

# HEROES

UNLIMITED

# UNIVERSE

## Companion Rules BHU13



Superhero roleplaying in the Beyond Heroes Unlimited Universe

## Atlas 7: The Sky Kingdoms

# Beyond Heroes Unlimited Universe Book XIII: Atlas 7, the Sky Kingdoms

Design: Marco Ferraro 2022

This is meant as an amateur free fan production. Absolutely no money is generated from it.

Copyright © 1990, 2005 and 2018 Palladium Books Inc. & Kevin Siembieda; all rights reserved world wide. No part of this work may be sold, distributed or reproduced in part or whole, in any form or by any means, without written permission from the publisher. All incidents, situations, institutions, governments and people are fictional and any similarity to characters or persons living or dead is strictly coincidental.

Rifts®, The Rifter®, RECON®, Splicers®, Palladium Books®, Phase World®, The Palladium Fantasy Role-Playing Game®, Megaverse®, Nightbane®, The Mechanoids®, The Mechanoid Invasion®, Coalition Wars® and After the Bomb® are Registered Trademarks of Palladium Books Inc. Heroes Unlimited, Beyond the Supernatural, and other published book titles, names, slogans and likenesses are trademarks of Palladium Books Inc. and Kevin Siembieda.

Nightlands™, Heroes Unlimited™, Villains Unlimited™, Powers Unlimited™, Aliens Unlimited™, Beyond the Supernatural™, Boxed Nightmares™, Dead Reign™, Warpath: Urban Jungle™, Ninjas & Superspies™, Mystic China™, Triax™, Arzno™, MercTown™, Mindwerks™, Vampire Kingdoms™, Federation of Magic™, Juicer Uprising™, Phase World™, Wormwood™, Psyscape™, Cyber-Knight™, Glitter Boy™, Juicer™, Mind Melter™, Psi-Stalker™, Coalition States™, Northern Gun™, Dog Boy™, SAMAS™, Wilk's™, Erin Tarn™, Emperor Prosek™, Naruni™, Naruni Enterprises™, Splugorth™, Mega-Damage™, M.D.C., S.D.C.™, I.S.P.™, P.P.E.™, O.C.C., R.C.C., is a trademark owned and licensed by Palladium Books, Inc. and Kevin Siembieda.

## Contents

Foreword	3
History of the Sky Kingdoms	3
The Cities in the Sky	4
Sky Weather	14
Altitude Sickness	17
Tornadoes	21
Flying	23
Sky Combat	29

## Foreword

The Beyond Heroes Unlimited Universe series represents a new series of pdfs converting the D20 Beyond Heroes setting to Palladium mechanics in general, and Heroes Unlimited specifically.

The sky realms are a mysterious place. Cloud cities come and go with the drifting of the winds, while mysterious winged creatures migrate vast distances in a single week. Some “terrain features” are permanent (such as persistent rainstorms or clouds that orbit in a fixed pattern), while others are completely unpredictable (such as cloud cities that move entirely at the whims of the wind).

For thousands of years they remained hidden. Then all that changed with the Shattered Realms invasion of earth in 2020 AD. In order to aid the humans in defeating the invaders the Sky Kingdoms were forced to reveal themselves and their magic.

Now in the aftermath of the war everyone knows of the existence of the various cities in the sky. As a result military and trade treaties were negotiated and most of the Kingdoms were made a part of the UN. For better or ill.

## 1. History of the Sky Kingdoms

**2,300,000 BC** – The Elves use their magic to lift large islands into the sky and name them Netheril, Sherjewel, Starmount, Enedthor and Skyrulme.

**1,500,000 BC** – In the world’s first sky wars Netheril, Enedthor, Sherjewel and Skyrulme blast each other into smaller pieces, and are abandoned by the surviving Elves. Starmount is obscured by magic and escapes the attack.

**77,000 BC** - Raptorans settle on the remains of Enedthor, and rename it Cirrus.

**59,878 BC** - Aarakocra settle on the remains of Netheril and rename it Aerie.

**52,900 BC** - Kenku settle on the remains of Skyrulme and rename it Aviary.

**37,000 BC** - Avariel settle on the remains of Sherjewel and rename it Starmount.

**30,000 BC** - Sky People settle on the last remaining floating rock and rename it Stratos.

**2013 AD** - Star City 15 antigravity floating city, jointly funded by Project Omega and the Russian and Chinese governments is finished.

**2034 AD** –Metatech, the US and Japan begin work on the first orbital city, dubbed Sky City.



## 2. The Cities in the Sky

### Aerie



Founded thousands of years ago Aerie is one of five floating rocks, all that remains of the sky continent of Netheril. Using arcane magic that has since been lost (though some speculate on that point), the floating Islands were all that remained of the destruction of the former large landmasses that floated in the air. Today, the various sky cities have established strong trade corridors between the cities and through the various other communities in the sky. Magic is accepted as a way of life, but it's practice is discouraged except for among the elite. Many practitioners of magic who grew up in the cities have turned to the council for support or have struck out on their own. In recent times however they have turned to technology, and are the industrial powerhouse of the sky.

**Coordinates:** Mobile within Peru  
**Area:** 500 km<sup>2</sup>  
**Altitude:** 4 kilometres  
**Climate:** Aerie is one of the sky cities hermetically protected by a magical

shield. It allows objects including lifeforms to pass through while keeping out external weather conditions. This in turn maintains an internal temperature of as low as 13° at night and up to 26°C during the day. It can also be adjusted to allow some rain through, but without gale force winds

**Created:** 59,878 BC  
**Technology:** Level 6. Mechanized Age; Electric calculators, telephone, radio, aircraft, steam turbines, internal combustion, alternating current, hydroelectricity, antibiotics, blood typing and safe transfusions, heredity, biochemistry, helium airships and manned balloons, radar  
**Culture:** Standard  
**Languages:** Craw, Kenk  
**Education:** Primary, Secondary, Tertiary, Thaumaturgy  
**Government:** Council  
**Population:** 525,660 Aarakocra  
 520 Kenku  
**Military:** 53,000 Aarakocra  
**Religions:** Gaea, Aerdrie Faenya, Quorlinn  
**Exports:** Tech, weapons, equipment, textiles, magic items, scrolls  
**Imports:** Steel  
**Agriculture:** Avocados, blueberries, artichokes, asparagus, coffee, cocoa, potatoes, pineapples, grapes, sugarcanes, rice, bananas, maize, cassavas, palm oil, tangerines, oranges,

mangoes, lemons,  
tomatoes, barley, wheat,  
olives, carrots, papaya,  
pepper, apples.

<b>Resources:</b>	None
<b>Hazards:</b>	Falling off, severe storms, storm surges, tornadoes, fog
<b>Industries:</b>	Farming, hunting, textiles, weapons, magic schools, magic objects
<b>Energy:</b>	Mana, wind, elemental furnace
<b>Transport:</b>	Skyships, giant eagles
<b>Currency:</b>	Asterius
<b>Treaties:</b>	Parliament of the Sky, the Fey Kingdoms, the Gaea Alliance, the 7 Kingdoms of the 7 Seas, the Parliament of Nature
<b>Disputes:</b>	Skycity 15

## Aviary



Founded thousands of years ago Aviary is one of five floating rocks, all that remains of the sky continent of Skyrulme. Aviary consists of three linked floating rocks. Being the breadbasket of the floating lands, crops like wheat and corn are grown extensively, along with orchards of fruit trees. Mining is also done here, but so as not to disturb the agricultural production is all done underground. Well constructed roadways line the interior of the cities.

<b>Coordinates:</b>	Mobile within Indonesia
<b>Area:</b>	452 km <sup>2</sup>
<b>Altitude:</b>	4 kilometres
<b>Climate:</b>	Aviary is one of the sky cities hermetically protected by a magical shield. It allows objects including lifeforms to pass through while keeping out external weather conditions. This in turn maintains an internal temperature of as

	low as 24° at night and up to 32°C during the day. It can also be adjusted to allow some rain through, but without gale force winds	canary seeds, dairy, eggs, seafood, forage, pears, peaches, plums, apricots, nectarines, sweet cherries, wine grapes, canola, hemp, honey.
<b>Created:</b>	52,900 BC	<b>Resources:</b> None
<b>Technology:</b>	Level 4. Age of Sail. Calculus, precise navigation, belt drives; clockwork, optical microscope, steel weapons, body armour, amputations, bone setting, cauterizing wounds, opium as a medical painkiller, basket hilt	<b>Hazards:</b> Falling off, severe storms, storm surges, tornadoes, fog
<b>Culture:</b>	Benevolent, more tolerant than standard but still with some violence	<b>Industries:</b> Farming, textiles, weapons, magic schools
<b>Languages:</b>	Kenk, Attic Greek	<b>Energy:</b> Mana, wind, elemental furnace
<b>Education:</b>	Primary, Secondary, Tertiary, Thaumaturgy	<b>Transport:</b> Skyships, giant eagles
<b>Government:</b>	Council	<b>Currency:</b> Asterius
<b>Population:</b>	250,000 Kenku 132,500 Enduk 5200 Aarakocra	<b>Treaties:</b> Parliament of the Sky, the Fey Kingdoms, the Gaea Alliance, the 7 Kingdoms of the 7 Seas, the Parliament of Nature
<b>Military:</b>	200,000 Kenku 132,000 Enduk	<b>Disputes:</b> Skycity 15
<b>Religions:</b>	Gaea, Aerdrie Faenya, Quorlinn, Zeus	
<b>Exports:</b>	Food	
<b>Imports:</b>	Steel	
<b>Agriculture:</b>	Rapeseeds, dry peas, lentils, oats, wheat, barley, soy, maize, potatoes, flax, sugar beets, tomatoes, apples, carrots, beans, chickpeas, rye, onions, cabbages, cranberries, blueberries, mustard seeds, mushrooms, truffles, grapes, cattle, sheep, chickens, turkeys, brewing, buckwheat,	

## Cirrus



Founded thousands of years ago Cirrus is one of five floating rocks, all that remains of the sky continent of Enedthor. A glittering jewel of the clouds, Cirrus is a political, economic, and military hub of the cloud realms. The city commands few resources of its own. In fact, the cloud realm is barely large enough to accommodate much more than the city. As the seasonal winds blow, cloud realms drift across the sky. While the general wind patterns make possible rough predictions of a particular cloud's location, the vagaries of the weather and the exact location of a given realm make trade difficult. Cirrus is one of the very few exceptions to this general rule. Floating high in the atmosphere, it follows the same path year after year. Some sages believe Cirrus is blessed by the gods to adhere to its course.

Cirrus's predictable location makes it the ideal trading centre for all the sky realms. As it moves through different regions of the sky, traders swarm from across the air lanes to meet at the city, sell their wares, and load up cargoes of worked goods and raw materials that are

rare in their home realms. While some traders may deal with other cloud realms, most lack the resources and interest to track down settlements as they drift across the sky. Cirrus's status as the preeminent trading port of the sky ensures that a merchant can find a market for his goods and a wide range of products to carry back home. It contains ruins, and what looks like landing pads, as well as underground dwellings, but they have appeared abandoned for several thousand years, no markings on the wall survive, resulting in the ruins leaving no clue as to the place.

**Coordinates:** Mobile within Pakistan  
**Area:** 241 km<sup>2</sup>  
**Altitude:** 4 kilometres  
**Climate:** Aerie is one of the sky cities hermetically protected by a magical shield. It allows objects including lifeforms to pass through while keeping out external weather conditions. This in turn maintains an internal temperature of as low as 22° at night and up to 34°C during the day. It can also be adjusted to allow some rain through, but without gale force winds.

**Created:** 77,000 BC  
**Technology:** Level 5. Industrial Revolution; Mechanical calculators, balloons and early airships, early repeating small arms, steam engines, direct current; batteries, germ theory of disease, safe anesthetics, vaccines, mass production,

	dynamite, direct current power, earliest internal combustion engine
<b>Culture:</b>	Benevolent, more tolerant than standard but still with some violence
<b>Languages:</b>	Devis
<b>Education:</b>	Primary, Secondary, Tertiary, Thaumaturgy
<b>Government:</b>	Council
<b>Population:</b>	136,540 Raptorans
<b>Military:</b>	100,000 Raptorans
<b>Religions:</b>	Gaea, Tuilviel Glithien
<b>Exports:</b>	Weapons
<b>Imports:</b>	Food, steel
<b>Agriculture:</b>	Avocados, blueberries, artichokes, asparagus, coffee, cocoa, potatoes, pineapples, grapes, sugarcanes, rice, bananas, maize, cassavas, palm oil, tangerines, oranges, mangoes, lemons, tomatoes, barley, wheat, olives, carrots, papaya, pepper, apples.
<b>Resources:</b>	None
<b>Hazards:</b>	Falling off, severe storms, storm surges, tornadoes, fog
<b>Industries:</b>	Farming, textiles, markets, weapons, magic schools
<b>Energy:</b>	Mana, wind, elemental furnace
<b>Transport:</b>	Skyships, giant eagles, giant owls
<b>Currency:</b>	Asterius
<b>Treaties:</b>	Parliament of the Sky, the Fey Kingdoms, the Gaea Alliance, the 7 Kingdoms of the 7 Seas, the Parliament of Nature
<b>Disputes:</b>	Skycity 15

## Sky City



Sky City is a completely man-made aerial scientific colony of a few thousand workers and support staff hovering over the North Pacific Ocean. 36,000 repulsorlift engines and tractor beam generators kept the giant city floating above the planet. It contains 392 levels, along with platforms and rooms for residents and visitors. The top 50 levels of the city are used for scientific research, while the lower levels are used for accommodation. Generators on the underside of the city emitted tractor beams that converged below the reactor bulb, creating a funnel of energy that suspend the city in the air.

<b>Coordinates:</b>	Mobile over the North Pacific Ocean usually floating between Japan and the United States
<b>Area:</b>	The main saucer-shaped city structure is 16.2 kilometres in diameter, and 17.3 kilometres tall.
<b>Altitude:</b>	4 kilometres
<b>Climate:</b>	None. The entire city is hermetically sealed.



<b>Created:</b>	2034 AD
<b>Technology:</b>	7. Nuclear Age; Mainframe computers, television, ballistic body armour, guided munitions, submarines, fission, organ transplants; pacemakers, ducted propellers for water vehicles.
<b>Culture:</b>	Benevolent, more tolerant than standard but still with some violence.
<b>Languages:</b>	English, Japanese
<b>Education:</b>	None
<b>Government:</b>	Military jointly run by the United States and Japan
<b>Population:</b>	55,000 Humans
<b>Military:</b>	11,000 United States soldiers
<b>Religions:</b>	Various
<b>Exports:</b>	Research
<b>Imports:</b>	Food
<b>Agriculture:</b>	None
<b>Resources:</b>	None
<b>Hazards:</b>	Falling off, severe storms, storm surges, tornadoes, fog
<b>Industries:</b>	Wind and sky research
<b>Energy:</b>	Fission, wind
<b>Transport:</b>	Various US and Japanese aircraft
<b>Currency:</b>	Yen
<b>Treaties:</b>	United States, Japan, Parliament of the Sky, the Fey Kingdoms, the Gaea Alliance, the 7 Kingdoms of the 7 Seas, the Parliament of Nature
<b>Disputes:</b>	Skycity 15

## Star City 15



Star City 15 makes use of reverse engineered alien technology, combining a thrust-driving principle with artificially reversed gravity. All incoming and outgoing flights by air craft is done via the runway on top. There are hangars surrounding this section. The Star City has taken important precautions against storms and violent rainfall, lightning, etc. Lightning conductors can be projected through roofs of the tallest buildings in the city.

<b>Coordinates:</b>	Mobile within the territories of China and Russia
<b>Area:</b>	369 km <sup>2</sup>
<b>Altitude:</b>	4 kilometres
<b>Climate:</b>	None. The entire city is hermetically sealed.
<b>Created:</b>	2013 AD
<b>Technology:</b>	7. Nuclear Age; Mainframe computers, television, ballistic body armour, guided munitions, submarines, fission, organ transplants; pacemakers, ducted propellers for water vehicles.
<b>Culture:</b>	Standard
<b>Languages:</b>	Russian, Chinese
<b>Education:</b>	None
<b>Government:</b>	Military jointly run by

	Russia and China
<b>Population:</b>	62,000 Humans
<b>Military:</b>	9000 Russian soldiers 9000 Chinese soldiers
<b>Religions:</b>	Various
<b>Exports:</b>	Research
<b>Imports:</b>	Food
<b>Agriculture:</b>	None
<b>Resources:</b>	None
<b>Resources:</b>	None
<b>Hazards:</b>	Falling off, severe storms, storm surges, tornadoes, fog
<b>Industries:</b>	Wind and sky research
<b>Energy:</b>	Nuclear
<b>Transport:</b>	Various Russian and Chinese aircraft
<b>Currency:</b>	Ruble
<b>Treaties:</b>	Russia
<b>Disputes:</b>	Parliament of the Sky, the 7 Kingdoms of the 7 Seas, the Parliament of Nature, the Fey Kingdoms, the Gaea Alliance

## Starmount



Founded thousands of years ago Starmount is one of five floating rocks, all that remains of the sky continent of Sherjewel.

According to legend, this cloud realm is the centre of sky elf civilization and the first realm the elves civilized when they came to the clouds. It is made up of two linked continents both of which are rich lands. In the southwest it is sunny and temperate with prosperous farmland and pastures. The southeast is much the same if not more densely populated because of its rich farmland. The northeast and mountainous northwest are wild and cold and only sparsely populated. This however affords many of the countries wizards much privacy and so the land of the northeast is dotted with their towers or summer villas for the nobles that require more luxurious privacy.

The central regions are thick with deep forests littered with dangerous beasts and monsters, many of whom are the result of some evil wizards experiment for it is here that those that require the most privacy to conduct their wild experiments come. Birds form a prominent part of Starmount; as mounts, pets, friends, familiars, and food.

Many breeds are raised. Here is a partial list:

-Azure Eagles are a larger breed of giant eagle developed here by the Sky Knights as a mount.

-Tengali Pigeons are used for messengers, as they function as homing pigeons. They are a common sight, and harming one is against the law.

-Dream Owls come from some unknown world, and quite rare. They are sentient owls capable of speech, and are much sought after by wizards.

-Whitehawks are friendly birds of prey and are bonded to children (of richer nobles), and seek to defend or seek help for their charges.

**Coordinates:** Mobile within Argentina

**Area:** 687 km<sup>2</sup>

**Altitude:** 4 kilometres

**Climate:** Starmount is one of the sky cities hermetically protected by a magical shield. It allows objects including lifeforms to pass through while keeping out external weather conditions. This in turn maintains an internal temperature of as low as 21° at night and up to 31°C during the day. It can also be adjusted to allow some rain through, but without gale force winds.

**Created:** 37,000 BC

**Technology:** Level 5. Industrial Revolution; Mechanical calculators, balloons and early airships, early repeating small arms, steam engines, direct current; batteries, germ theory of disease, safe anesthetics, vaccines, mass production,

dynamite, direct current power, earliest internal combustion engine.

**Culture:** Benevolent, more tolerant than standard but still with some violence.

**Languages:** Espruar, Eladrin

**Education:** Primary, Secondary, Tertiary, Thaumaturgy

**Government:** Council

**Population:** 162,630 Avariel  
11,000 Sky People

**Military:** 150,000 Avariel

**Religions:** Gaea, Seldarine pantheon

**Exports:** Food, skyships, animals

**Imports:** Steel

**Agriculture:** Rapeseeds, dry peas, lentils, oats, wheat, barley, soy, maize, potatoes, flax, sugar beets, tomatoes, apples, carrots, beans, chickpeas, rye, onions, cabbages, cranberries, blueberries, mustard seeds, mushrooms, truffles, grapes, cattle, sheep, chickens, turkeys, brewing, buckwheat, canary seeds, dairy, eggs, seafood, forage, pears, peaches, plums, apricots, nectarines, sweet cherries, wine grapes, canola, hemp, honey.

**Resources:** None

**Hazards:** Falling off, severe storms, storm surges, tornadoes, fog

**Industries:** Farming, animal breeding, textiles, weapons, magic schools, magic objects, skyships

**Energy:** Mana, wind, elemental furnace

**Transport:** Skyships, giant azure

<b>Currency:</b>	eagles, giant owls Asterius
<b>Treaties:</b>	Parliament of the Sky, the Fey Kingdoms, the Gaea Alliance, the 7 Kingdoms of the 7 Seas, the Parliament of Nature
<b>Disputes:</b>	Skycity 15

## Stratos



Stratos is second only to Starmount in size. Individuals with the ability to cast magical spells are automatically considered nobility and given the rank of aristocrat, regardless of their skill at spellcasting. Only aristocrats may attain the noble rank of Lord. People without the ability to cast magical spells are called "commoners" and can at best attain the rank of gentry or, at worst, the ranks of servants or slaves.

Stratos is ruled by an Emperor or Empress who is advised by a Council of Wizards. It was formed from the amalgamation of several floating isles, which were moved together, and as the city slowly grew more islands were merged into the complex. To further compound the city mining parties on the surface plus resources mined from other floating islands. The city as it floats in the sky is large, with armoured walls to help fight off raiders.

The city is divided into two levels the upper city starts at what is considered street level and goes up to the tops of the tallest skyscrapers where the elite of the city rule. The second part of the city



starts at street level and goes down deep into the bowels of city. This underworld as it is known is inhabited by the poor, new immigrants to the city (unless they are wealthy), criminals and other unsavoury elements. While the upper city is open with balconies every where and green plans, the under cities is always bathed in artificial light, and people may go months without having to venture up to street level. The under city is considered the lowest of the low region of the city, and consists of a network of girders, and small buildings that hang over open sky, with the city above. This part of the city is notorious for raider gangs to conceal themselves, and as a site for murder, as the bodies can easily be disposed of. It is also here that concealed docking bays and warehouses for black market dealings can be found.

**Coordinates:** Mobile within India  
**Area:** 592 km<sup>2</sup>  
**Altitude:** 4 kilometres  
**Climate:** Stratos is one of the sky cities hermetically protected by a magical shield. It allows objects including lifeforms to pass through while keeping out external weather conditions. This in turn maintains an internal temperature of as low as 25° at night and up to 34°C during the day. It can also be adjusted to allow some rain through, but without gale force winds.  
**Created:** 30,000 BC  
**Technology:** Level 4. Age of Sail. Calculus, precise navigation, belt drives;

clockwork, optical microscope, steel weapons, body armour, amputations, bone setting, cauterizing wounds, opium as a medical painkiller, basket hilt.  
**Culture:** Benevolent, more tolerant than standard but still with some violence.  
**Languages:** Espruar, Eladrin  
**Education:** Primary, Secondary, Tertiary, Thaumaturgy  
**Government:** Monarchy  
**Population:** 432,620 Sky People  
 9,600 Avariel  
**Military:** 400,000 Sky People  
**Religions:** Gaea, Seldarine pantheon  
**Exports:** Skyships  
**Imports:** Steel, food  
**Agriculture:** Rapeseeds, dry peas, lentils, oats, wheat, barley, soy, maize, potatoes, flax, sugar beets, tomatoes, apples, carrots, beans, chickpeas, rye, onions, cabbages, cranberries, blueberries, mustard seeds, mushrooms, truffles, grapes, cattle, sheep, chickens, turkeys, brewing, buckwheat, canary seeds, dairy, eggs, seafood, forage, pears, peaches, plums, apricots, nectarines, sweet cherries, wine grapes, canola, hemp, honey.  
**Resources:** None  
**Hazards:** Falling off, severe storms, storm surges, tornadoes, fog  
**Industries:** Farming, textiles, weapons, equipment  
**Energy:** Mana, wind, elemental

	furnace
<b>Transport:</b>	Skyships, giant eagles, giant owls, griffins, hippogriffs
<b>Currency:</b>	Asterius
<b>Treaties:</b>	Parliament of the Sky, the Fey Kingdoms, the Gaea Alliance, the 7 Kingdoms of the 7 Seas, the Parliament of Nature
<b>Disputes:</b>	Skycity 15

## 2. Sky Weather

Another challenge of travelling in the sky is surviving the elements. Only extreme temperatures and heavy precipitation need produce game mechanic effects. Precipitation most often causes problems with visibility. Extreme temperatures may cause minor damage to the characters. Weather is the state of the atmosphere as measured on a scale of hot or cold, wet or dry, calm or storm, clear or cloudy. Most weather phenomena occur in the troposphere, just below the stratosphere. Weather refers to day-to-day temperature and precipitation activity whereas climate is the term for the average atmospheric conditions over longer periods of time.

<u>Roll</u>	<u>Precipitation/wind</u>
01-19	Clear, calm, 1 kph
20-29	Partly cloudy, breeze 4-10 kph
30-39	Mostly cloudy, light Wind 11-21 kph
40-49	Cloudy, windy, 22-27 kph
50-59	Misty/Drizzle; maximum duration 14 days
	Heavy Wind; maximum duration 6 days.
28-33	kph
60-69	Rain/Sleet; maximum duration 10 days.
	Gale; maximum duration 3 days, 34-55 kph
70-79	Thunderstorm/Snow; maximum duration 6 days.
	Cyclone/Tornado; maximum duration 6 hours, also fast-moving phenomena, 64-85kph
80-89	Deluge/Blizzard; maximum duration 6 hours, also fast-moving phenomena, 74-105kph
90-0	Hurricane/Monsoon; maximum duration 1 day, 84-120kph

The table below lists the amount of possible precipitation in millimeters.

<u>Semi Arid</u>	<u>Winter</u>	<u>Spring</u>
D4mm	01-20	01-10
D12mm	21-30	11-20
D20mm	31-90	21-40
D20 +20mm	91-00	41-00

<u>Semi Arid</u>	<u>Summer</u>	<u>Autumn</u>
D4mm	01-20	01-10
D12mm	21-40	11-20
D20mm	41-50	21-80
D20 +20mm	51-00	81-00

<u>Sub Arctic</u>	<u>Winter</u>	<u>Spring</u>
D4mm	01-50	01-40
D12mm	51-00	41-50

<u>Sub Arctic</u>	<u>Summer</u>	<u>Autumn</u>
D4mm	01-40	01-00
D12mm	41-00	

<u>Sub Tropical</u>	<u>Winter</u>	<u>Spring</u>
D4mm	01-20	01-10
D12mm	21-40	11-20
D20mm	41-90	21-30
D20 +20mm	91-00	31-00

<u>Sub Tropical</u>	<u>Summer</u>	<u>Autumn</u>
D4mm	01-10	01-20
D12mm	11-20	21-70
D20mm	21-40	71-90
D20 +20mm	41-00	91-00

<u>Tropical</u>	<u>Winter</u>	<u>Spring</u>
D4mm	01-70	01-30
D12mm	71-80	31-50
D20mm	81-90	51-80
D20 +20mm	91-00	81-00

<u>Tropical</u>	<u>Summer</u>	<u>Autumn</u>
D4mm	01-20	01-30
D12mm	21-50	31-40
D20mm	51-70	41-50
D20 +20mm	71-00	51-00

A character caught out in the open during a hailstorm may suffer damage from being pelted by the rocklike clumps of ice, but a well-prepared or well-armoured character can often avoid any difficulties. A character who is wearing splint mail, banded mail, or any other armour with a natural armour class of 4 or better can avoid damage entirely by taking the simple precaution of squatting or rolling into a ball and covering his head. (Of course, this makes the character a much easier target to hit in a combat situation.)

A character can also protect himself by squatting or rolling into a ball and covering himself with a large shield. Partial or total protection may be afforded by draping a large skin or canvas over a couple of handy tree branches and taking refuge beneath this makeshift tent. A character who is not suitably protected has a 50% chance of suffering damage on a round-by-round basis, depending on the type of armour he is wearing and the size of the hailstones. Most hailstones will only do 1 point of damage but may do up to D4.

A lightning storm presents no special hazard to characters who take simple precautions. However, the word “simple” in this context is an expression of complexity and not necessarily a measure of difficulty. For instance, it may not be at all easy for a character to find somewhere to hole up during a lightning storm if he’s in the middle of a flat, featureless plain that extends for

hundreds of metres, or kilometres, in every direction.

The most important precaution to take against being struck by lightning in the outdoors is to get rid of, and get away from, any metal armour, weapons, and equipment. If time permits, it is a good idea to scatter individual pieces of metal (the parts of a suit of armour, for instance) over an area at least several yards in diameter to minimize the possibility of lightning hitting the armour and gear. Heaping everything up in a pile for easier access later is asking for trouble, especially if the top of the pile is higher than any surrounding terrain.

Second, if solid cover is not available, get as low as possible, either by dropping flat on the ground or lying in a ditch or depression. Lightning is not immediately absorbed into the ground after it hits; the electrical force may travel some distance (up to several hundred metres, if the stroke is very powerful) along the ground before dissipating, and along its route it will seek out gullies, ruts, and other such low spots.

Even an apparently safe place, such as a rock overhang, is not necessarily the best place to be.

If lightning strikes on a ridge above the overhang, it may travel downward and into the enclosure as described above. Still, an alcove of this sort is much more preferable than a more exposed position. Taking cover under a lone tree is not a good course of action at all; if the tree is taller than the surrounding terrain, it is a prime target for lightning - and even if the electrical force of the lightning

stroke does not travel down through the tree, a character is still vulnerable to damage from falling debris (at the GM's discretion) if the tree is hit.

Standing beneath a thick cover of trees of equal height is perhaps the best precaution one can take against lightning in the outdoors when no better cover is available. Of course, if an enclosed structure is within running distance, that is the place to head for. If lightning hits the structure, the electrical charge will ground itself through the roof and walls. A structure with an earthen floor is the safest of all, since the ground provides additional insulation against any electricity that may leak through the structure.

The chance of a character being struck by lightning is a very small one, even considering the possibility of normal foolish behaviour, such as standing out in the open while wearing a suit of plate mail. In contrast, abnormal foolish behaviour is rushing to the only tall tree in sight, climbing to the top, and thrusting your sword toward the heavens. The suggestions that follow do not take abnormal behaviour into account; the Dungeon Master is free to arbitrate such occurrences, and it is strongly recommended that if a character voluntarily and knowingly engages in such behaviour, he be given exactly what he appears to want the jolt to end all jolts.



### 3. Altitude Sickness

To people unfamiliar with altitude and its effects on the human body a trip from sea level to 3048 metres (10,000 feet) may seem like no big deal. Many people can make this change without feeling ill effects or may have only minor symptoms. However others acclimatize more slowly and may become extremely ill. This may include: headaches, nausea, loss of appetite, heavy fatigue and vomiting. None are life threatening, neither are they serious.

However the person experiencing them is probably not having a good time. Moreover the patient must be monitored closely to insure that dehydration does not develop. In any case, the first rule is: don't go any higher until the symptoms reduce. This is followed closely by the second rule: if the symptoms continue to get worse or don't improve within 48 hours, go down.

More severe forms are High Altitude Pulmonary Edema (characterized by the following: loss of muscle control resulting in difficulty maintaining balance, coughing, crackling or gurgling sounds while breathing, difficulty breathing and cyanosis; leading to respiratory and cardiac arrest) and High Altitude Cerebral Edema (characterized by the following: severe headache, ataxia, hallucinations and seizures; leading to unconsciousness and death.

If someone experiences signs and symptoms of either of these, they must be taken to a lower elevation without delay or they will die. For every 500 metres above sea level reduce the normal abilities of PS, PP, PE and SPD by 1. Over 1000 metres and the negative effects of cold must also be added.

### **Hypothermia**

Hypothermia is the lowering of the body temperature at a rate faster than the body can produce heat. Causes of hypothermia may be general exposure or the sudden wetting of the body by falling into a lake or spraying with fuel or other liquids. The initial symptom is shivering. This shivering may progress to the point that it is uncontrollable and interferes with an individual's ability to care for himself.

This begins when the body's core (rectal) temperature falls to about 35.5C. When the core temperature reaches 32C, sluggish thinking, irrational reasoning, and a false feeling of warmth may occur. Core temperatures of 30C and below result in muscle rigidity, unconsciousness, and barely detectable signs of life. If the victim's core temperature falls below 25C, death is almost certain. To treat hypothermia, rewarm the entire body. If there are means available, rewarm the person by first immersing the trunk area only in warm water of 37.7 to 43.3C.

Rewarming the total body in a warm water bath should be done only in a hospital environment because of the increased risk of cardiac arrest and rewarming shock.

### **Frostbite**

Exposure to severe cold can seriously injure characters. If a character spends time exposed to the cold without adequate protection (warm clothing or some kind of magic), he runs the risk of frostbite. For every half hour of exposure, the character suffers 1 point of damage to all affected areas. No armour protects against this damage. The gamemaster may increase the damage for exceptionally harsh conditions such

as snowstorms or being buried beneath an avalanche.

If the character remains in the cold long enough, he will eventually fall unconscious and freeze to death. When a character susceptible to frostbite suffers cold damage, the first points of that damage are applied to any vulnerable extremities for the purpose of determining whether frostbite occurs. If more than one body part is vulnerable and the damage cannot be distributed evenly among the parts, apply the “leftover” damage to the body part(s) named first, making the distribution as even as possible.

Frostbitten ears will cause discomfort and distraction; the victim takes a -1 penalty on all initiative rolls, and any opponent’s chance to surprise him is increased by 1 in 6. Severely frostbitten ears are numb; the victim suffers no noticeable discomfort, and the penalties given above no longer apply - but if the victim does not treat or receive treatment for the frostbite within two turns after it becomes severe, his ear(s) will be permanently damaged.

Frostbitten feet are a great hindrance to mobility and maneuverability for a character on foot; he moves at one-half normal speed and takes a -2 penalty to armour class in any situation that requires dodging ability or abrupt changes of position (such as defending himself in combat). Severely frostbitten feet are no longer painful, and because of this the character can once again move on foot at normal speed, but the penalty to armour class still applies.

A victim who is riding or being carried or is otherwise elevated so that his feet

are not touching the ground does not suffer either of the above penalties, but is still in danger of serious injury from the frostbite. If the victim does not receive treatment for severely frostbitten feet within one turn after the onset of that condition, his feet will be permanently damaged. A character with frostbitten hands has a -6 penalty to hit with any thrown or fired missile weapon, and is -4 to hit with a melee weapon. If his hands become severely frostbitten, the penalty to hit with a melee weapon lessens to -2, but the -6 penalty for missile weapons still applies.

### **Other Dangers**

Exposed skin can become sunburned even when the air temperature is below freezing. The sun's rays reflect at all angles from snow, ice, and water, hitting sensitive areas of skin; lips, nostrils, and eyelids. Exposure to the sun results in sunburn more quickly at high altitudes than at low altitudes. Apply sunburn cream or lip salve to your face when in the sun. The reflection of the sun's ultraviolet rays off a snow-covered area causes this condition.

The symptoms of snow blindness are a sensation of grit in the eyes, pain in and over the eyes that increases with eyeball movement, red and teary eyes, and a headache that intensifies with continued exposure to light. Prolonged exposure to these rays can result in permanent eye damage. A human needs to drink at least one quart of water each day, assuming he doesn’t get involved in any strenuous activity.

Others require less or more water, proportionate to their size. For each day that a character does not get sufficient water, he takes a -1 penalty to all PS, PP

and PE tests from dehydration (no armour provides protection).

Additionally, he receives a penalty to his recovery equal to the number of days he has gone without adequate water. This damage may be added to any damage inflicted by heat exposure.

If a character becomes exhausted when the effective temperature for that character is high enough to require a PE check for damage, then he has suffered heatstroke. He will immediately collapse, with a 50% chance of lapsing into unconsciousness. Even if he remains conscious, he will be incapable of moving or defending himself (unlike a normally exhausted character, who can still fight if necessary).

From this time until he recovers, all of his PE checks will automatically fail, and he will suffer maximum damage whenever damage from heat is indicated. The treatment for heatstroke involves much more than simply getting the victim into a tolerable environment - he must be cooled quickly and drastically by immersion in very cold water or by some magical means that cools him and keeps him cool for at least an hour.

If a heatstroke victim does not receive treatment within three turns after the onset of the condition, he will suffer a drop in constitution of one point per turn thereafter, and if constitution reaches zero, the character dies. If he is treated after the constitution loss has begun, he will naturally regain one point of constitution for every turn that he remains in the treatment up to a maximum of two-thirds (rounded up) of the points that were lost.

Clothing that becomes water-soaked will not be damaged as such, but if it is porous and becomes waterlogged by prolonged exposure to moisture it will lose some of its insulating quality until it is taken off and dried out. The wetness and loss of insulating ability may result in an alteration of the personal temperature for the character wearing the clothes.

Someone decked out in wet clothing when the environment is at an effective temperature of 30 degrees may be treated as if the effective temperature (for purposes of determining his personal temperature) was 10 degrees colder. Remember that clothing worn under metal armour is not necessarily safe from moisture, unless a character is completely covered with tight-fitting, leakproof armour - and this sort of attire can be dangerous in cool or cold weather, since it does not allow the body to "breathe" naturally.

Metal armour or equipment that is exposed to significant moisture will begin to rust if it is not dried off or dried out at least once every two days and oiled or otherwise protected at least once every two weeks. Rusted armour will not suffer a penalty to armour class, but the Dungeon Master may wish to allow the possibility that such armour will weaken or break if it is hit; for instance, if an opponent in melee combat makes an unmodified "to hit" roll of 20 and does more than four points of damage with a weapon, there is a 1 in 3 chance that the armour will crack or split and thereafter be treated as if it had an armour class one step worse.

On a second hit of this sort, the armour will break entirely and be useless until it

is repaired. Articles of leather (such as boots, armour, and backpacks or other accessory equipment) are not usually damaged by excess moisture as long as they are waterproofed periodically; even an item of leather that is not waterproofed will not be directly harmed by becoming waterlogged, but the water may seep through and moisten or harm materials (clothing, equipment, etc.) on the inside of the leather.

Boots are somewhat of an exception to this general statement; because of the stress they are under when they are being used, water-soaked boots may begin to come apart at the seams as the hide softens and weakens from being moistened. If boots are not thoroughly dried out once every two days or so, they may start to show signs of this deterioration.

Generally, the greatest danger to waterlogged leather is the owner's failure to dry it out properly. If too much heat is applied to the leather, it will certainly dry out - but in the process it will become cracked, and the seams will be weakened even more than they might have been if they had been allowed to remain wet. (Treat cracked leather armour the same as rusted metal armour for determining whether it is affected by a blow during combat.)

Leather gear should also be kept free of mud and grime; an excessive amount of dried mud can crack leather almost as quickly as an excessive application of heat. Rope expands when it gets wet. A knot made in a dry rope will be very difficult to untie quickly if the rope has been drenched in the meantime.

Conversely, a knot made with a wet rope will be weaker or looser, or both, after

the rope dries out. Certain items of equipment will be less useful, or perhaps altogether useless, if they take on moisture.

Vegetable matter may develop mold or begin to rot if it is kept for too long in a moisture-laden environment, especially at high temperatures. Nonmagical ink will run and bleed across the surface it is written on, making instructions and maps at least partially illegible. Spell scrolls, protection scrolls, and other types of magical writing are presumed to be written in waterproof ink - but the substance on which the ink was placed is not necessarily waterproof as well. Arrows that get wet will not fly true until the fletching is dried out; any character who is not a specialist in the use of his bow will take a -1 penalty "to hit" and damage when firing a waterlogged arrow.



## 4. Tornadoes

A tornado is a vortex of air rising into a cloud. In their early and mature stages all thunderstorms are characterized by rising air called updrafts. These updrafts supply the warm, humid air that fuels thunderstorms. But in some cases the column of rising air becomes a vortex, a funnel cloud or tornado. In a few cases the vortex becomes a strong tornado with wind whirling around at speeds close to 480kph. Often a tornado is located on the edge of the updraft, next to air that's coming down from the thunderstorm with falling rain or hail.

This is why a burst of heavy rain or hail sometimes announces a tornado's arrival. Air rising from the ground in the tornado vortex creates low air pressure near the ground which air rushes inward to fill. Such inflow winds can be damaging. In other words a house or auto doesn't have to be hit directly by the tornado to be damaged. The centre of the tornado's vortex is a low-pressure area. As air rushes into the vortex its pressure lowers, which cools the air. Cooling condenses water vapour in the air into the tornado's familiar funnel-shaped cloud. As the swirling winds pick up dust, dirt, and debris from the ground, the funnel turns even darker. Twisters that pick up little dirt can retain their white, cloud coloration.

Some tornadoes have taken on a red hue by picking up red dirt. Although the air is rising in a tornado the funnel itself grows from the cloud toward the ground as the tornado is forming. The term 'funnel cloud' refers to a tornado-like vortex that doesn't reach the ground. When a funnel cloud touches the ground, it becomes a tornado. Often, however, apparent funnel clouds are already

tornadoes. But the part nearest the ground is still invisible because cloud hasn't formed there and little dirt is being picked up. The lesson: Don't think you're safe near or under a funnel cloud.

Experts once thought tornado winds exceeded 800kph. But research in recent years including detailed analysis of movies and video tapes shows that winds rarely exceed 400kph and most tornadoes have winds of less than 112 mph. Tornadoes are also relatively small. An average tornado will be 400 to 150mtrs wide and travel 6 to 8 kilometres on the ground lasting only a few minutes. A mile wide tornado is an extremely large one and tornadoes this big are rare.

Many tornadoes are small, less than 30 metres wide, and last only a few minutes. A few monster tornadoes are a mile or more wide and can last for an hour or more. As the parent thunderstorm travels along tornadoes can come down from the cloud, run along the ground and lift back up to be followed by other tornadoes. Generally tornadoes move along the ground at around 32 to 76kph but some race along faster than 112kph. Often the most destructive tornadoes have smaller vortices, known as suction vortices rotating around the main vortex. These show up in some photos and leave distinctive, looped patterns in fields of corn or other crops knocked over by the winds.

### **Wind Damage Scale**

Forecasters and researchers use a wind damage scale created by T. Theodore Fujita to classify tornadoes and sometimes the damage done by other wind storms. The F for Fujita scale uses

numbers from 0 through 5. The ratings are based on the amount and type of wind damage. The scale had been calculated through F-12, which is Mach 1 the speed of sound (750 mph), but tornado wind speeds are not expected to reach these speeds. F-0 and F-1 tornadoes are considered weak, F-2 and F-3 are strong and F-4 and F-5 are violent. F-6 or higher rated tornadoes aren't thought to exist. The damage they would do would be inconceivable. The ratings are:

**F-0 Gale tornado (64-116kph):** Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.

**F-1 Moderate tornado (117 to 180kph):** The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.

**F-2 Significant tornado (181 to 251kph):** Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.

**F-3 Severe tornado (252 to 330kph):** Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.

**F-4 Devastating tornado (331 to 416kph):** Well-constructed houses levelled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

**F-5 Incredible tornado (417-509kph):** Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 metres; trees debarked; steel-reinforced concrete structures badly damaged.

**F-6 Inconceivable tornado (510-606kph):** These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F-4 and F-5 wind that would surround the F-6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F-6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.

<u>Scale</u>	<u>Wind Speed</u>	<u>Path Length</u>
-	0-64 kph	less than 0.5 kms
0	65-115 kph	0.6-1.5 kms
1	116-179 kph	1.6-4.9 kms
2	180-251 kph	5-16 kms
3	252-329 kph	17-50 kms
4	330-416 kph	51-159 kms
5	417-508 kph	160-504 kms

<u>Scale</u>	<u>Path Width</u>
-	less than 5.4 metres
0	5.5-6.5 metres
1	7-49.5 metres
2	50-67.5 metres
3	68-509.5 metres
4	510 metres -1 km
5	1.6-5 kms

## **Hurricanes**

Called typhoons or tropical cyclones in some parts of the world - form over all

of the world's tropical oceans except the South Atlantic and the South-eastern Pacific. In all parts of the world, a tropical storm has 63 kph to 117 kph winds. When the winds reach at least 118kph the storm becomes a hurricane, typhoon or tropical cyclone, depending on its location.

Technically, a cyclone is any kind of circular wind storm. But now, it is only used to describe a strong tropical storm found off of the coast of India.

Hurricanes and Typhoons are the same thing, but in different places. On the coast of Florida it is called hurricane.

In the Philippines, it is called typhoon. Hurricanes occur in the Atlantic and typhoons, in the Pacific. Basically, hurricanes and typhoons form over water and are huge, while tornadoes form over land and are much smaller in size. A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. In the United States, twister is used as a colloquial term for tornado.

## 5. Flying

Basic flight consists of turning, level flight, climbing, diving, and (usually) maintaining a minimum forward speed. Because a flying creature's ability to change direction is limited, and because flight takes place in three dimensions, you must know a creature's maneuverability rating, forward speed, direction of travel, and altitude to handle flying correctly.

### **Forward Speed**

Forward speed is the number of squares a flying creature traverses during the course of its movement for the round. Some flight manoeuvres (such as turning in place) use up flying movement but don't contribute to forward speed. Many flyers must maintain a minimum forward speed each round. If they fail to do so, they stall (see Minimum Forward Speed).

### **Direction of Travel**

Though the most games doesn't require you to keep track of which direction creatures face, flying movement usually restricts their ability to turn and that does require you to keep track of facing. For purposes of flying movement, a creature always faces the same direction as its movement.

When a creature ends its flying movement for the turn, place a mark or a marker on the grid so you know which direction in which it would travel. When it is time for the creature to move again, it resumes moving in that direction. The creature's direction of travel in no way limits where it can make melee or ranged attacks. A flying creature (if armed) threatens the spaces around it not matter what its maneuverability or which direction it flies.

**Altitude**

This is simply how high above the ground a flying creature happens to be. If keeping track of flyers' altitudes relative to the ground proves inconvenient, choose some other reference point, but make sure that all creatures in an aerial encounter use the same reference point to measure altitude. Altitude is measured from the ground (or other reference point) to the bottom of a flying creature's space.

The top of a creature's space usually sticks up above its altitude and the creature usually can reach up farther than that. If an aerial encounter contains creatures bigger than Medium size, it can prove helpful to indicate how high up each creature extends. Because maps and battle grids usually are two-dimensional, you must write down each flying creature's altitude at the end of its movement. It's usually best to record altitude directly on the grid. Several flying creatures can occupy the same square on your grid if they're at different altitudes.

**Minimum forward Speed**

If a flying creature fails to maintain its minimum forward speed, it must land at the end of its movement. If it is too high above the ground to land, it stalls. A creature in a stall falls straight down, descending 45 metres in the first round of falling. If this distance brings it to the ground, it takes falling damage. If the fall doesn't bring the creature to the ground, it must spend its next turn recovering from the stall. It must succeed on a PP save to recover. Otherwise it falls another 90 metres.

If it hits the ground, it takes falling damage. Otherwise, it has another

chance to recover on its next turn. Keep track of minimum forward speed by the turn, not by the move. As noted earlier, only moving from square to square counts toward minimum forward speed. Movement spent turning in place doesn't count. In some cases, a creature may spend part of its turn on the ground (or perhaps on a flying mount or flying device). If the creature uses a move or standard action on the ground, it need maintain only half its minimum forward speed once it takes to the air. If a flying creature moves along the ground and then takes to the air as part of the same move action, it must maintain all of its minimum forward speed to avoid stalling.

**Hover**

Hover is the ability to stay in one place while airborne. It can instead hover as a move action and, as part of that move action, can move at half speed in any direction it likes (including straight up, straight down, or backward). Before or after it moves, the hovering creature can turn to face any direction it likes. When it stops hovering, it can resume ordinary flight in any direction in which it could normally fly. Before or after it does this hovering movement, the creature can turn to face any direction it likes.

When it stops hovering, the creature can resume ordinary flight in any direction in which it could normally fly. If a creature begins its turn hovering, it can hover in place for the turn (no matter what its maneuverability) and take a full-round action. A hovering creature cannot make wing attacks, but it can attack with all other limbs and appendages it could use in a full attack. The creature can instead use a breath weapon or cast a spell

instead of making physical attacks, if it could normally do so.

### **Move Backward**

This is the ability to move backward without turning around.

### **Reverse**

A creature can use up 1.5 metres of its speed to start flying backward.

### **Turn**

How much the creature can turn after covering the stated distance.

### **Turn in Place**

A creature can use some of its speed to turn in place. (This represents the creature slowing down and banking hard to make a tight turn.) The extra movement spent turning does not count toward minimum forward speed; a creature that turns too sharply at low speeds stalls.

### **Maximum Turn**

This is how much the creature can turn in any one space. No matter how much movement the creature spends on turning, it can't change direction more than this in a single square.

### **Up Angle**

The up angle is the maximum angle at which the creature can climb through the air. A creature with an up angle of 60° must move ahead at least 1.5 metres for every 3 metres it climbs. A creature with an up angle of 45° must move ahead at least 1.5 metres for every 1.5 metres it climbs.

### **Up Speed**

Up speed is how fast the creature can move while gaining at least 3 metres of altitude; this represents the energy the

flyer loses when climbing. The creature cannot expend more movement than its up speed allows, even if that movement is not forward movement. If the creature climbs and dives in the same turn, any bonus movement it gains from the dive is not limited by the creature's up speed.

### **Down Angle**

The down angle is the maximum angle at which the creature can dive through the air. A creature with a down angle of 45° must move ahead at least 1.5 metres for every 1.5 metres it climbs.

### **Down Speed**

Any flying creature can fly down at twice its normal flying speed. An easy way to track diving movement is to allow it 1.5 metres of bonus movement for every 1.5 metres it descends, to a maximum of twice its normal flying speed. The creature can use the extra movement for any kind flying movement it normally could perform, except for hovering. Downward movement in a stall or freefall does not increase a creature's speed. Instead, the creature falls straight down at a fixed rate.

### **Between Down and Up**

An average, poor, or clumsy flier must fly level for a minimum distance after descending and before climbing (but it can turn). Any flier can begin descending after a climb without an intervening distance of level flight.

### **Climbing and Diving in a Tight Space**

Creatures that cannot fly straight up usually can ascend in a spiral by circling as they climb. Because most creatures that can't fly straight up also have minimum forward speeds of half their base flying speeds and can move at only half speed when climbing, its difficult

for them to turn in place while climbing because doing so requires them expend extra movement that does not count as forward movement (though many creatures can do so by making a double move).

A creature's up angle also determines how much altitude it can gain during a move action. Likewise, creatures that cannot fly straight down can descend in a spiral. Because creatures that have a limited down angles cannot turn in place, they cannot make their descending spirals any tighter than their turning radius normally allows. Because flying creatures descend at two to four times the speed they can ascend (most creatures ascend at half speed but descend at double speed), they lose altitude far more quickly than they can gain it.

### **Stalling and Freefalling**

Stalling represents the failure of a flying creature's wings (or other motive agent) to keep the creature aloft. A stalling creature falls, but its wings provide considerable drag and tend to slow the creature's fall. As noted earlier, a creature falls 45 metres during the first round spent stalling, and it falls 90 metres each round thereafter.

Wingless flyers that stall still have some residual lift and fall more slowly than non-flyers. A flying creature that cannot maintain its minimum forward speed because it has been rendered unconscious, has become paralyzed, has become magically held, or becomes unable to move for some other reason stalls at the beginning of its first turn after the debilitating effect occurs.

A stalling creature can take no actions, except to recover from the stall. It loses its PP bonus while stalling. A stalling creature falls more or less straight down, but it also tumbles and spins erratically. Melee or ranged attacks made against a stalling creature have a 20% miss chance.

A nonflyer (or flyer falling through the air) freefalls rather than stalls. A creature in freefall drops 150 metres the first round and 300 metres each round thereafter. While in freefall, a creature can attempt a single action each round. It must make a PP or PS check to avoid dropping any item it tries to use. Spellcasting is possible, but doing so requires a Concentration check.

### **Deliberately Freefalling**

A flying creature can simply stop flying and allow itself to drop like a stone. Exiting a freefall requires a full-round action (during which the creature falls 150 or 300 metres).

### **Fast Freefalls**

A creature with a fly speed can propel itself downward as a move action, adding up to twice its flying speed to the distance it freefalls.

### **Catching**

As a full-round action, a flyer can catch a freefalling creature or object, or a stalling creature, provided that the falling creature or object is at least one size category smaller than the creature attempting the catch. To make the catch, the creature must make a successful melee touch attack to grab the falling creature or object (a creature can voluntarily forego any PP bonus if desired).



If the grab succeeds, the catching creature must make a PP save to keep flying. If the save fails by 4 or less, the catcher drops the falling creature or object. If the save fails by 5 or more, the catcher drops the falling creature or object and stalls if it has a minimum forward speed. If the catcher does not have a minimum forward speed, it falls D4 x3 metres.

### **Obstacles and Collisions**

Because flying creatures cannot always change direction when they wish to, they must take great care to avoid blundering into obstacles or into other creatures. To turn and avoid an obstacle at its own altitude, a flying creature must be able to turn in place. If it cannot turn in place, it needs at least 1.5 metres of space between it and the obstacle if it wishes to turn to avoid a collision (because in an aerial turn you move into the square ahead of you and then turn left or right 45°). It cannot move diagonally past a corner in the air or on the ground, so any turn you make must carry you past an obstacle's corner before you can fly past it.

If turning to avoid an obstacle isn't possible, it may be possible to climb over or dive under the obstacle. A creature with maximum up or down angle of 45° needs at least 1.5 metres of clear space between it and an obstacle for every 1.5 metres it must climb or dive to get over or under the obstacle (you can't move past a corner on a diagonal, even when climbing or diving). A creature with a maximum up or down angle of 60° needs at least 1.5 metres of clear space between it and an obstacle for every 3 metres it must climb or dive to get over or under the obstacle.

Flying past another creature works much like flying past an obstacle except that you can move on a diagonal to get past a creature. This makes it slightly easier to pass by without colliding. If you fly into an obstacle and you cannot land there, you must make a PP save to avoid damage. If you fail the save, you and the object you strike take damage as though an object of your weight fell a distance equal to half your flying speed before you hit. (If it isn't clear what your speed before the collision was, use your flying speed during your previous turn.) Your flying movement stops when you strike, forcing you to stall (even if you don't have a minimum forward speed) and fall straight down.

If you're still conscious after the collision, you can make PP check to catch yourself and keep from falling. You can freely pass through your allies' spaces in the air just as you can on the ground. If you fly into a creature that is not your ally, you effectively attempt to overrun it. You can execute a bull rush against the creature instead, if you wish. An overrun or bull rush normally requires a standard action.

If you accidentally enter an enemy's space you must make a PP save; if you fail, you stall (even if you don't have a minimum forward speed). If you succeed, you can continue with your accidental bull rush or overrun, but you suffer a -4 penalty to all the opposed checks you make to resolve the bull rush or overrun.

As with an overrun attack, the creature can decide not to block your movement, though this might cause the creature to stall (see the section on overruns). If so, you simply move through its space (even

if you decide to bull rush the creature). You cannot stop in another creature's square, however, and if your speed isn't sufficient to carry you through the other creature's space, you must attempt an overrun or bull rush.

If the creature is too small to overrun, you must try to bull rush it instead if you can't pass through its space. If the creature is too big to overrun, you strike it just as if it were an obstacle, and you and the creature take nonlethal damage.

Both you and the creature you strike make PP saves to avoid damage, but the creature you strike gets a +4 bonus for each size category it is bigger than you. You stall just as if you struck an obstacle. The creature you strike stalls if it fails its PP save.

### Actions while Flying

Most actions work exactly the same way in the air as they do on the ground; exceptions are noted here. A creature with a minimum forward speed usually cannot use full-round actions in the air unless those actions allow it to move forward at least at its minimum speed. Flying spellcasters can cast their spells without too much difficulty; however, aerial spellcasters often encounter some problems other spellcasters do not. The rules for flanking apply in the air. It is possible, however, to flank a flying creature from the top and bottom.

Aerial combat takes place in three dimensions, and each flying creature occupies a roughly cubical space and can reach above and below itself. An aerial bull rush requires the attacker to ram a foe, which can prove risky for both the attacker and the defender. Flying creatures can use the charge action. A

flying charge must be in straight line and most cover at least 3 metres (2 squares). A flyer can charge while diving, but not while gaining more than 1.5 metres altitude.

### High Wind Speeds

Flying in high winds adds penalties on your Fly checks as noted below.

"Halted" means that creatures of that size or smaller must succeed on a PP fly check to move at all so long as the wind persists. "Pushed back" means that creatures of that size or smaller must make a PP Fly check or be blown back  $2D6 \times 3$  metres and take  $2D6$  points of nonlethal damage. This check must be made every round the creature remains airborne. A creature that is blown away must still make a PP fly check to move due to also being checked.

Wind Force	Speed	Halted
Light	0-16kph	
Moderate	17-32kph	
Strong	33-48kph	Tiny
Severe	49-80kph	Small
Storm	81-119kph	Medium
Hurricane	120-279kph	Large
Tornado	280kph+	Huge

Wind Force	Pushed Back	Penalty
Strong		-2
Severe	Tiny	-4
Storm	Small	-8
Hurricane	Medium	-12
Tornado	Large	-16

### Speed

How fast the wind is in kilometres per hour.

### Halted

What size lifeform or object is halted by the wind and unable to move forward.

**Pushed Back**

What size lifeform or object is thrown back by the wind.

**Penalty**

Effect on SPD

## 7. Sky Combat

Air to air combat can be broken down into essentially two elements; combat which occurs without the opponents seeing each other and the more direct Dogfighting.

Long distance combat involves little maneuvering, just two or more aircraft separated by dozens of miles, using their radar and other sensors to line up missile shots. This sort of aerial sniping merely requires the pilot to make a successful Pilot skill roll to detect the enemy in the first place, and then a successful strike roll prior to each shot.

The biggest issue with modern combat is missile velocity and range. Some missiles (especially medium range and long range missiles) can take several melees to reach their target. The defender can attempt to dodge or shoot down the incoming missile, but the missile can lock back on the next melee (with nothing but the missiles onboard guidance bonus). If the relock on fails the next melee, the missile has lost the target entirely.

Dogfighting involves the attacker and defender each maneuvering to place each other in their sights, while attempting to prevent the other from doing so. They manoeuvre in three dimensions accelerating, braking, diving, climbing, and turning to exploit their aircrafts capabilities.

Each player in initiative order chooses a target at the start of each melee round. The target chosen must then choose their response. Available options are for the pilot to attempt to escape the dogfight, the pilot to try to outmaneuver the other and get into a firing position, or for the

pilot to focus on attacking another target at the risk of being shot down in the process.

The participants roll a D20 and add their modifiers. Whichever player has the higher result has managed to manoeuvre into position to fire at their target. The faster an aircraft travels, the less maneuverable it becomes. As a result it is rare for dogfighting to occur at supersonic speeds. Basically there's a -1 penalty for every level of Mach speed, thus Mach 3 would incur a -3 modifier.

Aircraft and sky mounts move just like ground vehicles, but fixed-wing aircraft (airplanes and jets but not helicopters or craft capable of Vertical Take-Off and Landing) can never go below one quarter of their Top Speed while flying or they stall and automatically lose D4 metres of altitude at the end of their movement.

Should an aircraft hit the ground while moving forward, it suffers damage normally for its current speed (D6 per 1.5 metres of movement, rounded down). A wrecked aircraft plummets 6 metres toward the ground immediately on being wrecked, then 12 metres per round afterward. Damage for anyone on board the aircraft when it hits is figured as usual.

A pilot can try to save his aircraft—even if it is wrecked—by making a crash landing. This is a Piloting roll at -4. If he makes it, halve the damage for the landing. If the roll is failed, the craft takes damage as usual.

### **Aerial Initiative:**

Initiative works in aerial combat much the same way as it does in standard combat, except for one important difference. Flying creatures with an Intelligence of 8 or more roll initiative and take all their actions separately from their rider. Otherwise, the rider rolls initiative both for himself and his mount.

If the rider chooses to allow his mount to fly without direction, the mount moves on its initiative count and the rider may use his actions as normal. Otherwise, a rider must use a move-equivalent action to direct his mount as normal. In this case, the mount delays its action to the rider's count or moves on the rider's initiative, as appropriate. Remember that a Ride check may be necessary for mounts that are not trained for combat.

Unlike in standard combat, in air combat the direction in which a flying creature points is often extremely important. Facing determines which direction the creature must move and dictates manoeuvres for flyers. A flying creature can only attack a creature in its front arc. A creature's front arc extends in a straight line to the right and left of its current position and all areas extending out from that line in the direction of the creature's current facing.

The remaining area behind the creature is its rear arc. These flyers cannot simply turn around to confront an enemy that approaches from the rear, as per the standard flight maneuverability rules. Some have the ability to hover in place. These creatures have neither a front or rear arc.

Much like ground combatants, they can respond to threats and direct their attacks

in any direction. A creature that attacks an enemy while in its rear arc is considered to have flanked its target. Flying creatures with levels in barbarian or rogue gain the benefit of their uncanny dodge ability when attacked from their rear arc in aerial combat. These nimble flyers are capable of tracking opponents in their rear arc and responding to their attacks.

### **Aerial Manoeuvres:**

**Stunt (-2):** A plane on the table-top that needs to perform a barrel roll, fly through a narrow canyon, storm through a barn, or some other fantastic stunt may appear to move in a straight line, but must actually make important but minute adjustments. All of these efforts require a Piloting roll. Failure means the aircraft goes out of control.

**Pop-Up (0):** Helicopters, VTOLs, and other aircraft capable of hovering can hide behind cover, rise, attack, and then descend again—usually before the stunned enemy can react. This manoeuvre simply allows the pilot to ascend above an obstacle and then descend again in the same move, so that he's only vulnerable to opponents with Hold actions. It takes a Piloting roll to ascend and fire in time to descend again. If failed, the craft simply stays at its firing altitude or fails to fire—pilot's choice.

**Power Dive (0):** A pilot can enter a controlled power dive by making a Piloting roll. If failed, he loses control. If successful, he may descend up to 24 metres per round.

**Sharp Turn (-1):** You may use expert handling to make more turns in a round, or sharper turns, than your plane could normally make. Determine how many extra turns you wish to make that round. If you wish to make an especially sharp turn (i.e., make 2-45 degree turns in a space instead of only 1) each additional 45 degree turn in the space counts as an extra turn for this purpose. Thus, a ship that can normally make 2 turns per round that instead wants to make 3 turns all in the same space would count as making 3 extra turns for this purpose (1

extra turn, +2 for making two additional turns in the same space). If this check is made successfully, the plane turns as desired.

**Climb (0):** By turning a ship up, the pilot can ascend quicker than normal, adding the ship's normally-horizontal movement to the distance climbed. Just as when diving, standing creatures must pass a PP save or fall prone. Climbing is similar to diving, except only half of the horizontal movement sacrificed is added to the distance climbed. Failing the pilot check causes the ship to stall and go into freefall (described under conditions below).

**Defensive Piloting (-1):** You take evasive action, granting your vehicle an extra +1 dodge bonus.

**Offensive Piloting (-1):** You manoeuvre your vehicle in such a way as to aid your gunners. Any attack roll made by a creature aboard your vehicle against a target not aboard your vehicle gains a +1 bonus to their strike roll.

**Ram (0):** When two planes enter the same space at the same altitude band, there is a chance they will crash into each other. Other times, the pilot of a plane may deliberately crash into a building or creature in an attempt to destroy it. When a plane crashes into another plane, creature, or object, they are performing a ramming manoeuvre. If both ship pilots want to ram each other, the ram happens automatically. If both pilots don't wish to ram each other, the ram does not happen. When one party wants to ram and the other doesn't, the pilot attempting to initiate the ram makes an attack roll against their intended

target. There are three ways one ship may ram another:

**Head-on Collision:** When two ships ram into each other, their speeds are added together. Each ship suffers an additional D6 damage for every point of their combined speeds.

**Side Collision:** When one ship rams into the side of another ship, both ships suffer D6 points of damage for every point of the ramming ship's speed.

**Back Collision:** When one ship rams into the back of another ship, subtract the speed of the targeted ship from the speed of the ramming ship. Both ships suffer D6 damage for every point left in the ramming ship's speed (minimum: 0). If a ship is equipped with a ram, it deals extra damage when performing a ramming manoeuvre and only suffers half damage itself when it rams into another target.

If two ships ram into each other (a head-on collision) and both are equipped with rams, they both only deal half damage to each other. If a ramming ship is more than one location wide and rams a ship more than one location wide or long, both ship's suffer ramming damage in every location struck by the other ship.

**Called Shot (-2):** When firing weapons at a ship, it is possible to make a Called Shot, firing not just at a location, but at an individual Hardpoint/Deck. This becomes an especially useful tactic when targeting a vehicle's engine, sails, or attempting to blow a hole in their cargo bay to aid in boarding. Any damage dealt with a called shot is still subtracted from the location's total SDC (up to the total addition that Hardpoint or Deck



made to the location's total SDC), but is also tracked separately as well. When a Hardpoint/Deck is reduced to 0 SDC, it is destroyed and anything within that Deck or Hardpoint suffers all excess damage.

**Flat-Hatting (-2):** This is a dangerous manoeuvre, but it can save a pilot's life. Flat-hatting is flying at high speed at barely above ground level. It requires a Piloting roll every round to avoid the various obstacles, including the Earth itself. Unless your opponent is also flat-hatting, you gain a minimum concealment of -2 and other aircraft must make a Notice roll each round to pick out your position.

**Perch (-1):** Most air combat takes place on generally the same level as the pilots jockey so one does not get the height advantage. By using this manoeuvre and getting a raise on an opposed Piloting roll, a pilot can get that height advantage on his opponent. This gives the pilot a +2 bonus to attack rolls. Unlike Tail (below), the pilot must get a raise on his Piloting roll each round to maintain the advantage.

**Tail (0):** The pilot must move into a square adjacent to another plane and then makes an opposed Piloting roll with the other pilot. If the initiating pilot can get a raise, they are considered tailing the other plane. The tailing plane moves with the other plane and gains a +2 bonus to attack rolls. It is impossible for a slower plane to tail a faster plane for more than one round.

**Shake a Tail (0):** A pilot that is being tailed can attempt to lose his pursuer. This is a simple opposed Piloting roll, only the tailing plane gets a +2 bonus. If

successful, the plane takes its movement, leaving the tail behind. With a raise, the pilot can choose to reverse positions, and tail his old pursuer. If the tailed plane has a lower stall speed than his pursuer, the pilot gains the difference as a bonus to his Piloting roll.

**Rolling:** Sometimes, when a pilot attempts a sharp turn unsuccessfully, they can cause their plane to roll in the air. When a vehicle begins to roll, every creature aboard must pass a PP save to secure themselves, or slide off the end of the vehicle, falling to the ground below. If a target is tethered to the vehicle they fall prone if they fail this check, but otherwise do not slide off.

When a vehicle begins to roll, the pilot has one round to attempt to correct the vehicle with a piloting check. If they fail (or if they are unable to make this check), then the next round the vehicle turns completely upside down; all targets still aboard the vehicle must pass another PP save to hold on tightly, or be dropped to the ground below. At this point, the pilot must pass a piloting check to correct the vehicle. If they fail or are unable to make this check, the vehicle stalls.