Table 1: Expanded Sequence of Play

AAA Interaction Phase

1. Record target hex and altitude of plotted fire.
2. Place Barrage markers on units using Barrage fire.

SAM Interaction Phase

1. Attempt to reactivate shutdown radars (Die Roll 6−).
2. Attempt to showdown alerted radars (Die Roll 6−).
3. Declare BJM Nose Jamming arcs.
4. Execute BJM Stand-Off Jamming attacks.

– Multiple attacks against single radars allowed.

5. Attempt Quick Reactions SAM unit Lock-ons.
6. Attempt SAM Missile Launches.
7. Attempt EWR/CCU Passdowns (Die Roll 7−).
8. Attempt regular SAM unit Lock-ons.
9. Roll to Break Radar SAM lock-ons with DJMs.
10. Roll to Break Radar SAM lock-ons with Chaff and/or Mini-Jammers.
11. Roll to Break OG/LG SAM lock-ons with Flares.
12. Attempt Self-Defense ARM Launches

Stalled Aircraft Phase

1. Attempt Recovery from Departures (Die Roll 6−).
2. Determine if Stalled Aircraft Depart (Die Roll 5−).

Visual Sighting Phase

1. Ground FACs place Laser Spots and Smoke Marks.
2. Check lines of sight if necessary.
3. Declare aircraft searching for ground units.
4. Determine which ground units are openly sighted,
5. Attempt to sight camouflaged units (1/2 sighting range, Die Roll 5−).
6. Roll I.D. Ground units (Die Roll 10 − range to unit).
7. Announce Padlocked targets.
8. Enemy aircraft or missiles not padlocked are unsighted; roll for each unsighted target to see if it is sighted anew.
9. Check for aircraft I.D.

– Count each 2 alt. level difference as 1 hex or range if looking down and each 4 levels as 1 if looking up.
– At night, 2 alt. levels difference equal 1 hex of range if looking up or down.

Aircraft Decisions Phase

1. Declare DDS programs on or off.
2. Declare illuminating for RH/AH missiles.
3. Declare Engaging Missiles.
4. Declare Laser Designating aircraft.
5. Declare Target Marking FAC aircraft.
6. Declare special radar or weapons modes (IR Uncage, Autotrack on/off etc.)

– Note: Damage Control is declared in Flight Phase upon commencing one's move.

Order of Flight Determination Phase

1. Check aircraft relative positions; determine who is Disadvantaged, non-advantaged, and advantaged.
   To be advantaged over target, target must be in your 150+ arc, withing 9 hexes range, no more than 6 levels higher or 9 levels lower than you.
2. Roll one die per side to establish base initiative.
3. Each aircraft uses base number pluss any applicable modifiers. Low number in each categrory moves first. Ties are rolled off, no mods. apply

Flight Phase

1. Move air to ground weapons not in shoot out.
2. Move departed aircraft, then stalled aircraft.q
3. Move GLOC'd aircraft, then disoriented aircraft.
4. Move Engaged aircraft.
5. Move FAC aircraft marking targets.
6. Move Joint Attack Laster Designating aircraft.
7. Move aircraft guiding air to ground weapons.
8. Move disadvantaged, non-advantaged then advantaged aircraft in order.
9. Move unsighted but radar detected aircraft.
10. Move unsighted and undetected aircraft.

– Missiles move when their targets do.
– Illmuminating aircraft move when their targets do.
– Tailing aircraft move immediately after tailees do.
– Defensive Pre-emptions, and shoot outs may alter the order of movement.

Air to Air Missile Phase

1. Determine if launch prerequisites are met.
2. Declare and attempt to launch one or two missiles.
3. If all declared attempts fail, one additional try allowed.

Air Radar Search and Lock-On Phase

1. Roll for radar contacts (4 rolls per aircraft).
2. Roll for radar lock-ons.
3. Roll to break lock-ons due to DJMs.
4. Roll to break lock-ons due tu Chaff or Mini-jammers.

– Regular radars limited to one lock-on attempot per turn.
– Multi-tgt. Track radars may make as many lock-on attempts as capability allows per turn.
– Regular radars upon gaining lock, lose all other tgts.
– TWS radars retain other targets even with a lock-on and may continue to search for more.
– Limited TWS radars retain other targets with a lock but may not search for more.

Ground Unit Interaction Phase

1. Remove last game-turns's plooted fire markers.
2. Reveal target hex and alt. of this turn's plotted fire.
3. Resolve any plotted fire attacks and place markers.
4. Conduct ground unit movement allowed.
5. Resolve any required or permitted ground combat.

Aircraft Administrative Phase

1. Remove Missiles whose time of flight is ended.
2. Check for Progressive Damage.
3. Check for early recovery from GLOC.
4. Update Aircraft Logs as required.
5. Remove aircraft meeting disengagement criteria.

End of Turn Adminstrative Phase

1. Remove laser spots unless weapons still in flight.
2. Remove Blast Zone markers.
3. Remove Suppresion Removal markers.
4. Remove Smoke-2 markers.
5. Flip Suppresion markers to Suppr. Removal side.
6. Flip Smoke-1 markers to Smoke-2 side.
7. Flip Barrage fire markers to Out of Ammo side.
8. Roll for AAA resupply (Die Roll 2−).
9. Roll for infantry SAM reloads (Die Roll 3−).
10. Auto.reload capable SAM units that did not guide or launch missiles may reload up to two expended rails.

Table 2: Avoiding Departed Flight Modifiers

Pilot	
Veteran	+1
Novice	−1
Green	−2
Sierra Hotel	+1
Excellent confidence	+1
Poor confidence	−1
Aircraft	
Fly by Wire	+2

Table 3: Departed Flight Recovery Modifiers

Pilot	
Veteran	−1
Green	+2
Sierra Hotel	−1
Aircraft	
Fly by wire	−2

Table 4: Initiative Modifiers

Training Standard	
Excellent	+2
Good	+1
Average	+0
Limited	−1
Poor	−2
Pilot	
Veteran	+1
Regular	+0
Novice	−1
Green	−2
Sierra Hotel	+1
Tactics master	+1
Combat hero	+1
Excellent confidence	+1
Poor confidence	−1
Kills	
Side with first kill	+1
Side with most kills	+1

Table 5: G-Induced Loss of Consciousness

Crewmember	
Non-pilot crewmember	−1
Excellent fitness	+1
Poor fitness	−1
Aircraft	
Used snap-turn this phase	−1
Has canted seat (e.g., F-16)	+1
2nd or subsequent GLOC die roll in GLOC cycle (cumulative)	−1

- Check for GLOC if aircraft turned at ET rate while in the LO, ML, or MH altitude bands.
- Roll one die after each facing at the the ET rate for each crewmember. A "1" or less indicates he has GLOC'd.
- Cycle lasts until no BT/ET turns used in a game-turn.

Table 6: GLOC/Disoriented Flight

Die Roll	Aircraft Random Movement (Based on Current Flight Type)
	Level Flight
1	Stay level, no turns.
2	Stay level, TT turn.
3	Stay level, HT turn.
4	Descend one level, TT turn as above.
5	Descend one level, HT turn as above.
6	Maximum sustained climb, EZ turn.
7	Maximum zoom climb, TT turn.
8	Maximum zoom climb, HT turn.
9	Maximum steep dive, HT turn.
10	Half roll and dive, minimum vertical dive, random vertical rolls.
	Climbing Flight
1	Maximum sustained climb, EZ turn.
2	Maximum zoom climb, HT turn.
3	Maximum zoom climb, no turns.
4	Maximum zoom climb, TT turn.
5	Minimum vertical climb, no vertical rolls.
6	Maximum vertical climb, random vertical rolls.
7	Level flight, TT turns.
8	Level flight, HT turns.
9	Half roll and dive, minimum steep dive.
10	Half roll and dive, maximum steep dive.
	Diving Flight
1	Level flight if able or meet steep dive requirements while exiting vertical dive.
2	As above plus TT turns.
3	As 1 above plus HT turns.
4	Minimum steep dive, no turns.
5	Minimum steep dive, TT turns.
6	Minimum steep dive, HT turns.
7	Maximum steep dive, TT turns.
8	Maximum steep dive, HT turns.
9	Minimum vertical dive, random vertical rolls.
10	Maximum vertical dive, random vertical rolls.

Directions

- Expend all remaining FPs via directions above, it is allowed to switch between climbs and dives in mid-moves if required. Randomly determine direction of turns. Random vertical rolls occur on last VFP only, roll for direction and number of facings.
- For climbs and dives, use maximum allowed VFPs. A maximum climb/dive means each VFP gains max possible levels. Minimum means each gains least amount possible.

Table 7: Recovery from GLOC

- Automatic during admin phase of 2d game turn following the one in which GLOC occured.
- Early recovery possible in admin phase of game turn of GLOC occurence and in the admin phase of the turn following if crewmember has excellent fitness or is ina multi-crew aircraft where other member not GLOC'd. Die roll 4 or less equals early recovery.

Table 8: Aircraft Flight Rules Summary

ACCEL/DECEL

1. Each 2.0 accel accumulated = +0.5 speed normally.
2. Each 1.5 accel = +0.5 speed for Rapid Accel aircraft.
3. If speed ≥ Mach 1, each 3.0 accel = +0.5 speed for normal aircraft and each 2.0 = +0.5 for Rapid Accel aircraft.
4. Each 2.0 Decel accumulated = −0.5 speed always.

LEVEL FLIGHT

1. All FPs are HFPs. An aircraft may descend one altitude level freely at any point in its move.

TURNING FLIGHT

1. Turn Drag decel based on highest turn rate used in game turn, incur it only once per game turn even if aircraft faced more often than once.
2. Extra facings in a game turn constitute sustained turns. 1.0 decel is incurred for each dacing change after the first.
3. TT, HT, BT, ET turns require start speed of 0.5, 1.0, 1.5, and 2.0 > minimum respectively to perform.
4. Low Roll Rate aircraft take 1 FP of flight to enter a left or right bank before turning and 2 FPs of flight to reverse bank.
5. High Roll Rate aircraft may instantly switch from one angle of bank to another; others require 1 FP of flight to reverse.
6. No attacks of weapon launches allowed during or after an ET turn until a Recovery Period passes.

– A recovery period = half of the aircraft's flight (round up) while not ET turning and not doing rolls or prep-moving for them.

SNAP TURNING

1. Aircraft must be capable of BT turn rate.
2. One allowed per game-turn; costs one HFP; allows immediate facing change of 30 degrees or of 60 degrees if turn chart = 60 or 90 without moving forward.
3. One HFP prep required is wings not level or if speed ≥ to High Transonic. If both cases apply, two preps required.
4. Incur Decel as for BT turn unless aircraft used ET rate.
5. Unless ET follows a snap turn; the snap counts as a BT turn for purposes of combat and weapon launch modifiers until a recovery period passes.
6. Risky Snap turns may be tried if aircraft is capable of HT turn but roll for a departure on facing (1 to 4).

FP EXPENDITURE RESTRICTIONS

1. If going from level to climbing or diving flight; the first FP expended must be an HFP.
2. If going from dive to climb or climb to dive; FPs = to half the aircraft's speed (round down) must be expended as HFPs before using VFPs. High Pitch Rate aircraft need only expend FPs = to 1/3 speed (round down) in this case.
3. If continuing to climb or dive from previous turn; HFPs and VFPs may be mixed in any order.

SPEEDBRAKE USAGE

1. FPs up to amount listed on the ADC may be eliminated.
2. Eliminated FPs may not be used for any turns or other maneuver/combat/proportional move requirements.
3. 1.0 decel is incurred for each 0.5 FP eliminated.

CLIMBING FLIGHT

Zoom Climbs

1. At least one, but up to 2/3 of FPs may be VFPs.
2. If CCC rate for power setting <= 2.0, then each VFP can gain 1 altitude level only.
3. If CCC rate for power setting > 2, each VFP can gain 1 or 2 altitude levels.
4. If this is the first turn of climbing flight, 1.0 decel is incurred per level climbed.
5. If this is the second or subsequent turn of climbing flight, 1.5 decel is incurred per level climbed.
6. ET turn rates not allowed in zoom climbs.

Sustained Climbs

1. Start speed must be at least 1.0 > minimum speed.
2. If start speed is less than climb speed, then halve CCC value (retain fractions).
3. If CCC value is < than 1.0, only one VFP may be used in gameturn and it gains only the fractional altitude level.
4. If CCC value >= 1.0 but <= 2.0, up to 2/3s of the FPs may be VFPs. The first VFP gains any listed fraction (or 1 if no fractions listed), and the rest gain one altitude level each.
5. If CCC value is > 2.0, up to 2/3s of the FPs may be VFPs. The first VFP gains 1.0 level + any fraction and the rest may gain 1.0 or 2.0 altitude levels each.
6. If enough VFPs exist, an aircraft may climb more levels than listed on the CCC. However, the extra levels climbed cause decel as if zoom climbing.
7. Only EZ turns and Slide maneuvers allowed.
8. 0.5 decel is incurred for each level up to the CCC limit. Extra levels incur decel as for zoom climbing.

Vertical Climbs

1. Previous game-turn must have involved climbing flight.
2. Exception; High Pitch Rate aircraft may enter vertical climbs from level flight if speed < 4.0.
3. On first turn of vertical climb, 1/3 of FPs must be HFPs. If vertical climb continued, not more than 1/3 of FPs may be HFPs and up to all may be VFPs.
4. Each VFP may gain 1.0 or 2.0 altitude levels each.
5. Each level climbed causes 2.0 decel points.
6. No turns or maneuvers except Vertical Rolls allowed.
7. Diving flight may not follow Vertical climbs.
8. Exception, High Pitch Rate aircraft may enter Steep Dives or Unloaded Dives the turn after.
9. Exception, normal aircraft may use a Half-Roll and Dive maneuver to enter Steep Dives after a Vertical Climb.

DIVING FLIGHT

Steep Dives

1. At least one FP must be and up to 2/3s FPs may be VFPs.
2. Each VFP may Lose 1.0 or 2.0 altitude levels.
3. Each level dived gains 0.5 accel on the first turn of Diving.
4. If this is the second or subsequent turn of continuous Diving, each level dive gains 1.0 accel.

Unloaded Dives

1. All FPs are HFPs.
2. At least 1 HFP must be expended with the aircraft "unloaded". More than 1 and up to all may be expended "unloaded".
3. Each HFP expended while unloaded moves the aircraft forward one hex/hexside and loses it one altitude level.
4. The aircraft gains accel as if Steep Diving.
5. The aircraft may not make any attacks, guide weapons or aim while unloaded.
6. HFPs done while unloaded may not be used for turning or prep-moving.
7. All unloaded HFPs done in a single game-turn must be done in one continuous string.

Vertical Dives

1. Previous game turn must have involved diving flight.
2. Exceptions: a vertical dive may be entered from level flight using a Half Roll and Dive maneuver. If start speed <= 4.0, it may also be entered from a zoom or sustained climb by using a Half Roll and Dive maneuver.
3. On first turn of vertical diving, 1/3 of FPs must be HFPs. If vertical dive continued, no more than 1/3 of FPs may be HFPs and up to all may be VFPs.
4. Each VFP must lose 2.0 or 3.0 altitude levels.
5. Each altitude dived gains 1.0 accel.
6. No turns or maneuvers except vertical rolls allowed.
7. Climbing flight may never follow vertical dives.
8. Level flight may follow if A/C's new start speed is 3.0 or less for High Pitch Rate aircraft, or 2.0 or less for others.

– If case 8 does not apply, diving flight must follow vertical dive.

9. When Steep or Unloaded dives follow a vertical dive; at least half an aircraft's FPs (round down) must be expended as VFPs or Unloaded HFPs; except High Pitch Rate aircraft need only expend 1/3 FPs as VFPs or unloaded HFPs.

STALLED FLIGHT

1. Aircraft does not move or change facing.
2. Altitude lose = start speed (round 0.5 up) + 1.0; increase loss by 1.0 per additional turn of stalled flight.
3. Aircraft gains accel as it steep diving and by power.
4. Aircraft may recover to level or diving flight including immediately entering a vertical dive.

DEPARTED FLIGHT

1. Stay in same hex; randomly change facing left or right.
2. Roll die to find number of facing changes in that direction.
3. Altitude loss = start speed (round 0.5 up) + 2.0; increase altitude loss by 2.0 per additional turn of departed flight.
4. Power has no effect, all accel/decel = 0 whole departed.
5. Recovery is via recovery roll (6− including modifiers).
6. Upon recovery aircraft must enter diving flight (vertical dives allowed). High Pitch Rate aircraft may recover to level flight.
7. Upon recovery, start speed revers to higher of Minimum speed or speed at which departure occurred.

AIRCRAFT MANEUVERS

Slides

1. Expend two HFPs to prep for slide. One HFP to execute.
2. 1 slide allowed if speed <= 9.0, two if speed > 9.0 but at least 4 FPs must be expended between execution of first and start of preps for second.
3. One slide causes no decel; two slides cause 1.0 decel.

Lag/Displacement Rolls

1. Expend one HFP to prep for rolls. One HFP to execute.
2. Shift in direction of roll (see diagram) and optionally face 30 degrees in direction opposite to roll.
3. A displacement roll from a hexside shifts the aircraft to a hexside as in a slide and not sideways as depicted for the lag roll. Decel for these rolls varies, see ADC.

Vertical Rolls

1. Aircraft must be in vertical climb or dive and must have just expended a VFP.
2. Change facing left or right up to 180 degrees.
3. Decel cost varies; see ADC.
4. Multiple vertical rolls allowed in a single game turn but each must occur after separate VFP expenditures.

Barrel Rolls

1. Executed as 2 or more consecutive Lag/Displacement rolls.
2. If done in level flight, 1 altitude level may be gained or lost upon executing last roll at not additional FP code.
3. Altitude changes that occur in a diving or climbing B-Roll may be in lieu of, or in conjunction with altitude changes done via VFP expenditure.
4. Incur 2.0 decel per level gained in climbing Barrel Roll, and gain 0.5 accel per altitude level lost in a Barrel Roll.

Half Roll and Dive

1. Declare at start of move, perform normal Vertical dive except no vertical rolls allowed until last FP expended and then only if it was a VFP.
2. Allow vertical dive entry from level flight, ot if speed <= 4.0 allows entry from zoom/sustained climbs.
3. Allows steep dive entry from vertical climbs, with normal turning allowed.
4. No attacks or weapon launches allowed that turn.

– For purposes of weapons launch modifiers and gunsights, rolls count as BT turns until recovery period met.

– Incur 1.0 extra decel for each roll over one executed in a signle game-turn.

VIFF MANEUVERS (VIFF CAPABLE AIRCRAFT ONLY)

VIFF Sidestep

1. Executed as a slide except no prep-moves required but those imposed by altitude and supersonic speed.
2. Multiple sidesteps allowed so long as 1 HFP expended in forward flight between execution of each sidestep.
3. Each costs two HFPs to execute and each causes 2.0 decel.

VIFF Assisted Turn

1. Reduce listed turn requirements by one (90 is best allowed).
2. Treat aircraft as High Bleed Rate, incur 2.0 to use.

VIFF Vertical Pitch

1. Treat as Half Roll and Dive except aircraft may go from vertical climb direct to vertical dive, incur 2.0 decel.

VIFF Pop-up

1. Allows gain of one Altitude Level from level flight once per turn.
2. Costs 1 HFP, incurs 2.0 decel, aircraft must be wings level.

Table 9: Bingo Fuel

% of Bingo Fuel remaining at Disengagement	Safe Return to Base	Divert to Emergency Base	Run Out of fuel and Crash
100% or more	1-10	11+	NA
90-99%	1-9	10-12	13+
80-89%	1-8	7-9	10+
75-79%	1	2-4	5+
74% or less	—	1-2	3+

Modifiers

Aircraft	
L or 2L damage	+1
H damage	+3
C damage	+5
Pilot	
Veteran	−1
Novice	+1
Green	+2

If aircraft is Ata Refuel capable and reaches Tanker (die roll <= Tanker availability number); a safe return is automatic. Die roll modifier = +1 per each 20% under bingo fuel.

Table 10: Integrated Turn Chart

LO and ML Altitude Bands (1–7 and 8–16)													
Turn	Start Speed												
Rate	1	2	3	4	5	6	7	8	10	12	14	18+	Notes
EZ	60	1	2	3	4	6	8	10	12	14	16	20	
TT	90	60	1	2	3	4	5	6	8	10	12	14	
HT	NA	90	60	1	2	2	3	4	6	8	10	12	
BT	NA	NA	90	60	1	1	2	3	4	6	8	10	
ET	NA	NA	NA	90	60	1	1	2	3	4	6	8	GLOC possible
MH Altitude Band (17–25)													
Turn	Start Speed												
Rate	1	2	3	4	5	6	7	8	10	12	14	18+	Notes
EZ	1	2	3	4	6	8	10	12	14	16	18	22	
TT	60	1	2	3	4	6	7	8	10	12	14	18	
HT	NA	60	1	2	3	4	5	6	8	10	12	14	
BT	NA	NA	60	1	2	2	3	4	6	7	10	11	
ET	NA	NA	NA	60	1	1	2	2	4	5	7	9	GLOC possible
HI Altitude Band (26–35)													
Turn	Start Speed												
Rate	1	2	3	4	5	6	7	8	10	12	14	18+	Notes
EZ	2	3	4	6	8	10	12	14	16	18	20	24	Add 1 prep-move to all
TT	1	2	3	4	5	6	8	10	12	14	16	20	maneuvers and to snap
HT	NA	1	2	3	4	5	6	8	9	10	13	16	turns.
BT	NA	NA	1	2	3	3	4	6	7	8	10	12	
ET	NA	NA	NA	1	2	2	3	4	5	6	8	10	No more GLOC risk
VH Altitude Band (36–45)													
Turn	Start Speed												
Rate	1	2	3	4	5	6	7	8	10	12	14	18+	Notes
EZ	2	4	6	8	10	12	14	16	18	20	22	24	Add 2 prep-moves to all
TT	1	2	4	6	8	9	10	13	15	17	20	22	maneuvers and to snap
HT	NA	NA	3	4	6	7	8	10	12	14	17	20	turns. Reduce aircraft
BT	NA	NA	NA	3	4	5	6	7	9	11	14	16	power to 2/3ds that listed.
ET	NA	NA	NA	NA	3	4	5	6	7	8	10	12	
EH and UH Altitude Bands (46–60 and 61+)													
Turn	Start Speed												
Rate	1	2	3	4	5	6	7	8	10	12	14	18+	Notes
EZ	3	6	8	10	12	14	16	18	20	22	24	28	Add 3 prep-moves at EH &
TT	NA	4	6	8	10	12	13	14	16	18	21	24	4 Preps at UH to all
HT	NA	NA	4	6	7	8	10	11	13	15	18	21	maneuvers and to snap
BT	NA	NA	NA	4	5	6	7	8	10	12	14	18	Turns. Reduce aircraft
ET	NA	NA	NA	NA	4	5	6	7	9	10	12	14	power to 1/3 that listed.

Note:

1. Add 2 to all turn requirements if in UH band.
2. If aircraft of missile speed falls between two columns refer to the one on the left.
3. NA = not allowed. 60 or 90 = degrees of facing change per FP expended.

Table 11: Transonic/Supersonic Speed

Alt. Band	Low Trans.	High Trans.	Mach One
LO, ML	6.5	7.0	7.5
MH,HI	6.0	6.5	7.0
VH+	5.5	6.0	6.5

Table 12: Transonic/Supersonic Drag Penalty

Aircraft Type	Low Trans.	High Trans.	Mach One
LTD	0.0	0.5	1.0
NORMAL	0.5	1.0	1.5
HTD	1.0	1.5	2.0

Table 13: Supersonic Penalties

- Add 1 prep to all maneuvers and snap turns. Climb cap. = 2/3ds
- PSSM aircraft = +2.0 devel if any turns or rolls done, and reduce maximum turn rate by one but not to less than HT.
- Normal aircraft = +1.0 decel if any turns of rolls done.
- GSSM aircraft = No additional decel for turns or rolls.
- If in Mil. pwr., +1.0 decel per 0.5 speed over High Transonic.
- If in Normal pwer., +2.0 decel per 0.5 speed over High Transonic.
- If in Idle pwr., los 0.5 more speed than listed on ADC.
- Takes 3.0 accel to gain 0.5 speed (2.0 if Rapid Accel aircraft).

Table 14: Accel/Decel Point Summary

Accel Point Summary

- Aircraft power = + Variable.
- Steep or Unloaded dive = +0.5 per level initially, then +1.0 per level.
- Vert. dive = +1.0 per lvl.

Decel Point Summary

- Turning = Variable.
- Sust. climb = 0.5 per lvl.
- Zooms = 1.0 per level initially, then 1.5 per lvl.
- Vert. climb = 2.0 per lvl.
- Speed brake usage = 1.0 pero 0.5 speed lost.
- 1.0 if Idle or Normal Pwr. and above cruise speed.
- Sustained turns and rolls 1.0 each, or 2.0 if HBR.

Table 15: 1/3-2/3 Conversions

Base	1/3	2/3
1.0	0.5	0.5
1.5	0.5	1.0
2.0	1.0	1.0
2.5	1.0	1.5
3.0	1.0	2.0
3.5	1.0	2.5
4.0	1.0	3.0
4.5	1.5	3.0
5.0	2.0	3.0
5.5	2.0	3.5
6.0	2.0	4.0
6.5	2.0	4.5
7.0	2.0	5.0
7.5	2.5	5.0
8.0	3.0	5.0
8.5	3.0	5.5
9.0	3.0	6.0
9.5	3.0	6.5
10.0	3.0	7.0
10.5	3.5	7.0
11.0	4.0	7.0
11.5	4.0	7.5
12.0	4.0	8.0
12.5	4.0	8.5
13.0	4.0	9.0
13.5	4.5	9.0
14.0	5.0	9.0
14.5	5.0	9.5
15.0	5.0	10.0

Table 16: Missile Flight Rules

FP Costs

1. One FP to move forward one hex/hexside.
2. One FP to climb 1 or 2 Altitude levels.
3. Free lost of 1 level per hex entered.
4. One FP to dive 2 or 3 Altitude levels.
5. Once per turn may dive 1 level with 1 FP.
6. One FP to Snap-turn or Slide, 0 FP to vert. roll.

Manuever Limits

1. One Snap-turn allowed during entire flight.
2. Only Slide and Vertical roll maneuvers allowed.
3. Normally, 1 Vert. roll allowed in entire flight except anytime target performs one, missiles may in next move.
4. If Snap-turn first action other than forward flight after missile arms, no prep-move required.
5. If missile turns, or switches between climbs and dives before Snap-turning, normal prep-move must be met.

Flight Restrictions

1. Missiles may climb and dive in same game turn, and some may do both in same proportional move.
2. Vertical roll allowed when msl. expends 2 or more FPs while climbing or diving in same position.
3. If turn ability is not BT/2, ET/2, or ET/3 then missile is limited to switching between climbs and dives. Sich missiles may do either in proportional move but not both. Before changing between the two, missile must spend 1 proportional move in level flt.
4. Missiles may never dive if already below their target.
5. Missiles may only climb if already above their target if;
   (a) They are CG SAMs in boot phase.
   (b) They are TVM SAMs of MCG missiles.

Missile Speed Changes

1. If missile gained altitude over turn, −1 to speed for each set of alt. levels climbed equal to half or less of missile's speed.
2. If missile lost altitude over turn, +1 to speed for each set of alt. levels dived equal to half or more of missile's speed.

Missile Speed Determination

1. Air to air first turn = (Base + aircraft) × Speed Att. Factor.
2. SAM first turn = listed Base Speed.
3. Subsequent turns = (Previous ± changes) × Speed Att. factor.
4. If sustainer motor in effect, Speed Att. Factor = 1.0.

Table 17: Missile Speed Attenuation Factor

Alt.	Game Turn of Flight					
Band	1	2	3	4	5	6+
LO	0.6	0.6	0.6	0.7	0.8	0.8
ML	0.7	0.7	0.6	0.7	0.8	0.8
MH	0.8	0.7	0.6	0.7	0.8	0.8
HI	0.8	0.8	0.7	0.8	0.8	0.8
VH	0.9	0.8	0.7	0.8	0.8	0.9
EH	0.9	0.9	0.8	0.8	0.9	0.9
UH	1.0	0.9	0.9	0.9	0.9	0.9

Table 18: Missile Speed Math-Saver

Miss.	Attenuation Factor			
Speed	0.9	0.8	0.7	0.6
2	2	2	1	1
3	3	2	2	2
4	4	3	3	2
5	5	4	4	3
6	5	5	4	4
7	6	6	5	4
8	7	6	6	5
9	8	7	6	5
10	9	8	7	6
11	10	9	8	7
12	11	10	8	7
13	12	10	9	8
14	13	11	10	8
15	14	12	11	9
16	14	13	11	10
17	15	14	12	10
18	16	14	13	11
19	17	15	13	11
20	18	16	14	12
21	19	17	15	13
22	20	18	15	13
23	21	18	16	14
24	22	19	17	14
25	23	20	18	15
26	23	21	18	16
27	24	22	19	16
28	25	22	20	17
29	26	23	20	17
30	27	24	21	18
31	28	25	22	19
32	29	26	22	19
33	30	26	23	20
34	31	27	24	20
35	32	28	25	21
36	32	29	25	22

Table 19: Missile Speed Limits

Alt. Band	Minimum Speed	Maneuver Speed	Maximum Speed
LO	2	4	24
ML	3	5	26
MH	3	6	28
HI	4	7	30
VH	4	8	32
EH	5	10	34
UH	7	14	36

Table 20: IR Seeker Field of View Limits for Launch

1. Regular FOV = As Limited radar arc
2. Uncaged FOV = 180+ angle-off arcs
3. Uncaged FOV with Helmet sight = 150+ angle-off arcs
4. Uncaged FOV with radar assist = lesser of 150+ or radar arc
5. Uncaged FOV with VAS assist (M, A only) = 180+ arcs
6. IRSTS Assisted FOV = Same as IRSTS system

– If target one of several in unassisted Uncaged FOV a roll of 8− is required for seeker lock-on; 9− with helmet sights. Modifier of +1 to roll for each aircraft the seeker must look past.

Table 21: Allowed Target Angle-Off Arcs

Seeker Type	Arc
E	30− arcs or 60− if target used A/B Pwr.
I	60− arcs with any target power setting.
M	90− arcs, or 120− if target used A/B Pwr.
A	Any angle-off arc with any target power setting.

Table 22: Air to Air Gun and Rocket Attack Modifiers

Aircraft	
Firer Snap Shooting	+1
Firer L or 2L damaged	+1
Firer H damaged	+2
Firer C damaged	+3
RE Radar Ranging	−1
CA Radar Ranging	−2
IG Radar Ranging	−3
Each 1/3d FPs on SSGT	−1
Target Aircraft Size	Var. +, −
Gunsight Turn Rate	Var. +, −
Angle-Off	
0 line	−2
30 Arc	+0
60 Arc	+2
90 Arc	+4
120 Arc	+4
150 Arc	+4
180 Arc	+3
180 line	+2
Vertical Attack	+2
Pilot	
Veteran	−1
Combat Hero	−1
Novice	+1
Green	+2

Table 23: Cumulative Hits Effects

Three L	= H Damage
Two H	= C Damage
Two C	= K Aircraft Killed
C + H	= K Aircraft Killed

Table 24: Progressive Damage

Current Damage	Die Roll or less	Increased Damage
L or 2L	2	H
H	3	C
C	4	K

Table 25: Aircraft Damage

Die Roll	Weapon Attack Rating 1	2	3	4	5	6	7	8	9	10
0−	K	K	K	K	K	K	K	K	K	K
1	C	C	K	K	K	K	K	K	K	K
2	H	H	C	K	K	K	K	K	K	K
3	L	H	H	C	K	K	K	K	K	K
4	L	L	H	H	C	C	K	K	K	K
5	L	L	2L	H	C	C	C	K	K	K
6	L	L	L	H	H	C	C	C	K	K
7	—	L	L	L	H	H	C	C	C	K
8	—	—	L	L	2L	H	H	H	C	C
9	—	—	—	L	L	2L	H	H	H	C
10+	—	—	—	—	L	L	2L	H	H	H

Damage Modifiers

- Shift one column right if aircraft already L or more damaged.
- Shift one column left if hit was from gun snap shot.
- −2 to die roll if air to air rocket hit or direct hit from missile.
- Plus or Minus Aircraft Vulnerability as listed on target ADC.

Table 26: Air to Air Rocketry

Range to TGT	Total Rocket Factors Fired 1	2	3	4	5	6	7	8	9	10
1	1	2	2	3	3	4	4	5	6	6
2	1	2	2	2	2	3	3	4	4	5
3	0	1	1	1	2	2	2	2	3	3
4	0	0	1	1	1	1	2	2	2	2

(above = die roll to hit numbers)

Rocketry modifiers

1. If C.C. Rocket Attack Technology in effect, apply a −2 modifier to the hit roll.
2. All other gun and rocket attack modifiers apply as well.

C.C. Rocket Attack Procedure:

Target must be locked-on by radar, and firer may only use TT or less turns, altitude changes of no more than 1 level and no maneuvers except slides up to the point of firing.

Figure 1: Angle-Off Arcs

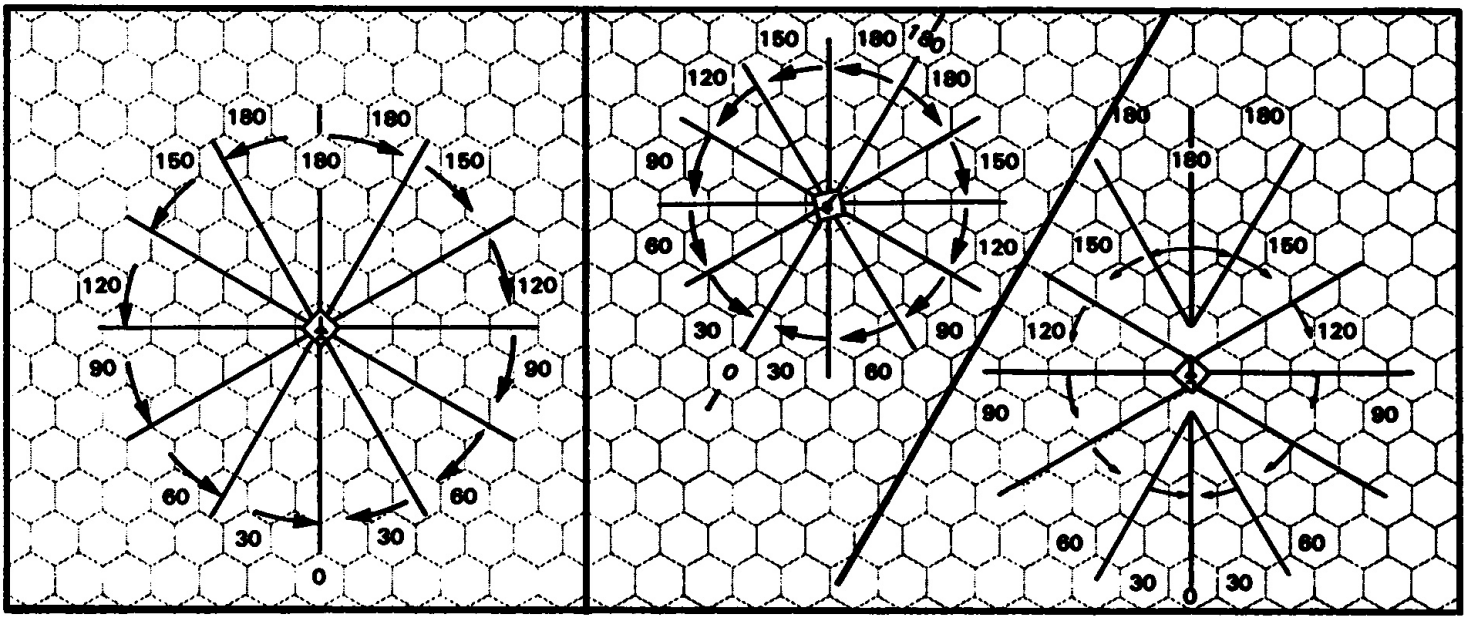

Figure 2: AIR-2 Genie Scatter

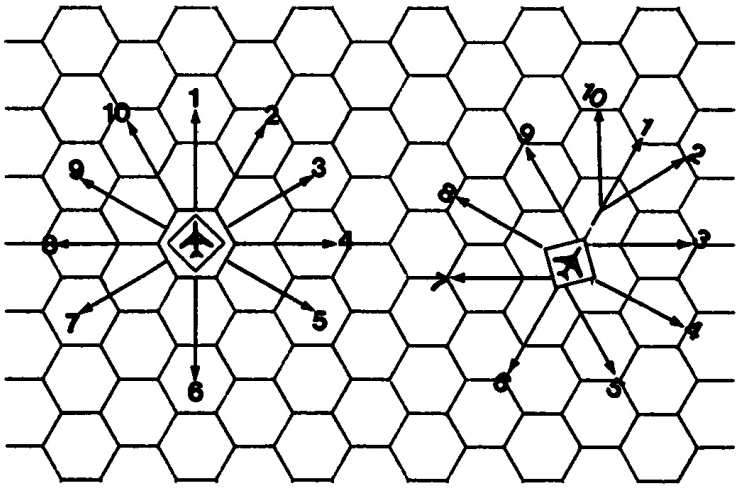

Figure 3: Air to Air Gun Attack Legal Target Positions

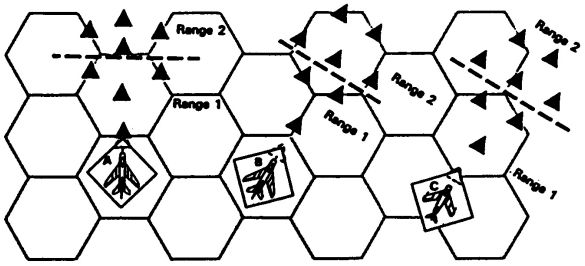

Figure 4: Limited Radar Arcs

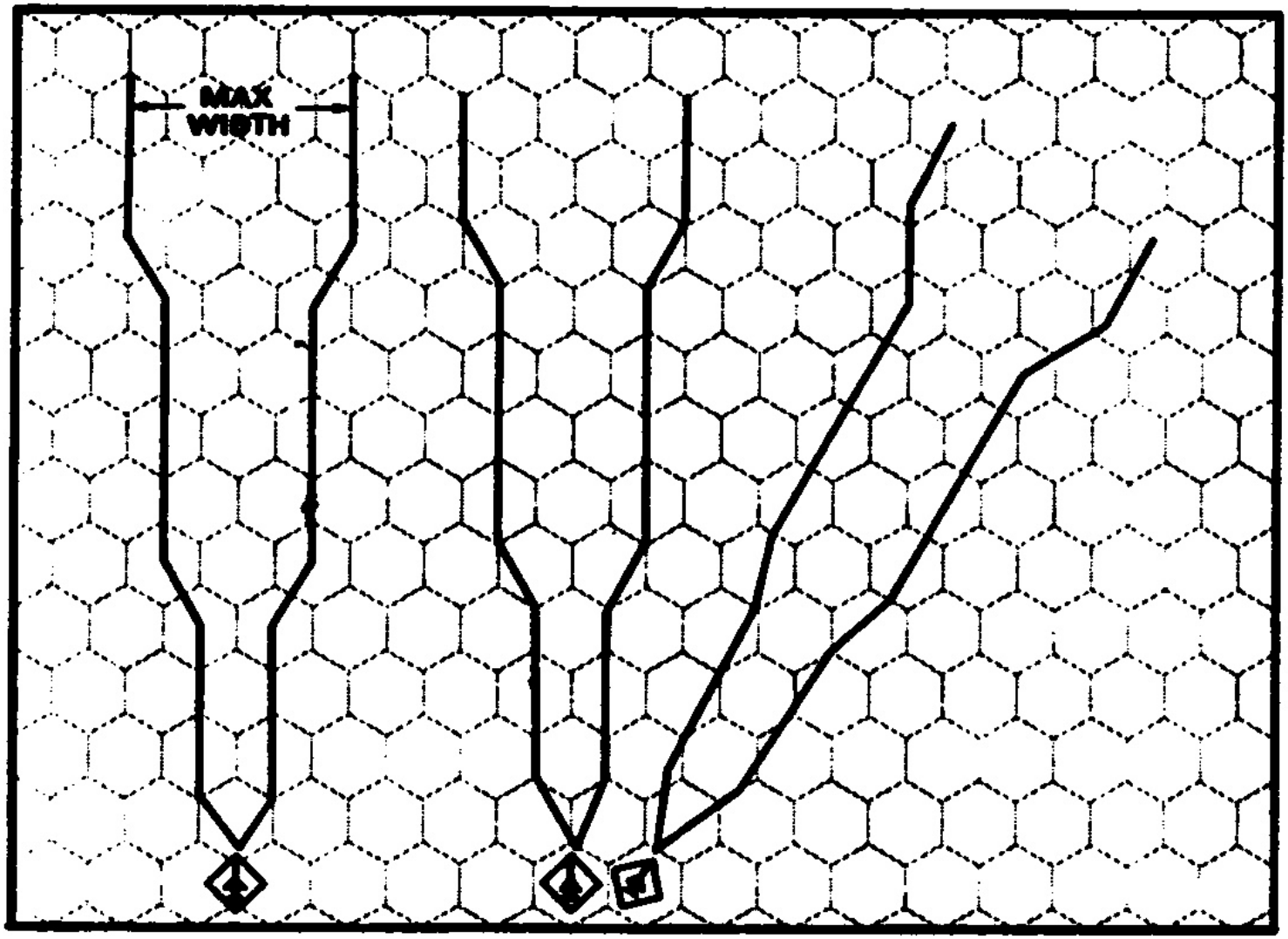

Figure 5: SSGT Legal Lines of Approach

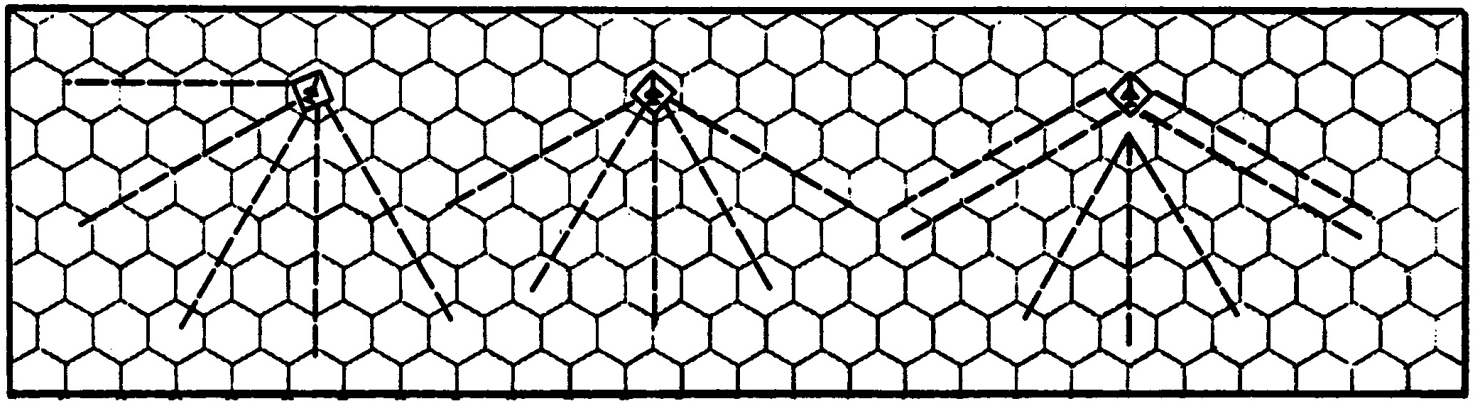

Figure 6: Slide Maneuver

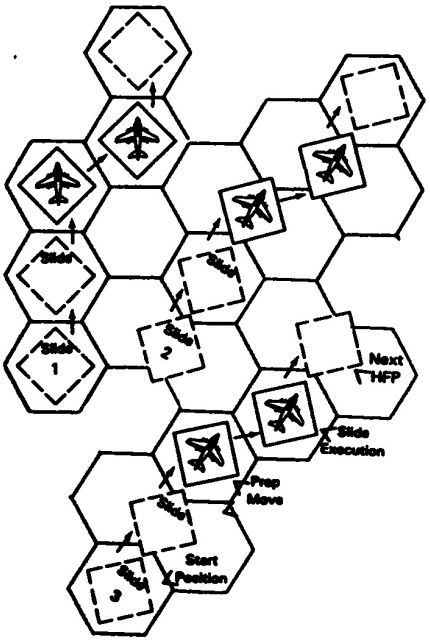

Figure 7: Lag Roll Maneuver

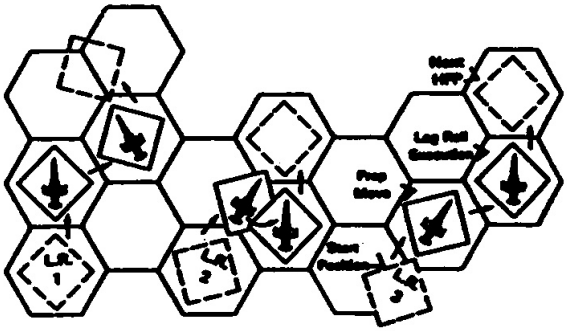

Figure 8: Displacement Roll Maneuver

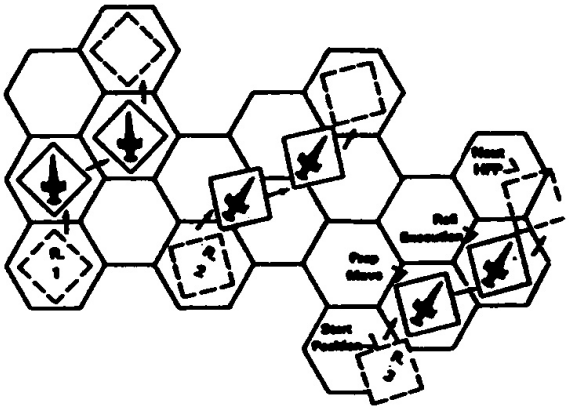

Figure 9: Barrel Roll Maneuver

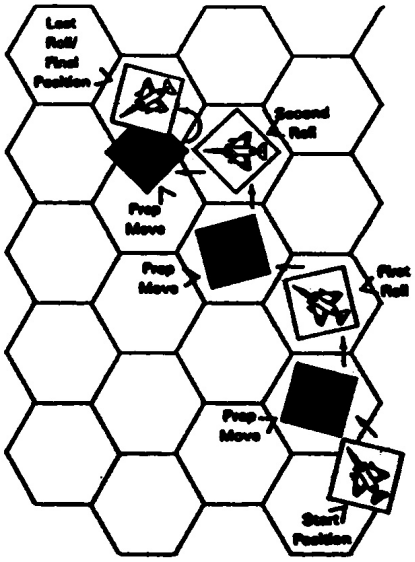

Table 27: Aircraft Damage Effects

Damage	Effect
—	Superficial Damage; no adverse effects.
L	Light Damage; no ET turns allowed; lose High Pitch Rate; aircraft becomes Low Roll Rate
2L	Light Damage; as L plus no BT turns allowed, +1 to all preparatory move requirements.
H	Heavy Damage; as 2L plus Mil and A/B power halved, CCC halved, no roll maneuvers allowed, no supersonic flight allowed. Roll once for Systems loss.
C	Crippled; as H plus lose A/B power, no HT turns, aircraft smokes, lose all technology. Roll again for Systems loss.
K	Aircraft Killed (shot down), remove from play.

Note: if end speed > High Transonic when “H” or “C” damaged, roll twice for prog. damage even if Damage Control done.

Figure 10: Jamming Cell Formations

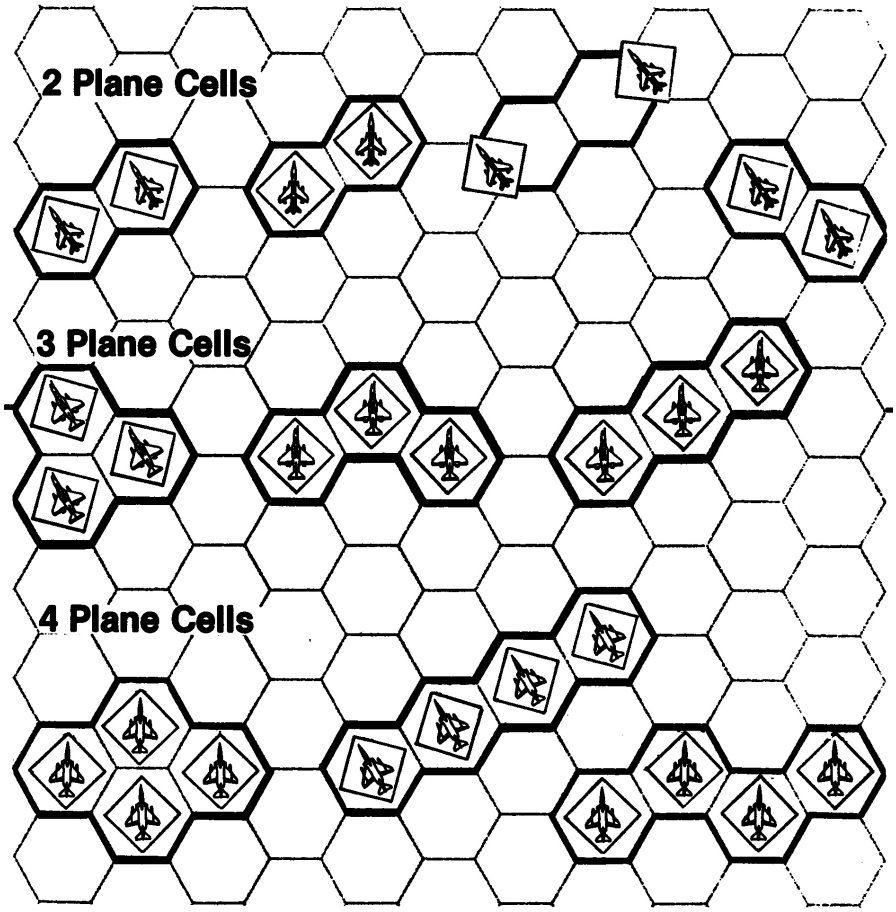

Figure 11: Crash Site Determination

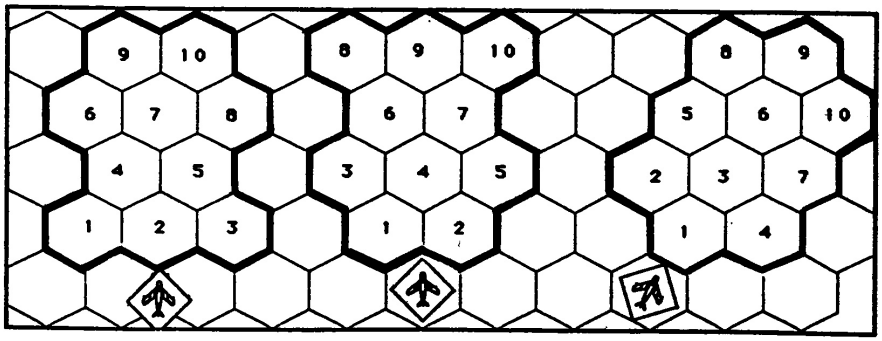

Table 28: Systems Loss

Die Roll	Critical System Lost
1	Cockpit: Pilot Killed, remove aircraft from play.
2	Cockpit: Crewman killed. Lose multi-crew bonuses and lose radar and weapon technology. Bomb system = manual.
3	One engine permanently flamed out
4,5	Radar disabled. Lose all radar functions.
6,7	ECM disabled. Lose all ECM functions.
8	Weapons System disabled, aircraft may no longer attack. Jettison stores.
9	Internal guns and any gunpods disabled.
10	Technology disabled, lose all technology.

Table 29: Air to Air Missile Launch Modifiers

IR Missiles	
Each Turn Rate over Launch Gee	+2
Fired from LO or ML alt. band at lower target	+2
Fired into sun clutter	+3
Fired out-of-enveloped	+3
Fired at lower target above highest cloud layer	+3
Lesser of Flare PPL or missile Flare Vulnerability number if DDS program is in effect.	+
BR, RH, and AH Missiles	
Each Turn Rate over Launch Gee	+2
Snap Fired	+3
Fired out-of-enveloped	+3
Crew	
Veteran	−1
Combat Hero, Tactics Master or both	−1
Green	+1
Damage	
L or 2L	+1
H	+2
C	+2

Table 30: Air to Air Missile and SAM Attack Modifiers

IRMs and IR SAMs	
Target in Afterburner Power	−3
Target in Military Power	−2
Target in Idle Power	+1
Missile must lose 2 or more levels during proportional move of attack against tgt. in LO alt. band (ground clutter)	+2
Target in Terrain Following Flight	+1
Less or Flare PPL or missile Flare Vulnerability no.	+
BRMs, RHMs, AHMs, & BR, CG, CW and TVM SAMs	
DJM rating − missile ECCM+	
Lesser of Chaff PPL or missile Chaff Vulnerability	+
Lesser of Mini-jammer PPL or Chaff Vulnerability + 1	+
Ground clutter (air to air missiles only) = 6 − target Altitude above terrain − missile ECCM.	+
Listed "T" level modifier (SAMs only, if applicable)	+
OG and LG SAMs	
No modifiers other than angle-off and aircraft size apply.	
ALL Missiles	
Target aircraft size modifier from ADC	+/−
Target did not engage the missile	−1

Reminder: Max launch range for RHM/AHM = 3 × radar Track Str. #.

Table 31: Missile Angle-Off Modifiers to Attack

Angle-Off Arc	Missile Seeker Type						
	E	I	M	A	BR	RH	AH
0 line	−1	−1	−1	−2	+0	−1	−2
30 arcs	+0	+0	+0	+0	+0	+0	+0
60 arcs	+1	+0	+0	+0	+1	+0	+0
90/120 arcs	+3	+2	+2	+2	+3	+3	+2
150 arcs	+4	+3	+2	+2	+5	+2	+2
180 arcs, line	+5	+4	+3	+1	+5	+1	+1

Angle-Off Arc	SAM Guidance Type				
	CG	CW	TVM	OG	LG
0 line	−1	−1	−1	+0	−1
30 arcs	+0	+0	+0	+0	+0
60 arcs	+0	+0	+0	+1	+0
90/120 arcs	+2	+3	+2	+3	+2
150 arcs	+2	+2	+1	+2	+2
180 arcs, line	+1	+1	+1	+1	+1

Table 32: Pilot/Crew Generation

	National Training Standard				
Quality	Excellent	Good	Average	Limited	Poor
Veteran	1–3	1–2	1	1	NA
Regular	4–8	3–7	2–6	2–4	1–4
Novice	9–10	8–9	7–9	5–8	5–7
Green	NA	10	10	9–10	8–10

– Roll one die per aircrew; reference training standard and roll to find crew quality at left. Example; die roll "6" under Good = Regular.

Table 33: Aircrew Attribute Determination

Attr. Level	Eyesight	Fitness	Confidence
Excellent	1–2	1–3	1–2
Average	3–9	4–8	3–8
Poor	10	9–10	9–10

– Roll once per attribute per aircrew; cross reference as above to find level of attribute (either excellent, average, or poor).
– Excellent Eyesight = −1 and Poor Eyesight = +1 for sighting die rolls.
– Excellent Fitness = +1 and Poor Fitness = −1 for GLOC and Post-Egress Fate rolls.
– Excellent Confidence = +1 and Poor Confidence = −1 to initiative, Departure and Post-Egress Fate die rolls.

Table 34: Aircrew Special Characteristics Determination

Crew Quality	Sierra Hotel	Tactics Master	Combat Hero
Veteran	1	1–3	1–2
Regular	1	1–2	1
Novice	1	1	NA

– Roll once per characteristic per Veteran, Regular, and Novice aircrew. Result <= to above number gives them the characteristic.
– Tactics master acquisition modifiers = −1 if Trainins Standard = Excellent; +1 is Training Standard = Limited or Poor.

Table 35: Pilot/Crew Ability Modifiers Summary

	Spec. Characteristic			Crew Quality			
Action	S.H.	T.M.	C.H.	Vet.	Reg.	Nov.	Green
Initiative	+1	+1	+1	+1	+0	−1	−2
Sighting	+0	−1	+0	+0	+0	+1	+2
Radar Use	+0	−1	+0	−1	+0	+1	+2
Wpn. Launch	+0	−1	−1	−1	+0	+0	+1
Gun & Atg Attack	+0	+0	−1	−1	+0	+1	+2
Departure	+1	+0	+0	+1	+0	−1	−2
Recovery	−1	+0	+0	−1	+0	+0	+2

– Sierra Hotel pilot increases position of advantage one level.
– These modifiers are shown on the other play aid charts.

Table 36: Loss of Aircrew V.P.s for Campaign Scenarios

Crew	Fate		
Quality	Killed	M.I.A.	P.O.W.
Green	6	2	10
Novice	8	4	10
Regular	10	6	12
Veteran	15	8	15
Combat Hero	+6	+2	+10

Table 37: Ejection/Bail-Out Success

Aircraft	Type Ejection Seat			
Damage	None	Early	Standard	Advanced
L, or 2L	7	8	9	9
H, or C	6	7	8	9
Kill by Progressive Damage die roll.				
	3	5	6	8
Kill by weapon with attack rating of 6 or less.				
	2	4	6	7
Kill by weapon with attack rating of 7 or more.				
	1	2	4	6

– Roll one die when egressing. If result, after applying modifiers is <= to above numbers; Egress succeeds.
– Bail-outs allowed only if speed <= 4.0 and if aircraft was destroyed, only if at least 4 levels above ground.

Ejection/Bailout Die Roll Modifiers

1. Aircraft at T-Level = +2
2. Aircraft 1 or 2 levels above ground = +1
3. Aircraft Speed <= 3.0 at egress = −1
4. Aircraft Speed >= 5.0 at egress = +1
5. Aircraft Speed >= High Mach at egress = +3

Table 38: Post Egress Fate

Die Roll:	1–2	3–5	6–10
Fate:	M.I.A.	P.O.W.	Rescued

Fate Die Roll Modifiers

1. Crew Egressed over friendly territory = +2
2. Crew Egressed over enemy territory = −2
3. Dedicated search and rescue forces available = +2
4. Excellent fitness = +1. Poor fitness = −1.
5. Excellent confidence = +1. Poor confidence = −1.

Table 39: Pilot Quality Flight Restrictions

– Green:
  1. No ET turns, no Snap turning.
  2. No T-level flight, no Viff maneuvers.
  3. No VTOL flight, no Vert. Rev. maneuvers.
  4. May not use High Pitch Rate aircraft abilities.
  5. May not engage attacking missiles.
  6. Risks disorientation for rolling maneuvers.
  7. Risks disorientation for Vert. climbs/dives.
  8. −2 die roll modifier for GLOC.
– Novice:
  1. No Vertical Reverse maneuvers.
  2. May not use High Pitch Rate aircraft abilities.
  3. Risks disorientation for Vertical rolls.
  4. −1 die roll modifier for GLOC.

Table 40: Pilot Damage Control Restrictions

– Green: May do damage control only if in a multi-crew aircraft and other crewmember is Reg. or Vet. In this case damage control is as for Novice.
– Novice: Must perform damage control for two turns in a row to complete unless in multi-crew aircraft and other crewmember is Reg. or Veteran. In this case damage control is done normally.

Table 41: Radar Contact

Radar Strength	Die Roll or Less for Contact											
	10	9	8	7	6	5	4	3	2	1	0−	
3	6	8	9	10	11	12	13	—	14	—		15+
6	12	15	18	20	22	24	26	28	29	30		31+
8	16	20	24	28	30	32	34	36	28	40		41+
10	20	25	30	35	38	40	42	45	48	50		51+
12	24	30	36	42	45	48	51	54	57	60		61+
15	30	38	45	52	56	60	64	68	72	75		76+
18	36	45	54	63	68	72	76	81	86	90		91+
20	40	50	60	70	75	80	85	90	95	100		101+
25	50	63	75	87	94	100	106	113	119	125		126+
30	60	75	90	105	113	120	128	135	143	150		151+
40	80	100	120	140	150	160	170	180	190	200		201+
50	100	125	150	175	188	200	213	225	238	250		251+
EWR	150	188	225	263	280	300	319	338	356	375		376+

Above = Maximum Range in Hexes for Each Column

1. No Aircraft may contact targets at a range greater than the maximum listed on its ADC.
2. Regular aircraft radar may not detect or track tgts. within 4 levels of the ground unless search is at lower altitude.
3. If tgt. below searcher & within 10 levels of ground, diff. in alt. between the aircraft must be < tgt.'s alt. above ground.
4. Lookdown radar may ignore cases 2 & 3. Boresight radar may ignore case 3 against visually sighted targets.

Table 42: Radar Search Limitations

1. Pilot Only aircraft may not search if they:
   (a) Snap-turned or turned at HT or greater rate.
   (b) Fired Guns or made an air to ground attack.
2. Multi-crew aircraft may not search if they:
   (a) Snap-turned or turned at BT or greater rate.
3. Neither type aircraft may search if they:
   (a) Are stalled, departed, or engaged.
   (b) Performed more than one vertical roll in the turn.
   (c) Performed any other roll types or Viff maneuvers.
   (d) Did an Unloaded Dive or Damage Control.
   (e) Were Hit and "H" or greater damage ensued.
   (f) Had their radar operator go into GLOC.

Note: Boresight and Auto-Track Modes allow maneuver restrictions to be ignored but not attack, damage, or operator GLOC restrictions; these always apply.

Table 43: Radar Search Modifiers

1. AJM # − Air Radar or EWR ECCM.
2. BJM # − Air Radar or EWR ECCM.
3. CHAFF PPL Effectiveness No.
4. Mini-Jammer PPL Effectiveness No.
5. Aircraft Size Modifier from ADC.
6. +4 if aircraft has Stealth Technology.
7. Tactics Master or Veteran = −1 (−2 if both).
8. Novice = +1, Green = +2

Table 44: Radar Boresight Mode

1. Radar Arc = Limited.
2. Max Range = Search Strength No.
3. Previous contacts and locks lost when mode declared.
4. Nearest Visually sighted target in aircraft's Limit arc automatically contacted.
5. Lock-on roll allowed, no mnvr. limitations.

Table 45: Radar Auto-Track Mode

1. Radar Arc = 180+ unless normally it's limited; in which case it remains limited.
2. Max Range = Search Strength No.
3. Nearest target in radar arc is automatically contacted.
4. If nearest aircraft was a friendly with IFF on, it may be ignored and next nearest is automatically contacted etc.
5. A visually sighted aircraft in arc may be selected for auto contact if not the closest by rolling 7 or less.
6. Lock-on roll allowed, no mnvr. limitations.
7. Previous contacts and locks lost when mode declared.

Table 46: Breaking Radar Locks

Locks are broken when:

1. Aircraft stalls, departs, or becomes engaged.
2. Aircraft does ET turns, Viffs, or does other than vertical rolls.
3. Aircraft takes a H or C hit, or radar operator GLOCs.
4. Target cannot be kept in radar arc while illuminating
5. Target deploys decoys and rolls effectiveness # or less.
6. Target employs EW jammers and makes break lock die roll.

Table 47: Radar Vertical Limits

Type Radar	Vertical Dive	Steep Dive	Level Flight	Sust. Climb	Zoom Climb	Vertical Climb
Limited	−2, −9	−0.5, −3	+0.5, −0.5	+2, +0	+4, +0.5	+9, +2
180+	−1, −*X*	−0, −5	+1, −1	+3, −0.5	+5, +0	+*X*, +1
150+	−0.5, −*X*	−0, −8	+2, −2	+4, −1	+8, +0	+*X*, +0.5
120+	−0, −*X*	+0.5, −*X*	+4, −4	+6, −2	+*X*, −0.5	+*X*, +0

Note: *X* = infinity. Above numbers = upper and lower altitude limits of target in terms of levels above/below searcher, per hex of range away from searcher based on searcher's flight type

Table 48: BJM Stand-Off Jamming

BJM Type	Allowed Stand-Off Attacks Pilot Only	Multi-Crew	Angle-Off Coverage
A	1	1	180+ and 30−
B	2	2	150+ and 60−
C	2	3	As B, or into any 3 adjacent arcs.
D	2	4	As B, or into any angle-off arcs.

Jamming Success Die Rol = BJM No. − Radar ECCM. Note: Noise Jamming Arcs = as for A, B, C above. Treat a BJM D as a C when noise jamming.

Table 49: BJM Programming Flexibility

Type	Programming Options
A	Pick Frequencies and Mode before play.
B	Pilot only: as "A". Multi-crew: may pick Frequencies and Mode during Aircraft Decisions Phase of game-turn.
C	Pilot Only: as for Multi-crew above. Multi-crew: Same as above.
D	Pilot Only and Multi-crew: may change Frequencies and Mode at start of SAM Interaction Phase.

Table 50: Decoy PPL Effectiveness

DDS Program		EWR Passdown Modifier and TTR Lock-on Modifier Radar Frequency					TTR Break-Lock No. SAM Type		Air Radar Search and Lock-on Modifier Type		Air Radar Break-lock No. Type	
Chaff PPL #	Mini-jam PPL #	LF	MF	HF	VF	MW	BR/CG	CW/TWM	Lim./180	150/120	Lim./180	150/120
1	—	1	1	—	—	—	—	—	1	—	1	—
2	1	2	1	1	—	—	1	—	1	1	1	1
3	—	2	2	1	1	1	2	1	2	1	2	1
4	2	3	2	1	1	1	3	1	2	2	2	2
5	3	2	2	2	2	1	3	2	3	2	3	2
6	4	3	3	2	2	2	4	2	4	3	4	3
—	5	4	3	3	2	2	5	3	4	3	5	3
—	6	4	4	3	3	2	5	4	4	4	6	4

Table 51: RWR and Internal DJM/AJM Detectable and Jammable Frequencies

RWR or Jammer	EWR			FCR				TTR				
Type	LF	MF	HF	LF	HF	VF	MW	LF	MF	HF	VF	MW
A	X	—	—	X	X	—	—	X	X	X	—	—
B	X	X	X	X	X	X	—	X	X	X	—	—
C	X	X	X	X	X	X	X	X	X	X	X	—
D	X	X	X	X	X	X	X	X	X	X	X	X

Notes

1. "X" indicates that radar operating in that frequency is detectable to RWR and vulnerable to DJMs and AJMs.
2. DJM and AJM pods have their frequency capabilities listed in the external stores tables under EPs.
3. Internal DJMs A and B cannot break CW or TVM lock-ons. Internal DJM C cannot break TVM lock-ons.

Table 52: RWR Also Detects

RWR or Jammer	SAM Launches				Air	Air	Tgt.	AHM
Type	BR	CG	CW	TVM	Search	Lock	Ilum.	Active
A	X	X	—	—	—	X	—	—
B	X	X	—	—	—	X	X	—
C	X	X	X	—	—	X	X	X
D	X	X	X	X	X	X	X	X

Table 53: Air Radar Search and Lock-On Modifiers

ECM Type	Die Roll Modifiers
CHAFF	Decoy Effectiveness No.
Mini-Jammer	Decoy Effectiveness No.
AJM	AJM No. − Air Radar ECCM
BJM Noise	BJM No. − Air Radar ECCM
Radar using Boresight for lookdown +2	

Table 54: Air Radar Break Lock Rolls

ECM Type	Break Lock Die Roll Number
CHAFF	Decoy Effectiveness No.
MINI-JAMMER	Decoy Effectiveness No.
DJM	DJM − Air Radar ECCM

Table 55: Relative Range Effects

Visual Range in Hexes	0–3	4–6	7–9	10–12	13–15	16–20	21–30	31+
Die Roll Modifier	−2	−1	+0	+1	+2	+3	+5	+8

V.A.S. Range in Hexes	0–20	21–30	31–40	41–50	51–60	61–70	71–80	81+
Die Roll Modifier	+0	+1	+2	+3	+4	+5	+6	+8

Table 56: Paint Scheme / Position / Weather Effects

Target Aircraft Position	Lower	Level	Higher	In Haze	In Stratus	Silh, by Cloud
Silver	−2	−1	−1	+1	+3	−1
Uncamouflaged	−1	+0	+0	+1	+3	−1
Camouflaged	+1	+0	−1	+0	+3	−2
Low Vis. Grey	+0	+1	+1	+2	+3	−1
Aircraft Smoking	−1	−2	−2	NA	NA	NA

Table 57: Addtitional Modifiers

Number of aircraft searching:	
1 or 2	+0
3 or 4	−1
5 or 8	−2
9+	−3
Tgt. is just launched Missile or SAM*	−3
Tgt. is aircraft which just launched Missile*	−3
Tgt. is in all searcher's Restricted Arcs	+2
Searcher is Looking out of Stratus	+2
Searcher is Veteran and Tactics Master	−2
Searcher is Veteran of Tactics Master	−1
Multi-crew aircraft Searching	−1
Hud Interface Technology used	−1
Searcher has RWR indications	−1
Has Poor Eyes	+1
Has Good Eyes	−1
is Novice	+1
is Green	+2
Target using DDS Flare program	+PPL No.

* does not apply to smokeless missiles.
NOTE: All modifiers are cumulative. Disoriented or GLOC aircrew may not search.

Table 58: Sighting Rules Summary

Maximum Sighting Ranges	
by Eyeball	4 × aircraft Vis. No.
by V.A.S.	6 × aircraft Vis. No.
by V.A.S. with radar assist	10 × aircraft Vis. No.
at Night	2 hexes
at Night in A/B	6 hexes
Target I.D. Ranges	
by Eyeball	2 × aircraft Vis. No.
by V.A.S.	4 × aircraft Vis. No.
at Night	Same position, facing and speed required.
With Tgt. I.D. radar technology available	2d turn of Lock
Padlocking (PL)	
One PL allowed per aircraft.	
Two PLs if multi-crew aircraft.	
No PLs allowed into blind arcs.	
No PLs by Novices or Greens.	
1 extra PL per Vet. or Tac. Mstr.	
No PLs if in Target Sun Arc.	

Table 59: Missile Data

"The Speed of Heat!"

Year	Type	Name	Weight	Load	Seeker	Launch G	Lau. Roll	Turn Rate	Flight Time	Visibility	ECCM #	Chaff #	Flare #	Launch Envelopes: Front 150–180	Launch Envelopes: Side 90–120	Launch Envelopes: Rear 0–60	Base Speed & Sustainer	Act. Homing	Countermeasures (TSOH): Direct	Die to
								U.S. Air to Air Missiles												
1956	AIM-4A	Falcon	130	1.0	RH	EZ	7	HT/2	1	7	–	5	–	18–9	15–6	15–4	16–0	–		5
1956	AIM-4B	Falcon	130	1.0	E	TT	7	HT/2	1	7	–	–	6	–	–	12–2	16–0	–		5
1957	AIM-4C	Falcon	130	1.0	I	TT	7	BT/2	1	7	–	–	5	–	–	12–2	16–0	–		6
1963	AIM-4D	Falcon	140	1.0	M	TT	7	BT/2	1	7	–	–	5	–	15–4	18–2	18–0	–		6
1958	AIM-4E	Super Falc.	150	1.0	RH	TT	7	BT/2	1	7	–	4	–	24–6	18–6	18–4	18–0	–		6
1959	AIM-4F	Super Falc.	150	1.0	RH	TT	8	BT/2	1	7	1	4	–	24–6	18–6	18–4	18–0	–		6
1959	AIM-4G	Super Falc.	150	1.0	M	TT	8	BT/2	1	7	–	–	5	–	15–4	18–2	18–0	–		6
1960	AIM-26A	Nuc. Falcon	200	1.0	RH	TT	8	BT/2	2	8	–	–	–	24–9	18–9	18–6	16–0	–		Nu
1960	AIM-26B	Super Falc.	260	1.0	RH	TT	8	BT/2	2	8	–	4	–	24–9	18–9	18–6	16–0	–		4
1956	AIR-2A	Genie	825	2.0	–	W.Lvl.	8	–	1	9	–	–	–	(See Adv. Rule 9.6)			15–0	–	–	Nu
1956	AIM-9B	Sidewinder	160	1.0	E	TT	7	HT/2	2	7	–	–	6	–	–	9–2	10–0	–	–	3
1962	AIM-9C	Sidewinder	190	1.0	RH	TT	6	HT/2	5	7	–	5	–	24–6	12–6	18–4	18–0	–	–	2
1965	AIM-9D	Sidewinder	200	1.0	I	TT	7	HT/2	5	7	–	–	5	–	–	12–2	18–0	–	–	7
1967	AIM-9E	Sidewinder	170	1.0	I	TT	7	BT/2	2	7	–	–	5	–	–	12–2	10–0	–	–	4
1968	AIM-9E2	Sidewinder	170	1.0	I	TT	7	BT/2	2	5	–	–	5	–	–	12–2	12–0	–	–	4
1967	AIM-9G	Sidewinder	190	1.0	M	HT	7	BT/2	5	7	–	–	5	–	9–4	12–2	18–0	–	–	7
1970	AIM-9H	Sidewinder	185	1.0	M	HT	8	ET/2	5	7	–	–	5	–	9–4	12–2	18–0	–	–	7
1975	AIM-9J	Sidewinder	175	1.0	I	HT	8	ET/2	3	7	–	–	5	–	–	12–1	18–0	–	–	5
[Changed in 1B by JDW in TSOH Errata.]																				
1975	AIM-9J	Sidewinder	175	1.0	I	HT	8	ET/2	3	7	–	–	5	–	–	12–1	18–0	–	–	5
1972	AIM-9J	Sidewinder	175	1.0	I	HT	8	ET/2	3	7	–	–	5	–	–	12–1	18–0	–	–	5
1956	AIM-7A	Sparrow-I	300	1.0	BR	EZ	7	HT/2	5	8	–	5	–	–	–	15–4	8–0	–	–	2
1958	AIM-7C	Sparrow-III	400	1.0	RH	TT	7	HT/2	5	8	–	4	–	45–9	30–9	20–4	8–0	–	–	3
1960	AIM-7D	Sparrow-III	450	1.0	RH	TT	7	HT/2	5	9	–	4	–	45–9	30–9	20–4	10–0	–	–	4
1962	AIM-7E	Sparrow-III	450	1.0	RH	TT	7	HT/2	5	9	–	4	–	60–9	40–6	24–3	12–0	–	–	4
1970	AIM-7E2	Sparrow-III	450	1.0	RH	HT	8	BT/2	5	9	–	4	–	60–9	40–6	24–2	12–0	–	–	4

"The Speed of Heat!"														Launch Envelopes						Die Roll to Hit		Attack Rating	
Year	Type	Name	Weight	Load	Seeker	Launch G	Lau. Roll	Turn Rate	Flight Time	Visibility	ECCM #	Chaff #	Flare #	Front 150–180	Side 90–120	Rear 0–60	Base Speed & Sustainer	Act. Homing	HOJ/MCG	Direct	Prox.	Direct	Prox.
Russian Air to Air Missiles																							
1958	AA-1A	Alkali	200	1.0	BR	EZ	6	HT	2	7	–	5	–	–	–	12–3	6–0	–	–	2	6	6	4
1965	AA-1B	Alkali	200	1.0	RH	TT	7	BT	2	7	–	5	–	15–9	9–6	12–2	6–0	–	–	3	7	6	4
1960	AA-1C	Alkali	200	1.0	E	EZ	7	BT	2	7	–	–	6	–	–	9–2	6–0	–	–	2	6	6	4
1959	AA-2	Atoll	160	1.0	E	TT	7	HT/2	2	7	–	–	6	–	–	9–2	10–0	–	–	3	7	5	3
1966	AA-2B	Atoll	180	1.0	I	HT	7	ET/2	2	7	–	–	5	–	–	12–2	14–0	–	–	4	8	5	3
1967	AA-2-2	Adv. Atoll	200	1.0	RH	TT	7	BT	2	7	–	4	–	24–6	12–6	15–4	14–0	–	–	2	7	5	3
1962	AA-3A	Anab	600	1.5	I	TT	7	BT/2	4	9	–	–	5	–	–	18–4	10–0	–	–	3	7	9	4
1962	AA-3B	Anab	600	1.5	RH	TT	7	BT/2	4	9	–	5	–	36–9	24–6	21–4	10–0	–	–	3	7	9	4
1972	AA-3-2	Anab	600	1.5	RH	HT	8	ET/2	4	9	–	4	–	45–9	30–9	24–3	12–0	–	Y/N	4	8	9	4

NOTES:

1. Instant Arming Missiles are indicated by a boldface typed name. There are none in *"The Speed of Heat"*.
2. Lookdown Missiles are indicated by "()" around the Launch roll #. There are none in *"The Speed of Heat"*.

"The Speed of Heat" AIR TO AIR MISSILE NOTES:

1. AIM-4, AIM-26, Genie, AIM-9E, & AIM-9J missiles were used only by the USAF.
2. AIM-9C, AIM-9D, AIM-9G, & AIM-9H missiles were used only by the USN/USMC.
3. AIM-9C RHMs were used only by USN/USMC F-8 Crusader aircraft.
4. AIM-9G and AIM-9H missiles are IR Uncage Technology compatible.
5. AA-1 missiles were used by MiG-17PFU, MiG-19PFU, MiG-21FP and Su-9 aircraft.
6. AA-2-2 RHMs may only be used on MiG-21MF & MiG-21PFM aircraft.
7. AA-3 missiles were used only Su-11 aircraft.
8. No Instant Arming, or Look Down missiles are depicted in *"The Speed of Heat"*

Table 60: Aircraft Accessories

Weapon Racks "WR"				
Type	Code	Weight	Load	Capacity
Dual Rack	DR	100	1.0	2 weapons up to 1100 lbs. each.
Triple Rack	TR	100	1.0	3 Weapons up to 1100 lbs. each.
Multi. Rack	MR	200	2.0	4 to 6 weapons up to 800 lbs. each.

1. All weapons on a rack must be identical.
2. DRs and TRs may carry BB, BG, RP, RK, & AGM-65 RG and RS weapons.
3. MRs may carry any BB class weapons.

U.S. Special Racks				
Missle-DR	MDR	100	1.0	Two Aim-9 Sidewinder missiles.
ARM-DR	ADR	200	2.0	Two AGM-45 Shrike ARMs.

Table 61: Aircraft Gun Pods

				"GP"	Air to Air	Attack Rating	
Type		Weight	load	Shots	Roll to Hit	ATA	ATG
U.S. Gunpods							
SUU-16 20mm Vulcan	(1966)	1600	4.0	6	6–4–3	6	6*
SUU-23 20mm Vulcon	(1970)	1700	4.0	6	6–4–3	6	6*
GPU-2/A Triple 20mm	(1966)	600	2.0	5	5–3–2	3	4*
Mk.4 Twin 20mm	(1964)	1400	3.5	5	6–4–2	5	5*
SUU-11B/A 7.62mm	(1965)	350	1.5	8	5–3–NA	2	2**
.50 Cal. Single M.G.	(1960)	300	1.5	5	3–1–NA	2	1**
Russian Gunpods							
GP-9 GSh Twin 23mm	(1970)	600	2.0	2	6–4–2	5	4
Ext. GSh Twin 23mm	(1971)	850	3.0	2	5–3–2	5	4

1. SUU-16 pod is powered by wind driven generator and will not fire unless aircraft speed is 2.5 or more.

Table 62: Electronic Warfare Pods "EP"

Type	Class	Weight	Load	Rating	Frequency Coverage	
USAF ECM Pods						
ALQ-71	BJM	500	2.0	A-3	Both LF and MF	(1967)
ALQ-72	BJM	500	2.0	A-3	Both MF and HF	(1968)
ALQ-87	BJM	500	2.0	A-4	Both MF and HF	(1968)
QRC-335	AJM	350	1.0	A-3	LF only	(1966)
ALQ-101	AJM	500	2.0	B-4	LF to VF and Air Srch.	(1967)*
ALQ-81	DJM	500	2.0	A-3	Both LF and MF	(1966)
ALQ-83	DJM	500	2.0	B-3	LF, MF, and HF	(1967)*
USN/USMC ECM Pods						
ALQ-31	BJM	600	2.0	A-3	Both LF and MF	(1965)
U.S. IRM Jammer Pods "EP"						
Type	Class	Weight	Load	IRM & IR SAM Attack Modifiers:		
ALQ-123	IR-Jammer	500	2.0	+1 in 60 arc, +2 in 30 arc.		(1971)
ALQ-132	IR-Jammer	500	2.0	+2 in 30, 60 & 90 arcs.		(1974)

1. ALQ-83 pod jams in all three frequencies at the same time.
2. ALQ-101 must choose any two of LF, MF, HF, and VF before play.

Table 63: Aircraft Fuel Tanks "FT"

Liter		Load Points		Fuel	
Capacity	Weight	Full	Empty	Points	Primary Users:
250L	550	1.5	1.0	24	All
400L	700	2.0	1.0	30	U.K., Russia
450L	800	2.5	1.5	40	U.K., Russia
600L	1100	3.0	2.0	50	All
700L	1300	3.0	2.0	60	U.S.
850L	1500	3.5	2.5	75	U.S., U.K., Russia
1000L	1800	3.5	2.5	85	U.S.
1200L	2200	4.0	2.5	100	All
1400L	2700	4.0	3.0	120	U.S.
1700L	2000	5.0	3.5	140	U.S., U.K., France
1900L	3500	6.0	4.0	175	U.S.
2200L	4500	8.0	5.0	200	U.S., NATO, Russia