them, then use grease pencils to mark speed/altitude changes, damage, and ammunition expenditures.

Dice: The game uses six-sided and ten-sided dice. The "0" on the ten-sided die is read as a 10. Unless stated by the specific rule, the normal die rolled is a ten-sided die.

Rule Contents:

Special points of interest:

- *Impulse system keeps players guessing about their opponent's intentions.*
- *Can be used with 1/300th to 1/144th scale aircraft models.*
- *Fast playing and suitable for group play.*
- *Missile combat, movement are simple systems, yet recreate the speed of jet combat.*

3.0 Sequence of Play

The game starts after setup is complete and is played in a series of Game Turns. Each game turn consists of a number of phases, which are explained below:

1) Set Speed Phase: Each aircraft adjusts its current speed set for the turn (the speed may change during the impulses). Each aircraft may adjust speed within the amount shown on the Normal Engine or Damaged Engine portion of the Speed Chart on the Aircraft Control Card. An aircraft's speed may not exceed the maximum speed for its current condition (Loaded or Level).

2) Break-Off Check Phase: During this phase an aircraft may attempt to break-off from the fighting.

3) Impulse Phase: There are 10 Impulses in each game turn, each Impulse is broken down into the following Segments:

Movement Segment: All air units moving at the same speed as the columns marked with an X must move one hex. Air units that should move, but are Out of Control (OOC) do not move, but check for recovery. Aircraft that reach their Maneuver Marker complete their maneuver and remove the marker. Adjust Aircraft Control Cards for any speed and altitude changes.

Fire-Check Segment: Any aircraft that is on fire (Critical Hit # 8) must check to see if the fire goes out or causes damage to the aircraft.

Afterburner Segment: Players with aircraft that have afterburners declare if they will use the afterburner this Impulse. The side with the Initiative Marker declares afterburner use first. Adjust Aircraft Control Cards for any speed changes.

Spotting Segment (optional): All players attempt to spot enemy aircraft.

Missile Impact Segment: Players check to see if missiles hit their target. Check pilot ejection for aircraft that are destroyed.

Gun Segment: Aircraft that moved and are in the proper arc and range of enemy aircraft may fire guns at the enemy aircraft. The side with the Initiative Marker fires first. Check pilot ejection for aircraft that are destroyed.

Break Lock/Missile Launch Segment: Aircraft that were previously locked onto may attempt to break radar lock. Aircraft may fire a missile at enemy aircraft which are in the proper range and missile arc. The side with the Initiative Marker fires first.

Radar Lock Segment: Players attempt to achieve a radar lock on enemy aircraft.

Maneuver Marking Segment: Aircraft that do not have a maneuver marker on the map must place a marker. The marker is placed at the appropriate maneuver distance from the aircraft. Aircraft that will climb or dive during a maneuver must announce (and place markers for) the number of levels they will climb or dive. The side with the Initiative Marker places maneuver markers first.

Impulse End: Go to the next impulse by repeating Step 3. If the current impulse is Impulse 10, start a new turn by going to Step 1.

4.0 Initiative

At the beginning a game each side rolls one die to determine which side initially has the Initiative Marker. The die roll is modified and the side with the highest modified number controls the Initiative Marker. If the modified die rolls are the same, re-roll until one side has a higher modified number.

The side that has the initiative marker places Maneuver Markers first during the Maneuver Marking Segment of each Impulse (see 6.1.1 Tailing Advantage). Also, the side with the Initiative Marker fires guns and missiles first in the appropriate segment.

A side may pass the Initiative Marker to the other side at the end of any segment during an Impulse.

<u>The modifiers for the initiative roll for the side having the following conditions are:</u>

Ace Pilot: +2	Loaded Aircraft: -2
Only Inexp. Or Green Pilots: -2	Ground or Airborne Controller: +1

5.0 Setting Speed

During the Set Speed Phase, each aircraft adjusts its speed for the upcoming turn. Each aircraft may adjust speed within the amount shown on the Normal Engine (for aircraft with no engine damage) or Damaged Engine (for aircraft with damaged engines) portion of the Speed Chart on the Aircraft Control Card. When setting speed in this phase, an aircraft's speed may not exceed the maximum speed for level flight. If the aircraft is loaded, it may not exceed the maximum loaded speed. An aircraft's speed may change during the Impulse Phase due to maneuvers, climbing, diving or using an afterburner.

6.0 Impulse Phase & Movement

All aircraft movement and combat occurs during the Impulse Phase. During each Movement Segment refer to the Movement Impulse Chart for the current impulse to determine which aircraft will move. All air units moving at the speeds in the columns marked with an X for the current impulse <u>must</u> be moved. Each aircraft is moved into the hex directly in front of it (Exception: aircraft that are out of control do not move). If the aircraft reaches its current maneuver marker and there are no climb/dive markers in the hex, the marker is removed and the aircraft completes the maneuver as described below.

6.1 Placing Maneuver Markers

During the Maneuver Marking Segment, aircraft without maneuver markers <u>must</u> place a maneuver marker. The side with the Initiative Marker places markers first, then the other side (Exception: see rule 6.1.1 Tailing Advantage). The number of hexes in front of the aircraft that the marker is placed is determined by cross-referencing the aircraft's current speed and the desired maneuver on the Maneuver Chart of the aircraft's Control Card. The number shown on the chart is the number of hexes the marker is placed in front of the aircraft. This number may be modified if the aircraft will climb or dive (see rule 6.3 Climbing and Diving During Movement)

6.1.1. Tailing Advantage

If an aircraft that needs to place a maneuver marker is in the hex directly behind and facing toward an enemy aircraft, it <u>does not</u> place its maneuver marker until after the enemy aircraft has placed its marker. In this case the side with the Initiative Marker places maneuver markers for all other aircraft, then the side without the Initiative Marker places maneuver markers and finally any tailing aircraft place their maneuver markers.

6.2 Standard Maneuvers

There are five basic maneuvers that an aircraft can perform. Not all aircraft can perform all the maneuvers shown below and the effect of each maneuver can be different for each type of aircraft. Each maneuver is explained below.

6.0 Impulse Phase & Movement (cont.)

6.2.1 Straight Maneuver:

If this maneuver is chosen, a "Straight" marker is always placed one hex in front of the aircraft. During the appropriate movement segment the aircraft will move into this hex without changing facing. This may be modified if the aircraft will climb or dive.

6.2.2 Normal Turn Maneuver (Right or Left):

If this maneuver is chosen, a "Right Turn" or "Left Turn" marker is placed in front of the aircraft the number of hexes shown on the Maneuver Chart. The number of hexes the marker is placed in front of the aircraft may be modified if the aircraft will climb or dive. When the aircraft reaches the marker during the movement segment, the marker is removed and the aircraft is turned one hexside left or right (depending on the turn type). The aircraft also loses the number of speed points shown on its Maneuver Chart for this maneuver.

6.2.3 Hard Turn Maneuver (Right or Left):

If this maneuver is chosen, a "Right Hard Turn" or "Left Hard Turn" marker is placed in front of the aircraft the number of hexes shown on the Maneuver Chart. The number of hexes the marker is placed in front of the aircraft may be modified if the aircraft will climb or dive. When the aircraft reaches this marker during the movement phase, the marker is removed and the aircraft is turned two hexsides left or right (depending on the turn type). The aircraft also loses the number of speed points shown on its Maneuver Chart for this maneuver. If the pilot of the aircraft has a Green or Inexperienced Pilot Quality Rating, the controlling player must check to see if the pilot loses control of the aircraft (see section 6.4 Losing Control of an Aircraft).

6.2.4 Sideslip Maneuver (Right or Left):

If this maneuver is chosen, a "Right Slip" or "Left Slip" marker is placed in front of the aircraft the number of hexes shown on the Maneuver Chart. The number of hexes the marker is placed in front of the aircraft may be modified if the aircraft will climb or dive. When the aircraft reaches this marker during the movement phase, the marker is removed and the aircraft is moved one row right or left (depending on the slip type) and back one hex. The aircraft also loses the number of speed points shown on its Maneuver Chart for this maneuver.

6.2.5 Loop Maneuver:

If this maneuver is chosen, a "Loop" marker is placed in front of the aircraft the number of hexes shown on the Maneuver Chart. The number of hexes the marker is placed in front of the aircraft may be modified if the aircraft will climb or dive. When the aircraft reaches this marker during the movement phase, the marker is removed and the aircraft is turned three hexsides. The aircraft also loses the number of speed points shown on its Maneuver Chart for this maneuver. If the pilot of the aircraft has a Green Pilot Quality Rating, the controlling player must check to see if the pilot loses control of the aircraft (see section 6.4 Losing Control of an Aircraft).

6.3 Climbing and Diving During Movement

In addition to plotting the aircraft's move when the maneuver marker is placed, the controlling player may also declare if the aircraft is changing altitude during this maneuver. Whenever an altitude change occurs, the aircraft that changed altitude will also have its current speed adjusted by the amount shown on the Aircraft Control Card for climbing or diving. The change in altitude is done as follows:

During the Maneuver Marking Phase, the player controlling the aircraft chooses a Maneuver Marker as described above.

The player then announces if the aircraft is climbing or diving during the maneuver and the number of levels that the aircraft will climb/dive.

The player places a number of Climb/Dive markers along the aircraft's flight path equal to the number of levels the aircraft will climb/dive. The player then places the Maneuver Marker for the aircraft, subtracting 1 hex from the placement distance for each level the aircraft will climb or dive.

During the movement segment in which the aircraft moves into a hex with a Climb/Dive marker, the marker is removed (to show that the aircraft has changed altitude) and the altitude and speed of the aircraft are adjusted on the Control Card (if using altitude stands for the aircraft, the altitude stand for the aircraft is also replaced with a new stand showing the new altitude).

This continues until all Climb/Dive markers are removed from the aircraft. The aircraft then continues with normal movement.

The number of levels an aircraft may climb or dive during a maneuver is limited by the number of hexes that the maneuver marker would be placed in front of the aircraft (Example: if an aircraft used a straight maneuver, it would only be able to climb or dive one level). An aircraft may never have its speed increased above its dive speed (although an aircraft may continue to dive when it is at its maximum dive speed). If an aircraft's

6.0 Impulse Phase & Movement (cont.)

speed is reduced to 0 or less, then the controlling player must check to see if the pilot loses control of the aircraft (see rule 6.4 Losing Control of an Aircraft). An aircraft may not climb and dive during the same maneuver.

6.4 Losing Control of an Aircraft

Because of the strains of combat, poorly trained pilots or those that are not familiar with their aircraft may attempt to do too much in the aircraft and subsequently lose control of it.

6.4.1 Loss of Control Checks

If an Inexperienced or Green Pilot makes a Hard Turn or if a Green Pilot makes a Loop Maneuver, the controlling player must check for a loss of control. The player controlling the pilot rolls one die, if the result is 1 - 6 for an Inexperienced Pilot or 1 - 4 for a Green Pilot then the maneuver is completed and play continues normally. If the die roll is outside this range, the pilot has lost control of the aircraft.

If during an Impulse an aircraft's speed is reduced to 0 or less by a maneuver (including climbs), then the player controlling the aircraft must check for loss of control. The player controlling the aircraft rolls one die, if the result is 1 - 8 for an Ace/Experienced/Average Pilot, 1 - 6 for an Inexperienced Pilot or 1 - 4 for a Green Pilot then the pilot does not lose control and the aircraft's speed is set at 1. If the die roll is outside this range, the pilot has lost control of the aircraft. The die roll is modified by -1 for each speed point less than zero that was caused by the maneuver.

6.4.2 Recovery

An out of control aircraft stays in its current hex at its current speed (an aircraft that had its speed reduced to 0 or less is treated as speed 1). During any impulse in which the aircraft would normally move, the controlling player checks to see if the pilot can recover the aircraft as follows:

The player controlling the pilot rolls one die, if the result is 1 - 8 for an Ace/Experienced/Average Pilot, 1 - 6 for an Inexperienced Pilot or 1 - 4 for a Green Pilot then the pilot recovers the aircraft. If the die roll is outside this range, the aircraft is still out of control.

6.4.3 Loss of Control Effects

If the pilot recovers the aircraft as described above, determine the aircraft's heading and speed as follows:

Roll 1 six-sided die and subtract the number from the aircraft's current speed. This is the aircraft's new speed. If this would reduce the aircraft's speed to ≤ 0, then set the aircraft's speed to 1.

Roll 1 six-sided die to determine the new aircraft facing. The number rolled is the number of hexsides the aircraft is turned from its current heading. Aircraft are always turned clockwise to determine the new heading. The aircraft then continues play normally.

If the pilot does not recover, then reduce the altitude of the aircraft by one level. If this would take the aircraft below altitude level 0, then the aircraft has crashed and is removed from the game (Note: the opposing side gets credit for a kill, even if the aircraft was not fired on).

6.5 Afterburners

Aircraft that are equipped with afterburners may use them during an Impulse to increase speed. During the Afterburner Segment players controlling aircraft equipped with an afterburner declare if they will use the afterburner during the Impulse. If the player chooses to use the afterburner, the aircraft's speed is immediately increased by the amount shown in the Speed Chart of the aircraft Control Card. An aircraft may not exceed its maximum speed for its current condition (level, loaded, or diving). If using an afterburner would cause an aircraft to exceed its maximum speed, the aircraft's speed is set to its maximum speed and all excess acceleration is lost. Each aircraft equipped with an afterburner may use the afterburner a maximum number of times during a game. This number is shown on the Ammunition track on the Control Card. Each time an aircraft uses its afterburner, reduce the number of remaining afterburner uses by one. If an aircraft has a damaged engine or is on fire, it may not use its afterburner.

7.0 Air to Air Combat

There are two types of air to air combat used in *Phantoms*; missile combat and gun combat. Each has its own segment during an Impulse. Only aircraft that moved in the Movement Segment may fire guns during the Impulse. An aircraft may always fire a missile during an Impulse (Exception: aircraft that are out of control or just recovered from being out of control may not fire). An aircraft may attack with either guns or missiles during an Impulse, but not both.

7.1 Missiles

There are two basic missile types: Heat-Seeking and Radar-Guided. The specific rules for each different type of missile are explained below. The rules for firing missiles and checking for impact are covered later. Missiles may not be launched at a target in the same hex and altitude as the firing aircraft.

7.0 Air to Air Combat (cont.)

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7.1.1 Missile Types

7.1.1a Heat-Seeking Missiles

Heat-seeking missiles are divided into 3 sub-types based on the abilities of the missile. These sub-types are Narrow Aspect (HN), Wide Aspect (HW) and All Aspect (HA). Each sub-type can only be fired when the firing aircraft is in a certain position compared to the target aircraft based on the missile sub-type. These positions are shown on the Combat Chart for the appropriate missile sub-type. In order to fire a missile, the firing aircraft must be in one of the positions shown on the chart for that sub-type of missile and facing in a direction shown on the chart. In addition to being in a firing position, heat-seeking missiles may only be fired at targets that are at the same altitude or one altitude level higher or lower. Missiles may not be launched at a target in the same hex and altitude as the firing aircraft.

Each heat-seeking missile has a Hit # which shows the effectiveness of the missile. The Hit # is used when checking for hits during the Missile Impact Segment and may be modified by the position from which the missile was fired.

7.1.1b Radar-Guided Missiles

Radar-guided missiles rely on the radar from their controlling aircraft or their own internal radar to guide them to a target. Before launching a radar guided missile the firing player must achieve a Radar Lock-On, be outside the minimum range for missile, and inside the maximum range for the missile.

A Radar Lock-On is checked for in the Missile Fire Segment before the radar-guided missile is fired. The firing aircraft must be facing so that the target is in its radar cone, then each player rolls a die to check for a successful Radar Lock-On. The die roll for each player is modified as follows:

The player attempting the Lock-On (Attacker) adds:

- + Aircraft's Radar Value
- + 2 Ace Pilot
- + 1 Experienced Pilot
- - 2 Green Pilot
- + 1 if the target aircraft is at a higher altitude
- - 1 if the target aircraft is at a lower altitude
- - 4 if the target aircraft is at altitude 0

The target aircraft (Target) adds:

- + Radar Counter-measures (C/M) rating
- + 2 Range between aircraft is ≥5 hexes

If the modified Target die roll is greater than or equal to the modified Attacker die roll, then a radar lock-on has not been achieved and a missile cannot be fired

If the modified Attacker die roll is greater than the modified Target die roll, then a radar lock-on has been achieved and a missile may be fired.

Remember; in order to fire a radar-guided missile the range to the target aircraft must be between the minimum and maximum range for the missile. If a radar-guided missile is fired outside of these ranges, it will automatically miss. The range to the target is equal to the number of hexes the firing aircraft is from the target, plus the difference in altitude between the two aircraft. (Example: An F-15 is attempting to lock onto a MiG-21 that is 3 hexes away. The F-15 is at altitude level 4 and the MiG-21 is at altitude level 1. The range between the F-15 and MiG-21 is 6.)

A player need only check for radar lock once, even if he does not fire the lock-on will be maintained as long as the target remains in the radar cone and the target lock is not broken. The lock is lost if the firing aircraft tries to lock onto another target, if the target moves out of the aircraft's radar cone, or if the target aircraft breaks the lock. (Note: Some aircraft may lock onto and maintain radar locks on several aircraft, this ability is noted in the notes section of the Aircraft Control Card).

A radar-guided missile travels 5 hexes per impulse. So, if the target aircraft is at a range greater than 5, it will take several impulses for the missile to reach the target. During the impulses between the missile launch and until the missile reaches the target, the target aircraft MUST stay in the radar cone of the firing aircraft and the aircraft must maintain a missile lock. If this is not the case, then the missile automatically misses. (Exception: Active Radar Homing missiles do not require the attacking aircraft to maintain a radar lock after launch.)

Each radar-guided missile has a Hit # which shows the effectiveness of the missile. The Hit # is used when checking for hits during the Missile Impact Segment and may be modified by the position from which the missile was fired.

7.1.1c Breaking a Missile Lock

During the Break Lock/Missile Launch Segment aircraft that were previously locked onto may attempt to break the enemy's radar lock. The Break Lock attempt is done in the same manner as a standard radar lock attempt. If the Break Lock attempt fails, the player with the radar lock may fire a radar guided missile and radar-missiles that were previously fired will continue to track. If the target is trying to break the lock of an Active Radar Homing missile, use the missile's radar value instead of the attacking aircraft's radar value.

7.0 Air to Air Combat (cont.)

7.1.2 Missile Launch

In the Missile Launch Segment of the Impulse, all eligible aircraft may fire a missile. An aircraft can only fire 1 missile at 1 target during the Missile Fire Segment (Note: some aircraft may fire more than one missile per impulse or fire missiles at different target aircraft, these aircraft will have this ability noted in the notes section of the Aircraft Control Card). An aircraft can fire either heat-seeking or radar-guided missiles during this segment, but not both.

To be eligible to fire a missile the following conditions must be met:

The aircraft must have missiles available to fire.

- The aircraft must be in firing position (as shown on the appropriate diagram for heat-seeking missiles OR have a lock-on and be within the range restrictions for radar-guided missiles).
- Missiles may not be launched at a target in the same hex and altitude as the firing aircraft.
- If the aircraft climbed during the Impulse, it may not fire at aircraft at lower altitudes.
- If the aircraft dove during the Impulse, it may not fire at aircraft at higher altitudes.

If the aircraft is eligible and the controlling player wishes to fire a missile, the player announces that a missile is being fired, announces the missile's target, and places a marker on the target, to note that it is the target of a missile attack. Then the player moves the ammo marker for the appropriate type of missile to show the expenditure. Players should also note the Hit # for the missile (see specific missile type for this number) modified by the firing position and, for radar-guided missiles, the number of impulses until the missile will reach the target (Note: heat-seeking missiles reach the target on the next impulse).

7.1.3 Missile Impact

In Missile Impact Segment of the Impulse, all aircraft with missile markers on them must check for missile impact. If a heat-seeking missile was fired at the aircraft, check for impact on the impulse after the missile was fired. If a radar-guided missile was fired at the aircraft, check for impact on the impulse that the missile reaches the target aircraft (a radar-guided missile moves at 5 hexes per impulse).

To determine if a missile hits the target aircraft the player that fired the missile and the player controlling the target aircraft each roll a die and modifies it as follows: (Note: For radar-guided missiles, if the target aircraft is outside the radar cone of the firing aircraft and the missile is not an active homing missile, then the missile automatically misses)

The player that fired the missile (Attacker) adds:

+ Modified Missile Hit # (the specific missile type hit # modified by the firing position modifier)

- +4 if the target aircraft used afterburner in this Impulse (heat-seeking missiles only)
- -2/-3 target aspect(RH missiles only)
- + 4 if firing aircraft is not spotted (optional)

The player controlling the target aircraft adds:

- + Counter-measures (C/M) rating of the aircraft for the missile type (heat-seeking or radar-guided)
- + Pilot Ability for the target aircraft (Green or Inexp. = 0, Average = 1, Experienced = 2, Ace = 3)
- + 3 if the target aircraft just completed or is in the process of doing a Loop or Hard Turn maneuver.
- + 2 if the target aircraft is at altitude 0
- + 3 if successfully completed Break Contact, but being chased by missile (see rule 7.1.4 Missile Impact vs. Break Offs).

If the modified Target die roll is greater than or equal to the modified Attacker die roll, then the missile has missed

If the modified Attacker die roll is greater than the modified Target die roll, then the missile has hit the target.

If the missile hits the target aircraft, it takes a number of hits equal to the *difference* between the modified Attacker die roll and the modified Target die roll. Mark this number of hits off on the Aircraft Control Card for the target. In addition the target aircraft automatically suffers one Critical Hit and will suffer another Critical Hit for each 3 points of damage done by the missile.

7.1.4 Missile Impact vs. Break Offs

If a missile is due to impact an aircraft that has successfully broken contact, there is still a chance that the missile will hit the aircraft. During the Missile Impact Segment players will check for impact on aircraft that broke contact at the beginning of the impulse first. The check is done normally except that the aircraft that broke contact gets a +3 die roll modifier (in addition to any modifiers for altitude and maneuver).

If an aircraft fired a radar guided missile, but breaks contact before the missile impacts, the missile automatically misses.

7.1.5 Emergency Maneuvers (Optional Rule)

When an aircraft has a missile fired at it, there is a chance the target aircraft can spot the missile and begin emergency maneuvering. The aircraft needs to roll as if for a spotting attempt, adding +3 (early missiles had a big flash and smoke trails). If the missile is spotted (this includes heatseekers which hit that turn), then the target aircraft can replace it's current Maneuver Marker with a Tight Turn or Loop, which will give it the positive modifiers to defeat the missile.

7.0 Air to Air Combat (cont.)

7.2 Gun Attacks

Gunfire takes place in the Gun Segment of the Impulse. An aircraft can only fire at 1 target during the Gun Segment. The side that has the Initiative Marker may attack with all of its aircraft that moved during the impulse, and then the side without the marker may attack. The effects of a gun attack are determined and applied immediately. This means that the player with the initiative may shoot down an enemy plane before it can fire. In order to be eligible to fire the firing aircraft must meet the following conditions:

- The firing aircraft must be equipped with a gun (or gun pod) and have ammunition remaining.
- The firing aircraft must be in a hex adjacent to the target, pointing at the target, and within one altitude level OR in the same hex as the target one altitude level above or below the target OR in the same hex at the same altitude.
- If in the same hex as the target at the same altitude, the firing aircraft must be facing the same direction as the target and be the last aircraft to enter the hex. If the aircraft entered the hex in the same impulse and are facing the same direction, only the slowest aircraft (after all adjustments for maneuvers and climb/dive) may fire.
- If the aircraft climbed during the Impulse, it may not fire at aircraft at lower altitudes.
- If the aircraft dove during the Impulse, it may not fire at aircraft at higher altitudes.

If the aircraft is eligible to fire and the controlling player wishes to use gunfire, the player announces that gunfire is taking place and announces the target aircraft. Then the player moves the ammo marker for the guns to show the expenditure of ammunition.

To determine if gunfire hits the target aircraft the player that fired and the player controlling the target aircraft each roll a die and modify it as follows:

The player that fired guns (Attacker) adds:

- Gun Attack Value (see specific Aircraft Control Card for this number)
- - The number shown on the Gun Firing Position Diagram
- + 4 Ace Pilot
- + 2 Experienced Pilot
- - 2 Green Pilot
- + 4 if firing aircraft is not spotted (optional)

The player controlling the target aircraft adds:

- + Defense Factor of aircraft
- + 2 Ace Pilot
- + 1 Experienced Pilot
- If the modified Target die roll is greater than or equal to the modified Attacker die roll, then the attacker has missed
- If the modified Attacker die roll is greater than the modified Target die roll, then the target has been hit.

If the target is hit, the attacking player compares the *difference* between the modified Attacker die roll and the modified Target die roll to the Gun Combat Information Chart on the Control Card for the attacking aircraft. The number shown under the difference is the number of hits the target aircraft takes. Mark this number of hits off on the Control Card for the target. In addition, the target aircraft will suffer a Critical Hit for each 3 points of damage done by the gunfire.

8.0 Damage Effects

Each aircraft is rated for a certain amount of damage that it can take. There are no restrictions on aircraft performance or operation due to damage, except for the restrictions imposed by critical hits, until an aircraft exceeds its maximum damage level. Once an aircraft's damage exceeds its maximum level (hits move into the gray portion of the damage track), the aircraft is treated as a loaded aircraft for the remainder of the game (with all the speed and maneuver restrictions).

Aircraft are only shot down by Critical Hits. A Critical Hit represents major damage to a section of the aircraft, the way that critical hits are received is explained below. The effects of critical hits are explained on the Critical Hit Table.

There are several ways to score critical hits on the target aircraft:

1. The aircraft takes a hit from a missile; roll once on the Critical Hit Table.
2. For every multiple of 3 damage points (rounded down) inflicted during a single combat, roll once on the Critical Hit Table. (Example: if 6 damage points are inflicted, the attacker would roll twice on the Critical Hit Table, if 5 damage points are inflicted, the attacker would roll once on the Critical Hit Table)
3. If the maximum damage level for an aircraft has been exceeded, the attacker rolls once on the Critical Hit Table for each damage point above the maximum level inflicted on the aircraft. (Example: an aircraft that can take a maximum of 5 damage points and already has 4 damage

8.0 Damage Effects (cont.)

points. It is fired on and has 3 more damage points inflicted on it. The attacking player would then roll 3 times on the Critical Hit Table, once for inflicting 3 damage points and two more times for each damage point over the maximum damage level for the target aircraft.)

For each Critical Hit, the attacking player rolls on the Critical Hit Table. Certain results will have no effect on the aircraft (the damage was to a non-vital section or the damage was not as bad as it could have been), some results will cause the immediate loss of the aircraft and others will limit the maneuverability the aircraft. When a critical hit which limits the ability of the aircraft is scored, mark the hit on the Control Card for the damaged aircraft. The effects of each critical hit are explained on the Critical Hit Table.

8.2 Ejecting

A pilot (or crew) may attempt to eject from an aircraft when it is destroyed. The player controlling the destroyed aircraft rolls one die for the pilot (or crew) and modifies the result. If the modified die roll is greater than or equal to 3, the pilot/crew has successfully ejected from the aircraft. The ejection die roll is modified as follows:

- 2 if the pilot is wounded

- 3 if the aircraft was on fire when the ejection was attempted

- 2 if the aircraft was destroyed by a Major Damage Critical Hit

- 4 if the aircraft was destroyed because it was in a Hard Turn/Loop maneuver when it received a Structural Damage Critical Hit.

9.0 Fire Check Segment

After aircraft move in an impulse, All aircraft that are on fire (Critical Hit # 8) check to see if they can put out the fire. The player controlling the aircraft rolls one die and modifies it based on the aircraft's speed (as below). If the result is >9, then the fire is out and the aircraft continues normal operations. If the result is ≤8, then the fire is still burning. If the result is ≤5, then the player rolls for damage on the Critical Hit Table (if a second Fire Critical Hit is rolled the aircraft is lost).

Modify the Fire Die Roll as follows:

+3 If current speed is >7

+2 If current speed is 6 - 7

+1 If current speed is 4 – 5

+1 If the aircraft dove during the impulse

+2 If Ace Pilot

+1 If Experienced Pilot

-1 If Green Pilot

10.0 Disengaging & Break-Off Checks

An aircraft can leave the map and the game by flying off the map edge or by making a successful break-off attempt. Aircraft that leave the game in either of these manners may not return to the map for the rest of the game.

Flying off the map to disengage is only allowed if playing with a static map (this is determined at the beginning of the game). If players are not playing with a static map, then the aircraft are all shifted on the map a number of hexes to keep all aircraft on the map.

Break-Off Checks are done after Set Speed Phase. In order to attempt a Break-Off Check the aircraft must not have an enemy aircraft in a tailing advantage position. Any aircraft that meet this restriction may attempt to break-off.

To determine if the break-off is successful the player controlling the aircraft that is breaking-off and any enemy player each roll a die and modify it as follows:

The player attempting to break-off adds:

+ 2 If it is Game Turn 1, 2, or 6

+ 4 If it is game turn 7, 8, or greater

- 2 If it is game turn 3, 4, or 5

+ 1 Ace Pilot

- 2 Green Pilot
- + 5 If aircraft is not spotted (optional)
- If the enemy player's die roll is greater than or equal to the modified break-off die roll, then the aircraft was unable to break-off.
- If the modified break-off die roll is greater than the enemy player's die roll, then the aircraft has broken off and is removed from the game. Note: any missiles fired at the aircraft still have a chance to hit the aircraft (see rule 7.1.4 Missile Impact vs. Break Offs).

11.0 Loaded Aircraft

Loaded aircraft have certain speed and maneuverability restrictions placed on them. In ***Phantoms*** an aircraft is considered loaded if it is carrying air to ground ordnance, loaded external fuel tanks, or has damage that exceeds its maximum damage level. Aircraft that are carrying air to ground ordnance or loaded external fuel tanks may jettison these during any Maneuver Marking Phase to lose the maneuver and speed restrictions for being loaded.

Loaded aircraft may not exceed the Max. Load Speed noted on the Control Card for the aircraft. They may not do any Hard Turn or Loop maneuvers, all other maneuvers have one hex added to the number of hexes needed to complete the maneuver and all maneuvers.

12.0 Pilot Quality

There are five levels of Pilot Quality on ***Phantoms***: Green, Inexperienced, Average, Experienced, and Ace. Each Pilot Quality type and its effects are explained below:

12.1 Green Pilot

A Green Pilot is one that has minimal training and little to no experience in an aircraft or a poor quality Inexperienced Pilot. This pilot would most likely be found flying for third world nations.

Green pilots must check for loss of control of their aircraft any time that they do a Hard Turn or Loop Maneuver. When trying to Lock-On with Radar Homing missiles, get a radar spot or a visual spot, there is a -2 to the attempt. When firing guns, there is a -2 modifier to all shots. They have a missile defense modifier of 0.

12.2 Inexperienced Pilot

This pilot has standard pilot training, but no advanced training and little to no experience or a poor quality Average Pilot. This pilot would be found flying for third world nations and possibly as a beginner in more advanced air forces.

Inexperienced pilots must check for loss of control of their aircraft any time they do a Hard Turn. They have a missile defense modifier of 0.

12.3 Average Pilot

This pilot has standard pilot training, some advanced training and some experience. This would be the standard pilot found in most advanced air forces around the world.

Average pilots have no special modifiers for attacks or missile Lock-On attempts. Average pilots have a missile defense modifier of 1.

12.4 Experienced Pilot

This pilot has a high level of experience, with lots of advanced training and some combat time. Some pilots of this quality would be found in NATO nations and the Soviet Union. Most Israeli pilots would rate as Experienced.

When trying to Lock-On with Radar Homing missiles, there is a +1 modifier to the Lock-On attempt. When firing guns, there is a +2 modifier to all shots. When fired at with guns they have a +1 defense modifier. They have a missile defense modifier of 2.

12.5 Ace Pilot

This pilot has an extremely high level of experience, with lots of advanced training and several combat kills. Some pilots of this quality would be found in NATO nations, the Soviet Union, and Israel.

When trying to Lock-On with Radar Homing missiles, there is a +2 modifier to the Lock-On attempt. When firing guns, there is a +4 modifier to all shots. When fired at with guns they have a +2 defense modifier. They have a missile defense modifier of 3.

13.0 Spotting (Optional)

During the game it is assumed that each side knows that the other side has aircraft in the area and spotting is assumed to occur without any special rules. However, in some cases players may want to use the spotting rules to add realism or show how important it is to know the precise location of the enemy. It will require extra bookkeeping for players to keep track of which aircraft are spotted. There are two ways to spot in ***Phantoms***: Radar and Visual Spotting. Each is explained below.

Players may use their radar to spot enemy aircraft. To spot an enemy aircraft the spotting player must have enemy aircraft in its radar cone. A player may attempt to spot any number of enemy aircraft with radar.

13.0 Spotting (cont.)

A radar-spotting attempt is made during the Spotting Segment. The player attempting to spot declares which enemy aircraft he will try to spot, then each player rolls a die to check for a successful radar spot. The die roll for each player is modified as follows:

The player attempting to spot (Spotter) adds:

+ Aircraft's Radar Value

+ 2 Ace Pilot

+ 1 Experienced Pilot

- 2 Green Pilot

+ 1 if the target aircraft is at a higher altitude

- 1 if the target aircraft is at a lower altitude

- 4 if the target aircraft is at altitude 0

The target aircraft (Target) adds:

- Radar counter-measures (C/M) rating of the aircraft
- If the modified Target die roll is greater than or equal to the modified Spotter die roll, then a radar spot has not been achieved.
- If the modified Spotter die roll is greater than the modified Target die roll, then a radar spot has been achieved.

A player must check for spotting for each enemy aircraft and if the enemy aircraft moves out of the radar cone of the spotting aircraft the radar spot is lost. The radar spot is also lost if the spotting aircraft goes into a spin. Friendly aircraft may share radar-spotting information.

13.2 Visual Spotting

In certain situations players may want to limit the ability of one side to fire unless they have a visual spot on the target. Visual spotting attempts are made during the Spotting Segment.

Each aircraft may only attempt to visually spot 1 enemy aircraft during each Spotting Segment. The maximum range for visual spotting is 10. The range is equal to the number of hexes the spotting aircraft is from the target, plus the difference in altitude between the two aircraft. The player attempting to spot declares which enemy aircraft he will try to spot, then each player rolls a die to check for a successful visual spot. The die roll for each player is modified as follows:

The player attempting to spot (Spotter) adds:

+ 3 Ace Pilot

+ 2 Experienced Pilot

-2 Green Pilot

+ 3 if spotter has radar spot or Lock-On on the target aircraft OR the spotter has an off-map controller (ground or air)

+2 if the spotter aircraft has an all-round vision canopy

+2 If target aircraft is large

+ 1 if the spotter aircraft has 2 (or more) crew

- 2 if the target aircraft is at altitude 0

The target aircraft (Target) adds:

+ Range between aircraft

+1 if aircraft is small

- If the modified Target die roll is greater than or equal to the modified Spotter die roll, then a visual spot has not been achieved.
- If the modified Spotter die roll is greater than the modified Target die roll, then a visual spot has been achieved.

An aircraft may have a visual spot on any number of enemy aircraft. Generally, friendly aircraft may not share visual spots, but "wingmen" may share visual contacts. At the beginning of the game a pair of aircraft (of the same type) may be designated as "wingmen". These two aircraft may share visual contact information as long as both aircraft are 5 or fewer hexes from each other. If they move outside of 5 hexes they lose the ability to share contacts, but still retain all current contacts. The wingmen relationship is re-established when the aircraft move within 5 hexes of each other.

Visual spots are lost in the following situations:

- If the enemy aircraft moves out of the 10 hex range for spotting.
- If an aircraft fires guns at a target, the aircraft loses the visual spot of all enemy aircraft, except the target. Exception: wingmen rule described above).
- If an aircraft goes into a spin it loses all visual spots.

Photo Credits

Title page-F-4:www.acepilots.com/ vietnam/phantom.jpg

P2: Mig-21: www.doononline.net/ media/airforce/mig21-13.jpg,

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P9: F-18: www.strangemilitary.com/ images/content/4403.jpg

Su-30: www.aeronautics.ru/ nws001/su30crash.jpg

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Other pictures are from the National War College Military Image Collection or could not be accredited for various reasons. Several pictures had multiple sources and it was impossible to tell which was the original source.

14.0 Countermeasures

Countermeasures are somewhat abstracted in *Phantoms* and can represent flares, internal jamming mechanisms, external pods, and even national training. This section provides some recommended countermeasure values that players can use when they are designing their own scenarios. The values given are guidelines and players can feel free to modify the values depending on their scenario.

There are two types of countermeasures in *Phantoms*; IR (infrared) and Radar countermeasures. IR countermeasures are used to defend against attacks by heat-seeking missiles. Radar countermeasures are used to defend against radar lock-on attempts and to defend against attacks by radar-guided missiles. The countermeasure values are given below and are organized by era and country, country type, or group.

Before 1960

Country/Group	Radar	IR
US	1	1
Russia	0	1
NATO	1	1
Warsaw Pact	0	0
2nd World	0	0
3rd World	0	0

1960 to 1969

Country/Group	Radar	IR
US	2	1
Russia	1	1
NATO	1	1
Warsaw Pact	0	0
2nd World	0	0
3rd World	0	0

1970 to 1979

Country/Group	Radar	IR
US	3	3
Russia	2	2
NATO	2	2
Warsaw Pact	1	2
2nd World	1	2
3rd World	0	0

1980 to 1989

Country/Group	Radar	IR
US	4	4
Russia	3	4
NATO	3	4
Warsaw Pact	3	3
2nd World	2 or 3	3
3rd World	2	2

1990 to current

Country/Group	Radar	IR
US	6	6
Russia	4	4
NATO	5	5
2nd World	4	4
3rd World	2	3

14.0 Stealth (optional)

For those gamers who wish to explore the new era of air combat featuring stealth fighters, use these optional rules:

- When attempting to use radar to spot or acquire a lock on to fire a radar guided missile, and when defending against radar guided missiles, the stealth target aircraft rolls 1D6 and adds that to the radar countermeasures rating.
- The normal +3 modifier for having ground control/AWACs assistance in spotting is reduced to a +1.
- These rules apply to aircraft such as the F-22, F-35, and F-117. Other aircraft with stealth materials, but not true stealth aircraft, such as the Eurofighter and Rafaele should be given additional modifiers to be decided by the referee for the scenario.

Note: If you're thinking this makes a F-22 almost impossible to kill with radar guided weapons, you're correct! Your best chance is to close the range, don't lose visual contact, and use heat-seekers.

15.0 5 Impulse System (Optional Rule)

By Gordon Colter

This system cuts down the 10 impulse game turn into only five impulses. Aircraft moving faster than Speed 6 can sometimes move twice in an impulse. Your group will need to come up with rules for marking maneuvers twice in a turn, but it will play much faster. Remember, radar guided missiles will move much faster using this system.

	Speed									
Impulse	1	2	3	4	5	6	7	8	9	10
1			x	x	x	x	x	xx	xx	xx
2		x		x	x	x	xx	xx	xx	xx
3	x		x		x	x	x	x	xx	xx
4		x		x	x	xx	xx	xx	xx	xx
5			x	x	x	x	x	x	x	xx

15.1 Hidden Maneuver Markers (Optional Rule)

While the basic Phantoms rules prefer that all maneuver markers are placed out in the open(which is why gaining the initiative is so important), a much more challenging game can be had by having all maneuver markers hidden. Once an aircraft reaches the marker it is flipped over and the aircraft performs that maneuver. The exception to this is if an aircraft is deemed to be tailing another aircraft, the disadvantaged aircraft must tell his/her opponent that the maneuver marker is a left/right turn or straight. You don't have to reveal if it's a loop or tight turn, just the basic direction. This makes the game much more challenging as both sides need to guess and anticipate what their opponents will be doing. It also make for a much more chaotic game, which is a pretty accurate portrayal of modern air combat.

This will, however, make the Initiative segment pretty unnecessary except to determine who shoots first in the same hex.

15.2 Missile Launch Rolls (Optional Rule)

Early air to air missiles were notorious for failing on launch. Whenever a missile is fired a D10 is rolled. After modifiers are applied , if the number is higher than the missile's launch number, the launch has failed and that missile is lost. As the technology improved, the chances of this happening are greatly reduced.

U.S./NATO (1960-1975)	8
Warsaw Pact/Russia (1960-75)	7
U.S./NATO (1976-1990)	9
Warsaw Pact/Russia (1976-1990)	8
U.S./NATO (1990-Present)	10
Others (1990-Present)	9

Modifiers

Firing aircraft in tight turn or loop +1

Firing aircraft at Level 2 or higher, firing at enemy at Level 0 or 1(1960-85) +1

Heatseeker fired at enemy aircraft in sun arc +1(1960-1980)

Game Reference Chart p.1

Game Turn Track

1 (+1)	2 (+1)	3 (-2)	4 (-2)	5 (-2)	6 (+2)	7 (+4)	8 (+4)

Break Off modifiers are shown in parentheses. Other modifiers:

+1 Ace pilot

-2 Green pilot

+5 if aircraft not spotted(optional)

Movement Impulse Chart

	Speed									
Im-pulse	1	2	3	4	5	6	7	8	9	10
1				X	X	X	X	X	X	X
2			X				X		X	X
3		X				X		X	X	X
4				X	X		X	X	X	X
5	X		X		X	X	X	X		X
6								X	X	X
7				X	X	X		X	X	X
8		X						X	X	X
9			X			X	X		X	X
10				X	X	X	X	X	X	X

Sequence of Play (page 2)

1) **Set Speed Phase**
2) **Break-Off Check Phase**
3) **Impulse Phase**
   - **Movement Segment**
   - **Fire-Check Segment**
   - **Afterburner Segment**
   - **Spotting Sement (optional rule)**
   - **Missile Impact Segment**
   - **Gun Segment**
   - **Break Lock/Missile Launch Segment**
   - **Radar Lock segment**
   - **Maneuver Marking segment**
4) **Impulse End**

D10 Critical Hit Table (p 16)

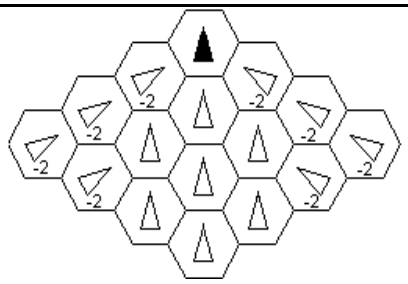
1-3	Minor Damage
4	Pilot Wounded
5-6	Structural Damage
7	Engine Hit
8	Fire Check
9-10	Major Damage

Losing Control of an Aircraft & Recovery Checks

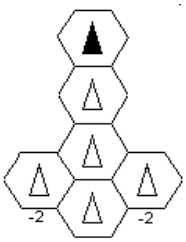
Condition	Loss of Control Checks		Recovery Checks	
Hard Turn:	**Safe**	**OOC**	**Recovered**	**OOC**
Green	1 - 4	5 - 10	1 - 4	5 - 10
Inexperienced	1 - 6	7 - 10	1 - 6	7 - 10
Loop	**Safe**	**OOC**	**Recovered**	**OOC**
Green	1 - 4	5 - 10	1 - 4	5 - 10
0 Speed	**Safe**	**OOC**	**Recovered**	**OOC**
Green	1 - 4	5 -10	1 - 4	5 - 10
Inexperienced	1 - 6	7 - 10	1 - 6	7 - 10
Average/ Experienced/ Ace	1 - 8	9 - 10	1 - 8	9 - 10

Game Reference Charts p.2

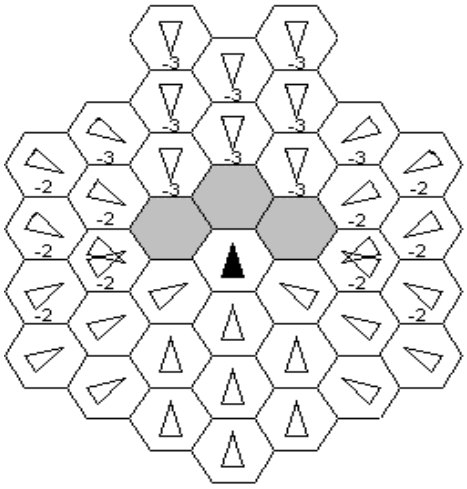
Heat Seeking Missile Charts



Wide Aspect



Narrow Aspect



All Aspect

Heat-Seeking Attack Modifiers

Attacker adds:

+ Modified Missile Hit # (the missile hit # modified by the firing position modifier)

+ 4 if the target aircraft used afterburner in this Impulse

+ 4 if firing aircraft is not spotted (optional)

Defender adds:

+ IR Counter-measures (C/M) rating of the aircraft

+ Pilot Ability for the target aircraft (Green or Inexp. = 0, Avg = 1, Exp = 2, Ace = 3)

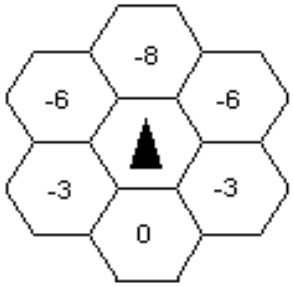
+ 3 if the target aircraft just completed or is in the process of doing a Loop or Hard Turn maneuver.

+ 2 if the target aircraft is at altitude 0

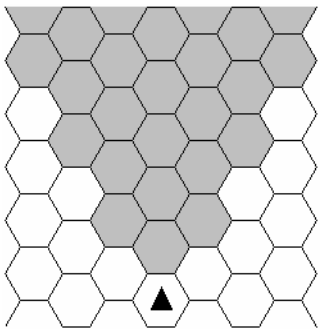
+ 3 if successfully completed Break Contact, but being chased by missile (see rule 7.1.4).

Gun Firing Modifiers

Firing at different altitude	-2
Firing at spinning aircraft	+2
Firing aircraft in Hard Turn/Loop	-3
Firing aircraft in Turn/Slideslip	-2
Pilot quality: Green	-2
Pilot quality: Experienced	+2
Pilot quality: Ace	+4
Pilot wounded	-1
Firing at an Ace:	+2(for target)
Firing at Experienced	+1(for target)
Gun Position Modifiers:	(see chart)



Gun Position Modifiers Diagram



Radar Arc

Radar Guided Missiles: Lock On Modifiers

+ Aircraft's Radar Value

+ 1 Experienced Pilot

+ 1 if the target aircraft is at a higher altitude

- 4 if the target aircraft is at altitude 0

+ 2 if range between aircraft is ≥5 hexes

+ 2 Ace Pilot

- 2 Green Pilot

- 1 if the target aircraft is at a lower altitude

+ Radar Counter-measures (C/M) rating of the aircraft (target only)

Radar Guided Missiles: Hit # Modifiers

Attacker Adds:

+ Missile Hit #

Firing from target's front aspect: -3

Firing from target's side aspect: -2

+ 4 if firing aircraft is not spotted (optional)

Defender Adds:

+ Radar Counter-measures (C/M) rating of the aircraft

+ Pilot Ability for the target aircraft (Green or Inexp. = 0, Avg = 1, Exp = 2, Ace = 3)

+ 3 if the target aircraft just completed or is in the process of doing a Loop or Hard Turn maneuver.

+ 2 if the target aircraft is at altitude 0

+ 3 if successfully completed Break Contact, but being chased by missile (see rule 7.1.4).

Game Reference Charts p.3

Critical Hit Results

Roll anytime hit by a missile or 3 or more points damage are scored or aircraft damage level is exceeded)

Roll	Effect	Roll	Effect
1-3	Minor Damage, no effect	7	Engine Hit, use Damaged Engine on Control Card. 2nd hit = Treat as #10
4	Pilot Wounded, no more Hard Turns or Loops (may complete current maneuver, but if Hard Turn or Loop check for spin as Inexp.), -1 when firing, -2 for eject. 2nd hit = Pilot Killed, remove aircraft.	8	Fire, check to see if put out Fire-Check Segment. Must roll >9 to put out fire. If ≤5 roll for critical hit. If second Fire critical hit, aircraft destroyed. -3 for eject.
5-6	Structural Damage, no more Hard Turns or Loops (if doing Hard Turn or Loop aircraft breaks up, -4 for eject). 2nd hit = Treat as #10	9-10	Major Damage, aircraft is lost, remove from game. -2 for eject.

Eject Survival Roll D10

If the modified die roll is greater than or equal to 3, the pilot/crew has successfully ejected from the aircraft

- 2 if the pilot is wounded

- 3 if the aircraft was on fire when the ejection was attempted

- 2 if the aircraft was destroyed by a Major Damage Critical Hit

- 4 if the aircraft was destroyed because it was in a Hard Turn/Loop maneuver when it received a Structural Damage Critical Hit.

Fire Check Table D10

≥9 Fire is out/≤8 Fire continues/≤5 Critical Hit

+3 If current speed is >7

+2 If current speed is 6 - 7

+1 If current speed is 4 – 5

+1 If the aircraft dove during the impulse

+2 If Ace Pilot

+1 If Experienced Pilot

1 If Green Pilot

Pilot Skill Summary

Green

Green pilots must check for loss of control of their aircraft any time that they do a Hard Turn or Loop Maneuver. When trying to Lock-On with Radar Homing missiles, get a radar spot or a visual spot, there is a -2 to the attempt. When firing guns, there is a -2 modifier to all shots. They have a missile defense modifier of 0.

Inexperienced

Inexperienced pilots must check for loss of control of their aircraft any time they do a Hard Turn. They have a missile defense modifier of 0.

Average

Average pilots have no special modifiers for attacks or missile Lock-On attempts. Average pilots have a missile defense modifier of 1.

Experienced

When trying to Lock-On with Radar Homing missiles, there is a +1 modifier to the Lock-On attempt. When firing guns, there is a +2 modifier to all shots. When fired at with guns they have a +1 defense modifier. They have a missile defense modifier of 2.

Ace

When trying to Lock-On with Radar Homing missiles, there is a +2 modifier to the Lock-On attempt. When firing guns, there is a +4 modifier to all shots. When fired at with guns they have a +2 defense modifier. They have a missile defense modifier of 3.

Phantoms Missile Data

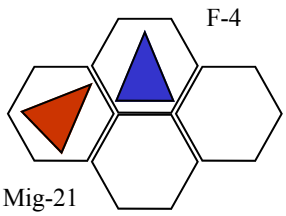
Heat Seeking	Sub-Type	Hit #	Notes
AIM-9B Sidewinder	HN	6	US
AA-2a/b Atoll	HN	5	USSR/Russia
AA-3b Anab	HN	6	USSR/Russia
AIM-4 B/C Falcon	HN	5	US, only used by US Air Force
Matra 530	HN	6	France
Firestreak	HN	5	UK
Red Top (early)	HN	7	UK
Shafir	HN	5	Israel
PL-2	HN	5	PRC, Chinese copy of AA-2
AIM-9D – J Sidewinder	HW	6/7	US, D-F model = 6, G-J model = 7
AIM-4D Falcon	HW	6	US, only used by US Air Force
R 550 Magic	HW	7	France
Red Top (late)	HW	7	UK
Shafir 2	HW	7	Israel
AA-6b Acrid	HW	7	USSR/Russia
AA-7 Apex	HW	7	USSR/Russia
PL-7	HW	6	PRC
AIM-9 L/M	HA	9/10	US
Magic 2	HA	9	France
Python 3	HA	9	Israel
AA-8a Aphid	HA	7	USSR/Russia
AA-10b Alamo	HA	9	USSR/Russia
AA-11 Archer	HA	10	USSR/Russia
Sky Sword I	HA	7	ROC

Radar Guided	Min Range	Max Range	Hit #	Notes
AIM-4 E/F Falcon	3	8	6	US, only used by US Air Force
AIM-7E Sparrow	4	32	7	US
AIM-7 F/M Sparrow	4/3	62	9	US
AIM-120 AMRAAM	2	80	12	US, Active Radar homing missile: firing aircraft does not need to maintain radar lock or target in forward arc after missile is launched. This missile has a radar value of 7.
AIM-54c Phoenix	3	120	10	US, Active Radar homing missile: firing aircraft does not need to maintain radar lock or target in forward arc after missile is launched. Large warhead: roll twice on critical hit table. This missile has a radar value of 6.
Matra 530	4	20	6	France
Skyflash	3	62	8	UK
AA-2c Atoll	3	7	5	USSR/Russia
AA-3a Anab	3	9	6	USSR/Russia
AA-5	4	36	7	USSR/Russia
AA-6a Acrid	4	36	6	USSR/Russia, Large warhead: roll twice on critical hit table
AA-7a Apex	3	26	7	USSR/Russia
AA-10a Alamo	3	60	9	USSR/Russia
PL-8	4	36	6	PRC
Sky Sword II	3	30	6	ROC

Examples of Play

1. Gun Combat

A Mig-21 at altitude 5 is shooting at an F-4 at altitude 4. The Mig pilot is Green while the F-4 pilot is Experienced.



Since the Mig-21 is one hex away and there is less than one level of altitude difference, the Mig can take the shot. The factors are added up as follows:

Mig-21

Mig-21 Cannon rating: +6

Gun Angle: -3

Green Pilot: -2

Firing at a different altitude: -2

Final die roll modifier: -1

F-4

Defense vs. Guns: +4

Experienced Pilot: +2

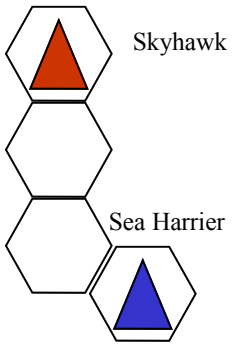
Final die roll modifier: +6

The Mig-21 player rolls 1D10 and gets a 9, which after the modifiers becomes a 8(9[die roll]-1[modifiers]=8). The F-4 player rolls 1D10 and gets a 1, which when adding the modifiers becomes a 7(1[die roll]+6[modifers]=7. The difference in the gun combat is one. Cross referencing the result on the Mig-21's Gun Combat Table results in 2 points of damage to the F-4.

If the Mig-21 had scored one more point of damage, the F-4 player would have had to roll for a Critical Hit. Likewise, if the F-4 had been in a Loop or a Hard Turn, the F-4 would have been almost impossible to hit from that angle.

2. Heat Seeking Missile Combat

Over the landings at San Carlos in the Falklands a British Sea Harrier fires a Sidewinder at an Argentine Skyhawk. Both pilots are average and the Skyhawk has jettisoned it's bombs and is doing a Hard Turn. The factors add up as follows:



Sea Harrier

AIM-9L: +7

Position Modifier: +0

Final die roll modifier: +7

Skyhawk:

Countermeasures: +2(1980-89 3rd World)

Hard Turn: +3

Final die roll modifier: +5

The Sea Harrier player rolls 1D10 and gets a 5, which with the modifiers for the AIM-9D becomes a 12(5 + 7[AIM-9D]). The Skyhawk players rolls 1D10 and gets a 4, which becomes a 9 after the modifiers(4 +5[Countermeasures + Hard Turn]). The final difference is 3, which means that the Skyhawk takes three damage points and an automatic critical hit from the missile. The Skyhawk also takes an additional critical hit because of taking three hits in the same turn. More than likely the Skyhawk will tumble out of the sky in flames.

3. Radar Homing Missile Combat

An Israeli F-15 over the Bekaa Valley fires an AIM-7 Sparrow at an approaching (head on)Syrian Mig-23. The F-15 pilot is Experienced while the Mig-23 pilot is average.

F-15

Front Aspect -3

AIM-7 +7

Final die roll modifier: +4

Mig-23

Average pilot: +1

Countermeasures +3

Final die roll modifier: +4

The F-15 player rolls a 6, which added to the final modifier ends up as a 10. The mig-23 player rolls a 7, which added to the final modifier ends up as an 11. Since the defender(Mig-23) roll is higher than the attacker's(F-15), the missile misses it's target.

4. Radar Lock

A Pakistani F-16 is on a border patrol when an Indian SU-30 crosses the border. The F-16 tries to lock up the SU-30 in case he needs to take a missile shot. The F-16 is head on with a range of 20 hexes and is at altitude 4. The SU-30 is at altitude 5 and both pilots are average.

F-16

Radar Value: +6

Range >5 hexes: +2

Target at higher altitude: +1

Final die roll modifier: +9

SU-30

Countermeasures: +4

Final die roll modifier: +4

The F-16 player rolls a 5, which added to the modifiers ends up as a 14. The SU-30 player rolls a 7, which added to the final modifier ends up as an 11. The F-16's total is greater than the SU-30's, so the F-16 has "locked up" the SU-30.

Getting Started

So now that you've read the rules and want to play, how do you get started? The best way is to decide on a conflict such as the Arab-Israeli Wars, Vietnam, Iran-Iraq, or any war where airpower was extensively used. Then, you need to determine a figure scale and the availability

of the miniatures that you need. This will have a big effect on what you can or cannot play. If you want to do the Falklands conflict in 1/200th scale, you may have to rethink your plans because there aren't that many miniatures in that scale for that period.

Once you've decided on a period and scale, then you need to decide which miniatures to buy. There are several manufacturers with widely varying styles. GHQ and CinC both make beautiful 1/285th models, but they have many parts and easily break with excessive handling during a game. Other companies have miniatures that are average, but with a good paint job they are great as game pieces and can survive rough handling.

Next, you need to figure out how you want to simulate altitude. Our group, like many others, uses brass tubing cut to certain lengths to show the levels of altitude. A piece of brass wire that will fit inside the tubing is glued on to the aircraft model. In this way the altitude tubes can be changed easily in a few seconds. We also paint a number of stripes around one end of the tube that show the altitude level. This is visually the best method as players can easily differentiate the height levels between aircraft.

You can also just base your planes at one height, then use some type of markers to show the altitude level. There is more information on this at the Air Pirates group on Yahoo.

The other major part of the game is naturally what you will be playing on. Again, there are more options than can possibly be discussed here. The most common is a fabric mat, approximately 5' x 9' with 5" hexes marked on the mat. This gives plenty of room for jets to maneuver and allows for multiple aircraft in the same hex. These mats can cost around $75-100 if you don't want to buy the fabric, sew it, then mark several hundred hexes on your own!

Another method is using the 1" hex mats sold for various other games. These can be made of paper, cardboard, fabric, or vinyl. Prices vary greatly, but you can pick up almost any size and color. Another alternative are hex tiles that are used for a variety of games. These can be assembled into a number of game boards that can be used for air gaming.

You will also need a set of maneuver markers for each aircraft. There are some in the Files section on the Air Pirates Yahoo group or you can make your own. Then, a number of aircraft control cards need to be printed out. At first we used counters to mark ammo, speed, altitude, etc…, but we found out that it was much easier to just laminate the aircraft control cards and use grease pencils to mark things.

Once you've accomplished the above, you're ready to play. For your first game it may be best advised to do a battle with cannon armed aircraft only, say some Mig-17s against some F-105s, just to test the system out. In your next battle add in some heat seeking missiles, then finally in your third battle add in radar and radar seeking missiles. It's best to start slow and get the main game systems down before you get into missiles, as they do add a bit of complexity. Overall, though, the main idea is to have fun and Phantoms does a great job of simulating the excitement of modern jet combat, but without the added on complexity.

1/300th Aircraft Manufacturers

GHQ

CinC

Navwar

Scotia-Grendel

Yahoo Groups

Air Pirates: This egroup focuses on the Phantoms and Mustangs rules for miniatures and is very helpful. There is an extensive files section with additional rules, aircraft data cards, scenarios, and more.

The Miniatures Page

www.theminiaturespage.com

THE site for miniatures wargaming with updated news, manufacturer listings, and numerous discussions about air combat in miniature.

Board Games

There are two outstanding board games that are still in print that deal with Vietnam era jet combat. While significantly more complex than Phantoms, they are great for scenario ideas, tactics, and reference material.

GMT Games-**Downtown**

Clash of Arms-**The Speed of Heat**

WFHGS

www.wfhgs.com

MODERN AIR COMBAT RULES FOR MINIATURES

Additional materials can be found on the Yahoo Air-Pirates group web page in the Files section and in the Downloads section of the WFHGS web site at www.wfhgs.com

For questions regarding this publication or the WFHGS gaming group, please contact Matt Irsik at: mirsik1@juno.com

PHANTOMS/INTRUDERS

INTRUDERS is the air to ground supplement for Phantoms. SAMs, AAA, air to ground weapons, a mission generator, and a solitaire system are available for you to do some "Terrain Alteration" scenarios with your Phantoms aircraft.

YAHOO! GAMES Groups

The Yahoo Air-Pirates group is very active in discussing air combat, history, and promoting the Mustangs and Phantoms miniatures rules. There are scenarios, optional rules, markers, and aircraft data cards available in the Files section.

Designer Notes-Final Thoughts

The *Phantoms* rules originally started as a way for my local miniatures group to use their modern jet miniatures in a game. We had been playing our miniatures conversion of Avalon Hill's *Mustangs* for a while and wanted a similar system for our jet miniatures. We tried converting several already existing board games to miniatures, but weren't happy with the results. So, the challenge went out to create a set of rules that would use all the equipment we already had (flight stands, hex mats, etc.), be easy enough to play at game conventions, and still resemble air combat.

My first attempt to meet these goals was basically a direct port of the *Mustangs* system to modern jets. But after a couple playtests, I found wasn't really happy with how it turned out. So I went back to the drawing board, throwing out those items that didn't work (or that I didn't like) and keeping those that did. I also looked through my other air games to see about incorporating rules I liked.

I started out by expanding the impulses to 10, with the corresponding increase in speed to give a better feel of fast moving jets. Next, I really wanted to give the game more three-dimensional action. I always felt *Mustangs* was too limiting in with the ability of planes to change altitude and wanted the new rules to allow the jets to take better advantage of altitude changes. A few other changes were made, including a change in the gunfire and damage system, to get the rules ready to playtest.

It took a little while to make sure the kinks were worked out, but the changes played well and the rules were still easy enough for new players to quickly pick up. It was really fun to watch players try to exploit altitude changes during the turn (as opposed to waiting until the Change Phase). With a few more additions, these rules went on to cover the Korean War as *MiG Alley Ace*.

Using the baseline rules of *MiG Alley Ace*, I started work on a version with missiles, radar, countermeasures, and all the other chrome associated with modern jet warfare. These additions added an extra layer of complexity and I wanted to make sure that they wouldn't overwhelm the system. The missiles also added a couple of aspects that hadn't been considered before; one of which was how to handle missiles against aircraft that successfully break off from the action. The rule that is now in place (rule 7.1.4 Missile Impact vs. Break Offs), was added when we were testing the rules with Israeli Mirage IIIs vs. Egyptian MiG-21s over a battle area that included pyramids as low level obstacles. A MiG-21 was being chased by a Mirage; the Mirage finally got in range to take a missile shot, but because the shot was taken at the end of the turn, the MiG had a chance to break off before the missile would impact on the next impulse. The MiG succeeded in breaking off and the rule, originally known as the 'Paul and the Pyramid' rule (named after Paul Hannah, the player that made the successful roll and rationalized that the missile had hit a nearby pyramid instead of his MiG), was added; showing me the extra dimensions involved with missile combat.

After the *Phantoms* rules were completed, my group used them for a few convention games and in our own games, but there wasn't a lot of interest in the rules until after the Air Pirates Yahoo group started to expand. I had posted the rules on the group and had a few people asked about them, but it wasn't until early 2003 when interest in the rules really grew. This caused me to make some rule changes/clarifications, add some new aircraft, and led Matt Irsik to write the *Intruders* Vietnam supplement for the rules. Matt's supplement kicked off another burst of interest in the rules and a reformatting of the rules into the version you are now reading.

If you have any questions or comments about the rules, feel free to post them on the Air Pirates Yahoo group. I or one of the other group members will do our best to respond.

Dave Schueler

After years of playing Air Superiority and The Speed of Heat, our group felt it was impossible to play modern jet combat as a group game because of the complexity. We then came across Phantoms and haven't looked back. Our group has successfully had up to eight players with a total of around 20 jets complete a scenario in under four hours. Phantoms is enjoyable, realistic within historical tolerances, and you can have new gamers playing in a matter of minutes. Hopefully, the rules system will continue to grow and attract new gamers to this exciting period. Matt Irsik

A Phantoms Supplement

Updated: 05/12/03

WASATCH FRONT HISTORICAL GAMING SOCIETY

INTRUDERS

Vietnam Air War

Beginning with recon missions in 1962, America's involvement in the Vietnam conflict expanded quickly. After the Gulf of Tonkin incident, the President authorized air strikes against North Vietnamese naval bases.

By 1965 U.S. aircraft were flying ground support and interdiction missions. Rolling Thunder, which was proposed to be a massive operation that would end the conflict quickly, instead ended up as a series of half-hearted measures that would go on for three years.

The first air to air combat was between F-105 Thuds and Mig-17s. These two aircraft would have almost a one to one kill ration over the Thud's involvement in the Vietnam conflict. As the conflict grew, F-4C/Ds and F-8s became more heavily engaged, with the F-8 achieving the best kill ratio of any U.S. fighter during the war.

During the first few years fighter-bombers made most of the deep strikes into enemy territory. North Vietnam responded by building one of the most dense and formidable air defense systems seen in modern warfare. As Rolling thunder came to an end in 1968, there was a lull which led to the second phase of U.S. involvement.

By 1969 and 1970 new aircraft began to appear. The A-6 Intruder, A-7 Corsair and the F-4E/J began to make their presence felt. In huge operations such as Linebacker and Linebacker II, the intensive air campaign brought the North Vietnamese to the negotiating table. By 1973 the U.S. forces had left South Vietnam and in 1975 the NVA finally overran the country, ending the war.

The Vietnam air war produced several weapons and concepts that changed the face of modern air combat. Laser guided bombs, cluster bombs, air to air missiles, ECM, Decoy Dispenser Systems (DDS), and terrain following radar all made their initial appearances. The war also saw the use of surface to air missiles, Wild Weasels, Anti-Radiation Missiles (ARMs), and electronic jamming as the defenses and suppression aircraft played a deadly game of cat and mouse. The U.S. also gained vital experience at conducting large air operations and in the area of weapons research.

In air combat the U.S. had several aces, most notably Cunningham and Driscoll in their F-4J and Steve Ritchie, who got all of his with Sparrows. The North Vietnamese had several aces, including a few pilots who became aces while flying Mig-17s.

The conflict was also notable in that it resulted in the creation of the Navy's Top Gun program which improved the kill ratio from a little over 1:1 to 10:1. This would set the stage for the U.S. becoming the leader in future air to air combat.

Inside this supplement

Intruders Features:

- *Extensive anti-aircraft and SAM rules*
- *A wide variety of air to ground weapons*
- *A mission generator to create Phantoms scenarios for air to ground operations.*
- *A solitaire system to resolve air to air or air to ground missions.*

Anti-Aircraft/Surface to Air Missiles

North Vietnam had a massive air defense system and the area around Hanoi was one of the most dense anti-air environments in modern warfare.

The proceeding rules are designed to portray anti-aircraft fire for Phantoms during the Vietnam era.

1. Unless supported by a radar unit, the anti-aircraft unit must have successfully spotted an aircraft to successfully engage it with the listed flak value. If the aircraft is not spotted the flak unit may use Barrage Fire (trying to fill the sky with lead) at a –2 modifier.
2. AA units with a supporting radar can attempt to achieve a radar lock on to an enemy aircraft. Successful lock-ons get the +2 firing modifier.
3. Light and Medium weapons can fire every impulse, but heavy weapons can only fire every other impulse.
4. An enemy aircraft can be fired at in each impulse that it MOVES. This will prevent those odd situations where an aircraft sits over an AAA unit for several impulses without moving.
5. Heavy AAA affects ALL aircraft in the target hex.. Conduct a separate attack on each aircraft in the target hex.
6. Aircraft flying at Level 0 can only be targeted by AAA out to 1 hex. Aircraft flying at level 1 can only be targeted out to 2 hexes.

AAA Firing Procedure:

Add the flak value plus or minus any modifiers, then add it to a die roll. The aircraft that is fired upon rolls a die and adds that number to it's defense value. The results are then applied exactly like the air to air gunnery system in Mustangs/Phantoms. Resolve the damage the same way as in the regular Phantoms rules.

AAA Weapon	Flak Value	Max Range	Altitude ranges	Optimal Altitude	Comments
Small Arms	**1**	**Same Hex**	**0-1**	**0**	**Light**
ZPU-1 14.5mm	**2**	**1**	**0-2**	**1**	**Light**
ZPU-4 14.5mm	**3**	**1**	**0-2**	**1**	**Light**
ZU-23 23mm	**5**	**2**	**0-3**	**1**	**Light**
M-38 37mm	**5**	**2**	**0-3**	**2**	**Medium**
S-60 57mm	**4**	**3**	**1-4**	**2**	**Medium**
KS-12 85mm	**4**	**4**	**2-5**	**3**	**Heavy**
KS-19 100mm	**4**	**4**	**2-5**	**4**	**Heavy**

AAA Firing Modifiers

Radar Directed AAA Fire	+2
Barrage Fire (non-spotted aircraft)	-2
Each altitude level above or under optimal	-2
Firing directly at the front or rear of the aircraft	+1
Flak unit is damaged	-2
Aircraft at level 1 or 2 performing turns or sideslip (Jinking-Evasive maneuvers)	-1

Anti-Aircraft/Surface to Air Missiles (cont.)

DAMAGE TABLE

Weapon	1	2	3	4	5	6	7	8	9	10
Small Arms	1	1	1	2	2	2	2	3	3	4
ZPU-1	2	2	2	3	3	3	3	4	4	5
ZPU-4	2	2	3	3	3	4	4	4	5	6
ZU-23	2	3	3	3	4	4	5	5	6	7
M-38	3	3	3	4	4	5	5	6	6	7
S-60	3	3	4	4	5	5	6	6	7	8
KS-12	4	4	4	5	5	6	6	6	7	8
KS-19	4	4	5	5	6	6	7	7	8	9

Surface to Air Missiles

Surface to air missiles are handled the same way as regular air to air missile attacks in Phantoms. For the Vietnam War, there were only two SAMs involved and their stats are listed below. The following rules are for using SAMs in the Vietnam era for Phantoms.

1. Each SA-2 battery consists of 4-6 missiles and a radar unit. The radar unit must have a lock on to an enemy aircraft to fire. The battery can fire up to two SA-2s at an enemy aircraft.
2. Each SAM radar gets two attempts per impulse to lock on to an enemy aircraft.
3. If the radar unit gets knocked out, the SA-2 battery cannot fire.
4. A SA-7 must have a visual lock on to fire a missile. Treat this as a normal spotting attempt.
5. The SAM radar unit has a 60 degree radar cone that extends to two hexes after the first hex, three after two hexes, etc… . The radar cone may change it's facing each impulse.

SAM Radar Lock On Modifiers

SAM Radar =5

Target at altitude 0 -4

Target $\geq$ 5 hexes away +2

SAM To Hit Modifiers

Attacker Adds:

+? Missile's Attack rating

+4 if the target aircraft used after burners this impulse (HS only)

-3 Firing from target's front aspect.

-2 Firing from target's side aspect.

Defender Adds:

+? IR/Radar Countermeasures value

+2 Aircraft is at Level 0

+3 If the aircraft just completed or is in the process of completing a tight turn or loop.

+? Pilot ability (Green or Inexp. 0, Avg. 1, Exper. 2, Ace 3)

+3 Aircraft successfully completed Break Contact and is fired on by a missile.

Missile	Type	Altitude Range	Max Range	Attack Factor	Launch Roll	Comments
SA-2	RA	1-6	32	2	7	Large missile/ Inflicts 2 critical hits
SA-7	HS	0-2	2	2	7	

Air to Ground Combat

Ground targets may be attacked by a variety of air to ground weapons. Aircraft may conduct different types of attacks, depending upon the weapon and flight profile. There are several types of air to ground attack profiles:

1. Low Level

Aircraft must be flying at Level 0 or 1 to conduct a Low Level attack. This profile has the advantage of not being in AAA/SAM fields of fire for a long time and is very accurate with high drag weapons. Aircraft flying at Level 0 or 1 should use high drag weapons and these are noted on the weapons chart. If an aircraft does not use high drag weapons, then roll a D10. On a 8,9, or 10 the aircraft is caught by the blast and suffers 1D6 worth of damage points.

2. Stand Off

This is used for laser guided bombs, air to surface missiles, and rocket attacks. They can be conducted from altitude levels 1-7. Rocket pods may be fired from 1 to 3 hexes from the target up to an altitude of Level 2. Laser guided and glide bombs cannot be dropped at any altitude lower than Level 3. Laser guided bombs can also only be dropped by or with the aid of an aircraft in the flight element who has a laser designator pod. Air to surface missiles may be fired from any altitude level.

3. Dive Bombing

Aircraft release their weapons while diving towards the target. The aircraft must have dived in the impulse that the weapons are released. This tactic does help with accuracy and increases your speed to egress from the defended areas.

4. Toss Bombing

This tactic is used to literally "toss" your weapons towards the target. Not very accurate, but helps to avoid heavily defended targets.

For a vertical toss the aircraft must have climbed or completed a loop on the impulse the weapons are released. The higher the altitude level, the further the weapons can be tossed. If the final altitude level is 1, then the weapons are tossed 1 hex out from the target. If from Level 2 or 3, then 2 hexes out. From Level 4 or 5 the weapons may be tossed from 3 hexes out. No toss bombing is allowed from higher than Level 5.

Lateral toss bombing is similar to vertical toss bombing, but there is no altitude change involved. The aircraft must have completed a Hard/Tight turn maneuver in the hex where the weapons will be released. From Level 1 the weapons can be laterally tossed 1 hex from the target and from Level 2 or 3 up to two hexes away from the target.

5. **Level Bombing**

This is the normal method to release an aircraft's weapons, particularly dumb bombs. However, the higher up the aircraft is, the less accurate the weapons released will be. Aircraft must have completed a Straight maneuver on the impulse that they release weapons.

By reviewing the weapons and air to ground combat modifiers, you can see which weapons work best with different flight profiles.

Bombsights/Targeting

Depending upon the type of bombsight available for a particular aircraft, the attacking aircraft needs to fly straight towards the release point a number of hexes before releasing weapons. Each altitude level dived can also count towards the requirement. If the minimum number is not met, then there is a negative modifier applied to the bombing to hit die roll.

Manual	3 Hexes
Advanced	2 Hexes
Computer	1 Hex

Release Point/Weapon Movement

Bombs that are dropped do not automatically reach the target in the same impulse that they were dropped in. The exception to this is rockets, which when fired are resolved in that impulse. Aircraft must drop their weapons at a **Release Point** depending upon their current altitude level. Once the weapons are dropped, they will continue to move towards the target one hex every time the aircraft moves in an impulse. This means that you may have a situation where an aircraft is shot down, but it's weapons still move towards the target and cause damage.

Altitude Level	Release Point
0-2	1 Hex From Target
3-5	2 Hexes From Target
6-7	3 Hexes From Target

Each level diving towards the target drops the release point by one hex.

Released weapons cannot be shot down by AAA or SAM fire. When the weapons reach the target hex the attack is resolved.

Weapons Release

For reasons of simplicity, most weapons should be released in groups, although single weapons can be released by a player's aircraft. You will need to do some research as to how the weapons were carried by each aircraft. An F-4E for example, could have well over 20 different configurations. Factors such as triple ejector racks, multiple ejector racks, etc…., can influence how weapons are deployed in combat. Rocket pods are always assumed to have expended the entire pod.

Air to Ground Combat (cont.)

Standard Bombing Table

Altitude	Direct Hit	On Target	Near Miss	Scatter
0	≥10	6-9	3-5	≤2
1	≥10	5-9	3-4	≤2
2	≥11	7-10	3-6	≤2
3	≥11	8-10	4-7	≤3
4	≥12	9-11	4-8	≤3
5	≥13	10-12	5-9	≤4
6,7	≥13	10-12	6-9	≤5

Air to Ground Combat Modifiers/Notes

Aircrew

Ace/Exper. Crew	+1
Average Crew	+0
Inexp/ Green Crew	-2
Pilot wounded	-1
Weapons Officer wounded (Two Seat Aircraft)	-1

Bombsights

Manual Bombsight	+0
Advanced Bombsight	+1
Computer Bombsight	+2
Aiming Requirements Not Met	-3

Aircraft

Aircraft Damaged	-1
Each Critical Hit	-2

Dive Bombing

Dove 1-2 Levels	+1
Dove 3-4 Levels	+2

Toss Bombing

Toss 1 Hex	-2
Toss 2 Hexes	-3
Toss 3 Hexes	-4

Low Level Bombing

Aircraft at Level 0 or 1 and using high-drag weapons	+1

Weapons

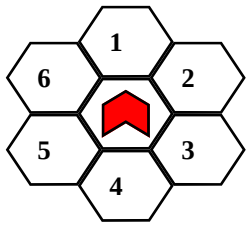
Laser guided/TV Bomb	+4
Rocket pods/1 Hex range	+0
Rocket pods/2 Hex range	-1
Rocket pods/3 Hex range	-2
Napalm dropped from Level 2 or higher	-2

Strafing

Aircraft can strafe from Level 0 or 1, but not in the target hex. Conduct a normal air to air gun attack using a defense rating of 3 for soft targets and 6 for hard targets.

Air to Ground Combat Notes

1. If the bombing roll ends up as a Scatter result, roll to see which adjacent hex the weapons land in.



2. The Walleye TV bomb can only be dropped from altitude Level 4 or higher and has a range of 5 hexes.

Air to Ground Combat (cont.)

Weapon	Type	Weight	Load Points	AS Hard	As Soft	Hi-Drag?	Points Value
M117	HE	750	1.5	4	8	Y	8
M118	HE	3000	4	14	20	N	30
Mk81	HE	250	0.5	2	4	Y	2
Mk82	HE	500	1	3	6	Y	5
Mk83	HE	1000	2	6	10	Y	10
Mk84	HE	2000	3	8	15	N	20
BLU-10	Napalm	250	0.5	1	3	Y	10
BLU-11	Napalm	500	1	2	5	Y	15
CBU-20	AT Cluster	500	1	6	3	Y	10
CBU-41	Napalm	850	1.5	3	6	Y	20
CBU-58	AP Cluster	800	1.5	1	12	N	25
CBU-59	Mixed Cluster	750	1.5	5	8	Y	25
CBU-71	AP Cluster	800	1.5	1	12	Y	25
KMU-388	HE/MK.82 Laser Guided	550	1	4	6	N	30
KMU-342	HE/M117 Laser Guided	800	1.5	5	8	N	35
KMU-421	HE/MK83 Laser Guided	1050	2	7	10	N	40
KMU-351	HE/MK84 Laser Guided	2100	3	9	15	N	50
Walleye I	HE/TV	1200	2.5	10	10	N	50
LAU-68	Rocket pod	250	0.5	2	4	NA	2
LAU-33	Rocket Pod	300	1	2	4	NA	2
LAU-3A	Rocket Pod	450	1	4	6	NA	5
LAU-10	Rocket Pod	550	1	6	8	NA	10
LAU-37	Rocket Pod	850	1.5	10	10	NA	20

Air to Ground Combat (cont.)

Ground Target	Defense Value	Hard/Soft	Comments
Tank	4	Hard	3-5 Average tanks/APCs
Non-Armored vehicle	2	Soft	4-6 Trucks, cars, jeeps
Gun/AAA in open	3	Soft	Guns not in positions
Gun/AAA/SAM fortified	4	Hard	SAM sites, sandbagged positions
Infantry Platoon	4(6 if entrenched)	Soft	30-40 infantry
Small Building	5	Hard	Average house
Large Building	8	Hard	Factory/Warehouse
Bridge	9	Hard	Normal bridge
Large Bridge	15	Hard	Rail Bridge/Large Bridge
Airplane	Aircraft's Defense Value –1	Soft	Parked aircraft
Barge, junk, river boat	3	Hard	Common river boat

Air to Ground Combat Procedure

1 Modify the Attack Value of the weapon by the number of weapons dropped or rocket salvos fired at the target.

2 Bombs = (AV) x 1.5 **3-4 Bombs = (AV) x 2** **≥5 Bombs = (AV) x 3**

2 Roll on the Bombing Table. Add or subtract any modifiers from the list below the table.

3 After determining the Attack Value, then rolling on the Bombing Table, the Attack Value is modified according to the bombing accuracy.

Direct Hit = (AV) x 2 **On Target = (AV) x 1** **Near Miss = (AV) x 0.75** **Scatter = (AV) x 0.5**

4 Check for target damage. If the target was previously damaged, then modify the Defense value by the following: **Light Damage = Defense Value x 0.8** **Heavy Damage = Defense Value x 0.5**

Result	Target Damage	Comments
Attack total < Defense total	No Damage	No Effect
Attack total > Defense total	Light Damage	Target is still usable
Attack total > 2 x Defense total	Heavy Damage	Target is not destroyed, but may not be used.
Attack total >3 x Defense total	Target Destroyed	Target is knocked out

Air to Ground Mission Generator

The Air to Ground Mission Generator will let gamers randomly create scenarios with missions, victory objectives, choice of aircraft, defenses, etc… . Simply choose a defense level suited to the number of players in your group. Then roll to see what the mission is and the number of points that are available to purchase aircraft and weapons. The defenders will also purchase anti-aircraft defenses and interceptors. This will let small groups run several aircraft in a strict air to ground role or if a larger group, multiple packages of air to ground aircraft with escorts. Very large groups can fly AAA/ SAM suppression missions, then air strikes with escorts. These would be massive games involving 12-20 aircraft on the U.S. side alone.

1 Decide upon a threat level according to the number of players.

2 Roll on the Mission Table. This will help both sides determine what type of aircraft, weapons, and defenses they will need.

3 Both sides purchase aircraft, defenses, and weapons with their points allowed for the mission.

4 The North Vietnamese player (s) roll to see what percentage of the defenses are known by the attacker, then deploy them on the board. The remaining defenses are hidden.

5 The U.S. player (s) choose their ingress and egress routes.

6 Play begins.

Point Values

AIRCRAFT

The points cost format is expressed in three numbers for U.S. aircraft. The first number is the actual points cost for selecting the aircraft. The second number is the amount of air to air weapons load points. The third number is the amount of air to ground weapons load points the aircraft can carry in addition to air to air weapons.

A-4 Skyhawk	80/0/12
A-6 Intruder	150/0/30
A-7 Corsair	120/2/24
A-1 Skyraider	70/0/13
F-100 Super Sabre	90/2/12
F-101 Voodoo	90/2/2
F-104 Starfighter	90/4/8
F-4B/C/D Phantom	200/8/20
F-4E/J Phantom	225/8/20
F-8 Crusader	120/2/0
F-105 Thud	140/2/18
F-105 Wild Weasel	200/0/18
B-52 Stratofortress	350/0/106
B-57 Canberra	225/0/20
A-37 Dragonfly	60/0/8
F-111 Aardvark	275/0/48

WEAPONS

Use the point values on the air to ground weapons chart. The North Vietnamese aircraft get their air to air missiles for free, while the U.S. side must pay for theirs. This helps to reflect that many of the fighters did not go out with full air to air loads.

AIM-9B	5
AIM-7F	5

Air to air missiles must be bought in pairs.

Laser Designator Pod	25
ECM pod	15

DEFENSES

Mig-17	50
Mig-19	65
Mig-21	100
SA-2	15
SA-7 (w/ 1 reload)	5
SAM Radar Unit	50
AAA Radar Unit	15
ZPU-1	5
ZPU-4	8
ZU-23	10
M-38	10
S-60	15
KS-12	20
KS-19	25

Mission Table

Threat Level
?/? Attacker/Defender point totals

Die Roll	Mission	Low	Medium	High	Set Up Notes	Objective
1	Recon	650/250	1000/500	1500/800	1	Recon aircraft must fly over target hex.
2	Ground Support	700/300	1100/600	1700/850	2	Destroy enemy ground forces.
3	SAM Suppression	650/250	1000/400	1500/750	3	Knock out SAM sites.
4	Ho Chin Minh Trail	700/300	1100/600	1800/900	4	Destroy enemy forces/supplies
5	Railroad Busting	650/300	1000/500	1500/750	5	Destroy the railroad/train
6	River Crossing	700/350	1100/550	1700/800	6	Prevent enemy forces from crossing a major river.
7	Ground Support	750/350	1150/600	1700/850	7	Destroy enemy ground forces.
8	SAR	600/250	1000/500	1500/700	8	Rescue a downed aircrew
9	Supply Interdiction	700/300	1200/600	1800/900	9	Air strike on a port, road hub, or convoy
0	Bridge Destruction	800/450	1250/700	2000/1000	0	Attack on a major bridge

Low Threat Level scenarios are good for 1-2 players flying the attackers and 1-2 players playing the ground defenses, although a one on one situation would be best. Medium Threat Level scenarios are good for 2-3 players flying aircraft and at least two players as the NVA defenders. The attackers will get anywhere between 4-6 aircraft while the defenders will have at least one SA-2 site with six SAMs and numerous AAA sites all over the board, or they can opt for a mix of AAA and aircraft. High Threat Level scenarios are designed for 3-4 players flying the attacking aircraft and 3-4 players as the defenders. The attackers will usually get 6-8 aircraft and the defenders can have a wide variety of AAA, SAMs, and aircraft.

Limits: To prevent non-historical situations such as the defenders purchasing 100 ZU-23s, no more than **10** of any one kind of AAA weapon may be purchased by the defenders.

Known Defenses: Before the game begins, the NVA player (s) rolls a D10 to determine the percentage of the defenses that are known to the U.S. player (s). These are placed on the board before the U.S. side plans it's mission. The remainder are hidden until they either fire, are spotted, or try for a radar lock.

Die Roll: **1,2,3** 50% **4,5** 60% **6,7** 75% **8,9** 80% **0** 90%

Mission Generator Set Up Notes

General Mission Notes: Because of the large size of the game mats, the North Vietnamese (Defenders) should place the objectives near the center of the board. The U.S. player (s) then informs the North Vietnamese player (s) which 3 sides they might enter from. This simulates the fuel restrictions on U.S. aircraft and not being able to fly completely around the defenses. The North Vietnamese player (s) then roll a D10 to see what percentage of the defenses (AAA or SAM) are known and deployed on the board. SA-2 batteries are placed in a circle with the missiles facing out. All of the batteries missiles and radars must be in the same hex.. Migs are deployed by a D10 roll; **1,2** Deployed on board-any height, speed and facing **3,4** On board, over the scenario objective-any height, speed, and facing. **5,6** Roll 1D6 for altitude, 1D6 +1 for speed, and 1D6 for facing, then roll 1D10 for number of hexes from the objective. **7,8,9,**10 Designate an airfield on the board at least 15 hexes from any objectives. Migs start speed 2, altitude 0.

Mission # 1: Recon
NVA Set Up: Choose three objectives (bridge, port, supply facility, factory, etc..) not closer than three hexes to each other. Deploy defenses normally.
U.S. Set Up: Purchase escort for the recon aircraft. Determine by die roll which objective the recon aircraft will fly over.
Special: The U.S. side gets one free recon aircraft (choose F-100, F-105, etc…) that is unarmed.
Victory Conditions: The recon aircraft must fly over the objective at altitude Level 3 or lower, then exit the board. If the recon aircraft is unable to accomplish it's mission the U.S. side loses.

Mission # 2: Ground Support
NVA Set Up: Roll 1D10 for armor units, 1D10 for infantry, 1D10 for trucks, then position them in 1D6+1 adjacent hexes. For larger group scenarios, multiply the numbers rolled by 2. AAA defenses may be positioned near the ground force, but not forward of their positions (the front line). SA-2s cannot be purchased for this scenario.
U.S. Set Up: U.S. aircraft enter as described in the general mission notes.
Special: none
Victory Conditions: The U.S. side must heavily damage or destroy at least 50% of the NVA ground force.

Mission # 3: SAM Suppression
NVA Set Up: A radar unit and 6 SA-2 missiles must be purchased and deployed.
U.S. Set Up: U.S. aircraft enter as described in the general mission notes.
Special: none
Victory Conditions: Either the SAM radar unit or three SA-2 missiles need to be destroyed or heavily damaged for a victory.

Mission # 4: Ho Chi Minh Trail
NVA Set Up: Roll 1D10 for armor units, 1D10 for artillery units, 1D10 for infantry units, and 1D10 for trucks. For large group scenarios, multiply the numbers rolled by 2. Designate a three hex wide strip that runs across the center of the board as the trail. All ground forces and AAA defenses must be set up in that three hex wide strip.
U.S. Set Up: U.S. aircraft enter as described in the general mission notes and if they are unable to spot the enemy ground forces they must take a –2 on their bombing attack.
Special: none
Victory Conditions: The U.S. side must heavily damage or destroy at least 50% of the NVA ground forces.

Mission # 5: Railroad Busting
NVA Set Up: Designate a row of hexes that are the railroad tracks. Using counters or miniatures place a train near the middle of the board. Defenses can now be purchased and deployed.
U.S. Set Up: U.S. aircraft enter as described in the general mission notes.
Special: The train moves at speed 2 and has a defense value of 4. The tracks have a defense value of 5 with a –1 to hit modifier (hard to target).
Victory Conditions: The US side achieves a marginal victory by destroying at least two railroad hexes in front of the advancing train. A total victory is achieved if the train is destroyed.

Mission Generator Notes (cont.)

Mission # 6: River Crossing
NVA Set Up: Place 4 pontoon bridges in adjacent hexes along a river. Roll 1D10 of armor units, 1D10 of infantry units, 1D10 of trucks, and 1D10 of artillery units. Place the ground forces in any of the hexes where the pontoon bridges are deployed with all on one side of the river. No SA-2s may be purchased for this scenario.
U.S. Set Up: U.S. aircraft enter as described in the general mission notes.
Special: On turns 2, 5, and 8 one ground unit may cross to the other side of the river on each pontoon bridge.
Victory Conditions: The U.S. side achieves a tactical victory by destroying at least 3 of the bridges. A total victory is if all 4 bridges are destroyed.

Mission # 7: Ground Support
NVA Set Up: Roll 1D10 for armor units, 1D10 for infantry, 1D10 for trucks, then position them in 1D6+1 adjacent hexes. For larger group scenarios, multiply the numbers rolled by 2. AAA defenses may be positioned near the ground force, but not forward of their positions (the front line). SA-2s cannot be purchased for this scenario.
U.S. Set Up: U.S. aircraft enter as described in the general mission notes.
Special: none
Victory Conditions: The U.S. side must heavily damage or destroy at least 50% of the NVA ground force.

Mission # 8: SAR
NVA Set Up: Set the defenses as per the normal set up. After the U.S. player puts down a counter to represent the downed air crew, the NVA sets up 5 infantry units within 3 hexes of the air crew.
U.S. Set Up: 1/2 of the U.S. aircraft are deployed on board at any altitude and facing, within 10 hexes of the downed air crew. The remaining 1/2 appear as normal. The rescue chopper is 12 hexes away and moves at speed 3. If it is shot down or damaged another rescue chopper appears at a board edge. On turns 2, 5, and 8 the NVA infantry may move one hex. If they reach the hex where the downed air crew are then they roll a D10 each turn. On a 6 or less the air crew is captured and the game is over.
Special: On turns 2, 5, and 8 one ground unit may cross to the other side of the river on each pontoon bridge.
Victory Conditions: The U.S. side achieves a victory by rescuing the downed air crew.

Mission # 9: Supply Interdiction
NVA Set Up: Select five objectives (factory, port facility, railroad yard, motor pool, etc….) and deploy them on the board. Each objective must be within 2 hexes of another objective. Then deploy your defenses as normal.
U.S. Set Up: U.S. aircraft enter as described in the general mission notes.
Special: none
Victory Conditions: The U.S. side must heavily damage or destroy at least 2 objectives for a tactical victory. If more than 2 are destroyed it is a major victory.

Mission # 10: Bridge Destruction
NVA Set Up: Place a railroad or major bridge on a river hex. Defenses can then be deployed as normal.
U.S. Set Up: U.S. aircraft enter as described in the general mission notes.
Special: none
Victory Conditions: The U.S. side must heavily damage or destroy the bridge.

U.S. Aircraft Weapon Load-Outs/Bombsights

These are typical weapon load outs for U.S. aircraft during the Vietnam War. While there could be hundreds of variations, these examples are the most common. There is also a point value given to make it easier to use with the Mission Generator. On most missions the U.S. aircraft needed to carry fuel tanks, so the full load capabilities were rarely used.

F-4E /J MIGCAP 265 points

(4) AIM-7F, (4) AIM-9B

F-4E/J Ground Support 285 points

(2) Aim-7F, (4) AIM-9B, (6) Mk82

F-4E/J Bridge Busting 360 points

(2) Walleye I, (2) Aim-7F, (1) laser designator pod

F-100 Ground Support 140 points

(2) Aim-9B, (4) Mk. 82, (2) Mk. 83

A-6 Deep Strike 270 points
(12) Mk. 83

A-6 Deep Strike 375 points
(9) CBU-71

B-52 Arclight 880 points

(106)Mk. 82

A-4 Ground Support 114 points

(2) LAU-68, (6) Mk. 82

F-111 Interdiction 575 points

(12) CBU-58

F-111 Deep Strike 435 points

(24) Mk. 82, (4) Mk. 83

F-105 Ground Support 198 points

(6) M117, (2) Lau-3

F-105 Bunker Buster 210 points

(2) AIM-9B, (2) M118

F-105 Deep Strike 180 points

(2) AIM-9B, (6) Mk. 82

A-37 Ground Support 105 points

(2) LAU-3A, (4) Mk. 82, (1) BLU-11

A-1 Ground Support 144 points

(2) LAU-68, (10) Mk. 82, (2) Mk. 83

A-1 Ground Support 178 points

(4) CBU-58, (4) LAU-68

A-7 Ground Support 200 points

(2) LAU-3A, (12) Mk. 82, (2) AIM-9

A-7 Deep Strike 190 points

(6) Mk. 83, (2) AIM-9B

F-104 Ground Support 120 points

(2) AIM-9B, (4) Mk. 82

Players may need to do some research to find out how weapon loads were balanced when fuel tanks and ECM pods were added on.

Aircraft Bombsights

A-1	Manual
A-4	Manual
A-6	Computer
A-7	Advanced
F-4	Advanced
F-8	Manual
F-100	Manual
F-101	Manual
F-104	Manual
F-105	Advanced
F-111	Computer
A-37	Manual
B-57	Advanced
B-52	Advanced

Electronic Counter-Measures (ECM)

Electronic Counter-Measures (ECM) was in it's infancy when the Vietnam War first began. By 1970, however, no less than 10 different ECM pods were available, along with various decoy systems. The Intruders gamers have two options for using ECM. The first is to use the generic ratings for particular years and the second is to use aircraft specific ratings.

Generic Ratings
(vs. radar/ vs. heatseekers)

1966-1969	2/1
1969-1975	3/3

Aircraft Specific

A-1	0/0
A-37	0/0
F-104	0/0
F-101	1/0
F-100	1/0
F-8 (1966-69)	1/0 (after '69) 3/0
A-7B	2/1
A-7E	3/2
A-6A	3/2
A-6E	4/3
A-4 (1966-69)	1/1 (after '69) 3/2
F-4 (1966-69)	1/0 (after '69) 3/2
F-105 (1966-'69)	1/0 (after '69) 2/1
F-105F/G	4/3
B-57B	0/0
B-57G	2/1
B-52D	3/1
B-52G	4/2

Players can also purchase extra ECM pods for 15 points each using the purchase system. For complexity reasons, the various kinds of pods have been classified into two items.

ECM pod	1/0
IR Jammer pod	0/1

Aircraft would generally only carry one pod, although Wild Weasels and Iron Hand aircraft would often carry two pods of each type.

Wild Weasel/Iron Hand Operations

Wild Weasel and Iron Hand operations usually involved hunting down SAM and radar sites, as well as protecting strike packages. There are three aircraft that are allowed to fulfill this function in Intruders. These are the F-105F/G, A-6B/E, and the A-7E. These aircraft were usually fitted with extra electronic gear to detect radar signals, find enemy radar installations, and launch Anti-Radiation Missiles (ARMs).

The procedure to launch an ARM is as follows:

1) The aircraft attempts a radar lock on to all operating enemy radars. Treat this as a normal radar lock on attempt.

2) The aircraft needs to get a targeting fix on the enemy radar. Roll 1D10 and on a 6 or less the radar is able to be targeted. Add +1 to every impulse the aircraft has a radar lock on to the target radar.

3) Perform a launch roll and the ARM is then moved at a speed of 5 hexes per impulse towards the target.

4) When the ARM reaches the target hex, roll 1D10 for the combat result.

1,2,3 Direct Hit-Radar is destroyed

4,5,6 Heavy Damage-Radar can only attempt one lock on per turn and control one SAM in flight. Add a –3 to all radar lock on attempts.

7,8,9 Light Damage-Add –1 to all radar lock on attempts.

0 No damage

AGM-78s add a –1 to the damage roll.

Each impulse that an ARM moves allows the target radar to possibly detect the ARM launch and shut the radar down. After an ARM has moved in the movement phase, a targeted radar can attempt to detect the ARM and shut down. Roll 1D10 and on a 4 or less the radar detects the ARM and can shut down. If it shuts down it loses all radar locks and any SAMs that it is guiding are lost. The only modifier is a +1 if there has already been an ARM attack on any other radar.

Weapon	Type	Range	Launch Roll	Points Cost
AGM-45	ARM	12	8	25
AGM-78	ARM	30	8	35

Sample Weapons Load Out:

F-105F/G 400 points
(2) AGM-45, (6) CBU-59

A-6E 290 points
(2) AGM-45, (1) ECM pod, (3) CBU-59

Vietnam Specific Rules/Optional Rules

1. Rules of Engagement

U.S. aircraft are not allowed to fire at enemy units that have not been spotted. This does include enemy units that have been locked up by radar.

2. Launch Rolls

Early air to air missiles were notorious for failing on launch. Whenever a missile is fired a D10 is rolled. After modifiers are applied , if the number is higher than the missile's launch number, the launch has failed and that missile is lost.

AIM-7F/AIM-9B	8
SA-2	8
SA-7	8
AA-2 Atoll	6

Modifiers

Firing aircraft in tight turn or loop	+1
Firing aircraft at Level 2 or higher, firing at enemy at Level 0 or 1	+1
Heatseeker fired at enemy aircraft in sun arc	+1

3. Altitude 0/1 Flight

Aircraft flying at altitude Level 0 or 1 may not fly faster than speed 6.

4. **Radar/Spotting**

Both the U.S. and NVA had long range radar assets. When a scenario starts roll a D10 for each aircraft. If the result is $\leq$8, then the aircraft has been picked up by long range radar and has the +3 modifier added for spotting purposes.

5. Emergency Maneuvers

When an aircraft has a missile fired at it, there is a chance the target aircraft can spot the missile and begin emergency maneuvering. The aircraft needs to roll as if for a spotting attempt, adding +3 (early missiles had a big flash and smoke trails). If the missile is spotted (this includes heatseekers which hit that turn), then the target aircraft can replace it's current Maneuver Marker with a Tight Turn or Loop, which will give it the positive modifiers to defeat the missile.

Solitaire Rules

Solitaire Air to Ground Combat

For solitaire air to ground combat, choose a Low Threat environment from the Mission Generator table. Buy the defenses as normal, then deploy them in the following method.:

1) SAMs and radar units are deployed on the board by rolling 1D10 for the number of hexes from the objective (s) and 1D6 for direction.
2) Take the remaining AAA defenses and roll 1D10 for each of them. On a 9 or 10 they are set aside and used as "hidden" defenses.
3) Divide equally the remaining AAA units. For the first half, roll 1D6 for direction from the objective (s), then roll 1D10 for distance. Take the second half of the units and roll 1D6 for direction and 3D6 for distance. These are the known air defenses and this should give a pretty random, spread out deployment. It is up to you to then find an ingress and egress path to the objective (s).
4) Use the standard Mig deployment from the Mission Generator notes if you chose aircraft for the defenses.
5) Each time you move one of your strike aircraft towards the objective you need to check to see if any of the hidden AAA units reveal themselves. Check the three forward arc hexes by rolling 1D10. If a 0 is rolled, then randomly place an AAA unit in that hex.
6) AAA and SAM units will fire at any opportunity they have.
7) Conduct bombing attacks as normal.

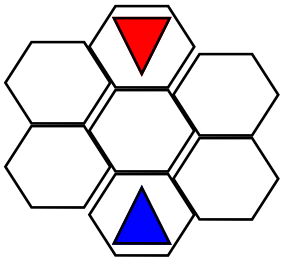
Air to Air Solitaire Combat

Simulating air to air combat for solitaire play is very difficult. This system should at least give you a reasonably good game and an active defense against your strike packages.

Mandatory Guidelines

1) Enemy aircraft will always attempt to close with your aircraft. If they start more than 5 hexes away from you, move them at the fastest speed possible and climb/dive to your aircraft's altitude level.
2) If they are head on or trailing your aircraft they will move directly towards your aircraft. If they are in a side arc they will move to intercept your aircraft.
3) Once the enemy force loses an aircraft and if they are outnumbered, there is a chance that they will break off. Roll 1D10 at the start of each turn and add +1 if they are outnumbered 2:1, +2 if 3:1, and +3 if 4:1 or greater. On an 8 or higher they break off. Choose a random table edge and move them at best possible speed towards it, diving to at least Level 2.
4) Enemy aircraft will always fire at any opportunity that presents itself.
5) Once the range closes to under 5 hexes roll on the following tables, depending upon their arc, each time a maneuver is finished.

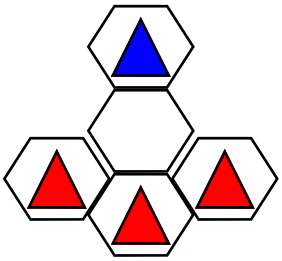
Head On



Die Roll	Result
1,2,3	Straight
4,5	Left Turn
5,6	Right Turn
7	Sideslip or Roll 1-5 left 6-10 right
8	Tight turn-left
9	Tight turn-right
0	Loop

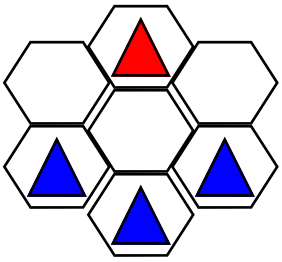
You will need to make some decisions for the enemy aircraft at times, but they should always press for the advantage. If because of speed considerations, they cannot make hard or tight turns, then use normal turns.

Tailing



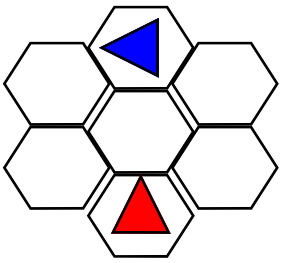
If an enemy aircraft is tailing any of your aircraft it will always maneuver for the best shot.

Being Tailed



Die Roll	Result
1,2	Straight
3	Left Turn
4	Right Turn
5	Sideslip or Roll 1-5 left 6-10 right
6,7	Tight turn-left
8,9	Tight turn-right
0	Loop

Side Arc



Die Roll	Result
1,2,3,4	Straight
5	Left Turn
6	Right Turn
7,8	Sideslip or Roll 1-5 left 6-10 right
9,0	Loop

Examples of Play

1. **Anti-Aircraft Fire #1**: A U.S. aircraft is at altitude level 2 on a bombing run and has a defense value of 4. A ZPU-4 with a radar unit is 1 hex away and decides to fire. The radar had successfully locked on to the aircraft last impulse. The ZPU-4 has a Flak value of 3, radar directed modifier of +2, but since level 2 is 1 level above optimum there is a –2 modifier. The ZPU-4 rolls a 6 for a modified roll of 9. The aircraft rolls a modified 6 and is hit. Checking the ZPU-4 damage table shows 3 points of damage for being 3 over on the die roll. The aircraft takes three points of damage and a critical hit.

2. **Anti-Aircraft Fire #2:** A U.S. aircraft with a defense value of 4 is at altitude level 1 and is performing a sideslip/roll (evasive). A ZU-23 is firing directly at the front of the aircraft since it is heading towards the gun. The ZU-23 is not radar directed, but has spotted the aircraft, so now Barrage die roll modifier is applied. The ZU-23 rolls a 4, with +1 for firing directly at the aircraft, but it is doing evasive maneuvers, so the modified roll is still a 4. The aircraft rolls a modified 6 and the ZU-23 misses.

3. **Anti-Aircraft Fire #3**: A U.S. aircraft is flying at altitude level 4 with a defense value of 3. An S-60 two hexes away fires at it, without spotting the aircraft. The S-60 rolls a2 8, modified by Barrage fire –2 and two levels above optimum –4, for a modified die roll of 2. The aircraft rolls a modified 8 and the S-60 misses.

4. **SAM Lock On/Firing**: A U.S. aircraft is 20 hexes away from a SAM radar unit. The radar unit has a value of 5, plus the +2 for being over 5 hexes away. The radar rolls a 6, giving a modified score of 13. The U.S. aircraft rolls a modified 10, so the radar unit locks on to the aircraft. An SA-2 is fired and rolls a 4 on it's launch roll, so the launch is successful. It reaches the aircraft in a few impulses and an attack is conducted. The SA-2 has an attack rating of 2, firing from the side –2, and rolls a 9, giving a modified total of 9. The aircraft after adding on modifiers for an ECM pod and evasive maneuvering (performing a hard turn) rolls a modified 8. The SA-2 inflicts 1 point of damage, but two critical hits which destroys the aircraft.

5. **Toss Bombing:** A target has three ZPU-1s defending it in the same hex. An A-7E at Altitude Level 1 approaches the target and zooms up to level 3, then releases two Mk. 82 bombs from two hexes out, which avoids fire from the ZPU-1s. The A-7 rolls a 5, modified by +1 for having an advanced bombsight and –3 for toss bombing two hexes away, giving a modified die roll of 3. From altitude 3 the result is a Scatter, so there is no effect on the target.

6. **Level Bombing:** An A-6E drops six Mk. 82 bombs on a small building from level 4. The A-6 rolls a 7, modified by +2 for having a computer bombsight, giving a roll of 9, which is an On target result. The Attack value is 9 (Attack value of a Mk. 82 x 3 for $\geq$ 5 weapons at the same target) x1 for being On target, giving a final, modified Attack Value of 9. Checking the Damage table, 9 vs. a Defense Value of 5 equals Light Damage.

7. **Dive Bombing:** An A-4 drops to altitude level 2 from 4, and drops three Mk. 82 bombs at a tank. The A-4 rolls a 8, modified by +0 for Manual bombsight and +1 for diving two levels, giving a modified result of 9. At level 2, this results in an On Target result. 3 Mk. 82s are modified to an Attack value of 6 vs. hard targets. Tanks have a Defense value of 4, so the tank suffers Light Damage.

8. Low Level Attack: A F-105 is at Level 1, dropping six Mk. 82 high drag bombs on a river barge. The F-105 rolls a 8, modified by +1 for Advanced bombsight and +1, giving a modified die roll of 10. A 10 at Level 1 is a Direct Hit. Six Mk. 82s are modified to 9, then x2 for a Direct Hit, giving a final Attack Value of 18. The barge has a defense strength of 3 and is sunk.

9. **Mission Generator:** A four player group rolls a D10 to create a mission for a game. Using the Medium threat environment, which is suitable for 4-6 players, a 5 is rolled which is a Railroad Busting mission. The NVA players decide to spend their points on a SAM radar unit, six SA-2s, 2 AAA radar units, 5 ZPU-4, 4 ZU-23, 2 M-38, 2 S-60, and 2 Mig-21s for 500 points. The U.S. players inform the NVA players that they will be entering anywhere from board edge 2,3, or 4. The NVA players roll a D10 and roll a 6, so 60% of the AAA must be put out on the board along with any SA-2 batteries. The remaining 40% are hidden and the positions are written down by the NVA players. The Migs roll a 7 and start at an airfield on the board. The U.S. players then analyze what they will need to accomplish their mission. They decide to take two F-105s with full loads and two F-4s for escort with small loads. The NVA players set sup the train and the U.S. players then choose a table edge, place their aircraft, and play begins.

Designer Notes

What makes the Mustangs/Phantoms system work so well is it's playability. Most air to air combat simulations are complex by nature, namely due to the application of physics, thrust, aerodynamics, sensors, and a bewildering array of weapons. I tried to keep the concepts in Intruders at the same level of complexity as Phantoms. Here's a look at some of the main topics:

1) AAA Effectiveness: Yes, it is difficult to try to shoot down jet aircraft with AAA fire. Even with radar directed weapons it is difficult at best. The Argentines had numerous radar directed sites around Port Stanley and while achieving some success, they were easily avoided. The incredible amount of AAA fired at Coalition aircraft during Desert Storm was fairly ineffective. Every so often, though, a shell will hit a jet and the chances that it goes down are pretty good.

2) Further AAA Notes: Barrage fire was put in to reflect how the NVA would often just point weapons at the general location of an aircraft and fire a ton of lead into the sky. Not very accurate, but every so often you will hit someone. The rule where AAA can only fire out to 1 or 2 hexes against aircraft at Level 0 or 1 is to simulate aircraft at low level using terrain features to shield themselves, plus the horizon and line of sight create problems for the AAA crews.

3) SAMs: I lumped all of the versions of the SA-2 into one missile type. In reality there were numerous versions of the SA-2, including an optically guided version. Again, I didn't want to add on too many layers of complexity. The ability of SAM radars to lock on to two targets represents the fact that they are larger radar systems than air radars and with bigger crews. They can track more than one target or at least try to.

4) Toss bombing: Yes, it adds a little more complexity, but it is a modern tactic that has had a lot of use. If you know that there are short range AAA weapons defending a target, then toss bombing is the best way to avoid them. Not as accurate, but at least you're plane will return in one piece.

5) Aircraft point costs: Why does the F-4 cost so much? Well, it can function as both a fighter and bomber, has incredible power, and is probably the best aircraft in the Vietnam War. The B-52 and the B-57 costs so much because the player (s) need to balance firepower against risk. They can both deliver an incredible amount of bombs, but losing one is catastrophic.

6) Mission generator: This is just a simple way to create scenarios of varying sizes. The points values are so that each side can "purchase" what it thinks it needs to win the game. There are many options for defense, ranging from a combination of SAMs, AAA, and aircraft, to just using strictly aircraft. The most challenging aspect is neither side will know what they other has until deployment. If you choose some B-57s and the other side chooses Mig-21s, the bombers could be in for a long day. Each side will need to balance out it's forces to win.

7) Load Outs/Weapons: Most U.S. Air Force aircraft had to refuel up to three times when going on missions in North Vietnam. Naturally, this alters the amount of ordnance you can carry since fuel tanks take up some of your pylons. I tried to factor that in when figuring out the weapon point values and what each aircraft could carry. On a short mission an A-6 could carry 30 Mk-82s, but with fuel tanks it would usually carry 6 –12.

8) Vietnam Specific Rules: Yes, the need to visually I.D. everything cuts down on the F-4 gamers' chance to become an ace. Also, on the outside the Mig-17 isn't very good. However, for chasing down attack aircraft and for low level dogfighting it's worth it's point value. For tangling with F-4s I heartily recommend the Mig-19 or 21. The missile launch rolls were designed to simulate the reliability and randomness of missile success. Sometimes the missile fell off the rail and ignited, sometimes it just fell off!

Hopefully, this supplement will have everything that you need to simulate Vietnam era air to ground combat. While thee is a lot here, it certainly isn't the final say on the subject. If you or your gaming group has any comments, suggestions, ideas, scenarios, or would like to see some rules changes, please email me.

PHANTOMS
2008 Update

Spring 2008

Optional rules, scenarios, and play aids for Phantoms

2008 Update

Special points of interest:

- Trial rules for attacking naval targets.
- Operation Musketeer: 1956 Suez Campaign.
- Hypothetical Soviet invasion of Germany in the 50's.
- Operation Vantage campaign.
- New aircraft data cards plus 5 and 10 impulse game cards.

Contents:

Phantoms Continues On…

I had almost given up on attempting to portray modern air combat with miniatures years ago. My last attempt was trying to convert The Speed of Heat for miniatures play, but there were several obstacles, namely that while it is a great game it is not suited for group play. Not only that, but the complexity level left the casual air gamer sitting around while the rest of us figured out the various charts, sorted out rules for weird situations, and the interest level dropped of significantly.

F-8 Crusaders escorting a CH-53 on a CSAR mission over North Vietnam.

Then I blundered into the Yahoo group for Phantoms. I quickly printed off the rules, some of the data cards, ordered in some aircraft, and went to work. Although making the mat, cutting the tubes, and getting everything ready took some work, our first test of the system proved to be very popular.

While not as realistic as GDW's Air Superiority or the aforementioned The Speed of Heat, Phantoms gave a good game, looked good visually, was suitable for group play, and even gamers who had little interest in the period had a good time. We've run games where there were more than 12 aircraft zooming around and had no problems finishing a game on time.

When the Intruders supplement came out we ventured into ground attack and Iron hand missions, adding A-4s, A-7s, F-105s, SAMs, and AAA batteries to our collections. While this can be a complex subject, the Phantoms and Intruders system does a good job of portraying this era without getting bogged down into too much detail and rules.

Our group is still talking about doing Arab-Israeli periods and after seeing some of the scenarios in this supplement I'm now thinking about ordering in some early jets as well. As with many gamers our ideas surpass our ability to finish projects in a timely manner!

So, what's next for Phantoms? My dream is that someday we could eventually see a published version of the rules and introduce a wider audience to this great system. The odds of that probably aren't very good, but it would be nice, followed up by the Intruders module and some scenario/campaign books.

I have plans for doing an Arab-Israeli War and Falklands War supplement someday down the road and I am more than willing to work with anyone to get these things done.

My best guess is that Phantoms will continue to be what it has always been, namely a labor of love for a small audience. The rules have come pretty far in the last five or so years and hopefully they will continue to grow with more scenarios, campaigns, data cards, and support from manufacturers. Enjoy the update!

Matt

F-4 Phantoms from the Sundowners moving in for the kill on a Mig-21.

Attacks Against Naval Targets in Phantoms/Intruders

At some point every air combat gamer will want to try an attack on naval targets. This could be a scenario where an air group has to stop a convoy, take out an enemy ship on patrol, or perhaps even providing CAP over a stranded/damaged vessel and protect it against enemy aircraft trying to finish the job.

The rules below and the ship chart to the left for a Russian Kashin class destroyer are designed to present some ideas on how to try these types of scenarios. I have deliberately chosen this kind of vessel as it possesses few of the ultra-modern defenses and where a two aircraft vs. one ship type of scenario would be challenging. Once you move up to Aegis equipped vessels and you need to use 50+ aircraft to get through the missile defenses you have gone beyond the scope of this game.

So what is presented here is a basic combat vessel suitable for the 60s, 70s, and early 80s that can be used as the basis for designing other ships and to test out this kind of scenario. If the reaction is positive maybe more ship charts could be created for other countries along with civilian vessels. The Kashins have very basic air defenses consisting of a variety of radars, early SAMs, and 76mm guns. This class served with several navies during the Cold War era and is a good generic modern fighting vessel.

Try this system out and we'll see if it merits more in depth rules, charts, and more specific scenarios in the future.

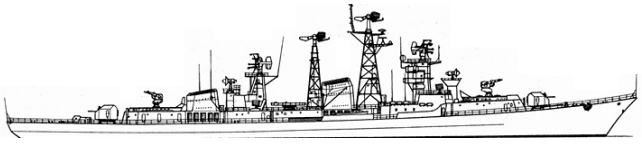
Rules

- **Ship Movement**: Ships move on the last impulse of every third turn and may turn one hex side . Against modern jets the movement of ships is largely irrelevant except to unmask weapons.
- **Hits by ARMs**: Any ARM that hits a ship automatically does one critical hit to the Radars/Sensors, two hits of normal damage, and an additional fire check.
- **Damage**: The Intruders air to ground system was designed for ground targets and used a modified system found in Mustangs. To attack ships, use the **final attack total** as the number of hits against the ship. Mark off the hits starting at the top row of the ship chart and move right. For each orange box crossed off the player must check for fires. For each yellow box checked off the player must check for critical hits and roll on the table below the damage boxes. Also, when the end of a row of damage boxes is reached, the player must roll for an additional critical hit.
- **Fire Checks**: Roll 1D10

1-3	Minor Fire	1D6 additional hits each even numbered turn if not contained.
4-6	No Effect	Smoke, hot fragments, and burning circuits, but no additional damage.
7-9	Major Fire	1D10 additional hits each even numbered turn if not contained.
10	Explosion	A Major Fire breaks out and an additional 1D6 points are added immediately.

- **Fires**: The player with the ship (s) can check to contain a fire at the end of each turn by rolling 1D10. On a roll of 1-5 the fire is contained, 6-9 the fire is still raging, and on a 10 the fire increases by one level. Although the fires get a chance to be contained each turn, fire damage only occurs at the end of each even numbered turn (Ship crews are well trained to fight fires).
- **Attack Example**: An A-4 drops four Mk. 82 500 lb. bombs on a Kashin destroyer. The Mk. 82's AS against hard targets is 3 and dropping 3-4 bombs equates to an Attack Value of 6 (3x 2). The A-4 player rolls an On Target result, meaning that the Attack Value of 6 is the final attack total and it is not modified. This translates into six hits on the destroyer. The fourth hit is a fire check and a 3 is rolled , resulting in a minor fire. The fifth hit is a critical hit with an 8 being rolled, meaning a weapons hit, then a 1 being rolled, taking out the forward SA-N-1 launcher. A D10 is rolled with a 6 being the result, so there is no ammunition explosion, but on the fire check roll for hitting a weapon another 3 is rolled which starts a second minor fire.

Kashin (Project 61M) Destroyer



Damage

	Roll for additional critical hit
	Roll for additional critical hit
	Roll for additional critical hit
	Ship sinks

Critical Hits Roll 1D10

1 Bridge/CIC: If both boxes are hit the ship is out of control for 1D6 turns. Loss of Fire Control for weapons for 1D6 turns.

2-3 Flooding: If both boxes are hit the ship suffers severe flooding and loses 2 hit boxes at end of every odd numbered turn. Roll 1D10 after applying hits and on a 1-3 the flooding stops and one box is marked as un-hit, 4-8 the flooding continues, and on a 9-10 the flooding increases to three hits each odd numbered turn.

4 Radar/Sensors: If both boxes are hit the ship 's sensors have been crippled and a +2 is added to all AAA and SAM attacks.

5 Engines: If both boxes are hit the ship goes dead in the water.

6-7 Misc. Damage:

8-10 Weapons: Roll 1D10 to see which weapon system is hit. Roll an additional D10 to see if there is an ammunition explosion and on a 10 result the ship takes an additional 1D10 hits. There is also an additional fire check for each weapon that is hit.

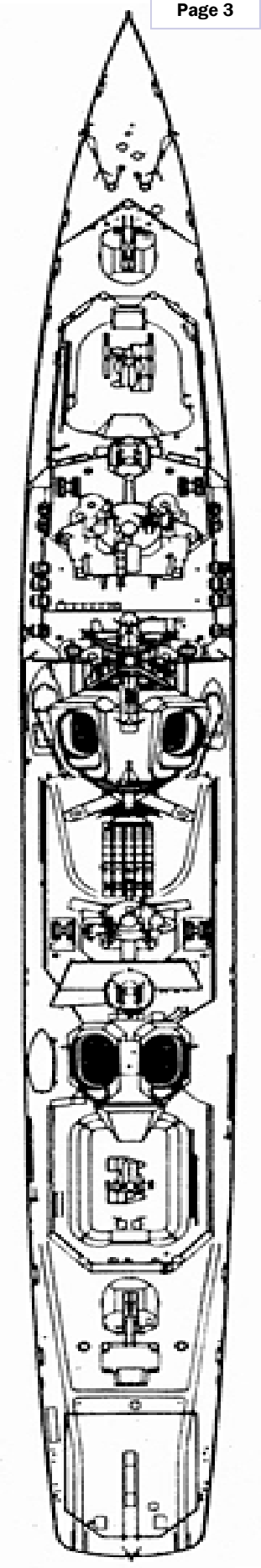
1 SA-N-1 forward launcher
2 SA-N-1 aft launcher
3 76mm forward turret
4 76mm aft turret
5 533mm torpedo tubes
6 RBU-6000 #1 ASW
7 RBU-6000 #2 ASW
8 RBU-1000 #1 ASW
9 RBU-1000 #2 ASW
10 Roll again

Weapons:
76mm-Use S-60 57mm stats from Intruders.

SAM radar = 5

The SAM radar gets two attempts per impulse to lock on to an enemy aircraft and can hold up to two locks at the same time. There is a –4 modifier for detecting aircraft at altitude 0.

Use SA-2 stats for the SA-N-1 but it only causes 1 critical hit.



N.A.T.O. 1952-1956: The Age of the Vampire

The arrival of the jet engine not only revolutionized the aircraft themselves, but the very people expected to fly and maintain them. My late father was part of that transition process and he maintained there was a distinct difference between the 'propeller' and the 'jet' people. He reckoned the propeller people could fix almost anything, and during his time on Guadalcanal during 1942-44, they certainly did. By comparison the jet people were seen as nothing but 'parts fitters'.

And to a large degree they were, given the many highly specialized components jets contained. But the pilots loved the early jets, as unreliable and dangerous as they were.

Tests between a Spitfire XIV and Vampire carried out by the RAE at Boscomb Down in 1945-6, demonstrated the marked difference in performance between the two. The Vampire easily exceeded the Spitfire in all tests; especially in climb rate and maneuverability. So marked was the contrast that the RAF immediately began the conversion process to jets. By 1952, the Vampire and Meteor were well established in RAF squadrons while the F86 had all but replaced earlier US jets in the NATO inventory.

In November 1950, the Soviets took the west by surprise with the sudden arrival of the MiG15 in Korea, flown by experienced Russian veterans. The same engine that powered the Venom and Sabre powered the MiG thus the performance differences were marginal, except in altitude and armament, where the MiG enjoyed a margin in both. The North Koreans had barely reached the industrial age when they became embroiled in a jet age war that necessitated large amounts of assistance from their Soviet and Chinese allies. The Korean air war ended in the north's defeat due to the inexperience of their aircrews and a lack of technical ability.

Both the Russians and the Allies welcomed the opportunity to combat test a completely new technology, their experiences driving the technology race to greater heights, and in so doing, created gunnery radar, the flying tail plane, reliable engines and ultimately the IR missile. But the greatest prize seems to have been a design that would safely cross the sound barrier. It wasn't until the mid 1950's's that combat aircraft were able to achieve this. The technical problems facing jet aircraft designers and manufacturers were indeed formidable, least of all reorienting the US and NATO aircraft manufacturing system to the production of jet engines and airframes. Sir Frank Whittle's writings on the subject are a fascinating insight into the difficulties experienced by designers and inventors in those years.

The single biggest problem facing combat aircraft performing combat maneuvers at high speed was structural failure. Thus many combat aircraft of the 1950's were limited in speed and maneuver. It wasn't until the late 1950's after sufficient knowledge of super sonic flight had been acquired that aircraft combat restrictions were removed. By 1955, we had entered the age of the US Century Fighter – the F100, F101, the notorious F104 'widow maker' and the ubiquitous 'thud' the F105. The Soviets had also crossed the sound barrier with their superb MiG19. From that point on, aviators measured their world in "Mach numbers".

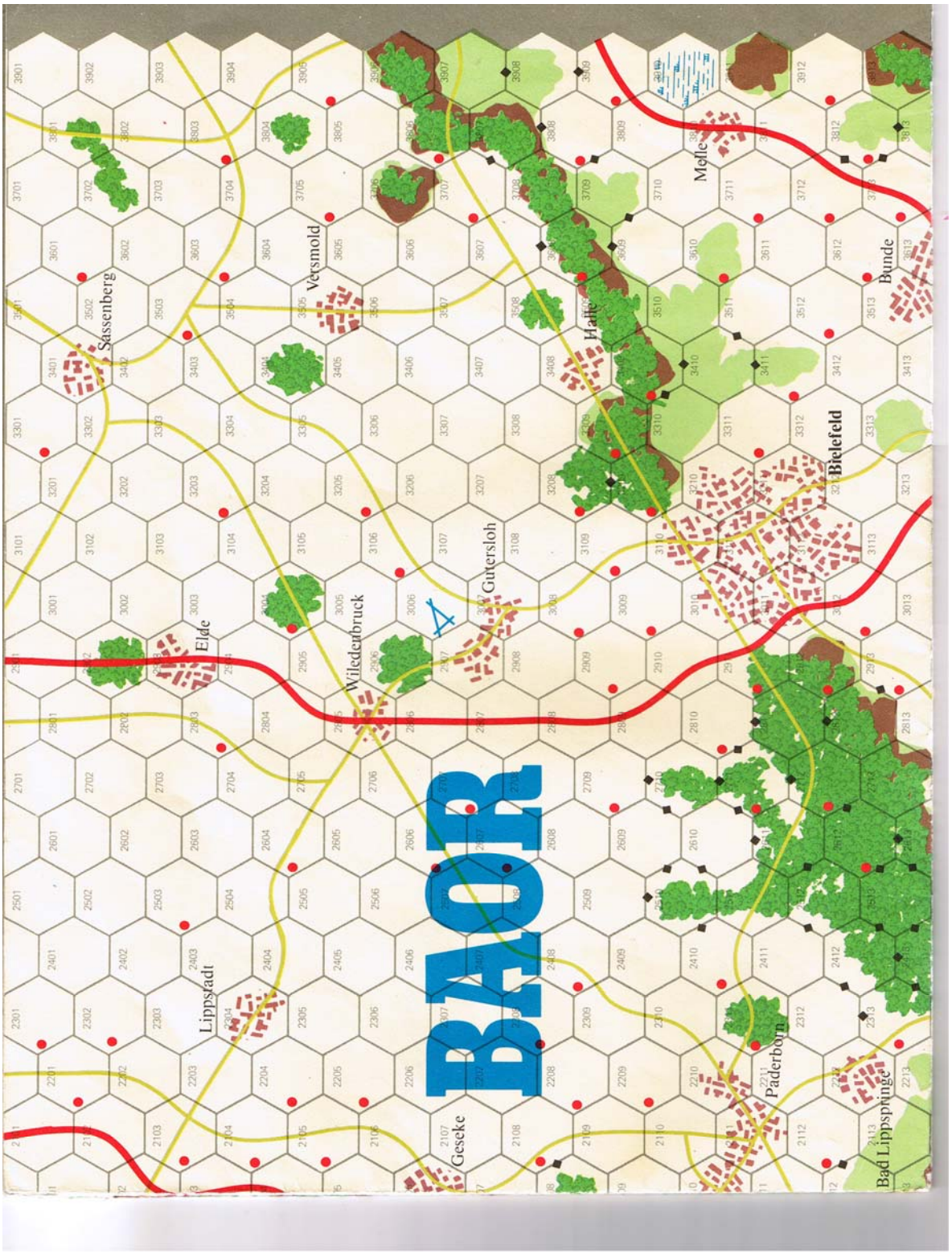
N.A.T.O. and the Warsaw Pact Threat

NATO came into existence in 1947 after a series of political crisis in Greece and Norway threatened to destabilize the northern and southern flanks of Europe. The NATO response was a barrier defense predicated on the belief that if the European forces could make the attrition rate unacceptably high for a Soviet invasion, then no invasion was likely. But in order to make that defense credible it required a high level of readiness, technical superiority and a broad based coalition of forces.

To this end the RAF and USAF placed a significant number of air units in France, Germany and Italy in a forward defense posture, heavily backed up by other air units in Britain. Canadian and US based bomber and fighter units formed a trans- Atlantic reinforcement pool if required.

The NATO campaign I have designed is a 'what if' series of scenarios based on probable events. The most likely of these is constructed around the RAF Tactical Airforce stationed at Gutersloh west of the Weser River and the USAF Tactical Fighter Wings stationed further south-west in eastern France at Etain-Rouvres, 12 miles west of Verdun on the Rhine River.

N.A.T.O. 1952-1956: The Age of the Vampire Campaign Map



This is a section of the map from the SPI game BAOR, which was part of SPI's Central Front series. It shows the area surrounding Gutersloh and is ideal for laying out a Phantoms hex mat for the scenarios.

N.A.T.O. 1952-1956: The Age of the Vampire Scenario 1

First Contact

The campaign begins in the summer of 1952 with sudden Soviet attacks across the whole of Western Europe at sunrise. Russian MiG 15's, escorting IL28 'Beagle', cross the Inner German Border at high altitude, in an attempt to deliver a decisive attack against the main RAF bases west of the Weser. The Russian attack is first detected 150 miles east of Hanover at an altitude of 40,000 feet.

The first combat takes place at 30,000 feet between intercepting Vampires and MiG15's assigned to sweep a clear path in front of the bombers. The IL28's are estimated to cross the Weser River 22 minutes after the Vampires intercept the MiG's. The morning standing patrol is alerted by GCI radar from Gutersloh that a large group of aircraft is approaching from the east at 30,000 feet, speed 300 knots. They have been ordered to intercept and identify this approaching force.

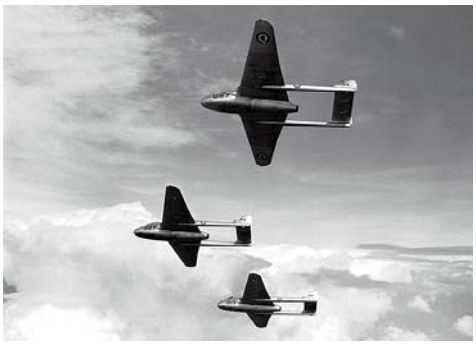
Forces

RAF

Four Vampire FB1's form the Morning Standing Patrol. The Vampire pilots are all experienced.

Soviet Frontal Aviation

A sweeping force of six MiG15's tasked with reaching Gutersloh airbase and engaging any enemy aircraft
that might attempt to intercept the incoming raid. The Russian pilots are a mixture of experienced and
veteran pilots. Two pilots are combat veterans from the Korean war, the remainder experienced.



Weather

The Soviet player(s) roll 1D10. This represents the visibility range in hexes. If a '1' is rolled, assume the target is covered by cloud and ground fog that is expected to clear soon after sunrise. Re-roll the dice immediately and this number becomes the maximum visibility range in the next game turn. Cloud and fog will only affect visibility at altitude level 1. Dice rolls between 2-4 indicate rain and banks of cumulus cloud. Dice rolls of 5 and above are normal clear skies.

Victory Conditions

The RAF player must shoot down or drive off all of the Soviet Migs.

N.A.T.O. 1952-1956: The Age of the Vampire Scenario 2

The second scenario of the campaign deals with the NATO defence of the Weser River as Russian forces from the 3rd Shock Army, attempt to break through the Fulda Gap and into the North German Plain.Gutersloh Airbase stands only 20 miles from the Weser River and is in immanent danger of being overrun. The Russian air raids of the early morning have damaged the base, but not destroyed it. The BAOR is now engaged in a desperate struggle to prevent the Soviet's crossing the Weser at Minden and Bad Oeynhausen and is calling for air strikes to contain Soviet penetrations south of Minden near Buckelburg. The RAF has allocated Canberra and Vampire strikes against these areas with effect immediately. The Vampires and Venoms will fly from Gutersloh while the Canberras will fly from Laarbruken and Wildenrath. Canberra PR3 reconnaissance flights will come from Wildenrath.

Day 2: Monday – 01.00 hours

Day 2 begins at dawn with a Canberra PR3 flight over the Soviet river crossings in the Mindin area. BAOR units report a penetration of several miles and are doing their best to hold Minden against the Soviet 106th Guards Tank Division attack that has been proceeding all night. Soviet units are suspected to be in hexes 3213 and 3313 east of Bielefeld.

Players should game this mission to establish the position of Soviet forces prior to launching an air attack. Once the Canberra has found and identified the target a strike can be launched. Not before! Daylight reconnaissance missions must be escorted if the Canberra is expected to survive. The RAF Players must decide what level of escort they wish to give the Canberra, but this must be tempered by the fact that whatever aircraft are allocated to protect the Canberra cannot be allocated for ground attack until the afternoon of day 2. The D10 roll to locate the Soviet units is 6-10 inclusive. The Canberra PR aircraft may attempt any number of passes to locate the enemy, but is only allowed ONE location attempt per pass.

The Soviet airforce of this time could not respond immediately to requests for assistance from ground units. The Soviet system relied on carefully pre-planned strike and interdiction missions that could either be carried out or cancelled. Variations were almost impossible. Frontal Aviation has two separate missions. Ground attack and local air defence. The IL28 'Beagle' formed the

N.A.T.O. 1952-1956: The Age of the Vampire Scenario 2 (cont.)

medium bomber force while the MiG15bis formed the fighter component. With overwhelming numbers of bombers and fighters facing the defenders, holding the line will be difficult.

NATO airforces have perfected the dispersal of air units since the end of the war and have gained considerable expertise in this tactic. At the beginning of the Soviet attack, ground crews have been dispersed to a number of locations along the autobahns running north and west from Gutersloh. The Vampires have been instructed to return to the dispersal locations after completing a mission. Gutersloh has become deserted over the hours following the first raid. The main RAF dispersal sites are in the forests near Elde, Halle and Wiledenbruch. Pre-positioned stores have been available for some time.

Gutersloh Air Base

Special Rules

Visibility in the air will follow the standard location rules as lair out in section 13.0 BUT the maximum number of hexes at which an aircraft may be visually located is determined by 1 D10 dice roll at the beginning of the game. Both sides may roll a dice each and an average of the two rolls (rounded up) determines the maximum visibility location range.

Soviet AA

The Soviet ground forces had adopted the 'flak corridor' as a means of protecting advancing columns. 14.5mm and 23mm AAA weapons formed the basis of these systems Use the AAA weapon values listed in the 'Vietnam Air War' supplement. Each hex will contain 2- ZPU4 - 14.5mm and 1-ZU23 - 23mm AA system.

Radar Countermeasures

The Soviets relied on very heavy jamming of all military radar frequencies as a countermeasure. The Canberra B1 and B2 series carried an improved H2S Mk 9 bombing radar system (Green Satin) that was highly accurate. However, it was not immune to jamming. When attacking Soviet ground units, Canberra will have 'advanced bombsights' but will not gain the +1 attributed to it. Aircraft without advanced bombsights (Vampires) will suffer no penalty, being tasked with low level ground attack missions. Portable battlefield AAA radar was in its infancy at this time and as such would not have been a serious factor in AAA weapon effectiveness calculations.

Monday – 06.00 hours

The **NATO** strike force consists of 2 Canberra bombers and four Vampires. Their air cover consists of three Vampires. The strike must attack the Soviet forces west of Minden. By 06.00 hours, the Soviet forces are some 24 kilometres from Gutersloh.

The **Soviet** fighter force consists of four MiG15bis with a further four available as replacements should the original aircraft be lost. They will arrive on a single D10 roll of 8,9 or 10. Soviet MiG's may be placed anywhere within 20 hexes of the 106th Guards Tank Division.

Victory Conditions

The RAF wins if they penetrate to the objective identified by the PR Canberra. The RAF will ignore losses in an attempt to attack the Soviet army bridgeheads located at map reference hexes 3213 and 3313 east of Bielefeld.

Operation Vantage: Background

At the beginning of 1961, the Iraqi dictator Abdullah al-Qarim Qassem, unilaterally announced that Kuwait was to be considered Iraqi territory and it was his intention to 'liberate' the inhabitants of Kuwait. Iraq has always considered Kuwait to be their 19th Province, after it was severed from Iraq in the post World War One territorial settlements following the defeat of Turkey. Prior to the bloody coup that had brought Qassem to power during July1958, Iraq had been ruled by the al Sabah family since the end of the War and enjoyed the confidence of successive British Governments.

Accordingly, the Royal Iraqi Air Force received a high level of RAF support and training. That all changed with the coup, as pilots and commanders were either imprisoned, killed or fled Iraq. By the beginning of 1961, the UK Joint Intelligence Committee assessed the Iraqi Air Force capability as 'moderate' in its primary support of the army and " indifferent in air defense due the lack of experienced pilots and trained radar operators." However, it was agreed that given the short distance between the Iraq border and Kuwait oil fields, any incursion would be difficult to halt before they reached the oil fields.

In 1961, the UK Government had given the Kuwait government assurances of military support in the event of an attack on their territory. In response to the threats from Iraq, the UK deployed a significant number of naval, ground and air forces into the region. The first units deployed to Kuwait were four Canberra PR3 of No.88 Squadron, tasked with photoreconnaissance of the southern areas of Iraq, near Al Basrah. The Canberras were specifically tasked with finding an armored regiment of some 70 tanks. Historically they failed to do so due mainly to climactic conditions. The principle concern of both the UK and Kuwait governments was the rising tide of pan Arab nationalism, fostered by Soviet political intrigue, that could result in internal civil disturbances in Kuwait leading to Iraqi intervention. Historically this failed to materialize, but our campaign is predicated on the assumption that it did.

The Iraqi Airforce

No.1 Squadron – 19 Venom FB Mk1 based at Habbanyah
No.2 Squadron – Mi4 at Rashid
No.3 Squadron – An12B based at Rashid
No.4 Squadron – Fury FB Mk11 based at Kirkuk
No.5 Squadron – 14 MiG17F based at Rashid
No.6 Squadron – 15 Hunter F Mk 6 based at Habbaniyah
No.7 Squadron – 14 MiG17F based at Kirkuk
No.8 Squadron – 12 IL28 based at Rashid
No.9 Squadron – MiG19 in the process of formation

British Forces

RAF (Sharyah in Kuwait)
No.88 Squadron – 4 Canberra PR7 (?) photo -reconnaissance
No 208 Squadron – 12 Hunter FGA Mk9

Royal Navy
HMS Victorious
No. 892 Squadron – 12 Sea Vixen Mk1
No.849 Squadron – 12 Fairy Gannet AEW

Canberra PR7
These Canberra PR7 were a major strategic asset and the loss of any of them would be considered a serious set back for RAF reconnaissance capabilities.

Sea Vixen Mk. 2
Although US commentators considered the Sea Vixen to be inferior to the F4 Phantom, it was in many respects superior. It was significantly more maneuverable and with a cannon-pack fitted, more useful. It was the match of any Soviet fighter when introduced in 1955

Fairey Gannet AEW 3
These were extremely valuable fleet assets, only 4 being assigned to each carrier. The cost of replacing their loss would have been prohibitive in the period they were operated. The AEW3 version was specifically tasked with preventing Soviet low -level jet fighter-bomber attacks reaching the carriers undetected.

Operation Vantage Scenario 1: Recon

The PR Canberras are tasked with finding the Iraqi armored regiment allegedly deployed in Al Basra. This is a daylight mission of a short duration therefore the primary target is set up in the centre of the gaming table. Because the mission will be conducted at high altitude (45-50,000 feet), the only aircraft in the Iraqi inventory capable of interception is the MiG17F. Two MiG's are allocated to intercept the Canberra. The MiG17's begin 15 hexes from the Canberra facing directly towards it. Once they come within 10 hexes they may begin to make visual location checks for the Canberra, in accordance with rule 13.0. The Iraqi air defense possesses British and Russian GCI radar, types unknown, but lacks experience in its operation. Kuwait has no radar available until British forces arrive after the Canberra deployment. The Soviet SA2 was not available to Iraq so there is no missile threat to the reconnaissance flight. The Canberra will locate the target on a roll of 7-10 (D20). The Soviet operated GCI will locate the Canberra with a roll of 6-10 (D20).

The Iraqi Force
Two Mig-17F
The UK Force
One Canberra

Operation Vantage Scenario 2: Interdiction

The Iraqi Army, emboldened by civil unrest in Kuwait City, decide to invade Kuwait. The UK forces have just hours to act before Iraqi forces penetrate deep into Kuwait. The Iraqi forces appear to be in Brigade strength with two infantry battalions supported by one armored regiment. Flying direct air support for the ground invasion are the Venoms and Hunters with the MiGs providing fighter cover. The Vixens from HMS Victorious and the RAF Hunters from Sharyah, immediately fly interdiction and strike missions to halt the Iraqi advance, while the Army prepares to reinforce Kuwaiti border units.

The Iraqi Force
Three Venom FB1, three Hunter FB 9 and three MiG17F as escorts.
The UK Force
Two Sea Vixens from Victorious and two Hunters from Sharjah.
In addition:
One RN Gannet AEW3 aircraft providing long-range radar tracking for the Sea Vixens. The aim of the RAF and RN aircraft is to intercept the Iraqi aircraft before they cross into Kuwaiti territory. The Iraqi aircraft are assumed to approach at low altitude (level 1) and will only be detected 20 hexes from the Gannet. The Gannet will detect the Iraqi aircraft using the radar detection rules in 13.00 (Spotting).
Scenario Victory conditions
The Iraqi leadership was extremely unstable and as a result, may not have responded to an immediate military loss, by withdrawing. Historically, the Soviets began the immediate supply of MiG19 and MiG21 aircraft, along with the customary 'advisors', soon after the crisis had ended. The Iraqi air defenses were significantly upgraded with Soviet radar and AAA. This changed the balance of military power in the region to such an extent the US government supplied the Royal Iranian Air Force with F14 and F4 almost immediately. It is therefore possible that there would have been a continuation of the conflict if the Iraqi forces had sufficient time to reorganize and retrain for the deployment of their MiG19's and new Soviet equipment.
The Iraqi player wins if they reach the oil fields. This is achieved unless all Iraqi aircraft are destroyed.
The UK player wins if they shoot down all Iraqi aircraft.

Operation Vantage Continuation Ideas

The Iraqi Airforce begins to introduce the MiG19 with considerable Soviet assistance. Experienced Soviet pilots are assigned to fly only over Iraqi airspace, tasked with defending airfields against Canberra and Sea Vixen attack. Iraqi pilots fly MiG17 air cover for the Vampires, Venoms and Hunters. Soviet Radar technicians and 'Fan Song' radar give the Iraqi Air Force a GCI capability giving the Iraqi player +3 to their spotting roll in accordance with section 13.00 (spotting).
Notes
The Arabian Gulf and Peninsula are extremely hot at the time of year these operations commenced. 45-50 c is not uncommon during the day. The UK Forces had extensive experience operating in these areas and were well prepared. Troops were regularly rotated our of front line positions for rest and recuperation. The Navy, being at sea and constantly on the move, were not so badly affected. Both sides would have suffered serviceability problems due to the heat. The Iraqi forces more so due to the lack of technical personnel after the 1958 coup. Players can introduce this 'un-serviceability' factor into the scenario as an optional rule. I would suggest the Iraqi Air Force should have a 50% serviceability rate (after the initial attack) and the RAF and RN forces 75%.

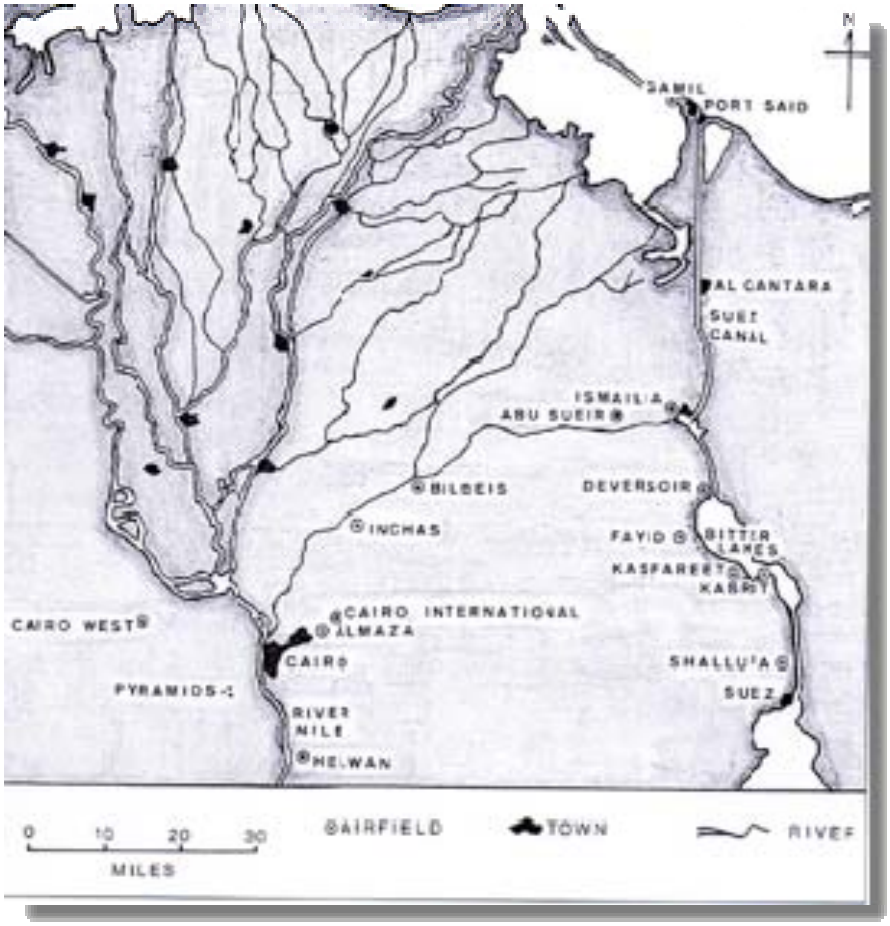
The Suez Crisis: Operation Musketeer

October 1956

On 26th July 1956, President Nasser of Egypt, nationalised the Suez Canal in response to funding being withdrawn for the completion of the Aswan Dam on the Upper Nile. The US and Britain both feared Nasser's pan Arab rhetoric, threatening a war against Israel in order to reverse the political and military defeat of 1948. The Egyptians had rebuilt their armed forces during the intervening years and by the outbreak of war in 1956, could be considered a major regional power. Much to the consternation of the US and Britain, the Egyptian air force had opted for the Soviet supplied MiG15 to replace aging Vampires and Meteors. These were superior in all respects to most of the RAF and RN aircraft available during the crisis. In response to the crisis, Egypt had request a supply of MiG17F, which they were in the process of receiving as war broke out. On paper at least, the EAF was well equipped and trained to resist the Anglo-French invasion.

The campaign covers the RAF actions against the EAF, for several reasons. There are no 1:300 scale models of the Sea Venom or Sea Hawk available. However, if at a later date, these aircraft become available, an updated campaign can be issued.

In order to avoid confusion, the RN was



Two maps showing the area of operations for the RAF during Operation Musketeer around the Cairo area, including the location of major airbases on Cyprus which played a vital role during the campaign.

allocated targets in and around Cairo while the RAF concentrated on the Canal Zone. Given the RAF were based on Cyprus, 250 miles (35-40 minutes flying time) to the north-west, while the RN aircraft carriers were only 60 miles off the coast, this made good operational sense.

The principle bases used by the RAF and AdA, were Akrotiri and Nicosia on Cyprus. Akrotiri had recently been completed and lacked many of the basic crew facilities a more established base could offer. The RAF crews were camped in tents and whatever other shelter could be hastily provided. The C.O of 249 Squadron – Squadron Leader 'Jock' Maitland had this to say about the airfield arrangements. 'Two squadrons of French RF84F' arrived on the 31st October; highly efficient, tents and all. They put us to shame and if they had controlled the operation we would have occupied the Canal Zone before world opinion turned against us'.

R.A.F. Order of Battle

Cyprus was literally bursting at the seams with aircraft. There were 115 aircraft at Akrotiri, 127 at Nicosia and 46 at Timbou. Canberra squadrons operated from Nicosia and shared Luqa on Malta with the Valiants.

While this model has been carefully painted with invasion stripes, the reality was somewhat different. In typical British fashion yellow paint was almost non-existent so had to be cobbled together from local army supplies of sand and white. Most stripes were hand painted without any masking!

Cyprus
Akrotiri

6 Squadron - Venom FB4	16 aircraft
8 Squadron - Venom FB4	16 aircraft
249 Squadron - Venom FB4	15 aircraft
1 Squadron - Hunter F.Mk.5	12 aircraft – retained for local air defence
13 Squadron - Canberra PR Mk7	7 aircraft with additional aircraft from 58 Squadron
39 Squadron - Meteor NF Mk13	8 aircraft - retained for local defence

Nicosia

10 Squadron – Canberra B Mk2	9 aircraft
15 Squadron – Canberra B Mk2	8 aircraft
18 Squadron – Canberra B Mk2	8 aircraft – target markers for Valiant 'V' Bombers
27 Squadron – Canberra B Mk2	8 aircraft
44 Squadron – Canberra B Mk2	8 aircraft
61 Squadron – Canberra B Mk2	10 or 11 aircraft
139 Squadron – Canberra B Mk6	12 aircraft- target markers

The RAF still retained a large number of pilots that had flown in WW2, many of them squadron commanders. The Territorial Squadrons also contained aircrew that had served in WW2. Historically, it was the most battle experienced air force in British history, a feat that was never to be repeated. All British crews should be considered 'experienced'.

Akrotiri airbase at the height of air operations.

Technical Challenges in Operation Musketeer

Since 1956, the British government has said little about the capabilities of the aircraft that took part in the Suez operations. The Canberra bombers were considered by the US to be too small for the job of strategic bombing, carrying only a small weapon load in comparison to the B52, which was just becoming available. However, Their bombing accuracy was exceptional for the period and their ability to perform well at very high or very low altitude made them a remarkable aircraft. The four days of operations in which they were involved were severely restricted by the American government attempting to evacuate citizens through airports that were under attack. Some commentators have suggested that Valiant bombing was inaccurate to the point of being ineffective, but this claim cannot be sustained. The Canberra and Valiant operations were clearly designed to make enemy runways unusable. This they most certainly did. The Venoms were tasked with destroying hangars, repair facilities and aircraft; a task they achieved with great skill and accuracy.

What makes this campaign so technically interesting is the fact there were no air-to-surface missiles. The Egyptian defenders were relying on WW2 AA weapons to fend off attacks by the latest jet aircraft then in existence. It was an unequal match, even though the defenders did manage to destroy and damage a number of attacking aircraft.

The Canberra B Mk2 was equipped with 'Blue Silk' (officially a 'Doppler Navigation Radar') a precision radar bombsight principally designed for delivering a nuclear weapon. Probably 'Green Parrot'. Another device known to have been fitted to 'V' Bombers, PR Canberras and possibly other marks as well, was a radar warning receiver (RWR) known as 'Orange Putter'. No details of this system have been made public. But given the fact that such RWR systems had been fitted into wartime Lancaster and Halifax bombers, there is little reason to assume the Canberra was not similarly fitted.

Note the Sea Venom with the squadron insignia under the cockpit (left foreground).

Note the lack of gun ports under the nose. This appears to be an early Sea Venom EAW21, rushed into service for 'Operation Musketeer'.

HMS Ark Royal received these aircraft in early 1956.

The Venom FB4 was also fitted with a DME (Distance Measuring Equipment) that was used to locate the 'landing gates' of operational military airfields. This was in effect a radar receiver that located a homing signal and gave the pilot an early form of 'instrument landing system'.

Lt Cdr Maurice Birrell DSC, OC 891 Squadron RN, had this to say about the AI Mk.21(US AN/APA-69) radar unit fitted to the Sea Venom FAW 21, in 1954
'The airborne performance of the AI Mk21 radar was most satisfactory, particularly during exercises 'Febex' and 'Cascade', when bomber-sized targets were regularly picked up at ranges well into double figures. As always the ASV mapping capabilities of the radar were outstanding, the aircraft invariably picking up the carrier well before the carrier had picked up the Venoms'.

The earlier US AI Mk18 radar had an effective range of 20 miles against airborne targets.

No official comment has been made about the electronic warfare assets available to the RAF or RN during the campaign. The RN flew modified Sea Venom FAW 21 aircraft with considerable EW capability from 1956 onwards. The Suez Crisis would have provided an excellent opportunity to test the Sea Venom EW21 under battlefield conditions and even though not specifically listed as being aboard the carriers, could well have been among the FAW 21 aircraft without being identified. Externally, such aircraft were indistinguishable from the standard aircraft The EW21 carried the US built ALT-9 airborne jamming transmitter. Only a small number of these aircraft were available due to the difficulty in converting the aircraft to a role it was never intended for and prolonged crew training.

Egyptian Order of Battle

The total number of aircraft available to the Egyptians was:
90 Vampires, 30 Meteors, 120 MiG15/17F, 39 IL28 'Beagle', plus a number of training aircraft

Abu Sueir	35 MiG15
Kibrit	31 MiG15
Inchas	20 MiG15
Almaza	25 MiG15, 4 Meteor, 21 Vampires, 10 IL28
Fayid	9 Meteor, 12 Vampires
Cairo West	9 Vampires, 16 IL28
Luxor	22 IL28
Kasfareet	1 Meteor, 2 Vampires

The EAF had a serviceability rate of about 60% at this time, which by Middle Eastern standards was comparatively high. On the day of the attacks, 69 MiG15 were serviceable. EAF pilots appear to have been well trained and highly motivated. Their contact with IAF fighters over the Sinai proved they were more than a match for the Israeli's. 50% of EAF crews should be considered 'experienced' with the balance being 'average'. This reflects the short time available to the EAF for conversion to MiG's rather than their flying experience.

The airfield defences contained a number of 40mm Bofors guns. To this the Egyptian's added a significant amount of small arms fire that proved quite effective.

The Attack

Phase 1

RAF to target former RAF bases in the Canal Zone, specifically Abu Sueir, Deversoir, Fayid, Kabrit, Kasfareet and Sallufa.

Phase 2

Attacks against armour, mechanised vehicles and all forms of army support.

Phase 3

Close support for parachute drops and seaborne landing in the Port Said area.

31 October

- 7 Nicosia based Canberra attacked Almaza at 21.30 hours.
- Canberra and Valiant attacks on Cairo West at night.
- Canberra and Valiant attacks on Cairo International at night

1st November

- 8 Venom FB4 from 6 Sqn based at Akrotiri attack Fayid and Abu Sueir at 06.04 hours. Hangars and parked aircraft destroyed or damaged.
- Venom FB4 from 249 Sqn based at Akrotiri attack Kabroit (MiG15 base) and Kasafareet, then Abu Sueir.
- Two attacks. First in the early morning and later in the afternoon.
- All attackers observed the "One pass then away policy" to reduce the risk of flak damage.

2nd November

- 6 Sqn launched three ground attacks against Shallufa, Kabrit and Abu Sueir. 1-MiG15 and buildings damaged.
- 8 Sqn (8 Venom FB4) launched dawn attack against Abu Sueir, Fayid and Kabrit.
- 249 Sqn attacked same targets.
- A second sortie by the same squadrons launched against Deversoir, Geneifa and Fayid in the afternoon.
- RAF launches a major effort against Huckstep Camp near Alamaza. Heavy flak and small arms fire encountered.

3rd November

- Continued attacks against vehicles and facilities in and around the Port Said area and Huckstep Camp.

4th November

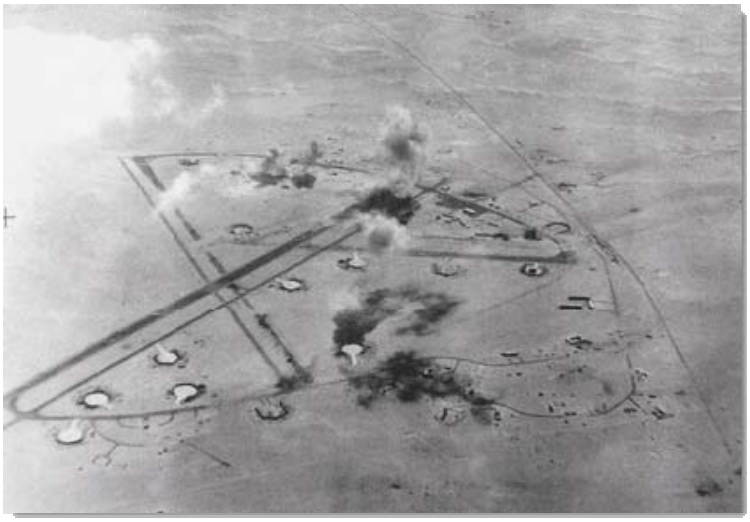
- RAF attacks in and around Port Said and Gamil airfield. Specific attention paid to radar and coastal defences (coastal artillery and AA) in preparation for Commando landings later that day.

The entire day spent on suppression duties and close air support for the troops coming ashore.

Game Objectives & Victory Conditions

The game objective is fairly obvious. The Anglo-French forces must gain control of the Canal Zone before the United States and Russia pressure both sides into a cease-fire. The Game lasts for four campaign days, with each day containing a maximum of two strike missions for each squadron. The Anglo-French air forces open the campaign with a night attack by Canberra and Valiant bombers against the airfields of Abu Sueir, Deversoir, Fayid, Kabrit, Kasfareet and Sallufa. Players can use the actual number of aircraft historically allocated to each raid.

After the initial night attacks, the RAF Venom, Canberra and French RF84F squadrons continue with daylight attacks. The attack phases listed in the introduction should be adhered to as far as possible.



Inchas airfield under attack.

The Egyptian Forces

The EAF must split itself between the Israeli attack in the Sinai and the Anglo-French invasion. The Egyptians understood the Anglo-French operation was aimed at occupying only the Canal Zone. The Israeli operation was aimed at sweeping Egypt from the Sinai Peninsula. This necessitated the deployment of most EAF resources in the defence of the Sinai. Accordingly, the maximum number of aircraft available for the Canal Zone will be 50% of serviceable aircraft. On the first day of the attacks 32 MiG15 will be available for air defence of the Canal Zone. There is no record of the number of Vampires available, which would be few, given the lack of spares caused by British reluctance to supply them. I will assume 30 Vampires to be serviceable at the beginning of the attack. The Meteor NF seem to have been unserviceable.
The EAF had 39 operational IL28 bombers available for an attack on Cyprus. I assume they were all serviceable at the beginning of the attack.

Weather

Weather remained fine and clear until 4th November when severe storms developed over Cyprus.

Victory conditions

The Anglo-French Forces win if they destroy the entire EAF or force it's withdrawal. Once the aircraft strength falls to below 50% (of the beginning total), the EAF must be withdrawn from combat.

The EAF wins if it reduces the RAF to 50% of its initial squadron strength. Each squadron is individually assessed for loss. If the EAF airfields are still operational by day three of the campaign, the RAF may not divert aircraft to phase three (the direct support of the Port Said landing zones) and the invasion must be cancelled.

Radar etc…

There is reason to suspect the RN provided Sea Venom EAW21 support for both the RAF and RN strikes against the Egyptian airfields. This in part explains the lack of Egyptian response to the first air raids. All RAF raids will have RADAR ONLY counter measure factor of 1.

EAF Mig-17

Good luck…

An interesting report…

Nigel Budd, flying a 6 Sqn Venom encountered a MiG15 over Gamil with Russian red star makings. He gave chase, firing a long burst of 20mm cannon fire at it, but the range was too great to score a hit. Fortunately for international relations, the MiG quickly retired inland and no further sighting of Russian aircraft were reported.

Coral Sea Mig Killers — Scenario #1

Background: On November 19th, 1967, two F-4Bs from the U.S.S. Coral Sea were flying MIGCAP escorting A-4s from U.S.S. Intrepid down the Red River Valley. Red Crown (the name given to early warning radar from off-shore) had warned of Migs in the area and two Mig-17s were noticed at a 3 o'clock position which started the engagement. The Mig-17s were the bait for four Mig-21s lurking behind the Phantoms.

Forces:

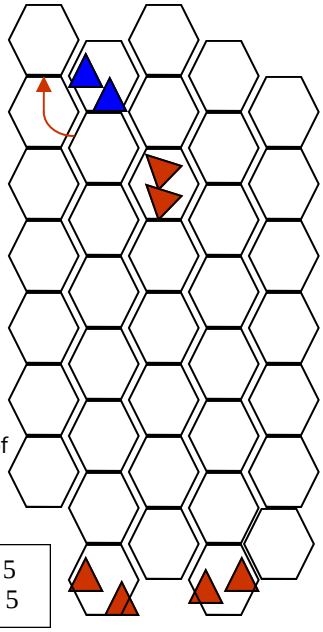
USN: Two F-4Bs with (4) AIM-7 and (4) AIM-9

NVAF: Two Mig-17s

Four Mig-21s

F-4s: Speed 4
Alt 4

Mig-17s: Max speed Alt4
The Migs have a turn marker out and must proceed to the marker (they over shot or took a bad angle).



Mig-21s: Speed 5
Alt 4 or 5

Scenario Notes: Some of the MIg-21s may have been carrying AA-2 Atolls. Roll 1D4 and the result is the number of Mig-21s that are carrying two missiles each. *This scenario is very tough for the USN players and would be good for a learning scenario with an experienced player (s) taking the F-4s and newer players flying the Migs.*

Historical Outcome: The Mig-17s came in on a firing pass, but apparently took the wrong angle and passed through the F-4s. LCDR. Doug Clower in the lead F-4B moved to attack the Mig-17s and was able to get into a firing position. Clower's F-4 launched a Sidewinder which according to Lt. Ted Stier, the RIO of the second Phantom hit one of the Mig-17s and downed it. This was followed by a frantic call to Clower to break left when his F-4 was apparently hit by a missile from the Mig-21s. The second Phantom took hits from a Mig cannon and it too went down. Clower's RIO, Walt Estes and Stier's pilot, Jack Teague, were both killed. Clower and Stier ended up as POWs, spending over 5 years in captivity.

Victory Conditions: The F-4s must down at least one Mig and then escape off the lower board edge. If one F-4 is knocked down it is a tactical defeat and losing both F-4s is a major defeat.

Coral Sea Mig Killers — Scenario #2

Background: On March 6th, 1972 two F-4Bs were flying MIGCAP for an A-5 recon mission when Red Crown called out a bandit. The F-4s picked up the Mig-17 coming up to them and rolled into the attack, starting a series of scissors maneuvers against a determined adversary.

Forces:

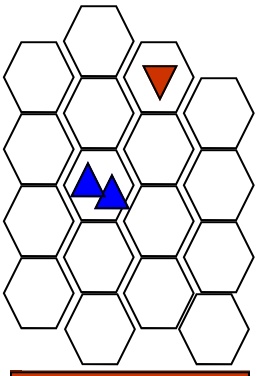
USN: Two F-4Bs with(4) AIM-9 each

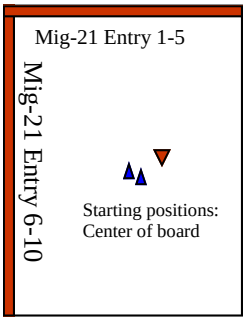
NVAF: One Mig-17

Six Mig-21s (see scenario notes)

F-4s: Speed 5
Alt 4

Mig-17: Speed 4
Alt 3





Scenario Notes: The F-4s only had one operating search radar and it was unable to be used for the Sparrows, so both F-4s have Sidewinders only. The Mig-17 pilot should be rated something just short of an ace as he demonstrated a high degree of skill during the encounter. Each turn roll 1D10 and if the result is a 9 or 10 a pair of Mig-21s enter from the board edges as in the diagram to the right. *This is a good two player scenario where an experienced player can fly the Mig-17 and additional players can be added if more Migs arrive.*

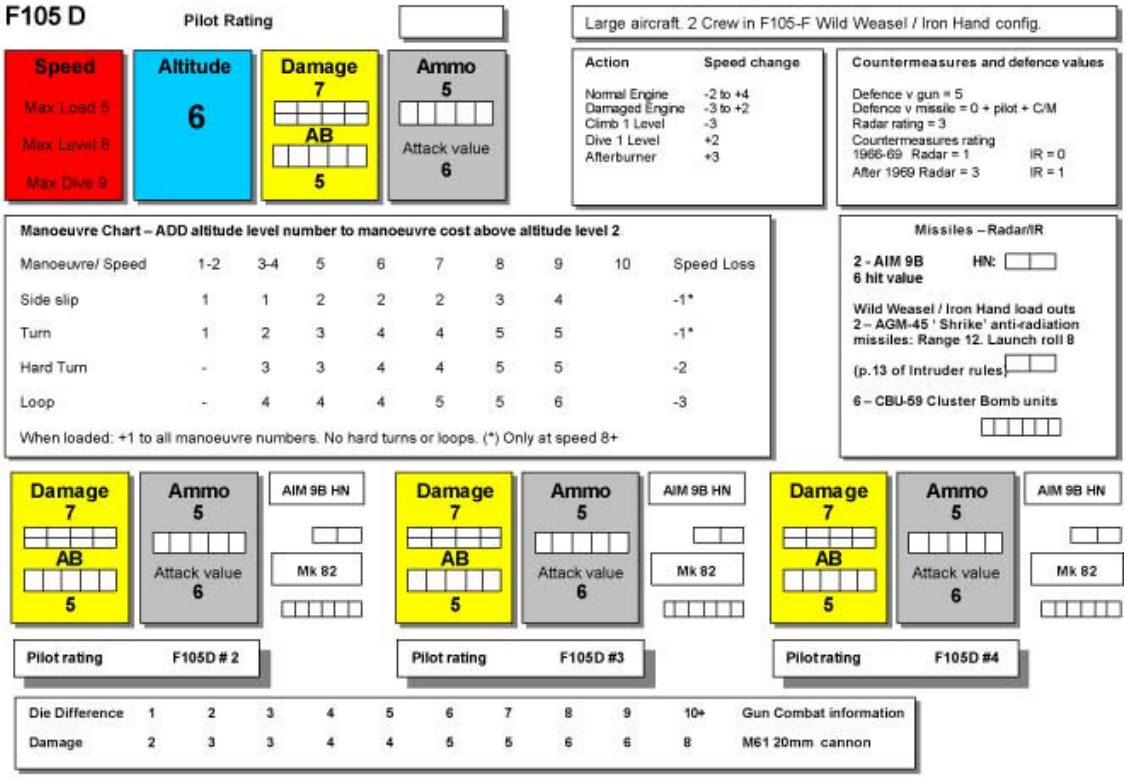
Historical Outcome: The F-4 crewed by Lt. Stillinger and Lt. Olin began their attack while the F-4 crewed by Lt. Weigand and Freckleton moved to a high cover position. After several maneuvers the first F-4 fired a Sidewinder, but the Mig-17 pilot skillfully evaded it and then turned to pursue Stillingetr and Olin as they tried to extend away from the Mig. Weigand and Freckleton swooped in from their cover position and got on the Mig's six o'clock position and downed it with a Sidewinder. Red Crown called out multiple bandits approaching, so both F-4s accelerated out of the combat zone and back to the Coral Sea. Whether or not this was an attempt to repeat the conditions in the first scenario will never be known, but if so the ambushing Mig-21s arrived too late to help the bait.

Mig-21s: Speed 5
Alt 4 or 5

Victory Conditions: The F-4s must knock down the Mig-17 then escape off the lower board edge for a victory. Losing an F-4 is a defeat.

US Airforce F105D 'Thud'

Configured for Vietnam Era – 1965-72 both for Iron Hand and Deep Strike roles



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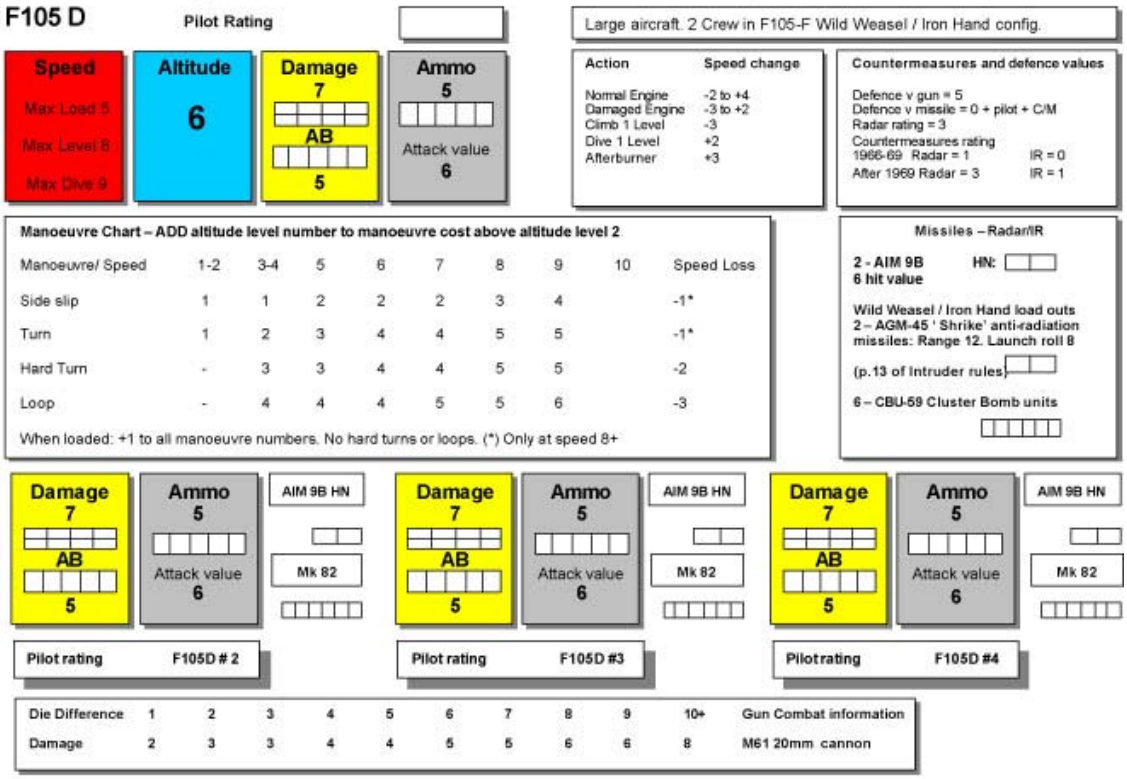

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A4 Skyhawk E/F

Configured for Vietnam era 1965-72

A4 Skyhawk E/F

Pilot Rating

Small aircraft

Speed
Max Load 4
Max Level 5
Max Dive 6

Altitude
5

Damage
4

Ammo
4
Attack value
5

Action	Speed change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 Level	-3
Dive 1 Level	+2

Countermeasures and defence values

Defence v gun = 4
Defence v missile = 0 + pilot + C/M
Radar rating = 0
Countermeasures rating
1960-69 Radar = 1 IR = 1
1970-72 Radar = 2 IR = 2

Manoeuvre Chart – ADD altitude level number to manoeuvre cost above altitude level 2

Manoeuvre/ Speed	1-2	3-4	5	6	7	8	9	10	Speed Loss
Side slip	1	1	2	2					
Turn	1	2	2	3					
Hard Turn	2	3	3	3					-2
Loop	4	4	4	5					-3

When loaded: +1 to all manoeuvre numbers. No hard turns or loops.

Missiles – Radar/IR

2 – AIM 9B **HN:**
6 hit value

Missiles were fitted only in the last years of the Vietnam War

Damage 4
Ammo 4 Attack value 5
AIM-9B HN
Pilot rating A4 # 2

Damage 4
Ammo 4 Attack value 5
AIM-9B HN
Pilot rating A4 #3

Damage 4
Ammo 4 Attack value 5
AIM-9B HN
Pilot rating A4 #4

Die Difference	1	2	3	4	5	6	7	8	9	10+	Gun Combat information
Damage	2	2	3	3	3	4	4	4	6	8	GSh 23mm cannon

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A4 Skyhawk E/F

Configured for Vietnam era 1965-72

A4 Skyhawk E/F

Pilot Rating

Small aircraft

Speed
Max Load 4
Max Level 5
Max Dive 6

Altitude
5

Damage
4

Ammo
4
Attack value
5

Action Speed change

Normal Engine -2 to +3
Damaged Engine -3 to +2
Climb 1 Level -3
Dive 1 Level +2

Countermeasures and defence values

Defence v gun = 4
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Hard Turn	2	3	3	3					-2
Loop	4	4	4	5					-3

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Missiles – Radar/IR

2 – AIM 9B HN:
6 hit value

Missiles were fitted only in the last years of the Vietnam War

Damage 4
Ammo 4 Attack value 5
AIM-9B HN
Pilot rating A4 # 2

Damage 4
Ammo 4 Attack value 5
AIM-9B HN
Pilot rating A4 #3

Damage 4
Ammo 4 Attack value 5
AIM-9B HN
Pilot rating A4 #4

Die Difference	1	2	3	4	5	6	7	8	9	10+	Gun Combat information
Damage	2	2	3	3	3	4	4	4	6	8	GSh 23mm cannon

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US Air Force F86/A Configured for the Korean War

F86/A Sabre Pilot Rating

All round vision canopy, small aircraft

Speed	Altitude	Damage	Ammo
Max Load 3 Max Level 4 Max Dive 5	5	4	7 Attack value 6

Action	Speed change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 Level	-3
Dive 1 Level	+2

Manoeuvre Chart – ADD altitude level number to manoeuvre cost above altitude level 2

Manoeuvre/ Speed	1-2	3-4	5	6	7	8	9	10	Speed Loss
Roll	1	1	2						
Turn	1	2	2						
Hard or Split 'S' Turn	1	2	3						-2
Loop	4	4	5						-3

When loaded: +1 to all manoeuvre numbers. No hard turns or loops.

Damage	Ammo	Pilot rating
4	7 Attack value 6	F86 # 2
4	7 Attack value 6	F86 # 3
4	7 Attack value 6	F86# 4

Die Difference	1	2	3	4	5	6	7	8	9	10+	Gun Combat information
Damage	2	2	3	3	3	4	4	5	5	6	Six .50 cal machineguns

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US Air Force F86/A Configured for the Korean War

F86/A Sabre Pilot Rating

All round vision canopy, small aircraft

Speed Max Load 3 Max Level 4 Max Dive 5 | Altitude 5 | Damage 4 | Ammo 7 Attack value 6

Action / Speed change: Normal Engine -2 to +3; Damaged Engine -3 to +2; Climb 1 Level -3; Dive 1 Level +2

Manoeuvre Chart – ADD altitude level number to manoeuvre cost above altitude level 2

Manoeuvre/ Speed | 1-2 | 3-4 | 5 | 6 | 7 | 8 | 9 | 10 | Speed Loss
Roll | 1 | 1 | 2
Turn | 1 | 2 | 2
Hard or Split 'S' Turn | 1 | 2 | 3 | -2
Loop | 4 | 4 | 5 | -3

When loaded: +1 to all manoeuvre numbers. No hard turns or loops.

Damage 4 / Ammo 7 Attack value 6 — Pilot rating F86 # 2
Damage 4 / Ammo 7 Attack value 6 — Pilot rating F86 # 3
Damage 4 / Ammo 7 Attack value 6 — Pilot rating F86# 4

Die Difference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10+ | Gun Combat information
Damage | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | Six .50 cal machineguns

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Standard MiG 15 bis configured for Korean War

MiG 15 bis Pilot Rating

All round vision canopy, small aircraft

Speed	Altitude	Damage	Ammo
Max Load 5 Max Level 8 Max Dive 9	6	6	4 Attack value 2

Action	Speed change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 Level	-3
Dive 1 Level	+2

Manoeuvre Chart – ADD altitude level number to manoeuvre cost above altitude level 2

Manoeuvre/ Speed	1-2	3-4	5	6	7	8	9	10	Speed Loss
Roll	1	1	1	2	2	3	4		0
Turn	1	1	2	2	2	3	3		-1*
Hard or Split 'S' Turn	-	2	2	2	3	4	4		-2
Loop	-	4	4	4	5	5	6		-3

When loaded: +1 to all manoeuvre numbers. No hard turns or loops. (*) Only at speed 9

Damage	Ammo	Pilot rating	
6	4 Attack value 2	MiG # 2	
6	4 Attack value 2	MiG # 3	
6	4 Attack value 2	MiG # 4	

Die Difference	1	2	3	4	5	6	7	8	9	10+	Gun Combat information
Damage	2	2	3	3	5	6	6	7	7	8	2 - 23mm cannon, 1 - 37mm cannon

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Standard MiG 15 bis configured for Korean War

MiG 15 bis Pilot Rating

All round vision canopy, small aircraft

Speed Max Load 5 Max Level 8 Max Dive 9 | Altitude 6 | Damage 6 | Ammo 4 Attack value 2

Action / Speed change: Normal Engine -2 to +4; Damaged Engine -3 to +2; Climb 1 Level -3; Dive 1 Level +2

Manoeuvre Chart – ADD altitude level number to manoeuvre cost above altitude level 2

Manoeuvre/ Speed	1-2	3-4	5	6	7	8	9	10	Speed Loss
Roll	1	1	1	2	2	3	4		0
Turn	1	1	2	2	2	3	3		-1*
Hard or Split 'S' Turn	-	2	2	2	3	4	4		-2
Loop	-	4	4	4	5	5	6		-3

When loaded: +1 to all manoeuvre numbers. No hard turns or loops. (*) Only at speed 9

Damage 6 | Ammo 4 Attack value 2 — Pilot rating MiG # 2

Damage 6 | Ammo 4 Attack value 2 — Pilot rating MiG # 3

Damage 6 | Ammo 4 Attack value 2 — Pilot rating MiG # 4

Die Difference	1	2	3	4	5	6	7	8	9	10+	Gun Combat information
Damage	2	2	3	3	5	6	6	7	7	8	2 - 23mm cannon, 1 - 37mm cannon

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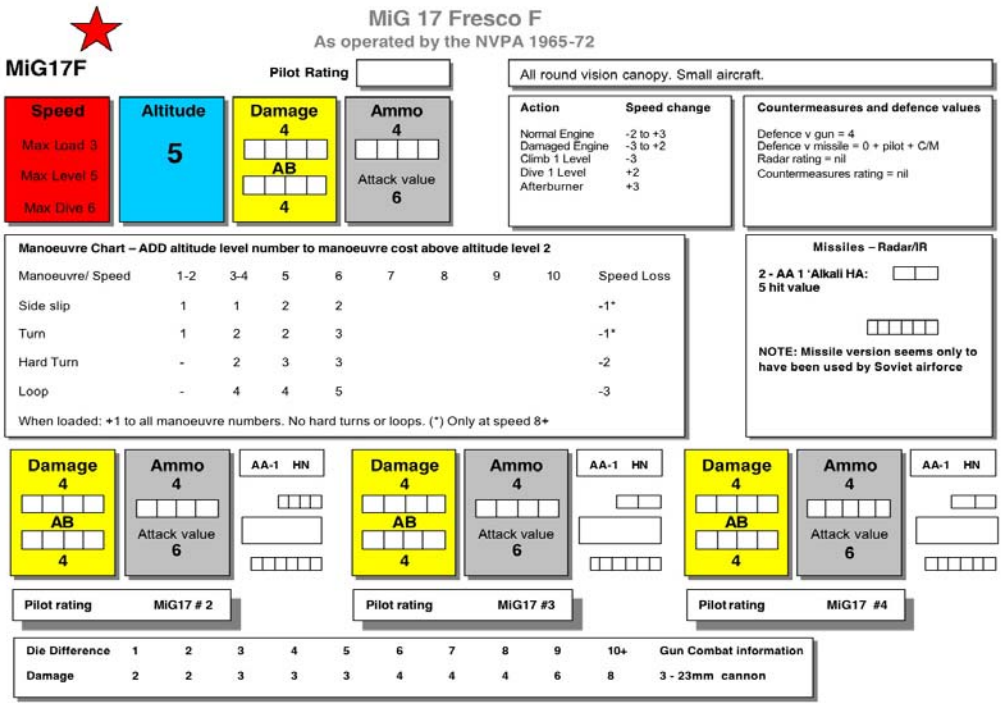

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MiG 17 Fresco F
As operated by the NVPA 1965-72
MiG17F
Pilot Rating
All round vision canopy. Small aircraft.
Speed
Max Load 3
Max Level 5
Max Dive 6
Altitude
5
Damage
4
AB
4
Ammo
4
Attack value
6
Action
Speed change
Normal Engine -2 to +3
Damaged Engine -3 to +2
Climb 1 Level -3
Dive 1 Level +2
Afterburner +3
Countermeasures and defence values
Defence v gun = 4
Defence v missile = 0 + pilot + C/M
Radar rating = nil
Countermeasures rating = nil
Manoeuvre Chart – ADD altitude level number to manoeuvre cost above altitude level 2
Manoeuvre/ Speed 1-2 3-4 5 6 7 8 9 10 Speed Loss
Side slip 1 1 2 2 -1*
Turn 1 2 2 3 -1*
Hard Turn - 2 3 3 -2
Loop - 4 4 5 -3
When loaded: +1 to all manoeuvre numbers. No hard turns or loops. (*) Only at speed 8+
Missiles – Radar/IR
2 - AA 1 'Alkali HA:
5 hit value
NOTE: Missile version seems only to have been used by Soviet airforce
AA-1 HN
Pilot rating MiG17 # 2
Pilot rating MiG17 #3
Pilot rating MiG17 #4
Die Difference 1 2 3 4 5 6 7 8 9 10+ Gun Combat information
Damage 2 2 3 3 3 4 4 4 6 8 3 - 23mm cannon

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MiG 21C

Configured for Vietnam era 1965-72

MiG 21 C

Pilot Rating

Small aircraft

Speed	Altitude	Damage	Ammo
Max Load 5 Max Level 7 Max Dive 9	6	5 AB 5	5 Attack value 6

Action	Speed change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 Level	-3
Dive 1 Level	+2
Afterburner	+3

Countermeasures and defence values

Defence v gun = 4
Defence v missile = 0 + pilot + C/M
Radar rating = 2
Countermeasures rating
1960-69 Radar = 1 IR = 1
1970-72 Radar = 2 IR = 2

Manoeuvre Chart – ADD altitude level number to manoeuvre cost above altitude level 2

Manoeuvre/ Speed	1-2	3-4	5	6	7	8	9	10	Speed Loss
Side slip	1	1	2	2	3	3	4	4	-1*
Turn	1	2	2	3	3	4	4	5	-1*
Hard Turn	-	2	3	3	4	4	5	5	-2
Loop	-	4	4	5	5	5	6	6	-3

When loaded: +1 to all manoeuvre numbers. No hard turns or loops. (*) Only at speed 8+

Missiles – Radar/IR

2 - AA 2a/b 'Atoll' HN ☐☐
5 hit value

Damage	Ammo	AA-2 HN	Pilot rating
5 AB 5	5 Attack value 6	☐☐ ☐ ☐☐☐☐☐	MiG21 #2
5 AB 5	5 Attack value 6	☐☐ ☐ ☐☐☐☐☐	MiG21 #3
5 AB 5	5 Attack value 6	☐☐ ☐ ☐☐☐☐☐	MiG21 #4

Die Difference	1	2	3	4	5	6	7	8	9	10+	Gun Combat information
Damage	2	2	3	3	3	4	4	4	6	8	GSh 23mm cannon

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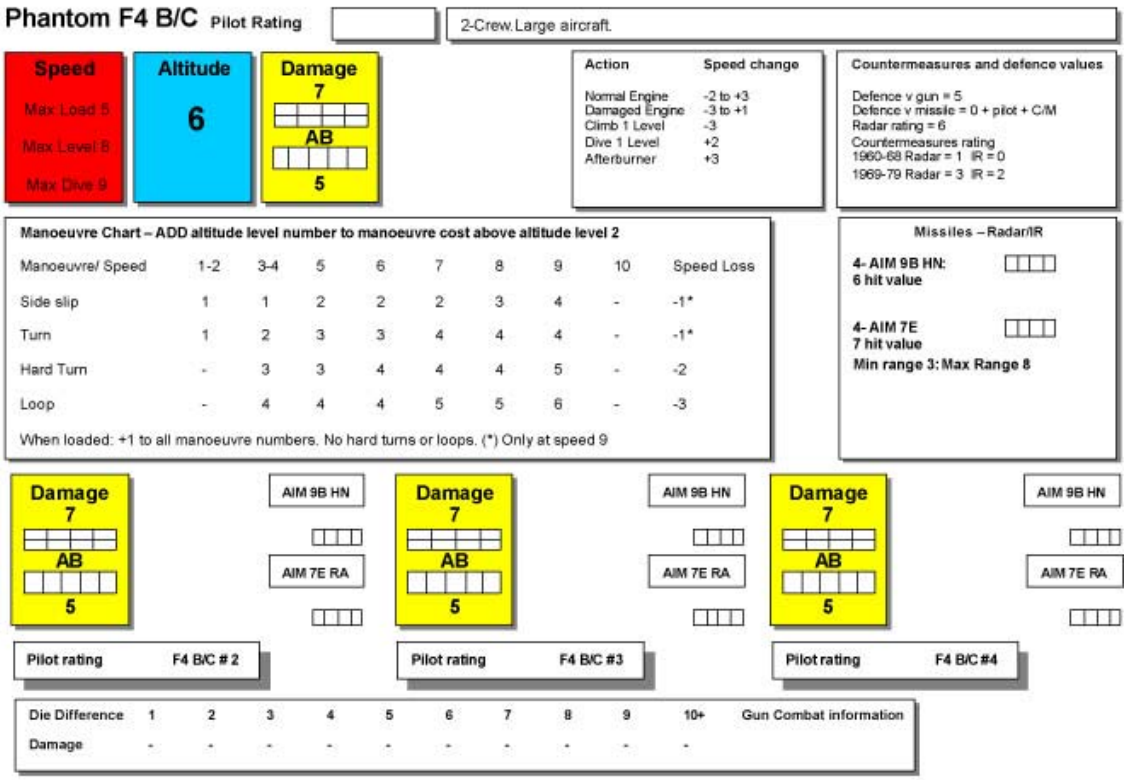
MiG 21C
Configured for Vietnam era 1965-72
MiG 21 C
Pilot Rating
Small aircraft
Speed Altitude Damage Ammo
Max Load 5 6 5 5
Max Level 7 AB Attack value
Max Dive 9 5 6
Action Speed change
Normal Engine -2 to +3
Damaged Engine -3 to +2
Climb 1 Level -3
Dive 1 Level +2
Afterburner +3
Countermeasures and defence values
Defence v gun = 4
Defence v missile = 0 + pilot + C/M
Radar rating = 2
Countermeasures rating
1960-69 Radar = 1 IR = 1
1970-72 Radar = 2 IR = 2
Manoeuvre Chart – ADD altitude level number to manoeuvre cost above altitude level 2
Manoeuvre/ Speed 1-2 3-4 5 6 7 8 9 10 Speed Loss
Side slip 1 1 2 2 3 3 4 4 -1*
Turn 1 2 2 3 3 4 4 5 -1*
Hard Turn - 2 3 3 4 4 5 5 -2
Loop - 4 4 5 5 5 6 6 -3
When loaded: +1 to all manoeuvre numbers. No hard turns or loops. (*) Only at speed 8+
Missiles – Radar/IR
2 - AA 2a/b 'Atoll' HN ☐☐
5 hit value
Damage Ammo AA-2 HN Pilot rating
5 5 ☐☐ MiG21 #2
AB Attack value ☐
5 6 ☐☐☐☐☐
Damage Ammo AA-2 HN Pilot rating
5 5 ☐☐ MiG21 #3
AB Attack value ☐
5 6 ☐☐☐☐☐
Damage Ammo AA-2 HN Pilot rating
5 5 ☐☐ MiG21 #4
AB Attack value ☐
5 6 ☐☐☐☐☐
Die Difference 1 2 3 4 5 6 7 8 9 10+ Gun Combat information
Damage 2 2 3 3 3 4 4 4 6 8 GSh 23mm cannon
David Child-Dennis Sept 2007 davidchild@ubernet.co.nz

Standard US Fighter configured for the Vietnam Era



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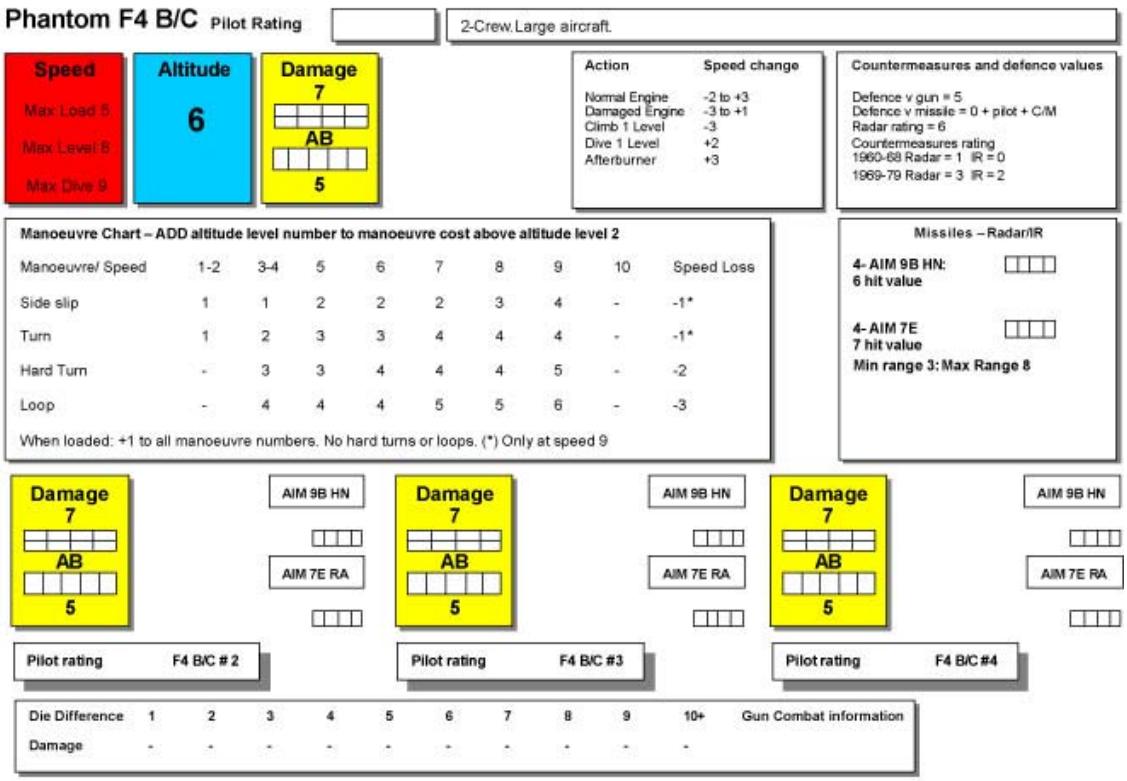
Standard US Fighter configured for the Vietnam Era



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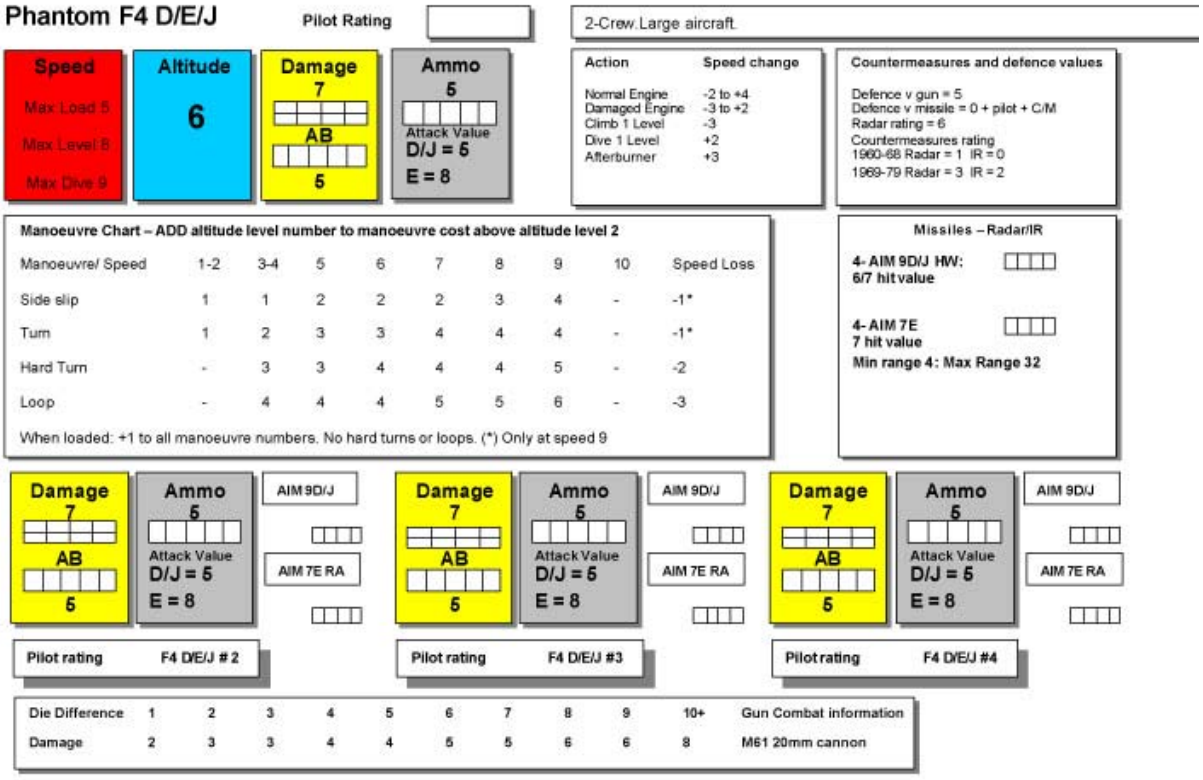
Standard US Fighter configured for the Vietnam Era



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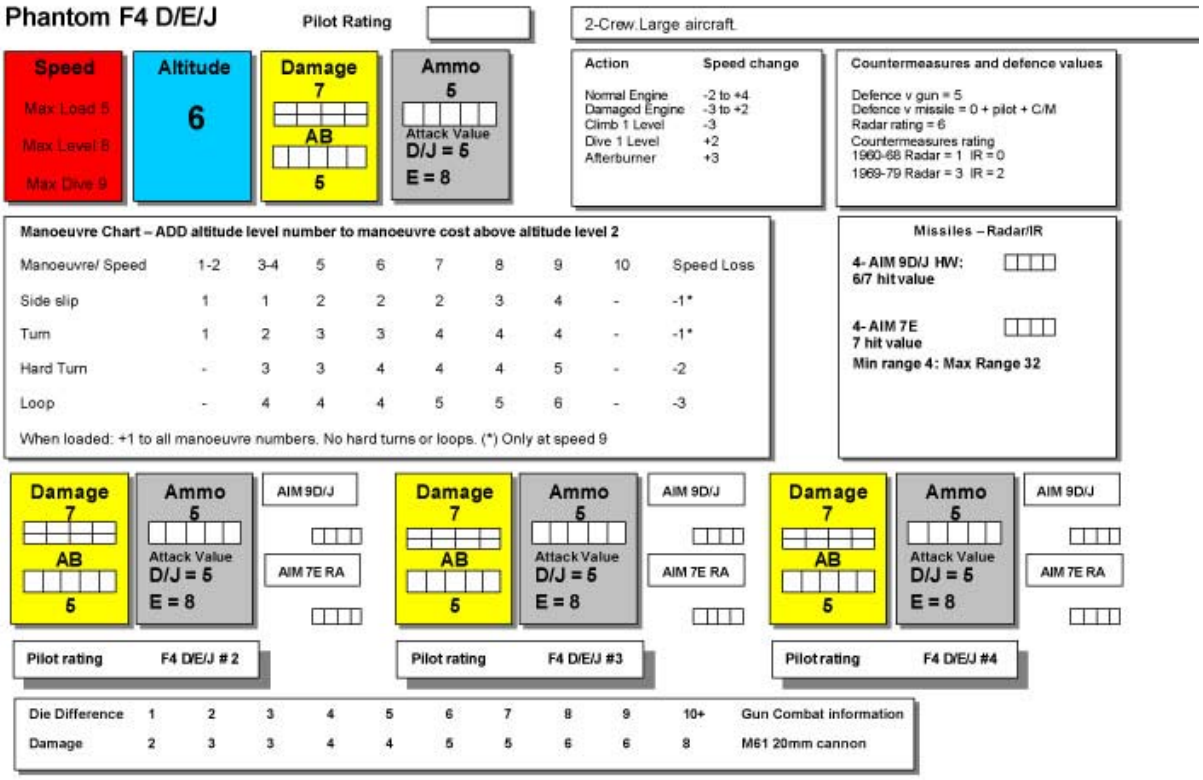
Standard US Fighter configured for the Vietnam Era



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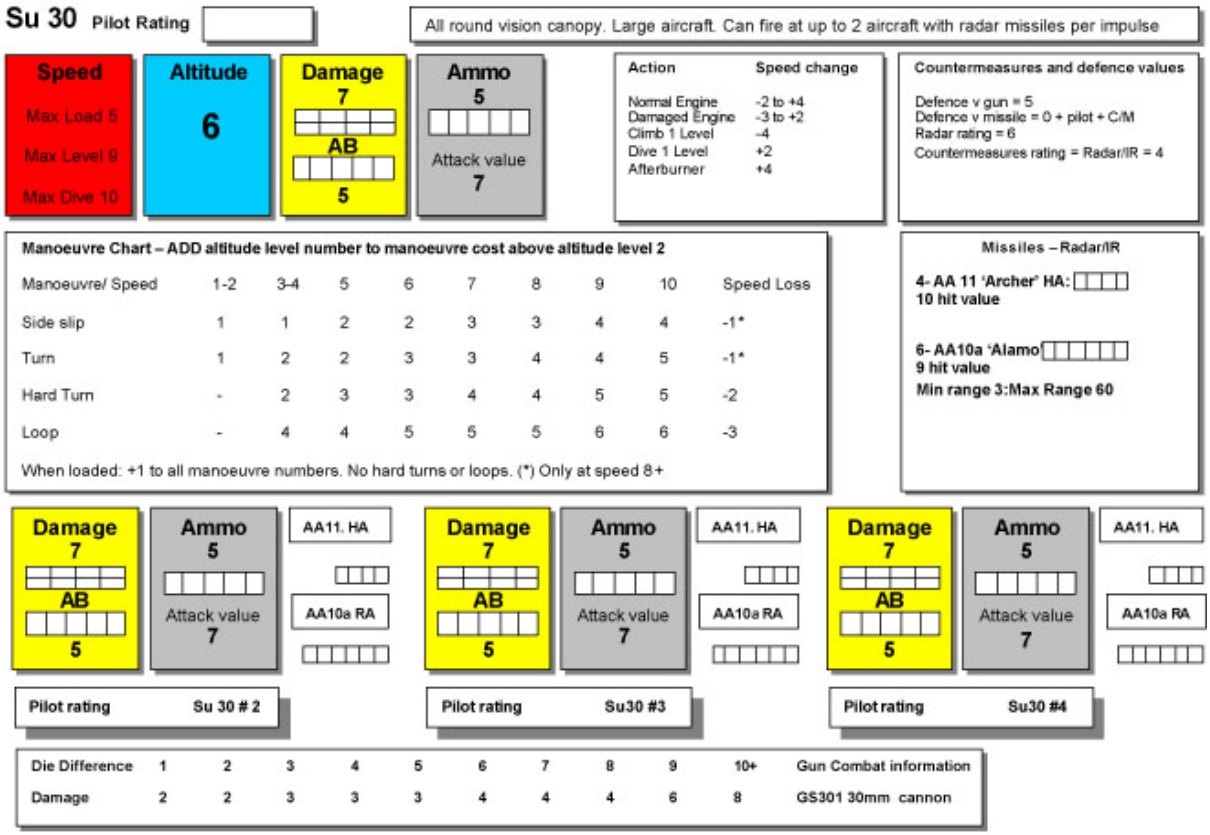

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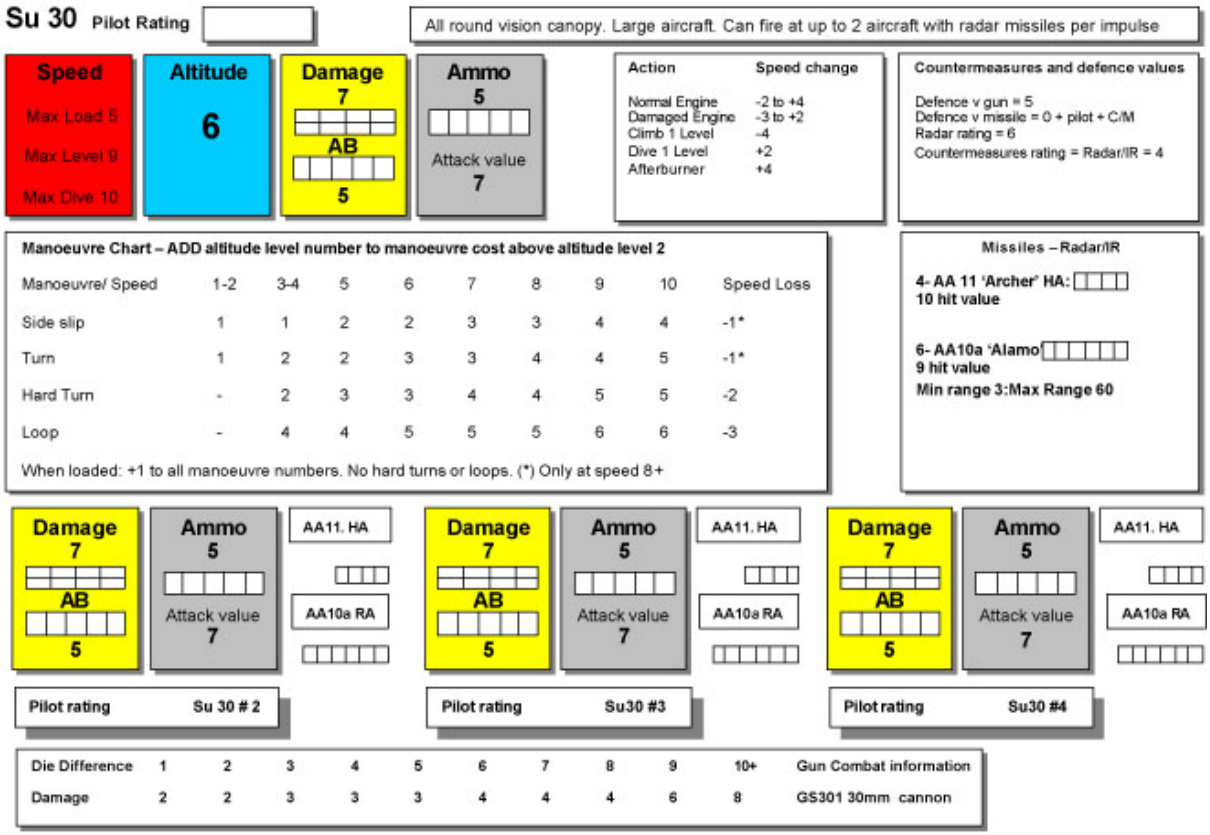

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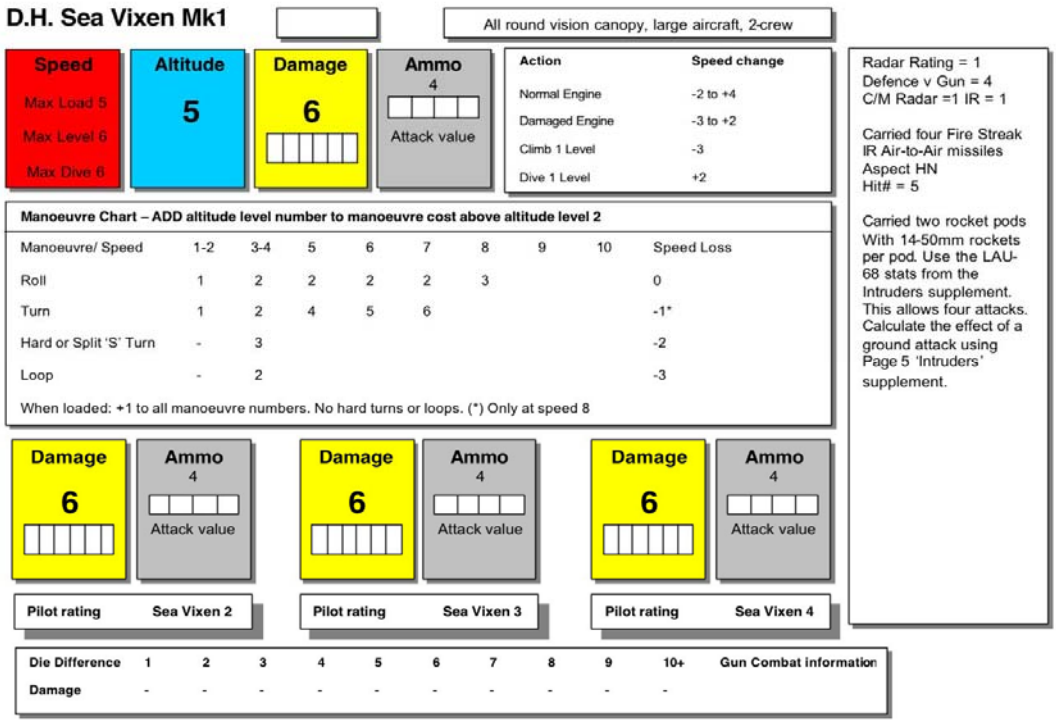
DH Sea Vixen Mk1



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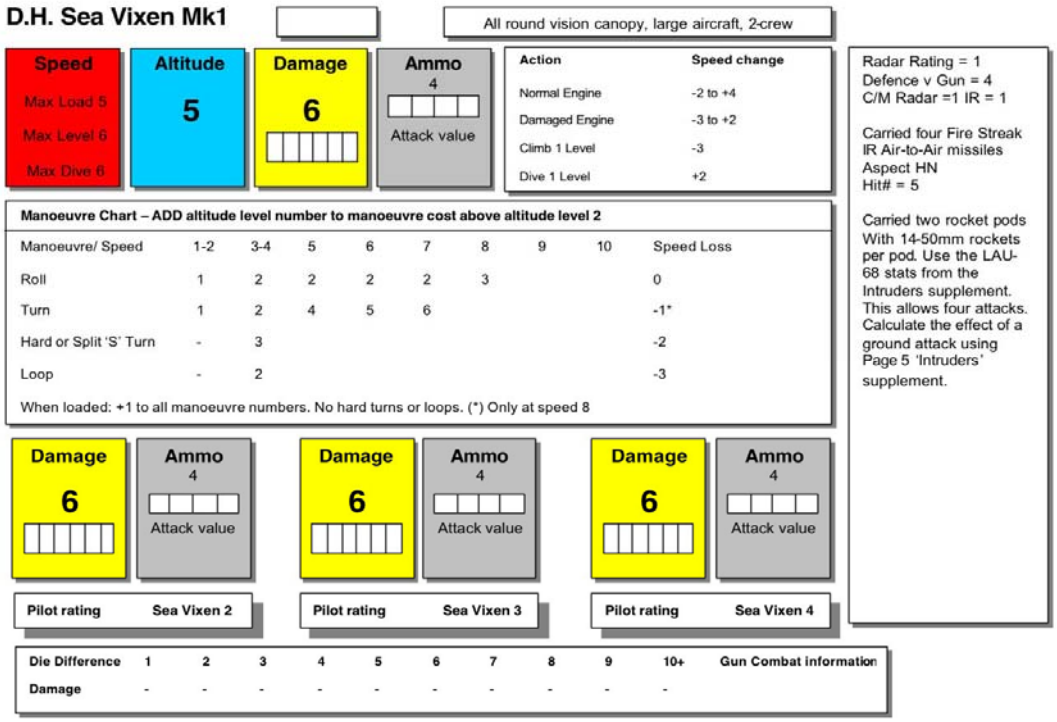
DH Sea Vixen Mk1



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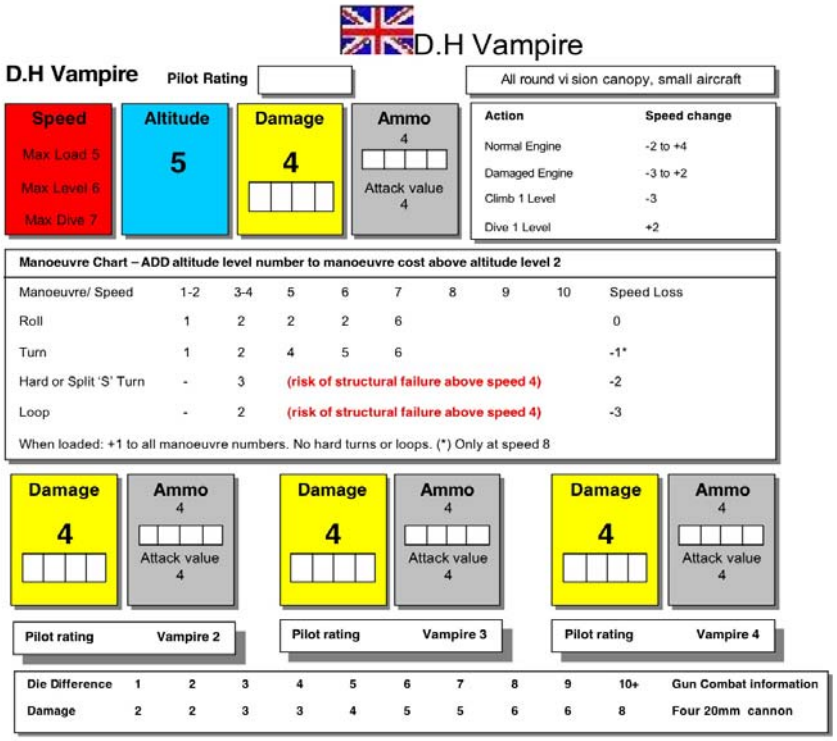

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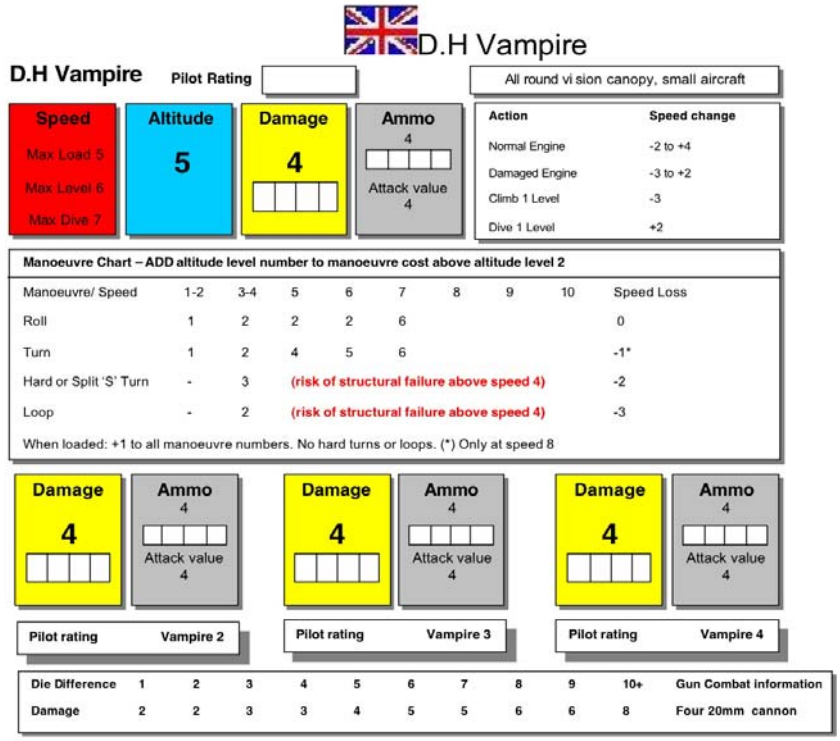

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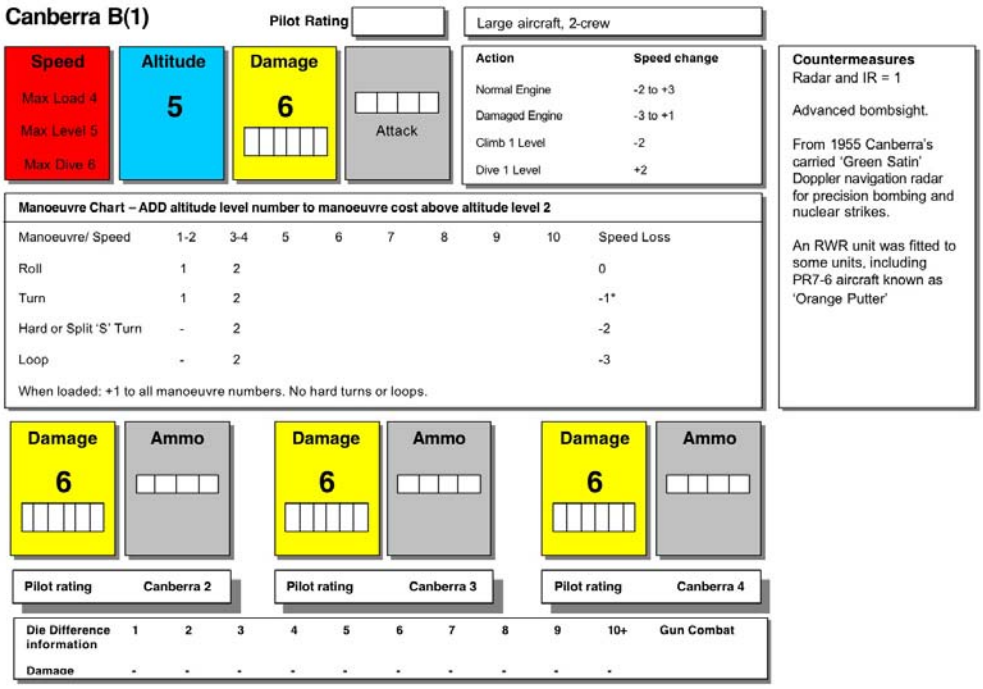
Canberra B(1) and B(1)8



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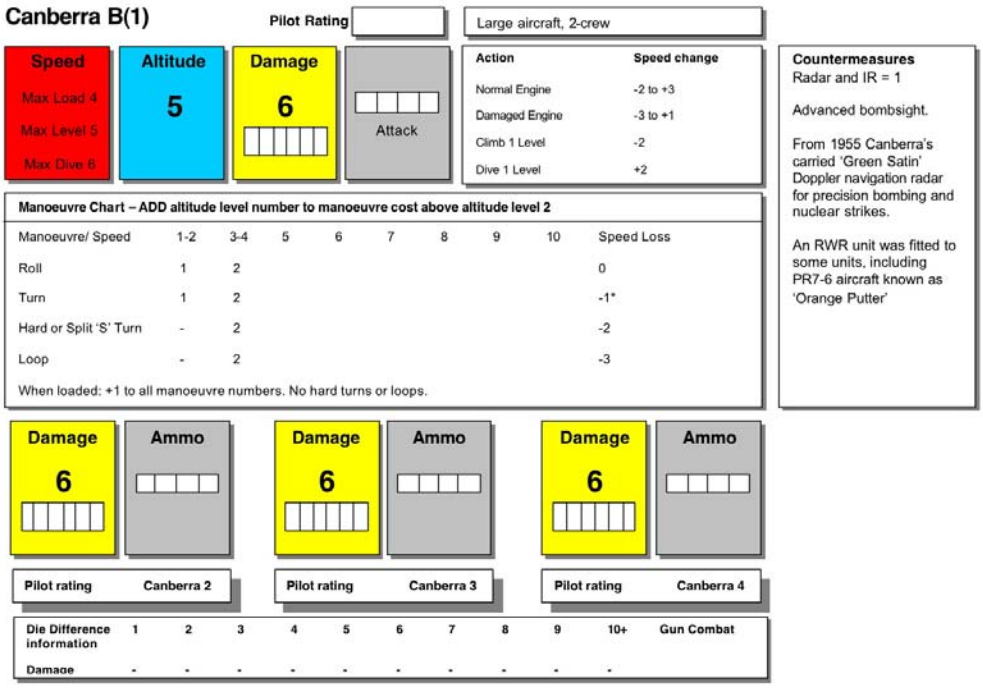
Canberra B(1) and B(1)8



David Child-Dennis Sept 2007

D.H. Sea Vixen Mk1

All round vision canopy, large aircraft, 2 crew

Speed	Altitude	Damage	Ammo	Action	Speed change
Max Load 5	5	6	4	Normal Engine	-2 to +4
Max Level 6			Attack value 4	Damaged Engine	-3 to +2
Max Dive 6				Climb 1 Level	-3
				Dive 1 Level	+2

Manoeuvre Chart – ADD altitude level number to manoeuvre cost above altitude level 2

Manoeuvre/ Speed	1-2	3-4	5	6	7	8	9	10	Speed Loss
Roll	1	2	2	2	2				0
Turn	1	2	4	5	6				-1*
Hard or Split 'S' Turn	-	3							-2
Loop	-	2							-3

When loaded: +1 to all manoeuvre numbers. No hard turns or loops. (*) Only at speed 8

Damage	Ammo	Pilot rating	Damage	Ammo	Pilot rating	Damage	Ammo	Pilot rating
6	4	Venom 2	6	4	Venom 3	6	4	Venom 4
	Attack value 4			Attack value 4			Attack value 4	

Die Difference	1	2	3	4	5	6	7	8	9	10+	Gun Combat information
Damage	-	-	-	-	-	-	-	-	-	-	

David Child-Dennis Sept 2007

D.H. Sea Vixen Mk1

All round vision canopy, large aircraft, 2 crew

Speed	Altitude	Damage	Ammo	Action	Speed change
Max Load 5	5	6	4	Normal Engine	-2 to +4
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6	4	Venom 2	6	4	Venom 3	6	4	Venom 4
	Attack value 4			Attack value 4			Attack value 4	

Die Difference	1	2	3	4	5	6	7	8	9	10+	Gun Combat information
Damage	-	-	-	-	-	-	-	-	-	-	

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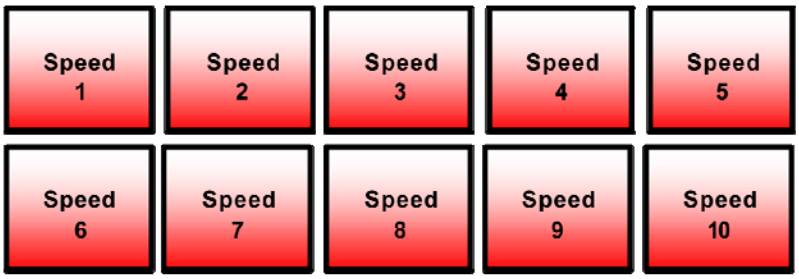
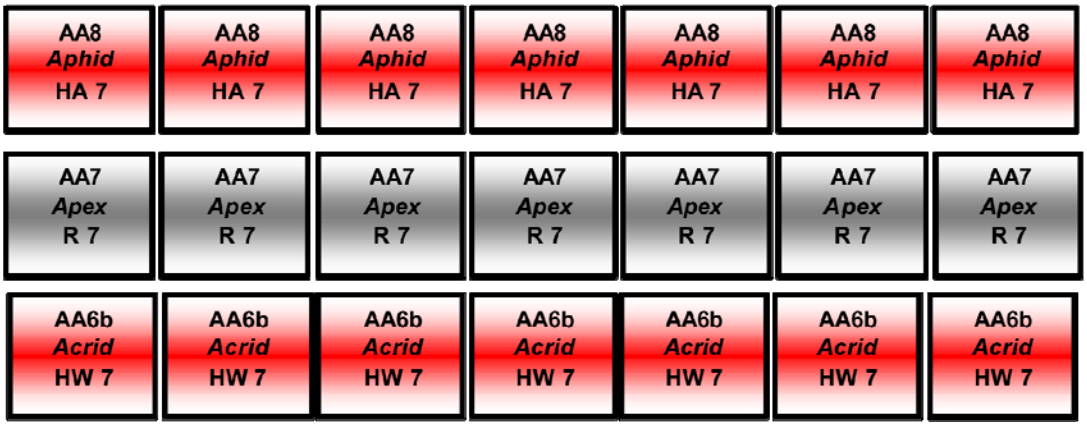
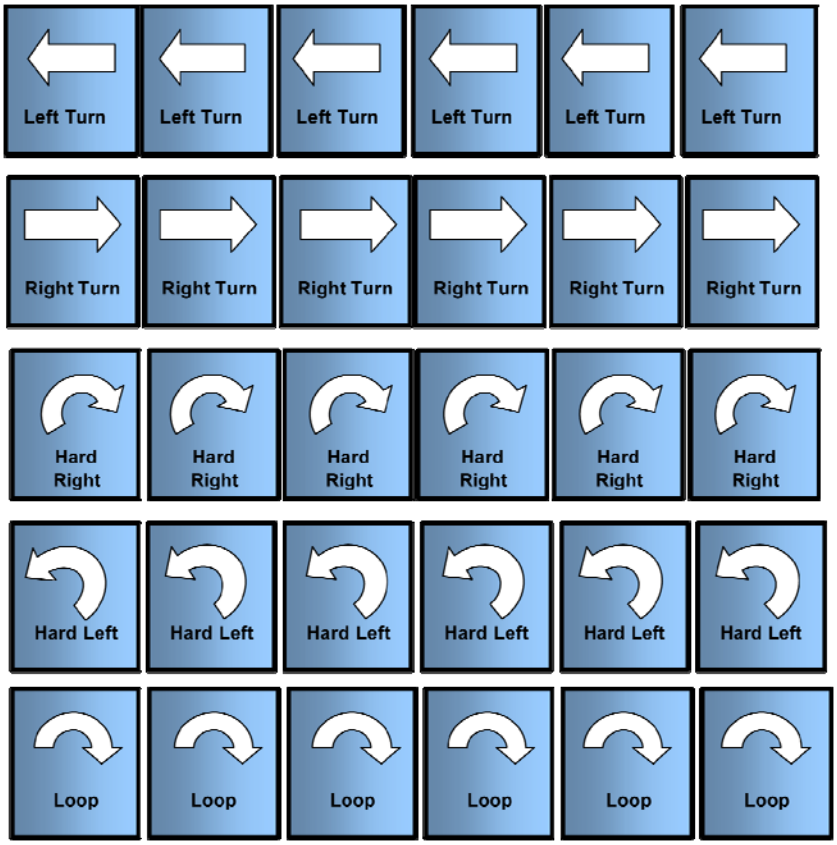
Game Markers

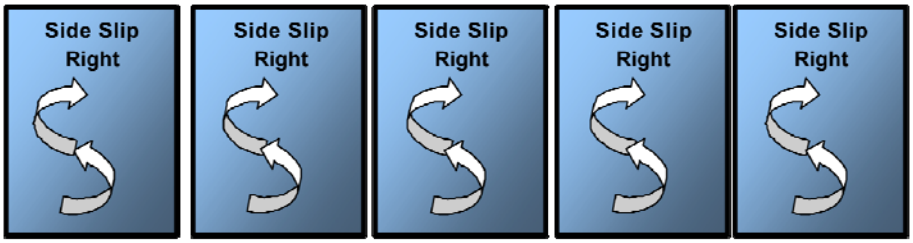
Game Markers

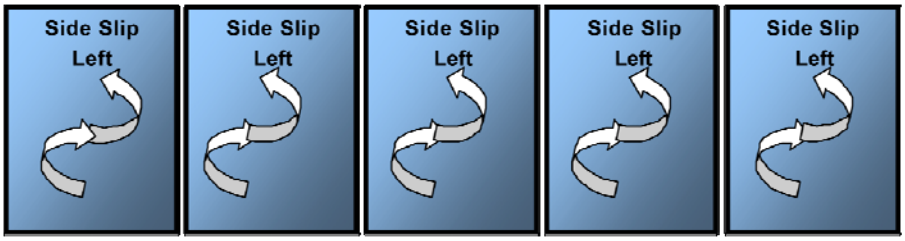




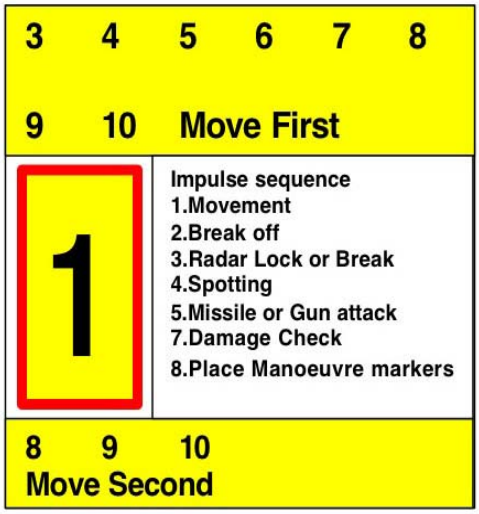
Game Markers

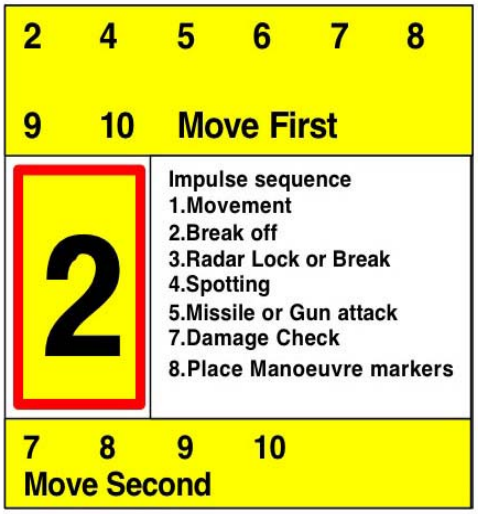


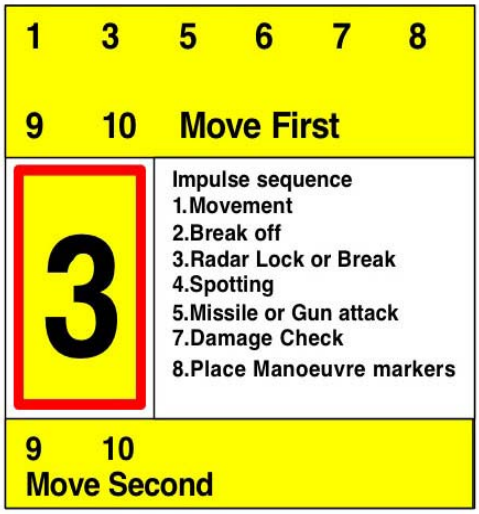


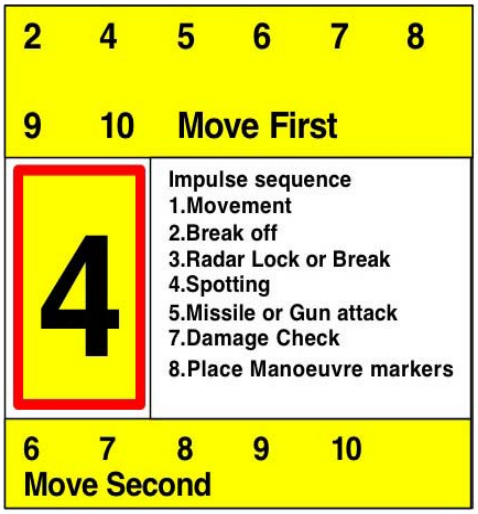


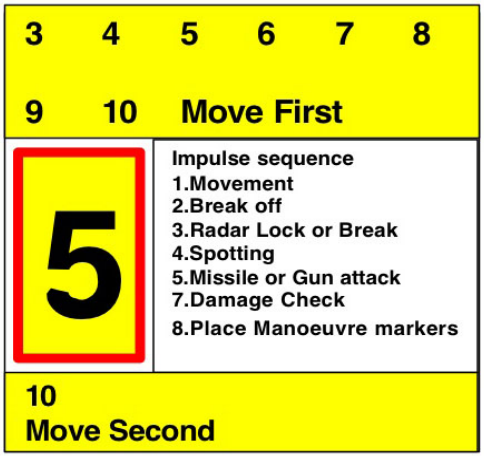
5 Impule Movement Cards







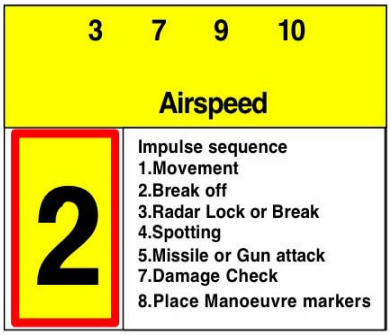


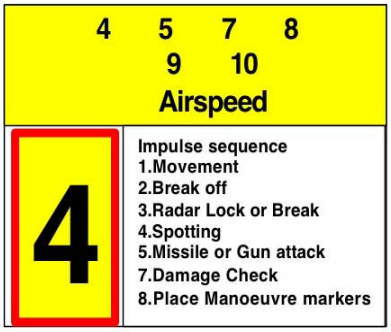


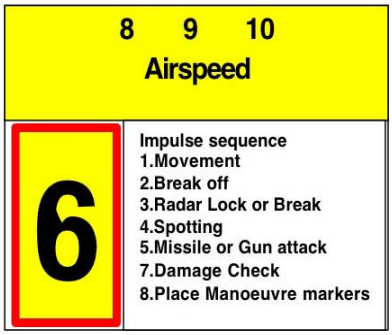
5 and 10 Impulse Movement Cards

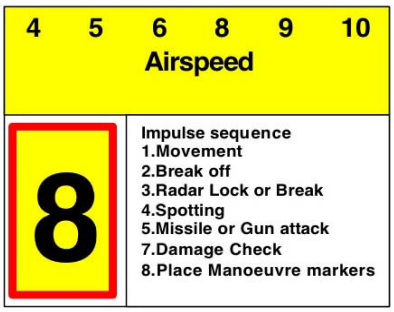
These are two decks of cards that can be used to regulate movement during Phantoms games rather than the impulse sheet that was provided in the rules.

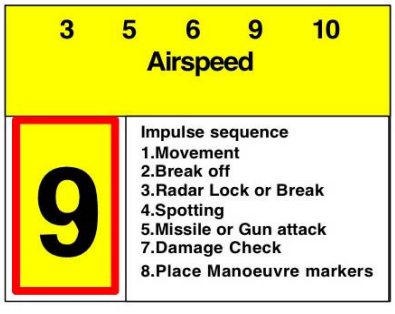
10 Impule Movement Cards

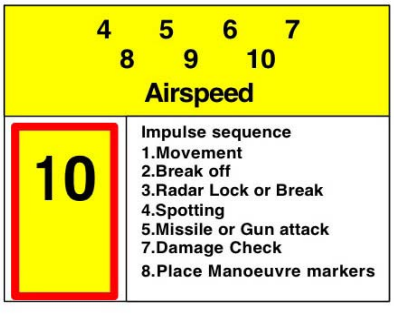












YAHOO! GAMES Groups

The Yahoo Air-Pirates group is very active in discussing air combat, history, and promoting the Mustangs and Phantoms miniatures rules. There are scenarios, optional rules, markers, and aircraft data cards available in the Files section.

WFHGS

The Wasatch Front Historical gaming Society meets every other Friday night in SLC, Utah. Besides helping with the Phantoms project we also publish a full color, free wargames journal called Warning Order. Visit our site at: www.wfhgs.com

This supplement would not have come about if were not the dogged perseverance of David Child-Dennis, who after joining the Phantoms community had a ton of great ideas and just had to share them! After several long email discussions we decided to put out the supplement that you see before you now. As you can tell, David loves the early jets, so this is why there are so many 50s and 60s scenarios! David wrote most of the material, provided the markers, and reworked the data cards for many of the jets while I re-formatted everything that he sent me and worked on the naval system that was presented here.

We still have a lot of ideas for the future of the system, including doing an India-Pakistan campaign with data cards, possible supplements for the Arab-Israeli, Iran-Iraq, France-Libya (Chad), and Falklands. If you have any ideas, suggestions, or material that can be used please send it along. Since this is a free game it will only get better if everyone contributes. Thanks also must go out to Dave Schueler who converted the Mustangs system to the jet era and is responsible for the creation of the Phantoms rules.

If you have any questions about the system you can post them on the Yahoo group or contact me directly at: mirsik1@juno.com

1/300 & 1/600 Aircraft Models and Accessories

This is just a brief listing of what we've seen currently on the market that can be used for Phantoms gaming. If anyone knows of others send us an email and we'll list them in a future supplement.

1/300

- Scotia-A good selection of jets that can be used for many periods. Well sculpted and good value for the money.
- Heroics & Ros/Navwar-A huge selection of jets that are still sold by The Last Square. The quality varies greatly from model to model.
- CinC-Similar to GHQ in that there is a small selection of models, but highly detailed.
- Raiden Miniatures-A company that primarily sells WW2 aircraft, but a few jets are beginning to appear.
- GHQ-A small selection of well detailed jets that are more like tiny models!

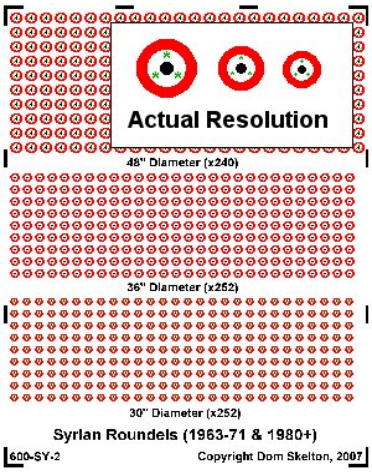
F-4E Phantom from the GHQ Models site. Truly an impressive work of art at this scale.

1/600

- Tumbling Dice-Wide range of 1/600 jets that are great for smaller hex mats. Despite their small size the aircraft are well done and are great for large scenarios.

Decals

- I-94 Enterprises-A good range of markings for WW2 and Modern period 1/300th scale aircraft.
- Dom's Decals-Wide range of 1/300 and 1/600 decals that cover almost every country.



1/300th Syrian decals from Dom's Decals.

Aircraft included in this file:

US
- F-4B/C Phantom
- F-4D/E/J Phantom
- F-5E Tiger
- F-8E Crusader
- F-14B Tomcat
- F-14D Tomcat
- F-15C Eagle
- F-16A Falcon
- F-16C Falcon
- F-18C Hornet
- F-86A/F Sabre
- F-100D Super Sabre
- F-101A Voodoo
- F-102 Delta Dagger
- F-104A Starfighter
- F-105D Thunderchief
- F-106 Delta Dart
- A-1 Skyraider
- A-4E/F Skyhawk
- A-7D Corsair II
- A-10 Thunderbolt

F-4 B/C **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 RA, HS
5 Max Load	5	5	5 A/B
6	6	6	
7		Excess	
8 Max Level			
9 Max Dive			

F-4 B/C **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 RA, HS
5 Max Load	5	5	5 A/B
6	6	6	
7		Excess	
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

F-4B/C Information: Radar Rating = 6 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	3	3	4	4	5	-	-1*
Hard Turn	-	3	3	4	4	5	5	-	-2
Loop	-	4	4	5	5	6	6	-	-3

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +1
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: None

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	-	-	-	-	-	-	-	-	-	-

Notes: Large aircraft, 2 crew

F-4 D/E/J #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3 Gun Pod
4	4	4	4 RA, HS
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7		Excess	
8 Max Level			
9 Max Dive			

F-4 D/E/J #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3 Gun Pod
4	4	4	4 RA, HS
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7		Excess	
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

F-4 D/E/J Information: Radar Rating = 6 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	3	3	4	4	5	-	-1*
Hard Turn	-	2	3	4	4	4	5	-	-2
Loop	-	4	4	5	5	6	6	-	-3

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9

Speed Chart

Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: M61 20mm Cannon Attack Value: D/J (gun pod) = 5, E = 7

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes: Large aircraft, 2 crew

F-5E **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	Excess	5 A/B, Gun
6			
7 Max Level			
8 Max Dive			

F-5E **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	Excess	5 A/B, Gun
6			
7 Max Level			
8 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-5E Information: Radar Rating = 4 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	-	-	
Normal Turn	1	2	2	3	3	4	-	-	
Hard Turn	-	2	3	3	4	4	-	-	-2
Loop	-	4	4	5	5	5	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +1
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 2 20mm Cannon Attack Value: 5

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	3	4	4	5	5	6	7

Notes: Small aircraft

F-8E **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	Excess	5 A/B, Gun
6			
7 Max Level			
8 Max Dive			

F-8E **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	Excess	5 A/B, Gun
6			
7 Max Level			
8 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 5
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-8E Information: Radar Rating = 2 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	-	-	
Normal Turn	1	2	2	3	3	4	-	-	
Hard Turn	-	2	3	3	4	4	-	-	-2
Loop	-	4	4	5	5	5	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 4 20mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	4	5	6	6	8

Notes:

F-14B **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 RA, HS
5 Max Load	5	5	5 A/B
6	6	6	6 Gun
7		7	
8		Excess	
9 Max Level			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-14B **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 RA, HS
5 Max Load	5	5	5 A/B
6	6	6	6 Gun
7		7	
8		Excess	
9 Max Level			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-14B Information: Radar Rating = 8 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	2	2	2	3	4	4	5	-1*
Normal Turn	1	2	2	2	3	4	4	5	-1*
Hard Turn	-	2	3	3	3	4	5	6	-2
Loop	-	4	4	4	4	5	5	6	-3

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥9

Speed Chart

Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+3
Afterburner	+4

Gun Combat Information: M61 20mm Cannon Attack Value: 8

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	3	3	3	4	4	5	5	6	6	8

Notes: Can target and fire at up to 2 aircraft with radar missiles per impulse, Large aircraft, 2 crew, All around vision canopy

F-14D **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 RA, HS
5 Max Load	5	5	5 A/B
6	6	6	6 Gun
7		7	
8		Excess	
9 Max Level			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-14D **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 RA, HS
5 Max Load	5	5	5 A/B
6	6	6	6 Gun
7		7	
8		Excess	
9 Max Level			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-14D Information: Radar Rating = 9 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	2	2	2	3	4	4	5	-1*
Normal Turn	1	2	2	2	3	4	4	5	-1*
Hard Turn	-	2	3	3	3	4	5	6	-2
Loop	-	4	4	4	4	5	5	6	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥9									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +3
Climb 1 level	-2
Dive 1 Level	+3
Afterburner	+4

Gun Combat Information: M61 20mm Cannon Attack Value: 8

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	3	3	3	4	4	5	5	6	6	8

Notes: Can target and fire at up to 2 aircraft with radar missiles per impulse, Large aircraft, 2 crew, All around vision canopy

F-15C **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 RA, HS
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7		7	
8		Excess	
9 Max Level			
10 Max Dive			

F-15C **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 RA, HS
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7		7	
8		Excess	
9 Max Level			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

F-15C Information: Radar Rating = 8 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	4	-1*
Normal Turn	1	2	2	3	3	4	4	5	-1*
Hard Turn	-	2	3	3	4	4	5	5	-2
Loop	-	4	4	5	5	5	6	6	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥9									

Speed Chart	
Action	Speed Change
Normal Engine	-3 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+3
Afterburner	+4

Gun Combat Information: M61 20mm Cannon Attack Value: 8

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes: Can target and fire at up to 2 aircraft with radar missiles per impulse, All-around vision canopy, large aircraft

F-16A **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B, Gun
6		6	
7		Excess	
8 Max Level			
9 Max Dive			

F-16A **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B, Gun
6		6	
7		Excess	
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

F-16A Information: Radar Rating = 6 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	1	2	2	2	3	-	-1*
Normal Turn	1	1	2	2	3	3	3	-	-1*
Hard Turn	1	1	2	3	3	3	4	-	-2
Loop	-	3	3	4	4	5	5	-	-3

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9

Speed Chart

Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: M61 20mm Cannon Attack Value: 8

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes: All-around vision canopy, Small aircraft

F-16C **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B, Gun
6		6	
7		Excess	
8 Max Level			
9 Max Dive			

F-16C **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B, Gun
6		6	
7		Excess	
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-16C Information: Radar Rating = 6 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	1	2	2	2	3	-	-1*
Normal Turn	1	1	2	2	3	3	3	-	-1*
Hard Turn	1	1	2	3	3	3	4	-	-2
Loop	-	3	3	4	4	5	5	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: M61 20mm Cannon Attack Value: 8

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes: All around vision canopy, Small aircraft

F-18C **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B, Gun
6		6	6 HS
7		Excess	
8 Max Level			
9 Max Dive			

F-18C **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B, Gun
6		6	6 HS
7		Excess	
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-18C Information: Radar Rating = 7 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	1	2	2	2	3	-	-1*
Normal Turn	1	1	2	2	3	3	3	-	-1*
Hard Turn	1	1	2	3	3	3	4	-	-2
Loop	-	3	3	4	4	5	5	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+4

Gun Combat Information: M61 20mm Cannon Attack Value: 8

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes: All around vision canopy

F-86 A/F #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 (F) HS
3 Max Load	3	3	3
4 Max Level	4	4	4
5 Max Dive	5	Excess	5
			6
			7 Gun

F-86 A/F #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 (F) HS
3 Max Load	3	3	3
4 Max Level	4	4	4
5 Max Dive	5	Excess	5
			6
			7 Gun

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O Structure O Engine O

F-86 A/F Information: Radar Rating = - Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	1	-	-	-	-	-	
Normal Turn	1	1	2	-	-	-	-	-	
Hard Turn	1	1	2	-	-	-	-	-	-2
Loop	-	3	3	-	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2

Gun Combat Information: Six .5 Cal Machine Guns Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	2	3	3	3	4	4	5	5	6

Notes: Small aircraft, All-round vision canopy

F-100D **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	Excess	5 A/B, Gun
6 Max Level			
7 Max Dive			

F-100D **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	Excess	5 A/B, Gun
6 Max Level			
7 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + __(pilot) + __(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + __(pilot) + __(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

F-100D Information: Radar Rating = 1 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	-	-	-	
Normal Turn	1	2	3	3	4	-	-	-	
Hard Turn	-	2	3	4	4	-	-	-	-2
Loop	-	4	4	5	5	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 4 20mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	4	5	6	6	8

Notes:

F-101A _____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS, Gun
5 Max Load	5	5	5 A/B
6		Excess	
7 Max Level			
8 Max Dive			

F-101A **#**_____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS, Gun
5 Max Load	5	5	5 A/B
6		Excess	
7 Max Level			
8 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-101A Information: Radar Rating = 3 **Counter-Measures (C/M)** **Radar/IR =** _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	-	-	
Normal Turn	1	2	3	4	4	5	-	-	
Hard Turn	-	3	3	4	4	5	-	-	-2
Loop	-	4	5	5	5	6	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 4 20mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	4	5	6	6	8

Notes:

F-102 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B
6 Max Level		Excess	
7 Max Dive			

F-102 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B
6 Max Level		Excess	
7 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-102 Information: Radar Rating = 4 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	-	-	-	-1*
Normal Turn	1	2	2	3	3	-	-	-	-1*
Hard Turn	-	2	3	3	4	-	-	-	-3
Loop	-	4	4	5	5	-	-	-	-4

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 7

Speed Chart

Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: None

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	-	-	-	-	-	-	-	-	-	-

Notes: Large Aircraft

F-104A **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 Gun, A/B
6	6	Excess	
7			
8 Max Level			
9			
10 Max Dive			

F-104A **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 Gun, A/B
6	6	Excess	
7			
8 Max Level			
9			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 5**
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

F-104A Information: Radar Rating = 3 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	4	-1*
Normal Turn	1	2	3	4	4	5	5	6	-1*
Hard Turn	-	3	3	4	4	5	5	6	-2
Loop	-	4	5	5	5	6	6	7	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: M61 20mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

F-105D **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7		7	
8 Max Level		Excess	
9 Max Dive			

F-105D **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7		7	
8 Max Level		Excess	
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 4
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O Structure O Engine O

F-105D Information: Radar Rating = 3 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	3	3	4	4	5	-	-1*
Hard Turn	-	3	3	4	4	5	5	-	-2
Loop	-	4	4	5	5	6	6	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: M61 20mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes: Large aircraft. For F-105G Wild Weasel; add a second crewman.

F-106 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 MS
5 Max Load	5	5	5 A/B
6		Excess	
7			
8 Max Level			
9			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-106 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 MS
5 Max Load	5	5	5 A/B
6		Excess	
7			
8 Max Level			
9			
10 Max Dive			

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-106 Information: Radar Rating = 5 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	4	-1*
Normal Turn	1	2	2	3	3	4	4	5	-1*
Hard Turn	-	2	3	3	4	4	5	5	-2
Loop	-	4	4	5	5	5	6	6	-3

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥8

Speed Chart

Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: M61 20mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

A-1 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3 Max Load	3	3	3
4 Max Dive	4	4	4
		5	5 Gun
		Excess	

A-1 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5 Gun
6		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 4**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 4**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

A-1 Information: Radar Rating = - **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	-	-	-	-	-	-	
Normal Turn	1	1	-	-	-	-	-	-	
Hard Turn	1	1	-	-	-	-	-	-	-1
Loop	-	3	-	-	-	-	-	-	-2
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +2
Damaged Engine	-3 to +1
Climb 1 level	-2
Dive 1 Level	+2

Gun Combat Information: 4 20mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	4	5	6	6	8

Notes: All-round vision canopy, Propeller

A-4 E/F **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4 Gun
5 Max Level	5	Excess	
6 Max Dive			

A-4 E/F **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4 Gun
5 Max Level	5	Excess	
6 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

A-4 E/F Information: Radar Rating = - **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	2	3	-	-	-	-	
Hard Turn	-	2	3	3	-	-	-	-	-2
Loop	-	4	4	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2

Gun Combat Information: Two 20mm Cannon Attack Value: 5

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	3	4	4	5	5	6	7

Notes: Small aircraft

A-7D **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4 HS
5 Max Level	5	5	5 Gun
6 Max Dive		Excess	

A-7D **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4 HS
5 Max Level	5	5	5 Gun
6 Max Dive		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 4**
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 4**
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

A-7D Information: Radar Rating = 2 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	2	3	-	-	-	-	
Hard Turn	-	2	3	3	-	-	-	-	-2
Loop	-	4	4	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2

Gun Combat Information: M61 20mm Cannon Attack Value: 7

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	3	3	3	4	4	5	5	6	6	8

Notes:

A-10 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3 Max Load	3	3	3
4 Max Dive	4	4	4 Gun
		5	
		6	
		7	
		Excess	

A-10 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3 Max Load	3	3	3
4 Max Dive	4	4	4 Gun
		5	
		6	
		7	
		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 4**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 4**
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

A-10 Information: Radar Rating = - **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	-	-	-	-	-	-	
Normal Turn	1	2	-	-	-	-	-	-	
Hard Turn	-	3	-	-	-	-	-	-	-1
Loop	-	4	-	-	-	-	-	-	-2
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2

Gun Combat Information: 30mm Gatling Gun Attack Value: 7

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	3	4	4	5	5	6	6	7	8	10

Notes: All-round vision canopy

Aircraft included in this file

UK
- Buccaneer
- Canberra (B-57)
- Gnat (HAL Ajeet)
- Hunter
- Javelin
- Lighting F.3/F.6
- Scimitar
- Sea Harrier
- Sea Hawk
- Sea Vixen
- Tornado ADV
- Vulcan

France
- Jaguar
- Mirage III
- Mirage V
- Mirage 2000
- Mirage F-1
- Mystere IV
- Ouragan
- Super Entendard
- Super Mystere B.2
- Vautor N

Buccaneer #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1 HS
2	2	2	
3	3	3	
4 Max Load	4	4	
5 Max Level		5	
6 Max Dive		6	
		Excess	

Buccaneer #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1 HS
2	2	2	
3	3	3	
4 Max Load	4	4	
5 Max Level		5	
6 Max Dive		6	
		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Buccaneer Information: Radar Rating = 1 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	3	3	-	-	-	-	
Hard Turn	-	3	3	4	-	-	-	-	-2
Loop	-	4	4	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2

Gun Combat Information: None

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	-	-	-	-	-	-	-	-	-	-

Notes: Large Aircraft, 2 Crew

Canberra #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	
2	2	2	
3	3	3	
4 Max Load	4	4	
5 Max Level	5	5	
6 Max Dive		6	
		Excess	

Canberra #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	
2	2	2	
3	3	3	
4 Max Load	4	4	
5 Max Level	5	5	
6 Max Dive		6	
		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Canberra Information: Radar Rating = - Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	3	3	-	-	-	-	
Hard Turn	-	3	3	4	-	-	-	-	-2
Loop	-	4	4	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2

Gun Combat Information: None

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	-	-	-	-	-	-	-	-	-	-

Notes: large, 2 crew. Use information for B-57

Gnat **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	Excess	4 Gun
5 Max Dive			

Gnat **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	Excess	4 Gun
5 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 5**
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Gnat Information: Radar Rating = - **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	1	-	-	-	-	-	
Normal Turn	1	1	2	-	-	-	-	-	
Hard Turn	1	1	2	-	-	-	-	-	-2
Loop	-	3	3	-	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2

Gun Combat Information: 2 30mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes: Small aircraft

Hunter #____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3 Max Load	3	3	3
4	4	4	4
5 Max Level	5	Excess	5 Gun
6 Max Dive			

Hunter #____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3 Max Load	3	3	3
4	4	4	4
5 Max Level	5	Excess	5 Gun
6 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Hunter Information: Radar Rating = - **Counter-Measures (C/M)** **Radar/IR =** _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	2	3	-	-	-	-	
Hard Turn	-	2	3	3	-	-	-	-	-2
Loop	-	4	4	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2

Gun Combat Information: Four Aden 30mm Cannon Gun Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	3	3	4	4	5	5	6	6	7	9

Notes: Small aircraft, all around vision canopy

Javelin #____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4 HS
5 Max Level	5	5	5 Gun
6 Max Dive		6	
		Excess	

Javelin #____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4 HS
5 Max Level	5	5	5 Gun
6 Max Dive		6	
		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Javelin Information: Radar Rating = 1 **Counter-Measures (C/M)** **Radar/IR =** _____/_____

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	3	3	-	-	-	-	
Hard Turn	-	3	3	4	-	-	-	-	-2
Loop	-	4	4	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2

Gun Combat Information: 2 30mm Cannon Attack Value: 5

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes: Large Aircraft, all around vision canopy, 2 Crew

Lightning #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 MS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B
6		Excess	
7			
8 Max Level			
9			
10 Max Dive			

Lightning #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 MS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B
6		Excess	
7			
8 Max Level			
9			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Lightning Information: Radar Rating = 4 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	4	-1*
Normal Turn	1	2	2	3	3	4	4	5	-1*
Hard Turn	-	2	3	3	4	4	5	5	-2
Loop	-	4	4	5	5	5	6	6	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+4

Gun Combat Information: 30mm Cannon Pod Attack Value: 5

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

Scimitar #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4 HS
5 Max Level	5	5	5 Gun
6 Max Dive		6	
		Excess	

Scimitar #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4 HS
5 Max Level	5	5	5 Gun
6 Max Dive		6	
		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Scimitar Information: Radar Rating = - Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	2	3	-	-	-	-	
Hard Turn	-	2	3	3	-	-	-	-	-2
Loop	-	4	4	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2

Gun Combat Information: 4 30mm Cannon Gun Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	3	3	4	4	5	5	6	6	7	9

Notes: Large Aircraft

Sea Harrier #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4 HS
5 Max Level	5	5	5 Viff, Gun
6 Max Dive		Excess	

Sea Harrier #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4 HS
5 Max Level	5	5	5 Viff, Gun
6 Max Dive		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Sea Harrier Information: Radar Rating = 5 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	2	3	-	-	-	-	
Hard Turn	1	2	3	3	-	-	-	-	-2
Loop	2	4	4	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-2/ -1 if VIFF
Dive 1 Level	+2

Gun Combat Information: 2 30mm Cannon Gun Attack Value: 7

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes: All around vision canopy. During Falklands Conflict, could only carry 2 HS

Sea Hawk #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4
5 Max Dive		Excess	5 Gun

Sea Hawk #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4
5 Max Dive		Excess	5 Gun

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Sea Hawk Information: Radar Rating = - Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	-	-	-	-	-	
Normal Turn	1	2	2	-	-	-	-	-	
Hard Turn	-	2	3	-	-	-	-	-	-2
Loop	-	4	4	-	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2

Gun Combat Information: 4 20mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	4	5	6	6	8

Notes: All around vision canopy

Sea Vixen #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4 HS
5 Max Level	5	5	
6 Max Dive		6	
		Excess	

Sea Vixen #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4 HS
5 Max Level	5	5	
6 Max Dive		6	
		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Sea Vixen Information: Radar Rating = 1 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	2	3	-	-	-	-	
Hard Turn	-	2	3	3	-	-	-	-	-2
Loop	-	4	4	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+3

Gun Combat Information: None

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	-	-	-	-	-	-	-	-	-	-

Notes: Large Aircraft, 2 Crew

Tornado #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4 RA
5 Max Load	5	5	5 Gun, A/B
6	6	6	
7		Excess	
8			
9 Max Level			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Tornado #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4 RA
5 Max Load	5	5	5 Gun, A/B
6	6	6	
7		Excess	
8			
9 Max Level			
10 Max Dive			

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Tornado Information: Radar Rating = 7 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	4	-1*
Normal Turn	1	2	2	3	3	4	4	5	-1*
Hard Turn	-	2	3	3	4	4	5	5	-2
Loop	-	4	4	5	5	5	6	6	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+4

Gun Combat Information: 2 27mm Cannon Attack Value: 7

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	4	5	6	6	8

Notes: 2 Crew

Vulcan #____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	
2	2	2	
3	3	3	
4	4	4	
5 Max Load	5	5	
6 Max Dive		6	
		7	
		Excess	

Vulcan #____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	
2	2	2	
3	3	3	
4	4	4	
5 Max Load	5	5	
6 Max Dive		6	
		7	
		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Vulcan Information: Radar Rating = - **Counter-Measures (C/M)** **Radar/IR =** _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	2	2	2	-	-	-	-	
Normal Turn	1	3	3	4	-	-	-	-	
Hard Turn	-	3	3	4	-	-	-	-	-2
Loop	-	4	5	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+3

Gun Combat Information: None

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	-	-	-	-	-	-	-	-	-	-

Notes: Large Aircraft, multiple crew (treat as 2 crew)

Jaguar #____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	Excess	5 Gun, A/B
6			
7 Max Level			
8 Max Dive			

Jaguar #____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	Excess	5 Gun, A/B
6			
7 Max Level			
8 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Jaguar Information: Radar Rating = 1 **Counter-Measures (C/M)** **Radar/IR =** _____/_____

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	-	-	
Normal Turn	1	2	3	3	4	4	-	-	
Hard Turn	-	2	3	4	4	4	-	-	-2
Loop	-	4	4	5	5	6	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 2 30mm Cannon Gun Attack Value: 7

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

Mirage III #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1 RA
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7 Max Level		Excess	
8			
9 Max Dive			

Mirage III #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1 RA
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7 Max Level		Excess	
8			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Mirage III Information: Radar Rating = 5 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	2	3	3	4	4	-	-1*
Hard Turn	-	2	3	3	4	4	5	-	-3
Loop	-	4	4	5	5	5	6	-	-4

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥8

Speed Chart

Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: Two DEFA 30mm Cannon Gun Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

Mirage V #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 Gun, A/B
6	6	6	
7 Max Level		Excess	
8			
9 Max Dive			

Mirage V #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 Gun, A/B
6	6	6	
7 Max Level		Excess	
8			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Mirage V Information: Radar Rating = 2 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	2	3	3	4	4	-	-1*
Hard Turn	-	2	3	3	4	4	5	-	-3
Loop	-	4	4	5	5	5	6	-	-4
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥8									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 2 30mm Cannon Gun Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

Mirage 2000 #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA, HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7		Excess	
8 Max Level			
9			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Mirage 2000 #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA, HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7		Excess	
8 Max Level			
9			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Mirage 2000 Information: Radar Rating = 6 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	4	-1*
Normal Turn	1	2	2	3	3	4	4	5	-1*
Hard Turn	-	2	3	3	4	4	5	5	-2
Loop	-	4	4	5	5	5	6	6	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥8									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2
Afterburner	+4

Gun Combat Information: Two DEFA 30mm Cannon **Gun Attack Value: 7**

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

Mirage F-1 #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3 RA
4	4	4	4
5 Max Load	5	5	5 Gun, A/B
6	6	6	
7		Excess	
8 Max Level			
9 Max Dive			

Mirage F-1 #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3 RA
4	4	4	4
5 Max Load	5	5	5 Gun, A/B
6	6	6	
7		Excess	
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Mirage F1 Information: Radar Rating = 5 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	2	3	3	4	4	-	-1*
Hard Turn	-	2	3	3	4	4	5	-	-2
Loop	-	4	4	5	5	5	6	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+4

Gun Combat Information: 2 30mm Cannon Gun Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

Mystere IV #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4
5 Max Dive		5	5 Gun
		Excess	

Mystere IV #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4
5 Max Dive		5	5 Gun
		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Mystere IV Information: Radar Rating = - Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	-	-	-	-	-	
Normal Turn	1	2	2	-	-	-	-	-	
Hard Turn	-	2	3	-	-	-	-	-	-2
Loop	-	4	4	-	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2

Gun Combat Information: 2 30mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

Ouragan #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4
5 Max Dive		Excess	5 Gun

Ouragan #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4
5 Max Dive		Excess	5 Gun

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Ouragan Information: Radar Rating = - Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	-	-	-	-	-	
Normal Turn	1	2	3	-	-	-	-	-	
Hard Turn	-	2	3	-	-	-	-	-	-2
Loop	-	4	4	-	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2

Gun Combat Information: 4 20mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	4	5	6	6	8

Notes: All around vision canopy

S. Entendard #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4 Max Load	4	4	4
5 Max Level	5	5	5 Gun, A/B
6 Max Dive		Excess	

S. Entendard #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4 Max Load	4	4	4
5 Max Level	5	5	5 Gun, A/B
6 Max Dive		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

S. Entendard Information: Radar Rating = 2 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	3	3	-	-	-	-	
Hard Turn	-	2	3	4	-	-	-	-	-2
Loop	-	4	4	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 2 30mm Cannon Gun Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

S. Mystere #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4 Max Load	4	4	4
5 Max Level	5	5	5 Gun, A/B
6 Max Dive		Excess	

S. Mystere #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4 Max Load	4	4	4
5 Max Level	5	5	5 Gun, A/B
6 Max Dive		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

S. Mystere Information: Radar Rating = - Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	2	3	-	-	-	-	
Hard Turn	-	2	3	3	-	-	-	-	-2
Loop	-	4	4	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+2

Gun Combat Information: 2 30mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

Vautor N #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 Gun
6 Max Level		6	
7		Excess	
8 Max Dive			

Vautor N #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 Gun
6 Max Level		6	
7		Excess	
8 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Vautor N Information: Radar Rating = 2 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	-	-	-1*
Normal Turn	1	2	3	3	4	4	-	-	-1*
Hard Turn	-	3	3	4	4	5	-	-	-2
Loop	-	4	4	5	5	6	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 8									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-4
Dive 1 Level	+3

Gun Combat Information: 4 30mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	3	3	4	4	5	5	6	6	7	9

Notes: Large Aircraft, 2 Crewmen

Aircraft included in this file:

USSR/Russia	MiG-17
	MiG-19C Farmer
	MiG-21C
	MiG-23B
	MiG-23E
	MiG-25
	MiG-29
	Su-7 Fitter
	Su-15
	Su-17
	Su-27
	Su-30
	Yak-38 Forger
PRC	J-6
	J-7
	J-8 II
	Q-5
Taiwan	Ching Kuo
Israel	Kfir
India	Marut
	Ajeet (See UK Gnat)
Japan	Mitsubishi F1
Argentina	Pucara
Sweden	Draken
	Viggen
Canada	CF-5D (F-5A)
	CF-101 Voodoo
	CF-104 Starfighter (F-104G)
	CF-105

MiG-17 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3 Max Load	3	3	3
4	4	4	4 Gun
5 Max Level	5	Excess	
6 Max Dive			

MiG-17 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3 Max Load	3	3	3
4	4	4	4 Gun
5 Max Level	5	Excess	
6 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

MiG-17 Information: Radar Rating = - **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	1	2	-	-	-	-	
Normal Turn	1	1	2	2	-	-	-	-	
Hard Turn	1	1	2	3	-	-	-	-	-2
Loop	-	3	3	4	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2

Gun Combat Information: Three 23mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	4	5	6	6	8

Notes: Small aircraft, All-around vision canopy

MiG-19C #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4 Gun
5 Max Load	5	Excess	5 A/B
6 Max Level			
7 Max Dive			

MiG-19C #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4 Gun
5 Max Load	5	Excess	5 A/B
6 Max Level			
7 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

MiG-19C Information: Radar Rating = 1 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	-	-	-	
Normal Turn	1	2	2	3	3	-	-	-	
Hard Turn	-	2	3	3	4	-	-	-	-2
Loop	-	4	4	5	5	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 3 23mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	4	5	6	6	8

Notes: Small aircraft

MiG-21C #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3 Gun
4	4	4	4
5 Max Load	5	5	5 A/B
6	6	Excess	
7 Max Level			
8			
9 Max Dive			

MiG-21C #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3 Gun
4	4	4	4
5 Max Load	5	5	5 A/B
6	6	Excess	
7 Max Level			
8			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

MiG-21C Information: Radar Rating = 2 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	2	3	3	4	4	-	-1*
Hard Turn	-	2	3	3	4	4	5	-	-3
Loop	-	4	4	5	5	5	6	-	-4

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: GSh 23mm Cannon Gun Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	3	4	4	5	5	6	7

Notes: Small aircraft

MiG-23B #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS, Gun
5 Max Load	5	5	5 A/B
6	6	6	
7		Excess	
8 Max Level			
9 Max Dive			

MiG-23B #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS, Gun
5 Max Load	5	5	5 A/B
6	6	6	
7		Excess	
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

MiG-23B Information: Radar Rating = 6 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	3	3	4	4	5	-	-1*
Hard Turn	-	3	3	4	4	5	5	-	-2
Loop	-	4	4	5	5	6	6	-	-3

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +1
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: GSh 23mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	3	4	4	5	5	6	7

Notes:

MiG-23E #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA, HS
3	3	3	3
4	4	4	4 Gun
5 Max Load	5	5	5 A/B
6	6	6	
7		Excess	
8 Max Level			
9 Max Dive			

MiG-23E #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA, HS
3	3	3	3
4	4	4	4 Gun
5 Max Load	5	5	5 A/B
6	6	6	
7		Excess	
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

MiG-23E Information: Radar Rating = 3 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart

Maneuver/ Speed	1 –2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	3	3	4	4	5	-	-1*
Hard Turn	-	3	3	4	4	5	5	-	-2
Loop	-	4	4	5	5	6	6	-	-3

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +1
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: GSh 23mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	3	4	4	5	5	6	7

Notes: Export version

MiG-25 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 MS
5 Max Load	5	5	5 A/B
6	6	6	
7		Excess	
8			
9 Max Level			
10 Max Dive			

MiG-25 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 MS
5 Max Load	5	5	5 A/B
6	6	6	
7		Excess	
8			
9 Max Level			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 4**
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 4**
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

MiG-25 Information: Radar Rating = 5 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	4	-1*
Normal Turn	1	2	3	4	4	5	5	6	-1*
Hard Turn	-	3	3	4	4	5	5	6	-2
Loop	-	4	5	5	5	6	6	7	-3

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥9

Speed Chart

Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+4

Gun Combat Information: None

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	-	-	-	-	-	-	-	-	-	-

Notes: Large Aircraft

MiG-29 **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7		Excess	
8 Max Level			
9			
10 Max Dive			

MiG-29 **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7		Excess	
8 Max Level			
9			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O Structure O Engine O

MiG-29 Information: Radar Rating = 6 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	1	2	2	2	3	3	-1*
Normal Turn	1	1	2	2	3	3	3	4	-1*
Hard Turn	1	1	2	3	3	3	4	4	-2
Loop	-	3	3	4	4	5	5	6	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥9									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: GS 301 30mm Cannon Attack Value: 7

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes: All-round vision canopy, Small aircraft

Su-7 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 Gun, A/B
6		Excess	
7 Max Level			
8 Max Dive			

Su-7 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 Gun, A/B
6		Excess	
7 Max Level			
8 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Su-7 Information: Radar Rating = 1 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	-	-	
Normal Turn	1	2	3	3	4	4	-	-	
Hard Turn	-	3	3	4	4	5	-	-	-2
Loop	-	4	4	5	5	6	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 8									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 2 30mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

Su-15 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 MS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B
6	6	Excess	
7			
8			
9 Max Level			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Su-15 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 MS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B
6	6	Excess	
7			
8			
9 Max Level			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Su-15 Information: Radar Rating = 4 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	4	-1*
Normal Turn	1	2	3	3	4	4	5	5	-1*
Hard Turn	-	3	3	4	4	5	5	5	-2
Loop	-	4	4	5	5	6	6	7	-3

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥9

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: None

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	-	-	-	-	-	-	-	-	-	-

Notes:

Su-17 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 Gun, A/B
6	6	Excess	
7			
8 Max Level			
9 Max Dive			

Su-17 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 Gun, A/B
6	6	Excess	
7			
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + __(pilot) + __(C/M)
Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 5
vs. Missile = 0 + __(pilot) + __(C/M)
Critical Hits:
Pilot O Structure O Engine O

Su-17 Information: Radar Rating = 0 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	3	3	4	4	5	-	-1*
Hard Turn	-	3	3	4	4	5	5	-	-2
Loop	-	4	4	5	5	6	6	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 2 30mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

Su-27 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 RA, HS
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7		7	
8		Excess	
9 Max Level			
10 Max Dive			

Su-27 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 RA, HS
5 Max Load	5	5	5 A/B, Gun
6	6	6	
7		7	
8		Excess	
9 Max Level			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + __(pilot) + __(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 5
vs. Missile = 0 + __(pilot) + __(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Su-27 Information: Radar Rating = 6 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	4	-1*
Normal Turn	1	2	2	3	3	4	4	5	-1*
Hard Turn	-	2	3	3	4	4	5	5	-2
Loop	-	4	4	5	5	5	6	6	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥8									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+4

Gun Combat Information: GS 301 30mm Cannon Attack Value: 7

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	3	4	4	5	5	6	8

Notes: Large aircraft, All-round vision canopy

Su-30 **#____ Pilot Quality _____** **#____ Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B, Gun
6	6	6	6 RA
7		7	
8		Excess	
9 Max Level			
10 Max Dive			

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B, Gun
6	6	6	6 RA
7		7	
8		Excess	
9 Max Level			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 5**
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Su-30 Information: Radar Rating = 6 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	4	-1*
Normal Turn	1	2	2	3	3	4	4	5	-1*
Hard Turn	-	2	3	3	4	4	5	5	-2
Loop	-	4	4	5	5	5	6	6	-3

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥8

Speed Chart

Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-4
Dive 1 Level	+2
Afterburner	+4

Gun Combat Information: GS 301 30mm Cannon Attack Value: 7

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	2	3	3	3	4	4	4	6	8

Notes: Can target and fire at up to 2 aircraft with radar missiles per impulse, large aircraft, 2 crew, all around vision canopy

Yak-38 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3 Max Load	3	3	3
4 Max Level	4	4	4 HS
5 Max Dive		Excess	

Yak-38 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3 Max Load	3	3	3
4 Max Level	4	4	4 HS
5 Max Dive		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 4**
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 4**
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Yak-38 Information: Radar Rating = 0 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	-	-	-	-	-	
Normal Turn	1	2	3	-	-	-	-	-	
Hard Turn	-	3	3	-	-	-	-	-	-2
Loop	-	4	4	-	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-2
Dive 1 Level	+2

Gun Combat Information: None

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	-	-	-	-	-	-	-	-	-	-

Notes: VTOL aircraft

J-6 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4 Gun
5 Max Load	5	Excess	5 A/B
6 Max Level			
7 Max Dive			

J-6 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4 Gun
5 Max Load	5	Excess	5 A/B
6 Max Level			
7 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

J-6 Information: Radar Rating = 2 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	-	-	-	
Normal Turn	1	2	2	3	3	-	-	-	
Hard Turn	-	2	3	3	4	-	-	-	-2
Loop	-	4	4	5	5	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +1
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: Three 30mm Cannon Attack Value: 5

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	3	3	4	4	4	5	5	6	6	8

Notes: Chinese copy of MiG-19, Small aircraft

J-7 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3 Gun
4	4	4	4
5 Max Load	5	5	5 A/B
6		Excess	
7 Max Level			
8			
9 Max Dive			

J-7 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3 Gun
4	4	4	4
5 Max Load	5	5	5 A/B
6		Excess	
7 Max Level			
8			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

J-7 Information: Radar Rating = 2 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	2	3	3	4	4	-	-1*
Hard Turn	-	2	3	3	4	4	5	-	-2
Loop	-	4	4	5	5	5	6	-	-4
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: Two 30mm Cannon Attack Value: 5

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes: Chinese copy of MiG-21C, Small aircraft

J-8II **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3 Gun
4	4	4	4 Missiles
5 Max Load	5	5	5 A/B
6	6	Excess	
7			
8 Max Level			
9 Max Dive			

J-8II **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3 Gun
4	4	4	4 Missiles
5 Max Load	5	5	5 A/B
6	6	Excess	
7			
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

J-8II Information: Radar Rating = 4 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	2	3	3	4	4	5	5	-	-1*
Normal Turn	2	3	3	4	4	5	5	-	-1*
Hard Turn	2	3	3	4	4	5	5	-	-2
Loop	2	3	3	4	4	5	5	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: Two 23mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	3	4	4	5	5	6	7

Notes:

Q-5 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3 Gun
4 Max Load	4	4	4 A/B
5 Max Level	5	Excess	
6 Max Dive			

Q-5 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3 Gun
4 Max Load	4	4	4 A/B
5 Max Level	5	Excess	
6 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Q-5 Information: Radar Rating = - **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	2	3	-	-	-	-	
Hard Turn	-	2	3	3	-	-	-	-	-2
Loop	-	4	4	5	-	-	-	-	-2
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +1
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: Two 23mm Cannon Attack Value: 5

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	3	4	4	5	5	6	7

Notes: Small aircraft, Modified MiG-19

Ching Kuo #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B, Gun
6		Excess	
7 Max Level			
8 Max Dive			

Ching Kuo #____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B, Gun
6		Excess	
7 Max Level			
8 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O Structure O Engine O

Ching Kuo Information: Radar Rating = 5 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	1	2	2	2	-	-	-
Normal Turn	1	1	2	2	3	3	-	-	-
Hard Turn	1	1	2	3	3	3	-	-	-2
Loop	-	3	3	4	4	5	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: M61 20mm Cannon Attack Value: 7

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	3	3	3	4	4	5	5	6	6	8

Notes: All-round vision canopy

Kfir #____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1 RA
2	2	2	2 HA
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 Gun, A/B
6	6	6	
7		Excess	
8 Max Level			
9 Max Dive			

Kfir #____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1 RA
2	2	2	2 HA
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 Gun, A/B
6	6	6	
7		Excess	
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Kfir Information: Radar Rating = 6 **Counter-Measures (C/M)** **Radar/IR =** _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	2	3	3	4	4	-	-1*
Hard Turn	-	2	3	3	4	4	5	-	-2
Loop	-	4	4	5	5	5	6	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 2 30mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

Marut **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4
5 Max Level		5	5 Gun
6 Max Dive		Excess	

Marut **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4 Max Load	4	4	4
5 Max Level		5	5 Gun
6 Max Dive		Excess	

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 5**
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Marut Information: Radar Rating = 1 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	-	-	-	-	
Normal Turn	1	2	3	3	-	-	-	-	
Hard Turn	-	2	3	4	-	-	-	-	-2
Loop	-	4	4	5	-	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2

Gun Combat Information: 4 30mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	3	3	4	4	5	5	6	6	7	9

Notes:

F-1 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	Excess	5 Gun, A/B
6 Max Level			
7 Max Dive			

F-1 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4
5 Max Load	5	Excess	5 Gun, A/B
6 Max Level			
7 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 5
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

F-1 Information: Radar Rating = 2 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	-	-	-	
Normal Turn	1	2	3	3	4	-	-	-	
Hard Turn	-	2	3	4	4	-	-	-	-2
Loop	-	4	4	5	5	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: JM61 20mm Cannon Attack Value: 7

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	2	3	3	3	4	4	4	6	8

Notes:

Pucara **#____ Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3 Max Load	3	3	3
4 Max Dive	4	Excess	4 Gun

#____ Pilot Quality _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3 Max Load	3	3	3
4 Max Dive	4	Excess	4 Gun

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 4**
vs. Missile = 0 + __(pilot) + __(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 4**
vs. Missile = 0 + __(pilot) + __(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Pucara Information: Radar Rating = - **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	-	-	-	-	-	-	
Normal Turn	1	1	-	-	-	-	-	-	
Hard Turn	1	1	-	-	-	-	-	-	-1
Loop	-	3	-	-	-	-	-	-	-2
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +2
Damaged Engine	-3 to +1
Climb 1 level	-2
Dive 1 Level	+2

Gun Combat Information: 2 20mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	3	4	4	5	5	6	7

Notes: Propeller

Draken #____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 Gun, A/B
6	6	Excess	
7			
8 Max Level			
9 Max Dive			

Draken #____ **Pilot Quality** _____

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 Gun, A/B
6	6	Excess	
7			
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Draken Information: Radar Rating = 5 Counter-Measures (C/M) Radar/IR = _____/_____

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	2	3	3	4	4	-	-1*
Hard Turn	-	2	3	3	4	4	5	-	-2
Loop	-	4	4	5	5	5	6	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 30mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

Viggen **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA, HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 Gun, A/B
6	6	Excess	
7			
8 Max Level			
9 Max Dive			

Viggen **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA, HS
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 Gun, A/B
6	6	Excess	
7			
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 5**
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Viggen Information: Radar Rating = 5 **Counter-Measures (C/M)** **Radar/IR = _____ / _____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	2	3	3	4	4	-	-1*
Hard Turn	-	2	3	3	4	4	5	-	-2
Loop	-	4	4	5	5	5	6	-	-3

Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 30mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	4	4	5	5	6	6	8

Notes:

CF-5D **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4 Gun
5 Max Load	5	Excess	5 A/B
6 Max Level			
7 Max Dive			

CF-5D **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 HS
3	3	3	3
4	4	4	4 Gun
5 Max Load	5	Excess	5 A/B
6 Max Level			
7 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 5**
vs. Missile = 0 + __(pilot) + __(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

CF-5D Information: Radar Rating = 0 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	-	-	-	
Normal Turn	1	2	2	3	3	-	-	-	
Hard Turn	-	2	3	3	4	-	-	-	-2
Loop	-	4	4	5	5	-	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: 2 20mm Cannon Attack Value: 6

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	3	3	3	4	4	5	5	6	7

Notes: Small Aircraft, 2 Crewmen. Use same information for F-5A, but only 1 Crewman.

CF-101 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B
6		Excess	
7 Max Level			
8 Max Dive			

CF-101 **#____** **Pilot Quality _____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2 RA
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 A/B
6		Excess	
7 Max Level			
8 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 4
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: vs. Gun = 4
vs. Missile = 0 + __(pilot) + __(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

CF-101 Information: Radar Rating = 5 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	-	-	
Normal Turn	1	2	3	4	4	5	-	-	
Hard Turn	-	3	3	4	4	5	-	-	-2
Loop	-	4	5	5	5	6	-	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop.									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+3

Gun Combat Information: None

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	-	-	-	-	-	-	-	-	-	-

Notes: 2 Crewmen

CF-104 **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 Gun, A/B
6	6	Excess	
7			
8			
9 Max Level			
10 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

CF-104 **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4 HS
5 Max Load	5	5	5 Gun, A/B
6	6	Excess	
7			
8			
9 Max Level			
10 Max Dive			

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: vs. Gun = 5
vs. Missile = 0 + ___(pilot) + ___(C/M)

Critical Hits:
Pilot O **Structure O** **Engine O**

CF-104 Information: Radar Rating = 4 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart									
Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	4	-1*
Normal Turn	1	2	3	4	4	5	5	6	-1*
Hard Turn	-	3	3	4	4	5	5	6	-2
Loop	-	4	5	5	5	6	6	7	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed ≥9									

Speed Chart	
Action	Speed Change
Normal Engine	-2 to +3
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+4

Gun Combat Information: M61 20mm Cannon Attack Value: 7

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	2	2	3	3	3	4	4	4	6	8

Notes: Use same information for F-104G

CF-105 **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B
6	6	Excess	6 RA
7			
8 Max Level			
9 Max Dive			

CF-105 **#____** **Pilot Quality** **_____**

Speed	Altitude	Damage	Ammo A/B
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5 Max Load	5	5	5 A/B
6	6	Excess	6 RA
7			
8 Max Level			
9 Max Dive			

Missile Data

Name	Type	Min Rnge	Max Rnge	Hit #

Name	Type	Min Rnge	Max Rnge	Hit #

Defense: **vs. Gun = 4**
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

Defense: **vs. Gun = 4**
vs. Missile = 0 + ___(pilot) + ___(C/M)
Critical Hits:
Pilot O **Structure O** **Engine O**

CF-105 Information: Radar Rating = 5 **Counter-Measures (C/M)** **Radar/IR = _____/_____**

Maneuver Chart

Maneuver/ Speed	1 -2	3 - 4	5	6	7	8	9	10	Speed Loss
Sideslip	1	1	2	2	3	3	4	-	-1*
Normal Turn	1	2	3	3	4	4	5	-	-1*
Hard Turn	-	2	3	3	4	4	5	-	-2
Loop	-	4	4	5	5	5	6	-	-3
Loaded: +1 to all Maneuver numbers, No Hard Turns or Loop. *= only at speed 9									

Speed Chart

Action	Speed Change
Normal Engine	-2 to +4
Damaged Engine	-3 to +2
Climb 1 level	-3
Dive 1 Level	+2
Afterburner	+4

Gun Combat Information: None

Die Difference	1	2	3	4	5	6	7	8	9	≥10
Damage	-	-	-	-	-	-	-	-	-	-

Notes: Proposed Canadian fighter, never built