MAIN AIRCRAFT TYPES

(*Vapour Trails* catalogue number in brackets)

Arab Air Forces (mainly Egyptian)
Fighters; Supermarine Spitfire (ISA 41a, 41d & 41c), Fiat G.55 Centauro (use ISA 471), Macchi M.C.205V Veltro (use ISA 471).

Bombers; Avro Anson (ISA 55), Douglas C-47 (ISA 270), Short Stirling (ISA 83).

Other; North American T-6 Texan/Harvard (ISA 810).

Israeli Air Force
Fighters; Supermarine Spitfire (ISA 41d & 41c), Avia S-199 Czech built Messerschmitt 109G (ISA 141a), North American P-51 Mustang (ISA 283b).

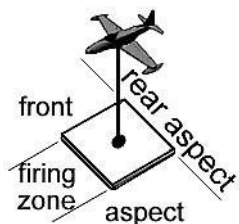*Bombers;* Boeing B-17 Flying Fortress (ISA 280b), Douglas C-47 (ISA 270).

Others; Bristol Beaufighter (ISA 56 & 56a), North American T-6 Texan/ Harvard (ISA 810).

Light Planes; Austers, Piper Cubs, Polish RWDs and many other types (use ISA825, ISA 832 and some of the more obscure French, Italian and Polish WW2 models).
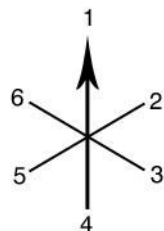

British RAF
Fighters; Supermarine Spitfires (ISA 41d), Hawker Tempest (ISA 77).

Other; De Havilland Mosquito reconnaissance plane (ISA 75a).

Aircraft Model   *Spin & Stall Diagram*

air combat wargames rules

Wings at War
In association with Tumbling Dice

DESERT SPITFIRES

air combat wargames rules for the Independence War 1948-49
using the *Wings at War* system
- for use with Tumbling Dice 'Vapour Trails' 1/600 scale aircraft -

BEFORE THE GAME

Models
One model represents one aircraft.
Model aircraft are mounted on a stand fixed to a square base 3cm x 3cm in size if a B-17, C-47 or Stirling bomber, 2.5cm x 2.5cm (though other base sizes can be used if both sides agree). Ground units should be mounted on a circular base 3cm in diameter.

There are four height levels. An aircraft's different levels can be represented by using stands of different heights. Models fitted with a short wire prong can be plugged into a hollow tube stand of appropriate height which in turn is plugged into a similar prong fitted in the centre of the base. Alternatively, a separate model can be used for each level, permanently mounted on a base by a thin piano-wire stand of appropriate height.

Stands should be 2cm high for level one; 5cm for two, 10cm for three and 15cm for four. Spare 5, 10 and 15cm long hollow tube stands can double as measuring sticks.

Numbered markers or dice placed on an aircraft model's base indicate energy. Other markers or counters can be used to denote low ammo, no ammo, damage and bomb load.

Dice
Two types are used; normal *D6* numbered 1 to 6, and *D3* numbered 1,1,2,2,3,3.

Playing Area
A normal 6ft by 4ft featureless table is recommended.

Picking Forces & Crew Rating
A game can be between of two or three opposing sides. If two sides are involved one represents an Arab force (mainly Egyptian) and their opponents represent an Israeli force. If a game is between three different sides a British force is included. The British count both of the others sides as enemy and are treated as enemy by them both.

Opposing sides pick starting forces. No more than two sections of each type of aircraft can be fielded by a side. Opposing forces need not be equal as victory target depends on the forces fielded (see *Victory* on page 6).

Inexperienced fighter crew are rated as *green*. Only one Egyptian fighter section *cannot* be green. Up to half of Israeli fighter sections can be green. No British fighter sections can be green.

Aircraft are organised into sections of one plane if a B-17 or Mosquito, three aircraft if fighters of the same type all with green crew or if light aircraft, two aircraft of the same type if other.

BOMBING

Aircraft with bombs can make one ground attack in a game, dropping all bombs in a single pass. Bombing range is 5cm directly forward of the attacker's base and can be performed from height levels 1, 2 or 3.

Throw a D6;

ATTACKER	SCORE					
B-17, Stirling	1	2			3	4,5,6
Anson, C-47	1	2	3		4	5,6
Beaufighter, Mustang, T-6	1	2		3,4	5,6	
Light aircraft	1	2	3	4	5,6	
Other	1	2	3	4,5	6	
Level 1	S	D		H	H	H
Level 2	S				H	H
Level 3						H

S   Attacker shot down by anti-aircraft fire.
D   Light aircraft, B-17, C-47, or Stirling shot down by anti-aircraft fire. Otherwise, attacking aircraft damaged by anti-aircraft fire and cannot make power actions for the rest of the game.
H   Target takes 2 hits from a B-17 bomber, 1 hit from other. If the dice score was **EVEN** remove the target from play.

VICTORY

Victory Target
A side's victory target depends on the composition of the side. Add up the value of each *section* of the following aircraft in the force;

Mustang, Spitfire	6
Beaufighter, S-199	4
Other fighter	5
Anson, B-17, C-47, Light aircraft	2
Other	3

The victory target is *one third* of the total value of the force.

Victory Points;
Keep a running total of the victory points gained for the following;

Each enemy B-17 bomber lost	2
Each other enemy aircraft lost	1
Each hit on an enemy ground target	1
If British; for the *first* Mosquito that reaches the short table edge opposite the British entry edge.	2

When a side gains at least as many victory points as its victory target it has won and the game is over.

AIR-TO-AIR GUNFIRE

Firing Zone
The B-17 and Stirling have an all-round firing zone extending 5cm in all directions from the base. Other aircraft have a firing zone the width of the base extending 5cm directly forward and those with rear-mounted guns also have a similar firing zone extending directly to the rear of their base.

The target must be at the same height level and part of its base must be within the firing zone. An aircraft cannot shoot fixed forward-firing weapons if its base overlaps the target's base at any point. An aircraft cannot fire at a target if there is another aircraft within the firing zone and any part of its base is between the firer and the target.

The C-47, Mosquito and any light aircraft are not armed with air-to-air weapons.

Other aircraft are armed with either machineguns or cannons:

> The Centauro and Mustang are armed with fixed multiple machineguns firing to the front.
> The B-17 and Stirling have flexible machineguns firing in all directions.
> The Anson and T-6 count as having a single fixed machinegun firing to the front and a single rear-mounted flexible machinegun.
> The Beaufighter has fixed cannon firing to the front and a single rear-mounted flexible machinegun.

All other aircraft are armed with fixed cannon firing to the front.

Checking For Hits
Throw one D6;

SITUATION	SCORE					
Green Crew	1,2	3	4		5	6
Other	1	2	3	4	5	6
Firing fixed cannon in target's rear aspect	W	W		D	S	S
Firing fixed multiple machineguns in target's rear aspect	W		D	D	D	S
Other	W					S

W   If fixed guns firing; low ammo warning, one shot left.

D   Light aircraft shot down. Otherwise, target damaged unless already damaged when shot down instead. No further effect on a B-17 or Stirling, other damaged aircraft cannot make power actions for the rest of the game and jettison bombs.

S   Target shot down.

Snap-Shots
If the target also has the firing aircraft in its own firing zone, e.g. in a closing engagement or in a tail chase on a bomber, both opposing aircraft can shoot in the same move. The aircraft whose move it is fires first. If the target is not shot down it may immediately fire back.

Aircraft Aspect
An aircraft has two aspects; *front* and *rear*. To count as in the rear aspect of an enemy aircraft, the whole of a model's base must be behind an imaginary line of unlimited length extending across the rear edge of the target's base. In all other situations the aircraft is in the target's front aspect.

Ground Targets
Before the first gameturn the Arab and Israeli sides throw for targets. Each throws two D3 and places this number of enemy ground targets in the enemy's half of the table. For each target throw one D3, subtracting 1 if there are 2 or 3 targets in this half of the table and adding 1 if there are 6. The result multiplied by 10cm is the distance from the table centre line that the target is positioned by the player throwing the dice. Targets cannot be placed within 30cm of a short table edge or of another ground target. Targets that cannot be positioned are discarded.

Bombs
Bombs include all air-dropped weapons used against targets on the ground. Aircraft count as *loaded* until the bombs are dropped. Bombs cannot be dropped in the first three gameturns. British aircraft do not carry bombs. All other planes may start the game with bombs.

AIRCRAFT PERFORMANCE

Each aircraft type has the following energy rating and maximum height level:

AIRCRAFT	ENERGY RATING	ENERGY RATING IF LOADED	MAX HEIGHT
Mosquito, Mustang, Spitfire	6	4	4
Tempest, Veltro	6	4	3
Centauro	5	4	4
S-199	5	4	3
B-17	4	4	4
Beaufighter	4	4	3
C-47, T-6, Stirling	4	3	3
Anson	4	3	2
Other	3	3	2

ENERGY

An aircraft's energy is a combination of engine power, momentum and potential energy due to height. Energy is lost and gained by performing certain actions and so varies from gameturn to gameturn. Use numbered markers or dice placed on an aircraft's base to indicate its energy.

The amount at the *start* of a gameturn determines how many action points an aircraft must expend on movement actions during that gameturn. It cannot use less action points than the energy indicated at the start of the gameturn. An aircraft's energy total can increase to more than its energy rating during a move. However, if an aircraft ends a gameturn with more energy than its energy rating it breaks up and crashes.

Once action point expenditure reaches starting energy, the aircraft's moves for that gameturn are over. However, if the last manoeuvre causes action point expenditure to exceed starting energy, the aircraft enters a spin (before it can use any weapons).

Stall Energy
Aircraft stall if they end a gameturn with energy less than 1.

Spins & Stalls
Aircraft whose actions take them outside of permitted parameters spin or stall. Throw a D3; the aircraft drops this number of height levels and its energy becomes this amount. If it does not crash it ends facing in a random D6 selected direction, 1 indicating original heading, etc. (see diagram on back page).

MOVEMENT

Starting The Game
Aircraft can be deployed on to the playing area at any height level up to their maximum, with any energy up to their energy rating, and on any gameturn. A section's aircraft all arrive on the same gameturn.

Arab and Israeli aircraft arrive on opposite long table edges. British aircraft arrive along one short table edge (chosen by the player) anywhere within 10cm of the table edge centre point.

Gameturn Sequence
There are three consecutive parts to each gameturn;

1) Move all Arab aircraft already on the playing area. May bring on to the table and move any Arab aircraft not yet committed.

2) Move all Israeli aircraft already on the playing area. May bring on to the table and move any Israeli aircraft not yet committed.

3) Move all British aircraft already on the playing area. May bring on to the table and move any British aircraft not yet committed.

Leaving The Playing Area
Aircraft touching a table edge exit the playing area and are removed from play.

Using Action Points
To perform an action an aircraft must expend action points. Each aircraft's movement and combat is completed before the next aircraft. Actions are performed one at a time until expended action points equal *starting* energy or the plane spins or stalls.

Any change in energy due to manoeuvres performed during a gameturn is applied at the *end* of the aircraft's moves.

Completed actions cannot be changed. The possible move of an aircraft cannot be measured but ranges to enemy targets can be. Aircraft models can pass through each other without risk of collision.

Action Table
The following table lists actions, their action point cost and effect on energy;

ACTION	EFFECT	AP COST	ENERGY
MOVE	Move straight forward 5cm; then may turn up to 45°; then may shoot once or drop bombs.	1	No change
CLIMB	Move straight forward 5cm (10cm if already *dived* this gameturn); then climb up 1 height level; then may shoot once *or* drop bombs.	3	-2
DIVE	Move straight forward 5cm (10cm if already *climbed* this gameturn); then drop 1 height level; then may shoot once *or* drop bombs.	1	+2
POWER	Move straight forward 5cm; then may shoot once *or* drop bombs.	1	+1
BRAKE	Move straight forward 5cm; then may shoot once *or* drop bombs.	1	-1
TIGHT-TURN	**Not if at height level 4 &/or Energy 6:** Move straight forward 5cm; then turn 45° to 90°. If not *green* may then shoot once.	D	-1
REVERSE	**Only if the aircraft's last action was *climb* or *dive*:** Change facing on the spot through 180°.	D	-1

A tight turn or reverse is not allowed if loaded, damaged or a bomber.

D indicates random action point cost, throw one D3 *after* the model has performed the action and modify the score by the following;

Tight-turning Spitfire	-1
Tight-turning and energy is 4 or less	-1
Beaufighter, Mosquito, T-6, &/or any fighter with green crew	+1

The minimum random action point cost is 1 if performing a tight-turn, 2 if performing a reverse.

All turns are performed by pivoting the model forward on the stationary left rear corner of the base if turning to the left, stationary right rear corner if to the right.

If performing a reverse, the last action can have been at the end of the previous gameturn.